ICP Metals

Method SW6010

Calibration Blanks

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: CCB4
QC Type: Continuing Calibration

Run ID: IT100309-2A1
Date Analyzed: 03/09/2010
Time Analyzed: 12:28:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

20000830

Data Package ID: *IT1003063-1*

ICP Metals

Method SW6010

Calibration Blanks

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: CCB5
QC Type: Continuing Calibration

Run ID: IT100309-2A1
Date Analyzed: 03/09/2010
Time Analyzed: 12:51:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

20000831

Data Package ID: *IT1003063-1*

ICP Metals

Method SW6010

Calibration Blanks

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: CCB6
QC Type: Continuing Calibration

Run ID: IT100309-2A1
Date Analyzed: 03/09/2010
Time Analyzed: 1:12:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

20000832

Data Package ID: *IT1003063-1*

ICP Metals

Method SW6010

Calibration Blanks

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: CCB7
QC Type: Continuing Calibration

Run ID: IT100309-2A1
Date Analyzed: 03/09/2010
Time Analyzed: 1:34:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

20000833

Data Package ID: *IT1003063-1*

ICP Metals

Method SW6010

Calibration Blanks

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: CCB8
QC Type: Continuing Calibration

Run ID: IT100309-2A1
Date Analyzed: 03/09/2010
Time Analyzed: 1:55:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

20000834

Data Package ID: *IT1003063-1*

ICP Metals

Method SW6010

Calibration Blanks

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: CCB9
QC Type: Continuing Calibration

Run ID: IT100309-2A1
Date Analyzed: 03/09/2010
Time Analyzed: 2:19:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

20000835

Data Package ID: *IT1003063-1*

ICP Metals

Method SW6010

Calibration Blanks

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: CCB10
QC Type: Continuing Calibration

Run ID: IT100309-2A1
Date Analyzed: 03/09/2010
Time Analyzed: 2:40:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

20000836

Data Package ID: *IT1003063-1*

ICP Metals

Method SW6010

Calibration Blanks

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: CCB11
QC Type: Continuing Calibration

Run ID: IT100309-2A1
Date Analyzed: 03/09/2010
Time Analyzed: 2:54:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

20000837

Data Package ID: *IT1003063-1*

ANTIMONY

Method SW6010

Calibration Blanks

Lab Name: **ALS Laboratory Group -- FC**
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Run ID: IT100310-2A1
Result Units: MG/L

Lab ID	Verification Type	Date Analyzed	Time Analyzed	Result	Reporting Limit	Flag
ICB	Initial Calibration	3/10/2010	10:44	0.02	0.02	U
CCB1	Continuing Calibration	3/10/2010	10:53	0.02	0.02	U
CCB2	Continuing Calibration	3/10/2010	11:15	0.02	0.02	U
CCB3	Continuing Calibration	3/10/2010	11:37	0.02	0.02	U
CCB4	Continuing Calibration	3/10/2010	11:59	0.02	0.02	U
CCB5	Continuing Calibration	3/10/2010	12:17	0.02	0.02	U
CCB6	Continuing Calibration	3/10/2010	13:39	0.02	0.02	U
CCB7	Continuing Calibration	3/10/2010	14:00	0.02	0.02	U
CCB8	Continuing Calibration	3/10/2010	14:22	0.02	0.02	U
CCB9	Continuing Calibration	3/10/2010	14:43	0.02	0.02	U
CCB10	Continuing Calibration	3/10/2010	15:05	0.02	0.02	U
CCB11	Continuing Calibration	3/10/2010	15:28	0.02	0.02	U
CCB12	Continuing Calibration	3/10/2010	15:50	0.02	0.02	U
CCB13	Continuing Calibration	3/10/2010	16:00	0.02	0.02	U

CALCIUM

Method SW6010

Calibration Blanks

Lab Name: **ALS Laboratory Group -- FC**
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Run ID: IT100310-2A1
Result Units: MG/L

Lab ID	Verification Type	Date Analyzed	Time Analyzed	Result	Reporting Limit	Flag
ICB	Initial Calibration	3/10/2010	10:44	1	1	U
CCB1	Continuing Calibration	3/10/2010	10:53	1	1	U
CCB2	Continuing Calibration	3/10/2010	11:15	1	1	U
CCB3	Continuing Calibration	3/10/2010	11:37	1	1	U
CCB4	Continuing Calibration	3/10/2010	11:59	1	1	U
CCB5	Continuing Calibration	3/10/2010	12:17	1	1	U
CCB6	Continuing Calibration	3/10/2010	13:39	1	1	U
CCB7	Continuing Calibration	3/10/2010	14:00	1	1	U
CCB8	Continuing Calibration	3/10/2010	14:22	1	1	U
CCB9	Continuing Calibration	3/10/2010	14:43	1	1	U
CCB10	Continuing Calibration	3/10/2010	15:05	1	1	U
CCB11	Continuing Calibration	3/10/2010	15:28	1	1	U
CCB12	Continuing Calibration	3/10/2010	15:50	1	1	U
CCB13	Continuing Calibration	3/10/2010	16:00	1	1	U

ICP Metals

Method SW6010

ICP Interference Check Sample

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Run ID: IT100309-2A1
Date Analyzed: 03/09/2010
Result Units: MG/L

CASNO	Target Analyte	Spike Added		Results		% Rec.
		ICSA1	ICSAB1	ICSA1	ICSAB1	
7429-90-5	ALUMINUM	250	250	262	265	106
7440-36-0	ANTIMONY		0.6		0.607	101
7440-38-2	ARSENIC		0.1		0.10800	108
7440-39-3	BARIUM		0.5		0.50700	101
7440-41-7	BERYLLIUM		0.5		0.47400	95
7440-43-9	CADMIUM		1		1	100
7440-70-2	CALCIUM	250	250	262	262	105
7440-47-3	CHROMIUM		0.5		0.466	93
7440-48-4	COBALT		0.5		0.464	93
7440-50-8	COPPER		0.5		0.52600	105
7439-89-6	IRON	100	100	107	108	108
7439-92-1	LEAD		0.05		0.05350	107
7439-95-4	MAGNESIUM	250	250	269	271	108
7439-96-5	MANGANESE		0.5		0.463	93
7440-02-0	NICKEL		1		0.926	93
7440-09-7	POTASSIUM					
7782-49-2	SELENIUM		0.05		0.0554	111
7440-22-4	SILVER		0.2		0.203	102
7440-23-5	SODIUM					
7440-28-0	THALLIUM		0.1		0.10800	108
7440-62-2	VANADIUM		0.5		0.47600	95
7440-66-6	ZINC		1		0.877	88

20000840

Data Package ID: *IT1003063-1*

ICP Metals

Method SW6010

ICP Interference Check Sample

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Run ID: IT100309-2A1
Date Analyzed: 03/09/2010
Result Units: MG/L

CASNO	Target Analyte	Spike Added		Results		% Rec.
		ICSA2	ICSAB2	ICSA2	ICSAB2	
7429-90-5	ALUMINUM	250	250	270	273	109
7440-36-0	ANTIMONY		0.6		0.616	103
7440-38-2	ARSENIC		0.1		0.11	110
7440-39-3	BARIUM		0.5		0.51800	104
7440-41-7	BERYLLIUM		0.5		0.49900	100
7440-43-9	CADMIUM		1		1	100
7440-70-2	CALCIUM	250	250	270	273	109
7440-47-3	CHROMIUM		0.5		0.48800	98
7440-48-4	COBALT		0.5		0.487	97
7440-50-8	COPPER		0.5		0.538	108
7439-89-6	IRON	100	100	110	112	112
7439-92-1	LEAD		0.05		0.05730	115
7439-95-4	MAGNESIUM	250	250	281	286	114
7439-96-5	MANGANESE		0.5		0.48300	97
7440-02-0	NICKEL		1		0.94900	95
7440-09-7	POTASSIUM					
7782-49-2	SELENIUM		0.05		0.0591	118
7440-22-4	SILVER		0.2		0.20800	104
7440-23-5	SODIUM					
7440-28-0	THALLIUM		0.1		0.11200	112
7440-62-2	VANADIUM		0.5		0.49500	99
7440-66-6	ZINC		1		0.94900	95

20000841

Data Package ID: *IT1003063-1*

ICP Metals

Method SW6010

ICP Interference Check Sample

Lab Name: **ALS Laboratory Group -- FC**

Work Order Number: 1003063

Client Name: Weston Solutions, Inc.

ClientProject ID: Paguate TO0019100202

Run ID: IT100310-2A1

Date Analyzed: 03/10/2010

Result Units: MG/L

CASNO	Target Analyte	Spike Added		Results		% Rec.
		ICSA1	ICSAB1	ICSA1	ICSAB1	
7440-36-0	ANTIMONY		0.6		0.60100	100
7440-70-2	CALCIUM	250	250	258	261	104

20000842

Data Package ID: *IT1003063-1*

ICP Metals

Method SW6010

ICP Interference Check Sample

Lab Name: **ALS Laboratory Group -- FC**

Work Order Number: 1003063

Client Name: Weston Solutions, Inc.

ClientProject ID: Paguate TO0019100202

Run ID: IT100310-2A1

Date Analyzed: 03/10/2010

Result Units: MG/L

CASNO	Target Analyte	Spike Added		Results		% Rec.
		ICSA2	ICSAB2	ICSA2	ICSAB2	
7440-36-0	ANTIMONY		0.6		0.608	101
7440-70-2	CALCIUM	250	250	263	265	106

20000843

Data Package ID: *IT1003063-1*

ICP Metals

Method SW6010

ICP Interference Check Sample

Lab Name: **ALS Laboratory Group -- FC**

Work Order Number: 1003063

Client Name: Weston Solutions, Inc.

ClientProject ID: Paguate TO0019100202

Run ID: IT100310-2A1

Date Analyzed: 03/10/2010

Result Units: MG/L

CASNO	Target Analyte	Spike Added		Results		% Rec.
		ICSA3	ICSAB3	ICSA3	ICSAB3	
7440-36-0	ANTIMONY		0.6		0.608	101
7440-70-2	CALCIUM	250	250	262	269	107

20000844

Data Package ID: *IT1003063-1*

Metals Linear Ranges

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Instrument ID: ICPTrace2
Active Date: 03/02/2010
Expiration Date: 05/31/2010

CASNO	Target Analyte	Concentration (ppm)
7429-90-5	ALUMINUM	500
7440-36-0	ANTIMONY	2
7440-38-2	ARSENIC	5
7440-39-3	BARIUM	10
7440-41-7	BERYLLIUM	1
7440-43-9	CADMIUM	5
7440-70-2	CALCIUM	500
7440-47-3	CHROMIUM	10
7440-48-4	COBALT	5
7440-50-8	COPPER	10
7439-89-6	IRON	200
7439-92-1	LEAD	10
7439-95-4	MAGNESIUM	500
7439-96-5	MANGANESE	10
7440-02-0	NICKEL	10
7440-09-7	POTASSIUM	250
7782-49-2	SELENIUM	5
7440-22-4	SILVER	2
7440-23-5	SODIUM	250
7440-28-0	THALLIUM	5
7440-62-2	VANADIUM	5
7440-66-6	ZINC	10

20000845

ICP Interelement Correction Factors

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Instrument ID: ICPTrace2
Active Date: 11/17/2009
Expiration Date: 11/17/2010

Analyte	Lamda (nm)	Al	Sb	As	Ba	Be	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Ni	Th
ALUMINUM																	
ANTIMONY									0.0103504								
BERYLLIUM																	
CADMIUM				0.0068507													
CHROMIUM																	
COBALT					-0.001400												
COPPER																	
LEAD		0.0002386										0.0000243					
SELENIUM												0.000036					
SILVER																	
THALLIUM												-0.000142			-0.000176		
VANADIUM												-0.000194					

20000846

ICP Interelement Correction Factors

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Instrument ID: ICPTrace2
Active Date: 11/17/2009
Expiration Date: 11/17/2010

Analyte	Lamda (nm)	K	Se	Ag	Na	Tl	V	Zn	Sn	Ti	Mo	Li	Sr	B	Si	U	Zr
ALUMINUM							0.0125517				0.0033239					-0.028003	
ANTIMONY											-0.008489						
BERYLLIUM							0.0010513										
CADMIUM																	
CHROMIUM																0.0005333	
COBALT										0.002105							
COPPER																0.0007767	
LEAD										0.0002142	-0.001821					0.0009113	
SELENIUM																0.0000151	
SILVER																0.0006982	
THALLIUM							0.0006359			-0.000251						-0.000582	
VANADIUM																	

20000847

ICPTrace2 Run Log -- 3/9/2010

Instrument ID: ICPTrace2
File Name: 100309A.
AnalRunID: IT100309-2A1
CalibRefID: IT100309-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		MIXBHIGH	1	3/9/2010	10:48
		MIXAHIGH	1	3/9/2010	10:50
		MIXCHIGH	1	3/9/2010	10:52
		ICV	1	3/9/2010	11:12
		ICB	1	3/9/2010	11:13
		CRI1	1	3/9/2010	11:15
		ICSA1	1	3/9/2010	11:17
		ICSAB1	1	3/9/2010	11:19
		CCV1	1	3/9/2010	11:21
		CCB1	1	3/9/2010	11:24
		IP100308-1MB	1	3/9/2010	11:26
		IP100308-1RVS	1	3/9/2010	11:27
		IP100308-1LCS	1	3/9/2010	11:29
- S	RP-SW-02	1003063-4	1	3/9/2010	11:31
- S	RP-SW-02	1003063-4DUP	1	3/9/2010	11:33
- S	RP-SW-02	1003063-4SER	5	3/9/2010	11:34
- S	RP-SW-02	1003063-4MS	1	3/9/2010	11:36
- S	RP-SW-02	1003063-4MSD	1	3/9/2010	11:38
- Ca,Mg,Na,S,Sr,Th	JM-SW-02	1003063-7	1	3/9/2010	11:40
- S	RP-JM-SW	1003063-10	1	3/9/2010	11:41
		CCV2	1	3/9/2010	11:43
		CCB2	1	3/9/2010	11:45
- S	RP-JM-SW-01	1003063-11	1	3/9/2010	11:47
- S	RM-JM-SW	1003063-15	1	3/9/2010	11:49
- S	RP-SW-01	1003063-17	1	3/9/2010	11:50
- S	RP-SW-01D	1003063-18	1	3/9/2010	11:52
		IP100308-2MB	1	3/9/2010	11:54
		IP100308-2RVS	1	3/9/2010	11:56
		IP100308-2LCS	1	3/9/2010	11:58
		IP100308-2LCSD	1	3/9/2010	11:59
- S		1002238-1	1	3/9/2010	12:01
		1002238-2	1	3/9/2010	12:03
		CCV3	1	3/9/2010	12:05
		CCB3	1	3/9/2010	12:06
		1002238-3	1	3/9/2010	12:08

20000848

Data Package ID: IT1003063-1

20000848

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

ICPTrace2 Run Log -- 3/9/2010

Instrument ID: ICPTrace2
File Name: 100309A.
AnalRunID: IT100309-2A1
CalibRefID: IT100309-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
- S		1002238-4	1	3/9/2010	12:10
		1002238-5	1	3/9/2010	12:12
- S		1002238-6	1	3/9/2010	12:14
		1002238-7	1	3/9/2010	12:15
		1002244-2	1	3/9/2010	12:17
- S		1002244-3	1	3/9/2010	12:19
		1002244-4	1	3/9/2010	12:21
- S		1002244-5	1	3/9/2010	12:22
		1002244-6	1	3/9/2010	12:24
		CCV4	1	3/9/2010	12:26
		CCB4	1	3/9/2010	12:28
- S		1003014-1	1	3/9/2010	12:30
- S		1003014-2	1	3/9/2010	12:32
		1003014-3	1	3/9/2010	12:33
- S,Sr		1003014-4	1	3/9/2010	12:35
- Sr		1003014-5	1	3/9/2010	12:37
- Sr		1003014-6	1	3/9/2010	12:39
- S		1003014-7	1	3/9/2010	12:40
- S		1003014-8	1	3/9/2010	12:42
		IP100308-3MB	1	3/9/2010	12:44
		IP100308-3RVS	1	3/9/2010	12:46
		CCV5	1	3/9/2010	12:48
		CCB5	1	3/9/2010	12:51
		IP100308-3LCS	1	3/9/2010	12:52
- Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr		1003039-1	1	3/9/2010	12:54
- Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr		1003039-1DUP	1	3/9/2010	12:56
- Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr		1003039-1SER	5	3/9/2010	12:58
- Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr		1003039-1MS	1	3/9/2010	13:00
		1003039-1MSD	1	3/9/2010	13:01
		1003055-3	1	3/9/2010	13:03
		1003055-4	1	3/9/2010	13:05
- Pb		1003055-5	1	3/9/2010	13:07
- Fe,Pb,Se,Th,Tl,U,V		1003055-6	1	3/9/2010	13:08
		CCV6	1	3/9/2010	13:10
		CCB6	1	3/9/2010	13:12

20000849

Data Package ID: IT1003063-1

20000849

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

ICPTrace2 Run Log -- 3/9/2010

Instrument ID: ICPTrace2
File Name: 100309A.
AnalRunID: IT100309-2A1
CalibRefID: IT100309-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
- Fe,Pb,Se,Th,Tl,U,V		1003055-7	1	3/9/2010	13:14
		IP100308-4MB	1	3/9/2010	13:16
		IP100308-4RVS	1	3/9/2010	13:18
		IP100308-4LCS	1	3/9/2010	13:19
	JM-SS-04	1003063-1	1	3/9/2010	13:21
	JM-SS-05	1003063-2	1	3/9/2010	13:23
	RM-JM-SED	1003063-3	1	3/9/2010	13:25
	JM-SED-02	1003063-5	1	3/9/2010	13:27
	JM-SS-03	1003063-6	1	3/9/2010	13:28
	RP-JM-SED	1003063-8	1	3/9/2010	13:30
		CCV7	1	3/9/2010	13:32
		CCB7	1	3/9/2010	13:34
	RP-JM-SED-01	1003063-9	1	3/9/2010	13:36
	RP-SED-01	1003063-12	1	3/9/2010	13:38
	RP-SED-01D	1003063-13	1	3/9/2010	13:39
	JM-SS-01	1003063-14	1	3/9/2010	13:41
	RP-SED-02	1003063-16	1	3/9/2010	13:43
	RP-SED-02	1003063-16DUP	1	3/9/2010	13:45
	RP-SED-02	1003063-16SER	5	3/9/2010	13:47
	RP-SED-02	1003063-16MS	1	3/9/2010	13:48
	RP-SED-02	1003063-16MSD	1	3/9/2010	13:50
		CCV8	1	3/9/2010	13:52
		CCB8	1	3/9/2010	13:55
		CCV9	1	3/9/2010	14:17
		CCB9	1	3/9/2010	14:19
+ Ca,Mg,Na,S,Sr,Th	JM-SW-02	1003063-7	100	3/9/2010	14:20
		1002238-2A	1	3/9/2010	14:22
+ Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr		1003039-1	2	3/9/2010	14:24
+ Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr		1003039-1DUP	2	3/9/2010	14:26
+ Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr		1003039-1SER	10	3/9/2010	14:28
+ Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr		1003039-1MS	2	3/9/2010	14:29
		1003039-1MSD	2	3/9/2010	14:31
- Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr		1003039-1A	1	3/9/2010	14:33
+ Pb		1003055-5	10	3/9/2010	14:35
+ Fe,Pb,Se,Th,Tl,U,V		1003055-6	2	3/9/2010	14:36

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Data Package ID: IT1003063-1

20000850

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

ICPTrace2 Run Log -- 3/9/2010

Instrument ID: ICPTrace2
File Name: 100309A.
AnalRunID: IT100309-2A1
CalibRefID: IT100309-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		CCV10	1	3/9/2010	14:38
		CCB10	1	3/9/2010	14:40
+ Fe,Pb,Se,Th,Tl,U,V		1003055-7	2	3/9/2010	14:42
		CRI2	1	3/9/2010	14:44
		ICSA2	1	3/9/2010	14:46
		ICSAB2	1	3/9/2010	14:47
		CCV11	1	3/9/2010	14:49
		CCB11	1	3/9/2010	14:54
- S		AS100219-3MMB	1	3/9/2010	14:56
- S		AS100219-3PMB	1	3/9/2010	14:57
- S		AS100219-4MMB	1	3/9/2010	14:59
- S		AS100219-4PMB	1	3/9/2010	15:01
- S		AS100219-5MMB	1	3/9/2010	15:03
- S		AS100219-5PMB	1	3/9/2010	15:05
- S		AS100219-3LCS	1	3/9/2010	15:06
- S		AS100219-3LCSD	1	3/9/2010	15:08
- S		AS100219-4LCS	1	3/9/2010	15:10
- S		AS100219-4LCSD	1	3/9/2010	15:12
		CCV12	1	3/9/2010	15:13
		CCB12	1	3/9/2010	15:17
- S		AS100219-5LCS	1	3/9/2010	15:18
- S		AS100219-5LCSD	1	3/9/2010	15:20
- S		1002179-1	1	3/9/2010	15:22
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr		1002179-2	1	3/9/2010	15:24
- S		1002179-5	1	3/9/2010	15:26
- S		1002179-6	1	3/9/2010	15:27
- S		1002179-8	1	3/9/2010	15:29
- S		1002179-12	1	3/9/2010	15:31
- S		1002179-15	1	3/9/2010	15:33
- S		1002179-16	1	3/9/2010	15:35
		CCV13	1	3/9/2010	15:36
		CCB13	1	3/9/2010	15:40
- S		1002179-17	1	3/9/2010	15:42
- S		1002179-18	1	3/9/2010	15:44
- S		1002179-20	1	3/9/2010	15:46

20000851

Data Package ID: IT1003063-1

20000851

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

ICPTrace2 Run Log -- 3/9/2010

Instrument ID: ICPTrace2
File Name: 100309A.
AnalRunID: IT100309-2A1
CalibRefID: IT100309-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
- S		1002179-24	1	3/9/2010	15:47
- Al,Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr		1002179-25	1	3/9/2010	15:49
- S		1002179-28	1	3/9/2010	15:51
- S		1002179-29	1	3/9/2010	15:53
- S		1002179-30	1	3/9/2010	15:55
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr		1002179-31	1	3/9/2010	15:56
- S		1002179-32	1	3/9/2010	15:58
		CCV14	1	3/9/2010	16:00
		CCB14	1	3/9/2010	16:05
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr		1002179-33	1	3/9/2010	16:06
- S		1002179-35	1	3/9/2010	16:08
- S		1002179-41	1	3/9/2010	16:10
- S		1002179-42	1	3/9/2010	16:12
- Bi,Co,P,Pb,S,Si,Sn,Ti,Tl,Zn,Zr		1002179-43	1	3/9/2010	16:14
- P,S		1002179-45	1	3/9/2010	16:15
- S		1002179-50	1	3/9/2010	16:17
- Bi,Co,P,Pb,S,Si,Sn,Ti,Tl,Zr		1002179-51	1	3/9/2010	16:19
- S		1002179-52	1	3/9/2010	16:21
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr		1002179-53	1	3/9/2010	16:23
		CCV15	1	3/9/2010	16:24
		CCB15	1	3/9/2010	16:26
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr		1002179-54	1	3/9/2010	16:28
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr		1002179-55	1	3/9/2010	16:30
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr		1002179-56	1	3/9/2010	16:32
- S		1002179-57	1	3/9/2010	16:34
- S		1002179-59	1	3/9/2010	16:35
- S		1002179-60	1	3/9/2010	16:37
- S		1002179-61	1	3/9/2010	16:39
- S		1002179-62	1	3/9/2010	16:41
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr		1002179-63	1	3/9/2010	16:43
- S		1002179-64	1	3/9/2010	16:45
		CCV16	1	3/9/2010	16:46
		CCB16	1	3/9/2010	16:48
- S		1002179-65	1	3/9/2010	16:50
- S		1002179-66	1	3/9/2010	16:52

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Data Package ID: IT1003063-1

20000852

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

ICPTrace2 Run Log -- 3/9/2010

Instrument ID: ICPTrace2
File Name: 100309A.
AnalRunID: IT100309-2A1
CalibRefID: IT100309-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
- S		1002179-67	1	3/9/2010	16:54
- S		1002179-68	1	3/9/2010	16:56
+ Al,Bi,Co,Pb,Si,Sn,Ti,Tl,Zr		1002179-25	10	3/9/2010	16:57
		CRI3	1	3/9/2010	16:59
		ICSA3	1	3/9/2010	17:01
		ICSAB3	1	3/9/2010	17:03
		CCV17	1	3/9/2010	17:05
		CCB17	1	3/9/2010	17:07

20000853

Data Package ID: IT1003063-1

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

ICPTrace2 Run Log -- 3/10/2010

Instrument ID: ICPTrace2
File Name: 100310A.
AnalRunID: IT100310-2A1
CalibRefID: IT100310-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		MIXBHIGH	1	3/10/2010	10:32
		MIXAHIGH	1	3/10/2010	10:34
		MIXCHIGH	1	3/10/2010	10:36
		ICV	1	3/10/2010	10:42
		ICB	1	3/10/2010	10:44
		CRI1	1	3/10/2010	10:46
		ICSA1	1	3/10/2010	10:48
		ICSAB1	1	3/10/2010	10:50
		CCV1	1	3/10/2010	10:51
		CCB1	1	3/10/2010	10:53
		IP100309-1MB	1	3/10/2010	10:55
		IP100309-1RVS	1	3/10/2010	10:57
		IP100309-1LCS	1	3/10/2010	10:59
		IP100309-1LCSD	1	3/10/2010	11:01
		1002108-1	50	3/10/2010	11:02
		1002108-3	50	3/10/2010	11:05
		1002174-8	50	3/10/2010	11:06
		1002174-9	50	3/10/2010	11:08
		IP100309-3MB	1	3/10/2010	11:10
		IP100309-3RVS	1	3/10/2010	11:12
		CCV2	1	3/10/2010	11:13
		CCB2	1	3/10/2010	11:15
		IP100309-3LCS	1	3/10/2010	11:17
- Fe,Pb,S,Se,Th,Tl,U,V		1002155-2	10	3/10/2010	11:19
- Fe,Pb,S,Se,Th,Tl,U,V		1002155-3	10	3/10/2010	11:21
- Fe,Pb,S,Se,Th,Tl,U,V		1002155-4	10	3/10/2010	11:23
- Fe,Pb,S,Se,Th,Tl,U,V		1002155-5	10	3/10/2010	11:24
		1002163-2	10	3/10/2010	11:26
		1002163-3	10	3/10/2010	11:28
- Fe,Pb,S,Se,Th,Tl,U,V		1002163-4	10	3/10/2010	11:30
- S		1002163-5	10	3/10/2010	11:32
		1002163-6	10	3/10/2010	11:34
		CCV3	1	3/10/2010	11:35
		CCB3	1	3/10/2010	11:37
		1002163-7	10	3/10/2010	11:39

20000854

Data Package ID: IT1003063-1

20000854

ALS Laboratory Group -- FC
LIMS Version: 6.337A

Date Printed: Monday, March 15, 2010

ICPTrace2 Run Log -- 3/10/2010

Instrument ID: ICPTrace2
File Name: 100310A.
AnalRunID: IT100310-2A1
CalibRefID: IT100310-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
- Fe,Pb,S,Se,Th,Tl,U,V		1002163-8	10	3/10/2010	11:41
- S		1002163-9	10	3/10/2010	11:43
		1002172-2	10	3/10/2010	11:44
		1002172-3	10	3/10/2010	11:46
		1002172-4	10	3/10/2010	11:48
		1002172-5	10	3/10/2010	11:50
		1002189-2	10	3/10/2010	11:52
		1002189-3	10	3/10/2010	11:53
		1002189-4	10	3/10/2010	11:55
		CCV4	1	3/10/2010	11:57
		CCB4	1	3/10/2010	11:59
		1002189-5	10	3/10/2010	12:01
		1002189-5DUP	10	3/10/2010	12:02
		1002189-5SER	50	3/10/2010	12:04
		1002189-5MS	10	3/10/2010	12:06
		1002189-5MSD	10	3/10/2010	12:08
		CRI2	1	3/10/2010	12:09
		ICSA2	1	3/10/2010	12:11
		ICSAB2	1	3/10/2010	12:13
		CCV5	1	3/10/2010	12:15
		CCB5	1	3/10/2010	12:17
		CCV6	1	3/10/2010	13:37
		CCB6	1	3/10/2010	13:39
		1002174-8A	50	3/10/2010	13:41
+ Fe,Pb,S,Se,Th,Tl,U,V		1002155-2	100	3/10/2010	13:43
+ Fe,Pb,S,Se,Th,Tl,U,V		1002155-3	100	3/10/2010	13:44
+ Fe,Pb,S,Se,Th,Tl,U,V		1002155-4	100	3/10/2010	13:46
+ Fe,Pb,S,Se,Th,Tl,U,V		1002155-5	100	3/10/2010	13:48
+ Fe,Pb,S,Se,Th,Tl,U,V		1002163-4	50	3/10/2010	13:50
+ Fe,Pb,S,Se,Th,Tl,U,V		1002163-8	50	3/10/2010	13:51
		1002189-3	1	3/10/2010	13:53
		1002189-5	1	3/10/2010	13:55
		1002189-5DUP	1	3/10/2010	13:57
		CCV7	1	3/10/2010	13:58
		CCB7	1	3/10/2010	14:00

20000855

Data Package ID: IT1003063-1

20000855

ALS Laboratory Group -- FC
LIMS Version: 6.337A

Date Printed: Monday, March 15, 2010

ICPTrace2 Run Log -- 3/10/2010

Instrument ID: ICPTrace2
File Name: 100310A.
AnalRunID: IT100310-2A1
CalibRefID: IT100310-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		1002189-5SER	5	3/10/2010	14:02
		1002189-5MS	1	3/10/2010	14:04
		1002189-5MSD	1	3/10/2010	14:06
		EX100309-1MB	1	3/10/2010	14:08
		EX100309-1RVS	1	3/10/2010	14:09
		EX100309-1LCS	1	3/10/2010	14:11
		EX100309-1LCSD	1	3/10/2010	14:13
- Zn		1002224-9	1	3/10/2010	14:15
- Zn		1002224-10	1	3/10/2010	14:16
- Zn		1002224-10DUP	1	3/10/2010	14:18
		CCV8	1	3/10/2010	14:20
		CCB8	1	3/10/2010	14:22
- Zn		1002224-10SER	5	3/10/2010	14:24
- Zn		1002224-10MS	1	3/10/2010	14:25
- Zn		1002224-10MSD	1	3/10/2010	14:27
- Zn		1002224-11	1	3/10/2010	14:29
- Zn		1002224-12	1	3/10/2010	14:31
		1002224-13	1	3/10/2010	14:33
- Zn		1002224-14	1	3/10/2010	14:34
		1002224-15	1	3/10/2010	14:36
- Zn		1002224-16	1	3/10/2010	14:38
		1002230-4	1	3/10/2010	14:40
		CCV9	1	3/10/2010	14:42
		CCB9	1	3/10/2010	14:43
		1002230-5	1	3/10/2010	14:45
		1002230-6	1	3/10/2010	14:47
		1003025-2	1	3/10/2010	14:49
		1003025-2DUP	1	3/10/2010	14:51
		1003025-2SER	5	3/10/2010	14:52
		1003025-2MS	1	3/10/2010	14:54
		1003025-2MSD	1	3/10/2010	14:56
		1003055-10	1	3/10/2010	14:58
	RP-SED-02	1003063-16A	1	3/10/2010	15:00
		TEST	1	3/10/2010	15:01
		CCV10	1	3/10/2010	15:03

20000856

20000856

Data Package ID: IT1003063-1

ALS Laboratory Group -- FC
LIMS Version: 6.337A

Date Printed: Monday, March 15, 2010

ICPTrace2 Run Log -- 3/10/2010

Instrument ID: ICPTrace2
File Name: 100310A.
AnalRunID: IT100310-2A1
CalibRefID: IT100310-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		CCB10	1	3/10/2010	15:05
		1002239-1	1	3/10/2010	15:07
		1002239-2	1	3/10/2010	15:09
		1002239-2SER	5	3/10/2010	15:11
		1002239-2MS	1	3/10/2010	15:12
		1002239-2MSD	1	3/10/2010	15:14
- S		1002239-3	1	3/10/2010	15:16
		1002239-4	2	3/10/2010	15:18
		1002239-5	1	3/10/2010	15:20
		1002239-6	1	3/10/2010	15:21
		1002239-7	1	3/10/2010	15:23
		CCV11	1	3/10/2010	15:25
		CCB11	1	3/10/2010	15:28
+ S		1003007-1	2	3/10/2010	15:30
		1003007-2	1	3/10/2010	15:32
+ S		1003007-3	2	3/10/2010	15:34
+ S		1003009-1	2	3/10/2010	15:36
+ S,Sr		1003010-1	5	3/10/2010	15:37
		1002239-4	1	3/10/2010	15:39
- S		1003007-1	1	3/10/2010	15:41
- S		1003007-3	1	3/10/2010	15:43
- S		1003009-1	1	3/10/2010	15:45
- S,Sr		1003010-1	1	3/10/2010	15:46
		CCV12	1	3/10/2010	15:48
		CCB12	1	3/10/2010	15:50
		CRI3	1	3/10/2010	15:52
		ICSA3	1	3/10/2010	15:54
		ICSAB3	1	3/10/2010	15:56
		CCV13	1	3/10/2010	15:58
		CCB13	1	3/10/2010	16:00

20000857

Data Package ID: IT1003063-1

ALS Laboratory Group -- FC
LIMS Version: 6.337A

Date Printed: Monday, March 15, 2010

Mercury

Method SW7470A

Method Blank

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: HG100308-1MB

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 08-Mar-10
Date Analyzed: 08-Mar-10
Prep Method: METHOD

Prep Batch: HG100308-1
QCBatchID: HG100308-1-2
Run ID: HG100308-2A1
Cleanup: NONE
Basis: N/A
File Name: 10030801

Sample Aliquot: 20 g
Final Volume: 20 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	DF	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7439-97-6	MERCURY	1	0.0002	0.0002	U	

20000858

Data Package ID: *HG1003063-1*

Mercury

Method SW7471A

Method Blank

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: HG100308-2MB

Sample Matrix: SEDIMENT
% Moisture: N/A
Date Collected: N/A
Date Extracted: 08-Mar-10
Date Analyzed: 08-Mar-10
Prep Method: METHOD

Prep Batch: HG100308-2
QCBatchID: HG100308-2-1
Run ID: HG100308-3A1
Cleanup: NONE
Basis: N/A
File Name: 10030802

Sample Aliquot: 0.6 g
Final Volume: 100 g
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	DF	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7439-97-6	MERCURY	1	0.033	0.033	U	

20000859

Data Package ID: *HG1003063-1*

Mercury

Method SW7470A

Laboratory Control Sample

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: HG100308-1LCS

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 03/08/2010
Date Analyzed: 03/08/2010
Prep Method: METHOD

Prep Batch: HG100308-1
QCBatchID: HG100308-1-2
Run ID: HG100308-2A1
Cleanup: NONE
Basis: N/A
File Name: 10030801

Sample Aliquot: 20 g
Final Volume: 20 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7439-97-6	MERCURY	0.001	0.000997	0.0002		100	80 - 120%

20000860

Data Package ID: *HG1003063-1*

Mercury

Method SW7471

Laboratory Control Sample

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: HG100308-2LCS

Sample Matrix: SEDIMENT
% Moisture: N/A
Date Collected: N/A
Date Extracted: 03/08/2010
Date Analyzed: 03/08/2010
Prep Method: METHOD

Prep Batch: HG100308-2
QCBatchID: HG100308-2-1
Run ID: HG100308-3A1
Cleanup: NONE
Basis: N/A
File Name: 10030802

Sample Aliquot: 0.6 g
Final Volume: 100 g
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7439-97-6	MERCURY	0.167	0.166	0.0333		100	80 - 120%

20000861

Data Package ID: *HG1003063-1*

Mercury

Method SW7471A

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SED-02
LabID: 1003063-16MS

Sample Matrix: SEDIMENT
% Moisture: 32.5
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 08-Mar-10
Prep Method: METHOD

Prep Batch: HG100308-2
QCBatchID: HG100308-2-1
Run ID: HG100308-3A1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 0.6 g
Final Volume: 100 g
Result Units: MG/KG
File Name: 10030802

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7439-97-6	MERCURY	0.0494	U	0.524		0.0494	0.494	106	80 - 120%

Field ID: RP-SED-02
LabID: 1003063-16MSD

Sample Matrix: SEDIMENT
% Moisture: 32.5
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 08-Mar-10
Prep Method: METHOD

Prep Batch: HG100308-2
QCBatchID: HG100308-2-1
Run ID: HG100308-3A1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 0.602 g
Final Volume: 100 g
Result Units: MG/KG
File Name: 10030802

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7439-97-6	MERCURY	0.515		0.492	104	0.0492	20	2

20000862

Data Package ID: *HG1003063-1*

Mercury

Method SW7470A

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SW-02
LabID: 1003063-4MS

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 08-Mar-10
Prep Method: METHOD

Prep Batch: HG100308-1
QCBatchID: HG100308-1-2
Run ID: HG100308-2A1
Cleanup: NONE
Basis: As Received

Sample Aliquot: 20 g
Final Volume: 20 g
Result Units: MG/L
File Name: 10030801

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7439-97-6	MERCURY	0.0002	U	0.00195		0.0002	0.002	98	80 - 120%

Field ID: RP-SW-02
LabID: 1003063-4MSD

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 08-Mar-10
Prep Method: METHOD

Prep Batch: HG100308-1
QCBatchID: HG100308-1-2
Run ID: HG100308-2A1
Cleanup: NONE
Basis: As Received

Sample Aliquot: 20 g
Final Volume: 20 g
Result Units: MG/L
File Name: 10030801

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7439-97-6	MERCURY	0.00196		0.002	98	0.0002	20	1

20000863

Data Package ID: *HG1003063-1*

Mercury

Method SW7471

Duplicate Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SED-02
Lab ID: 1003063-16D

Sample Matrix: SEDIMENT
% Moisture: 32.5
Date Collected: 03/03/2010
Date Extracted: 03/08/2010
Date Analyzed: 03/08/2010

Prep Batch: HG100308-2
QCBatchID: HG100308-2-1
Run ID: HG100308-3A1
Cleanup: NONE
Basis: Dry Weight
File Name: 10030802

Sample Aliquot: 0.6 g
Final Volume: 100 g
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Sample Result	Samp Qual	Duplicate Result	Dup Qual	Reporting Limit	Dilution Factor	RPD	RPD Limit
7439-97-6	MERCURY	0.0494	U	0.0494	U	0.0494	1		20

20000864

Data Package ID: *HG1003063-1*

Mercury

Method SW7470

Duplicate Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SW-02
Lab ID: 1003063-4D

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 03/03/2010
Date Extracted: 03/08/2010
Date Analyzed: 03/08/2010

Prep Batch: HG100308-1
QCBatchID: HG100308-1-2
Run ID: HG100308-2A1
Cleanup: NONE
Basis: As Received
File Name: 10030801

Sample Aliquot: 20 g
Final Volume: 20 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Sample Result	Samp Qual	Duplicate Result	Dup Qual	Reporting Limit	Dilution Factor	RPD	RPD Limit
7439-97-6	MERCURY	0.0002	U	0.0002	U	0.0002	1		20

20000865

Data Package ID: *HG1003063-1*

Prep Batch ID: HG100308-1

Start Date: 03/08/10
Start Time: 9:09
Prep Analyst: Sheri Lafferty

End Date: 03/08/10
End Time: 9:09

Concentration Method: NONE
Extract Method: METHOD
Initial Volume Units: g
Final Volume Units: g

Batch Created By: skl
Date Created: 03/08/10
Time Created: 9:09
Validated By: skl
Date Validated: 03/08/10
Time Validated: 12:19

Comments:

QC Batch ID: HG100308-1-2

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
HG100308-1	MB	XXXXXX	WATER	XXXXXX	20	20	NONE	1	1003063
HG100308-1	LCS	XXXXXX	WATER	XXXXXX	20	20	NONE	1	1003063
HG100308-1	LCSD	XXXXXX	WATER	XXXXXX	20	20	NONE	1	1003063
1003063-4	MS	RP-SW-02	WATER	3/3/2010	20	20	NONE	1	1003063
1003063-4	MSD	RP-SW-02	WATER	3/3/2010	20	20	NONE	1	1003063
1003063-4	DUP	RP-SW-02	WATER	3/3/2010	20	20	NONE	1	1003063
1003063-10	SMP	RP-JM-SW	WATER	3/3/2010	20	20	NONE	1	1003063
1003063-11	SMP	RP-JM-SW-01	WATER	3/3/2010	20	20	NONE	1	1003063
1003063-15	SMP	RM-JM-SW	WATER	3/3/2010	20	20	NONE	1	1003063
1003063-17	SMP	RP-SW-01	WATER	3/3/2010	20	20	NONE	1	1003063
1003063-18	SMP	RP-SW-01D	WATER	3/3/2010	20	20	NONE	1	1003063
1003063-4	SMP	RP-SW-02	WATER	3/3/2010	20	20	NONE	1	1003063
1003063-7	SMP	JM-SW-02	WATER	3/3/2010	20	20	NONE	1	1003063

QC Types

CAR	Carrier reference sample		DUP	Laboratory Duplicate
LCS	Laboratory Control Sample		LCSD	Laboratory Control Sample Duplicat
MB	Method Blank		MS	Laboratory Matrix Spike
MSD	Laboratory Matrix Spike Duplicate		REP	Sample replicate
RVS	Reporting Level Verification Standar		SMP	Field Sample
SYS	Sample Yield Spike			

20000866

ALS Laboratory Group -- FC

LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

Prep Batch ID: HG100308-2

Start Date: 03/08/10
Start Time: 10:20
Prep Analyst: Sheri Lafferty

End Date: 03/08/10
End Time: 10:20

Concentration Method: NONE
Extract Method: METHOD
Initial Volume Units: g
Final Volume Units: g

Batch Created By: skl
Date Created: 03/08/10
Time Created: 10:20
Validated By: skl
Date Validated: 03/08/10
Time Validated: 12:23

Comments:

QC Batch ID: HG100308-2-1

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
HG100308-2	MB	XXXXXX	SEDIME	XXXXXX	0.6	100	NONE	1	1003063
HG100308-2	LCS	XXXXXX	SEDIME	XXXXXX	0.6	100	NONE	1	1003063
HG100308-2	LCSD	XXXXXX	SEDIME	XXXXXX	0.6	100	NONE	1	1003063
1003063-16	MS	RP-SED-02	SEDIME	3/3/2010	0.6	100	NONE	1	1003063
1003063-16	MSD	RP-SED-02	SEDIME	3/3/2010	0.602	100	NONE	1	1003063
1003063-16	DUP	RP-SED-02	SEDIME	3/3/2010	0.6	100	NONE	1	1003063
1003039-1	SMP	XXXXXX	SOIL	XXXXXX	0.606	100	NONE	1	1003039
1003063-1	SMP	JM-SS-04	SOIL	3/3/2010	0.604	100	NONE	1	1003063
1003063-12	SMP	RP-SED-01	SEDIME	3/3/2010	0.607	100	NONE	1	1003063
1003063-13	SMP	RP-SED-01D	SEDIME	3/3/2010	0.604	100	NONE	1	1003063
1003063-14	SMP	JM-SS-01	SOIL	3/4/2010	0.605	100	NONE	1	1003063
1003063-16	SMP	RP-SED-02	SEDIME	3/3/2010	0.6	100	NONE	1	1003063
1003063-2	SMP	JM-SS-05	SOIL	3/3/2010	0.603	100	NONE	1	1003063
1003063-3	SMP	RM-JM-SED	SEDIME	3/3/2010	0.608	100	NONE	1	1003063
1003063-5	SMP	JM-SED-02	SOIL	3/3/2010	0.606	100	NONE	1	1003063
1003063-6	SMP	JM-SS-03	SOIL	3/3/2010	0.604	100	NONE	1	1003063
1003063-8	SMP	RP-JM-SED	SEDIME	3/3/2010	0.602	100	NONE	1	1003063
1003063-9	SMP	RP-JM-SED-01	SEDIME	3/3/2010	0.609	100	NONE	1	1003063

QC Types

CAR	Carrier reference sample		DUP	Laboratory Duplicate
LCS	Laboratory Control Sample		LCSD	Laboratory Control Sample Duplicat
MB	Method Blank		MS	Laboratory Matrix Spike
MSD	Laboratory Matrix Spike Duplicate		REP	Sample replicate
RVS	Reporting Level Verification Standar		SMP	Field Sample
SYS	Sample Yield Spike			

20000867

ALS Laboratory Group -- FC

LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

MERCURY

Method SW7470

Calibration Verifications

Lab Name: **ALS Laboratory Group -- FC**
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Run ID: HG100308-2A1
Result Units: MG/L

Lab ID	Verification Type	Date Analyzed	Time Analyzed	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
ICV	Initial Calibration	3/8/2010	14:28	0.001	0.00101	0.0002	N/A	101	90 - 110
CCV1	Continuing Calibration	3/8/2010	14:47	0.002	0.00198	0.0002	N/A	99	80 - 120
CCV2	Continuing Calibration	3/8/2010	15:06	0.002	0.00202	0.0002	N/A	101	80 - 120
CCV3	Continuing Calibration	3/8/2010	15:21	0.002	0.00197	0.0002	N/A	99	80 - 120

Data Package ID: *HG1003063-1*

MERCURY

Method SW7471

Calibration Verifications

Lab Name: **ALS Laboratory Group -- FC**
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Run ID: HG100308-3A1
Result Units: MG/L

Lab ID	Verification Type	Date Analyzed	Time Analyzed	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
ICV	Initial Calibration	3/8/2010	15:50	0.001	0.00101	0.0002	N/A	101	90 - 110
CCV1	Continuing Calibration	3/8/2010	16:09	0.002	0.00202	0.0002	N/A	101	80 - 120
CCV2	Continuing Calibration	3/8/2010	16:28	0.002	0.00202	0.0002	N/A	101	80 - 120

MERCURY

Method SW7470

Calibration Blanks

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Run ID: HG100308-2A1
Result Units: MG/L

Lab ID	Verification Type	Date Analyzed	Time Analyzed	Result	Reporting Limit	Flag
ICB	Initial Calibration	3/8/2010	14:29	0.0002	0.0002	U
CCB1	Continuing Calibration	3/8/2010	14:48	0.0002	0.0002	U
CCB2	Continuing Calibration	3/8/2010	15:08	0.0002	0.0002	U
CCB3	Continuing Calibration	3/8/2010	15:22	0.0002	0.0002	U

MERCURY

Method SW7471

Calibration Blanks

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Run ID: HG100308-3A1
Result Units: MG/L

Lab ID	Verification Type	Date Analyzed	Time Analyzed	Result	Reporting Limit	Flag
ICB	Initial Calibration	3/8/2010	15:51	0.0002	0.0002	U
CCB1	Continuing Calibration	3/8/2010	16:10	0.0002	0.0002	U
CCB2	Continuing Calibration	3/8/2010	16:30	0.0002	0.0002	U

Metals Linear Ranges

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Instrument ID: CETAC
Active Date: 01/28/2010
Expiration Date: 04/27/2010

CASNO	Target Analyte	Concentration (ppm)
7439-97-6	MERCURY	0.005

20000872

Mercury Run Log -- 3/8/2010

Instrument ID: CETAC
File Name: 10030801
AnalRunID: HG100308-2A1
CalibRefID: HG100308-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		STD0	1	3/8/2010	14:16
		STD1	1	3/8/2010	14:18
		STD2	1	3/8/2010	14:20
		STD3	1	3/8/2010	14:21
		STD4	1	3/8/2010	14:23
		STD5	1	3/8/2010	14:24
		IPC	1	3/8/2010	14:26
		ICV	1	3/8/2010	14:28
		ICB	1	3/8/2010	14:29
		CRA1	1	3/8/2010	14:31
		HG100308-1MB	1	3/8/2010	14:32
		HG100308-1LCS	1	3/8/2010	14:34
		HG100308-1LCSD	1	3/8/2010	14:36
		1003006-4	1	3/8/2010	14:37
		1003037-3	1	3/8/2010	14:39
		1003037-3DUP	1	3/8/2010	14:40
		1003037-3L	5	3/8/2010	14:42
		1003037-3MS	1	3/8/2010	14:44
		1003037-3MSD	1	3/8/2010	14:45
		CCV1	1	3/8/2010	14:47
		CCB1	1	3/8/2010	14:48
		1003037-9	1	3/8/2010	14:50
		1003037-15	1	3/8/2010	14:52
		1003037-20	1	3/8/2010	14:53
		1003037-25	1	3/8/2010	14:55
		1003058-1	1	3/8/2010	14:56
	RP-SW-02	1003063-4	1	3/8/2010	14:58
	RP-SW-02	1003063-4DUP	1	3/8/2010	15:00
		1003063-4L	5	3/8/2010	15:01
	RP-SW-02	1003063-4MS	1	3/8/2010	15:03
	RP-SW-02	1003063-4MSD	1	3/8/2010	15:05
		CCV2	1	3/8/2010	15:06
		CCB2	1	3/8/2010	15:08
	JM-SW-02	1003063-7	1	3/8/2010	15:09
	RP-JM-SW	1003063-10	1	3/8/2010	15:11

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Data Package ID: HG1003063-1

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

Mercury Run Log -- 3/8/2010

Instrument ID: CETAC
File Name: 10030801
AnalRunID: HG100308-2A1
CalibRefID: HG100308-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
	RP-JM-SW-01	1003063-11	1	3/8/2010	15:13
	RM-JM-SW	1003063-15	1	3/8/2010	15:14
	RP-SW-01	1003063-17	1	3/8/2010	15:16
	RP-SW-01D	1003063-18	1	3/8/2010	15:17
		CRA2	1	3/8/2010	15:19
		CCV3	1	3/8/2010	15:21
		CCB3	1	3/8/2010	15:22

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Data Package ID: HG1003063-1

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

Mercury Run Log -- 3/8/2010

Instrument ID: CETAC
File Name: 10030802
AnalRunID: HG100308-3A1
CalibRefID: HG100308-3A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		STD0	1	3/8/2010	15:40
		STD1	1	3/8/2010	15:42
		STD2	1	3/8/2010	15:43
		STD3	1	3/8/2010	15:45
		STD4	1	3/8/2010	15:46
		STD5	1	3/8/2010	15:48
		ICV	1	3/8/2010	15:50
		ICB	1	3/8/2010	15:51
		CRA1	1	3/8/2010	15:53
		HG100308-2MB	1	3/8/2010	15:54
		HG100308-2LCS	1	3/8/2010	15:56
		HG100308-2LCSD	1	3/8/2010	15:58
		1003039-1	1	3/8/2010	15:59
	JM-SS-04	1003063-1	1	3/8/2010	16:01
	JM-SS-05	1003063-2	1	3/8/2010	16:02
	RM-JM-SED	1003063-3	1	3/8/2010	16:04
	JM-SED-02	1003063-5	1	3/8/2010	16:06
	JM-SS-03	1003063-6	1	3/8/2010	16:07
		CCV1	1	3/8/2010	16:09
		CCB1	1	3/8/2010	16:10
	RP-JM-SED	1003063-8	1	3/8/2010	16:12
	RP-JM-SED-01	1003063-9	1	3/8/2010	16:14
	RP-SED-01	1003063-12	1	3/8/2010	16:15
	RP-SED-01D	1003063-13	1	3/8/2010	16:17
	JM-SS-01	1003063-14	1	3/8/2010	16:18
	RP-SED-02	1003063-16	1	3/8/2010	16:20
	RP-SED-02	1003063-16DUP	1	3/8/2010	16:22
		1003063-16L	5	3/8/2010	16:23
	RP-SED-02	1003063-16MS	1	3/8/2010	16:25
	RP-SED-02	1003063-16MSD	1	3/8/2010	16:27
		CCV2	1	3/8/2010	16:28
		CCB2	1	3/8/2010	16:30
		CRA2	1	3/8/2010	16:31
		CCV3	1	3/8/2010	16:33
		CCB3	1	3/8/2010	16:35

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Data Package ID: HG1003063-1

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

Raw Data

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HEADER INFROMATION FOR ANALYTICAL SEQUENCE 100309A
STANDARD SOLUTION CODES

Stock A (ST100301-49) Exp. 5-31-15

Element	ug/ml
Al, Ca, Mg	1000
Na, K	500
Fe	400
Li	20

Standard	Dilution	Procedure
A1	1/2 of Stock A	5ml of Stock A to 10ml final volume.
A2	1/2.5 of Stock A	2ml of Stock A to a 5ml final volume.
A3	1/5 of Stock A	1ml of Stock A to a 5ml final volume.
A4	1/10 of A1	1ml of Standard A1 up to a 10ml final volume.
A5	1/10 of A2	1ml of Standard A2 up to a 10ml final volume.

Stock B (ST100301-50) Exp. 2-28-15

Element	ug/ml
P, Si	100
B, Ba, Cr, Cu, Mn, Mo, Ni, Pb, Sn, Sr, Ti ,Zn	20
As, Cd, Co, Se, Tl, V	10
Ag, Sb	4
Be	2

Stock Ag- 1000 ug/ml (ST090107-6) Exp. 4-06-10
Stock Th – 1000 ug/ml (ST090107-7) Exp. 4-06-10

The following dilutions of Stock Ag and Stock Th are made to provide the daily calibration Standards.

Standard	Dilution	Procedure
B1	1/2 of Stock B 1/500 Ag and 1/500 Th	5ml of Stock B and 0.02ml of Stock Ag and Stock Th up to a 10ml final volume.
B2	1/10 of B1	1.0ml of Standard B1 up to a 10ml final volume.
B3	1/10 of B2	1.0ml of Standard B2 up to a 10ml final volume.

Stock C (ST100301-51) Exp. 6-30-15

Element	ug/ml
S, U	100
Bi, Zr	10

Standard	Dilution	Procedure
C1	1/2 of Stock C	5ml of Stock C up to a 10ml final volume.
C2	1/10 of C1	1.0ml of Standard C1 up to a 10ml final volume.
C3	1/10 of C2	1.0ml of Standard C2 up to a 10ml final volume.

RL STD (Reporting Limit Standard) Intermediate.
(ST100301-54) Exp. 2-28-15

Element	ug/ml
K, Na	500
Ca, Mg	200
Al, U	100
B, Fe, P, S, Si	50
Li, Mo, Sn, Sr, Ti	10
Sb	8
Ni, As, Bi, Se, Tl, Zn, Zr	5
Pb	3
Ag, Ba, Co, Cr, Cu, Mn, V, Th	2
Be, Cd	1

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RL STD (working standard) made daily by diluting the intermediate above 1000 fold. This working standard has concentration levels at the normal ALS-FC reporting limits for all elements except Ca, Mg and Na, K which are at 0.2ppm and 0.5ppm; this is below the normal ALS-FC reporting limit.

RL2 (working standard) made daily by diluting the intermediate above 333 fold.

Blank Solution

Double D.I. water, 3% HNO_3 and 5%HCl
Used for Std. Blank, ICB and CCB

CCV (ST100304-2) Exp. 1-1-11

Element	ug/ml
Al, Ca, Mg, K, Na	50
Fe	20
U, P, S, Si	5
B, Ba, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sn, Zn, Zr	1
As, Be, Bi, Cd, Co, Li, Sb, Sr, Ti, Tl, V	0.5
Ag, Th	0.2

ICV (ST100304-2) Exp. 1-1-11
Prepared daily by diluting the CCV (described above) ½.
The 1/2 dilution is made by diluting 5ml of the CCV to a 10ml final volume.
The resulting concentrations are:

Element	ug/ml
Al, Ca, Mg, K, Na	25
Fe	10
U, P, S, Si	2.5
B, Ba, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sn, Zn, Zr	0.5
As, Be, Bi, Cd, Co, Li, Sb, Sr, Ti, Tl, V	0.25
Ag, Th	0.1

CRI (ST100111-17) Exp. 1-1-11
Made By diluting
1.0ml of CRI Stock (ST100111-16) Exp. 1-10-10
to a 100ml final volume.

Element	ug/ml
Ca, Mg, K, Na	5.0
Al, B, Ba	0.4
Fe, U, P, S	0.2
Sb	0.12
Co, Si,, Sn, V, Th	0.1
Ni	0.08
Cu, Bi, Zr	0.05
Zn	0.04
Mn	0.03
Ag, Cr, Li, Mo, Sr, Ti, Tl	0.02
Be, Cd, As, Se,	0.01
Pb	0.006

ICSA (ST100111-7) Exp. 1-1-11

Element	ug/ml
Ca, Mg, Al	250
Fe	100

ICSAB (ST100111-8) Exp. 1-1-11

Element	ug/ml
Ca, Mg, Al	250
Fe	100
U	10
B, Si, Li, Mo, Sn, Sr, Ti, Cd, Zn, Ni, P, S	1.0
Sb	0.6
Ba, Be, Co, V, Cr, Cu, Mn, Bi, Zr	0.5
Ag	0.2
As, Tl	0.1
Se, Pb, Th	0.05

Pipette ID Numbers

1.0ml to 5.0ml --- M-55
0.1ml to 1.0ml --- M-61
0.01ml to 0.1ml --- M-57

Acid Lot Numbers

HCl – H19031
HNO_3 – H14024

Inter Element Correction Information

The following table summarizes spectral interferences that have been identified and for which IEC's are used. If a sample contains a concentration of an interfering element that exceeds the upper analytical range, and an affected element is being determined, it is necessary to dilute the sample to bring the interfering element into analytical range.

Interfering Element (ug/ml)	Affected Element
Al (500)	Pb
Mg (500)	Th
Fe (200)	Se, Tl, V, Pb, U
Si (50)	Zr
U (50)	Al, Cr, Cu, Bi, Pb, Mg, Se, Ag, Tl, Si
Ba (10)	Co
Cr (10)	Sb
Cu (10)	Bi
Mn (10)	Tl
Mo (10)	Al, Si, Pb,, Sb
Ti (10)	Co, Bi, Si, Sn, Tl, Pb, Zr
As (5)	Cd
V (5)	Al, Be, Tl
Zr (5)	Ag

The following table lists element concentrations (ug/ml) that no significant spectral interferences have been observed.

Element	Concentration	Element	Concentration	Element	Concentration
K	500	Se	10		
Na	500	Pb	10	Li	5
Ca	500	Zn	10	Cd	5
P	50	Sr	10	Co	5
S	50	Sn	10	Ag	2
Ni	10	Bi	5	Sb	2
B	10	Tl	5	Be	1

2X – Dilution made by diluting 2.5ml of sample up to a 5ml final volume.
3X - Dilution made by diluting 2.0ml of sample up to a 6ml final volume.
4X - Dilution made by diluting 2.0ml of sample up to a 8ml final volume.
5X - Dilution made by diluting 1.0ml of sample to a 5ml final volume.
10X - Dilution made by diluting 0.5ml of sample to a 5ml final volume.
20X – Dilution made by diluting 0.25ml of sample to a 5ml final volume.
25X – Dilution made by diluting 0.2ml of sample to a 5ml final volume.
50X – Dilution made by diluting 0.1ml of sample to a 5ml final volume.
100X – Dilution made by diluting 0.05ml of sample to a 5ml final volume.
500X – Dilution made by diluting 0.02ml of sample to a 10ml final volume.
1000X – Dilution made by diluting a 10X dilution 100X.

Analytical Spikes

1002238-2 – Post spiked for all requested elements by diluting 0.1ml of Z spike (ST100302-16), 0.1ml ml of Cation spike (ST100108-2) and 0.05ml of C spike (ST100208-20) up to a 5ml final volume with sample digestate.

1003039-1 – Post spike for Ca, Mg at 80ppm, Sb, Mn, V at 1ppm, Cu at 0.5ppm and Cr at 0.4ppm by diluting 0.2ml of Z spike (ST100302-16) and 0.2ml ml of Cation spike (ST100108-2) up to a 5ml final volume with sample digestate.

Comments

1. Please see run log and work orders for elements of interest.

Daily Maintenance

1. Check/ Change Peristaltic pump tubing.
2. Check the torch for deposits, clean if necessary.
3. Check/ Empty drain water.

Daily Maintenance done by RF .

Monthly Maintenance

1. Check/Clean nebulizer and spray chamber.
2. Clean air filters
3. Check/Clean entrance slit.
4. Fill water recirculating reservoir.

Monthly maintenance done by: RF 03-04-10.

Major problems / adjustments / repairs recorded in the ICP Maintenance Log (3716).

ICPTrace2 Run Log -- 3/9/2010

Instrument ID: ICPTrace2
File Name: 100309A.
AnalRunID: IT100309-2A1
CalibRefID: IT100309-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
	MIXBHIGH	MIXBHIGH	1	3/9/2010	10:48
	MIXAHIGH	MIXAHIGH	1	3/9/2010	10:50
	MIXCHIGH	MIXCHIGH	1	3/9/2010	10:52
	ICV	ICV	1	3/9/2010	11:12
	ICB	ICB	1	3/9/2010	11:13
	CRI	CRI1	1	3/9/2010	11:15
	ICSA	ICSA1	1	3/9/2010	11:17
	ICSAB	ICSAB1	1	3/9/2010	11:19
	CCV	CCV1	1	3/9/2010	11:21
	CCB	CCB1	1	3/9/2010	11:24
	IP100308-1MB	IP100308-1MB	1	3/9/2010	11:26
	IP100308-1RVS	IP100308-1RVS	1	3/9/2010	11:27
	IP100308-1LCS	IP100308-1LCS	1	3/9/2010	11:29
- S	1003063-4	1003063-4	1	3/9/2010	11:31
- S	1003063-4D	1003063-4DUP	1	3/9/2010	11:33
- S	1003063-4L 5X	1003063-4SER	5	3/9/2010	11:34
- S	1003063-4MS	1003063-4MS	1	3/9/2010	11:36
- S	1003063-4MSD	1003063-4MSD	1	3/9/2010	11:38
- Ca,Mg,Na,S,Sr,Th	1003063-7	1003063-7	1	3/9/2010	11:40
- S	1003063-10	1003063-10	1	3/9/2010	11:41
	CCV	CCV2	1	3/9/2010	11:43
	CCB	CCB2	1	3/9/2010	11:45
- S	1003063-11	1003063-11	1	3/9/2010	11:47
- S	1003063-15	1003063-15	1	3/9/2010	11:49
- S	1003063-17	1003063-17	1	3/9/2010	11:50
- S	1003063-18	1003063-18	1	3/9/2010	11:52
	IP100308-2MB	IP100308-2MB	1	3/9/2010	11:54
	IP100308-2RVS	IP100308-2RVS	1	3/9/2010	11:56
	IP100308-2LCS	IP100308-2LCS	1	3/9/2010	11:58
	IP100308-2LCSD	IP100308-2LCSD	1	3/9/2010	11:59
- S	1002238-1	1002238-1	1	3/9/2010	12:01
	1002238-2	1002238-2	1	3/9/2010	12:03
	CCV	CCV3	1	3/9/2010	12:05
	CCB	CCB3	1	3/9/2010	12:06
	1002238-3	1002238-3	1	3/9/2010	12:08

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Data Package ID: 20000881

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

#Name?

ICPTrace2 Run Log -- 3/9/2010

Instrument ID: ICPTrace2
File Name: 100309A.
AnalRunID: IT100309-2A1
CalibRefID: IT100309-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
- S	1002238-4	1002238-4	1	3/9/2010	12:10
	1002238-5	1002238-5	1	3/9/2010	12:12
- S	1002238-6	1002238-6	1	3/9/2010	12:14
	1002238-7	1002238-7	1	3/9/2010	12:15
	1002244-2	1002244-2	1	3/9/2010	12:17
- S	1002244-3	1002244-3	1	3/9/2010	12:19
	1002244-4	1002244-4	1	3/9/2010	12:21
- S	1002244-5	1002244-5	1	3/9/2010	12:22
	1002244-6	1002244-6	1	3/9/2010	12:24
	CCV	CCV4	1	3/9/2010	12:26
	CCB	CCB4	1	3/9/2010	12:28
- S	1003014-1	1003014-1	1	3/9/2010	12:30
- S	1003014-2	1003014-2	1	3/9/2010	12:32
	1003014-3	1003014-3	1	3/9/2010	12:33
- S,Sr	1003014-4	1003014-4	1	3/9/2010	12:35
- Sr	1003014-5	1003014-5	1	3/9/2010	12:37
- Sr	1003014-6	1003014-6	1	3/9/2010	12:39
- S	1003014-7	1003014-7	1	3/9/2010	12:40
- S	1003014-8	1003014-8	1	3/9/2010	12:42
	IP100308-3MB	IP100308-3MB	1	3/9/2010	12:44
	IP100308-3RVS	IP100308-3RVS	1	3/9/2010	12:46
	CCV	CCV5	1	3/9/2010	12:48
	CCB	CCB5	1	3/9/2010	12:51
	IP100308-3LCS	IP100308-3LCS	1	3/9/2010	12:52
- Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr	1003039-1	1003039-1	1	3/9/2010	12:54
- Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr	1003039-1D	1003039-1DUP	1	3/9/2010	12:56
- Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr	1003039-1L 5X	1003039-1SER	5	3/9/2010	12:58
- Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr	1003039-1MS	1003039-1MS	1	3/9/2010	13:00
	1003039-1MSD	1003039-1MSD	1	3/9/2010	13:01
	1003055-3	1003055-3	1	3/9/2010	13:03
	1003055-4	1003055-4	1	3/9/2010	13:05
- Pb	1003055-5	1003055-5	1	3/9/2010	13:07
- Fe,Pb,Se,Th,Tl,U,V	1003055-6	1003055-6	1	3/9/2010	13:08
	CCV	CCV6	1	3/9/2010	13:10
	CCB	CCB6	1	3/9/2010	13:12

20000882

Data Package ID: 20000882

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

#Name?

ICPTrace2 Run Log -- 3/9/2010

Instrument ID: ICPTrace2
File Name: 100309A.
AnalRunID: IT100309-2A1
CalibRefID: IT100309-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
- Fe,Pb,Se,Th,Tl,U,V	1003055-7	1003055-7	1	3/9/2010	13:14
	IP100308-4MB	IP100308-4MB	1	3/9/2010	13:16
	IP100308-4RVS	IP100308-4RVS	1	3/9/2010	13:18
	IP100308-4LCS	IP100308-4LCS	1	3/9/2010	13:19
	1003063-1	1003063-1	1	3/9/2010	13:21
	1003063-2	1003063-2	1	3/9/2010	13:23
	1003063-3	1003063-3	1	3/9/2010	13:25
	1003063-5	1003063-5	1	3/9/2010	13:27
	1003063-6	1003063-6	1	3/9/2010	13:28
	1003063-8	1003063-8	1	3/9/2010	13:30
	CCV	CCV7	1	3/9/2010	13:32
	CCB	CCB7	1	3/9/2010	13:34
	1003063-9	1003063-9	1	3/9/2010	13:36
	1003063-12	1003063-12	1	3/9/2010	13:38
	1003063-13	1003063-13	1	3/9/2010	13:39
	1003063-14	1003063-14	1	3/9/2010	13:41
	1003063-16	1003063-16	1	3/9/2010	13:43
	1003063-16D	1003063-16DUP	1	3/9/2010	13:45
	1003063-16L 5X	1003063-16SER	5	3/9/2010	13:47
	1003063-16MS	1003063-16MS	1	3/9/2010	13:48
	1003063-16MSD	1003063-16MSD	1	3/9/2010	13:50
	CCV	CCV8	1	3/9/2010	13:52
	CCB	CCB8	1	3/9/2010	13:55
	CCV	CCV9	1	3/9/2010	14:17
	CCB	CCB9	1	3/9/2010	14:19
+ Ca,Mg,Na,S,Sr,Th	1003063-7 100X	1003063-7	100	3/9/2010	14:20
	1002238-2A	1002238-2A	1	3/9/2010	14:22
+ Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr	1003039-1 2X	1003039-1	2	3/9/2010	14:24
+ Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr	1003039-1D 2X	1003039-1DUP	2	3/9/2010	14:26
+ Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr	1003039-1L 10X	1003039-1SER	10	3/9/2010	14:28
+ Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr	1003039-1MS 2X	1003039-1MS	2	3/9/2010	14:29
	1003039-1MSD 2X	1003039-1MSD	2	3/9/2010	14:31
- Bi,Co,Fe,Pb,Se,Si,Sn,Th,Ti,Tl,U,V,Zr	1003039-1A	1003039-1A	1	3/9/2010	14:33
+ Pb	1003055-5 10X	1003055-5	10	3/9/2010	14:35
+ Fe,Pb,Se,Th,Tl,U,V	1003055-6 2X	1003055-6	2	3/9/2010	14:36

20000883

Data Package ID: 20000883

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

#Name?

ICPTrace2 Run Log -- 3/9/2010

Instrument ID: ICPTrace2
File Name: 100309A.
AnalRunID: IT100309-2A1
CalibRefID: IT100309-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
	CCV	CCV10	1	3/9/2010	14:38
	CCB	CCB10	1	3/9/2010	14:40
+ Fe,Pb,Se,Th,Tl,U,V	1003055-7 2X	1003055-7	2	3/9/2010	14:42
	CRI	CRI2	1	3/9/2010	14:44
	ICSA	ICSA2	1	3/9/2010	14:46
	ICSAB	ICSAB2	1	3/9/2010	14:47
	CCV	CCV11	1	3/9/2010	14:49
	CCB	CCB11	1	3/9/2010	14:54
- S	AS100219-3MMB	AS100219-3MMB	1	3/9/2010	14:56
- S	AS100219-3PMB	AS100219-3PMB	1	3/9/2010	14:57
- S	AS100219-4MMB	AS100219-4MMB	1	3/9/2010	14:59
- S	AS100219-4PMB	AS100219-4PMB	1	3/9/2010	15:01
- S	AS100219-5MMB	AS100219-5MMB	1	3/9/2010	15:03
- S	AS100219-5PMB	AS100219-5PMB	1	3/9/2010	15:05
- S	AS100219-3LCS	AS100219-3LCS	1	3/9/2010	15:06
- S	AS100219-3LCSD	AS100219-3LCSD	1	3/9/2010	15:08
- S	AS100219-4LCS	AS100219-4LCS	1	3/9/2010	15:10
- S	AS100219-4LCSD	AS100219-4LCSD	1	3/9/2010	15:12
	CCV	CCV12	1	3/9/2010	15:13
	CCB	CCB12	1	3/9/2010	15:17
- S	AS100219-5LCS	AS100219-5LCS	1	3/9/2010	15:18
- S	AS100219-5LCSD	AS100219-5LCSD	1	3/9/2010	15:20
- S	1002179-1	1002179-1	1	3/9/2010	15:22
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr	1002179-2	1002179-2	1	3/9/2010	15:24
- S	1002179-5	1002179-5	1	3/9/2010	15:26
- S	1002179-6	1002179-6	1	3/9/2010	15:27
- S	1002179-8	1002179-8	1	3/9/2010	15:29
- S	1002179-12	1002179-12	1	3/9/2010	15:31
- S	1002179-15	1002179-15	1	3/9/2010	15:33
- S	1002179-16	1002179-16	1	3/9/2010	15:35
	CCV	CCV13	1	3/9/2010	15:36
	CCB	CCB13	1	3/9/2010	15:40
- S	1002179-17	1002179-17	1	3/9/2010	15:42
- S	1002179-18	1002179-18	1	3/9/2010	15:44
- S	1002179-20	1002179-20	1	3/9/2010	15:46

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Data Package ID: 20000884

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

#Name?

ICPTrace2 Run Log -- 3/9/2010

Instrument ID: ICPTrace2
File Name: 100309A.
AnalRunID: IT100309-2A1
CalibRefID: IT100309-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
- S	1002179-24	1002179-24	1	3/9/2010	15:47
- Al,Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr	1002179-25	1002179-25	1	3/9/2010	15:49
- S	1002179-28	1002179-28	1	3/9/2010	15:51
- S	1002179-29	1002179-29	1	3/9/2010	15:53
- S	1002179-30	1002179-30	1	3/9/2010	15:55
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr	1002179-31	1002179-31	1	3/9/2010	15:56
- S	1002179-32	1002179-32	1	3/9/2010	15:58
	CCV	CCV14	1	3/9/2010	16:00
	CCB	CCB14	1	3/9/2010	16:05
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr	1002179-33	1002179-33	1	3/9/2010	16:06
- S	1002179-35	1002179-35	1	3/9/2010	16:08
- S	1002179-41	1002179-41	1	3/9/2010	16:10
- S	1002179-42	1002179-42	1	3/9/2010	16:12
- Bi,Co,P,Pb,S,Si,Sn,Ti,Tl,Zn,Zr	1002179-43	1002179-43	1	3/9/2010	16:14
- P,S	1002179-45	1002179-45	1	3/9/2010	16:15
- S	1002179-50	1002179-50	1	3/9/2010	16:17
- Bi,Co,P,Pb,S,Si,Sn,Ti,Tl,Zr	1002179-51	1002179-51	1	3/9/2010	16:19
- S	1002179-52	1002179-52	1	3/9/2010	16:21
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr	1002179-53	1002179-53	1	3/9/2010	16:23
	CCV	CCV15	1	3/9/2010	16:24
	CCB	CCB15	1	3/9/2010	16:26
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr	1002179-54	1002179-54	1	3/9/2010	16:28
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr	1002179-55	1002179-55	1	3/9/2010	16:30
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr	1002179-56	1002179-56	1	3/9/2010	16:32
- S	1002179-57	1002179-57	1	3/9/2010	16:34
- S	1002179-59	1002179-59	1	3/9/2010	16:35
- S	1002179-60	1002179-60	1	3/9/2010	16:37
- S	1002179-61	1002179-61	1	3/9/2010	16:39
- S	1002179-62	1002179-62	1	3/9/2010	16:41
- Bi,Co,Pb,S,Si,Sn,Ti,Tl,Zr	1002179-63	1002179-63	1	3/9/2010	16:43
- S	1002179-64	1002179-64	1	3/9/2010	16:45
	CCV	CCV16	1	3/9/2010	16:46
	CCB	CCB16	1	3/9/2010	16:48
- S	1002179-65	1002179-65	1	3/9/2010	16:50
- S	1002179-66	1002179-66	1	3/9/2010	16:52

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Data Package ID: 20000885

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

#Name?

ICPTrace2 Run Log -- 3/9/2010

Instrument ID: ICPTrace2
File Name: 100309A.
AnalRunID: IT100309-2A1
CalibRefID: IT100309-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
- S	1002179-67	1002179-67	1	3/9/2010	16:54
- S	1002179-68	1002179-68	1	3/9/2010	16:56
+ Al,Bi,Co,Pb,Si,Sn,Ti,Tl,Zr	1002179-25 10X	1002179-25	10	3/9/2010	16:57
	CRI	CRI3	1	3/9/2010	16:59
	ICSA	ICSA3	1	3/9/2010	17:01
	ICSAB	ICSAB3	1	3/9/2010	17:03
	CCV	CCV17	1	3/9/2010	17:05
	CCB	CCB17	1	3/9/2010	17:07

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Data Package ID:

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

#Name?

Sample Id1	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
MIXBHIGH	1.98870	0.05265	4.98571	9.91427	9.84302	0.99316	0.00337	-0.04051	4.99051	4.99637	9.96658	9.87509
MIXAHIGH	0.00037	495.57274	0.00222	0.02322	0.00140	0.00076	0.00771	497.04294	0.00051	0.00116	0.00501	-0.00739
MIXCHIGH	0.00015	0.09946	-0.00716	0.02577	-0.00165	0.00383	4.88912	0.02472	-0.00153	0.00511	-0.00724	-0.00147
ICV	0.10420	26.18496	0.26938	0.50871	0.51754	0.26460	0.26668	26.19186	0.25944	0.26576	0.52669	0.53270
ICB	0.00029	0.06011	-0.00231	0.00044	-0.00069	0.00019	-0.00547	0.00434	-0.00022	-0.00034	-0.00014	-0.00102
CRI	0.01963	0.44478	0.00995	0.40082	0.41181	0.00984	0.04865	5.07416	0.00968	0.09873	0.01970	0.05168
ICSA	0.00043	262.40157	-0.00304	0.00092	-0.00046	0.00041	0.00011	262.05219	-0.00031	0.00104	-0.00108	-0.00529
ICSAB	0.20312	264.94381	0.10753	0.98970	0.50701	0.47418	0.52544	262.38108	1.00124	0.46448	0.46600	0.52561
CCV	0.19709	49.76697	0.50075	0.96394	0.97335	0.49029	0.50187	49.20251	0.48802	0.49217	0.97669	0.99953
CCB	0.00016	0.08529	-0.00021	0.00272	-0.00045	0.00017	-0.00287	0.03070	-0.00009	0.00020	0.00033	-0.00048
IP100308-1MB	-0.00036	0.03885	-0.00046	0.00198	-0.00086	0.00002	-0.00403	0.00158	-0.00051	-0.00040	-0.00043	-0.00113
IP100308-1RVS	0.00254	0.13279	0.00417	0.00663	0.00402	0.00092	0.00846	0.49467	0.00176	0.00163	0.00477	0.00386
IP100308-1LCS	0.10212	2.13256	2.10519	1.00674	2.01958	0.04982	-0.00580	41.68454	0.05038	0.49901	0.19908	0.26209
1003063-4	-0.00026	0.36649	0.00008	0.09045	0.02939	0.00005	-0.00266	137.09249	-0.00073	0.00009	-0.00018	-0.00050
1003063-4D	-0.00040	0.37281	0.00151	0.08622	0.02866	-0.00001	-0.00492	134.56095	-0.00066	-0.00010	-0.00039	-0.00069
1003063-4L 5X	0.00017	0.10084	0.00025	0.01882	0.00505	-0.00003	-0.00272	27.24871	-0.00016	0.00007	-0.00001	-0.00103
1003063-4MS	0.10214	2.70281	2.10537	1.10705	2.04900	0.04824	0.00008	182.04466	0.05009	0.48330	0.19187	0.26617
1003063-4MSD	0.10035	2.63315	2.03319	1.07363	2.00179	0.04645	-0.00159	174.87933	0.04844	0.46595	0.18592	0.26103
1003063-7	-0.00040	3.51944	0.00759	0.45286	0.04502	0.00114	-0.00118	H680.71899	-0.00041	0.02341	0.00107	0.00156
1003063-10	0.00042	0.39567	-0.00018	0.03440	0.04552	0.00005	0.00042	131.87929	-0.00059	0.00021	0.00057	-0.00046
CCV	0.19907	49.67541	0.50770	0.97215	0.97329	0.49899	0.50524	50.05795	0.49591	0.50007	0.99245	1.00729
CCB	-0.00007	0.09542	-0.00175	0.00289	-0.00031	0.00032	-0.00229	0.04109	-0.00007	-0.00015	0.00011	-0.00091
1003063-11	-0.00002	0.17858	0.00116	0.07796	0.03307	0.00014	-0.00094	129.34549	-0.00040	0.00027	0.00024	-0.00075
1003063-15	0.00050	0.14795	0.00005	0.11166	0.02389	0.00008	-0.00200	126.57861	-0.00030	0.00004	0.00011	-0.00081
1003063-17	-0.00052	0.14134	0.00118	0.08541	0.02934	0.00018	-0.00497	144.87745	-0.00055	-0.00007	-0.00016	-0.00142
1003063-18	0.00008	0.16337	0.00034	0.08562	0.02942	0.00014	-0.00483	141.04181	-0.00048	0.00039	-0.00022	-0.00092
IP100308-2MB	-0.00025	0.06315	0.00027	-0.00143	-0.00105	0.00015	-0.00278	0.00428	-0.00062	-0.00073	-0.00082	-0.00203
IP100308-2RVS	0.00202	0.16654	0.00322	0.00433	0.00421	0.00124	0.00726	0.51490	0.00127	0.00201	0.00465	0.00390
IP100308-2LCS	0.10212	2.19974	2.15725	1.02819	2.05114	0.05001	-0.00415	41.87111	0.05113	0.50331	0.19868	0.26922
IP100308-2LCSD	0.10281	2.19333	2.14215	1.02358	2.05251	0.04964	-0.00093	41.42816	0.05064	0.49950	0.19788	0.26993
1002238-1	0.00003	0.06894	0.00034	0.06110	0.02837	0.00010	-0.00215	103.17814	-0.00052	-0.00018	0.00929	-0.00131
1002238-2	0.01074	0.05320	0.02682	0.04250	0.02789	0.02765	-0.01401	0.05895	0.02840	0.02649	0.02694	0.02647
CCV	0.19493	48.93820	0.49520	0.95147	0.96455	0.47507	0.50239	47.80207	0.48655	0.48015	0.94946	0.99996
CCB	-0.00004	0.08774	-0.00034	0.00114	-0.00062	0.00033	-0.00432	0.00772	-0.00042	-0.00034	-0.00027	-0.00177
1002238-3	0.00002	0.06527	-0.00077	0.00225	-0.00056	0.00009	-0.00259	0.25849	-0.00047	-0.00028	0.00009	-0.00142
1002238-4	0.00065	0.07498	0.00473	0.19043	0.01985	0.00014	0.00050	51.18881	-0.00043	0.00004	0.00066	-0.00110
1002238-5	-0.00010	0.06955	-0.00096	0.13550	0.01670	0.00015	-0.00085	26.26695	-0.00047	-0.00039	-0.00046	-0.00161
1002238-6	-0.00008	0.06442	-0.00198	0.05793	0.02021	0.00005	-0.00278	115.08379	-0.00056	-0.00061	0.00101	-0.00164
1002238-7	0.01295	0.05894	0.03108	0.04307	0.02754	0.02744	-0.00587	0.05206	0.02870	0.02764	0.02776	0.02777
1002244-2	0.01679	0.06313	0.03858	0.05146	0.03617	0.03539	-0.00349	0.04155	0.03746	0.03625	0.03607	0.03686
1002244-3	-0.00020	0.06709	-0.00086	0.10519	0.04035	0.00010	-0.00206	82.72342	-0.00060	-0.00049	0.00138	-0.00174
1002244-4	-0.00044	0.07538	-0.00012	0.00186	0.00052	0.00000	-0.00258	0.64770	-0.00075	-0.00028	0.00530	-0.00037
1002244-5	-0.00040	0.06674	0.00395	0.09953	0.02130	0.00009	-0.00037	62.81915	-0.00044	-0.00075	0.00225	-0.00186
1002244-6	0.00066	0.07313	-0.00008	0.14273	0.01748	0.00016	-0.00205	28.39172	-0.00044	-0.00012	0.00068	-0.00125
CCV	0.19591	48.86681	0.49775	0.95730	0.96399	0.48344	0.49922	48.86458	0.49117	0.48716	0.96562	0.99813
CCB	0.00047	0.12645	0.00005	0.00116	0.00025	0.00072	-0.00210	0.04913	0.00051	0.00041	0.00088	-0.00045
1003014-1	0.00006	0.06722	0.00092	0.06685	0.03417	0.00020	-0.00225	86.45195	-0.00022	-0.00027	0.00079	-0.00088
1003014-2	-0.00037	0.06384	-0.00038	0.06583	0.03286	0.00005	-0.00306	82.85928	-0.00034	-0.00043	0.00102	-0.00110
1003014-3	-0.00060	0.06920	-0.00055	0.00044	-0.00066	0.00007	-0.00263	0.26940	-0.00045	-0.00032	0.00033	-0.00171
1003014-4	-0.00065	0.07249	-0.00098	0.12335	0.03263	0.00019	-0.00504	133.36141	-0.00058	-0.00062	0.01786	-0.00036

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Sample Id1	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
1003014-5	0.00042	0.07987	0.00051	0.12272	0.04406	0.00017	-0.00566	126.74419	-0.00033	0.00010	0.02341	-0.00149
1003014-6	0.00025	0.07661	-0.00066	0.12261	0.04208	0.00018	-0.00360	126.60703	-0.00045	-0.00022	0.02101	-0.00182
1003014-7	0.00000	0.07064	-0.00023	0.05755	0.03627	0.00011	-0.00162	104.56644	-0.00026	-0.00019	0.00042	-0.00124
1003014-8	-0.00003	0.07610	0.00070	0.05497	0.03078	0.00013	-0.00335	104.50011	-0.00047	-0.00015	0.00068	-0.00182
IP100308-3MB	-0.00072	0.07934	-0.00198	-0.00184	-0.00098	0.00016	-0.00504	0.03121	-0.00065	-0.00073	-0.00025	-0.00210
IP100308-3RVS	0.00178	0.18307	0.00371	0.00301	0.00396	0.00116	0.00495	0.49800	0.00155	0.00152	0.00476	0.00351
CCV	0.20048	50.14605	0.51619	0.98800	0.98636	0.49297	0.52797	50.01704	0.50769	0.50059	0.98649	1.03144
CCB	0.00007	0.08713	-0.00034	-0.00058	-0.00028	0.00046	-0.00042	0.02093	-0.00009	0.00008	0.00037	-0.00041
IP100308-3LCS	0.09937	2.09261	2.04206	0.95736	2.01700	0.04827	-0.00263	40.88910	0.04863	0.49269	0.19641	0.26422
1003039-1	0.00008	85.07663	-0.00266	0.39534	0.29809	0.00155	0.00610	95.14734	-0.00016	0.10599	0.08705	0.66723
1003039-1D	0.00015	95.01511	-0.00229	0.37451	0.26535	0.00146	0.00306	108.78984	0.00035	0.10752	0.09226	0.68133
1003039-1L 5X	0.00002	16.82125	0.00062	0.07984	0.05896	0.00024	-0.00306	19.09952	-0.00045	0.02139	0.01745	0.13044
1003039-1MS	0.09676	119.67309	1.89809	1.56453	2.28918	0.04732	0.00200	250.86303	0.04717	0.59802	0.54846	1.01886
1003039-1MSD	0.09799	84.05650	1.94080	1.22786	2.22540	0.04752	-0.00042	137.89809	0.04754	0.55612	0.28178	0.80487
1003055-3	-0.00041	55.01220	0.03905	0.02507	0.38672	0.00325	0.00262	8.77230	0.00252	0.04084	0.08983	0.24796
1003055-4	0.00029	79.18031	0.03838	0.08862	0.64564	0.00397	0.00710	17.34863	0.00230	0.06688	0.12918	0.35728
1003055-5	0.00443	61.38283	0.16177	0.12177	1.14422	0.00301	0.00786	12.12982	0.05016	0.10938	0.40265	1.22487
1003055-6	0.00022	80.35920	0.01504	0.06221	1.17706	0.00688	0.00697	23.54456	0.00183	0.10459	0.16595	0.05839
CCV	0.19718	50.01675	0.50222	0.96470	0.97586	0.49508	0.50467	49.55136	0.48806	0.49717	0.98634	1.00683
CCB	0.00024	0.09111	0.00150	0.00281	-0.00008	0.00042	-0.00552	0.03322	-0.00003	0.00011	0.00045	-0.00091
1003055-7	0.00043	76.80774	0.13263	0.05580	0.82910	0.00648	0.00870	18.56925	0.00282	0.08104	0.20247	0.38566
IP100308-4MB	-0.00002	0.06476	-0.00148	0.00036	-0.00044	-0.00001	-0.00475	0.02076	-0.00048	-0.00037	0.00015	-0.00123
IP100308-4RVS	0.00220	0.15329	0.00469	0.00546	0.00418	0.00087	0.00841	0.50714	0.00179	0.00177	0.00499	0.00422
IP100308-4LCS	0.09697	2.05887	1.97787	0.92505	1.97058	0.04699	-0.00598	39.85931	0.04825	0.48016	0.19272	0.25889
1003063-1	-0.00107	23.41782	0.02838	0.01777	0.21541	0.00281	-0.00032	48.36075	-0.00012	0.03087	0.01540	0.09320
1003063-2	-0.00057	18.59047	0.01534	0.01025	0.29905	0.00242	0.00199	9.01983	-0.00036	0.00959	0.01141	0.01231
1003063-3	-0.00189	53.10783	0.04260	0.04309	0.48919	0.00440	0.00337	114.76694	0.00004	0.04202	0.05443	0.08069
1003063-5	-0.00057	40.00242	0.05996	0.06410	0.19103	0.00324	0.00595	235.59396	0.00002	0.03403	0.03416	0.04837
1003063-6	-0.00152	29.72627	0.02827	0.01695	0.55710	0.00275	-0.00168	83.59358	-0.00017	0.02826	0.03040	0.03773
1003063-8	-0.00083	41.00104	0.03752	0.02419	0.75674	0.00409	0.00457	101.48918	0.00031	0.03822	0.04166	0.06616
CCV	0.19947	49.83096	0.50921	0.96733	0.97389	0.49990	0.50932	50.22809	0.49409	0.50180	0.99473	1.00929
CCB	-0.00020	0.08995	0.00047	0.00030	-0.00020	0.00030	-0.00417	0.03724	-0.00036	-0.00004	0.00015	-0.00128
1003063-9	-0.00100	36.75651	0.03518	0.02153	0.40609	0.00313	0.00272	274.94766	0.00023	0.03788	0.05640	0.05492
1003063-12	-0.00076	34.99888	0.03225	0.02233	0.49045	0.00306	0.00185	114.31708	0.00011	0.02819	0.04445	0.04374
1003063-13	-0.00087	35.36041	0.03548	0.02159	0.62228	0.00331	0.00366	136.08443	0.00000	0.03235	0.04026	0.04436
1003063-14	-0.00090	19.24821	0.02868	0.00889	0.52445	0.00326	-0.00306	9.25240	-0.00020	0.01688	0.00914	0.03204
1003063-16	-0.00114	43.84795	0.03910	0.02369	0.75332	0.00402	0.00555	154.12827	-0.00007	0.03667	0.04386	0.06399
1003063-16D	-0.00129	43.79395	0.03964	0.02369	0.72662	0.00380	0.00276	145.91536	0.00025	0.03602	0.04288	0.06384
1003063-16L 5X	-0.00076	8.72927	0.00832	0.00291	0.14950	0.00076	-0.00586	29.65360	-0.00034	0.00721	0.00835	0.01057
1003063-16MS	0.09358	69.49598	1.92246	0.84177	2.62090	0.04912	0.00472	187.03202	0.04646	0.48802	0.23620	0.32035
1003063-16MSD	0.09545	72.95459	1.95847	0.85722	2.66493	0.05053	0.00639	197.64138	0.04795	0.49880	0.24430	0.32552
CCV	0.19963	49.78557	0.50860	0.96525	0.97359	0.49274	0.50701	49.78483	0.49458	0.49665	0.98556	1.01087
CCB	0.00027	0.08157	0.00153	0.00110	-0.00001	0.00020	-0.00321	0.04402	0.00005	0.00025	0.00031	-0.00063
CCV	0.19346	49.25355	0.48677	0.92413	0.95378	0.48979	0.47614	47.89487	0.46046	0.48572	0.97234	0.97732
CCB	0.00017	0.03331	0.00163	0.00028	-0.00011	0.00009	-0.00287	0.02581	0.00000	0.00039	0.00036	0.00028
1003063-7 100X	0.00006	0.04779	-0.00096	0.00383	-0.00034	-0.00018	-0.00337	7.46827	-0.00040	-0.00011	-0.00046	-0.00026
1002238-2A	0.11319	2.24997	2.23206	1.07332	2.14498	0.07920	-0.00494	43.97537	0.07855	0.55402	0.23798	0.30343
1003039-1 2X	-0.00024	43.57985	0.00126	0.20598	0.15300	0.00059	0.00182	49.34968	-0.00033	0.05765	0.04671	0.33549
1003039-1D 2X	0.00017	50.00104	0.00088	0.19236	0.13961	0.00058	0.00402	58.96592	0.00005	0.06065	0.05036	0.35214
1003039-1L 10X	0.00036	8.57906	-0.00038	0.04016	0.02964	-0.00019	-0.00245	9.68560	-0.00025	0.01132	0.00868	0.06691

2008080800

Sample Id1	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
1003039-1MS 2X	0.04953	62.88926	0.98126	0.80625	1.18116	0.02491	0.00253	127.40742	0.02427	0.31772	0.29417	0.52368
1003039-1MSD 2X	0.04716	43.77747	0.95467	0.60563	1.10953	0.02372	-0.00081	68.60122	0.02284	0.28102	0.14356	0.41302
1003039-1A	-0.00036	85.65810	3.89069	2.21984	4.13969	0.09310	0.00789	169.75113	0.09454	1.02035	0.45074	1.12393
1003039-5 10X	0.00002	6.10614	0.01619	0.01685	0.11508	0.00010	0.00001	1.28373	0.00457	0.01131	0.04198	0.12007
1003039-6 2X	0.00025	40.34937	0.00971	0.03358	0.58435	0.00324	0.00636	11.89206	0.00075	0.05307	0.08539	0.02786
CCV	0.19767	49.71411	0.50297	0.94866	0.96320	0.50477	0.48953	49.69416	0.47430	0.50148	0.99990	0.99081
CCB	-0.00032	0.05223	0.00029	0.00244	-0.00004	0.00024	-0.00393	0.03207	-0.00007	0.00000	0.00027	-0.00001
1003039-7 2X	-0.00381	38.66675	0.06070	0.02626	0.41735	0.00320	-0.01353	9.38708	0.00038	0.03892	0.10161	0.18921
CRI	0.02010	0.44207	0.00911	0.41172	0.42293	0.01050	0.04630	5.36016	0.01005	0.10543	0.02083	0.05414
ICSA	0.00024	270.05558	-0.00109	0.00009	-0.00039	0.00037	0.00434	269.50521	-0.00049	0.00145	-0.00081	-0.00456
ICSAB	0.20804	273.43904	0.10992	1.00941	0.51757	0.49884	0.53824	273.10492	1.00480	0.48704	0.48802	0.53805
CCV	0.20192	51.55857	0.52014	0.98431	1.00283	0.51583	0.50466	50.99881	0.48952	0.51473	1.02345	1.02922
CCB	0.00004	0.05327	0.00012	0.00085	-0.00042	0.00001	-0.00302	0.03006	-0.00020	-0.00032	0.00013	-0.00051
AS100219-3MMB	0.00975	2.50453	-0.00205	0.20992	0.04296	0.00008	0.00305	9.58014	0.00053	0.11564	0.11327	0.05459
AS100219-3PMB	0.00975	1.89629	-0.00419	0.18243	0.04101	0.00002	0.00012	7.58205	-0.00015	0.07917	0.11382	0.00173
AS100219-4MMB	0.01069	2.14471	-0.00025	0.16359	0.03902	-0.00006	0.00184	8.39881	-0.00022	0.08045	0.16447	0.00252
AS100219-4PMB	0.00956	1.81787	-0.00486	0.17522	0.03782	-0.00004	-0.01422	7.77958	-0.00067	0.08946	0.10710	0.00340
AS100219-5MMB	0.00903	2.32622	-0.00577	0.13901	0.03884	0.00004	-0.00141	8.01512	0.00079	0.07294	0.09741	0.00417
AS100219-5PMB	0.01051	1.53271	0.00334	0.14542	0.03158	-0.00016	-0.00078	6.13659	0.00060	0.08066	0.09855	0.00522
AS100219-3LCS	0.00967	48.13710	0.00207	0.17873	0.17658	0.00489	-0.00378	35.66608	0.00003	0.12075	0.14133	0.00565
AS100219-3LCSD	0.00953	48.91288	0.00465	0.18366	0.17881	0.00495	-0.00180	36.72396	0.00074	0.12964	0.11818	0.00785
AS100219-4LCS	0.01179	49.13010	0.00421	0.19466	0.19040	0.00502	-0.00124	37.54184	0.00032	0.09821	0.10726	0.01100
AS100219-4LCSD	0.01156	47.75257	0.00393	0.14434	0.18877	0.00468	-0.00416	35.07540	0.00019	0.09042	0.10540	0.00934
CCV	0.19769	50.18991	0.50590	0.94827	0.97110	0.50363	0.48919	49.72699	0.47610	0.50117	0.99882	1.00124
CCB	-0.00054	0.04169	0.00012	-0.00069	-0.00051	0.00003	-0.00778	0.01732	-0.00045	-0.00071	-0.00028	-0.00076
AS100219-5LCS	0.01169	49.42518	0.00553	0.23856	0.18310	0.00500	-0.00114	38.80042	0.00140	0.10966	0.09364	0.01148
AS100219-5LCSD	0.00966	47.98127	0.00126	0.18058	0.18111	0.00474	-0.00178	35.93379	0.00138	0.10785	0.09296	0.00571
1002179-1	0.01244	213.36428	0.07187	0.34422	0.52022	0.00858	-0.00273	92.30637	0.07552	0.14528	0.97538	0.50634
1002179-2	0.01003	298.66306	0.07626	0.27756	0.43650	0.01003	-0.00687	151.55331	0.00501	0.13782	0.69383	0.39715
1002179-5	0.00982	75.72777	0.04657	0.26901	0.59372	0.00294	-0.00608	39.99151	0.06378	0.12561	0.39321	0.44491
1002179-6	0.00910	120.54454	0.03542	0.29366	0.60000	0.00597	-0.00394	49.26615	0.01220	0.12438	0.31516	0.17068
1002179-8	0.00924	82.43594	0.03461	0.24282	0.54310	0.00324	0.00064	42.18552	0.03440	0.11785	0.48718	0.10149
1002179-12	0.01071	83.08383	0.03176	0.28894	0.64481	0.00306	-0.00424	47.02589	0.00520	0.11128	0.26264	0.09158
1002179-15	0.00981	157.16219	0.04713	0.29360	0.58286	0.00590	-0.00511	67.75879	0.00443	0.13740	0.41967	0.16822
1002179-16	0.00962	115.14500	0.03704	0.28278	0.61125	0.00481	-0.00601	47.37292	0.30443	0.13027	0.44031	1.11956
CCV	0.20167	50.72350	0.51524	0.96745	0.98170	0.51106	0.50257	50.79390	0.48596	0.51016	1.01594	1.01412
CCB	0.00044	0.06240	-0.00211	-0.00017	0.00211	0.00014	-0.00003	0.02099	-0.00021	0.00000	0.00030	-0.00034
1002179-17	0.01019	102.94095	0.04159	0.33238	0.68099	0.00373	-0.00393	47.68270	0.00721	0.09412	0.53959	0.10623
1002179-18	0.00999	83.76457	0.03137	0.37714	0.51901	0.00329	-0.00041	42.47812	0.09717	0.12802	0.38314	0.33110
1002179-20	0.00957	62.37087	0.02444	0.37667	0.57183	0.00234	-0.00581	34.50181	0.10893	0.14700	0.43411	0.40605
1002179-24	0.00877	173.78829	0.03721	0.23902	0.64576	0.00688	-0.00304	51.91201	0.05693	0.13903	0.34695	0.29915
1002179-25	0.01155	H526.99946	0.08611	0.19490	0.53870	0.02523	-0.00429	178.12112	0.03215	0.13273	0.48468	0.39500
1002179-28	0.00891	153.07762	0.03489	0.27480	0.77249	0.00782	-0.00156	49.38161	0.06722	0.12779	0.50413	0.54544
1002179-29	0.00929	64.39941	0.02457	0.26724	0.58067	0.00249	-0.00191	32.06034	0.11045	0.15376	0.32757	0.48897
1002179-30	0.01020	225.07104	0.04559	0.23421	0.60170	0.01092	0.00025	58.97561	0.01515	0.16390	0.43857	0.14479
1002179-31	0.01011	135.07968	0.04637	0.30946	0.69321	0.00572	-0.00469	69.54353	0.00700	0.09869	0.42377	0.26874
1002179-32	0.00911	123.71044	0.03821	0.21535	0.67805	0.00503	-0.00212	58.08204	0.00930	0.11624	0.39652	0.20455
CCV	0.20105	50.81906	0.51747	0.98023	0.99435	0.50696	0.50673	50.60477	0.49332	0.50981	1.00909	1.02874
CCB	-0.00032	0.04376	-0.00151	-0.00157	0.00108	0.00014	-0.00710	0.02007	-0.00025	-0.00051	0.00006	-0.00008
1002179-33	0.01023	264.68733	0.06111	0.18241	0.54348	0.01112	-0.00480	77.85814	0.01179	0.09835	0.45272	1.16890

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Sample Id1	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
1002179-35	0.00855	120.55224	0.04475	0.19180	0.57421	0.00457	-0.00839	56.78874	0.00491	0.12755	0.36219	0.28116
1002179-41	0.00996	106.69333	0.04338	0.20997	0.77443	0.00357	-0.00667	60.38897	0.06377	0.12720	0.37734	0.75429
1002179-42	0.01027	99.68822	0.04100	0.22326	0.70445	0.00364	-0.00238	62.06461	0.00648	0.11803	0.39785	0.08111
1002179-43	0.01017	381.25315	0.16008	0.21371	0.65352	0.01428	-0.00822	276.09835	0.00423	0.11836	0.49280	0.24834
1002179-45	0.01019	93.74607	0.03368	0.23725	0.69403	0.00344	-0.00535	50.99225	0.11579	0.08834	0.42261	0.42551
1002179-50	0.01169	108.03151	0.04446	0.26951	0.98069	0.00416	-0.00462	50.47581	0.03515	0.07110	0.40596	0.17763
1002179-51	0.00976	242.74880	0.05440	0.17343	0.80365	0.00851	-0.00807	106.90140	0.01121	0.10493	0.40467	0.21975
1002179-52	0.01085	207.86826	0.04585	0.19178	0.86433	0.00760	-0.00237	82.17301	0.00774	0.09304	0.69093	0.11739
1002179-53	0.01014	194.12573	0.04092	0.17201	0.77134	0.00683	-0.00651	79.44877	0.01271	0.08002	0.50797	0.20816
CCV	0.19862	49.99186	0.50871	0.94415	0.97089	0.51132	0.48564	50.26197	0.47499	0.50733	1.01285	0.99926
CCB	-0.00078	0.04142	-0.00086	-0.00024	0.00509	0.00008	-0.00441	0.02312	-0.00013	-0.00047	0.00013	-0.00004
1002179-54	0.00858	174.42752	0.03855	0.15825	0.76847	0.00624	-0.00477	71.75271	0.00606	0.10610	0.46966	0.20042
1002179-55	0.00850	129.25241	0.03831	0.25159	0.89929	0.00523	-0.00122	55.60851	0.00481	0.11009	0.48458	0.12850
1002179-56	0.00998	145.03605	0.03535	0.17467	0.86611	0.00602	0.00339	57.72474	0.00259	0.10902	0.55085	0.10665
1002179-57	0.01052	138.16765	0.03818	0.22905	0.84908	0.00565	0.00573	55.07157	0.00326	0.09086	0.57003	0.20741
1002179-59	0.01075	4.80554	-0.00205	0.18535	0.05269	0.00007	0.00425	8.93685	0.00099	0.06429	0.32742	0.01223
1002179-60	0.01033	2.92167	-0.00274	0.19920	0.04325	-0.00007	0.00890	9.07212	0.00082	0.09046	0.29924	0.02822
1002179-61	0.00956	2.94115	-0.00205	0.16340	0.04111	-0.00001	0.00625	8.17030	0.00175	0.13315	0.23470	0.01204
1002179-62	0.01200	3.02714	0.00127	0.14526	0.03916	-0.00012	-0.00075	7.16501	0.00241	0.08098	0.23359	0.01600
1002179-63	0.01233	140.28361	0.04295	0.23105	0.81361	0.00700	0.00040	56.61542	0.06660	0.11408	0.45423	0.20788
1002179-64	0.01069	2.99685	0.00036	0.21693	0.04217	-0.00008	-0.00072	9.24706	0.00010	0.10797	0.20990	0.00952
CCV	0.19687	49.54763	0.50034	0.93635	0.96121	0.49842	0.48478	49.04578	0.47039	0.49570	0.98939	0.99585
CCB	-0.00150	0.03387	-0.00443	-0.00178	0.00150	0.00020	-0.01120	0.00887	-0.00052	-0.00135	-0.00107	-0.00161
1002179-65	0.01255	3.34502	-0.00300	0.25664	0.04507	0.00020	0.00202	10.11995	0.00033	0.06703	0.31170	0.01364
1002179-66	0.01156	3.19472	-0.00170	0.23754	0.04844	0.00029	0.00419	9.87512	0.00046	0.10268	0.26712	0.01335
1002179-67	0.01123	3.41327	-0.00166	0.22901	0.04276	0.00022	0.00179	9.19145	0.00088	0.11558	0.27110	0.01078
1002179-68	0.01102	3.56283	-0.00324	0.18952	0.04356	0.00028	0.00125	8.83194	0.00269	0.11266	0.27663	0.01303
1002179-25 10X	0.00066	50.51881	0.00558	0.01812	0.07450	0.00251	-0.00433	17.56121	0.00258	0.01347	0.05047	0.03856
CRI	0.02042	0.44117	0.00997	0.40027	0.41439	0.01027	0.05216	5.29567	0.00976	0.10374	0.02078	0.05349
ICSA	0.00003	266.73116	-0.00419	-0.00198	-0.00001	0.00034	0.00655	269.67383	-0.00028	0.00145	-0.00011	-0.00508
ICSAB	0.20494	267.93527	0.11095	0.97955	0.50612	0.48433	0.51506	265.01669	0.97674	0.47245	0.47537	0.53093
CCV	0.19699	49.88437	0.50247	0.94526	0.96707	0.50026	0.48620	49.41709	0.47322	0.49834	0.99356	1.00168
CCB	-0.00062	0.05239	-0.00105	0.00063	-0.00023	0.00024	-0.00335	0.02622	-0.00025	-0.00019	0.00004	-0.00041

20000890

Sample Id1	Fe	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Pb I	Pb II
MIXBHIGH	-0.01391	-0.23320	0.00153	-0.05950	9.93511	H10.01100	-0.13264	H10.10638	H50.00867	9.98393	H10.02575	9.96305
MIXAHIGH	195.61047	247.54631	9.89935	493.77852	-0.00617	0.00194	249.36068	0.00055	0.01867	0.00293	L-0.00591	0.00734
MIXCHIGH	-0.00112	-0.34991	0.00169	-0.25629	0.00336	-0.00117	-0.18265	-0.00159	0.00894	0.00128	L-0.00630	0.00506
ICV	10.71264	25.39973	0.25186	26.57657	0.52171	0.51663	25.77032	0.53392	2.56302	0.51330	0.51675	0.51158
ICB	0.00798	-0.33164	0.00116	0.00901	-0.00020	-0.00102	-0.19789	-0.00129	-0.00383	0.00003	-0.00274	0.00142
CRI	0.20882	3.65336	0.01683	5.08808	0.02931	0.01949	4.22145	0.07990	0.20386	0.00517	0.00497	0.00527
ICSA	107.47958	-0.45562	0.00261	268.82317	-0.00158	-0.00185	-0.19272	0.00001	0.00468	0.00065	L-0.00341	0.00268
ICSAB	107.80754	-0.44328	1.06922	270.72656	0.46337	0.97688	-0.20124	0.92624	1.00558	0.05350	0.04530	0.05759
CCV	20.20729	49.79466	0.51273	50.20885	0.96955	0.96830	49.03163	0.98151	4.83012	0.95329	0.95755	0.95116
CCB	0.01880	-0.35216	0.00118	0.03918	0.00005	-0.00100	-0.19459	-0.00036	-0.00353	0.00060	0.00155	0.00012
IP100308-1MB	0.00619	-0.29357	0.00114	-0.01187	-0.00037	-0.00077	-0.20449	-0.00091	0.00270	0.00014	-0.00024	0.00032
IP100308-1RVS	0.10615	0.33609	0.00426	0.48905	0.00445	0.00916	0.58891	0.00429	0.10291	0.00504	0.00574	0.00469
IP100308-1LCS	1.04115	38.68295	0.52048	42.26775	0.49373	1.02303	38.48299	0.50178	0.00326	0.48660	0.48799	0.48591
1003063-4	0.60829	7.52001	0.04492	89.91688	0.08674	0.00107	119.78052	0.00093	0.01299	0.00001	-0.00152	0.00078
1003063-4D	0.58994	7.43137	0.04453	88.39114	0.08525	0.00093	119.02425	0.00044	0.01644	-0.00053	-0.00182	0.00011
1003063-4L 5X	0.12280	0.83561	0.00815	17.87436	0.01755	-0.00093	23.54025	-0.00031	0.00017	-0.00020	0.00238	-0.00148
1003063-4MS	1.63926	54.28524	0.64707	134.36566	0.56683	1.01096	162.62074	0.48286	0.01852	0.47251	0.47270	0.47242
1003063-4MSD	1.59095	53.31560	0.63385	129.33954	0.54846	0.97610	158.49997	0.46729	0.01542	0.45625	0.45423	0.45725
1003063-7	10.46952	57.34167	0.73610	H0.21	1.26451	0.00431	H925.09397	0.01620	0.18946	0.00203	0.00293	0.00158
1003063-10	0.74336	6.12604	0.02644	51.83570	0.13599	0.00070	45.76998	0.00026	0.02855	-0.00010	0.00141	-0.00086
CCV	20.40946	49.65884	0.50814	50.99169	0.97885	0.98072	48.41527	1.00566	4.93980	0.97161	0.97138	0.97172
CCB	0.01813	-0.37482	0.00132	0.05200	0.00028	-0.00086	-0.15463	-0.00024	0.00159	0.00065	-0.00059	0.00126
1003063-11	0.32984	6.98462	0.03952	73.66635	0.09539	0.00105	97.73798	-0.00023	0.01553	0.00032	0.00182	-0.00042
1003063-15	0.19980	7.57408	0.05060	90.03103	0.07189	0.00162	138.78215	-0.00015	0.00939	0.00030	0.00319	-0.00114
1003063-17	0.40207	7.42506	0.04472	92.79980	0.19349	0.00120	119.26160	0.00005	0.01193	-0.00041	-0.00050	-0.00036
1003063-18	0.40884	7.36116	0.04473	90.69266	0.19219	0.00107	118.81301	0.00016	0.01137	-0.00027	0.00013	-0.00046
IP100308-2MB	-0.00139	-0.36082	0.00112	-0.00944	-0.00048	-0.00121	-0.18240	-0.00142	0.00058	-0.00003	-0.00112	0.00052
IP100308-2RVS	0.10653	0.38229	0.00447	0.50452	0.00457	0.00937	0.60195	0.00450	0.10534	0.00425	0.00599	0.00338
IP100308-2LCS	1.04043	39.24676	0.53028	42.37073	0.49261	1.03824	38.69208	0.52091	0.00427	0.48316	0.48777	0.48086
IP100308-2LCSD	1.04397	39.20759	0.53000	41.83808	0.49031	1.03140	38.65962	0.51546	0.00600	0.48172	0.48589	0.47963
1002238-1	0.07099	3.33438	0.01973	61.99406	0.00020	0.00785	37.38940	0.00148	0.00392	0.00035	0.00016	0.00045
1002238-2	0.01236	-0.39297	0.00100	0.01697	0.02759	-0.00233	-0.19184	0.02647	0.02779	0.02711	0.01408	0.03362
CCV	19.60684	49.62621	0.50926	48.59340	0.93901	0.94904	48.43974	0.97856	4.76113	0.91654	0.92479	0.91242
CCB	0.00793	-0.31907	0.00127	0.01056	-0.00008	-0.00066	-0.18310	-0.00097	-0.00297	-0.00022	L-0.00366	0.00150
1002238-3	0.01212	-0.30377	0.00115	0.10095	-0.00012	-0.00096	-0.09135	-0.00058	0.00270	-0.00008	-0.00005	-0.00009
1002238-4	0.01677	5.45720	0.04073	24.08574	0.00083	0.01144	101.92402	0.00813	0.01076	0.00041	0.00116	0.00004
1002238-5	0.02542	1.56581	0.03165	18.23393	0.01770	0.00389	52.84222	-0.00004	0.00696	0.00023	-0.00042	0.00055
1002238-6	0.00441	2.75180	0.02017	63.30243	-0.00035	0.00569	34.97053	0.00334	0.02607	0.00019	-0.00046	0.00051
1002238-7	0.00366	-0.36581	0.00103	0.02316	0.02759	-0.00113	-0.19024	0.02798	0.03093	0.02625	0.02505	0.02685
1002244-2	0.00750	-0.37292	0.00099	0.01863	0.03570	-0.00165	-0.20224	0.03661	0.03777	0.03577	0.03428	0.03651
1002244-3	0.03215	1.81424	0.01913	54.51871	0.00016	0.00658	37.41648	0.01581	0.00220	0.00034	-0.00006	0.00055
1002244-4	0.07909	-0.27459	0.00107	0.17962	0.00154	-0.00083	0.31408	0.00318	0.00737	0.00087	0.00026	0.00117
1002244-5	0.01151	4.75625	0.03346	39.31506	0.00005	0.01034	68.14435	0.02004	0.00873	0.00031	0.00074	0.00010
1002244-6	0.03950	1.66328	0.03294	19.62676	0.01785	0.00581	54.93392	-0.00029	0.00433	-0.00034	0.00299	-0.00200
CCV	19.85868	49.11499	0.50246	49.45895	0.95018	0.96300	48.03985	0.99186	4.88861	0.93512	0.93960	0.93288
CCB	0.02409	-0.23948	0.00161	0.05376	0.00075	0.00057	-0.14946	0.00022	0.00108	0.00062	0.00126	0.00031
1003014-1	0.01650	5.24540	0.02272	52.91283	0.00075	0.00679	58.78123	0.02232	0.00944	0.00032	0.00033	0.00031
1003014-2	0.01821	5.07939	0.02235	50.83978	0.00056	0.00661	58.24464	0.02122	0.00417	0.00050	-0.00110	0.00129
1003014-3	0.01263	-0.30365	0.00114	0.15310	-0.00003	-0.00092	-0.05988	-0.00057	0.00392	-0.00071	-0.00117	-0.00048
1003014-4	0.35135	3.22439	0.04562	74.36044	0.01396	-0.00114	45.53520	0.00157	0.01852	0.00003	-0.00166	0.00087

Sample Id1	Fe	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Pb I	Pb II
1003014-5	0.09637	3.16021	0.04484	72.24465	0.01377	-0.00012	45.32424	0.00083	0.02987	0.00016	0.00086	-0.00020
1003014-6	0.12745	3.18317	0.04480	72.12525	0.01305	-0.00040	45.30304	0.00130	0.02571	0.00013	0.00118	-0.00039
1003014-7	0.01113	3.40420	0.02196	65.52959	0.00648	0.00620	36.27544	0.03328	0.00483	-0.00017	-0.00020	-0.00015
1003014-8	0.01514	3.25501	0.02170	66.82888	0.00287	0.00572	36.96453	0.04246	0.00889	-0.00007	0.00020	-0.00020
IP100308-3MB	0.07455	-0.34944	0.00103	0.00083	0.00030	-0.00165	-0.18992	-0.00111	0.02429	-0.00013	L-0.00446	0.00204
IP100308-3RVS	0.15784	0.31595	0.00403	0.48010	0.00481	0.00860	0.57898	0.00495	0.12501	0.00447	0.00455	0.00444
CCV	20.30640	50.23156	0.51547	50.61570	0.96728	0.98580	48.77711	1.03816	5.01982	0.95009	0.96275	0.94378
CCB	0.01327	-0.30839	0.00133	0.02968	0.00018	0.00005	-0.17845	-0.00019	0.00007	-0.00058	0.00031	-0.00102
IP100308-3LCS	1.07127	37.94236	0.50300	41.36546	0.48632	1.01732	37.15785	0.49791	0.02723	0.47495	0.47515	0.47485
1003039-1	H219.36669	1.35200	0.06750	92.85703	1.99120	-0.00062	9.58826	0.22179	2.47283	0.01538	0.01436	0.01589
1003039-1D	H222.64488	1.20149	0.06410	92.83589	2.22421	-0.00013	8.89881	0.21952	2.46358	0.01600	0.01540	0.01630
1003039-1L 5X	40.67199	-0.10205	0.01210	18.45796	0.41099	-0.00119	1.51959	0.04564	0.50139	0.00335	0.00219	0.00394
1003039-1MS	H274.70531	43.88204	0.65063	158.21087	3.99901	0.93896	51.46116	0.74714	2.96237	0.45308	0.45506	0.45209
1003039-1MSD	186.32589	42.30106	0.60597	121.52617	2.39368	0.96173	47.96013	0.66211	2.08293	0.46390	0.46420	0.46376
1003055-3	121.15399	3.65748	0.07770	15.96774	1.89287	0.00469	0.31153	0.10013	3.78816	0.49132	0.49104	0.49146
1003055-4	182.52776	5.67208	0.12321	27.58431	2.59796	0.00686	0.49412	0.16189	5.49320	0.74017	0.74238	0.73907
1003055-5	169.33618	2.92729	0.10585	24.72654	3.36000	0.33302	0.57445	4.13728	3.17141	18.14802	H18.25320	H18.09551
1003055-6	H217.52176	15.09912	0.36910	49.62166	8.15663	0.00379	0.79796	0.22626	4.30708	0.17855	0.18066	0.17750
CCV	20.27116	49.60559	0.51183	50.69707	0.97683	0.97587	48.95168	0.98936	5.02905	0.96313	0.96255	0.96342
CCB	0.03432	-0.26332	0.00148	0.03951	0.00100	-0.00025	-0.17025	-0.00068	0.00007	0.00118	0.00061	0.00147
1003055-7	H226.06963	9.12109	0.24603	36.47444	4.26516	0.00477	0.74105	0.18096	4.00354	0.44616	0.44535	0.44656
IP100308-4MB	0.10188	-0.31254	0.00113	-0.00602	0.00111	-0.00131	-0.19477	-0.00048	0.02313	0.00065	0.00043	0.00076
IP100308-4RVS	0.15861	0.31038	0.00404	0.48883	0.00519	0.00872	0.57893	0.00439	0.12734	0.00576	0.00599	0.00564
IP100308-4LCS	1.03062	37.55717	0.49265	40.25785	0.47414	0.98573	36.75783	0.48097	0.02044	0.46514	0.46396	0.46573
1003063-1	61.75260	4.54980	0.03966	28.33030	0.48744	0.00088	0.48166	0.03393	1.16170	0.06243	0.06229	0.06250
1003063-2	36.51919	3.63583	0.02113	7.20825	0.25031	0.00022	-0.05208	0.01121	0.38506	0.09100	0.09223	0.09039
1003063-3	134.72526	11.06822	0.08304	34.73247	1.45429	0.00382	2.43594	0.08284	2.58265	0.07928	0.07821	0.07981
1003063-5	101.69167	9.96505	0.12740	78.27663	1.57594	0.00242	12.83681	0.06771	2.31687	0.06093	0.06198	0.06040
1003063-6	86.16391	6.08248	0.04530	28.76585	0.81262	0.00159	2.55777	0.04335	1.81119	0.07957	0.07899	0.07986
1003063-8	145.62525	8.01520	0.06237	29.27659	1.66088	0.00195	2.11325	0.06937	2.91471	0.06542	0.06479	0.06573
CCV	20.32512	49.43347	0.50869	51.21457	0.97757	0.98669	48.76927	1.00285	5.06406	0.96925	0.97512	0.96631
CCB	0.02815	-0.36106	0.00123	0.03111	0.00045	-0.00061	-0.18045	-0.00084	-0.00105	0.00051	-0.00107	0.00130
1003063-9	126.45609	6.91599	0.06929	33.62069	1.28722	0.00318	2.20526	0.07681	3.59592	0.05288	0.05368	0.05247
1003063-12	99.90863	7.67649	0.04886	27.21176	1.35449	0.00272	1.39261	0.05220	2.25021	0.06170	0.06407	0.06052
1003063-13	114.49606	7.62301	0.05107	27.42718	1.62626	0.00266	1.51417	0.05987	2.35565	0.05865	0.05709	0.05944
1003063-14	34.16949	3.48931	0.02366	7.75937	0.15570	0.00013	0.07463	0.01599	0.40901	0.05363	0.05547	0.05272
1003063-16	119.12610	9.44049	0.06962	35.49854	1.47307	0.00278	1.89132	0.06764	2.46164	0.07380	0.07334	0.07402
1003063-16D	113.25559	9.37823	0.06935	34.04591	1.43595	0.00323	1.85920	0.06681	2.35223	0.07084	0.07029	0.07112
1003063-16L 5X	22.04816	1.23401	0.01212	7.06467	0.29837	-0.00043	0.14399	0.01266	0.49672	0.01516	0.01641	0.01453
1003063-16MS	118.56298	50.07088	0.61802	74.85105	1.89711	0.90110	41.03206	0.52023	2.32801	0.50420	0.50361	0.50450
1003063-16MSD	127.28396	50.76626	0.62372	78.46248	1.95763	0.91173	41.27280	0.53775	2.46016	0.51685	0.51949	0.51553
CCV	20.09711	49.62114	0.50926	50.66539	0.96594	0.97992	48.81204	1.00098	5.03085	0.95729	0.96147	0.95520
CCB	0.03052	-0.31705	0.00132	0.03332	0.00049	-0.00083	-0.18225	-0.00043	0.00027	-0.00003	0.00124	-0.00066
CCV	19.82284	48.66062	0.50549	49.83584	0.96649	0.94350	48.50036	0.92394	4.96908	0.95431	0.94250	0.96021
CCB	0.02022	-0.33817	0.00130	0.02912	0.00047	0.00017	-0.17675	-0.00033	-0.00211	0.00061	0.00134	0.00024
1003063-7 100X	0.13330	0.02101	0.00647	19.26940	0.01581	-0.00146	13.89901	-0.00045	-0.00145	-0.00001	0.00076	-0.00040
1002238-2A	1.10019	41.59717	0.56690	45.59385	0.55399	1.06722	41.66133	0.52713	0.03296	0.57141	0.54010	0.58705
1003039-1 2X	111.03965	0.51458	0.03226	49.49845	1.06102	-0.00036	4.73333	0.11451	1.41413	0.00791	0.00944	0.00714
1003039-1D 2X	118.41245	0.47680	0.03101	51.07631	1.24285	-0.00053	4.45300	0.11812	1.52044	0.00875	0.00979	0.00823
1003039-1L 10X	20.35266	-0.27293	0.00613	9.62089	0.21268	-0.00109	0.65945	0.02206	0.27461	0.00112	0.00112	0.00113

20000892

Sample Id1	Fe	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Pb I	Pb II
1003039-1MS 2X	144.21344	21.42289	0.31311	83.80838	2.14658	0.48090	26.64902	0.38454	1.68739	0.24395	0.23896	0.24644
1003039-1MSD 2X	93.69933	20.03027	0.28218	61.99294	1.25011	0.46958	24.24712	0.32271	1.18546	0.23644	0.23101	0.23915
1003039-1A	H203.48762	81.00565	1.17455	173.77083	2.77866	1.90665	85.91099	1.08203	2.60152	0.91204	0.91150	0.91231
1003039-5 10X	15.66491	-0.02321	0.00972	2.59963	0.35540	0.03323	-0.12002	0.41534	0.33650	1.93838	1.88615	1.96446
1003039-6 2X	105.62104	6.82513	0.17217	25.32251	4.13739	0.00162	0.26296	0.11065	2.26180	0.08955	0.08857	0.09003
CCV	20.36300	48.74866	0.50544	51.49422	0.99020	0.97362	48.58516	0.96335	5.10150	0.97772	0.97528	0.97893
CCB	0.02211	-0.30400	0.00140	0.03277	0.00056	0.00019	-0.16915	-0.00024	-0.00150	0.00037	-0.00062	0.00086
1003039-7 2X	110.16219	4.00742	0.11601	18.56777	2.19145	0.00028	0.25303	0.08644	2.07063	0.23347	0.21121	0.24458
CRI	0.23475	3.74031	0.01722	5.46008	0.03129	0.02031	4.27724	0.08205	0.22262	0.00625	0.00476	0.00699
ICSA	110.35231	-0.46618	0.00268	280.67581	-0.00139	-0.00079	-0.19054	0.00102	0.00772	-0.00002	0.00087	-0.00046
ICSAB	112.07293	-0.43853	1.08305	285.80173	0.48307	1.01872	-0.19812	0.94886	1.09932	0.05729	0.05732	0.05728
CCV	20.96064	49.98899	0.52278	52.88785	1.01405	1.01079	49.79213	1.00430	5.32121	1.00064	0.99828	1.00181
CCB	0.02072	-0.42465	0.00107	0.03233	0.00018	-0.00080	-0.19434	-0.00076	-0.00176	-0.00008	-0.00190	0.00082
AS100219-3MMB	144.37019	-0.39867	0.00154	2.16466	0.51669	0.00292	2.50689	0.25852	4.93366	0.07512	0.07560	0.07488
AS100219-3PMB	96.47411	-0.39357	0.00151	2.07987	0.50979	0.00131	1.92314	0.26102	4.87346	0.04325	0.04081	0.04448
AS100219-4MMB	81.64400	-0.40887	0.00139	2.02868	0.50329	0.00255	2.01484	0.26747	4.36166	0.03570	0.03525	0.03592
AS100219-4PMB	16.57342	-0.38704	0.00141	2.22481	0.51677	0.00052	2.19909	0.28048	5.59486	0.04369	0.03097	0.05004
AS100219-5MMB	147.61452	-0.37874	0.00144	1.80613	0.51798	0.00053	1.54965	0.21004	4.15275	0.03133	0.02453	0.03473
AS100219-5PMB	1.53738	-0.42904	0.00117	1.82979	0.43781	0.00098	1.51280	0.17497	4.08644	0.04115	0.04284	0.04030
AS100219-3LCS	53.30220	-0.37980	0.00150	2.07555	0.51456	0.00049	2.30056	0.21497	4.96671	0.05931	0.05608	0.06091
AS100219-3LCSD	40.30777	-0.31492	0.00163	2.19905	0.52671	0.00238	2.51618	0.23080	5.11956	0.05410	0.05534	0.05348
AS100219-4LCS	33.27275	-0.31029	0.00169	2.45611	0.52736	0.00080	3.06066	0.25882	4.77823	0.06794	0.06976	0.06704
AS100219-4LCSD	24.36852	-0.44648	0.00136	2.05300	0.51798	0.00173	2.25671	0.24583	4.78338	0.04380	0.04215	0.04462
CCV	20.35144	49.06127	0.51168	51.45235	0.98806	0.97713	49.12204	0.96580	5.15572	0.97015	0.97419	0.96813
CCB	0.01682	-0.38455	0.00115	0.01586	0.00009	-0.00109	-0.19187	-0.00092	-0.00292	-0.00001	-0.00270	0.00134
AS100219-5LCS	4.12692	-0.32037	0.00172	2.59676	0.52749	0.00141	3.68820	0.22594	4.26105	0.06544	0.06785	0.06423
AS100219-5LCSD	58.78969	-0.41006	0.00151	2.20734	0.50941	0.00163	2.86965	0.24693	4.28527	0.05062	0.04920	0.05134
1002179-1	17.91822	9.00406	0.01757	18.24858	3.24963	0.00213	10.76233	0.54147	12.41687	0.39062	0.39765	0.38711
1002179-2	11.90198	9.80878	0.02387	31.76869	4.01364	0.00242	17.65296	0.36569	12.41285	0.43383	0.43552	0.43298
1002179-5	13.18341	2.06927	0.00707	9.26965	1.36326	0.00171	5.25188	0.30067	27.61413	2.17972	2.17951	2.17982
1002179-6	25.66268	4.23984	0.00935	11.68656	1.74631	0.00832	9.49507	0.26440	27.33348	0.34765	0.35339	0.34479
1002179-8	66.28172	2.54770	0.00692	10.25500	1.37224	0.00322	6.58856	0.29627	7.43328	0.25753	0.25910	0.25675
1002179-12	11.16684	2.11200	0.00784	11.71183	1.45673	0.00138	8.63755	0.26640	15.53827	0.23506	0.23400	0.23559
1002179-15	14.35079	4.53006	0.01173	14.71474	2.24950	0.00213	19.55797	0.31829	32.55341	0.32045	0.32229	0.31953
1002179-16	12.39793	3.67925	0.00979	11.13123	1.81723	0.00112	8.49920	0.33788	19.05407	0.74443	0.74257	0.74536
CCV	20.64170	49.47979	0.51442	52.42176	1.00035	0.99395	49.44602	0.99053	5.24813	0.98703	0.99162	0.98474
CCB	0.01864	-0.34742	0.00123	0.02404	0.00028	-0.00036	-0.18855	-0.00006	-0.00302	0.00077	0.00125	0.00053
1002179-17	12.51717	2.96582	0.00823	10.81741	1.66783	0.00235	10.17562	0.41025	40.21145	0.28210	0.28390	0.28119
1002179-18	23.73868	2.14163	0.00618	9.91356	1.38431	0.00319	6.24962	0.32569	8.10753	0.34817	0.34867	0.34793
1002179-20	27.87085	1.36347	0.00508	9.24340	1.20937	0.00255	7.65814	0.31222	7.23559	0.31421	0.31455	0.31403
1002179-24	29.95634	5.60738	0.01175	14.77164	2.22150	0.00282	9.90164	0.28000	31.77116	0.33811	0.34012	0.33711
1002179-25	5.23998	25.97413	0.03626	25.27068	5.13904	0.00203	29.94251	0.31806	46.64661	0.59236	0.61927	0.57893
1002179-28	59.79372	5.55123	0.01153	13.13949	1.95692	0.00379	8.81949	0.30458	12.27923	0.44589	0.45173	0.44298
1002179-29	24.18026	1.44066	0.00509	8.76705	1.21387	0.00325	6.14440	0.31908	10.09406	0.33134	0.33222	0.33090
1002179-30	55.89820	8.00155	0.01445	16.86356	2.65753	0.00392	11.63702	0.39525	8.26748	0.52216	0.54032	0.51309
1002179-31	34.73777	4.64951	0.01201	14.25568	1.98293	0.00252	10.68088	0.30164	11.48305	0.49382	0.50053	0.49048
1002179-32	77.91057	4.03071	0.01043	13.26333	1.86337	0.00206	11.80622	0.31469	9.04038	0.36475	0.36844	0.36290
CCV	20.59132	49.63117	0.51865	52.12469	0.99314	1.00107	49.41685	1.01273	5.29530	0.97930	0.98529	0.97631
CCB	0.01853	-0.32286	0.00128	0.02249	0.00022	-0.00035	-0.18897	-0.00077	0.00189	0.00061	-0.00178	0.00180
1002179-33	6.06666	10.01050	0.02044	18.04354	3.23418	0.00177	24.45602	0.43564	14.35405	0.67677	0.67875	0.67579

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Sample Id1	Fe	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Pb I	Pb II
1002179-35	23.88951	3.57640	0.01093	13.09691	1.92489	0.00363	16.97927	0.29073	9.90268	0.36059	0.36167	0.36005
1002179-41	14.15655	2.77726	0.00793	14.68978	2.16739	0.00127	7.27271	0.19674	7.75640	0.55833	0.55731	0.55885
1002179-42	30.93097	4.16590	0.01198	14.07503	1.73685	0.00138	5.12157	0.26811	12.21574	0.25617	0.25794	0.25529
1002179-43	8.70422	12.56432	0.03249	29.58053	4.12498	0.00124	13.02969	0.22262	H109.71688	0.33813	0.34183	0.33629
1002179-45	7.30340	2.45194	0.00828	10.49520	1.67480	0.00221	9.08886	0.23090	H68.97276	0.38345	0.38540	0.38248
1002179-50	32.63113	2.26920	0.00814	12.32212	1.71722	0.00189	9.79314	0.23315	16.48615	0.87580	0.87198	0.87771
1002179-51	8.02336	8.55503	0.02043	24.04183	2.87698	0.00112	9.61266	0.28204	H62.05607	0.38852	0.38787	0.38884
1002179-52	12.16081	7.16077	0.01352	18.83180	2.67104	0.00265	14.52149	0.26211	15.30786	0.29394	0.30208	0.28987
1002179-53	3.72940	6.55563	0.01186	19.03033	2.59041	0.00093	12.40406	0.26249	15.30706	0.31640	0.31789	0.31565
CCV	20.58371	48.64352	0.50905	52.25548	0.99955	0.97968	48.96121	0.96701	5.21056	0.98667	0.98777	0.98613
CCB	0.01992	-0.33639	0.00129	0.02194	0.00026	-0.00087	-0.18567	-0.00056	-0.00272	0.00038	-0.00111	0.00112
1002179-54	33.57967	6.11890	0.01361	16.98242	2.40906	0.00275	11.86580	0.29837	30.66918	0.36876	0.36470	0.37079
1002179-55	62.13768	4.85546	0.01304	13.04558	1.93641	0.00327	9.12476	0.34119	32.17748	0.40739	0.40923	0.40647
1002179-56	138.95067	5.60972	0.01465	14.61314	1.98759	0.00277	8.56593	0.31304	8.24251	0.41415	0.41714	0.41266
1002179-57	116.69731	5.74568	0.01546	14.39321	1.92114	0.00118	8.96990	0.28749	7.50899	0.45369	0.45837	0.45135
1002179-59	189.71661	-0.29902	0.00165	2.58117	0.54376	0.00078	2.65333	0.26665	4.71291	0.04703	0.04550	0.04780
1002179-60	191.05561	-0.39297	0.00150	2.59255	0.52772	0.00420	2.74136	0.29394	4.71023	0.04637	0.04559	0.04675
1002179-61	163.09882	-0.33983	0.00159	2.28628	0.52513	0.00535	2.21655	0.29214	4.85279	0.02992	0.03056	0.02959
1002179-62	47.47322	-0.40187	0.00133	1.90773	0.46571	0.00189	1.63300	0.24783	4.53916	0.02497	0.02385	0.02553
1002179-63	55.46038	5.96477	0.01310	13.83771	1.94404	0.00103	9.61212	0.30843	9.03129	0.37009	0.37601	0.36713
1002179-64	54.94791	-0.40970	0.00149	2.89819	0.51534	0.00143	2.98373	0.26534	4.62520	0.04857	0.04660	0.04955
CCV	20.09260	48.57820	0.50768	50.95329	0.97520	0.96202	48.68654	0.95222	5.11327	0.95968	0.96344	0.95780
CCB	0.00953	-0.29582	0.00138	0.00360	-0.00004	-0.00080	-0.17985	-0.00119	-0.00069	0.00024	L-0.00870	0.00470
1002179-65	98.08994	-0.36581	0.00167	3.35713	0.54293	0.00257	3.41676	0.26063	4.78132	0.04677	0.04694	0.04668
1002179-66	137.89990	-0.36260	0.00171	3.23459	0.53705	0.00107	3.39424	0.29625	5.07046	0.04441	0.04321	0.04501
1002179-67	117.52944	-0.43580	0.00151	2.08694	0.53656	0.00122	1.88127	0.31249	4.33939	0.04210	0.04116	0.04257
1002179-68	96.90727	-0.34991	0.00159	2.14178	0.53901	0.00013	2.06148	0.29239	4.28949	0.05370	0.05381	0.05365
1002179-25 10X	0.56689	1.72199	0.00370	2.68101	0.54121	-0.00159	2.41381	0.03300	4.87351	0.06321	0.06418	0.06273
CRI	0.22050	3.69113	0.01720	5.38418	0.03061	0.01998	4.25753	0.08090	0.22049	0.00545	0.00559	0.00538
ICSA	109.63906	-0.41587	0.00278	280.29102	-0.00156	-0.00194	-0.18942	0.00028	0.00291	0.00198	0.00048	0.00273
ICSAB	108.37606	-0.46535	1.07638	277.77291	0.46937	0.98857	-0.20229	0.91044	1.07907	0.05531	0.05079	0.05757
CCV	20.24766	48.71093	0.51039	51.27435	0.98025	0.97260	48.94004	0.96391	5.13911	0.96612	0.96454	0.96691
CCB	0.01645	-0.25680	0.00148	0.03034	0.00024	-0.00051	-0.17642	-0.00071	-0.00206	-0.00022	-0.00283	0.00109

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Sample Id1	S	Sb	Se	Se I	Se II	Si	Sn	Sr	Th	Ti	Tl	U
MIXBHIGH	-0.00671	1.96824	4.93372	4.94682	4.92719	49.18114	H10.06976	9.78406	1.97132	9.86173	H5.01196	-0.06333
MIXAHIGH	0.02214	0.00801	0.00124	0.00353	0.00009	0.00197	0.00237	0.00451	0.00184	-0.00055	-0.00258	0.09117
MIXCHIGH	48.43172	0.00040	-0.00363	L-0.01166	0.00038	-0.03567	0.01839	-0.00043	L-0.32800	0.00750	0.00035	49.10216
ICV	2.58086	0.26141	0.52603	0.52473	0.52668	2.50702	0.52633	0.25646	0.06855	0.25421	0.26731	2.55838
ICB	-0.01176	-0.00188	-0.00084	-0.00066	-0.00093	-0.00947	-0.00112	-0.00180	-0.00100	-0.00091	-0.00188	-0.00462
CRI	0.19524	0.12192	0.00727	0.00571	0.00805	0.09375	0.10154	0.01858	0.08542	0.01917	0.02083	0.20102
ICSA	-0.00022	0.00265	-0.00238	L-0.00577	-0.00068	-0.01562	-0.00118	0.01082	-0.01092	-0.00132	-0.00135	0.03644
ICSAB	0.98595	0.60722	0.05541	0.05039	0.05791	0.93656	0.99242	0.99224	-0.02618	0.95620	0.10759	10.01456
CCV	4.80664	0.48999	0.98258	0.99090	0.97843	4.70349	0.98386	0.48552	0.13184	0.47628	0.49970	4.82430
CCB	-0.00382	-0.00126	0.00065	0.00327	-0.00067	-0.01089	-0.00101	-0.00165	-0.00104	-0.00065	0.00062	-0.00660
IP100308-1MB	-0.00310	-0.00057	-0.00209	0.00193	-0.00410	-0.00528	0.00116	-0.00191	0.01104	0.00007	0.00004	-0.01424
IP100308-1RVS	0.08921	0.00852	0.00220	0.00054	0.00303	0.02119	0.01020	0.00296	-0.00278	0.00396	0.00969	0.04219
IP100308-1LCS	-0.00238	0.51041	2.08816	2.10670	2.07890	1.99186	0.52146	0.50276	-0.01646	0.50109	2.11772	-0.03074
1003063-4	H219.19713	-0.00183	0.00071	-0.00190	0.00201	10.99401	-0.00137	1.68141	-0.02108	0.00608	-0.00050	0.01817
1003063-4D	H216.09547	-0.00058	-0.00047	L-0.00522	0.00190	10.89949	-0.00150	1.66483	-0.02263	0.00595	0.00211	0.02953
1003063-4L 5X	44.78711	-0.00054	-0.00315	-0.00139	-0.00403	2.22288	-0.00004	0.34186	-0.01020	0.00042	0.00007	0.00221
1003063-4MS	H221.93998	0.51095	2.09723	2.12328	2.08423	13.41949	0.51821	2.19819	-0.02370	0.49695	2.08178	0.02363
1003063-4MSD	H214.33411	0.49541	2.03224	2.04610	2.02532	13.01485	0.49825	2.14038	-0.02426	0.48166	2.01262	0.02490
1003063-7	H1343.27316	0.00077	0.00208	0.00072	0.00276	10.42326	0.01275	H17.05436	0.04136	0.03334	0.00265	7.95032
1003063-10	H121.01083	-0.00167	-0.00058	0.00032	-0.00103	15.84324	0.00043	1.04774	-0.01682	0.00659	0.00045	0.01265
CCV	4.98605	0.49469	0.99273	0.99780	0.99019	4.71720	1.00773	0.48683	0.13200	0.47857	0.51065	4.79209
CCB	0.05676	-0.00319	-0.00131	-0.00224	-0.00084	-0.01043	-0.00107	-0.00134	-0.00199	-0.00065	0.00323	-0.01079
1003063-11	H181.70241	-0.00109	-0.00056	-0.00006	-0.00081	11.43371	0.00086	1.40918	-0.02383	0.00134	-0.00069	0.00725
1003063-15	H228.16336	0.00046	0.00063	0.00222	-0.00016	8.48434	-0.00022	1.69539	-0.02162	0.00067	0.00111	0.00068
1003063-17	H225.09712	-0.00207	-0.00042	-0.00017	-0.00054	10.55197	0.00267	1.72611	-0.02112	0.00019	-0.00128	0.03508
1003063-18	H221.92296	0.00010	-0.00038	0.00030	-0.00071	10.45652	-0.00004	1.71253	-0.02006	0.00053	0.00069	0.04421
IP100308-2MB	0.03873	-0.00170	-0.00271	-0.00496	-0.00159	-0.00886	-0.00034	-0.00179	0.00043	-0.00100	-0.00017	-0.01991
IP100308-2RVS	0.11518	0.00861	0.00296	0.00163	0.00363	0.02427	0.01044	0.00306	-0.00249	0.00412	0.01096	0.04195
IP100308-2LCS	0.01493	0.52562	2.11957	2.16472	2.09704	1.99653	0.53034	0.51093	-0.01325	0.49668	2.15710	-0.03148
IP100308-2LCSD	0.01781	0.52330	2.12772	2.14911	2.11703	1.98997	0.55629	0.51024	-0.01313	0.49493	2.14144	-0.01939
1002238-1	H99.99234	-0.00024	0.00307	0.00305	0.00308	13.76198	0.00580	2.50357	-0.01954	-0.00117	0.00295	-0.00812
1002238-2	0.03584	-0.00756	0.02776	0.01641	0.03344	0.01764	-0.00293	0.02747	0.00778	-0.00012	0.02292	-0.06433
CCV	4.70464	0.48677	0.95781	0.97396	0.94975	4.57436	0.96592	0.48066	0.12236	0.46065	0.49438	4.73073
CCB	0.01060	-0.00289	-0.00110	-0.00329	-0.00001	-0.01501	-0.00094	-0.00175	-0.00115	-0.00092	-0.00055	-0.02633
1002238-3	0.09354	0.00002	-0.00158	-0.00200	-0.00137	0.06355	-0.00149	0.00578	-0.00127	-0.00086	-0.00054	-0.01153
1002238-4	H89.95589	-0.00041	0.00093	0.00024	0.00128	24.40973	0.00147	1.54352	-0.01391	-0.00098	0.00020	0.00228
1002238-5	39.19368	-0.00166	-0.00260	-0.00449	-0.00165	6.06394	-0.00125	1.32360	-0.01042	-0.00104	-0.00213	-0.00463
1002238-6	H105.06106	-0.00130	0.00106	-0.00021	0.00169	13.04922	0.02346	2.45442	-0.02177	-0.00153	-0.00140	-0.01227
1002238-7	0.03224	-0.00220	0.02634	0.02439	0.02731	0.01965	-0.00046	0.02700	-0.00156	-0.00078	0.02627	-0.01646
1002244-2	0.00627	-0.00322	0.03456	0.03210	0.03579	0.01910	0.00201	0.03488	-0.00133	-0.00086	0.03537	-0.02115
1002244-3	H66.36532	-0.00159	0.00093	-0.00002	0.00141	10.21498	0.00104	1.84744	-0.01869	-0.00102	-0.00096	-0.01845
1002244-4	0.32218	0.00012	-0.00277	-0.00449	-0.00191	0.21848	-0.00107	0.01276	-0.00088	-0.00041	0.00232	-0.01034
1002244-5	H88.17675	-0.00193	0.00029	0.00001	0.00043	21.15267	0.00032	2.38595	-0.01693	-0.00117	0.00007	-0.00783
1002244-6	42.88519	0.00040	-0.00113	0.00130	-0.00234	6.73175	0.00068	1.42167	-0.00954	-0.00079	0.00015	0.00572
CCV	4.78421	0.48645	0.96197	0.97806	0.95394	4.59687	0.98157	0.48193	0.12752	0.46477	0.50573	4.71674
CCB	0.01276	-0.00179	0.00058	0.00246	-0.00036	-0.01010	0.00147	-0.00123	-0.00342	-0.00064	-0.00222	-0.00093
1003014-1	H103.83758	-0.00081	0.00021	0.00018	0.00022	14.53895	-0.00076	3.09564	-0.01727	-0.00126	0.00009	-0.00413
1003014-2	H100.67964	-0.00126	0.00051	0.00145	0.00004	14.16489	-0.00137	3.02622	-0.01892	-0.00112	-0.00083	-0.00685
1003014-3	0.14042	-0.00171	-0.00137	-0.00202	-0.00104	0.09335	0.00315	0.00823	-0.00040	-0.00074	0.00242	-0.00635
1003014-4	H61.70710	-0.00186	-0.00198	L-0.00635	0.00020	7.75483	-0.00016	H12.94543	-0.01743	-0.00131	-0.00494	-0.01768

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Sample Id1	S	Sb	Se	Se I	Se II	Si	Sn	Sr	Th	Ti	Tl	U
1003014-5	20.72627	0.00003	-0.00140	0.00153	-0.00286	7.52927	0.00123	H11.95160	-0.01680	-0.00118	0.00083	-0.01184
1003014-6	21.45569	0.00041	-0.00215	-0.00205	-0.00221	7.43586	-0.00016	H11.91708	-0.01927	-0.00134	-0.00012	-0.01062
1003014-7	H102.51457	0.00074	-0.00025	0.00191	-0.00134	13.11711	-0.00106	2.48908	-0.02044	-0.00131	0.00041	-0.00364
1003014-8	H105.00420	-0.00264	-0.00042	0.00018	-0.00072	13.92210	0.00044	2.53859	-0.02011	-0.00137	-0.00087	-0.00561
IP100308-3MB	0.03079	-0.00040	-0.00216	L-0.00882	0.00117	-0.00274	0.00086	-0.00089	0.00031	-0.00067	-0.00269	-0.02243
IP100308-3RVS	0.09354	0.00959	0.00275	0.00083	0.00371	0.02377	0.01212	0.00309	-0.00017	0.00380	0.00712	0.02908
CCV	4.90575	0.50570	0.99433	1.01433	0.98434	4.67605	1.01553	0.49305	0.13405	0.46899	0.52202	4.77958
CCB	0.00411	-0.00069	-0.00148	-0.00322	-0.00061	-0.00494	0.00020	-0.00153	0.00333	-0.00043	0.00055	-0.00808
IP100308-3LCS	-0.00022	0.49511	1.94838	1.96428	1.94045	1.78783	0.51821	0.50074	-0.01174	0.49483	2.06939	-0.02706
1003039-1	0.65908	0.00687	0.00537	0.00047	0.00782	4.93134	0.01233	0.25444	-0.00539	H10.24357	L-0.01122	0.03897
1003039-1D	0.55736	0.00804	0.00390	-0.00092	0.00630	4.14073	0.01118	0.25625	-0.00436	H10.39560	L-0.01020	0.04808
1003039-1L 5X	0.13826	0.00002	-0.00127	L-0.00582	0.00101	1.01173	0.00306	0.04959	-0.00261	2.09973	-0.00127	-0.00122
1003039-1MS	0.62806	0.32687	1.81153	1.81666	1.80897	6.85558	0.49494	0.89018	-0.00087	H11.77994	1.89928	0.08197
1003039-1MSD	0.55014	0.33772	1.85468	1.86524	1.84940	5.82800	0.50717	0.71018	-0.00240	9.72145	1.95402	0.03901
1003055-3	1.91714	0.00712	0.00444	-0.00143	0.00737	6.86961	0.03299	0.04172	0.01563	1.38649	0.00036	0.07969
1003055-4	2.07672	0.00528	0.00502	-0.00069	0.00787	8.13151	0.03516	0.07083	0.01669	2.16772	-0.00305	0.19605
1003055-5	1.60452	0.20729	0.01135	0.00967	0.01219	5.52001	0.33683	0.05334	0.01352	6.31998	-0.00575	0.37503
1003055-6	1.57636	0.00642	0.00836	0.00871	0.00818	4.48057	0.00992	0.09385	0.03468	2.52086	-0.00437	0.05256
CCV	4.90068	0.48825	0.99359	1.00114	0.98982	4.72672	0.99594	0.48589	0.13119	0.47765	0.50346	4.82080
CCB	0.00483	-0.00129	0.00048	-0.00224	0.00183	-0.00815	0.00014	-0.00151	-0.00287	-0.00034	-0.00054	-0.01253
1003055-7	1.81966	0.01063	0.00616	0.00106	0.00870	4.87415	0.02771	0.08075	0.04007	2.77194	-0.00539	0.04575
IP100308-4MB	-0.00166	-0.00129	-0.00169	-0.00084	-0.00212	0.00828	0.00032	-0.00173	-0.00081	0.00027	-0.00020	-0.01850
IP100308-4RVS	0.09282	0.00890	0.00091	0.00125	0.00074	0.03782	0.01351	0.00304	-0.00206	0.00466	0.00834	0.04191
IP100308-4LCS	0.00123	0.48053	1.88226	1.87978	1.88350	1.72930	0.50645	0.48924	-0.01533	0.48442	2.01648	-0.01099
1003063-1	8.70555	0.00056	0.00111	-0.00161	0.00246	5.50832	0.00871	0.21636	0.01477	0.19024	-0.00121	0.07276
1003063-2	0.29910	0.00179	-0.00251	-0.00456	-0.00148	5.16515	0.01305	0.12103	-0.01353	0.29305	-0.00247	3.99476
1003063-3	4.43702	0.00284	0.00095	L-0.00571	0.00427	7.93354	0.00879	0.68731	0.04561	0.64772	-0.00420	0.01222
1003063-5	38.91581	0.00360	0.02017	0.01777	0.02137	7.14648	0.00708	5.16796	0.00882	0.25054	-0.00272	1.06924
1003063-6	10.27421	0.00051	0.01829	0.01111	0.02187	5.36821	0.00880	0.43660	0.01884	0.89521	-0.00396	1.05933
1003063-8	3.08588	0.00262	0.00642	0.00207	0.00859	9.00346	0.00847	0.47469	0.03496	1.33496	-0.00881	0.02651
CCV	4.93468	0.49323	0.99064	1.00653	0.98271	4.72938	1.00972	0.48671	0.13092	0.47743	0.51706	4.81312
CCB	-0.00238	-0.00215	-0.00148	-0.00300	-0.00072	-0.01171	-0.00173	-0.00147	-0.00201	-0.00058	-0.00119	-0.00907
1003063-9	3.62504	0.00174	0.00579	0.00309	0.00714	5.97802	0.00881	1.10636	0.02030	2.90780	-0.00379	0.03906
1003063-12	2.40172	0.00293	0.00069	-0.00113	0.00160	6.40601	0.00691	0.52304	0.02662	1.06932	-0.00598	0.02704
1003063-13	2.69645	0.00315	0.00320	-0.00386	0.00673	6.91124	0.00749	0.54125	0.02654	1.03359	-0.00275	0.02796
1003063-14	2.90307	0.00077	0.01617	0.01355	0.01748	4.25720	0.01145	0.25521	0.01132	0.11571	-0.00386	0.49667
1003063-16	3.57806	0.00029	0.00461	-0.00045	0.00713	9.84333	0.00787	0.64749	0.03677	0.65555	-0.00507	0.01445
1003063-16D	3.45590	0.00236	0.00545	0.00368	0.00633	7.49245	0.00773	0.63775	0.03458	0.62566	-0.00436	0.01993
1003063-16L 5X	0.72763	-0.00021	0.00118	0.00091	0.00132	1.98794	0.00143	0.12826	0.00697	0.13266	-0.00103	-0.01173
1003063-16MS	3.39519	0.22861	1.78629	1.79391	1.78249	11.55052	0.48775	1.12450	0.02945	1.09987	1.91684	0.02347
1003063-16MSD	3.58023	0.21631	1.79501	1.81529	1.78489	14.91799	0.50238	1.15923	0.02939	1.18534	1.95512	0.02888
CCV	4.86885	0.49339	0.97705	0.98226	0.97445	4.68241	1.00163	0.48598	0.12986	0.47158	0.51114	4.78367
CCB	-0.00238	-0.00028	-0.00126	-0.00104	-0.00137	-0.00799	-0.00131	-0.00147	-0.00280	-0.00054	-0.00035	-0.00414
CCV	4.90140	0.46546	0.97967	0.96910	0.98495	4.72806	0.95956	0.47268	0.12933	0.47862	0.48768	4.78953
CCB	0.00411	-0.00161	0.00013	0.00229	-0.00095	-0.00456	-0.00107	-0.00154	-0.00489	-0.00057	0.00324	-0.00364
1003063-7 100X	34.98256	-0.00081	-0.00174	-0.00314	-0.00104	0.15108	-0.00173	0.21290	-0.01362	0.00095	0.00364	0.08511
1002238-2A	0.00339	0.50991	2.38918	2.27554	2.44592	2.18313	0.54785	0.55018	-0.01454	0.54134	2.21510	-0.03719
1003039-1 2X	0.34815	0.00136	0.00276	0.00342	0.00244	3.93787	0.00685	0.13362	-0.00498	5.62605	-0.00661	0.01009
1003039-1D 2X	0.29982	0.00257	-0.00063	0.00189	-0.00190	4.16121	0.00722	0.13811	-0.00498	6.03247	-0.00452	0.00975
1003039-1L 10X	0.06469	-0.00057	-0.00035	-0.00020	-0.00042	0.79017	0.00027	0.02527	-0.00571	1.13154	0.00056	-0.01304

Sample Id1	S	Sb	Se	Se I	Se II	Si	Sn	Sr	Th	Ti	Tl	U
1003039-1MS 2X	0.33156	0.16118	0.96726	0.96268	0.96955	4.41723	0.25432	0.45978	-0.00287	6.53251	0.98147	0.01883
1003039-1MSD 2X	0.27602	0.15895	0.94637	0.94051	0.94930	4.48867	0.24829	0.35855	-0.00686	5.39517	0.96108	-0.00648
1003039-1A	0.63527	0.93431	3.81739	3.83303	3.80958	10.99563	0.98509	1.19580	0.00093	H11.00434	3.83973	0.03053
1003039-5 10X	0.16494	0.01992	0.00202	-0.00148	0.00377	0.62608	0.03570	0.00367	-0.00104	0.66861	-0.00084	0.01852
1003039-6 2X	0.79184	0.00190	0.00273	0.00068	0.00376	3.39693	0.00502	0.04625	0.01733	1.29561	-0.00289	0.01328
CCV	5.00703	0.48154	1.00168	1.00330	1.00087	4.80488	0.99497	0.47906	0.13220	0.48526	0.50204	4.82888
CCB	-0.00166	-0.00051	-0.00125	-0.00238	-0.00068	-0.00521	0.00110	-0.00150	-0.00393	-0.00061	0.00281	-0.00932
1003039-7 2X	0.94482	-0.00823	0.00339	L-0.01535	0.01275	3.11899	0.00678	0.03961	0.02257	1.43648	L-0.01018	-0.05668
CRI	0.21832	0.12186	0.00860	0.00862	0.00858	0.10558	0.10666	0.01920	0.09039	0.02050	0.02194	0.20248
ICSA	0.00844	0.00236	-0.00132	0.00609	L-0.00503	-0.00897	0.00231	0.01107	-0.00638	-0.00138	-0.00055	0.02684
ICSAB	1.09059	0.61619	0.05907	0.05604	0.06059	0.98544	1.04152	1.00949	-0.02552	0.99346	0.11178	10.34872
CCV	5.20962	0.49642	1.04526	1.05295	1.04142	4.95163	1.02390	0.49831	0.14218	0.49666	0.51732	4.98288
CCB	-0.00671	-0.00304	-0.00237	-0.00463	-0.00125	-0.00663	-0.00034	-0.00165	-0.00325	-0.00069	-0.00248	-0.01203
AS100219-3MMB	H1123.13283	0.00511	0.00285	0.00102	0.00377	1.28259	0.00322	0.00745	0.01091	1.49332	-0.00476	0.00516
AS100219-3PMB	H1102.68946	0.00196	0.00087	0.00103	0.00078	1.21038	0.00292	0.01087	0.00668	1.39096	-0.00620	-0.00615
AS100219-4MMB	H1110.77416	0.00175	-0.00027	-0.00168	0.00043	1.04272	0.00272	0.00612	0.00537	1.35601	-0.00513	0.00222
AS100219-4PMB	H1059.84296	-0.00670	0.00001	L-0.01248	0.00625	1.07501	-0.00392	0.00914	0.00252	1.46675	L-0.01213	-0.06426
AS100219-5MMB	H981.25285	0.00025	0.00483	-0.00289	0.00868	1.07401	0.00211	0.00538	0.01192	1.57200	-0.00672	-0.02099
AS100219-5PMB	H724.21948	0.00125	-0.00023	0.00016	-0.00042	0.96114	-0.00040	0.00768	-0.00595	1.18724	-0.00199	-0.02343
AS100219-3LCS	H978.20588	0.00137	-0.00063	-0.00338	0.00075	0.69798	0.00241	0.00973	0.00377	1.35905	-0.00569	-0.01623
AS100219-3LCSD	H999.61731	0.00196	0.00220	0.00446	0.00108	0.68118	0.00422	0.00991	0.00297	1.40902	-0.00572	-0.00566
AS100219-4LCS	H1104.62390	0.00363	-0.00133	-0.00121	-0.00138	0.72711	0.00252	0.00940	0.00053	1.42069	-0.00609	-0.00704
AS100219-4LCSD	H1047.78000	-0.00018	-0.00056	-0.00362	0.00097	0.63409	0.00272	0.00951	0.00012	1.40808	-0.00497	-0.02219
CCV	5.41152	0.48167	0.99849	1.00637	0.99455	4.81553	0.99599	0.48206	0.13569	0.48643	0.50248	4.84985
CCB	0.11590	-0.00349	-0.00059	-0.00315	0.00068	-0.00713	-0.00191	-0.00171	-0.00569	-0.00096	-0.00062	-0.02560
AS100219-5LCS	H1072.98407	0.00095	-0.00235	-0.00129	-0.00287	0.73881	0.00179	0.01003	-0.00492	1.42618	-0.00324	-0.01507
AS100219-5LCSD	H1084.15555	0.00153	0.00039	-0.00123	0.00120	0.76311	0.00258	0.00975	0.00236	1.37236	-0.00376	-0.00862
1002179-1	H1232.46490	0.00902	0.00143	0.00420	0.00004	0.62636	0.00118	0.49579	-0.01221	9.46119	-0.00750	-0.01830
1002179-2	H1143.81716	0.00815	-0.00086	-0.00123	-0.00067	0.43978	-0.00157	0.81261	0.00385	H15.51035	L-0.01386	-0.03468
1002179-5	H1034.75449	0.00330	-0.00067	-0.00202	0.00000	0.52825	0.00229	0.20613	-0.00672	7.42113	-0.00903	-0.02889
1002179-6	H1073.31033	0.00688	-0.00065	-0.00218	0.00012	0.55876	0.00292	0.27415	-0.00591	6.92932	-0.00788	-0.01839
1002179-8	H1052.41646	0.00625	0.00192	0.00487	0.00044	0.57209	0.00223	0.21704	0.00015	6.08061	-0.00435	-0.00928
1002179-12	H1043.87695	0.00397	0.00140	-0.00166	0.00293	0.60047	0.00122	0.26495	-0.00830	5.13439	-0.00820	-0.02949
1002179-15	H1045.12935	0.00512	0.00134	0.00223	0.00090	0.62223	0.00128	0.36913	-0.00926	7.77261	-0.00952	-0.02845
1002179-16	H1034.85015	0.00695	0.00128	0.00091	0.00146	0.67796	0.00076	0.24890	-0.00820	7.18336	L-0.01210	-0.02638
CCV	5.46001	0.48774	1.01107	1.02433	1.00444	4.86658	1.01944	0.48715	0.13542	0.48998	0.51323	4.88122
CCB	0.15124	-0.00251	-0.00120	-0.00156	-0.00102	-0.00830	-0.00161	-0.00162	-0.00171	-0.00050	0.00166	-0.00142
1002179-17	H1050.26862	0.00337	0.00045	-0.00063	0.00098	0.74329	0.00042	0.24494	-0.00497	5.81775	-0.00751	-0.01486
1002179-18	H1007.68253	0.00515	0.00032	-0.00019	0.00057	0.71807	0.00338	0.21735	-0.00451	4.67499	L-0.01019	-0.01486
1002179-20	H979.57310	0.00762	0.00128	0.00141	0.00121	0.78573	0.00046	0.18500	-0.00600	7.49522	-0.00766	-0.02409
1002179-24	H1030.30067	0.00549	-0.00222	L-0.00615	-0.00026	0.67311	0.00150	0.35114	-0.00457	7.73942	L-0.01206	-0.02797
1002179-25	H1152.87015	0.00668	-0.00098	0.00478	-0.00386	0.40956	-0.00046	0.62610	-0.01971	H13.93398	L-0.01454	-0.01386
1002179-28	H1015.57444	0.00738	0.00065	0.00154	0.00021	0.90541	0.00177	0.27980	-0.00364	7.25090	-0.00680	-0.01302
1002179-29	H998.04335	0.00647	0.00058	0.00214	-0.00019	0.78518	0.00146	0.18045	-0.00522	5.90959	-0.00710	-0.01565
1002179-30	H1130.04059	0.01101	0.00205	0.00986	-0.00184	0.60658	0.00497	0.32828	-0.00397	8.63977	L-0.01057	-0.01064
1002179-31	H1105.32817	0.00660	0.00223	0.01065	-0.00197	0.68118	0.00232	0.32734	-0.00307	H11.02021	L-0.01254	-0.02432
1002179-32	H1071.28857	0.00741	0.00352	0.00275	0.00390	0.62012	0.00444	0.30076	-0.00277	8.47174	L-0.01220	-0.00955
CCV	5.49909	0.49809	1.02429	1.03457	1.01915	4.84590	1.02156	0.49370	0.13655	0.48346	0.51550	4.90740
CCB	0.17288	-0.00352	-0.00165	-0.00295	-0.00100	-0.00524	-0.00095	-0.00167	-0.00267	-0.00052	-0.00156	-0.01376
1002179-33	H1140.94410	0.00367	0.00260	0.00134	0.00322	0.68458	-0.00045	0.44209	-0.01291	H12.36879	L-0.01786	-0.04057

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Sample Id1	S	Sb	Se	Se I	Se II	Si	Sn	Sr	Th	Ti	Tl	U
1002179-35	H1106.76859	0.00361	-0.00157	0.00050	-0.00261	0.70645	0.00473	0.32202	-0.00805	8.01533	-0.00976	-0.02606
1002179-41	H960.15737	0.00439	0.00218	0.00094	0.00280	0.74789	0.00423	0.34407	-0.00921	6.27458	-0.00911	-0.01253
1002179-42	H1120.00835	0.00322	0.00159	0.00535	-0.00029	0.58865	0.00275	0.31212	-0.00157	5.99182	-0.00608	-0.02568
1002179-43	H1040.87658	0.00790	0.00050	0.00385	-0.00117	0.56074	0.00110	0.79365	-0.01556	H15.49393	L-0.01802	-0.03472
1002179-45	H994.98164	0.00327	-0.00039	0.00094	-0.00105	0.63329	0.00245	0.24133	-0.00836	5.62907	-0.00904	-0.02020
1002179-50	H996.32372	0.00410	0.00012	-0.00092	0.00064	0.79935	0.00178	0.26571	-0.00738	8.33155	L-0.01097	-0.01894
1002179-51	H1102.78773	0.00211	0.00081	L-0.00621	0.00432	0.71855	0.00104	0.47570	-0.01520	H10.56845	L-0.01383	-0.03993
1002179-52	H1116.87482	0.00467	0.00218	0.00789	-0.00067	0.63376	0.00561	0.43092	-0.01060	9.85696	L-0.01093	-0.02474
1002179-53	H1086.31744	0.00387	0.00007	-0.00153	0.00087	0.60403	0.00195	0.44260	-0.01315	H11.80700	-0.00844	-0.04120
CCV	5.47810	0.47720	1.00178	1.00844	0.99846	4.85428	1.00693	0.48055	0.13248	0.48936	0.50492	4.84451
CCB	0.20028	-0.00263	0.00088	-0.00102	0.00183	-0.00652	-0.00173	-0.00165	-0.00203	-0.00020	-0.00072	-0.01252
1002179-54	H1106.40841	0.00261	-0.00183	-0.00248	-0.00150	0.64064	0.00147	0.39437	-0.00878	H11.38818	L-0.01257	-0.04154
1002179-55	H1120.91567	0.00645	0.00068	0.00044	0.00081	0.81916	0.00281	0.27368	-0.00313	H11.06868	L-0.01031	-0.01139
1002179-56	H1142.11658	0.00594	0.00051	0.00148	0.00003	0.81505	0.00313	0.29337	0.00750	H10.06932	-0.00924	0.00366
1002179-57	H1112.83475	0.00701	0.00061	0.00118	0.00032	0.87674	0.00512	0.28448	0.00116	6.59613	L-0.01059	-0.00142
1002179-59	H1058.61546	0.00311	0.00238	0.00101	0.00306	0.79475	0.00388	0.00916	0.01559	1.60317	-0.00435	-0.00524
1002179-60	H1134.04260	0.00778	0.00335	0.00411	0.00298	0.76104	0.00391	0.00688	0.01221	1.57329	-0.00113	0.00717
1002179-61	H1090.86529	0.00569	0.00298	0.00720	0.00087	0.91001	0.00404	0.00679	0.01329	1.56903	-0.00107	0.00227
1002179-62	H933.55585	0.00153	0.00038	0.00013	0.00050	0.72012	0.00132	0.00656	0.00269	1.47047	-0.00454	-0.01054
1002179-63	H1188.36456	0.00642	0.00098	0.00387	-0.00047	0.72229	0.00419	0.29990	-0.00463	H10.92140	L-0.01044	-0.00364
1002179-64	H1086.62205	0.00228	0.00076	0.00115	0.00057	0.83261	0.00195	0.00745	0.00382	1.49754	-0.00521	-0.01020
CCV	5.41369	0.47732	0.98714	0.99762	0.98190	4.77284	0.98011	0.47726	0.12800	0.47807	0.50189	4.81377
CCB	0.25222	-0.00604	-0.00056	L-0.00995	0.00413	-0.01183	-0.00372	-0.00177	0.00468	-0.00019	-0.00337	-0.04607
1002179-65	H1051.20593	0.00424	0.00250	0.00361	0.00195	1.03005	0.00284	0.00804	0.00596	1.56445	-0.00548	0.00040
1002179-66	H1120.12614	0.00171	0.00487	0.00492	0.00484	1.00869	0.00467	0.00771	0.01018	1.54534	-0.00409	-0.00895
1002179-67	H1081.05296	0.00132	0.00428	0.00427	0.00429	1.07136	0.00490	0.01179	0.00996	1.49973	-0.00570	-0.00544
1002179-68	H1078.69242	0.00360	0.00096	-0.00095	0.00191	0.91616	0.00328	0.00879	0.00791	1.54423	-0.00474	-0.01113
1002179-25 10X	H169.20646	-0.00298	-0.00072	-0.00149	-0.00033	0.06007	-0.00354	0.06339	-0.00313	1.45373	-0.00434	-0.01956
CRI	0.50613	0.11953	0.01045	0.01310	0.00913	0.10336	0.10491	0.01885	0.08728	0.01993	0.02089	0.20891
ICSA	0.22481	-0.00061	-0.00045	-0.00141	0.00003	-0.01158	-0.00317	0.01091	-0.00809	-0.00138	-0.00204	0.03473
ICSAB	1.22555	0.59379	0.05691	0.05509	0.05782	0.96130	1.00136	0.98445	-0.03332	0.96609	0.10559	10.15694
CCV	5.19877	0.47612	0.99477	0.99713	0.99359	4.78431	0.98971	0.48110	0.13422	0.47945	0.50035	4.83956
CCB	0.15989	-0.00170	0.00028	-0.00151	0.00118	-0.00777	-0.00137	-0.00163	-0.00522	-0.00066	-0.00087	-0.00956

20000898

Sample Id1	V	Zn	Zr
MIXBHIGH	4.97555	H10.07753	L-0.04324
MIXAHIGH	-0.00125	0.02604	0.00302
MIXCHIGH	-0.00739	-0.00165	4.90165
ICV	0.25618	0.54384	0.51639
ICB	-0.00025	-0.00030	-0.00036
CRI	0.10035	0.03748	0.04998
ICSA	-0.00075	-0.00073	0.00231
ICSAB	0.47636	0.87724	0.49507
CCV	0.47881	1.00090	0.96190
CCB	0.00003	-0.00001	0.00014
IP100308-1MB	-0.00036	0.00418	-0.00142
IP100308-1RVS	0.00466	0.00556	0.00457
IP100308-1LCS	0.50498	0.49132	-0.00022
1003063-4	0.00069	0.01836	-0.00103
1003063-4D	0.00089	0.00748	-0.00095
1003063-4L 5X	0.00020	0.00329	-0.00022
1003063-4MS	0.49544	0.46505	-0.00150
1003063-4MSD	0.48097	0.44257	-0.00167
1003063-7	0.00819	0.02575	-0.00029
1003063-10	0.00209	0.00304	-0.00182
CCV	0.48362	1.01855	0.97151
CCB	0.00007	-0.00023	0.00029
1003063-11	0.00125	0.01136	-0.00081
1003063-15	0.00068	0.00190	-0.00068
1003063-17	0.00069	0.00098	-0.00130
1003063-18	0.00068	0.00542	-0.00117
IP100308-2MB	-0.00074	0.00102	-0.00103
IP100308-2RVS	0.00497	0.00702	0.00464
IP100308-2LCS	0.50802	0.48233	-0.00081
IP100308-2LCSD	0.50650	0.53281	-0.00057
1002238-1	0.00241	0.00304	-0.00195
1002238-2	0.02699	0.03044	-0.00241
CCV	0.46803	0.94977	0.94723
CCB	-0.00035	-0.00034	-0.00026
1002238-3	0.00046	0.01562	-0.00028
1002238-4	0.02046	0.01857	-0.00377
1002238-5	0.00037	0.01225	-0.00115
1002238-6	0.00173	0.00521	-0.00177
1002238-7	0.02821	0.03627	-0.00071
1002244-2	0.03652	0.04015	-0.00081
1002244-3	0.00083	0.00592	-0.00140
1002244-4	0.00209	0.34474	-0.00074
1002244-5	0.02431	0.01385	-0.00363
1002244-6	0.00095	0.02316	-0.00109
CCV	0.48357	0.97408	0.95388
CCB	0.00051	0.00055	0.00102
1003014-1	0.01042	0.02931	-0.00223
1003014-2	0.00976	0.04623	-0.00228
1003014-3	0.00008	0.02383	-0.00078
1003014-4	0.00217	0.10291	-0.00102

20000899

Sample Id1	V	Zn	Zr
1003014-5	0.00484	0.03059	-0.00053
1003014-6	0.00368	0.04018	-0.00068
1003014-7	0.00265	0.04509	-0.00171
1003014-8	0.00340	0.04015	-0.00202
IP100308-3MB	-0.00090	0.00126	-0.00090
IP100308-3RVS	0.00463	0.01175	0.00431
CCV	0.48439	0.98867	0.97893
CCB	0.00028	0.00041	-0.00001
IP100308-3LCS	0.50072	0.47619	-0.00055
1003039-1	0.35000	0.17657	0.10356
1003039-1D	0.40654	0.21719	0.10742
1003039-1L 5X	0.07058	0.03709	0.02074
1003039-1MS	0.98893	0.70507	0.13316
1003039-1MSD	0.78598	0.60504	0.10371
1003055-3	0.14470	0.54859	0.01165
1003055-4	0.18809	0.90025	0.02281
1003055-5	0.15196	6.50353	0.04484
1003055-6	0.19524	0.58042	0.02888
CCV	0.48212	1.01034	0.96792
CCB	0.00001	0.00073	0.00033
1003055-7	0.24102	0.68064	0.02207
IP100308-4MB	-0.00015	0.00446	-0.00054
IP100308-4RVS	0.00517	0.00713	0.00477
IP100308-4LCS	0.49003	0.45870	0.00004
1003063-1	0.03630	0.44614	0.02307
1003063-2	0.89145	0.03236	0.06042
1003063-3	0.11982	0.28882	0.05090
1003063-5	0.08932	0.21235	0.02753
1003063-6	0.19156	0.15632	0.06147
1003063-8	0.11873	0.27432	0.04777
CCV	0.48497	1.02206	0.97214
CCB	-0.00008	0.00016	0.00005
1003063-9	0.12904	0.21025	0.04659
1003063-12	0.10047	0.18785	0.03872
1003063-13	0.10563	0.19590	0.03896
1003063-14	0.29320	0.04861	0.02976
1003063-16	0.10727	0.24992	0.04177
1003063-16D	0.10539	0.23514	0.04127
1003063-16L 5X	0.02107	0.05032	0.00782
1003063-16MS	0.58254	0.65554	0.05145
1003063-16MSD	0.59985	0.68587	0.05239
CCV	0.48139	1.00105	0.96784
CCB	0.00025	0.00023	0.00023
CCV	0.48359	1.01536	0.94395
CCB	0.00010	0.00062	0.00055
1003063-7 100X	0.00001	-0.00005	0.00051
1002238-2A	0.56321	0.55674	-0.00103
1003039-1 2X	0.18162	0.09601	0.05392
1003039-1D 2X	0.22132	0.12447	0.05896
1003039-1L 10X	0.03542	0.01864	0.01058

20000900

Sample Id1	V	Zn	Zr
1003039-1MS 2X	0.52071	0.39002	0.07154
1003039-1MSD 2X	0.39752	0.31248	0.05572
1003039-1A	1.26615	1.05579	0.09464
1003039-5 10X	0.01499	0.71283	0.00435
1003039-6 2X	0.09770	0.30557	0.01584
CCV	0.48418	1.05938	0.96286
CCB	0.00007	0.00155	0.00046
1003039-7 2X	0.11834	0.35747	0.00996
CRI	0.10595	0.04146	0.05220
ICSA	-0.00115	-0.00005	0.00215
ICSAB	0.49465	0.94924	0.51135
CCV	0.49779	1.08209	0.99421
CCB	-0.00008	0.00130	0.00005
AS100219-3MMB	1.02247	0.45395	0.00585
AS100219-3PMB	1.01830	0.25811	0.00384
AS100219-4MMB	0.98793	0.20985	0.00398
AS100219-4PMB	1.03423	0.21804	0.00170
AS100219-5MMB	1.02435	0.21676	0.00335
AS100219-5PMB	0.89646	0.19946	0.00243
AS100219-3LCS	1.02748	0.28672	0.00361
AS100219-3LCSD	1.07400	0.37925	0.00448
AS100219-4LCS	1.07203	0.21861	0.00538
AS100219-4LCSD	1.05950	0.17959	0.00354
CCV	0.48488	1.05080	0.96722
CCB	-0.00043	0.00123	0.00001
AS100219-5LCS	1.09806	0.37551	0.00624
AS100219-5LCSD	1.05679	0.32681	0.00466
1002179-1	1.38210	1.53649	0.31432
1002179-2	1.41125	0.62370	0.58181
1002179-5	1.14213	2.87082	0.09076
1002179-6	1.14369	3.88060	0.15371
1002179-8	1.13431	0.80816	0.07126
1002179-12	1.13219	1.39398	0.08184
1002179-15	1.22205	3.40339	0.23112
1002179-16	1.14802	2.51983	0.13602
CCV	0.49078	1.06727	0.98002
CCB	0.00009	0.00148	0.00017
1002179-17	1.14731	5.18866	0.13822
1002179-18	1.13812	1.07136	0.07617
1002179-20	1.11612	1.03143	0.06053
1002179-24	1.19832	4.52223	0.22529
1002179-25	1.32740	3.85724	0.70980
1002179-28	1.18952	1.81338	0.16064
1002179-29	1.18888	1.25155	0.03939
1002179-30	1.36184	0.76392	0.28623
1002179-31	1.18615	0.92178	0.14711
1002179-32	1.15132	0.84515	0.19931
CCV	0.48954	1.05464	0.98436
CCB	-0.00038	0.00148	-0.00009
1002179-33	1.27299	1.55916	0.39381

20000901

Sample Id1	V	Zn	Zr
1002179-35	1.18495	0.64614	0.26031
1002179-41	1.08178	0.59164	0.12515
1002179-42	1.17932	0.78869	0.13795
1002179-43	1.38330	H12.69001	0.55587
1002179-45	1.15718	5.96206	0.16605
1002179-50	1.16739	1.38164	0.21761
1002179-51	1.27409	5.53731	0.30493
1002179-52	1.24335	1.20397	0.25566
1002179-53	1.23126	0.84841	0.21729
CCV	0.48675	1.07412	0.96921
CCB	0.00002	0.00173	0.00001
1002179-54	1.21072	3.50693	0.20806
1002179-55	1.17748	5.00968	0.16385
1002179-56	1.19124	0.55763	0.17515
1002179-57	1.16102	0.45691	0.15369
1002179-59	1.01790	0.27179	0.00594
1002179-60	1.00205	0.47533	0.00624
1002179-61	1.01267	0.43429	0.00517
1002179-62	0.93271	0.16183	0.00265
1002179-63	1.16655	0.45117	0.20047
1002179-64	0.98012	0.30642	0.00497
CCV	0.47835	1.03372	0.95723
CCB	-0.00126	0.00066	-0.00118
1002179-65	1.00421	0.42580	0.00656
1002179-66	1.02066	0.34791	0.00665
1002179-67	1.04503	0.20366	0.00385
1002179-68	1.05619	0.21733	0.00412
1002179-25 10X	0.13894	0.41339	0.07537
CRI	0.10380	0.04043	0.05152
ICSA	-0.00127	-0.00030	0.00241
ICSAB	0.48088	0.91193	0.49941
CCV	0.48096	1.04079	0.96351
CCB	-0.00031	-0.00005	0.00031

20000902

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:26
SampleId1 : BLANK **SampleId2 :** **[STD]**
Analysis commenced : 3/9/2010 10:10:09
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE1

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.897	2.382	4.366	1.418	0.340	5.506	2.955	0.804	2.116
#2	1.886	2.398	4.316	1.407	0.341	5.542	2.985	0.822	2.145
Mean	**1.892**	**2.390**	**4.341**	**1.413**	**0.341**	**5.524**	**2.970**	**0.813**	**2.131**
%RSD	0.411	0.473	0.814	0.551	0.208	0.461	0.714	1.566	0.963

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.971	3.634	0.996	0.868	10.355	1.652	2.045	0.218	1.564
#2	1.982	3.640	1.002	0.890	10.398	1.661	2.052	0.220	1.565
Mean	**1.977**	**3.637**	**0.999**	**0.879**	**10.377**	**1.657**	**2.048**	**0.219**	**1.565**
%RSD	0.394	0.117	0.425	1.770	0.293	0.384	0.242	0.646	0.045

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.201	4.122	1.268	46.630	13.139	0.142	3.770	8.256	6.039
#2	2.217	4.187	1.276	46.826	13.007	0.146	3.755	8.266	6.066
Mean	**2.209**	**4.155**	**1.272**	**46.728**	**13.073**	**0.144**	**3.763**	**8.261**	**6.053**
%RSD	0.512	1.106	0.445	0.297	0.714	1.964	0.282	0.086	0.315

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	4.783	1.445	0.560	9.719	3.496	5.206	2.613	2.494	0.436
#2	4.804	1.452	0.564	9.788	3.512	5.240	2.618	2.510	0.436
Mean	**4.794**	**1.449**	**0.562**	**9.753**	**3.504**	**5.223**	**2.616**	**2.502**	**0.436**
%RSD	0.310	0.342	0.503	0.500	0.323	0.460	0.135	0.452	0.000

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	4.339		
#2	4.367		
Mean	**4.353**	**0.000**	**0.000**
%RSD	0.455	0.000	0.000

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:26
SampleId1 : BL **SampleId2 :** **[STD]**
Analysis commenced : 3/9/2010 10:12:46
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE2

Raw intensities

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.901	2.727	4.421	2.841	0.430	7.065	2.973	2.730	2.220
#2	1.904	2.725	4.460	2.844	0.430	7.039	2.936	2.725	2.212
Mean	**1.903**	**2.726**	**4.441**	**2.843**	**0.430**	**7.052**	**2.955**	**2.728**	**2.216**
%RSD	0.112	0.052	0.621	0.075	0.000	0.261	0.886	0.130	0.255

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.011	3.708	1.012	1.836	13.904	5.440	3.040	0.269	1.983
#2	2.011	3.686	1.013	1.838	13.909	5.442	3.040	0.268	1.957
Mean	**2.011**	**3.697**	**1.013**	**1.837**	**13.907**	**5.441**	**3.040**	**0.269**	**1.970**
%RSD	0.000	0.421	0.070	0.077	0.025	0.026	0.000	0.263	0.933

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	14.945	4.523	1.804	45.999	13.009	0.186	3.867	8.202	6.107
#2	14.907	4.508	1.762	45.798	12.995	0.186	3.838	8.138	6.157
Mean	**14.926**	**4.515**	**1.783**	**45.899**	**13.002**	**0.186**	**3.853**	**8.170**	**6.132**
%RSD	0.180	0.235	1.666	0.310	0.076	0.000	0.532	0.554	0.577

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	5.530	1.521	2.555	9.765	5.466	5.307	2.770	2.564	0.512
#2	5.514	1.534	2.551	9.750	5.454	5.220	2.759	2.554	0.510
Mean	**5.522**	**1.528**	**2.553**	**9.758**	**5.460**	**5.264**	**2.765**	**2.559**	**0.511**
%RSD	0.205	0.602	0.111	0.109	0.155	1.169	0.281	0.276	0.277

	Zr	Pb	Se
	Reading	Reading	Reading
#1	5.005		
#2	4.986		
Mean	**4.996**	**0.000**	**0.000**
%RSD	0.269	0.000	0.000

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:27
SampleId1 : RL2 **SampleId2 :** **[STD]**
Analysis commenced : 3/9/2010 10:14:45
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE3

Raw intensities

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.131	3.514	4.824	5.864	0.618	10.414	3.204	6.727	2.634
#2	2.116	3.539	4.885	5.865	0.618	10.445	3.213	6.738	2.640
Mean	**2.124**	**3.527**	**4.855**	**5.865**	**0.618**	**10.430**	**3.209**	**6.733**	**2.637**
%RSD	0.499	0.501	0.889	0.012	0.000	0.210	0.198	0.116	0.161

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

20000904

	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.257	4.244	1.114	3.884	19.334	13.007	5.298	0.394	2.937
#2	2.252	4.225	1.122	3.878	19.360	13.079	5.299	0.395	2.940
Mean	**2.255**	**4.235**	**1.118**	**3.881**	**19.347**	**13.043**	**5.299**	**0.395**	**2.939**
%RSD	0.157	0.317	0.506	0.109	0.095	0.390	0.013	0.179	0.072

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	38.942	5.759	2.869	48.557	13.956	0.268	4.297	8.769	6.651
#2	39.133	5.756	2.869	48.632	13.975	0.265	4.287	8.706	6.673
Mean	**39.038**	**5.758**	**2.869**	**48.594**	**13.965**	**0.267**	**4.292**	**8.738**	**6.662**
%RSD	0.346	0.037	0.000	0.109	0.096	0.796	0.165	0.510	0.234

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	7.251	1.758	5.970	10.695	9.711	5.826	3.310	2.887	0.688
#2	7.249	1.769	5.993	10.771	9.758	5.843	3.315	2.908	0.694
Mean	**7.250**	**1.764**	**5.982**	**10.733**	**9.735**	**5.835**	**3.313**	**2.898**	**0.691**
%RSD	0.020	0.441	0.272	0.501	0.341	0.206	0.107	0.512	0.614

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	6.715		
#2	6.743		
Mean	**6.729**	**0.000**	**0.000**
%RSD	0.294	0.000	0.000

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:27
SampleId1 : B3 **SampleId2 :** **[STD]**
Analysis commenced : 3/9/2010 10:16:36
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE4

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.511	2.431	5.910	4.361	4.414	19.264	3.023	0.753	8.808
#2	2.514	2.431	5.903	4.343	4.436	19.290	3.011	0.756	8.830
Mean	**2.513**	**2.431**	**5.907**	**4.352**	**4.425**	**19.277**	**3.017**	**0.755**	**8.819**
%RSD	0.084	0.000	0.084	0.292	0.352	0.095	0.281	0.281	0.176

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	3.947	11.784	2.592	0.831	10.349	1.653	2.026	2.936	5.880
#2	3.945	11.740	2.600	0.836	10.247	1.643	2.015	2.946	5.892
Mean	**3.946**	**11.762**	**2.596**	**0.833**	**10.298**	**1.648**	**2.021**	**2.941**	**5.886**
%RSD	0.036	0.265	0.218	0.424	0.700	0.429	0.385	0.240	0.144

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading

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20000905

#1	2.102	14.063	6.359	61.338	20.729	0.148	4.244	9.353	7.718
#2	2.090	14.050	6.408	61.105	20.806	0.149	4.254	9.339	7.756
Mean	**2.096**	**14.057**	**6.384**	**61.222**	**20.767**	**0.149**	**4.249**	**9.346**	**7.737**
%RSD	0.405	0.065	0.543	0.269	0.262	0.476	0.166	0.106	0.347

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	12.314	2.360	16.949	10.678	23.334	6.915	2.630	5.321	1.954
#2	12.337	2.366	17.020	10.592	23.436	6.808	2.596	5.304	1.962
Mean	**12.326**	**2.363**	**16.985**	**10.635**	**23.385**	**6.862**	**2.613**	**5.313**	**1.958**
%RSD	0.132	0.180	0.296	0.572	0.308	1.103	0.920	0.226	0.289

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	4.556		
#2	4.506		
Mean	**4.531**	**0.000**	**0.000**
%RSD	0.780	0.000	0.000

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:28
SampleId1 : B2 **SampleId2 :** **[STD]**
Analysis commenced : 3/9/2010 10:18:35
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE5

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	7.847	2.593	18.822	30.431	40.103	140.814	3.124	0.828	67.580
#2	7.863	2.589	19.003	30.559	40.341	141.365	3.124	0.826	67.785
Mean	**7.855**	**2.591**	**18.913**	**30.495**	**40.222**	**141.089**	**3.124**	**0.827**	**67.683**
%RSD	0.144	0.109	0.677	0.297	0.418	0.276	0.000	0.171	0.214

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	21.273	83.485	16.665	0.910	10.508	1.677	2.078	26.903	43.446
#2	21.330	83.652	16.747	0.905	10.454	1.672	2.054	27.011	43.565
Mean	**21.301**	**83.569**	**16.706**	**0.908**	**10.481**	**1.675**	**2.066**	**26.957**	**43.506**
%RSD	0.189	0.141	0.347	0.390	0.364	0.211	0.821	0.283	0.193

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.403	101.319	51.045	185.423	85.976	0.154	7.928	17.754	20.852
#2	2.386	101.324	51.086	185.704	85.948	0.153	7.935	17.877	20.788
Mean	**2.395**	**101.322**	**51.066**	**185.564**	**85.962**	**0.154**	**7.932**	**17.816**	**20.820**
%RSD	0.502	0.003	0.057	0.107	0.023	0.461	0.062	0.488	0.217

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	78.303	10.039	159.980	18.057	198.860	20.800	2.687	29.874	15.388

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#2	78.458	10.034	160.713	18.003	199.638	20.948	2.668	30.005	15.416
Mean	**78.381**	**10.037**	**160.347**	**18.030**	**199.249**	**20.874**	**2.678**	**29.940**	**15.402**
%RSD	0.140	0.035	0.323	0.212	0.276	0.501	0.502	0.309	0.129

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	6.021		
#2	6.000		
Mean	**6.011**	**0.000**	**0.000**
%RSD	0.247	0.000	0.000

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:28
SampleId1 : B1 **SampleId2 :** **[STD]**
Analysis commenced : 3/9/2010 10:20:30
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE6

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	61.285	4.262	146.992	288.286	386.873	1338.786	4.249	0.965	635.125
#2	61.567	4.258	148.066	290.060	389.546	1343.362	4.215	0.962	637.360
Mean	**61.426**	**4.260**	**147.529**	**289.173**	**388.210**	**1341.074**	**4.232**	**0.964**	**636.243**
%RSD	0.325	0.066	0.515	0.434	0.487	0.241	0.568	0.220	0.248

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	192.773	800.146	158.775	1.353	10.412	1.770	2.301	254.869	410.909
#2	193.410	803.010	159.789	1.354	10.353	1.753	2.291	255.935	413.262
Mean	**193.092**	**801.578**	**159.282**	**1.354**	**10.383**	**1.762**	**2.296**	**255.402**	**412.086**
%RSD	0.233	0.253	0.450	0.052	0.402	0.682	0.308	0.295	0.404

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	3.402	960.418	464.032	1412.218	736.195	0.215	44.826	101.689	150.225
#2	3.402	964.128	466.492	1418.003	731.961	0.216	45.039	102.148	149.561
Mean	**3.402**	**962.273**	**465.262**	**1415.111**	**734.078**	**0.216**	**44.933**	**101.919**	**149.893**
%RSD	0.000	0.273	0.374	0.289	0.408	0.328	0.335	0.318	0.313

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	721.067	85.621	1436.196	90.836	1984.536	160.138	2.910	275.013	144.241
#2	726.431	85.934	1443.758	91.248	1994.101	161.309	2.898	275.839	144.453
Mean	**723.749**	**85.778**	**1439.977**	**91.042**	**1989.319**	**160.724**	**2.904**	**275.426**	**144.347**
%RSD	0.524	0.258	0.371	0.320	0.340	0.515	0.292	0.212	0.104

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	20.185		
#2	20.234		

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Mean	**20.210**	**0.000**	**0.000CH**
%RSD	0.171	0.000	0.000

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:28
SampleId1 : A5 **SampleId2 :** **[STD]**
Analysis commenced : 3/9/2010 10:22:24
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE7

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.958	18.419	4.594	2.272	0.500	5.932	2.975	44.847	2.385
#2	1.938	18.466	4.514	2.204	0.449	5.775	2.967	44.886	2.298
Mean	**1.948**	**18.443**	**4.554**	**2.238**	**0.475**	**5.854**	**2.971**	**44.867**	**2.342**
%RSD	0.726	0.180	1.242	2.148	7.600	1.897	0.190	0.061	2.627

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.055	4.012	1.058	37.598	23.551	36.718	25.613	0.313	1.824
#2	2.021	3.876	1.038	37.669	23.571	36.969	25.620	0.284	1.754
Mean	**2.038**	**3.944**	**1.048**	**37.634**	**23.561**	**36.844**	**25.617**	**0.299**	**1.789**
%RSD	1.180	2.438	1.349	0.133	0.060	0.482	0.019	6.870	2.767

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	58.211	4.474	1.450	48.028	13.700	0.151	3.906	8.438	6.220
#2	58.706	4.362	1.380	47.507	13.636	0.148	3.832	8.378	6.178
Mean	**58.459**	**4.418**	**1.415**	**47.768**	**13.668**	**0.150**	**3.869**	**8.408**	**6.199**
%RSD	0.599	1.793	3.498	0.771	0.331	1.419	1.352	0.505	0.479

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	5.559	1.498	1.439	10.917	4.359	5.315	2.734	2.670	0.505
#2	5.313	1.488	1.258	10.829	4.102	5.334	2.709	2.608	0.484
Mean	**5.436**	**1.493**	**1.349**	**10.873**	**4.231**	**5.325**	**2.721**	**2.639**	**0.495**
%RSD	3.200	0.474	9.491	0.572	4.296	0.252	0.650	1.661	3.003

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	4.444		
#2	4.391		
Mean	**4.418**	**0.000**	**0.000**
%RSD	0.848	0.000	0.000

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:28
SampleId1 : A4 **SampleId2 :** **[STD]**
Analysis commenced : 3/9/2010 10:24:21
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE8

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Raw intensities **17:09:30** **User: ROY FRENCH**

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.939	163.103	4.966	1.965	0.345	5.592	2.971	437.703	2.156
#2	1.927	163.000	4.912	1.937	0.349	5.586	2.948	436.431	2.173
Mean	**1.933**	**163.052**	**4.939**	**1.951**	**0.347**	**5.589**	**2.960**	**437.067**	**2.165**
%RSD	0.439	0.045	0.773	1.015	0.815	0.076	0.550	0.206	0.555

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.986	4.006	1.000	360.416	117.488	362.765	236.750	0.255	1.887
#2	1.985	4.000	1.002	359.845	117.329	362.196	236.353	0.256	1.879
Mean	**1.986**	**4.003**	**1.001**	**360.131**	**117.409**	**362.481**	**236.552**	**0.256**	**1.883**
%RSD	0.036	0.106	0.141	0.112	0.096	0.111	0.119	0.277	0.300

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	493.601	4.164	1.404	53.687	15.354	0.164	4.547	9.570	7.092
#2	492.576	4.125	1.382	53.537	15.392	0.162	4.531	9.611	7.107
Mean	**493.089**	**4.145**	**1.393**	**53.612**	**15.373**	**0.163**	**4.539**	**9.591**	**7.100**
%RSD	0.147	0.665	1.117	0.198	0.175	0.868	0.249	0.302	0.149

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	5.344	1.671	0.706	16.268	3.924	5.841	3.123	2.780	0.578
#2	5.336	1.643	0.717	16.273	3.905	5.919	3.120	2.775	0.580
Mean	**5.340**	**1.657**	**0.712**	**16.271**	**3.915**	**5.880**	**3.122**	**2.778**	**0.579**
%RSD	0.106	1.195	1.093	0.022	0.343	0.938	0.068	0.127	0.244

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	4.506		
#2	4.503		
Mean	**4.505**	**0.000**	**0.000**
%RSD	0.047	0.000	0.000

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:29
SampleId1 : A3 **SampleId2 :** **[STD]**
Analysis commenced : 3/9/2010 10:26:11
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE9

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.975	319.702	5.604	1.957	0.358	5.748	3.043	853.704	2.245
#2	1.986	317.819	5.523	1.978	0.358	5.748	2.997	851.498	2.258
Mean	**1.981**	**318.761**	**5.563**	**1.968**	**0.358**	**5.748**	**3.020**	**852.601**	**2.252**
%RSD	0.393	0.418	1.029	0.755	0.000	0.000	1.077	0.183	0.408

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ted: 3/9/2010 17:09:30 User: ROY FRENCH

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.060	4.284	1.026	689.295	233.998	770.492	465.189	0.294	2.237
#2	2.053	4.299	1.022	687.698	232.915	766.913	463.598	0.294	2.202
Mean	**2.056**	**4.292**	**1.024**	**688.497**	**233.457**	**768.703**	**464.394**	**0.294**	**2.220**
%RSD	0.241	0.247	0.276	0.164	0.328	0.329	0.242	0.000	1.115

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	940.941	4.279	1.546	62.125	17.871	0.176	5.427	11.048	8.193
#2	936.757	4.321	1.543	62.002	17.763	0.173	5.435	11.117	8.138
Mean	**938.849**	**4.300**	**1.545**	**62.064**	**17.817**	**0.175**	**5.431**	**11.083**	**8.166**
%RSD	0.315	0.691	0.137	0.140	0.429	1.216	0.104	0.440	0.476

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	5.671	1.862	0.820	19.588	4.186	6.704	3.460	2.988	0.720
#2	5.641	1.853	0.818	19.627	4.174	6.725	3.457	2.992	0.724
Mean	**5.656**	**1.858**	**0.819**	**19.608**	**4.180**	**6.714**	**3.459**	**2.990**	**0.722**
%RSD	0.375	0.343	0.173	0.141	0.203	0.221	0.061	0.095	0.392

	Zr	Pb	Se
	Reading	Reading	Reading
#1	4.666		
#2	4.661		
Mean	**4.664**	**0.000**	**0.000**
%RSD	0.076	0.000	0.000

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:29
SampleId1 : A2 SampleId2 : [STD]
Analysis commenced : 3/9/2010 10:28:02
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE10

Raw intensities

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.067	626.812	6.906	2.148	0.366	6.044	3.195	1666.819	2.438
#2	2.060	628.738	6.900	2.129	0.366	6.044	3.211	1669.936	2.482
Mean	**2.064**	**627.775**	**6.903**	**2.139**	**0.366**	**6.044**	**3.203**	**1668.378**	**2.460**
%RSD	0.240	0.217	0.061	0.628	0.000	0.000	0.353	0.132	1.265

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.208	4.718	1.062	1303.373	458.741	1620.224	931.661	0.364	2.881
#2	2.209	4.724	1.069	1305.993	459.695	1623.267	934.110	0.365	2.887
Mean	**2.209**	**4.721**	**1.066**	**1304.683**	**459.218**	**1621.746**	**932.886**	**0.365**	**2.884**
%RSD	0.032	0.090	0.465	0.142	0.147	0.133	0.186	0.194	0.147

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	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1697.280	4.561	1.782	79.739	23.032	0.212	7.289	14.264	10.393
#2	1700.365	4.613	1.785	79.768	22.947	0.208	7.308	14.207	10.391
Mean	**1698.823**	**4.587**	**1.784**	**79.754**	**22.990**	**0.210**	**7.299**	**14.236**	**10.392**
%RSD	0.128	0.802	0.119	0.026	0.261	1.347	0.184	0.283	0.014

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	6.159	2.325	0.991	24.002	4.524	8.477	4.014	3.366	1.016
#2	6.178	2.337	0.994	24.032	4.535	8.481	4.022	3.374	1.013
Mean	**6.169**	**2.331**	**0.993**	**24.017**	**4.530**	**8.479**	**4.018**	**3.370**	**1.015**
%RSD	0.218	0.364	0.214	0.088	0.172	0.033	0.141	0.168	0.209

	Zr	Pb	Se
	Reading	Reading	Reading
#1	4.973		
#2	4.959		
Mean	**4.966**	**0.000**	**0.000**
%RSD	0.199	0.000	0.000

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:29
SampleId1 : A1 **SampleId2 :** **[STD]**
Analysis commenced : 3/9/2010 10:29:53
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE11

Raw intensities

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.044	1459.658	10.290	2.629	0.383	6.563	3.388	3662.734	2.822
#2	2.042	1466.480	10.328	2.639	0.386	6.578	3.409	3680.776	2.848
Mean	**2.043**	**1463.069**	**10.309**	**2.634**	**0.385**	**6.571**	**3.399**	**3671.755**	**2.835**
%RSD	0.069	0.330	0.261	0.268	0.552	0.161	0.437	0.347	0.648

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.438	5.364	1.086	2664.739	1044.171	4072.532	2184.677	0.542	4.725
#2	2.449	5.370	1.087	2675.074	1047.199	4082.405	2194.458	0.546	4.709
Mean	**2.444**	**5.367**	**1.087**	**2669.907**	**1045.685**	**4077.469**	**2189.568**	**0.544**	**4.717**
%RSD	0.318	0.079	0.065	0.274	0.205	0.171	0.316	0.520	0.240

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	3228.546	4.923	2.451	122.559	35.759	0.294	12.198	22.254	16.203
#2	3230.822	4.936	2.421	123.356	35.687	0.290	12.278	22.417	16.287
Mean	**3229.684**	**4.930**	**2.436**	**122.958**	**35.723**	**0.292**	**12.238**	**22.336**	**16.245**
%RSD	0.050	0.186	0.871	0.458	0.143	0.969	0.462	0.516	0.366

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn

20000911

20000911

	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	6.954	3.476	1.486	30.933	5.048	12.876	5.140	3.978	1.814
#2	6.888	3.485	1.489	30.987	5.074	12.991	5.159	3.995	1.808
Mean	**6.921**	**3.481**	**1.488**	**30.960**	**5.061**	**12.933**	**5.150**	**3.987**	**1.811**
%RSD	0.674	0.183	0.143	0.123	0.363	0.629	0.261	0.302	0.234

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	5.184		
#2	5.182		
Mean	**5.183**	**0.000**	**0.000**
%RSD	0.027	0.000	0.000

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:30
SampleId1 : C3 **SampleId2 :** **[STD]**
Analysis commenced : 3/9/2010 10:31:44
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE12

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.961	2.663	4.389	1.537	0.340	5.621	3.596	1.335	2.155
#2	1.995	2.594	4.358	1.537	0.341	5.596	3.606	1.163	2.163
Mean	**1.978**	**2.628**	**4.374**	**1.537**	**0.341**	**5.609**	**3.601**	**1.249**	**2.159**
%RSD	1.215	1.856	0.501	0.000	0.208	0.315	0.196	9.738	0.262

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.003	3.741	1.018	1.372	10.503	1.970	2.421	0.220	1.586
#2	2.023	3.780	1.020	1.216	10.565	1.899	2.335	0.222	1.581
Mean	**2.013**	**3.761**	**1.019**	**1.294**	**10.534**	**1.935**	**2.378**	**0.221**	**1.584**
%RSD	0.703	0.733	0.139	8.525	0.416	2.595	2.557	0.640	0.223

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.694	4.161	1.264	47.337	13.442	0.506	3.799	8.339	6.148
#2	2.560	4.219	1.291	47.631	13.321	0.493	3.822	8.350	6.161
Mean	**2.627**	**4.190**	**1.277**	**47.484**	**13.382**	**0.500**	**3.811**	**8.345**	**6.155**
%RSD	3.607	0.979	1.494	0.438	0.639	1.840	0.427	0.093	0.149

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	4.906	1.486	0.565	10.756	3.586	5.285	3.726	2.570	0.445
#2	4.911	1.495	0.568	10.858	3.610	5.377	3.732	2.602	0.446
Mean	**4.909**	**1.491**	**0.567**	**10.807**	**3.598**	**5.331**	**3.729**	**2.586**	**0.446**
%RSD	0.072	0.427	0.374	0.667	0.472	1.220	0.114	0.875	0.159

	Zr	**Pb**	**Se**
	Reading	Reading	Reading

20000912
20000912

#1	11.515		**CH**
#2	11.519		
Mean	**11.517**	**0.000**	**0.000**
%RSD	0.025	0.000	0.000

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:30
SampleId1 : C2 **SampleId2 :** **[STD]**
Analysis commenced : 3/9/2010 10:33:39
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE13

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.245	2.669	4.369	1.559	0.327	6.064	8.955	0.956	2.112
#2	2.244	2.676	4.346	1.546	0.324	6.078	9.056	0.936	2.112
Mean	**2.245**	**2.673**	**4.358**	**1.553**	**0.326**	**6.071**	**9.006**	**0.946**	**2.112**
%RSD	0.032	0.185	0.373	0.592	0.652	0.163	0.793	1.495	0.000

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.995	4.459	1.110	0.959	10.043	1.648	2.708	0.242	1.573
#2	1.991	4.448	1.103	0.944	10.012	1.640	2.712	0.244	1.557
Mean	**1.993**	**4.454**	**1.107**	**0.952**	**10.028**	**1.644**	**2.710**	**0.243**	**1.565**
%RSD	0.142	0.175	0.447	1.115	0.219	0.344	0.104	0.582	0.723

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.298	4.144	1.290	47.376	13.506	3.656	3.749	8.337	6.074
#2	2.278	4.134	1.312	47.048	13.529	3.693	3.759	8.279	6.063
Mean	**2.288**	**4.139**	**1.301**	**47.212**	**13.518**	**3.675**	**3.754**	**8.308**	**6.069**
%RSD	0.618	0.171	1.196	0.491	0.120	0.712	0.188	0.494	0.128

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	5.403	1.482	0.572	18.310	3.890	5.209	13.140	2.768	0.454
#2	5.403	1.484	0.568	18.340	3.857	5.193	13.217	2.746	0.453
Mean	**5.403**	**1.483**	**0.570**	**18.325**	**3.874**	**5.201**	**13.179**	**2.757**	**0.454**
%RSD	0.000	0.095	0.496	0.116	0.602	0.218	0.413	0.564	0.156

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	75.042		
#2	75.481		
Mean	**75.262**	**0.000**	**0.000**
%RSD	0.412	0.000	0.000

20000913

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:30
SampleId1 : C1 **SampleId2 :** **[STD]**
Analysis commenced : 3/9/2010 10:35:43

20000913

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE14

Raw intensities

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	5.970	5.319	4.994	2.821	0.368	11.293	64.185	2.061	2.654
#2	5.980	5.322	4.992	2.832	0.368	11.304	64.306	2.062	2.657
Mean	**5.975**	**5.321**	**4.993**	**2.827**	**0.368**	**11.299**	**64.245**	**2.061**	**2.656**
%RSD	0.118	0.040	0.028	0.275	0.000	0.069	0.133	0.034	0.080

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.740	13.284	2.408	2.062	10.380	1.791	9.622	0.556	1.798
#2	2.722	13.308	2.412	2.063	10.357	1.786	9.618	0.557	1.799
Mean	**2.731**	**13.296**	**2.410**	**2.063**	**10.369**	**1.789**	**9.620**	**0.557**	**1.799**
%RSD	0.466	0.128	0.117	0.034	0.157	0.198	0.029	0.127	0.039

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.284	5.599	1.618	64.994	19.815	34.899	4.354	9.809	6.976
#2	2.290	5.608	1.631	65.167	19.827	34.893	4.343	9.799	7.012
Mean	**2.287**	**5.604**	**1.625**	**65.081**	**19.821**	**34.896**	**4.348**	**9.804**	**6.994**
%RSD	0.186	0.114	0.566	0.188	0.043	0.012	0.179	0.072	0.364

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	12.061	1.847	0.896	98.876	8.594	6.095	108.721	5.848	0.503
#2	12.123	1.836	0.897	99.307	8.602	6.143	109.119	5.852	0.510
Mean	**12.092**	**1.842**	**0.897**	**99.092**	**8.598**	**6.119**	**108.920**	**5.850**	**0.506**
%RSD	0.363	0.422	0.079	0.308	0.066	0.555	0.258	0.048	0.977

	Zr	Pb	Se
	Reading	Reading	Reading
#1	722.751		
#2	724.757		
Mean	**723.754**	**0.000**	**0.000**
%RSD	0.196	0.000	0.000

20000914

Line calibration information

Analyte	Reporting name	C0	C1	C2	C3	Correlation coefficient	Low limit	High limit	Date of last regression
Ag 328.068	Ag	0.0006556	0.0356939	-0.0000025	0	1.0000	-0.026	56.234	3/9/2010 10:46:35
Al 308.215	Al	-0.0636102	0.3154992	0.0000292	0	0.99968	0.172	1406.319	3/9/2010 10:46:36
As 189.042/2	As	0.0050446	0.0371579	0.0000047	0	1.0000	-0.103	132.205	3/9/2010 10:46:36
B 249.678/2	B	-0.0037097	0.0389449	0.0000017	0	1.0000	0.079	254.028	3/9/2010 10:46:36
Ba 493.409	Ba	-0.0010087	0.0279906	0.0000025	0	1.0000	0.005	346.516	3/9/2010 10:46:37
Be 313.042	Be	-0.0043013	0.0007381	0.0	0	1.0000	5.524	1341.074	3/9/2010 10:46:37
Bi 223.061	Bi	-0.0005574	0.0961414	-0.0000218	0	1.0000	0.004	52.641	3/9/2010 10:46:37
Ca 317.933	Ca	-0.0289705	0.1148485	0.0000078	0	0.99966	0.125	3513.433	3/9/2010 10:46:38
Cd 226.502/2	Cd	-0.0007443	0.0089403	0.0000006	0	1.0000	0.052	538.908	3/9/2010 10:46:38
Co 228.616	Co	0.0004639	0.0265198	0.0000015	0	1.0000	-0.016	186.532	3/9/2010 10:46:38
Cr 267.716	Cr	-0.0004911	0.0127356	0.0000000	0	1.0000	0.017	784.579	3/9/2010 10:46:39
Cu 324.753	Cu	-0.0120016	0.0724264	-0.0000048	0	1.0000	0.167	145.670	3/9/2010 10:46:39
Fe 259.94	Fe	-0.0053419	0.0534055	0.0000084	0	0.99986	0.071	2621.041	3/9/2010 10:46:39
K 766.491	K	-2.803504	0.2384659	-0.0000598	6.023387616	0.99999	10.377	1045.685	3/9/2010 10:46:40
Li 670.784	Li	-0.0036451	0.0028296	-0.0000003	5.343620428	1.0000	1.657	4077.469	3/9/2010 10:46:40
Mg 279.078	Mg	-0.0169558	0.2209957	0.0000063	0	0.99964	0.034	2123.650	3/9/2010 10:46:40
Mn 257.61	Mn	-0.0006115	0.0377961	0.000008	0	1.0000	0.006	251.165	3/9/2010 10:46:41
Mo 202.03/2	Mo	-0.001425	0.0258779	0.0000016	0	1.0000	0.015	377.840	3/9/2010 10:46:41
Na 588.995	Na	-0.3060399	0.0499724	0.0000018	2.073915438	1.0000	2.209	3229.684	3/9/2010 10:46:41
Ni 231.604	Ni	-0.0015038	0.0120667	0.0000002	0	1.0000	0.123	816.222	3/9/2010 10:46:42
P 178.287/2	P	-0.0083945	0.1013485	0.0000181	0	1.0000	0.052	456.248	3/9/2010 10:46:42
Pb 220.351	Pb I	0.0020684	0.0074612	0.0000001	0	1.0000	-0.112	1323.479	3/9/2010 10:46:42
Pb 220.352/2	Pb II	-0.0026253	0.014583	0.0000002	0	1.0000	0.074	680.464	3/9/2010 10:46:43
S 182.04/2	S	-0.0168045	1.4423476	0.0006675	0	1.0000	0.006	34.138	3/9/2010 10:46:43
Sb 206.838/2	Sb	-0.0021125	0.0595641	0.0000003	0	1.0000	0.048	33.607	3/9/2010 10:46:43
Se 196.021	Se I	-0.0001443	0.0542548	0.0000068	0	1.0000	0.027	91.116	3/9/2010 10:46:44
Se 196.021/2	Se II	-0.0030915	0.0353863	0.0000051	0	1.0000	0.035	138.591	3/9/2010 10:46:44
Si 288.158	Si	-0.0989056	0.0691338	0.0000024	0	1.0000	1.348	707.315	3/9/2010 10:46:44
Sn 189.989	Sn	-0.0000417	0.1205041	0.0000225	0	1.0000	-0.005	81.736	3/9/2010 10:46:45
Sr 421.552	Sr	-0.0020094	0.0070462	0.0000007	0	1.0000	0.012	1263.617	3/9/2010 10:46:45

Th 283.73/2	Th	-0.0164669	0.0271396	-0.0000034	0	0.99999	0.462	75.004	3/9/2010 10:46:45
Ti 334.941	Ti	-0.0005177	0.005358	0.0000000	0	1.0000	-0.103	1936.803	3/9/2010 10:46:46
Tl 190.864/2	Tl	0.0066226	0.0362475	0.0000001	0	1.0000	-0.139	137.685	3/9/2010 10:46:46
U 385.958	U	0.0003208	0.4934746	-0.0000082	0	1.0000	-0.012	101.492	3/9/2010 10:46:46
V 292.402	V	-0.0001273	0.0187741	0.0000003	0	1.0000	-0.004	265.288	3/9/2010 10:46:47
Zn 206.2	Zn	-0.0011525	0.0710725	0.0000233	0	1.0000	0.002	134.765	3/9/2010 10:46:47
Zr 339.198	Zr	-0.0008415	0.0072955	-0.0000002	0	1.0000	0.056	696.450	3/9/2010 10:46:47

20000916

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:41
SampleId1 : MIXBHIGH **SampleId2 :** **[CV]**
Analysis commenced : 3/9/2010 10:48:20
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.98792	0.05251	4.98769	9.91721	9.83105	0.99332	0.00453	-0.04091	4.99524
#2	1.98948	0.05280	4.98373	9.91132	9.85500	0.99300	0.00220	-0.04011	4.98579
Mean	**1.98870**	**0.05265**	**4.98571**	**9.91427**	**9.84302**	**0.99316**	**0.00337**	**-0.04051**	**4.99051**
%RSD	0.05540	0.39844	0.05610	0.04202	0.17200	0.02297	48.90300	1.40317	0.13390

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.99828	9.96682	9.88063	-0.01362	-0.23426	0.00153	-0.05983	9.92915	10.00502
#2	4.99446	9.96634	9.86954	-0.01421	-0.23213	0.00152	-0.05917	9.94107	10.01698
Mean	**4.99637**	**9.96658**	**9.87509**	**-0.01391**	**-0.23320**	**0.00152**	**-0.05950**	**9.93511**	**10.01100**
%RSD	0.05408	0.00344	0.07943	2.98547	0.64730	0.39348	0.78793	0.08481	0.08449

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.13261	10.11001	50.06926	10.02802	9.94475	-0.00527	1.96381	4.94890	4.91047
#2	-0.13266	10.10275	49.94809	10.02347	9.98136	-0.00815	1.97267	4.94473	4.94391
Mean	**-0.13264**	**10.10638**	**50.00867**	**10.02575**	**9.96306**	**-0.00671**	**1.96824**	**4.94682**	**4.92719**
%RSD	0.02665	0.05085	0.17133	0.03211	0.25980	30.40851	0.31851	0.05948	0.47997

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	49.13705	10.06957	9.80466	1.97069	9.85972	5.00657	-0.06333	4.97638	10.07029
#2	49.22522	10.06994	9.76347	1.97194	9.86374	5.01735	-0.06333	4.97472	10.08477
Mean	**49.18114**	**10.06976**	**9.78406**	**1.97132**	**9.86173**	**5.01196**	**-0.06333**	**4.97555**	**10.07753**
%RSD	0.12676	0.00258	0.29768	0.04489	0.02880	0.15210	0.00045	0.02366	0.10156

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.04326	9.97248	4.92326
#2	-0.04322	9.99538	4.94418
Mean	**-0.04324**	**9.98393**	**4.93372**
%RSD	0.06886	0.16219	0.29985

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:41
SampleId1 : MIXAHIGH **SampleId2 :** **[CV]**
Analysis commenced : 3/9/2010 10:50:11
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE11

Final concentrations

20000917 M100917

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00016	495.00992	-0.00008	0.02511	0.00182	0.00078	0.00829	496.31087	0.00092
#2	0.00057	496.13556	0.00452	0.02133	0.00098	0.00074	0.00714	497.77501	0.00011
Mean	**0.00037**	**495.57274**	**0.00222**	**0.02322**	**0.00140**	**0.00076**	**0.00771**	**497.04294**	**0.00051**
%RSD	80.16934	0.16061	146.71565	11.50386	42.45882	3.80530	10.57232	0.20829	111.23051

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00108	0.00515	-0.00679	195.33178	247.25997	9.89552	493.14288	-0.00590	0.00168
#2	0.00124	0.00487	-0.00798	195.88917	247.83264	9.90317	494.41417	-0.00643	0.00220
Mean	**0.00116**	**0.00501**	**-0.00739**	**195.61047**	**247.54631**	**9.89935**	**493.77852**	**-0.00617**	**0.00194**
%RSD	9.76317	3.92310	11.44294	0.20149	0.16358	0.05467	0.18205	6.06640	18.87252

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	249.55609	0.00048	0.01998	-0.00635	0.00738	0.01925	0.00815	0.00222	0.00155
#2	249.16526	0.00063	0.01735	-0.00547	0.00730	0.02502	0.00786	0.00484	-0.00137
Mean	**249.36068**	**0.00055**	**0.01867**	**-0.00591**	**0.00734**	**0.02214**	**0.00801**	**0.00353**	**0.00009**
%RSD	0.11083	20.03703	9.98268	10.62720	0.82177	18.42721	2.56562	52.45129	2297.58564

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00475	-0.00004	0.00490	0.00353	-0.00014	-0.00269	0.08149	-0.00132	0.02643
#2	-0.00080	0.00478	0.00411	0.00015	-0.00096	-0.00246	0.10084	-0.00117	0.02565
Mean	**0.00197**	**0.00237**	**0.00451**	**0.00184**	**-0.00055**	**-0.00257**	**0.09117**	**-0.00125**	**0.02604**
%RSD	198.99972	143.90333	12.37823	129.91009	105.76884	6.23254	15.01556	8.25695	2.12379

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00305	0.00281	0.00177
#2	0.00300	0.00305	0.00070
Mean	**0.00302**	**0.00293**	**0.00123**
%RSD	1.06236	5.76711	61.73727

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:41
SampleId1 : MIXCHIGH SampleId2 : [CV]
Analysis commenced : 3/9/2010 10:52:03
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE14

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00060	0.10287	-0.00781	0.02554	-0.00162	0.00384	4.89794	0.02869	-0.00144
#2	-0.00030	0.09605	-0.00651	0.02601	-0.00168	0.00382	4.88031	0.02076	-0.00162
Mean	**0.00015**	**0.09946**	**-0.00716**	**0.02577**	**-0.00165**	**0.00383**	**4.88912**	**0.02472**	**-0.00153**
%RSD	433.03738	4.85046	12.84034	1.28230	2.39542	0.48812	0.25493	22.66668	8.25618

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00501	-0.00732	-0.00115	-0.00021	-0.34718	0.00175	-0.25474	0.00336	-0.00083
#2	0.00522	-0.00715	-0.00180	-0.00203	-0.35264	0.00163	-0.25783	0.00336	-0.00150
Mean	**0.00511**	**-0.00724**	**-0.00147**	**-0.00112**	**-0.34991**	**0.00169**	**-0.25629**	**0.00336**	**-0.00117**
%RSD	2.93990	1.64206	30.89160	114.35481	1.10272	5.20603	0.85358	0.00000	40.79640

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.18020	-0.00178	0.00407	-0.00661	0.00540	48.48301	0.00064	-0.00763	0.00183
#2	-0.18510	-0.00140	0.01380	-0.00598	0.00472	48.38044	0.00015	-0.01569	-0.00107
Mean	**-0.18265**	**-0.00159**	**0.00894**	**-0.00629**	**0.00506**	**48.43172**	**0.00039**	**-0.01166**	**0.00038**
%RSD	1.89631	17.19104	76.98869	7.16736	9.56017	0.14975	86.71169	48.89386	541.83826

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.03637	0.01971	-0.00045	-0.32690	0.00762	-0.00185	49.22389	-0.00767	-0.00186
#2	-0.03497	0.01706	-0.00041	-0.32910	0.00737	0.00254	48.98043	-0.00711	-0.00144
Mean	**-0.03567**	**0.01839**	**-0.00043**	**-0.32800**	**0.00750**	**0.00035**	**49.10216**	**-0.00739**	**-0.00165**
%RSD	2.77938	10.19466	6.93694	0.47475	2.28170	890.64528	0.35061	5.38352	18.27459

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	4.91479	0.00140	-0.00132
#2	4.88851	0.00116	-0.00594
Mean	**4.90165**	**0.00128**	**-0.00363**
%RSD	0.37917	13.48858	89.94849

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:41
SampleId1 : ICV **SampleId2 :** **[CV]**
Analysis commenced : 3/9/2010 11:12:02
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10385	26.15718	0.27007	0.50836	0.51686	0.26434	0.26932	26.15505	0.25885
#2	0.10455	26.21274	0.26869	0.50906	0.51821	0.26486	0.26404	26.22866	0.26004
Mean	**0.10420**	**26.18496**	**0.26938**	**0.50871**	**0.51754**	**0.26460**	**0.26668**	**26.19186**	**0.25944**
%RSD	0.47568	0.15004	0.36154	0.09755	0.18418	0.13773	1.39824	0.19872	0.32553

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.26566	0.52596	0.53242	10.69859	25.36812	0.25177	26.53040	0.52110	0.51668
#2	0.26587	0.52743	0.53299	10.72669	25.43134	0.25195	26.62274	0.52232	0.51658
Mean	**0.26576**	**0.52669**	**0.53270**	**10.71264**	**25.39973**	**0.25186**	**26.57657**	**0.52171**	**0.51663**
%RSD	0.05646	0.19715	0.07511	0.18551	0.17600	0.04907	0.24568	0.16489	0.01420

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	25.76386	0.53326	2.55565	0.51570	0.51174	2.56858	0.26172	0.52372	0.52643
#2	25.77679	0.53458	2.57038	0.51780	0.51142	2.59314	0.26111	0.52575	0.52693
Mean	**25.77032**	**0.53392**	**2.56302**	**0.51675**	**0.51158**	**2.58086**	**0.26141**	**0.52473**	**0.52668**
%RSD	0.03547	0.17448	0.40627	0.28744	0.04368	0.67292	0.16548	0.27297	0.06734

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.50221	0.52464	0.25615	0.06730	0.25372	0.26731	2.55000	0.25611	0.54099
#2	2.51182	0.52802	0.25678	0.06980	0.25470	0.26732	2.56676	0.25626	0.54670
Mean	**2.50702**	**0.52633**	**0.25646**	**0.06855**	**0.25421**	**0.26731**	**2.55838**	**0.25618**	**0.54384**
%RSD	0.27100	0.45388	0.17218	2.57736	0.27399	0.00411	0.46312	0.04298	0.74298

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.51628	0.51306	0.52552
#2	0.51651	0.51354	0.52653
Mean	**0.51639**	**0.51330**	**0.52603**
%RSD	0.03166	0.06732	0.13565

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:42
SampleId1 : ICB **SampleId2 :** **[CB]**
Analysis commenced : 3/9/2010 11:13:54
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00034	0.05972	-0.00131	-0.00009	-0.00067	0.00020	-0.00441	0.00422	-0.00026
#2	0.00023	0.06049	-0.00332	0.00096	-0.00070	0.00019	-0.00652	0.00445	-0.00018
Mean	**0.00029**	**0.06010**	**-0.00231**	**0.00044**	**-0.00069**	**0.00019**	**-0.00547**	**0.00434**	**-0.00022**
%RSD	25.76407	0.91240	61.35148	169.78772	2.88168	3.28972	27.36279	3.74582	27.55476

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00073	-0.00044	-0.00128	0.00774	-0.32061	0.00118	0.00802	-0.00023	-0.00155
#2	0.00004	0.00016	-0.00077	0.00822	-0.34267	0.00114	0.01001	-0.00016	-0.00049
Mean	**-0.00034**	**-0.00014**	**-0.00103**	**0.00798**	**-0.33164**	**0.00116**	**0.00901**	**-0.00020**	**-0.00102**
%RSD	158.06467	307.36249	35.27514	4.25760	4.70424	2.58630	15.60727	27.30164	73.27595

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.19699	-0.00164	-0.00444	-0.00432	0.00186	-0.01825	-0.00176	-0.00280	-0.00206
#2	-0.19879	-0.00095	-0.00323	-0.00116	0.00097	-0.00527	-0.00200	0.00148	0.00020
Mean	**-0.19789**	**-0.00129**	**-0.00383**	**-0.00274**	**0.00142**	**-0.01176**	**-0.00188**	**-0.00066**	**-0.00093**
%RSD	0.64293	37.62500	22.43149	81.73412	44.10402	78.07844	8.84987	456.26983	171.90857

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.01014	0.00008	-0.00182	-0.00144	-0.00092	-0.00095	-0.00166	-0.00031	-0.00023

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#2	-0.00881	-0.00233	-0.00178	-0.00056	-0.00091	-0.00280	-0.00758	-0.00018	-0.00037
Mean	**-0.00947**	**-0.00113**	**-0.00180**	**-0.00100**	**-0.00091**	**-0.00188**	**-0.00462**	**-0.00025**	**-0.00030**
%RSD	9.90414	151.45544	1.66270	62.04908	0.82885	69.70756	90.65022	37.53189	33.54480

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00049	-0.00020	-0.00231
#2	-0.00022	0.00027	0.00063
Mean	**-0.00036**	**0.00003**	**-0.00084**
%RSD	53.96210	1003.45182	246.49657

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:42
SampleId1 : CRI **SampleId2 :** **[FLEXQC]**
Analysis commenced : 3/9/2010 11:15:45
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD3

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01934	0.43936	0.01010	0.39866	0.40962	0.00982	0.04937	5.05498	0.00970
#2	0.01992	0.45020	0.00980	0.40298	0.41400	0.00985	0.04793	5.09334	0.00965
Mean	**0.01963**	**0.44478**	**0.00995**	**0.40082**	**0.41181**	**0.00984**	**0.04865**	**5.07416**	**0.00968**
%RSD	2.06471	1.72439	2.11271	0.76332	0.75175	0.27305	2.09444	0.53453	0.37721

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09850	0.01924	0.05128	0.20825	3.63289	0.01674	5.06839	0.02918	0.01938
#2	0.09896	0.02015	0.05208	0.20938	3.67384	0.01691	5.10778	0.02944	0.01959
Mean	**0.09873**	**0.01970**	**0.05168**	**0.20882**	**3.65336**	**0.01682**	**5.08808**	**0.02931**	**0.01949**
%RSD	0.32702	3.25953	1.09723	0.38025	0.79256	0.71239	0.54740	0.63852	0.75134

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.19177	0.07967	0.20026	0.00399	0.00560	0.19235	0.12109	0.00523	0.00886
#2	4.25113	0.08014	0.20746	0.00594	0.00495	0.19812	0.12275	0.00620	0.00724
Mean	**4.22145**	**0.07990**	**0.20386**	**0.00497**	**0.00527**	**0.19524**	**0.12192**	**0.00571**	**0.00805**
%RSD	0.99440	0.41657	2.49780	27.79507	8.69610	2.08986	0.96285	12.01666	14.29912

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09271	0.10118	0.01849	0.08518	0.01904	0.02047	0.20448	0.10016	0.03730
#2	0.09480	0.10190	0.01867	0.08566	0.01930	0.02119	0.19757	0.10055	0.03766
Mean	**0.09375**	**0.10154**	**0.01858**	**0.08542**	**0.01917**	**0.02083**	**0.20102**	**0.10035**	**0.03748**
%RSD	1.27286	0.50347	0.67071	0.39525	0.94848	2.44802	2.43040	0.27800	0.67063

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.04964	0.00506	0.00765
#2	0.05033	0.00528	0.00689

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Mean	**0.04998**	**0.00517**	**0.00727CH**
%RSD	0.97769	2.97459	7.41294

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:43
SampleId1 : ICSA **SampleId2 :** **[FLEXQC]**
Analysis commenced : 3/9/2010 11:17:37
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD4

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00037	261.99978	-0.00436	0.00011	-0.00045	0.00041	-0.00114	262.02152	-0.00018
#2	0.00048	262.80335	-0.00172	0.00174	-0.00048	0.00042	0.00136	262.08285	-0.00044
Mean	**0.00042**	**262.40157**	**-0.00304**	**0.00092**	**-0.00046**	**0.00041**	**0.00011**	**262.05219**	**-0.00031**
%RSD	16.79348	0.21654	61.42133	125.07494	4.27565	1.43557	1632.85050	0.01655	59.62064

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00097	-0.00117	-0.00551	107.46324	-0.45396	0.00261	268.72059	-0.00159	-0.00236
#2	0.00110	-0.00098	-0.00508	107.49592	-0.45728	0.00261	268.92574	-0.00156	-0.00135
Mean	**0.00104**	**-0.00108**	**-0.00529**	**107.47958**	**-0.45562**	**0.00261**	**268.82317**	**-0.00158**	**-0.00185**
%RSD	9.01760	12.21154	5.70692	0.02150	0.51560	0.00000	0.05396	1.69650	38.53450

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.19239	-0.00002	0.00579	-0.00368	0.00370	0.00483	0.00300	-0.01057	0.00000
#2	-0.19304	0.00004	0.00356	-0.00314	0.00165	-0.00527	0.00229	-0.00096	-0.00137
Mean	**-0.19272**	**0.00001**	**0.00468**	**-0.00341**	**0.00268**	**-0.00022**	**0.00265**	**-0.00577**	**-0.00068**
%RSD	0.23840	403.12018	33.69192	11.21138	54.17312	3284.47900	18.90882	117.80345	142.29141

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.01655	-0.00064	0.01080	-0.01110	-0.00142	-0.00036	0.03177	-0.00065	-0.00058
#2	-0.01469	-0.00173	0.01083	-0.01073	-0.00122	-0.00234	0.04112	-0.00086	-0.00087
Mean	**-0.01562**	**-0.00118**	**0.01082**	**-0.01092**	**-0.00132**	**-0.00135**	**0.03644**	**-0.00076**	**-0.00073**
%RSD	8.40316	64.73027	0.18431	2.36961	10.58703	104.02838	18.14949	20.49599	27.68646

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00236	0.00124	-0.00352
#2	0.00227	0.00006	-0.00124
Mean	**0.00231**	**0.00065**	**-0.00238**
%RSD	2.73156	129.26711	67.92357

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Method : Paragon File : 100309A Printed : 3/9/2010 17:09:43
SampleId1 : ICSAB **SampleId2 :** **[FLEXQC]**
Analysis commenced : 3/9/2010 11:19:29
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD5

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Final concentrations:**39** **User: ROY FRENCH**

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.20320	265.71070	0.10723	0.99019	0.50779	0.47421	0.52334	262.32894	1.00250
#2	0.20303	264.17693	0.10782	0.98921	0.50622	0.47416	0.52754	262.43323	0.99999
Mean	**0.20312**	**264.94381**	**0.10752**	**0.98970**	**0.50701**	**0.47418**	**0.52544**	**262.38108**	**1.00124**
%RSD	0.05864	0.40935	0.39125	0.06972	0.21932	0.00752	0.56632	0.02811	0.17728

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.46455	0.46571	0.52698	107.85050	-0.45182	1.07189	270.78105	0.46367	0.97656
#2	0.46441	0.46630	0.52424	107.76459	-0.43473	1.06655	270.67206	0.46307	0.97721
Mean	**0.46448**	**0.46600**	**0.52561**	**107.80754**	**-0.44328**	**1.06922**	**270.72656**	**0.46337**	**0.97688**
%RSD	0.02028	0.08969	0.36886	0.05634	2.72542	0.35292	0.02847	0.09276	0.04704

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.20104	0.92547	1.00792	0.04163	0.05859	0.99028	0.60626	0.04893	0.05735
#2	-0.20144	0.92702	1.00324	0.04898	0.05660	0.98162	0.60817	0.05185	0.05847
Mean	**-0.20124**	**0.92624**	**1.00558**	**0.04530**	**0.05759**	**0.98595**	**0.60722**	**0.05039**	**0.05791**
%RSD	0.14049	0.11826	0.32900	11.46820	2.44471	0.62106	0.22192	4.10136	1.36745

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.93611	0.99406	0.99369	-0.02496	0.95664	0.10715	10.01947	0.47587	0.87606
#2	0.93702	0.99079	0.99079	-0.02740	0.95576	0.10803	10.00966	0.47685	0.87843
Mean	**0.93656**	**0.99242**	**0.99224**	**-0.02618**	**0.95620**	**0.10759**	**10.01456**	**0.47636**	**0.87724**
%RSD	0.06930	0.23246	0.20683	6.57324	0.06556	0.58031	0.06923	0.14534	0.19058

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.49546	0.05294	0.05455
#2	0.49468	0.05406	0.05627
Mean	**0.49507**	**0.05350**	**0.05541**
%RSD	0.11078	1.47843	2.19544

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:43
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/9/2010 11:21:20
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19710	49.76706	0.49810	0.96247	0.97310	0.48967	0.50009	49.11686	0.48738
#2	0.19709	49.76688	0.50340	0.96540	0.97360	0.49091	0.50364	49.28816	0.48865
Mean	**0.19709**	**49.76697**	**0.50075**	**0.96394**	**0.97335**	**0.49029**	**0.50187**	**49.20251**	**0.48802**
%RSD	0.00470	0.00026	0.74760	0.21473	0.03683	0.17915	0.50058	0.24618	0.18403

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ted: 3/9/2010 17:10:39 User: ROY FRENCH

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49169	0.97530	1.00018	20.18787	49.81814	0.51327	50.15546	0.96835	0.96520
#2	0.49265	0.97808	0.99887	20.22672	49.77118	0.51220	50.26223	0.97075	0.97141
Mean	**0.49217**	**0.97669**	**0.99953**	**20.20729**	**49.79466**	**0.51274**	**50.20885**	**0.96955**	**0.96830**
%RSD	0.13710	0.20127	0.09303	0.13593	0.06669	0.14778	0.15037	0.17555	0.45369

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	49.07363	0.98029	4.81548	0.95506	0.95668	4.79072	0.49021	0.98882	0.98240
#2	48.98964	0.98274	4.84475	0.96003	0.94565	4.82255	0.48976	0.99298	0.97445
Mean	**49.03163**	**0.98151**	**4.83012**	**0.95755**	**0.95116**	**4.80664**	**0.48999**	**0.99090**	**0.97843**
%RSD	0.12112	0.17614	0.42850	0.36698	0.81953	0.46825	0.06531	0.29660	0.57446

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.69710	0.97975	0.48518	0.13177	0.47553	0.50216	4.81543	0.47840	0.99656
#2	4.70988	0.98796	0.48586	0.13190	0.47704	0.49725	4.83316	0.47922	1.00524
Mean	**4.70349**	**0.98386**	**0.48552**	**0.13183**	**0.47628**	**0.49970**	**4.82430**	**0.47881**	**1.00090**
%RSD	0.19211	0.59060	0.09776	0.06772	0.22396	0.69509	0.25991	0.12042	0.61314

	Zr	Pb	Se
	ppm	calc	calc
#1	0.96180	0.95614	0.98454
#2	0.96199	0.95044	0.98062
Mean	**0.96189**	**0.95329**	**0.98258**
%RSD	0.01362	0.42266	0.28194

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:43
SampleId1 : CCB SampleId2 : [CB]
Analysis commenced : 3/9/2010 11:24:16
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00044	0.08159	-0.00079	0.00303	-0.00045	0.00015	-0.00248	0.02581	-0.00014
#2	-0.00012	0.08899	0.00036	0.00240	-0.00045	0.00019	-0.00326	0.03558	-0.00005
Mean	**0.00016**	**0.08529**	**-0.00021**	**0.00272**	**-0.00045**	**0.00017**	**-0.00287**	**0.03070**	**-0.00009**
%RSD	247.11228	6.13234	382.06648	16.22169	0.00000	20.22361	19.08717	22.48985	67.59617

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00031	0.00039	-0.00042	0.01629	-0.34505	0.00118	0.03498	-0.00001	-0.00117
#2	0.00009	0.00028	-0.00055	0.02131	-0.35928	0.00117	0.04338	0.00011	-0.00083
Mean	**0.00020**	**0.00033**	**-0.00048**	**0.01880**	**-0.35216**	**0.00118**	**0.03918**	**0.00005**	**-0.00100**
%RSD	75.11501	22.27054	19.27524	18.88526	2.85826	0.68055	15.15729	160.70026	23.83629

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	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.19539	-0.00029	-0.00221	0.00320	-0.00102	-0.00527	0.00026	0.00588	-0.00086
#2	-0.19379	-0.00044	-0.00485	-0.00009	0.00126	-0.00238	-0.00278	0.00066	-0.00047
Mean	**-0.19459**	**-0.00036**	**-0.00353**	**0.00155**	**0.00012**	**-0.00382**	**-0.00126**	**0.00327**	**-0.00066**
%RSD	0.58118	30.51620	52.78812	149.56563	1313.37399	53.35226	170.15996	112.99785	41.52706

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.01063	-0.00101	-0.00166	0.00064	-0.00057	0.00101	0.00228	0.00031	-0.00030
#2	-0.01115	-0.00100	-0.00164	-0.00273	-0.00073	0.00024	-0.01548	-0.00025	0.00027
Mean	**-0.01089**	**-0.00101**	**-0.00165**	**-0.00104**	**-0.00065**	**0.00062**	**-0.00660**	**0.00003**	**-0.00002**
%RSD	3.40827	0.01272	0.90398	228.30155	16.92996	87.38663	190.34776	1497.42263	2620.31760

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00008	0.00039	0.00138
#2	0.00019	0.00081	-0.00009
Mean	**0.00014**	**0.00060**	**0.00065**
%RSD	55.41990	50.18894	162.10732

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:44
SampleId1 : IP100308-1MB SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 11:26:07
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE1

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00079	0.03837	-0.00038	0.00186	-0.00087	0.00002	-0.00374	0.00112	-0.00044
#2	0.00006	0.03934	-0.00053	0.00209	-0.00084	0.00001	-0.00431	0.00204	-0.00058
Mean	**-0.00036**	**0.03885**	**-0.00045**	**0.00198**	**-0.00085**	**0.00002**	**-0.00403**	**0.00158**	**-0.00051**
%RSD	165.34690	1.77593	23.11307	8.36080	2.31549	49.01495	9.99599	41.12733	19.74242

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00057	-0.00065	-0.00156	0.00603	-0.29119	0.00114	-0.01364	-0.00038	-0.00083
#2	-0.00023	-0.00022	-0.00070	0.00635	-0.29594	0.00114	-0.01010	-0.00035	-0.00070
Mean	**-0.00040**	**-0.00043**	**-0.00113**	**0.00619**	**-0.29357**	**0.00114**	**-0.01187**	**-0.00037**	**-0.00077**
%RSD	60.59395	69.70437	53.94547	3.65826	1.14279	0.35039	21.05878	7.30484	11.95866

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.20419	-0.00109	0.00144	-0.00125	0.00123	-0.00238	-0.00223	0.00044	-0.00440
#2	-0.20479	-0.00072	0.00397	0.00077	-0.00059	-0.00382	0.00110	0.00343	-0.00380
Mean	**-0.20449**	**-0.00091**	**0.00270**	**-0.00024**	**0.00032**	**-0.00310**	**-0.00057**	**0.00193**	**-0.00410**
%RSD	0.20739	29.17920	66.27652	590.77041	398.96506	32.87785	416.43422	109.52499	10.37539

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00651	0.00128	-0.00193	0.00265	-0.00053	-0.00227	-0.02041	-0.00037	0.00333
#2	-0.00404	0.00104	-0.00189	0.01943	0.00068	0.00234	-0.00807	-0.00035	0.00503
Mean	**-0.00528**	**0.00116**	**-0.00191**	**0.01104**	**0.00007**	**0.00004**	**-0.01424**	**-0.00036**	**0.00418**
%RSD	33.10352	14.73666	1.56459	107.52831	1156.71941	8867.00392	61.25528	3.69197	28.86984

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00102	0.00041	-0.00279
#2	-0.00183	-0.00014	-0.00139
Mean	**-0.00143**	**0.00013**	**-0.00209**
%RSD	39.83744	284.60794	47.29786

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:44
SampleId1 : IP100308-1RVS SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 11:27:53
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00232	0.13238	0.00434	0.00646	0.00403	0.00093	0.00716	0.49387	0.00168
#2	0.00275	0.13320	0.00400	0.00681	0.00400	0.00092	0.00976	0.49547	0.00185
Mean	**0.00254**	**0.13279**	**0.00417**	**0.00663**	**0.00402**	**0.00092**	**0.00846**	**0.49467**	**0.00176**
%RSD	11.78105	0.43722	5.66889	3.73816	0.49289	1.32072	21.69977	0.22998	6.90989

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00150	0.00451	0.00405	0.10610	0.33870	0.00427	0.48651	0.00438	0.00913
#2	0.00176	0.00504	0.00368	0.10621	0.33349	0.00425	0.49159	0.00453	0.00919
Mean	**0.00163**	**0.00477**	**0.00386**	**0.10615**	**0.33609**	**0.00426**	**0.48905**	**0.00445**	**0.00916**
%RSD	11.52515	7.87198	6.72664	0.07120	1.09659	0.32838	0.73503	2.40069	0.39958

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.58631	0.00422	0.10108	0.00498	0.00448	0.08561	0.00900	-0.00098	0.00227
#2	0.59152	0.00437	0.10473	0.00651	0.00489	0.09282	0.00804	0.00206	0.00379
Mean	**0.58891**	**0.00429**	**0.10291**	**0.00574**	**0.00469**	**0.08921**	**0.00852**	**0.00054**	**0.00303**
%RSD	0.62486	2.58304	2.50799	18.84248	6.28877	5.71653	7.95309	398.35173	35.53016

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02082	0.01080	0.00294	-0.00127	0.00401	0.00663	0.03874	0.00453	0.00560
#2	0.02157	0.00959	0.00297	-0.00429	0.00392	0.01276	0.04565	0.00479	0.00553
Mean	**0.02119**	**0.01020**	**0.00296**	**-0.00278**	**0.00396**	**0.00969**	**0.04219**	**0.00466**	**0.00556**
%RSD	2.50399	8.35612	0.84315	76.75512	1.62469	44.71605	11.57774	3.98698	0.90328

	Zr	**Pb**	**Se**
	ppm	calc	calc

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#1	0.00444	0.00464	0.00119	**CH**
#2	0.00470	0.00543	0.00321	
Mean	**0.00457**	**0.00504**	**0.00220**	
%RSD	4.00049	11.05353	65.20626	

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:45
SampleId1 : IP100308-1LCS SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 11:29:39
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE3

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10225	2.13060	2.10548	1.00596	2.01799	0.04978	-0.00624	41.67220	0.05017
#2	0.10198	2.13452	2.10491	1.00752	2.02117	0.04986	-0.00536	41.69687	0.05060
Mean	**0.10212**	**2.13256**	**2.10520**	**1.00674**	**2.01958**	**0.04982**	**-0.00580**	**41.68454**	**0.05038**
%RSD	0.18703	0.12989	0.01899	0.10967	0.11118	0.11195	10.66185	0.04185	0.60834

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49892	0.19884	0.26203	1.04027	38.70211	0.52078	42.23156	0.49335	1.02166
#2	0.49909	0.19933	0.26215	1.04204	38.66380	0.52017	42.30394	0.49411	1.02439
Mean	**0.49901**	**0.19908**	**0.26209**	**1.04115**	**38.68295**	**0.52047**	**42.26775**	**0.49373**	**1.02303**
%RSD	0.02303	0.17562	0.03317	0.12043	0.07003	0.08235	0.12108	0.10886	0.18871

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	38.52300	0.50085	0.00215	0.48510	0.48702	0.00195	0.50856	2.10044	2.07982
#2	38.44298	0.50270	0.00438	0.49087	0.48480	-0.00671	0.51227	2.11295	2.07798
Mean	**38.48299**	**0.50178**	**0.00326**	**0.48799**	**0.48591**	**-0.00238**	**0.51041**	**2.10670**	**2.07890**
%RSD	0.14703	0.26058	48.35289	0.83641	0.32401	257.02009	0.51416	0.42000	0.06243

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.99080	0.52098	0.50229	-0.01619	0.50076	2.11477	-0.04480	0.50417	0.49186
#2	1.99292	0.52194	0.50323	-0.01673	0.50142	2.12066	-0.01667	0.50579	0.49079
Mean	**1.99186**	**0.52146**	**0.50276**	**-0.01646**	**0.50109**	**2.11772**	**-0.03074**	**0.50498**	**0.49132**
%RSD	0.07511	0.13083	0.13263	2.31225	0.09435	0.19669	64.70640	0.22631	0.15413

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00031	0.48638	2.08668
#2	-0.00013	0.48682	2.08963
Mean	**-0.00022**	**0.48660**	**2.08816**
%RSD	58.86344	0.06351	0.09964

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Method : Paragon File : 100309A Printed : 3/9/2010 17:09:45
SampleId1 : 1003063-4 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 11:31:24

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE4

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00004	0.36270	0.00274	0.09024	0.02934	0.00006	-0.00189	136.69994	-0.00079
#2	-0.00056	0.37029	-0.00257	0.09066	0.02945	0.00005	-0.00343	137.48504	-0.00067
Mean	**-0.00026**	**0.36649**	**0.00008**	**0.09045**	**0.02939**	**0.00005**	**-0.00266**	**137.09249**	**-0.00073**
%RSD	160.89092	1.46419	4467.60842	0.33498	0.26941	11.63555	41.02778	0.40495	11.29784

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00025	-0.00005	-0.00058	0.60666	7.46968	0.04463	89.55948	0.08644	0.00132
#2	-0.00006	-0.00032	-0.00042	0.60993	7.57035	0.04521	90.27428	0.08704	0.00083
Mean	**0.00009**	**-0.00018**	**-0.00050**	**0.60829**	**7.52001**	**0.04492**	**89.91688**	**0.08674**	**0.00107**
%RSD	237.00858	106.36024	21.67826	0.38005	0.94661	0.91416	0.56212	0.49347	32.42410

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	119.09139	0.00115	0.01188	-0.00106	0.00047	218.02812	-0.00240	0.00041	0.00227
#2	120.46966	0.00070	0.01411	-0.00198	0.00108	220.36614	-0.00127	-0.00421	0.00174
Mean	**119.78052**	**0.00093**	**0.01299**	**-0.00152**	**0.00078**	**219.19713**	**-0.00183**	**-0.00190**	**0.00201**
%RSD	0.81364	34.03225	12.13730	42.48255	55.28112	0.75422	43.59571	172.32672	18.67357

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.93018	-0.00089	1.67143	-0.02097	0.00644	0.00010	0.02359	0.00076	0.01854
#2	11.05783	-0.00186	1.69139	-0.02117	0.00571	-0.00110	0.01274	0.00061	0.01818
Mean	**10.99401**	**-0.00137**	**1.68141**	**-0.02107**	**0.00608**	**-0.00050**	**0.01817**	**0.00069**	**0.01836**
%RSD	0.82102	49.55572	0.83966	0.67165	8.54349	169.63020	42.26904	15.43302	1.36897

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00100	-0.00004	0.00165
#2	-0.00107	0.00006	-0.00024
Mean	**-0.00103**	**0.00001**	**0.00071**
%RSD	4.74399	584.59974	189.06394

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:45
SampleId1 : 1003063-4D SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 11:33:09
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE5

Final concentrations

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00078	0.37088	0.00393	0.08502	0.02855	0.00000	-0.00391	134.36545	-0.00067
#2	-0.00001	0.37473	-0.00090	0.08743	0.02878	-0.00002	-0.00592	134.75645	-0.00064

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	Mean	%RSD
Ag	-0.00040	138.29964
Al	0.37280	0.73124
As	0.00151	225.50815
B	0.08622	1.98058
Ba	0.02866	0.55250
Be	-0.00001	121.13817
Bi	-0.00491	28.99140
Ca	134.56095	0.20547
Cd	-0.00066	3.56542

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00007	-0.00069	-0.00065	0.58913	7.41595	0.04447	88.24527	0.08508	0.00062
#2	-0.00015	-0.00008	-0.00073	0.59074	7.44678	0.04459	88.53700	0.08542	0.00124
Mean	**-0.00011**	**-0.00039**	**-0.00069**	**0.58994**	**7.43137**	**0.04453**	**88.39114**	**0.08525**	**0.00093**
%RSD	53.62623	113.00196	8.52334	0.19271	0.29342	0.19249	0.23338	0.28244	47.22527

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	118.93205	0.00041	0.01765	-0.00246	-0.00023	215.81345	-0.00156	-0.00599	0.00287
#2	119.11646	0.00046	0.01522	-0.00118	0.00045	216.37748	0.00040	-0.00446	0.00093
Mean	**119.02425**	**0.00044**	**0.01644**	**-0.00182**	**0.00011**	**216.09547**	**-0.00058**	**-0.00522**	**0.00190**
%RSD	0.10956	7.77531	10.46480	49.90420	426.39626	0.18456	238.80334	20.71608	72.49352

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.89083	-0.00089	1.66203	-0.02439	0.00582	0.00231	0.02262	0.00085	0.00752
#2	10.90814	-0.00210	1.66764	-0.02087	0.00608	0.00192	0.03644	0.00093	0.00745
Mean	**10.89949**	**-0.00149**	**1.66483**	**-0.02263**	**0.00595**	**0.00211**	**0.02953**	**0.00089**	**0.00748**
%RSD	0.11233	57.02152	0.23835	10.99356	3.11897	13.07047	33.08609	6.00329	0.67164

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00098	-0.00097	-0.00008
#2	-0.00091	-0.00009	-0.00087
Mean	**-0.00094**	**-0.00053**	**-0.00047**
%RSD	4.77791	116.71533	117.86868

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:46
SampleId1 : 1003063-4L 5X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 11:34:54
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00026	0.10141	0.00073	0.01868	0.00504	-0.00003	-0.00046	27.18692	-0.00011
#2	0.00009	0.10026	-0.00023	0.01896	0.00507	-0.00002	-0.00498	27.31049	-0.00021
Mean	**0.00017**	**0.10084**	**0.00025**	**0.01882**	**0.00505**	**-0.00003**	**-0.00272**	**27.24871**	**-0.00016**
%RSD	67.21300	0.80798	271.85610	1.02430	0.39184	22.05454	117.53659	0.32067	40.44006

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00010	0.00023	-0.00086	0.12229	0.84378	0.00815	17.82485	0.01753	-0.00083
#2	0.00005	-0.00026	-0.00120	0.12331	0.82745	0.00815	17.92387	0.01757	-0.00104
Mean	**0.00007**	**-0.00001**	**-0.00103**	**0.12280**	**0.83561**	**0.00815**	**17.87436**	**0.01755**	**-0.00093**

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%RSD	51.75885	2338.09863	23.84230	0.58473	1.38192	0.02452	0.39171	0.15230	15.68531

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	23.43660	-0.00044	0.00093	0.00390	-0.00168	44.51716	-0.00022	0.00003	-0.00601
#2	23.64389	-0.00018	-0.00059	0.00084	-0.00128	45.05706	-0.00087	-0.00281	-0.00205
Mean	**23.54024**	**-0.00031**	**0.00017**	**0.00237**	**-0.00148**	**44.78711**	**-0.00054**	**-0.00139**	**-0.00403**
%RSD	0.62268	60.71252	634.09757	91.11954	18.88373	0.85240	85.08435	144.18727	69.57525

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.21289	-0.00028	0.34025	-0.01024	0.00044	0.00100	0.01159	0.00033	0.00304
#2	2.23287	0.00020	0.34347	-0.01017	0.00039	-0.00086	-0.00717	0.00007	0.00354
Mean	**2.22288**	**-0.00004**	**0.34186**	**-0.01020**	**0.00042**	**0.00007**	**0.00221**	**0.00020**	**0.00329**
%RSD	0.63571	807.31297	0.66649	0.49910	8.17184	1834.13863	599.72153	94.31986	10.69443

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00010	0.00018	-0.00400
#2	-0.00033	-0.00058	-0.00230
Mean	**-0.00022**	**-0.00020**	**-0.00315**
%RSD	74.52486	269.54008	38.14317

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:46
SampleId1 : 1003063-4MS SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 11:36:39
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE7

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10217	2.70181	2.10465	1.10437	2.04393	0.04820	-0.00150	181.95215	0.04966
#2	0.10210	2.70381	2.10608	1.10972	2.05406	0.04827	0.00167	182.13718	0.05052
Mean	**0.10214**	**2.70281**	**2.10537**	**1.10705**	**2.04900**	**0.04824**	**0.00008**	**182.04466**	**0.05009**
%RSD	0.04640	0.05244	0.04810	0.34165	0.34935	0.10084	2677.15209	0.07187	1.21162

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48268	0.19168	0.26559	1.63734	54.13588	0.64533	134.23403	0.56582	1.01064
#2	0.48391	0.19206	0.26675	1.64117	54.43460	0.64881	134.49729	0.56784	1.01129
Mean	**0.48330**	**0.19187**	**0.26617**	**1.63926**	**54.28524**	**0.64707**	**134.36566**	**0.56683**	**1.01096**
%RSD	0.18052	0.14207	0.30902	0.16513	0.38910	0.38040	0.13854	0.25149	0.04546

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	162.36568	0.48178	0.01593	0.47190	0.47235	221.66041	0.51009	2.11666	2.07933
#2	162.87579	0.48393	0.02110	0.47349	0.47249	222.21956	0.51182	2.12991	2.08912
Mean	**162.62074**	**0.48286**	**0.01851**	**0.47270**	**0.47242**	**221.93998**	**0.51095**	**2.12328**	**2.08422**
%RSD	0.22181	0.31502	19.74219	0.23913	0.02073	0.17815	0.23928	0.44136	0.33213

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ted: 3/9/2010 17:10:39 User: ROY FRENCH

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	13.39688	0.51772	2.19393	-0.02328	0.49629	2.08311	0.02684	0.49441	0.46416
#2	13.44209	0.51869	2.20245	-0.02413	0.49761	2.08046	0.02042	0.49647	0.46594
Mean	**13.41949**	**0.51821**	**2.19819**	**-0.02370**	**0.49695**	**2.08178**	**0.02363**	**0.49544**	**0.46505**
%RSD	0.23819	0.13155	0.27417	2.51704	0.18723	0.09004	19.20331	0.29508	0.27132

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00152	0.47220	2.09176
#2	-0.00148	0.47283	2.10270
Mean	**-0.00150**	**0.47251**	**2.09723**
%RSD	1.80252	0.09349	0.36895

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:47
SampleId1 : 1003063-4MSD SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 11:38:24
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE8

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10057	2.63937	2.04218	1.07782	2.00793	0.04650	-0.00231	175.02417	0.04791
#2	0.10014	2.62693	2.02421	1.06943	1.99565	0.04639	-0.00087	174.73449	0.04897
Mean	**0.10035**	**2.63315**	**2.03319**	**1.07363**	**2.00179**	**0.04645**	**-0.00159**	**174.87933**	**0.04844**
%RSD	0.30488	0.33420	0.62491	0.55281	0.43359	0.16212	63.81022	0.11713	1.55149

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.46698	0.18595	0.26161	1.59368	53.44394	0.63581	129.46656	0.54928	0.97921
#2	0.46492	0.18589	0.26045	1.58823	53.18727	0.63189	129.21253	0.54764	0.97299
Mean	**0.46595**	**0.18592**	**0.26103**	**1.59095**	**53.31560**	**0.63385**	**129.33954**	**0.54846**	**0.97610**
%RSD	0.31253	0.02058	0.31500	0.24197	0.34041	0.43743	0.13888	0.21083	0.45009

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	158.96311	0.46855	0.01299	0.45325	0.45920	214.91393	0.49749	2.05267	2.02946
#2	158.03682	0.46603	0.01786	0.45521	0.45531	213.75429	0.49333	2.03953	2.02118
Mean	**158.49997**	**0.46729**	**0.01542**	**0.45423**	**0.45725**	**214.33411**	**0.49541**	**2.04610**	**2.02532**
%RSD	0.41324	0.38218	22.30494	0.30581	0.60224	0.38258	0.59412	0.45408	0.28889

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	13.03924	0.49903	2.14651	-0.02565	0.48257	2.01202	0.02194	0.48130	0.44332
#2	12.99046	0.49747	2.13425	-0.02287	0.48075	2.01322	0.02786	0.48064	0.44182
Mean	**13.01485**	**0.49825**	**2.14038**	**-0.02426**	**0.48166**	**2.01262**	**0.02490**	**0.48097**	**0.44257**
%RSD	0.26502	0.22236	0.40502	8.12889	0.26857	0.04212	16.82810	0.09683	0.23944

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	Zr	Pb	SeCH
	ppm	calc	calc
#1	-0.00172	0.45722	2.03719
#2	-0.00162	0.45528	2.02729
Mean	**-0.00167**	**0.45625**	**2.03224**
%RSD	4.26511	0.30120	0.34427

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:47
SampleId1 : 1003063-7 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 11:40:10
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE9

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00054	3.51997	0.00909	0.45226	0.04507	0.00116	-0.00157	680.86376	-0.00036
#2	-0.00026	3.51892	0.00608	0.45347	0.04496	0.00113	-0.00080	680.57421	-0.00046
Mean	**-0.00040**	**3.51944**	**0.00759**	**0.45286**	**0.04501**	**0.00114**	**-0.00118**	**680.71899**	**-0.00041**
%RSD	50.10193	0.02104	28.04089	0.18870	0.17593	1.37374	46.42324	0.03008	17.95078

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02356	0.00118	0.00131	10.46190	57.26980	0.73499	2050.52296	1.26382	0.00393
#2	0.02326	0.00096	0.00181	10.47713	57.41353	0.73722	2051.53660	1.26520	0.00468
Mean	**0.02341**	**0.00107**	**0.00156**	**10.46951**	**57.34166**	**0.73610**	**2051.02978**	**1.26451**	**0.00431**
%RSD	0.89830	14.58509	22.71340	0.10281	0.17724	0.21451	0.03495	0.07716	12.32088

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	928.27289	0.01604	0.19032	0.00393	0.00158	1343.45408	0.00023	-0.00056	0.00315
#2	921.91504	0.01636	0.18859	0.00193	0.00157	1343.09224	0.00131	0.00200	0.00237
Mean	**925.09397**	**0.01620**	**0.18946**	**0.00293**	**0.00158**	**1343.27316**	**0.00077**	**0.00072**	**0.00276**
%RSD	0.48597	1.36960	0.64350	48.23718	0.25465	0.01905	98.98385	250.87168	19.88598

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.41076	0.01318	16.95449	0.03949	0.03203	0.00265	7.94638	0.00815	0.02550
#2	10.43576	0.01233	17.15424	0.04323	0.03464	0.00266	7.95426	0.00823	0.02600
Mean	**10.42326**	**0.01275**	**17.05436**	**0.04136**	**0.03334**	**0.00265**	**7.95032**	**0.00819**	**0.02575**
%RSD	0.16959	4.69395	0.82820	6.39526	5.54529	0.22308	0.07009	0.67375	1.36642

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00015	0.00236	0.00191
#2	-0.00043	0.00169	0.00225
Mean	**-0.00029**	**0.00203**	**0.00208**
%RSD	68.99916	23.34500	11.32743

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:47

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SampleId1 : 1003063-10 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 11:41:55
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE10

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00019	0.39341	0.00062	0.03489	0.04549	0.00005	-0.00131	131.96876	-0.00040
#2	0.00066	0.39793	-0.00097	0.03391	0.04555	0.00005	0.00215	131.78983	-0.00077
Mean	**0.00042**	**0.39567**	**-0.00018**	**0.03440**	**0.04552**	**0.00005**	**0.00042**	**131.87930**	**-0.00059**
%RSD	78.71382	0.80707	641.83742	2.00152	0.08699	2.43897	584.64051	0.09594	45.02188

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00051	0.00075	-0.00057	0.74446	6.11726	0.02646	51.90086	0.13601	0.00039
#2	-0.00010	0.00038	-0.00035	0.74226	6.13483	0.02641	51.77053	0.13598	0.00101
Mean	**0.00021**	**0.00057**	**-0.00046**	**0.74336**	**6.12604**	**0.02644**	**51.83570**	**0.13599**	**0.00070**
%RSD	206.42259	45.65089	34.38023	0.20920	0.20275	0.14347	0.17778	0.01968	63.00473

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	45.73408	0.00026	0.02749	0.00039	-0.00099	120.91238	-0.00236	0.00198	-0.00174
#2	45.80589	0.00027	0.02961	0.00244	-0.00072	121.10927	-0.00098	-0.00133	-0.00033
Mean	**45.76998**	**0.00026**	**0.02855**	**0.00141**	**-0.00086**	**121.01083**	**-0.00167**	**0.00032**	**-0.00103**
%RSD	0.11095	3.23219	5.27207	102.81873	22.29137	0.11505	58.54187	724.96332	96.88193

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	15.83308	0.00055	1.04712	-0.01704	0.00672	0.00144	0.01659	0.00231	0.00297
#2	15.85339	0.00031	1.04836	-0.01660	0.00647	-0.00053	0.00870	0.00188	0.00311
Mean	**15.84324**	**0.00043**	**1.04774**	**-0.01682**	**0.00659**	**0.00045**	**0.01264**	**0.00209**	**0.00304**
%RSD	0.09065	39.34758	0.08365	1.84636	2.58510	305.60703	44.14380	14.61439	3.30551

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00181	-0.00053	-0.00050
#2	-0.00183	0.00033	-0.00066
Mean	**-0.00182**	**-0.00010**	**-0.00058**
%RSD	0.95258	594.83660	19.49035

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:48
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/9/2010 11:43:41
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

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Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	0.19973	49.69122	0.51011	0.97251	0.97321	0.49989	0.50395	50.13579	0.49638
#2	0.19841	49.65960	0.50530	0.97180	0.97338	0.49808	0.50653	49.98011	0.49544
Mean	**0.19907**	**49.67541**	**0.50770**	**0.97215**	**0.97329**	**0.49899**	**0.50524**	**50.05795**	**0.49591**
%RSD	0.46880	0.04501	0.66989	0.05110	0.01228	0.25625	0.36015	0.21990	0.13406

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.50102	0.99411	1.00807	20.43752	49.64396	0.50810	51.08560	0.97969	0.98110
#2	0.49913	0.99079	1.00651	20.38140	49.67373	0.50818	50.89777	0.97801	0.98032
Mean	**0.50007**	**0.99245**	**1.00729**	**20.40946**	**49.65884**	**0.50814**	**50.99169**	**0.97885**	**0.98071**
%RSD	0.26654	0.23624	0.10944	0.19445	0.04239	0.01060	0.26048	0.12145	0.05623

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.42424	1.00777	4.95939	0.97328	0.97412	4.99763	0.49551	0.99901	0.99564
#2	48.40629	1.00356	4.92021	0.96947	0.96932	4.97447	0.49387	0.99658	0.98475
Mean	**48.41526**	**1.00566**	**4.93980**	**0.97138**	**0.97172**	**4.98605**	**0.49469**	**0.99780**	**0.99019**
%RSD	0.02623	0.29619	0.56082	0.27724	0.34935	0.32833	0.23445	0.17225	0.77754

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.72314	1.01141	0.48703	0.13318	0.47897	0.51333	4.81230	0.48422	1.02224
#2	4.71125	1.00404	0.48663	0.13082	0.47817	0.50797	4.77189	0.48303	1.01485
Mean	**4.71720**	**1.00773**	**0.48683**	**0.13200**	**0.47857**	**0.51065**	**4.79209**	**0.48362**	**1.01855**
%RSD	0.17823	0.51734	0.05705	1.26474	0.11935	0.74263	0.59633	0.17465	0.51297

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.97244	0.97384	0.99676
#2	0.97058	0.96937	0.98869
Mean	**0.97151**	**0.97160**	**0.99272**
%RSD	0.13505	0.32534	0.57495

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:48
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/9/2010 11:45:33
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00036	0.09576	-0.00190	0.00287	-0.00028	0.00034	-0.00230	0.04247	0.00000
#2	0.00023	0.09509	-0.00161	0.00291	-0.00034	0.00030	-0.00229	0.03971	-0.00013
Mean	**-0.00007**	**0.09542**	**-0.00176**	**0.00289**	**-0.00031**	**0.00032**	**-0.00229**	**0.04109**	**-0.00007**
%RSD	598.04630	0.50236	11.97532	0.95241	12.81226	9.01320	0.23101	4.74375	145.47062

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00036	-0.00010	-0.00134	0.01853	-0.37541	0.00134	0.05133	0.00026	-0.00070

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#2	0.00007	0.00032	-0.00049	0.01773	-0.37423	0.00129	0.05266	0.00030	-0.00101
Mean	**-0.00015**	**0.00011**	**-0.00091**	**0.01813**	**-0.37482**	**0.00132**	**0.05200**	**0.00028**	**-0.00086**
%RSD	206.89967	263.39952	66.10357	3.12457	0.22380	2.42985	1.80328	9.65988	25.66270

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.15321	-0.00038	0.00032	-0.00175	0.00211	0.05531	-0.00432	-0.00526	-0.00227
#2	-0.15606	-0.00009	0.00286	0.00057	0.00042	0.05820	-0.00206	0.00078	0.00059
Mean	**-0.15463**	**-0.00024**	**0.00159**	**-0.00059**	**0.00127**	**0.05676**	**-0.00319**	**-0.00224**	**-0.00084**
%RSD	1.30283	86.48318	112.79288	276.14561	94.83776	3.59407	49.96900	190.48404	240.81223

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.01135	-0.00101	-0.00135	-0.00122	-0.00055	0.00190	-0.02140	-0.00037	-0.00030
#2	-0.00951	-0.00113	-0.00133	-0.00277	-0.00076	0.00456	-0.00018	0.00051	-0.00016
Mean	**-0.01043**	**-0.00107**	**-0.00134**	**-0.00199**	**-0.00065**	**0.00323**	**-0.01079**	**0.00007**	**-0.00023**
%RSD	12.42966	7.98275	0.74368	54.95943	22.58144	58.17182	139.00066	850.40990	43.97577

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00009	0.00083	-0.00327
#2	0.00050	0.00047	0.00065
Mean	**0.00029**	**0.00065**	**-0.00131**
%RSD	97.23508	39.28369	212.08364

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:48
SampleId1 : 1003063-11 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 11:47:24
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE11

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00026	0.17973	0.00036	0.07695	0.03306	0.00017	0.00060	129.42556	-0.00035
#2	-0.00031	0.17743	0.00196	0.07898	0.03309	0.00012	-0.00248	129.26541	-0.00045
Mean	**-0.00002**	**0.17858**	**0.00116**	**0.07797**	**0.03307**	**0.00014**	**-0.00094**	**129.34548**	**-0.00040**
%RSD	1624.18894	0.91111	97.25866	1.83704	0.05986	22.41057	231.72891	0.08756	17.58372

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00043	-0.00004	-0.00100	0.33011	6.96697	0.03952	73.64845	0.09544	0.00077
#2	0.00011	0.00053	-0.00049	0.32957	7.00227	0.03952	73.68425	0.09533	0.00132
Mean	**0.00027**	**0.00024**	**-0.00074**	**0.32984**	**6.98462**	**0.03952**	**73.66635**	**0.09539**	**0.00105**
%RSD	83.63997	164.82562	49.17407	0.11472	0.35743	0.00505	0.03436	0.08415	36.72344

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	97.63464	-0.00010	0.01583	0.00143	0.00087	181.49017	-0.00169	0.00057	-0.00134
#2	97.84131	-0.00035	0.01522	0.00220	-0.00172	181.91464	-0.00050	-0.00069	-0.00028

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Mean	**97.73798**	**-0.00022**	**0.01552**	**0.00182**	**-0.00042**	**181.70241**	**-0.00109**	**-0.00006**	**-0.00081**
%RSD	0.14953	75.93924	2.76992	30.24478	432.69334	0.16518	76.95040	1517.20732	92.42038

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	11.41846	0.00164	1.40824	-0.02156	0.00143	-0.00159	0.01441	0.00104	0.01107
#2	11.44897	0.00008	1.41012	-0.02610	0.00125	0.00021	0.00010	0.00146	0.01164
Mean	**11.43371**	**0.00086**	**1.40918**	**-0.02383**	**0.00134**	**-0.00069**	**0.00725**	**0.00125**	**0.01136**
%RSD	0.18871	128.71425	0.09435	13.46914	9.64067	185.40711	139.54195	23.34324	3.54050

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00089	0.00106	-0.00071
#2	-0.00074	-0.00042	-0.00042
Mean	**-0.00081**	**0.00032**	**-0.00056**
%RSD	13.30056	323.88690	36.37673

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:49
SampleId1 : 1003063-15 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 11:49:11
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE12

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00002	0.15018	0.00077	0.11150	0.02385	0.00008	-0.00421	126.29076	-0.00053
#2	0.00098	0.14572	-0.00068	0.11182	0.02393	0.00009	0.00021	126.86646	-0.00007
Mean	**0.00050**	**0.14795**	**0.00005**	**0.11166**	**0.02389**	**0.00008**	**-0.00200**	**126.57861**	**-0.00030**
%RSD	135.91738	2.13163	2183.95083	0.19735	0.24857	6.39425	156.40358	0.32161	109.07194

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00002	-0.00002	-0.00077	0.19959	7.56147	0.05050	89.79230	0.07165	0.00189
#2	0.00007	0.00023	-0.00085	0.20002	7.58670	0.05070	90.26975	0.07214	0.00134
Mean	**0.00005**	**0.00011**	**-0.00081**	**0.19981**	**7.57408**	**0.05060**	**90.03103**	**0.07189**	**0.00162**
%RSD	84.14206	164.71384	6.97174	0.15138	0.23548	0.29138	0.37499	0.48367	23.78345

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	138.52286	-0.00009	0.00752	0.00213	-0.00138	227.29826	0.00041	0.00262	-0.00108
#2	139.04144	-0.00020	0.01127	0.00425	-0.00090	229.02847	0.00052	0.00181	0.00076
Mean	**138.78215**	**-0.00015**	**0.00939**	**0.00319**	**-0.00114**	**228.16336**	**0.00046**	**0.00222**	**-0.00016**
%RSD	0.26422	52.49511	28.23201	46.92664	30.12293	0.53621	17.15429	25.72191	815.45165

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	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	8.45660	-0.00028	1.69053	-0.02047	0.00078	0.00305	-0.00426	0.00047	0.00169
#2	8.51208	-0.00016	1.70026	-0.02276	0.00056	-0.00083	0.00561	0.00089	0.00212
Mean	**8.48434**	**-0.00022**	**1.69539**	**-0.02162**	**0.00067**	**0.00111**	**0.00068**	**0.00068**	**0.00190**

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%RSD	0.46243	38.24610	0.40576	7.48697	23.68738	246.75188	1028.98368	42.88396	15.84028

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00083	-0.00021	0.00015
#2	-0.00053	0.00082	0.00111
Mean	**-0.00068**	**0.00030**	**0.00063**
%RSD	31.53834	240.38627	107.41388

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:49
SampleId1 : 1003063-17 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 11:50:57
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE13

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00068	0.14208	0.00018	0.08626	0.02939	0.00020	-0.00507	145.10759	-0.00050
#2	-0.00037	0.14060	0.00218	0.08455	0.02928	0.00017	-0.00488	144.64730	-0.00061
Mean	**-0.00052**	**0.14134**	**0.00118**	**0.08541**	**0.02934**	**0.00018**	**-0.00497**	**144.87745**	**-0.00055**
%RSD	42.81882	0.73763	120.21599	1.41903	0.26992	13.28827	2.74021	0.22466	14.37979

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00003	0.00009	-0.00145	0.40220	7.45192	0.04486	92.96098	0.19372	0.00106
#2	-0.00011	-0.00041	-0.00138	0.40193	7.39819	0.04458	92.63862	0.19327	0.00134
Mean	**-0.00007**	**-0.00016**	**-0.00142**	**0.40207**	**7.42506**	**0.04472**	**92.79980**	**0.19349**	**0.00120**
%RSD	84.98272	220.98226	3.45760	0.04707	0.51171	0.45020	0.24563	0.16611	16.75057

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	119.67235	-0.00032	0.01238	-0.00160	-0.00088	225.61703	-0.00133	0.00243	-0.00197
#2	118.85085	0.00041	0.01147	0.00059	0.00016	224.57721	-0.00281	-0.00277	0.00090
Mean	**119.26160**	**0.00005**	**0.01193**	**-0.00050**	**-0.00036**	**225.09712**	**-0.00207**	**-0.00017**	**-0.00054**
%RSD	0.48707	1112.53167	5.40830	308.50182	204.78970	0.32664	50.58802	2137.60194	377.82740

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.58118	0.00261	1.72935	-0.01879	0.00039	-0.00166	0.03311	0.00044	0.00126
#2	10.52276	0.00273	1.72288	-0.02345	-0.00001	-0.00089	0.03706	0.00095	0.00070
Mean	**10.55197**	**0.00267**	**1.72611**	**-0.02112**	**0.00019**	**-0.00127**	**0.03508**	**0.00069**	**0.00098**
%RSD	0.39145	3.20449	0.26499	15.61405	152.05853	42.31864	7.95708	51.77533	41.03912

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00146	-0.00112	-0.00050
#2	-0.00114	0.00031	-0.00033
Mean	**-0.00130**	**-0.00041**	**-0.00042**
%RSD	17.62633	247.32233	30.39342

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ted: 3/9/2010 17:10:39 User: ROY FRENCH
Method : Paragon File : 100309A Printed : 3/9/2010 17:09:49
SampleId1 : 1003063-18 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 11:52:43
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE14

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00024	0.16197	0.00073	0.08560	0.02931	0.00014	-0.00478	140.67625	-0.00043
#2	-0.00008	0.16477	-0.00005	0.08564	0.02953	0.00014	-0.00487	141.40737	-0.00053
Mean	**0.00008**	**0.16337**	**0.00034**	**0.08562**	**0.02942**	**0.00014**	**-0.00483**	**141.04181**	**-0.00048**
%RSD	296.20822	1.20872	160.31269	0.03217	0.53831	1.99779	1.40532	0.36655	15.06703

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00048	-0.00008	-0.00088	0.40793	7.33628	0.04459	90.43864	0.19164	0.00077
#2	0.00029	-0.00036	-0.00095	0.40975	7.38604	0.04487	90.94669	0.19274	0.00137
Mean	**0.00038**	**-0.00022**	**-0.00092**	**0.40884**	**7.36116**	**0.04473**	**90.69266**	**0.19219**	**0.00107**
%RSD	34.24284	89.07870	5.48674	0.31481	0.47806	0.45456	0.39611	0.40415	39.25022

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	118.56905	0.00026	0.00833	0.00025	-0.00107	221.09978	-0.00002	0.00206	-0.00038
#2	119.05696	0.00005	0.01441	0.00001	0.00014	222.74615	0.00023	-0.00147	-0.00105
Mean	**118.81301**	**0.00016**	**0.01137**	**0.00013**	**-0.00046**	**221.92296**	**0.00010**	**0.00030**	**-0.00071**
%RSD	0.29038	93.35076	37.82310	134.07813	185.57899	0.52458	169.35072	841.86297	66.69895

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.42361	0.00092	1.70744	-0.02183	0.00031	0.00245	0.04495	0.00053	0.00510
#2	10.48943	-0.00101	1.71761	-0.01828	0.00075	-0.00107	0.04347	0.00083	0.00574
Mean	**10.45652**	**-0.00004**	**1.71253**	**-0.02006**	**0.00053**	**0.00069**	**0.04421**	**0.00068**	**0.00542**
%RSD	0.44506	3219.61766	0.42014	12.50992	58.34638	360.86259	2.36990	31.08344	8.34265

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00097	-0.00063	0.00043
#2	-0.00137	0.00010	-0.00119
Mean	**-0.00117**	**-0.00027**	**-0.00038**
%RSD	24.09381	193.68109	304.77669

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:50
SampleId1 : LP100308-2MB SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 11:54:29
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE15

Final concentrations

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00032	0.06072	-0.00239	-0.00168	-0.00109	0.00015	-0.00105	0.00663	-0.00063
#2	-0.00018	0.06559	0.00293	-0.00118	-0.00101	0.00015	-0.00451	0.00192	-0.00061
Mean	**-0.00025**	**0.06315**	**0.00027**	**-0.00143**	**-0.00105**	**0.00015**	**-0.00278**	**0.00428**	**-0.00062**
%RSD	38.68502	5.45977	1392.15064	25.00956	5.65111	0.22761	87.92092	77.81993	1.96336

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00083	-0.00094	-0.00221	-0.00150	-0.35406	0.00114	-0.01010	-0.00050	-0.00130
#2	-0.00062	-0.00071	-0.00185	-0.00128	-0.36759	0.00110	-0.00878	-0.00046	-0.00111
Mean	**-0.00073**	**-0.00082**	**-0.00203**	**-0.00139**	**-0.36082**	**0.00112**	**-0.00944**	**-0.00048**	**-0.00120**
%RSD	20.52325	19.43755	12.49545	10.86862	2.65022	1.96366	9.93026	5.57656	10.62982

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.17995	-0.00127	-0.00171	-0.00261	0.00124	0.04089	-0.00211	-0.00255	-0.00196
#2	-0.18485	-0.00156	0.00286	0.00038	-0.00020	0.03656	-0.00128	-0.00737	-0.00122
Mean	**-0.18240**	**-0.00142**	**0.00057**	**-0.00112**	**0.00052**	**0.03873**	**-0.00170**	**-0.00496**	**-0.00159**
%RSD	1.89890	14.42790	560.92051	189.39353	195.22596	7.90094	34.70874	68.75406	33.09890

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.01010	-0.00125	-0.00176	-0.00034	-0.00117	-0.00057	-0.02238	-0.00050	0.00105
#2	-0.00762	0.00056	-0.00182	0.00120	-0.00083	0.00023	-0.01744	-0.00097	0.00098
Mean	**-0.00886**	**-0.00034**	**-0.00179**	**0.00043**	**-0.00100**	**-0.00017**	**-0.01991**	**-0.00074**	**0.00102**
%RSD	19.80139	373.82340	2.50880	252.54467	24.24934	338.23884	17.52467	44.98398	4.95033

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00104	-0.00005	-0.00216
#2	-0.00102	-0.00001	-0.00327
Mean	**-0.00103**	**-0.00003**	**-0.00271**
%RSD	1.71738	110.97582	28.97520

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:50
SampleId1 : IP100308-2RVS SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 11:56:14
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE16

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00175	0.16593	0.00371	0.00427	0.00420	0.00125	0.00630	0.51524	0.00134
#2	0.00229	0.16715	0.00274	0.00439	0.00423	0.00124	0.00822	0.51455	0.00120
Mean	**0.00202**	**0.16654**	**0.00322**	**0.00433**	**0.00421**	**0.00124**	**0.00726**	**0.51490**	**0.00127**
%RSD	18.82307	0.51678	21.18996	1.90691	0.46996	0.59329	18.70285	0.09469	7.58375

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00184	0.00454	0.00433	0.10663	0.38347	0.00449	0.50375	0.00453	0.00900
#2	0.00218	0.00476	0.00347	0.10642	0.38110	0.00445	0.50529	0.00460	0.00973
Mean	**0.00201**	**0.00465**	**0.00390**	**0.10653**	**0.38229**	**0.00447**	**0.50452**	**0.00457**	**0.00937**
%RSD	12.11511	3.30375	15.73885	0.14189	0.43818	0.62660	0.21684	1.17054	5.47043

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.60353	0.00451	0.10524	0.00570	0.00410	0.11445	0.00828	-0.00044	0.00584
#2	0.60037	0.00451	0.10544	0.00629	0.00267	0.11590	0.00894	0.00369	0.00142
Mean	**0.60195**	**0.00451**	**0.10534**	**0.00599**	**0.00338**	**0.11518**	**0.00861**	**0.00163**	**0.00363**
%RSD	0.37033	0.00000	0.13612	6.96458	29.81829	0.88558	5.41259	179.35092	86.17083

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02447	0.01008	0.00306	-0.00333	0.00412	0.01171	0.04269	0.00492	0.00716
#2	0.02406	0.01080	0.00306	-0.00164	0.00412	0.01022	0.04121	0.00502	0.00688
Mean	**0.02427**	**0.01044**	**0.00306**	**-0.00249**	**0.00412**	**0.01096**	**0.04195**	**0.00497**	**0.00702**
%RSD	1.19361	4.89846	0.00000	48.08743	0.09197	9.59299	2.49533	1.33449	2.86333

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00474	0.00463	0.00375
#2	0.00454	0.00388	0.00217
Mean	**0.00464**	**0.00425**	**0.00296**
%RSD	3.08916	12.55604	37.66211

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:50
SampleId1 : IP100308-2LCS **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 11:58:00
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE17

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10211	2.20741	2.15787	1.03281	2.05755	0.05012	-0.00430	41.96193	0.05151
#2	0.10213	2.19207	2.15663	1.02356	2.04473	0.04990	-0.00401	41.78028	0.05075
Mean	**0.10212**	**2.19974**	**2.15725**	**1.02819**	**2.05114**	**0.05001**	**-0.00415**	**41.87111**	**0.05113**
%RSD	0.01696	0.49319	0.04078	0.63624	0.44186	0.30492	4.83125	0.30676	1.04025

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.50412	0.19911	0.26991	1.04215	39.34716	0.53173	42.45317	0.49373	1.03968
#2	0.50251	0.19825	0.26853	1.03871	39.14637	0.52883	42.28830	0.49149	1.03680
Mean	**0.50331**	**0.19868**	**0.26922**	**1.04043**	**39.24676**	**0.53028**	**42.37073**	**0.49261**	**1.03824**
%RSD	0.22579	0.30650	0.36427	0.23371	0.36177	0.38753	0.27514	0.32187	0.19658

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	38.78146	0.52146	0.00377	0.48885	0.48104	0.01781	0.52563	2.16548	2.09011
#2	38.60271	0.52036	0.00478	0.48669	0.48068	0.01204	0.52561	2.16396	2.10397
Mean	**38.69208**	**0.52091**	**0.00427**	**0.48777**	**0.48086**	**0.01493**	**0.52562**	**2.16472**	**2.09704**
%RSD	0.32667	0.14930	16.76706	0.31300	0.05211	27.32979	0.00210	0.04973	0.46722

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.00015	0.53112	0.51277	-0.01425	0.49797	2.16083	-0.03888	0.50917	0.48322
#2	1.99291	0.52955	0.50909	-0.01225	0.49538	2.15336	-0.02407	0.50686	0.48143
Mean	**1.99653**	**0.53034**	**0.51093**	**-0.01325**	**0.49667**	**2.15710**	**-0.03148**	**0.50802**	**0.48233**
%RSD	0.25630	0.20881	0.51029	10.71111	0.36857	0.24461	33.26236	0.32177	0.26165

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00091	0.48364	2.11521
#2	-0.00070	0.48269	2.12394
Mean	**-0.00080**	**0.48316**	**2.11958**
%RSD	18.97812	0.13982	0.29141

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:50
SampleId1 : IP100308-2LCSD SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 11:59:45
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE18

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10284	2.19279	2.14166	1.02071	2.04850	0.04965	0.00003	41.44200	0.05087
#2	0.10278	2.19386	2.14264	1.02645	2.05653	0.04962	-0.00189	41.41432	0.05041
Mean	**0.10281**	**2.19333**	**2.14215**	**1.02358**	**2.05251**	**0.04964**	**-0.00093**	**41.42816**	**0.05064**
%RSD	0.03990	0.03471	0.03235	0.39640	0.27647	0.03479	146.23214	0.04723	0.64666

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49954	0.19787	0.26982	1.04290	39.13078	0.52907	41.83328	0.49035	1.03139
#2	0.49947	0.19790	0.27005	1.04505	39.28439	0.53093	41.84288	0.49027	1.03141
Mean	**0.49950**	**0.19789**	**0.26993**	**1.04397**	**39.20759**	**0.53000**	**41.83808**	**0.49031**	**1.03140**
%RSD	0.01011	0.00803	0.06060	0.14558	0.27703	0.24750	0.01623	0.01096	0.00178

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	38.56434	0.51496	0.00711	0.48787	0.48111	0.01925	0.52420	2.14112	2.13284
#2	38.75490	0.51596	0.00488	0.48392	0.47816	0.01637	0.52241	2.15710	2.10123
Mean	**38.65962**	**0.51546**	**0.00600**	**0.48589**	**0.47963**	**0.01781**	**0.52330**	**2.14911**	**2.11703**
%RSD	0.34856	0.13761	26.29001	0.57530	0.43420	11.45184	0.24148	0.52594	1.05565

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.98657	0.55780	0.50964	-0.01307	0.49424	2.13803	-0.01026	0.50684	0.53349

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#2	1.99338	0.55478	0.51084	-0.01319	0.49563	2.14484	-0.02852	0.50617	0.53213
Mean	**1.98998**	**0.55629**	**0.51024**	**-0.01313**	**0.49493**	**2.14144**	**-0.01939**	**0.50650**	**0.53281**
%RSD	0.24218	0.38380	0.16735	0.63830	0.19946	0.22481	66.59395	0.09437	0.18009

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00050	0.48336	2.13559
#2	-0.00065	0.48008	2.11984
Mean	**-0.00057**	**0.48172**	**2.12772**
%RSD	18.99444	0.48159	0.52369

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:51
SampleId1 : 1002238-1 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:01:31
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE19

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00050	0.06783	0.00111	0.06118	0.02855	0.00011	-0.00336	103.16547	-0.00070
#2	0.00056	0.07005	-0.00042	0.06102	0.02819	0.00009	-0.00095	103.19082	-0.00034
Mean	**0.00003**	**0.06894**	**0.00034**	**0.06110**	**0.02837**	**0.00010**	**-0.00215**	**103.17814**	**-0.00052**
%RSD	2844.77597	2.27661	312.99012	0.18031	0.90711	14.88322	79.10481	0.01737	48.96089

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00024	0.00902	-0.00134	0.07105	3.33768	0.01977	61.97531	0.00018	0.00737
#2	-0.00013	0.00957	-0.00128	0.07094	3.33108	0.01969	62.01280	0.00022	0.00833
Mean	**-0.00018**	**0.00929**	**-0.00131**	**0.07099**	**3.33438**	**0.01973**	**61.99406**	**0.00020**	**0.00785**
%RSD	40.59143	4.21527	3.40640	0.10644	0.13983	0.28345	0.04276	13.29138	8.62240

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	37.40271	0.00116	0.00427	-0.00124	0.00096	100.02605	0.00030	0.00310	0.00421
#2	37.37609	0.00179	0.00356	0.00156	-0.00006	99.95864	-0.00077	0.00300	0.00194
Mean	**37.38940**	**0.00148**	**0.00392**	**0.00016**	**0.00045**	**99.99234**	**-0.00024**	**0.00305**	**0.00308**
%RSD	0.05036	30.04619	12.79916	1229.93732	160.17066	0.04767	320.57928	2.29400	52.05560

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	13.75813	0.00611	2.50680	-0.02115	-0.00124	0.00532	-0.01404	0.00233	0.00283
#2	13.76583	0.00550	2.50034	-0.01793	-0.00111	0.00058	-0.00219	0.00250	0.00325
Mean	**13.76198**	**0.00580**	**2.50357**	**-0.01954**	**-0.00117**	**0.00295**	**-0.00812**	**0.00241**	**0.00304**
%RSD	0.03954	7.34228	0.18265	11.67935	7.42207	113.63088	103.17820	4.95371	9.91653

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00195	0.00022	0.00384
#2	-0.00196	0.00048	0.00230

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Mean	**-0.00195**	**0.00035**	**0.00307CH**
%RSD	0.38548	51.52117	35.58197

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:51
SampleId1 : 1002238-2 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:03:16
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE20

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01117	0.05631	0.02749	0.04307	0.02805	0.02806	-0.01117	0.07164	0.02869
#2	0.01031	0.05010	0.02615	0.04194	0.02774	0.02724	-0.01685	0.04626	0.02810
Mean	**0.01074**	**0.05320**	**0.02682**	**0.04250**	**0.02789**	**0.02765**	**-0.01401**	**0.05895**	**0.02840**
%RSD	5.66734	8.25355	3.52722	1.87924	0.78065	2.08811	28.64342	30.44801	1.46934

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02713	0.02749	0.02687	0.01292	-0.34244	0.00112	0.02481	0.02793	-0.00218
#2	0.02586	0.02640	0.02607	0.01180	-0.44351	0.00087	0.00912	0.02725	-0.00249
Mean	**0.02649**	**0.02694**	**0.02647**	**0.01236**	**-0.39298**	**0.00099**	**0.01697**	**0.02759**	**-0.00233**
%RSD	3.39362	2.84510	2.13429	6.41525	18.18760	17.69766	65.39138	1.74425	9.42128

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.18540	0.02659	0.02779	0.01638	0.03356	0.04666	-0.00670	0.01934	0.03443
#2	-0.19829	0.02635	0.02779	0.01178	0.03367	0.02502	-0.00842	0.01348	0.03244
Mean	**-0.19184**	**0.02647**	**0.02779**	**0.01408**	**0.03362**	**0.03584**	**-0.00756**	**0.01641**	**0.03344**
%RSD	4.75293	0.64479	0.00000	23.11447	0.23680	42.68416	16.06885	25.24601	4.19255

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02024	-0.00305	0.02786	0.01304	0.00035	0.02031	-0.06581	0.02764	0.03204
#2	0.01505	-0.00281	0.02707	0.00252	-0.00060	0.02553	-0.06285	0.02635	0.02884
Mean	**0.01764**	**-0.00293**	**0.02747**	**0.00778**	**-0.00012**	**0.02292**	**-0.06433**	**0.02699**	**0.03044**
%RSD	20.80073	5.83557	2.05150	95.58218	541.26178	16.10730	3.25523	3.39393	7.43064

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00268	0.02784	0.02940
#2	-0.00214	0.02638	0.02613
Mean	**-0.00241**	**0.02711**	**0.02776**
%RSD	15.67880	3.80133	8.33524

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Method : Paragon File : 100309A Printed : 3/9/2010 17:09:51
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/9/2010 12:05:03
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations:**39** **User: ROY FRENCH**

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19461	48.91967	0.49691	0.95159	0.96270	0.47471	0.50416	47.78112	0.48552
#2	0.19525	48.95672	0.49348	0.95135	0.96639	0.47543	0.50062	47.82303	0.48758
Mean	**0.19493**	**48.93820**	**0.49520**	**0.95147**	**0.96455**	**0.47507**	**0.50239**	**47.80207**	**0.48655**
%RSD	0.23232	0.05353	0.48978	0.01740	0.27047	0.10820	0.49876	0.06200	0.29801

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.47975	0.94839	0.99873	19.58886	49.61529	0.50919	48.56320	0.93801	0.94749
#2	0.48055	0.95053	1.00119	19.62481	49.63712	0.50933	48.62361	0.94000	0.95059
Mean	**0.48015**	**0.94946**	**0.99996**	**19.60684**	**49.62621**	**0.50926**	**48.59340**	**0.93901**	**0.94904**
%RSD	0.11802	0.15876	0.17427	0.12966	0.03110	0.02002	0.08791	0.14956	0.23046

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.45414	0.97767	4.76118	0.92250	0.91620	4.69234	0.48867	0.97186	0.95010
#2	48.42535	0.97944	4.76107	0.92708	0.90864	4.71694	0.48486	0.97605	0.94940
Mean	**48.43974**	**0.97855**	**4.76113**	**0.92479**	**0.91242**	**4.70464**	**0.48677**	**0.97396**	**0.94975**
%RSD	0.04201	0.12857	0.00153	0.34960	0.58524	0.36965	0.55321	0.30416	0.05269

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.56970	0.96345	0.47989	0.12386	0.46041	0.49387	4.73493	0.46741	0.94981
#2	4.57903	0.96840	0.48142	0.12087	0.46088	0.49489	4.72652	0.46866	0.94974
Mean	**4.57436**	**0.96593**	**0.48066**	**0.12236**	**0.46064**	**0.49438**	**4.73073**	**0.46803**	**0.94977**
%RSD	0.14426	0.36273	0.22478	1.72891	0.07144	0.14542	0.12572	0.18839	0.00534

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.94628	0.91830	0.95735
#2	0.94818	0.91478	0.95827
Mean	**0.94723**	**0.91654**	**0.95781**
%RSD	0.14190	0.27114	0.06815

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:52
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/9/2010 12:06:54
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00000	0.08885	0.00029	0.00131	-0.00067	0.00035	-0.00634	0.00813	-0.00056
#2	-0.00008	0.08663	-0.00097	0.00096	-0.00056	0.00032	-0.00230	0.00732	-0.00028
Mean	**-0.00004**	**0.08774**	**-0.00034**	**0.00114**	**-0.00062**	**0.00033**	**-0.00432**	**0.00772**	**-0.00042**
%RSD	145.72386	1.78763	260.26677	21.76121	12.83431	7.30941	66.11305	7.35976	46.60674

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ted: 3/9/2010 17:10:39 User: ROY FRENCH

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00028	-0.00016	-0.00155	0.00801	-0.31088	0.00129	0.00956	-0.00004	-0.00062
#2	-0.00041	-0.00038	-0.00199	0.00785	-0.32725	0.00125	0.01155	-0.00012	-0.00070
Mean	**-0.00034**	**-0.00027**	**-0.00177**	**0.00793**	**-0.31907**	**0.00127**	**0.01056**	**-0.00008**	**-0.00066**
%RSD	27.19214	58.88358	17.70623	1.42876	3.62769	2.04680	13.32053	64.87358	8.29787

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.18140	-0.00074	-0.00252	-0.00381	0.00096	0.01060	-0.00325	-0.00174	0.00013
#2	-0.18480	-0.00119	-0.00343	-0.00351	0.00204	0.01060	-0.00253	-0.00483	-0.00015
Mean	**-0.18310**	**-0.00097**	**-0.00297**	**-0.00366**	**0.00150**	**0.01060**	**-0.00289**	**-0.00329**	**-0.00001**
%RSD	1.31257	32.65345	21.69967	5.77941	51.16282	0.00000	17.53076	66.37260	1780.95660

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.01507	-0.00100	-0.00175	0.00037	-0.00088	-0.00159	-0.03176	-0.00028	-0.00037
#2	-0.01494	-0.00088	-0.00175	-0.00267	-0.00097	0.00049	-0.02090	-0.00043	-0.00030
Mean	**-0.01500**	**-0.00094**	**-0.00175**	**-0.00115**	**-0.00092**	**-0.00055**	**-0.02633**	**-0.00035**	**-0.00034**
%RSD	0.57334	9.03006	0.00000	186.56611	6.98385	266.39726	29.15340	30.26003	14.99411

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00040	-0.00063	-0.00049
#2	-0.00011	0.00019	-0.00171
Mean	**-0.00026**	**-0.00022**	**-0.00110**
%RSD	79.16637	263.25760	78.05037

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:52
SampleId1 : 1002238-3 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 12:08:46
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE21

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00020	0.06367	-0.00053	0.00268	-0.00059	0.00010	0.00049	0.25877	-0.00051
#2	0.00024	0.06686	-0.00101	0.00182	-0.00053	0.00009	-0.00566	0.25820	-0.00042
Mean	**0.00002**	**0.06527**	**-0.00077**	**0.00225**	**-0.00056**	**0.00009**	**-0.00258**	**0.25849**	**-0.00047**
%RSD	1383.73413	3.45969	44.32763	26.94001	7.05766	9.21877	168.39482	0.15714	12.70344

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00030	-0.00014	-0.00135	0.01196	-0.30495	0.00116	0.09995	-0.00012	-0.00091
#2	-0.00025	0.00033	-0.00149	0.01228	-0.30258	0.00115	0.10194	-0.00012	-0.00101
Mean	**-0.00028**	**0.00009**	**-0.00142**	**0.01212**	**-0.30377**	**0.00115**	**0.10095**	**-0.00012**	**-0.00096**
%RSD	13.45803	356.55244	6.83875	1.86927	0.55222	0.69391	1.39325	0.00000	7.63106

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	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.09137	-0.00086	0.00184	-0.00042	0.00092	0.09859	0.00056	-0.00140	-0.00143
#2	-0.09132	-0.00030	0.00356	0.00031	-0.00109	0.08849	-0.00052	-0.00260	-0.00132
Mean	**-0.09135**	**-0.00058**	**0.00270**	**-0.00005**	**-0.00009**	**0.09354**	**0.00002**	**-0.00200**	**-0.00137**
%RSD	0.03869	69.06058	45.06806	961.30133	1639.12045	7.63292	3355.44483	42.51699	5.47658

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.06358	-0.00064	0.00580	-0.00247	-0.00092	-0.00183	-0.00660	0.00040	0.01541
#2	0.06352	-0.00233	0.00576	-0.00007	-0.00079	0.00074	-0.01647	0.00051	0.01584
Mean	**0.06355**	**-0.00149**	**0.00578**	**-0.00127**	**-0.00086**	**-0.00054**	**-0.01153**	**0.00046**	**0.01562**
%RSD	0.06096	80.24210	0.51754	133.67784	10.63165	335.51501	60.52398	17.43657	1.93051

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00023	0.00047	-0.00142
#2	-0.00032	-0.00062	-0.00175
Mean	**-0.00028**	**-0.00008**	**-0.00158**
%RSD	24.30484	1023.57978	14.71905

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:52
SampleId1 : 1002238-4 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:10:32
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE22

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00021	0.07497	0.00423	0.19024	0.01973	0.00014	-0.00172	51.11386	-0.00034
#2	0.00110	0.07499	0.00523	0.19063	0.01996	0.00013	0.00271	51.26376	-0.00052
Mean	**0.00065**	**0.07498**	**0.00473**	**0.19043**	**0.01985**	**0.00014**	**0.00050**	**51.18881**	**-0.00043**
%RSD	96.79683	0.01977	15.00219	0.14467	0.79796	6.86983	630.64212	0.20707	30.67806

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00007	0.00072	-0.00121	0.01645	5.44794	0.04064	24.04160	0.00086	0.01146
#2	0.00002	0.00060	-0.00100	0.01709	5.46646	0.04083	24.12988	0.00079	0.01141
Mean	**0.00004**	**0.00066**	**-0.00110**	**0.01677**	**5.45720**	**0.04073**	**24.08574**	**0.00082**	**0.01144**
%RSD	86.00985	12.33221	13.87657	2.70266	0.24005	0.33286	0.25917	6.48129	0.32001

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	101.82791	0.00799	0.01177	0.00118	0.00006	89.71443	-0.00024	-0.00210	0.00215
#2	102.02014	0.00826	0.00975	0.00114	0.00001	90.19734	-0.00059	0.00257	0.00041
Mean	**101.92402**	**0.00813**	**0.01076**	**0.00116**	**0.00004**	**89.95589**	**-0.00041**	**0.00024**	**0.00128**
%RSD	0.13336	2.31023	13.32019	2.72758	89.03555	0.37959	60.91402	1390.95497	95.68862

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	24.36250	0.00285	1.53893	-0.01296	-0.00084	0.00266	0.00179	0.02019	0.01882
#2	24.45696	0.00008	1.54811	-0.01487	-0.00111	-0.00227	0.00278	0.02073	0.01832
Mean	**24.40973**	**0.00147**	**1.54352**	**-0.01391**	**-0.00098**	**0.00020**	**0.00228**	**0.02046**	**0.01857**
%RSD	0.27364	133.69663	0.42042	9.70403	19.80115	1758.27742	30.55155	1.88194	1.89456

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00386	0.00043	0.00073
#2	-0.00369	0.00039	0.00113
Mean	**-0.00377**	**0.00041**	**0.00093**
%RSD	3.18933	7.72446	30.10551

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:53
SampleId1 : 1002238-5 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 12:12:18
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE23

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00037	0.06779	-0.00023	0.13492	0.01668	0.00017	0.00088	26.23481	-0.00060
#2	0.00016	0.07131	-0.00168	0.13609	0.01671	0.00014	-0.00258	26.29908	-0.00035
Mean	**-0.00010**	**0.06955**	**-0.00096**	**0.13550**	**0.01670**	**0.00015**	**-0.00085**	**26.26695**	**-0.00047**
%RSD	362.64697	3.58066	107.14836	0.60989	0.11856	14.12512	286.73098	0.17300	37.49378

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00044	-0.00049	-0.00157	0.02537	1.56462	0.03164	18.21317	0.01772	0.00360
#2	-0.00033	-0.00043	-0.00164	0.02548	1.56699	0.03166	18.25469	0.01768	0.00419
Mean	**-0.00039**	**-0.00046**	**-0.00160**	**0.02542**	**1.56580**	**0.03165**	**18.23393**	**0.01770**	**0.00389**
%RSD	19.36266	9.69380	3.25861	0.29714	0.10672	0.05043	0.16101	0.15100	10.81102

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	52.85388	0.00005	0.00782	-0.00124	0.00154	39.18999	-0.00160	-0.00237	-0.00139
#2	52.83055	-0.00014	0.00610	0.00039	-0.00044	39.19738	-0.00172	-0.00660	-0.00192
Mean	**52.84222**	**-0.00004**	**0.00696**	**-0.00042**	**0.00055**	**39.19368**	**-0.00166**	**-0.00449**	**-0.00165**
%RSD	0.03121	312.27830	17.50472	273.39470	253.78368	0.01333	4.89351	66.64115	22.68723

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	6.06098	-0.00076	1.32130	-0.01129	-0.00116	-0.00414	-0.00562	0.00027	0.01221
#2	6.06690	-0.00173	1.32590	-0.00955	-0.00092	-0.00011	-0.00364	0.00046	0.01228
Mean	**6.06394**	**-0.00125**	**1.32360**	**-0.01042**	**-0.00104**	**-0.00213**	**-0.00463**	**0.00037**	**0.01225**
%RSD	0.06894	54.74325	0.24571	11.82503	16.06870	133.83484	30.13649	36.29834	0.41045

	Zr	**Pb**	**Se**
	ppm	calc	calc

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#1	-0.00119	0.00062	-0.00172	**CH**
#2	-0.00112	-0.00016	-0.00348	
Mean	**-0.00115**	**0.00023**	**-0.00260**	
%RSD	4.29659	241.67595	47.97300	

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:53
SampleId1 : 1002238-6 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:14:05
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE24

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00024	0.06604	-0.00153	0.05771	0.02010	0.00005	-0.00268	114.88234	-0.00069
#2	-0.00040	0.06280	-0.00242	0.05814	0.02032	0.00006	-0.00288	115.28525	-0.00042
Mean	**-0.00008**	**0.06442**	**-0.00198**	**0.05792**	**0.02021**	**0.00006**	**-0.00278**	**115.08379**	**-0.00056**
%RSD	575.84599	3.56095	31.87698	0.52303	0.78359	20.70500	4.95874	0.24756	33.72781

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00041	0.00109	-0.00135	0.00416	2.75144	0.02011	63.13254	-0.00035	0.00574
#2	-0.00080	0.00093	-0.00192	0.00465	2.75215	0.02022	63.47232	-0.00035	0.00564
Mean	**-0.00061**	**0.00101**	**-0.00164**	**0.00440**	**2.75180**	**0.02016**	**63.30243**	**-0.00035**	**0.00569**
%RSD	46.42323	11.44121	24.93967	7.71621	0.01817	0.38625	0.37954	0.00000	1.28604

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	34.87251	0.00353	0.01927	0.00059	0.00022	104.59011	0.00025	0.00001	0.00172
#2	35.06856	0.00314	0.03286	-0.00150	0.00080	105.53201	-0.00285	-0.00043	0.00165
Mean	**34.97053**	**0.00333**	**0.02607**	**-0.00046**	**0.00051**	**105.06106**	**-0.00130**	**-0.00021**	**0.00169**
%RSD	0.39642	8.18720	36.84542	323.36149	79.24570	0.63394	168.39009	148.14197	2.96201

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	12.99851	0.02322	2.44627	-0.02097	-0.00149	-0.00270	-0.01054	0.00203	0.00539
#2	13.09993	0.02370	2.46257	-0.02257	-0.00157	-0.00009	-0.01399	0.00143	0.00503
Mean	**13.04922**	**0.02346**	**2.45442**	**-0.02177**	**-0.00153**	**-0.00140**	**-0.01227**	**0.00173**	**0.00521**
%RSD	0.54959	1.45328	0.46953	5.19805	3.70701	132.12105	19.91555	24.52045	4.82454

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00167	0.00034	0.00115
#2	-0.00187	0.00003	0.00096
Mean	**-0.00177**	**0.00019**	**0.00106**
%RSD	8.04928	116.99365	12.90162

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Method : Paragon File : 100309A Printed : 3/9/2010 17:09:53
SampleId1 : 1002238-7 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:15:51

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE25

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01320	0.06119	0.03132	0.04299	0.02766	0.02743	-0.00645	0.05751	0.02873
#2	0.01270	0.05670	0.03083	0.04314	0.02743	0.02744	-0.00530	0.04660	0.02866
Mean	**0.01295**	**0.05894**	**0.03108**	**0.04307**	**0.02754**	**0.02744**	**-0.00587**	**0.05206**	**0.02870**
%RSD	2.70901	5.39091	1.09934	0.25581	0.57496	0.03143	13.87647	14.82107	0.16817

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02761	0.02775	0.02784	0.00352	-0.36616	0.00102	0.02503	0.02763	-0.00083
#2	0.02766	0.02778	0.02770	0.00379	-0.36545	0.00103	0.02128	0.02755	-0.00142
Mean	**0.02764**	**0.02777**	**0.02777**	**0.00366**	**-0.36581**	**0.00103**	**0.02316**	**0.02759**	**-0.00113**
%RSD	0.13530	0.06889	0.36293	5.16320	0.13759	0.39002	11.47294	0.19381	37.33174

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.18829	0.02771	0.03144	0.02533	0.02717	0.04089	-0.00354	0.02285	0.02763
#2	-0.19219	0.02825	0.03042	0.02476	0.02652	0.02358	-0.00086	0.02594	0.02699
Mean	**-0.19024**	**0.02798**	**0.03093**	**0.02505**	**0.02685**	**0.03224**	**-0.00220**	**0.02439**	**0.02731**
%RSD	1.44902	1.37227	2.31720	1.60131	1.72410	37.96703	85.94241	8.95833	1.64939

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02058	-0.00040	0.02715	-0.00241	-0.00075	0.02614	-0.01498	0.02839	0.03617
#2	0.01872	-0.00052	0.02686	-0.00071	-0.00082	0.02639	-0.01794	0.02804	0.03638
Mean	**0.01965**	**-0.00046**	**0.02700**	**-0.00156**	**-0.00078**	**0.02626**	**-0.01646**	**0.02821**	**0.03627**
%RSD	6.70943	18.40756	0.77554	77.17654	6.29085	0.67914	12.72044	0.89392	0.41578

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00051	0.02656	0.02604
#2	-0.00091	0.02593	0.02664
Mean	**-0.00071**	**0.02625**	**0.02634**
%RSD	39.87700	1.68508	1.62215

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:54
SampleId1 : 1002244-2 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:17:38
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE26

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01720	0.06234	0.03730	0.05183	0.03620	0.03541	-0.00239	0.04316	0.03775
#2	0.01638	0.06392	0.03987	0.05109	0.03614	0.03537	-0.00460	0.03994	0.03717

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	Mean	%RSD
Ag	0.01679	3.42272
Al	0.06313	1.76825
As	0.03858	4.69985
B	0.05146	1.01691
Ba	0.03617	0.10948
Be	0.03539	0.07164
Bi	-0.00349	44.80244
Ca	0.04155	5.47318
Cd	0.03746	1.09700

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03664	0.03627	0.03675	0.00742	-0.37162	0.00099	0.02106	0.03572	-0.00179
#2	0.03587	0.03587	0.03698	0.00758	-0.37423	0.00099	0.01619	0.03568	-0.00150
Mean	**0.03625**	**0.03607**	**0.03686**	**0.00750**	**-0.37292**	**0.00099**	**0.01862**	**0.03570**	**-0.00164**
%RSD	1.50025	0.78704	0.43364	1.51012	0.49486	0.60591	18.45893	0.07490	12.23660

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.20119	0.03731	0.03945	0.03501	0.03677	0.01060	-0.00310	0.03370	0.03464
#2	-0.20329	0.03592	0.03610	0.03355	0.03625	0.00195	-0.00333	0.03049	0.03694
Mean	**-0.20224**	**0.03661**	**0.03777**	**0.03428**	**0.03651**	**0.00627**	**-0.00321**	**0.03210**	**0.03579**
%RSD	0.73395	2.68046	6.26181	3.01733	0.99603	97.54792	5.09637	7.07357	4.54644

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01982	0.00237	0.03492	-0.00222	-0.00084	0.03454	-0.01548	0.03669	0.04022
#2	0.01839	0.00165	0.03483	-0.00044	-0.00088	0.03621	-0.02683	0.03635	0.04008
Mean	**0.01910**	**0.00201**	**0.03488**	**-0.00133**	**-0.00086**	**0.03538**	**-0.02115**	**0.03652**	**0.04015**
%RSD	5.30646	25.46182	0.18589	94.52404	2.64136	3.32018	37.94564	0.65425	0.25045

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00077	0.03618	0.03433
#2	-0.00085	0.03535	0.03479
Mean	**-0.00081**	**0.03577**	**0.03456**
%RSD	7.33851	1.64115	0.95275

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:54
SampleId1 : 1002244-3 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:19:24
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE27

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00025	0.06521	-0.00060	0.10367	0.04020	0.00010	-0.00144	82.46388	-0.00065
#2	-0.00015	0.06898	-0.00112	0.10671	0.04051	0.00010	-0.00268	82.98296	-0.00055
Mean	**-0.00020**	**0.06709**	**-0.00086**	**0.10519**	**0.04035**	**0.00010**	**-0.00206**	**82.72342**	**-0.00060**
%RSD	32.49727	3.97000	42.60158	2.04243	0.53967	0.45406	42.66430	0.44370	12.01455

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00049	0.00141	-0.00206	0.03194	1.81294	0.01907	54.34135	0.00014	0.00696
#2	-0.00049	0.00136	-0.00142	0.03237	1.81554	0.01920	54.69607	0.00018	0.00621
Mean	**-0.00049**	**0.00138**	**-0.00174**	**0.03215**	**1.81424**	**0.01913**	**54.51871**	**0.00016**	**0.00658**

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%RSD	0.05626	2.54277	25.81889	0.93980	0.10127	0.48020	0.46007	16.36805	8.05957

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	37.29733	0.01599	0.00356	-0.00006	0.00074	66.02124	-0.00147	-0.00142	0.00120
#2	37.53562	0.01563	0.00083	-0.00006	0.00035	66.70940	-0.00172	0.00137	0.00162
Mean	**37.41648**	**0.01581**	**0.00220**	**-0.00006**	**0.00055**	**66.36532**	**-0.00159**	**-0.00002**	**0.00141**
%RSD	0.45032	1.61890	88.09207	1.39136	49.86940	0.73322	10.82626	8291.92503	21.31616

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.16509	0.00189	1.83749	-0.01726	-0.00103	-0.00154	-0.02931	0.00087	0.00588
#2	10.26487	0.00020	1.85738	-0.02012	-0.00101	-0.00037	-0.00760	0.00078	0.00595
Mean	**10.21498**	**0.00104**	**1.84743**	**-0.01869**	**-0.00102**	**-0.00096**	**-0.01845**	**0.00083**	**0.00592**
%RSD	0.69066	114.26920	0.76147	10.84260	1.49161	86.52010	83.20056	8.01873	0.84905

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00137	0.00047	0.00033
#2	-0.00143	0.00021	0.00154
Mean	**-0.00140**	**0.00034**	**0.00093**
%RSD	3.10843	53.04240	91.91609

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:54
SampleId1 : 1002244-4 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:21:10
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE28

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00019	0.07590	0.00070	0.00178	0.00056	0.00000	-0.00287	0.65235	-0.00067
#2	-0.00069	0.07485	-0.00094	0.00194	0.00047	-0.00001	-0.00229	0.64304	-0.00083
Mean	**-0.00044**	**0.07538**	**-0.00012**	**0.00186**	**0.00052**	**0.00000**	**-0.00258**	**0.64770**	**-0.00075**
%RSD	79.61303	0.97701	961.07861	5.92410	11.49019	284.87814	15.75900	1.01641	15.00108

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00006	0.00533	-0.00019	0.07970	-0.27079	0.00106	0.18460	0.00154	-0.00109
#2	-0.00049	0.00527	-0.00055	0.07847	-0.27838	0.00107	0.17465	0.00154	-0.00057
Mean	**-0.00028**	**0.00530**	**-0.00037**	**0.07909**	**-0.27459**	**0.00107**	**0.17962**	**0.00154**	**-0.00083**
%RSD	108.37267	0.82457	68.84083	1.09878	1.95476	0.37552	3.91505	0.00000	44.10508

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.31575	0.00325	0.00721	0.00075	0.00035	0.33084	0.00003	-0.00552	-0.00340
#2	0.31240	0.00312	0.00752	-0.00023	0.00198	0.31353	0.00021	-0.00346	-0.00043
Mean	**0.31408**	**0.00318**	**0.00737**	**0.00026**	**0.00117**	**0.32218**	**0.00012**	**-0.00449**	**-0.00191**
%RSD	0.75449	2.94767	2.91904	264.61512	99.22636	3.79950	109.33851	32.39932	109.94750

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	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.22035	0.00020	0.01287	-0.00097	-0.00047	0.00054	-0.00862	0.00223	0.34552
#2	0.21662	-0.00233	0.01265	-0.00080	-0.00035	0.00409	-0.01207	0.00195	0.34395
Mean	**0.21848**	**-0.00107**	**0.01276**	**-0.00088**	**-0.00041**	**0.00232**	**-0.01034**	**0.00209**	**0.34474**
%RSD	1.20629	167.94145	1.21105	13.50920	20.30239	108.33705	23.61052	9.51759	0.32174

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00061	0.00048	-0.00411
#2	-0.00087	0.00125	-0.00144
Mean	**-0.00074**	**0.00087**	**-0.00277**
%RSD	25.30026	62.42640	68.07774

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:54
SampleId1 : 1002244-5 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 12:22:56
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE29

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00060	0.06590	0.00267	0.09916	0.02127	0.00009	0.00078	62.74194	-0.00048
#2	-0.00019	0.06757	0.00523	0.09990	0.02133	0.00009	-0.00152	62.89636	-0.00040
Mean	**-0.00040**	**0.06674**	**0.00395**	**0.09953**	**0.02130**	**0.00009**	**-0.00037**	**62.81915**	**-0.00044**
%RSD	72.86261	1.76493	45.91543	0.52584	0.18586	4.96943	434.16554	0.17382	13.09952

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00083	0.00198	-0.00221	0.01137	4.75707	0.03345	39.26316	-0.00001	0.01040
#2	-0.00067	0.00252	-0.00150	0.01164	4.75543	0.03347	39.36696	0.00011	0.01027
Mean	**-0.00075**	**0.00225**	**-0.00186**	**0.01151**	**4.75625**	**0.03346**	**39.31506**	**0.00005**	**0.01034**
%RSD	15.02699	17.16309	26.82077	1.64085	0.02444	0.02981	0.18669	160.70026	0.88515

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	68.17228	0.01946	0.00792	-0.00079	0.00056	88.08848	-0.00204	-0.00407	0.00155
#2	68.11643	0.02062	0.00954	0.00227	-0.00036	88.26501	-0.00181	0.00409	-0.00068
Mean	**68.14435**	**0.02004**	**0.00873**	**0.00074**	**0.00010**	**88.17675**	**-0.00193**	**0.00001**	**0.00043**
%RSD	0.05796	4.08849	13.12931	293.46512	636.71921	0.14156	8.48656	47683.31296	365.51232

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	21.14471	-0.00028	2.38675	-0.01682	-0.00111	-0.00177	-0.02091	0.01377	0.01392
#2	21.15063	0.00092	2.38515	-0.01704	-0.00122	0.00191	0.00525	0.01486	0.01377
Mean	**21.15267**	**0.00032**	**2.38595**	**-0.01693**	**-0.00117**	**0.00007**	**-0.00783**	**0.01431**	**0.01384**
%RSD	0.05320	265.37160	0.04733	0.92887	7.14831	3810.72389	236.20789	5.38010	0.72609

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	Zr	Pb	SeCH
	ppm	calc	calc
#1	-0.00394	0.00011	-0.00032
#2	-0.00331	0.00052	0.00091
Mean	**-0.00363**	**0.00031**	**0.00029**
%RSD	12.16726	92.88095	298.07073

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:55
SampleId1 : 1002244-6 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:24:42
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE30

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00101	0.07171	0.00081	0.14275	0.01752	0.00016	-0.00412	28.44309	-0.00030
#2	0.00030	0.07456	-0.00097	0.14271	0.01744	0.00016	0.00001	28.34036	-0.00058
Mean	**0.00066**	**0.07314**	**-0.00008**	**0.14273**	**0.01748**	**0.00016**	**-0.00205**	**28.39172**	**-0.00044**
%RSD	76.07773	2.75832	1517.08694	0.01930	0.33972	1.26128	142.37581	0.25585	44.04143

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00022	0.00108	-0.00093	0.03963	1.66670	0.03297	19.65797	0.01791	0.00585
#2	-0.00046	0.00029	-0.00157	0.03936	1.65985	0.03292	19.59556	0.01780	0.00577
Mean	**-0.00012**	**0.00068**	**-0.00125**	**0.03950**	**1.66328**	**0.03294**	**19.62676**	**0.01785**	**0.00581**
%RSD	406.64850	82.36227	36.37303	0.47817	0.29130	0.09084	0.22486	0.44917	0.94519

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	55.02451	-0.00016	0.00458	0.00319	-0.00283	42.84816	0.00055	0.00084	-0.00273
#2	54.84333	-0.00042	0.00407	0.00280	-0.00117	42.92223	0.00026	0.00175	-0.00195
Mean	**54.93392**	**-0.00029**	**0.00432**	**0.00299**	**-0.00200**	**42.88519**	**0.00040**	**0.00130**	**-0.00234**
%RSD	0.23322	61.55645	8.28530	9.19665	58.63145	0.12214	51.09412	49.77331	23.50375

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	6.73711	0.00092	1.42144	-0.01007	-0.00083	0.00030	0.01115	0.00101	0.02330
#2	6.72640	0.00044	1.42190	-0.00901	-0.00075	0.00000	0.00029	0.00089	0.02301
Mean	**6.73175**	**0.00068**	**1.42167**	**-0.00954**	**-0.00079**	**0.00015**	**0.00572**	**0.00095**	**0.02316**
%RSD	0.11243	49.97009	0.02293	7.79264	6.70593	141.97116	134.15587	8.38391	0.86828

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00100	-0.00083	-0.00154
#2	-0.00117	0.00015	-0.00072
Mean	**-0.00109**	**-0.00034**	**-0.00113**
%RSD	10.88096	204.87252	51.52368

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:55

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SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/9/2010 12:26:29
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19515	48.95381	0.49687	0.95966	0.96448	0.48360	0.49601	48.91551	0.49206
#2	0.19667	48.77981	0.49863	0.95494	0.96349	0.48329	0.50243	48.81364	0.49029
Mean	**0.19591**	**48.86681**	**0.49775**	**0.95730**	**0.96398**	**0.48344**	**0.49922**	**48.86458**	**0.49117**
%RSD	0.54883	0.25178	0.24893	0.34883	0.07230	0.04532	0.90887	0.14742	0.25466

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48767	0.96638	0.99851	19.86621	49.22451	0.50353	49.49700	0.95050	0.96260
#2	0.48665	0.96486	0.99774	19.85115	49.00547	0.50139	49.42090	0.94986	0.96340
Mean	**0.48716**	**0.96562**	**0.99813**	**19.85868**	**49.11499**	**0.50246**	**49.45895**	**0.95018**	**0.96300**
%RSD	0.14669	0.11180	0.05484	0.05363	0.31535	0.30107	0.10879	0.04833	0.05917

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.14943	0.99313	4.88351	0.93930	0.93352	4.77191	0.48671	0.98047	0.95061
#2	47.93027	0.99058	4.89372	0.93991	0.93224	4.79651	0.48619	0.97565	0.95728
Mean	**48.03985**	**0.99186**	**4.88861**	**0.93960**	**0.93288**	**4.78421**	**0.48645**	**0.97806**	**0.95394**
%RSD	0.32258	0.18208	0.14761	0.04595	0.09690	0.36352	0.07464	0.34831	0.49419

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.60130	0.98266	0.48217	0.12642	0.46491	0.50581	4.73030	0.47361	0.97505
#2	4.59245	0.98049	0.48168	0.12862	0.46462	0.50565	4.70318	0.47353	0.97311
Mean	**4.59687**	**0.98157**	**0.48193**	**0.12752**	**0.46477**	**0.50573**	**4.71674**	**0.47357**	**0.97408**
%RSD	0.13608	0.15671	0.07229	1.21934	0.04395	0.02291	0.40660	0.01166	0.14055

	Zr	Pb	Se
	ppm	calc	calc
#1	0.95436	0.93544	0.96055
#2	0.95341	0.93479	0.96340
Mean	**0.95388**	**0.93512**	**0.96197**
%RSD	0.07050	0.04910	0.20895

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:55
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/9/2010 12:28:22
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	0.00069	0.12969	0.00047	0.00159	0.00039	0.00074	-0.00171	0.05361	0.00079
#2	0.00026	0.12322	-0.00038	0.00073	0.00011	0.00070	-0.00248	0.04465	0.00022
Mean	**0.00047**	**0.12645**	**0.00005**	**0.00116**	**0.00025**	**0.00072**	**-0.00210**	**0.04913**	**0.00051**
%RSD	64.42296	3.62032	1288.00314	52.29988	78.90028	4.43256	25.84721	12.89429	78.97416

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00036	0.00094	-0.00056	0.02537	-0.23592	0.00163	0.06172	0.00082	0.00065
#2	0.00047	0.00082	-0.00034	0.02281	-0.24304	0.00159	0.04581	0.00067	0.00049
Mean	**0.00041**	**0.00088**	**-0.00045**	**0.02409**	**-0.23948**	**0.00161**	**0.05376**	**0.00075**	**0.00057**
%RSD	18.09449	9.45947	33.55764	7.52667	2.10108	1.73485	20.92771	14.27060	19.34154

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.14581	0.00022	0.00204	0.00113	0.00060	0.01493	-0.00093	0.00479	-0.00086
#2	-0.15311	0.00022	0.00012	0.00140	0.00001	0.01060	-0.00265	0.00013	0.00013
Mean	**-0.14946**	**0.00022**	**0.00108**	**0.00126**	**0.00031**	**0.01276**	**-0.00179**	**0.00246**	**-0.00036**
%RSD	3.45262	0.00000	125.88226	15.13054	136.43176	23.97173	68.27289	134.04376	192.88891

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.01102	0.00273	-0.00118	-0.00327	-0.00067	-0.00135	-0.00364	0.00048	0.00048
#2	-0.00917	0.00020	-0.00128	-0.00356	-0.00061	-0.00309	0.00179	0.00053	0.00062
Mean	**-0.01010**	**0.00147**	**-0.00123**	**-0.00342**	**-0.00064**	**-0.00222**	**-0.00093**	**0.00051**	**0.00055**
%RSD	13.01370	122.12090	6.07262	6.06853	6.52952	55.38350	413.16179	7.79644	18.16800

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00107	0.00078	0.00102
#2	0.00096	0.00047	0.00013
Mean	**0.00102**	**0.00062**	**0.00058**
%RSD	7.34850	34.31796	109.33485

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:56
SampleId1 : 1003014-1 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:30:13
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE31

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00004	0.06823	-0.00101	0.06651	0.03401	0.00019	-0.00383	86.35355	-0.00028
#2	0.00016	0.06620	0.00285	0.06718	0.03432	0.00020	-0.00066	86.55035	-0.00016
Mean	**0.00006**	**0.06722**	**0.00092**	**0.06684**	**0.03417**	**0.00020**	**-0.00225**	**86.45195**	**-0.00022**
%RSD	244.40944	2.13007	296.97247	0.70047	0.63738	4.44041	99.98439	0.16097	36.95055

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00049	0.00047	-0.00106	0.01597	5.23636	0.02269	52.83723	0.00071	0.00709

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#2	-0.00004	0.00110	-0.00070	0.01704	5.25443	0.02275	52.98843	0.00079	0.00649
Mean	**-0.00027**	**0.00078**	**-0.00088**	**0.01650**	**5.24540**	**0.02272**	**52.91283**	**0.00075**	**0.00679**
%RSD	119.07811	57.05383	28.63404	4.57732	0.24352	0.18453	0.20205	7.13530	6.19723

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	58.66679	0.02265	0.00417	-0.00020	0.00063	103.69785	-0.00063	-0.00134	0.00070
#2	58.89566	0.02199	0.01471	0.00087	0.00000	103.97731	-0.00100	0.00170	-0.00026
Mean	**58.78123**	**0.02232**	**0.00944**	**0.00033**	**0.00031**	**103.83758**	**-0.00081**	**0.00018**	**0.00022**
%RSD	0.27532	2.10242	78.92864	227.85043	142.84100	0.19030	32.12870	1210.57278	307.45096

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	14.50757	-0.00125	3.08983	-0.01594	-0.00126	-0.00256	-0.00759	0.00996	0.02948
#2	14.57034	-0.00028	3.10145	-0.01859	-0.00126	0.00274	-0.00068	0.01088	0.02913
Mean	**14.53895**	**-0.00076**	**3.09564**	**-0.01727**	**-0.00126**	**0.00009**	**-0.00413**	**0.01042**	**0.02931**
%RSD	0.30525	89.30677	0.26551	10.86718	0.00000	4069.63495	118.22242	6.24561	0.85766

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00230	0.00035	0.00002
#2	-0.00215	0.00029	0.00039
Mean	**-0.00223**	**0.00032**	**0.00021**
%RSD	4.55407	14.40350	129.33072

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:56
SampleId1 : 1003014-2 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:32:00
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE32

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00030	0.06464	0.00107	0.06581	0.03292	0.00006	-0.00326	82.89092	-0.00072
#2	-0.00043	0.06303	-0.00183	0.06585	0.03281	0.00004	-0.00287	82.82764	0.00005
Mean	**-0.00037**	**0.06384**	**-0.00038**	**0.06583**	**0.03286**	**0.00005**	**-0.00306**	**82.85928**	**-0.00033**
%RSD	25.78928	1.78560	538.76649	0.04184	0.24096	24.90311	8.83821	0.05400	160.88532

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00065	0.00091	-0.00135	0.01826	5.08643	0.02238	50.86665	0.00056	0.00683
#2	-0.00020	0.00112	-0.00084	0.01816	5.07235	0.02231	50.81292	0.00056	0.00639
Mean	**-0.00043**	**0.00102**	**-0.00110**	**0.01821**	**5.07939**	**0.02235**	**50.83978**	**0.00056**	**0.00661**
%RSD	74.19822	14.64937	33.32157	0.41478	0.19602	0.22337	0.07473	0.00000	4.70608

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	58.37497	0.02130	0.00235	-0.00110	0.00073	100.73865	-0.00165	0.00175	-0.00026
#2	58.11432	0.02115	0.00600	-0.00111	0.00186	100.62063	-0.00088	0.00115	0.00034

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Mean	**58.24464**	**0.02122**	**0.00417**	**-0.00110**	**0.00129**	**100.67964**	**-0.00126**	**0.00145**	**0.00004**
%RSD	0.31643	0.52265	61.82737	0.54441	62.00071	0.08289	43.02956	29.57806	987.35922

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	14.18497	-0.00161	3.02825	-0.01983	-0.00119	0.00093	-0.00068	0.00953	0.04641
#2	14.14481	-0.00113	3.02420	-0.01801	-0.00105	-0.00259	-0.01302	0.01000	0.04605
Mean	**14.16489**	**-0.00137**	**3.02622**	**-0.01892**	**-0.00112**	**-0.00083**	**-0.00685**	**0.00976**	**0.04623**
%RSD	0.20048	24.94334	0.09465	6.78891	8.81244	299.05061	127.40500	3.40003	0.54381

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00219	0.00012	0.00041
#2	-0.00237	0.00087	0.00061
Mean	**-0.00228**	**0.00050**	**0.00051**
%RSD	5.85770	107.56887	27.53800

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:56
SampleId1 : 1003014-3 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:33:46
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE33

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00081	0.06933	-0.00094	-0.00001	-0.00067	0.00008	-0.00181	0.27256	-0.00040
#2	-0.00040	0.06907	-0.00016	0.00089	-0.00064	0.00007	-0.00345	0.26624	-0.00049
Mean	**-0.00060**	**0.06920**	**-0.00055**	**0.00044**	**-0.00066**	**0.00007**	**-0.00263**	**0.26940**	**-0.00045**
%RSD	47.66940	0.26291	100.75929	144.63401	3.00411	1.85886	44.02358	1.65854	15.03961

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00049	0.00040	-0.00194	0.01266	-0.29760	0.00114	0.15520	-0.00001	-0.00101
#2	-0.00015	0.00027	-0.00149	0.01260	-0.30970	0.00112	0.15100	-0.00004	-0.00083
Mean	**-0.00032**	**0.00033**	**-0.00171**	**0.01263**	**-0.30365**	**0.00113**	**0.15310**	**-0.00003**	**-0.00092**
%RSD	76.76344	27.39823	18.59545	0.29903	2.81741	1.23402	1.93934	103.99358	13.91760

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.05833	-0.00055	0.00620	-0.00208	-0.00052	0.14763	-0.00171	-0.00578	-0.00114
#2	-0.06143	-0.00059	0.00164	-0.00027	-0.00043	0.13321	-0.00171	0.00174	-0.00093
Mean	**-0.05988**	**-0.00057**	**0.00392**	**-0.00117**	**-0.00048**	**0.14042**	**-0.00171**	**-0.00202**	**-0.00104**
%RSD	3.65995	4.50167	82.28014	108.76458	13.54813	7.26393	0.11915	263.25044	14.49711

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	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09343	0.00442	0.00834	-0.00042	-0.00068	0.00260	0.00377	-0.00014	0.02394
#2	0.09326	0.00189	0.00813	-0.00038	-0.00080	0.00223	-0.01647	0.00031	0.02373
Mean	**0.09335**	**0.00315**	**0.00823**	**-0.00040**	**-0.00074**	**0.00242**	**-0.00635**	**0.00008**	**0.02383**

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%RSD	0.13338	56.75877	1.75535	7.04871	10.75073	10.96131	225.30837	390.07282	0.63276

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00072	-0.00104	-0.00269
#2	-0.00083	-0.00038	-0.00004
Mean	**-0.00077**	**-0.00071**	**-0.00136**
%RSD	10.88140	66.02881	137.17503

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:57
SampleId1 : 1003014-4 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 12:35:32
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE34

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00138	0.06629	-0.00250	0.12311	0.03247	0.00018	-0.00961	133.36766	-0.00083
#2	0.00009	0.07868	0.00055	0.12358	0.03278	0.00019	-0.00046	133.35516	-0.00033
Mean	**-0.00065**	**0.07249**	**-0.00097**	**0.12335**	**0.03263**	**0.00019**	**-0.00504**	**133.36141**	**-0.00058**
%RSD	160.09795	12.08648	220.99443	0.26799	0.66746	1.20823	128.42619	0.00663	61.64363

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00137	0.01745	-0.00104	0.35023	3.22345	0.04559	74.30797	0.01383	-0.00174
#2	0.00014	0.01828	0.00031	0.35248	3.22534	0.04565	74.41291	0.01409	-0.00055
Mean	**-0.00061**	**0.01786**	**-0.00036**	**0.35135**	**3.22439**	**0.04562**	**74.36044**	**0.01396**	**-0.00114**
%RSD	173.94901	3.29839	262.01459	0.45236	0.04132	0.10049	0.09979	1.34034	73.81631

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	45.52680	0.00086	0.01796	-0.00510	0.00238	61.64042	-0.00433	-0.00934	0.00103
#2	45.54361	0.00227	0.01907	0.00179	-0.00063	61.77378	0.00061	-0.00335	-0.00063
Mean	**45.53520**	**0.00157**	**0.01851**	**-0.00166**	**0.00087**	**61.70710**	**-0.00186**	**-0.00635**	**0.00020**
%RSD	0.02610	63.69998	4.25812	294.51355	243.32434	0.15281	187.97082	66.84238	588.61950

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.74485	-0.00221	12.93311	-0.01579	-0.00122	-0.00696	-0.03643	0.00157	0.10281
#2	7.76480	0.00189	12.95776	-0.01907	-0.00139	-0.00291	0.00107	0.00276	0.10302
Mean	**7.75483**	**-0.00016**	**12.94543**	**-0.01743**	**-0.00131**	**-0.00494**	**-0.01768**	**0.00217**	**0.10291**
%RSD	0.18187	1802.69439	0.13467	13.32831	8.70740	57.93929	149.96029	38.63484	0.14664

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00155	-0.00011	-0.00242
#2	-0.00049	0.00018	-0.00154
Mean	**-0.00102**	**0.00003**	**-0.00198**
%RSD	73.64098	650.02544	31.71320

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ted: 3/9/2010 17:10:39 User: ROY FRENCH
Method : Paragon File : 100309A Printed : 3/9/2010 17:09:57
SampleId1 : 1003014-5 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 12:37:19
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE35

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00010	0.07797	0.00051	0.12179	0.04395	0.00017	-0.00547	126.50125	-0.00017
#2	0.00073	0.08177	0.00051	0.12366	0.04417	0.00017	-0.00585	126.98714	-0.00050
Mean	**0.00042**	**0.07987**	**0.00051**	**0.12272**	**0.04406**	**0.00017**	**-0.00566**	**126.74419**	**-0.00033**
%RSD	106.24301	3.36316	0.00000	1.07739	0.35945	0.43223	4.70660	0.27108	70.44641

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00003	0.02352	-0.00184	0.09632	3.14996	0.04473	72.07742	0.01371	-0.00047
#2	0.00024	0.02331	-0.00114	0.09643	3.17045	0.04494	72.41188	0.01383	0.00023
Mean	**0.00010**	**0.02341**	**-0.00149**	**0.09637**	**3.16021**	**0.04484**	**72.24465**	**0.01377**	**-0.00012**
%RSD	181.24979	0.61429	33.50148	0.07842	0.45857	0.32899	0.32736	0.58231	418.26201

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	45.19537	0.00062	0.02809	-0.00014	0.00014	20.68389	-0.00087	0.00000	-0.00173
#2	45.45311	0.00104	0.03164	0.00186	-0.00053	20.76865	0.00092	0.00306	-0.00400
Mean	**45.32424**	**0.00083**	**0.02987**	**0.00086**	**-0.00020**	**20.72627**	**0.00003**	**0.00153**	**-0.00286**
%RSD	0.40209	35.93181	8.39916	164.61261	244.69463	0.28918	4744.53124	141.51014	55.91520

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.50567	0.00092	11.93857	-0.01566	-0.00109	-0.00066	-0.02343	0.00470	0.03069
#2	7.55287	0.00153	11.96463	-0.01794	-0.00127	0.00233	-0.00024	0.00498	0.03048
Mean	**7.52927**	**0.00122**	**11.95160**	**-0.01680**	**-0.00118**	**0.00083**	**-0.01183**	**0.00484**	**0.03059**
%RSD	0.44326	34.79331	0.15421	9.60202	10.60068	253.22004	138.57313	4.11595	0.49307

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00067	0.00005	-0.00116
#2	-0.00038	0.00026	-0.00165
Mean	**-0.00053**	**0.00016**	**-0.00140**
%RSD	38.91963	97.60913	24.85698

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:57
SampleId1 : 1003014-6 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 12:39:05
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE36

Final concentrations

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00027	0.07583	-0.00202	0.12272	0.04205	0.00018	-0.00162	126.61743	-0.00041
#2	0.00024	0.07739	0.00070	0.12249	0.04210	0.00017	-0.00557	126.59663	-0.00050
Mean	**0.00026**	**0.07661**	**-0.00066**	**0.12261**	**0.04207**	**0.00018**	**-0.00360**	**126.60703**	**-0.00045**
%RSD	9.72193	1.43604	291.01998	0.13480	0.09411	3.43933	77.54536	0.01162	14.04465

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00024	0.02108	-0.00164	0.12769	3.17917	0.04469	72.10713	0.01300	-0.00013
#2	-0.00019	0.02094	-0.00200	0.12721	3.18718	0.04491	72.14337	0.01311	-0.00067
Mean	**-0.00022**	**0.02101**	**-0.00182**	**0.12745**	**3.18317**	**0.04480**	**72.12525**	**0.01305**	**-0.00040**
%RSD	17.53994	0.46981	14.05894	0.26688	0.17791	0.34262	0.03553	0.61435	95.40399

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	45.21954	0.00144	0.02779	0.00205	0.00020	21.38551	0.00118	-0.00569	-0.00226
#2	45.38654	0.00116	0.02363	0.00031	-0.00098	21.52587	-0.00037	0.00158	-0.00215
Mean	**45.30304**	**0.00130**	**0.02571**	**0.00118**	**-0.00039**	**21.45569**	**0.00041**	**-0.00205**	**-0.00221**
%RSD	0.26066	15.07595	11.42917	103.82333	215.41210	0.46258	269.84888	250.44550	3.40238

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.42178	0.00020	11.90538	-0.01820	-0.00117	0.00138	-0.01013	0.00384	0.04050
#2	7.44992	-0.00052	11.92878	-0.02033	-0.00150	-0.00162	-0.01112	0.00352	0.03986
Mean	**7.43585**	**-0.00016**	**11.91708**	**-0.01927**	**-0.00134**	**-0.00012**	**-0.01062**	**0.00368**	**0.04018**
%RSD	0.26759	317.99952	0.13884	7.81791	17.56275	1779.35723	6.56767	6.13376	1.12601

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00069	0.00082	-0.00340
#2	-0.00067	-0.00055	-0.00091
Mean	**-0.00068**	**0.00013**	**-0.00215**
%RSD	2.22939	718.08707	81.77891

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:58
SampleId1 : 1003014-7 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 12:40:53
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE37

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00012	0.07088	0.00070	0.05798	0.03639	0.00012	-0.00345	105.04362	-0.00024
#2	0.00013	0.07041	-0.00116	0.05713	0.03614	0.00010	0.00021	104.08926	-0.00028
Mean	**0.00000**	**0.07064**	**-0.00023**	**0.05755**	**0.03627**	**0.00011**	**-0.00162**	**104.56644**	**-0.00026**
%RSD	3828.53578	0.47314	566.84137	1.05278	0.49131	15.71585	159.39198	0.64536	11.13202

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00054	0.00033	-0.00135	0.01111	3.41773	0.02205	65.83203	0.00646	0.00621
#2	0.00017	0.00052	-0.00114	0.01116	3.39066	0.02187	65.22714	0.00649	0.00618
Mean	**-0.00019**	**0.00042**	**-0.00124**	**0.01113**	**3.40420**	**0.02196**	**65.52958**	**0.00648**	**0.00620**
%RSD	272.93740	31.52480	12.09349	0.33919	0.56244	0.58197	0.65271	0.41276	0.29533

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	36.42636	0.03354	0.00164	-0.00091	0.00016	103.02243	-0.00111	0.00186	0.00041
#2	36.12453	0.03302	0.00802	0.00052	-0.00047	102.00671	0.00258	0.00197	-0.00309
Mean	**36.27544**	**0.03328**	**0.00483**	**-0.00020**	**-0.00015**	**102.51457**	**0.00074**	**0.00191**	**-0.00134**
%RSD	0.58835	1.10256	93.44539	511.42611	291.89123	0.70060	354.93948	4.18471	185.13196

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	13.18454	-0.00149	2.50200	-0.01881	-0.00136	0.00118	-0.00660	0.00235	0.04541
#2	13.04969	-0.00064	2.47615	-0.02206	-0.00127	-0.00037	-0.00067	0.00295	0.04477
Mean	**13.11711**	**-0.00106**	**2.48908**	**-0.02044**	**-0.00131**	**0.00041**	**-0.00363**	**0.00265**	**0.04509**
%RSD	0.72691	56.02552	0.73416	11.23830	4.90400	271.38488	115.20501	16.01008	1.00354

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00204	-0.00020	0.00089
#2	-0.00138	-0.00014	-0.00140
Mean	**-0.00171**	**-0.00017**	**-0.00026**
%RSD	27.39703	23.24007	637.44156

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:58
SampleId1 : 1003014-8 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:42:41
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE38

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00031	0.07377	0.00222	0.05510	0.03057	0.00011	-0.00335	104.16141	-0.00044
#2	-0.00037	0.07843	-0.00083	0.05483	0.03099	0.00014	-0.00335	104.83880	-0.00050
Mean	**-0.00003**	**0.07610**	**0.00070**	**0.05496**	**0.03078**	**0.00013**	**-0.00335**	**104.50011**	**-0.00047**
%RSD	1671.98918	4.32402	309.02974	0.35076	0.96480	12.89801	0.01179	0.45836	9.01482

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00005	0.00064	-0.00193	0.01506	3.23641	0.02158	66.57365	0.00290	0.00595
#2	-0.00026	0.00071	-0.00171	0.01522	3.27362	0.02183	67.08411	0.00283	0.00548
Mean	**-0.00015**	**0.00068**	**-0.00182**	**0.01514**	**3.25501**	**0.02170**	**66.82888**	**0.00287**	**0.00572**
%RSD	97.43827	6.81415	8.52447	0.74836	0.80840	0.81884	0.54010	1.86525	5.76100

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	36.74437	0.04199	0.00762	0.00079	0.00060	104.55939	-0.00296	-0.00416	-0.00054
#2	37.18469	0.04294	0.01015	-0.00040	-0.00099	105.44902	-0.00231	0.00452	-0.00090
Mean	**36.96453**	**0.04246**	**0.00889**	**0.00019**	**-0.00020**	**105.00420**	**-0.00264**	**0.00018**	**-0.00072**
%RSD	0.84230	1.58758	20.16356	433.74288	575.15960	0.59908	17.44635	3473.96723	34.83308

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	13.83984	-0.00076	2.52552	-0.01848	-0.00127	-0.00005	-0.00413	0.00348	0.04036
#2	14.00437	0.00165	2.55166	-0.02175	-0.00147	-0.00168	-0.00709	0.00331	0.03994
Mean	**13.92210**	**0.00044**	**2.53859**	**-0.02011**	**-0.00137**	**-0.00086**	**-0.00561**	**0.00340**	**0.04015**
%RSD	0.83563	385.71259	0.72804	11.49212	10.25505	133.49648	37.31291	3.51777	0.75134

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00206	0.00066	-0.00175
#2	-0.00199	-0.00079	0.00091
Mean	**-0.00202**	**-0.00007**	**-0.00042**
%RSD	2.66255	1579.65087	446.57131

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:58
SampleId1 : IP100308-3MB SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 12:44:28
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE39

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00199	0.07305	-0.00320	-0.00278	-0.00106	0.00017	-0.00817	0.03477	-0.00087
#2	0.00056	0.08563	-0.00075	-0.00091	-0.00090	0.00016	-0.00191	0.02765	-0.00043
Mean	**-0.00072**	**0.07934**	**-0.00198**	**-0.00184**	**-0.00098**	**0.00016**	**-0.00504**	**0.03121**	**-0.00065**
%RSD	251.54339	11.21361	87.66190	71.82469	12.10866	3.41958	87.78941	16.13273	48.72830

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00121	-0.00079	-0.00278	0.07404	-0.34932	0.00103	-0.00171	0.00018	-0.00192
#2	-0.00025	0.00029	-0.00142	0.07505	-0.34955	0.00104	0.00338	0.00041	-0.00137
Mean	**-0.00073**	**-0.00025**	**-0.00210**	**0.07454**	**-0.34944**	**0.00103**	**0.00083**	**0.00030**	**-0.00164**
%RSD	92.59593	306.60738	45.81033	0.96297	0.04801	0.38682	430.74376	54.25346	23.36079

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.18839	-0.00181	0.01775	-0.00886	0.00470	0.03079	-0.00325	-0.01276	0.00294
#2	-0.19144	-0.00042	0.03083	-0.00007	-0.00063	0.03079	0.00246	-0.00487	-0.00060
Mean	**-0.18992**	**-0.00111**	**0.02429**	**-0.00446**	**0.00204**	**0.03079**	**-0.00040**	**-0.00882**	**0.00117**
%RSD	1.13514	88.27028	38.06040	139.24462	184.83815	0.00000	1018.61200	63.23499	214.50950

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00497	-0.00076	-0.00078	0.00042	-0.00059	-0.00494	-0.03329	-0.00148	0.00112

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#2	-0.00051	0.00249	-0.00099	0.00020	-0.00074	-0.00044	-0.01157	-0.00032	0.00141
Mean	**-0.00274**	**0.00086**	**-0.00089**	**0.00031**	**-0.00067**	**-0.00269**	**-0.02243**	**-0.00090**	**0.00126**
%RSD	115.08242	266.65826	17.44397	51.19726	16.52077	118.41270	68.44839	91.33036	15.90433

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00131	0.00019	-0.00229
#2	-0.00049	-0.00044	-0.00203
Mean	**-0.00090**	**-0.00013**	**-0.00216**
%RSD	64.62140	348.66575	8.68310

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:59
SampleId1 : IP100308-3RVS **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:46:15
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE40

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00229	0.18246	0.00430	0.00314	0.00397	0.00115	0.00610	0.49777	0.00152
#2	0.00127	0.18367	0.00311	0.00287	0.00395	0.00118	0.00379	0.49823	0.00158
Mean	**0.00178**	**0.18307**	**0.00371**	**0.00301**	**0.00396**	**0.00116**	**0.00495**	**0.49800**	**0.00155**
%RSD	40.80246	0.46751	22.68153	6.40791	0.49986	1.76223	33.01477	0.06527	2.82625

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00158	0.00475	0.00325	0.15752	0.32590	0.00405	0.48253	0.00479	0.00919
#2	0.00147	0.00477	0.00377	0.15816	0.30600	0.00402	0.47766	0.00483	0.00802
Mean	**0.00152**	**0.00476**	**0.00351**	**0.15784**	**0.31595**	**0.00403**	**0.48010**	**0.00481**	**0.00860**
%RSD	4.92004	0.29478	10.41838	0.28738	4.45406	0.59512	0.71618	0.55539	9.57192

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.57550	0.00515	0.12714	0.00416	0.00418	0.09138	0.01054	0.00086	0.00210
#2	0.58246	0.00475	0.12288	0.00493	0.00470	0.09570	0.00863	0.00080	0.00532
Mean	**0.57898**	**0.00495**	**0.12501**	**0.00455**	**0.00444**	**0.09354**	**0.00959**	**0.00083**	**0.00371**
%RSD	0.84946	5.69310	2.40883	11.90414	8.31149	3.27125	14.13455	5.55382	61.40630

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02303	0.01273	0.00309	0.00078	0.00384	0.00736	0.03574	0.00471	0.01185
#2	0.02450	0.01152	0.00309	-0.00111	0.00375	0.00688	0.02242	0.00456	0.01164
Mean	**0.02377**	**0.01212**	**0.00309**	**-0.00016**	**0.00380**	**0.00712**	**0.02908**	**0.00463**	**0.01175**
%RSD	4.38581	7.02718	0.00000	812.14332	1.79676	4.75355	32.39736	2.28973	1.28351

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00425	0.00417	0.00169
#2	0.00438	0.00478	0.00381

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Mean	**0.00432**	**0.00447**	**0.00275CH**
%RSD	1.97741	9.52720	54.69216

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:59
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/9/2010 12:48:02
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.20032	49.97030	0.51350	0.98312	0.98118	0.49113	0.52651	49.88517	0.50577
#2	0.20064	50.32180	0.51887	0.99288	0.99155	0.49481	0.52942	50.14890	0.50961
Mean	**0.20048**	**50.14605**	**0.51619**	**0.98800**	**0.98636**	**0.49297**	**0.52797**	**50.01704**	**0.50769**
%RSD	0.11270	0.49564	0.73554	0.69838	0.74309	0.52824	0.39012	0.37284	0.53461

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49879	0.98326	1.02653	20.23450	50.09546	0.51370	50.46146	0.96387	0.98051
#2	0.50239	0.98973	1.03635	20.37831	50.36765	0.51723	50.76994	0.97068	0.99109
Mean	**0.50059**	**0.98649**	**1.03144**	**20.30640**	**50.23156**	**0.51547**	**50.61570**	**0.96728**	**0.98580**
%RSD	0.50785	0.46339	0.67338	0.50077	0.38317	0.48490	0.43095	0.49715	0.75896

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.67444	1.03335	4.99919	0.95984	0.94458	4.86885	0.50354	1.00596	0.98252
#2	48.87978	1.04297	5.04044	0.96565	0.94297	4.94264	0.50786	1.02270	0.98618
Mean	**48.77711**	**1.03816**	**5.01982**	**0.96274**	**0.94378**	**4.90575**	**0.50570**	**1.01433**	**0.98435**
%RSD	0.29767	0.65553	0.58108	0.42671	0.12000	1.06362	0.60293	1.16715	0.26292

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.65826	1.01288	0.49077	0.13322	0.46730	0.51820	4.77396	0.48217	0.98509
#2	4.69385	1.01819	0.49534	0.13488	0.47069	0.52584	4.78521	0.48661	0.99226
Mean	**4.67605**	**1.01553**	**0.49305**	**0.13405**	**0.46899**	**0.52202**	**4.77958**	**0.48439**	**0.98867**
%RSD	0.53817	0.37007	0.65555	0.87654	0.51135	1.03573	0.16641	0.64860	0.51294

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.97518	0.94966	0.99032
#2	0.98268	0.95053	0.99834
Mean	**0.97893**	**0.95009**	**0.99433**
%RSD	0.54229	0.06448	0.57009

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:59
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/9/2010 12:51:06
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

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Final concentrations:**39** **User: ROY FRENCH**

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00008	0.08582	0.00051	-0.00071	-0.00028	0.00047	0.00049	0.02283	-0.00008
#2	0.00023	0.08844	-0.00120	-0.00044	-0.00028	0.00046	-0.00133	0.01904	-0.00011
Mean	**0.00007**	**0.08713**	**-0.00034**	**-0.00057**	**-0.00028**	**0.00046**	**-0.00042**	**0.02093**	**-0.00009**
%RSD	304.00876	2.12769	352.12679	33.54521	0.00000	1.62439	308.92819	12.80342	24.88994

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00009	0.00049	-0.00040	0.01372	-0.29641	0.00137	0.03122	0.00026	0.00044
#2	0.00007	0.00026	-0.00041	0.01282	-0.32037	0.00130	0.02813	0.00011	-0.00034
Mean	**0.00008**	**0.00037**	**-0.00041**	**0.01327**	**-0.30839**	**0.00133**	**0.02967**	**0.00018**	**0.00005**
%RSD	23.33628	42.55899	1.99693	4.83800	5.49380	3.59840	7.37254	58.68053	1096.04678

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.17670	-0.00036	0.00002	0.00052	-0.00117	0.00195	-0.00229	-0.00303	-0.00196
#2	-0.18020	-0.00002	0.00012	0.00011	-0.00087	0.00627	0.00092	-0.00340	0.00073
Mean	**-0.17845**	**-0.00019**	**0.00007**	**0.00031**	**-0.00102**	**0.00411**	**-0.00069**	**-0.00322**	**-0.00061**
%RSD	1.38638	126.73009	105.11495	93.20410	21.29107	74.45083	330.92596	8.08644	310.54766

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00651	0.00056	-0.00152	0.00365	-0.00039	0.00136	-0.01548	0.00012	0.00041
#2	-0.00336	-0.00016	-0.00154	0.00301	-0.00047	-0.00026	-0.00067	0.00044	0.00041
Mean	**-0.00494**	**0.00020**	**-0.00153**	**0.00333**	**-0.00043**	**0.00055**	**-0.00808**	**0.00028**	**0.00041**
%RSD	45.20135	255.88984	1.30244	13.52138	13.23786	209.13037	129.60489	80.86481	0.00000

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00001	-0.00061	-0.00231
#2	-0.00002	-0.00054	-0.00064
Mean	**-0.00001**	**-0.00058**	**-0.00148**
%RSD	271.90803	8.30764	79.87310

Method : Paragon File : 100309A Printed : 3/9/2010 17:09:59
SampleId1 : IP100308-3LCS **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:52:58
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE41

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09970	2.08595	2.03735	0.95545	2.01173	0.04820	0.00021	40.85646	0.04857
#2	0.09904	2.09928	2.04677	0.95927	2.02227	0.04833	-0.00547	40.92175	0.04869
Mean	**0.09937**	**2.09261**	**2.04206**	**0.95736**	**2.01700**	**0.04827**	**-0.00263**	**40.88910**	**0.04863**
%RSD	0.47268	0.45042	0.32612	0.28251	0.36973	0.18921	152.53354	0.11292	0.16643

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	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49202	0.19658	0.26410	1.07030	37.83792	0.50158	41.34056	0.48590	1.01646
#2	0.49336	0.19625	0.26434	1.07224	38.04680	0.50441	41.39037	0.48674	1.01818
Mean	**0.49269**	**0.19641**	**0.26422**	**1.07127**	**37.94236**	**0.50300**	**41.36546**	**0.48632**	**1.01732**
%RSD	0.19246	0.12001	0.06222	0.12770	0.38928	0.39868	0.08514	0.12156	0.11928

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	37.06100	0.49766	0.02465	0.47570	0.47477	0.00050	0.49317	1.96328	1.94386
#2	37.25470	0.49815	0.02982	0.47459	0.47494	-0.00094	0.49706	1.96529	1.93703
Mean	**37.15785**	**0.49791**	**0.02723**	**0.47515**	**0.47485**	**-0.00022**	**0.49511**	**1.96428**	**1.94045**
%RSD	0.36861	0.06865	13.42308	0.16472	0.02492	469.19400	0.55556	0.07234	0.24887

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.78369	0.51664	0.49962	-0.01154	0.49422	2.06431	-0.01719	0.50027	0.47558
#2	1.79197	0.51978	0.50186	-0.01193	0.49544	2.07446	-0.03693	0.50117	0.47679
Mean	**1.78783**	**0.51821**	**0.50074**	**-0.01174**	**0.49483**	**2.06939**	**-0.02706**	**0.50072**	**0.47619**
%RSD	0.32741	0.42801	0.31676	2.32982	0.17427	0.34657	51.59065	0.12741	0.18020

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00056	0.47508	1.95033
#2	-0.00053	0.47482	1.94644
Mean	**-0.00055**	**0.47495**	**1.94839**
%RSD	3.91828	0.03826	0.14103

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:00
SampleId1 : 1003039-1 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 12:54:45
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE42

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00020	85.09516	-0.00205	0.39480	0.29833	0.00156	0.00442	95.07479	-0.00024
#2	0.00036	85.05811	-0.00328	0.39589	0.29785	0.00155	0.00779	95.21989	-0.00009
Mean	**0.00008**	**85.07663**	**-0.00267**	**0.39534**	**0.29809**	**0.00155**	**0.00610**	**95.14734**	**-0.00016**
%RSD	483.45086	0.03079	32.52745	0.19521	0.11309	0.36004	38.97083	0.10784	65.79763

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10582	0.08640	0.66735	219.25849	1.34834	0.06753	92.81009	1.99071	-0.00086
#2	0.10615	0.08769	0.66712	219.47489	1.35567	0.06747	92.90397	1.99168	-0.00039
Mean	**0.10599**	**0.08705**	**0.66723**	**219.36669**	**1.35200**	**0.06750**	**92.85703**	**1.99120**	**-0.00062**
%RSD	0.21496	1.05020	0.02396	0.06976	0.38332	0.06485	0.07149	0.03430	52.89061

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	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	9.59193	0.22169	2.46660	0.01207	0.01643	0.65259	0.00455	-0.00173	0.00669
#2	9.58459	0.22189	2.47907	0.01666	0.01534	0.66558	0.00919	0.00267	0.00896
Mean	**9.58826**	**0.22179**	**2.47283**	**0.01436**	**0.01589**	**0.65908**	**0.00687**	**0.00047**	**0.00782**
%RSD	0.05408	0.06545	0.35664	22.57464	4.83064	1.39331	47.73023	666.61463	20.43751

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.91582	0.01238	0.25456	-0.00577	10.24463	-0.01179	0.03312	0.35081	0.17632
#2	4.94687	0.01227	0.25433	-0.00502	10.24251	-0.01066	0.04481	0.34920	0.17682
Mean	**4.93134**	**0.01233**	**0.25444**	**-0.00540**	**10.24357**	**-0.01122**	**0.03897**	**0.35000**	**0.17657**
%RSD	0.44515	0.67728	0.06508	9.75408	0.01459	7.16026	21.22391	0.32547	0.19957

	Zr	Pb	Se
	ppm	calc	calc
#1	0.10335	0.01498	0.00389
#2	0.10378	0.01578	0.00686
Mean	**0.10356**	**0.01538**	**0.00537**
%RSD	0.29218	3.69315	39.13696

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:00
SampleId1 : 1003039-1D **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 12:56:32
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE43

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00038	94.76712	-0.00242	0.37363	0.26440	0.00146	0.00182	108.64414	0.00040
#2	-0.00008	95.26310	-0.00216	0.37539	0.26631	0.00147	0.00430	108.93555	0.00031
Mean	**0.00015**	**95.01511**	**-0.00229**	**0.37451**	**0.26535**	**0.00146**	**0.00306**	**108.78984**	**0.00035**
%RSD	216.79797	0.36911	8.01737	0.33117	0.50807	0.25980	57.37116	0.18941	18.25323

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10741	0.09203	0.67992	222.37764	1.19393	0.06392	92.63455	2.21956	0.00015
#2	0.10762	0.09248	0.68275	222.91213	1.20906	0.06428	93.03722	2.22885	-0.00042
Mean	**0.10752**	**0.09226**	**0.68133**	**222.64488**	**1.20149**	**0.06410**	**92.83589**	**2.22421**	**-0.00013**
%RSD	0.13719	0.34624	0.29368	0.16975	0.89078	0.40054	0.30671	0.29552	307.15977

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	8.86893	0.21821	2.45290	0.01434	0.01667	0.55303	0.00885	0.00223	0.00780
#2	8.92868	0.22083	2.47427	0.01645	0.01594	0.56168	0.00723	-0.00408	0.00481
Mean	**8.89881**	**0.21952**	**2.46358**	**0.01540**	**0.01630**	**0.55736**	**0.00804**	**-0.00093**	**0.00630**
%RSD	0.47474	0.84403	0.61324	9.71920	3.16724	1.09833	14.22739	481.92667	33.61812

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.12612	0.01211	0.25560	-0.00363	10.37518	-0.01183	0.05369	0.40558	0.21669
#2	4.15533	0.01026	0.25690	-0.00509	10.41601	-0.00857	0.04247	0.40749	0.21769
Mean	**4.14073**	**0.01118**	**0.25625**	**-0.00436**	**10.39560**	**-0.01020**	**0.04808**	**0.40654**	**0.21719**
%RSD	0.49876	11.72886	0.36031	23.70107	0.27772	22.60395	16.49999	0.33168	0.32460

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.10698	0.01589	0.00595
#2	0.10787	0.01611	0.00185
Mean	**0.10742**	**0.01600**	**0.00390**
%RSD	0.58505	0.96140	74.37922

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:00
SampleId1 : 1003039-1L 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 12:58:19
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE44

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00043	16.78170	0.00085	0.07937	0.05868	0.00025	-0.00178	19.08309	-0.00032
#2	-0.00038	16.86081	0.00040	0.08030	0.05924	0.00024	-0.00435	19.11596	-0.00059
Mean	**0.00002**	**16.82125**	**0.00062**	**0.07983**	**0.05896**	**0.00024**	**-0.00306**	**19.09952**	**-0.00045**
%RSD	2550.65583	0.33258	50.62020	0.82801	0.67166	2.53874	59.43757	0.12170	41.34430

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02118	0.01773	0.13000	40.58407	-0.09363	0.01210	18.43831	0.41016	-0.00127
#2	0.02160	0.01717	0.13089	40.75990	-0.11046	0.01211	18.47762	0.41183	-0.00111
Mean	**0.02139**	**0.01745**	**0.13044**	**40.67199**	**-0.10205**	**0.01210**	**18.45797**	**0.41099**	**-0.00119**
%RSD	1.40471	2.28185	0.47895	0.30568	11.66630	0.06604	0.15056	0.28744	9.21018

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.51508	0.04551	0.50124	0.00314	0.00364	0.14330	0.00061	-0.00457	-0.00208
#2	1.52410	0.04578	0.50154	0.00123	0.00423	0.13321	-0.00057	-0.00708	0.00410
Mean	**1.51959**	**0.04564**	**0.50139**	**0.00219**	**0.00393**	**0.13826**	**0.00002**	**-0.00582**	**0.00101**
%RSD	0.41975	0.41131	0.04296	61.70167	10.46809	5.16432	4224.50379	30.49462	433.01360

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.00864	0.00246	0.04934	-0.00285	2.09337	-0.00171	0.00822	0.07030	0.03723
#2	1.01482	0.00365	0.04984	-0.00237	2.10609	-0.00082	-0.01065	0.07086	0.03695
Mean	**1.01173**	**0.00306**	**0.04959**	**-0.00261**	**2.09973**	**-0.00127**	**-0.00122**	**0.07058**	**0.03709**
%RSD	0.43174	27.51276	0.71440	12.94013	0.42851	50.05730	1095.00508	0.56087	0.54216

	Zr	**Pb**	**Se**
	ppm	calc	calc

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#1	0.02068	0.00348	-0.00291	**CH**
#2	0.02080	0.00323	0.00038	
Mean	**0.02074**	**0.00335**	**-0.00127**	
%RSD	0.41314	5.20529	183.67656	

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:01
SampleId1 : 1003039-1MS SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:00:05
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE45

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09689	119.84904	1.89988	1.56609	2.29178	0.04735	0.00040	251.16602	0.04713
#2	0.09662	119.49715	1.89631	1.56296	2.28659	0.04730	0.00360	250.56003	0.04720
Mean	**0.09676**	**119.67309**	**1.89809**	**1.56453**	**2.28919**	**0.04732**	**0.00200**	**250.86303**	**0.04716**
%RSD	0.19879	0.20792	0.13320	0.14131	0.16053	0.07241	113.34981	0.17081	0.11722

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.59851	0.54914	1.02091	274.98115	43.92026	0.65142	158.39083	4.00138	0.93938
#2	0.59752	0.54779	1.01681	274.42947	43.84382	0.64984	158.03092	3.99665	0.93853
Mean	**0.59802**	**0.54846**	**1.01886**	**274.70531**	**43.88204**	**0.65063**	**158.21087**	**3.99901**	**0.93896**
%RSD	0.11676	0.17454	0.28506	0.14200	0.12318	0.17083	0.16086	0.08373	0.06459

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	51.51525	0.74913	2.96775	0.45466	0.45266	0.62662	0.32582	1.81612	1.81133
#2	51.40706	0.74515	2.95700	0.45546	0.45151	0.62950	0.32792	1.81720	1.80661
Mean	**51.46116**	**0.74714**	**2.96237**	**0.45506**	**0.45209**	**0.62806**	**0.32687**	**1.81666**	**1.80897**
%RSD	0.14866	0.37660	0.25666	0.12414	0.17952	0.32491	0.45247	0.04216	0.18427

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	6.85465	0.49710	0.89154	0.00024	11.79345	1.89969	0.09042	0.99014	0.70654
#2	6.85651	0.49279	0.88882	-0.00199	11.76643	1.89888	0.07352	0.98772	0.70360
Mean	**6.85558**	**0.49494**	**0.89018**	**-0.00087**	**11.77994**	**1.89928**	**0.08197**	**0.98893**	**0.70507**
%RSD	0.01915	0.61626	0.21617	180.23176	0.16219	0.03020	14.57517	0.17300	0.29414

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.13337	0.45333	1.81292
#2	0.13295	0.45283	1.81014
Mean	**0.13316**	**0.45308**	**1.81153**
%RSD	0.22226	0.07796	0.10865

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:01
SampleId1 : 1003039-1MSD SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:01:51

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Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE46

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09815	84.03475	1.93432	1.22475	2.22267	0.04747	-0.00072	137.92181	0.04787
#2	0.09783	84.07825	1.94727	1.23096	2.22813	0.04756	-0.00011	137.87436	0.04721
Mean	**0.09799**	**84.05650**	**1.94080**	**1.22786**	**2.22540**	**0.04752**	**-0.00041**	**137.89809**	**0.04754**
%RSD	0.23015	0.03660	0.47183	0.35759	0.17318	0.13766	104.52344	0.02433	0.98377

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.55619	0.28206	0.80375	186.29130	42.31160	0.60599	121.48026	2.39145	0.96200
#2	0.55605	0.28150	0.80600	186.36049	42.29052	0.60594	121.57207	2.39591	0.96145
Mean	**0.55612**	**0.28178**	**0.80487**	**186.32589**	**42.30106**	**0.60596**	**121.52617**	**2.39368**	**0.96173**
%RSD	0.01703	0.13989	0.19733	0.02626	0.03524	0.00630	0.05342	0.13182	0.04014

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	47.97388	0.66207	2.08023	0.46501	0.46101	0.55880	0.33974	1.86143	1.84196
#2	47.94638	0.66214	2.08564	0.46339	0.46650	0.54148	0.33569	1.86904	1.85684
Mean	**47.96013**	**0.66211**	**2.08293**	**0.46420**	**0.46376**	**0.55014**	**0.33772**	**1.86524**	**1.84940**
%RSD	0.04054	0.00775	0.18369	0.24616	0.83694	2.22546	0.84787	0.28818	0.56887

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.82539	0.50761	0.70957	-0.00263	9.71308	1.94616	0.04175	0.78603	0.60443
#2	5.83060	0.50674	0.71079	-0.00217	9.72983	1.96188	0.03627	0.78594	0.60565
Mean	**5.82800**	**0.50717**	**0.71018**	**-0.00240**	**9.72145**	**1.95402**	**0.03901**	**0.78599**	**0.60504**
%RSD	0.06317	0.12051	0.12160	13.39411	0.12183	0.56875	9.92432	0.00894	0.14199

	Zr	Pb	Se
	ppm	calc	calc
#1	0.10350	0.46234	1.84845
#2	0.10392	0.46547	1.86090
Mean	**0.10371**	**0.46391**	**1.85468**
%RSD	0.28743	0.47604	0.47487

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:01
SampleId1 : 1003055-3 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 13:03:38
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE47

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00002	54.96770	0.04027	0.02550	0.38619	0.00326	0.00127	8.78506	0.00253
#2	-0.00084	55.05669	0.03782	0.02464	0.38726	0.00324	0.00398	8.75953	0.00250

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Mean	**-0.00041**	**55.01220**	**0.03905**	**0.02507**	**0.38672**	**0.00325**	**0.00262**	**8.77230**	**0.00252**
%RSD	149.91713	0.11438	4.44204	2.41661	0.19497	0.58732	72.98043	0.20576	0.78431

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.04085	0.08982	0.24782	121.16554	3.66113	0.07771	15.96574	1.89236	0.00497
#2	0.04083	0.08983	0.24810	121.14244	3.65383	0.07769	15.96974	1.89337	0.00442
Mean	**0.04084**	**0.08983**	**0.24796**	**121.15399**	**3.65748**	**0.07770**	**15.96774**	**1.89287**	**0.00470**
%RSD	0.02037	0.01342	0.07908	0.01348	0.14104	0.01535	0.01769	0.03748	8.18440

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.31560	0.10014	3.78395	0.49115	0.49354	1.90992	0.00689	-0.00155	0.00671
#2	0.30745	0.10013	3.79237	0.49092	0.48938	1.92436	0.00736	-0.00132	0.00802
Mean	**0.31153**	**0.10013**	**3.78816**	**0.49104**	**0.49146**	**1.91714**	**0.00712**	**-0.00143**	**0.00736**
%RSD	1.85058	0.00852	0.15719	0.03438	0.59865	0.53265	4.68248	11.34307	12.53428

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	6.85772	0.03306	0.04173	0.01656	1.38334	-0.00055	0.07178	0.14450	0.54927
#2	6.88149	0.03293	0.04171	0.01470	1.38964	0.00127	0.08759	0.14491	0.54792
Mean	**6.86961**	**0.03299**	**0.04172**	**0.01563**	**1.38649**	**0.00036**	**0.07969**	**0.14470**	**0.54859**
%RSD	0.24474	0.27400	0.03587	8.40745	0.32119	357.39906	14.02641	0.19968	0.17494

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.01168	0.49275	0.00396
#2	0.01161	0.48989	0.00491
Mean	**0.01165**	**0.49132**	**0.00444**
%RSD	0.41389	0.41086	15.10368

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:02
SampleId1 : 1003055-4 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 13:05:24
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE48

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00010	78.97203	0.03923	0.08833	0.64430	0.00397	0.00892	17.33586	0.00217
#2	0.00047	79.38860	0.03752	0.08891	0.64697	0.00397	0.00528	17.36141	0.00243
Mean	**0.00029**	**79.18031**	**0.03838**	**0.08862**	**0.64564**	**0.00397**	**0.00710**	**17.34863**	**0.00230**
%RSD	90.06074	0.37202	3.14992	0.46622	0.29243	0.04480	36.26555	0.10411	8.05366

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.06691	0.12915	0.35622	182.40629	5.66270	0.12302	27.55293	2.59506	0.00670
#2	0.06685	0.12921	0.35833	182.64922	5.68145	0.12341	27.61569	2.60086	0.00701
Mean	**0.06688**	**0.12918**	**0.35728**	**182.52776**	**5.67208**	**0.12321**	**27.58431**	**2.59796**	**0.00686**

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%RSD	0.06330	0.03153	0.41734	0.09411	0.23378	0.22351	0.16089	0.15770	3.20282

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49369	0.16216	5.49335	0.74196	0.73938	2.07167	0.00483	0.00520	0.00582
#2	0.49455	0.16162	5.49304	0.74280	0.73876	2.08178	0.00572	-0.00658	0.00993
Mean	**0.49412**	**0.16189**	**5.49320**	**0.74238**	**0.73907**	**2.07673**	**0.00528**	**-0.00069**	**0.00787**
%RSD	0.12172	0.23729	0.00399	0.08016	0.05917	0.34424	12.00356	1207.06728	36.87195

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	8.11108	0.03456	0.07063	0.01637	2.16522	-0.00401	0.20230	0.18760	0.90150
#2	8.15194	0.03576	0.07104	0.01701	2.17023	-0.00208	0.18980	0.18858	0.89899
Mean	**8.13151**	**0.03516**	**0.07083**	**0.01669**	**2.16772**	**-0.00305**	**0.19605**	**0.18809**	**0.90025**
%RSD	0.35532	2.41225	0.40174	2.69327	0.16359	44.70233	4.50913	0.37069	0.19700

	Zr	Pb	Se
	ppm	calc	calc
#1	0.02281	0.74024	0.00561
#2	0.02281	0.74011	0.00443
Mean	**0.02281**	**0.74017**	**0.00502**
%RSD	0.00846	0.01264	16.69479

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:02
SampleId1 : 1003055-5 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:07:10
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE49

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00501	61.02557	0.16461	0.12070	1.13752	0.00300	0.00880	12.10204	0.05015
#2	0.00385	61.74010	0.15892	0.12284	1.15092	0.00301	0.00693	12.15760	0.05018
Mean	**0.00443**	**61.38283**	**0.16177**	**0.12177**	**1.14422**	**0.00301**	**0.00786**	**12.12982**	**0.05016**
%RSD	18.41155	0.82312	2.48772	1.24418	0.82766	0.30072	16.81320	0.32389	0.04235

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10930	0.40122	1.21729	168.95655	2.92423	0.10537	24.66983	3.34914	0.33212
#2	0.10946	0.40407	1.23246	169.71581	2.93036	0.10633	24.78325	3.37085	0.33393
Mean	**0.10938**	**0.40265**	**1.22487**	**169.33618**	**2.92729**	**0.10585**	**24.72654**	**3.36000**	**0.33302**
%RSD	0.10766	0.49959	0.87537	0.31705	0.14802	0.64099	0.32436	0.45704	0.38523

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.56965	4.12639	3.15296	18.21898	18.10795	1.59513	0.20634	0.00540	0.01312
#2	0.57926	4.14817	3.18985	18.28743	18.08308	1.61390	0.20824	0.01393	0.01126
Mean	**0.57445**	**4.13728**	**3.17141**	**18.25320**	**18.09551**	**1.60452**	**0.20729**	**0.00966**	**0.01219**
%RSD	1.18260	0.37226	0.82256	0.26518	0.09720	0.82719	0.64543	62.38678	10.82798

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ted: 3/9/2010 17:10:40 User: ROY FRENCH

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.49926	0.33578	0.05299	0.01497	6.29206	-0.00702	0.36740	0.15102	6.50116
#2	5.54077	0.33788	0.05368	0.01207	6.34790	-0.00449	0.38267	0.15289	6.50590
Mean	**5.52001**	**0.33683**	**0.05334**	**0.01352**	**6.31998**	**-0.00575**	**0.37503**	**0.15196**	**6.50353**
%RSD	0.53172	0.44220	0.92625	15.20621	0.62480	31.07938	2.87979	0.87236	0.05152

	Zr	Pb	Se
	ppm	calc	calc
#1	0.04473	18.14492	0.01055
#2	0.04495	18.15113	0.01215
Mean	**0.04484**	**18.14802**	**0.01135**
%RSD	0.34752	0.02417	9.93291

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:02
SampleId1 : 1003055-6 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:08:57
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE50

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00040	79.81723	0.01530	0.06188	1.16865	0.00684	0.00448	23.45034	0.00196
#2	0.00004	80.90116	0.01478	0.06254	1.18546	0.00691	0.00945	23.63878	0.00170
Mean	**0.00022**	**80.35920**	**0.01504**	**0.06221**	**1.17706**	**0.00688**	**0.00697**	**23.54456**	**0.00183**
%RSD	115.25338	0.95379	2.44588	0.75265	1.00973	0.68612	50.43552	0.56591	9.87871

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10389	0.16501	0.05763	216.43702	15.01895	0.36707	49.38890	8.11592	0.00365
#2	0.10530	0.16689	0.05915	218.60650	15.17929	0.37113	49.85442	8.19734	0.00393
Mean	**0.10459**	**0.16595**	**0.05839**	**217.52176**	**15.09912**	**0.36910**	**49.62166**	**8.15663**	**0.00379**
%RSD	0.95599	0.80304	1.84125	0.70524	0.75089	0.77801	0.66336	0.70586	5.31172

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.79116	0.22504	4.27555	0.18008	0.17757	1.56770	0.00556	0.00839	0.00666
#2	0.80477	0.22748	4.33861	0.18124	0.17743	1.58502	0.00727	0.00903	0.00971
Mean	**0.79796**	**0.22626**	**4.30708**	**0.18066**	**0.17750**	**1.57636**	**0.00642**	**0.00871**	**0.00818**
%RSD	1.20650	0.76229	1.03535	0.45481	0.05494	0.77718	18.84505	5.20456	26.38059

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.48690	0.01018	0.09329	0.03435	2.50453	-0.00519	0.05231	0.19432	0.57742
#2	4.47424	0.00966	0.09441	0.03501	2.53718	-0.00356	0.05281	0.19615	0.58342
Mean	**4.48057**	**0.00992**	**0.09385**	**0.03468**	**2.52085**	**-0.00437**	**0.05256**	**0.19524**	**0.58042**
%RSD	1.37837	3.70661	0.84635	1.33770	0.91574	26.43785	0.66819	0.66238	0.73121

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	Zr	Pb	SeCH
	ppm	calc	calc
#1	0.02854	0.17841	0.00723
#2	0.02922	0.17870	0.00948
Mean	**0.02888**	**0.17855**	**0.00836**
%RSD	1.67723	0.11681	19.03351

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:03
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/9/2010 13:10:45
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19698	49.93749	0.49807	0.96493	0.97386	0.49429	0.50461	49.51508	0.48823
#2	0.19738	50.09602	0.50638	0.96447	0.97786	0.49587	0.50473	49.58765	0.48789
Mean	**0.19718**	**50.01675**	**0.50222**	**0.96470**	**0.97586**	**0.49508**	**0.50467**	**49.55136**	**0.48806**
%RSD	0.14385	0.22411	1.17062	0.03433	0.28980	0.22686	0.01623	0.10357	0.04872

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49738	0.98561	1.00482	20.26747	49.55708	0.51130	50.65666	0.97629	0.97640
#2	0.49696	0.98706	1.00884	20.27484	49.65410	0.51236	50.73748	0.97736	0.97533
Mean	**0.49717**	**0.98634**	**1.00683**	**20.27115**	**49.60559**	**0.51183**	**50.69707**	**0.97683**	**0.97587**
%RSD	0.05997	0.10396	0.28281	0.02570	0.13830	0.14730	0.11272	0.07745	0.07723

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.89531	0.98906	5.01744	0.96420	0.96483	4.89345	0.48818	0.99950	0.98955
#2	49.00805	0.98967	5.04065	0.96091	0.96200	4.90792	0.48833	1.00279	0.99008
Mean	**48.95168**	**0.98936**	**5.02905**	**0.96255**	**0.96342**	**4.90068**	**0.48825**	**1.00114**	**0.98982**
%RSD	0.16286	0.04412	0.32627	0.24187	0.20753	0.20877	0.02240	0.23256	0.03828

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.71890	0.99667	0.48496	0.13211	0.47717	0.50608	4.80699	0.48137	1.00991
#2	4.73455	0.99522	0.48682	0.13028	0.47813	0.50084	4.83461	0.48287	1.01077
Mean	**4.72672**	**0.99594**	**0.48589**	**0.13119**	**0.47765**	**0.50346**	**4.82080**	**0.48212**	**1.01034**
%RSD	0.23416	0.10306	0.27019	0.98597	0.14254	0.73588	0.40513	0.22066	0.06024

	Zr	Pb	Se
	ppm	calc	calc
#1	0.96695	0.96462	0.99286
#2	0.96889	0.96164	0.99431
Mean	**0.96792**	**0.96313**	**0.99359**
%RSD	0.14181	0.21896	0.10346

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:03

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SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/9/2010 13:12:38
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00041	0.09304	0.00203	0.00353	0.00000	0.00043	-0.00604	0.03466	-0.00019
#2	0.00006	0.08919	0.00096	0.00209	-0.00017	0.00040	-0.00499	0.03179	0.00013
Mean	**0.00023**	**0.09111**	**0.00150**	**0.00281**	**-0.00009**	**0.00042**	**-0.00552**	**0.03322**	**-0.00003**
%RSD	104.28263	2.99291	50.93102	36.21453	139.65409	6.25305	13.52356	6.11158	767.40460

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00020	0.00049	-0.00106	0.03541	-0.25751	0.00150	0.04271	0.00109	-0.00029
#2	0.00001	0.00041	-0.00076	0.03322	-0.26913	0.00145	0.03630	0.00090	-0.00021
Mean	**0.00011**	**0.00045**	**-0.00091**	**0.03432**	**-0.26332**	**0.00148**	**0.03951**	**0.00099**	**-0.00025**
%RSD	123.49604	12.80442	23.32696	4.51290	3.12123	2.30231	11.47035	13.43293	22.17889

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.16850	-0.00057	0.00306	0.00056	0.00087	0.00339	-0.00224	-0.00330	0.00215
#2	-0.17200	-0.00078	-0.00292	0.00065	0.00207	0.00627	-0.00033	-0.00119	0.00151
Mean	**-0.17025**	**-0.00068**	**0.00007**	**0.00060**	**0.00147**	**0.00483**	**-0.00129**	**-0.00224**	**0.00183**
%RSD	1.45315	21.41869	6200.34987	10.52503	57.38579	42.22430	104.94006	66.34066	24.58137

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00771	-0.00004	-0.00147	-0.00386	-0.00035	-0.00051	-0.00563	0.00007	0.00062
#2	-0.00858	0.00032	-0.00156	-0.00188	-0.00033	-0.00056	-0.01944	-0.00005	0.00084
Mean	**-0.00815**	**0.00014**	**-0.00151**	**-0.00287**	**-0.00034**	**-0.00054**	**-0.01253**	**0.00001**	**0.00073**
%RSD	7.61939	183.34566	4.28222	48.99674	4.44559	5.88254	77.94862	741.42642	20.62723

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00046	0.00077	0.00034
#2	0.00019	0.00160	0.00061
Mean	**0.00033**	**0.00118**	**0.00048**
%RSD	58.76893	49.40507	41.04780

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:03
SampleId1 : 1003055-7 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 13:14:30
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE51

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	0.00011	76.80718	0.13370	0.05522	0.82808	0.00647	0.00989	18.54719	0.00265
#2	0.00075	76.80831	0.13155	0.05639	0.83011	0.00650	0.00750	18.59131	0.00299
Mean	**0.00043**	**76.80774**	**0.13263**	**0.05580**	**0.82910**	**0.00648**	**0.00870**	**18.56925**	**0.00282**
%RSD	104.91069	0.00104	1.15004	1.48069	0.17279	0.34304	19.42109	0.16800	8.44902

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.08072	0.20207	0.38479	225.82310	9.13075	0.24615	36.45559	4.26092	0.00435
#2	0.08136	0.20287	0.38652	226.31616	9.11142	0.24592	36.49329	4.26939	0.00520
Mean	**0.08104**	**0.20247**	**0.38566**	**226.06963**	**9.12109**	**0.24603**	**36.47444**	**4.26516**	**0.00477**
%RSD	0.54983	0.27917	0.31768	0.15422	0.14984	0.06382	0.07308	0.14039	12.65201

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.74080	0.18119	3.98982	0.44521	0.44772	1.81317	0.00977	-0.00181	0.00974
#2	0.74130	0.18072	4.01726	0.44549	0.44540	1.82616	0.01150	0.00394	0.00766
Mean	**0.74105**	**0.18095**	**4.00354**	**0.44535**	**0.44656**	**1.81966**	**0.01063**	**0.00106**	**0.00870**
%RSD	0.04776	0.18400	0.48465	0.04516	0.36731	0.50503	11.47921	382.47237	16.94114

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.88305	0.02759	0.08062	0.03794	2.76970	-0.00316	0.04296	0.24054	0.67778
#2	4.86525	0.02782	0.08089	0.04220	2.77417	-0.00763	0.04855	0.24151	0.68350
Mean	**4.87415**	**0.02770**	**0.08076**	**0.04007**	**2.77193**	**-0.00539**	**0.04575**	**0.24102**	**0.68064**
%RSD	0.25816	0.60193	0.22881	7.51395	0.11386	58.56769	8.63304	0.28699	0.59439

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.02211	0.44688	0.00589
#2	0.02204	0.44543	0.00642
Mean	**0.02207**	**0.44616**	**0.00616**
%RSD	0.20705	0.23020	6.04289

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:03
SampleId1 : IP100308-4MB **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 13:16:18
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE52

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00017	0.06978	-0.00112	0.00046	-0.00036	-0.00002	-0.00537	0.02122	-0.00044
#2	-0.00022	0.05975	-0.00183	0.00026	-0.00050	-0.00001	-0.00412	0.02030	-0.00052
Mean	**-0.00003**	**0.06476**	**-0.00148**	**0.00036**	**-0.00043**	**-0.00001**	**-0.00475**	**0.02076**	**-0.00048**
%RSD	1073.86740	10.94228	33.80943	38.24450	22.75413	22.52628	18.57908	3.12962	11.15614

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00017	0.00018	-0.00127	0.10717	-0.30733	0.00115	-0.00458	0.00120	-0.00073

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#2	-0.00057	0.00012	-0.00119	0.09659	-0.31776	0.00111	-0.00745	0.00101	-0.00189
Mean	**-0.00037**	**0.00015**	**-0.00123**	**0.10188**	**-0.31254**	**0.00113**	**-0.00602**	**0.00111**	**-0.00131**
%RSD	75.42888	27.94444	4.55261	7.34402	2.36157	2.47113	33.76531	12.05849	62.92888

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.19424	-0.00073	0.02303	0.00199	0.00152	-0.00094	-0.00021	0.00201	-0.00180
#2	-0.19529	-0.00024	0.02323	-0.00113	-0.00001	-0.00238	-0.00237	-0.00369	-0.00244
Mean	**-0.19477**	**-0.00048**	**0.02313**	**0.00043**	**0.00076**	**-0.00166**	**-0.00129**	**-0.00084**	**-0.00212**
%RSD	0.38106	72.25629	0.61982	515.84558	142.53121	61.44975	117.93551	481.33182	21.29044

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00772	0.00044	-0.00171	-0.00081	0.00038	-0.00054	-0.01406	0.00001	0.00432
#2	0.00884	0.00020	-0.00174	-0.00080	0.00017	0.00014	-0.02294	-0.00030	0.00460
Mean	**0.00828**	**0.00032**	**-0.00173**	**-0.00080**	**0.00027**	**-0.00020**	**-0.01850**	**-0.00015**	**0.00446**
%RSD	9.52310	53.29256	1.15368	0.54116	54.20389	239.97377	33.92218	147.39489	4.50510

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00043	0.00167	-0.00053
#2	-0.00065	-0.00038	-0.00286
Mean	**-0.00054**	**0.00065**	**-0.00169**
%RSD	29.69390	224.67012	97.09793

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:04
SampleId1 : IP100308-4RVS SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:18:06
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE53

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00235	0.15345	0.00519	0.00517	0.00420	0.00087	0.00688	0.50662	0.00180
#2	0.00204	0.15312	0.00419	0.00575	0.00417	0.00087	0.00995	0.50766	0.00178
Mean	**0.00220**	**0.15328**	**0.00469**	**0.00546**	**0.00418**	**0.00087**	**0.00841**	**0.50714**	**0.00179**
%RSD	10.12665	0.14869	15.12101	7.56298	0.47311	0.32180	25.84167	0.14421	0.78629

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00181	0.00495	0.00390	0.16131	0.31050	0.00404	0.48960	0.00528	0.00849
#2	0.00173	0.00503	0.00456	0.15591	0.31027	0.00403	0.48805	0.00510	0.00895
Mean	**0.00177**	**0.00499**	**0.00423**	**0.15861**	**0.31039**	**0.00404**	**0.48883**	**0.00519**	**0.00872**
%RSD	3.17520	1.16896	11.05549	2.40699	0.05398	0.04954	0.22380	2.57474	3.77763

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.57505	0.00431	0.12410	0.00507	0.00551	0.08993	0.00887	0.00201	0.00072
#2	0.58281	0.00447	0.13059	0.00692	0.00578	0.09570	0.00893	0.00048	0.00075

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Mean	**0.57893**	**0.00439**	**0.12734**	**0.00599**	**0.00564**	**0.09282**	**0.00890**	**0.00125**	**0.00074**
%RSD	0.94732	2.52625	3.60340	21.84677	3.42544	4.39556	0.49790	86.79050	3.33797

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03802	0.01333	0.00303	-0.00081	0.00466	0.00838	0.04758	0.00505	0.00716
#2	0.03762	0.01369	0.00304	-0.00332	0.00466	0.00830	0.03624	0.00529	0.00709
Mean	**0.03782**	**0.01351**	**0.00304**	**-0.00206**	**0.00466**	**0.00834**	**0.04191**	**0.00517**	**0.00713**
%RSD	0.74013	1.89224	0.32826	86.16436	0.00000	0.68073	19.14275	3.32405	0.70513

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00462	0.00536	0.00115
#2	0.00492	0.00616	0.00066
Mean	**0.00477**	**0.00576**	**0.00091**
%RSD	4.54628	9.80786	37.93131

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:04
SampleId1 : IP100308-4LCS SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:19:53
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE54

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09674	2.05840	1.97363	0.92286	1.96538	0.04690	-0.00820	39.76886	0.04785
#2	0.09719	2.05934	1.98210	0.92723	1.97578	0.04708	-0.00376	39.94976	0.04866
Mean	**0.09697**	**2.05887**	**1.97786**	**0.92505**	**1.97058**	**0.04699**	**-0.00598**	**39.85931**	**0.04825**
%RSD	0.33158	0.03236	0.30290	0.33412	0.37325	0.26343	52.50424	0.32091	1.18705

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.47912	0.19206	0.25759	1.02775	37.47264	0.49133	40.15414	0.47302	0.98472
#2	0.48120	0.19338	0.26019	1.03350	37.64170	0.49397	40.36157	0.47526	0.98675
Mean	**0.48016**	**0.19272**	**0.25889**	**1.03062**	**37.55717**	**0.49265**	**40.25785**	**0.47414**	**0.98573**
%RSD	0.30652	0.48358	0.70919	0.39444	0.31828	0.37922	0.36433	0.33434	0.14546

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	36.68079	0.48106	0.02090	0.46197	0.46402	-0.00094	0.47841	1.87625	1.87284
#2	36.83486	0.48088	0.01998	0.46594	0.46743	0.00339	0.48264	1.88332	1.89415
Mean	**36.75783**	**0.48097**	**0.02044**	**0.46396**	**0.46573**	**0.00122**	**0.48053**	**1.87978**	**1.88350**
%RSD	0.29639	0.02665	3.15570	0.60502	0.51725	249.77459	0.62290	0.26593	0.79994

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.72366	0.50519	0.48789	-0.01670	0.48300	2.01191	-0.01716	0.48891	0.45702
#2	1.73494	0.50772	0.49059	-0.01397	0.48584	2.02105	-0.00482	0.49115	0.46038
Mean	**1.72930**	**0.50645**	**0.48924**	**-0.01533**	**0.48442**	**2.01648**	**-0.01099**	**0.49003**	**0.45870**

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%RSD	0.46109	0.35341	0.39016	12.57003	0.41461	0.32073	79.34646	0.32279	0.51712

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00003	0.46334	1.87398
#2	0.00010	0.46694	1.89054
Mean	**0.00003**	**0.46514**	**1.88226**
%RSD	281.40466	0.54641	0.62235

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:04
SampleId1 : 1003063-1 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 13:21:41
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE55

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00095	23.38765	0.02912	0.01802	0.21512	0.00281	0.00074	48.37778	-0.00041
#2	-0.00120	23.44799	0.02764	0.01752	0.21571	0.00281	-0.00137	48.34372	0.00018
Mean	**-0.00107**	**23.41782**	**0.02838**	**0.01777**	**0.21541**	**0.00281**	**-0.00032**	**48.36075**	**-0.00012**
%RSD	16.92042	0.18219	3.70364	2.01483	0.19322	0.17335	471.99341	0.04980	354.45545

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03092	0.01540	0.09324	61.74552	4.55156	0.03963	28.31839	0.48708	0.00036
#2	0.03081	0.01539	0.09316	61.75969	4.54803	0.03969	28.34220	0.48780	0.00140
Mean	**0.03086**	**0.01540**	**0.09320**	**61.75260**	**4.54980**	**0.03966**	**28.33030**	**0.48744**	**0.00088**
%RSD	0.24027	0.07781	0.05958	0.01622	0.05477	0.11063	0.05945	0.10475	83.34747

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48054	0.03409	1.16612	0.06136	0.06296	8.71208	0.00053	0.00162	0.00356
#2	0.48279	0.03377	1.15727	0.06322	0.06204	8.69902	0.00060	-0.00483	0.00137
Mean	**0.48166**	**0.03393**	**1.16170**	**0.06229**	**0.06250**	**8.70555**	**0.00056**	**-0.00161**	**0.00246**
%RSD	0.33052	0.67901	0.53891	2.10355	1.03990	0.10603	8.57735	283.48649	62.89332

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.50533	0.00769	0.21616	0.01609	0.19034	-0.00334	0.06882	0.03606	0.44639
#2	5.51131	0.00974	0.21655	0.01346	0.19015	0.00091	0.07670	0.03653	0.44589
Mean	**5.50832**	**0.00871**	**0.21635**	**0.01477**	**0.19024**	**-0.00121**	**0.07276**	**0.03629**	**0.44614**
%RSD	0.07665	16.62432	0.12511	12.58269	0.06966	247.47636	7.66387	0.91980	0.07918

	Zr	Pb	Se
	ppm	calc	calc
#1	0.02288	0.06243	0.00291
#2	0.02326	0.06243	-0.00070
Mean	**0.02307**	**0.06243**	**0.00111**
%RSD	1.18218	0.00453	230.38368

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ted: 3/9/2010 17:10:40 User: ROY FRENCH
Method : Paragon File : 100309A Printed : 3/9/2010 17:10:05
SampleId1 : 1003063-2 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:23:28
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE56

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00030	18.58479	0.01541	0.01012	0.29839	0.00242	0.00127	9.01635	-0.00023
#2	-0.00084	18.59615	0.01526	0.01039	0.29970	0.00242	0.00271	9.02331	-0.00048
Mean	**-0.00057**	**18.59047**	**0.01534**	**0.01025**	**0.29905**	**0.00242**	**0.00199**	**9.01983**	**-0.00036**
%RSD	67.55950	0.04319	0.68528	1.88031	0.31167	0.04239	51.38972	0.05459	49.29647

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00973	0.01170	0.01235	36.48351	3.64348	0.02115	7.21168	0.24995	0.00021
#2	0.00944	0.01113	0.01227	36.55486	3.62818	0.02111	7.20482	0.25067	0.00023
Mean	**0.00959**	**0.01141**	**0.01231**	**36.51919**	**3.63583**	**0.02113**	**7.20825**	**0.25031**	**0.00022**
%RSD	2.15076	3.49771	0.45107	0.13816	0.29751	0.15122	0.06733	0.20344	8.38260

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.05158	0.01094	0.38582	0.09306	0.09062	0.29477	0.00289	-0.00372	-0.00163
#2	-0.05258	0.01148	0.38430	0.09140	0.09016	0.30343	0.00069	-0.00539	-0.00134
Mean	**-0.05208**	**0.01121**	**0.38506**	**0.09223**	**0.09039**	**0.29910**	**0.00179**	**-0.00456**	**-0.00148**
%RSD	1.35743	3.42568	0.27956	1.27375	0.35935	2.04633	86.73180	26.01045	14.00207

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.15928	0.01360	0.12084	-0.01281	0.29264	-0.00228	3.99083	0.89041	0.03226
#2	5.17101	0.01251	0.12121	-0.01426	0.29346	-0.00266	3.99868	0.89249	0.03247
Mean	**5.16515**	**0.01305**	**0.12103**	**-0.01353**	**0.29305**	**-0.00247**	**3.99476**	**0.89145**	**0.03236**
%RSD	0.16062	5.88020	0.21893	7.59231	0.19890	10.93619	0.13886	0.16513	0.46600

	Zr	Pb	Se
	ppm	calc	calc
#1	0.06038	0.09143	-0.00233
#2	0.06046	0.09057	-0.00269
Mean	**0.06042**	**0.09100**	**-0.00251**
%RSD	0.08902	0.66796	10.21538

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:05
SampleId1 : 1003063-3 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:25:15
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE57

Final concentrations

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00159	53.02166	0.04410	0.04256	0.48752	0.00440	0.00500	114.70268	0.00019
#2	-0.00219	53.19400	0.04109	0.04361	0.49086	0.00441	0.00174	114.83121	-0.00011
Mean	**-0.00189**	**53.10783**	**0.04260**	**0.04309**	**0.48919**	**0.00440**	**0.00337**	**114.76694**	**0.00004**
%RSD	22.69094	0.22947	4.99746	1.72591	0.48298	0.09620	68.39372	0.07919	579.36568

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.04193	0.05430	0.08032	134.57335	11.04757	0.08292	34.71697	1.45156	0.00398
#2	0.04211	0.05456	0.08105	134.87717	11.08887	0.08315	34.74796	1.45702	0.00365
Mean	**0.04202**	**0.05443**	**0.08069**	**134.72526**	**11.06822**	**0.08304**	**34.73247**	**1.45429**	**0.00382**
%RSD	0.31082	0.33104	0.63475	0.15946	0.26386	0.20105	0.06310	0.26520	6.23491

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.43210	0.08249	2.57938	0.07823	0.07875	4.43630	0.00284	-0.00551	0.00248
#2	2.43978	0.08319	2.58592	0.07819	0.08087	4.43774	0.00283	-0.00590	0.00606
Mean	**2.43594**	**0.08284**	**2.58265**	**0.07821**	**0.07981**	**4.43702**	**0.00284**	**-0.00570**	**0.00427**
%RSD	0.22291	0.59754	0.17920	0.03311	1.88476	0.02305	0.13695	4.72797	59.34344

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.93508	0.00921	0.68553	0.04584	0.64638	-0.00477	0.01232	0.11951	0.28836
#2	7.93201	0.00836	0.68908	0.04537	0.64906	-0.00363	0.01211	0.12013	0.28928
Mean	**7.93354**	**0.00879**	**0.68730**	**0.04560**	**0.64772**	**-0.00420**	**0.01222**	**0.11982**	**0.28882**
%RSD	0.02736	6.81482	0.36563	0.73159	0.29240	19.31370	1.19748	0.36717	0.22681

	Zr	Pb	Se
	ppm	calc	calc
#1	0.05095	0.07857	-0.00018
#2	0.05084	0.07998	0.00208
Mean	**0.05090**	**0.07928**	**0.00095**
%RSD	0.14993	1.25472	168.67106

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:05
SampleId1 : 1003063-5 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:27:03
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE58

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00080	40.23151	0.05960	0.06414	0.19185	0.00326	0.00465	236.24382	0.00021
#2	-0.00034	39.77334	0.06031	0.06406	0.19020	0.00321	0.00725	234.94409	-0.00017
Mean	**-0.00057**	**40.00243**	**0.05996**	**0.06410**	**0.19103**	**0.00323**	**0.00595**	**235.59396**	**0.00002**
%RSD	56.56454	0.80989	0.83296	0.08594	0.61205	0.90397	30.92024	0.39010	1270.91994

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03378	0.03387	0.04822	101.97298	10.03259	0.12807	78.46823	1.58028	0.00225
#2	0.03428	0.03444	0.04851	101.41036	9.89750	0.12672	78.08503	1.57159	0.00259
Mean	**0.03403**	**0.03416**	**0.04836**	**101.69167**	**9.96505**	**0.12740**	**78.27663**	**1.57594**	**0.00242**
%RSD	1.03876	1.17667	0.41355	0.39122	0.95855	0.75248	0.34616	0.39001	9.83828

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	12.91736	0.06798	2.32035	0.06230	0.06074	38.98749	0.00298	0.02029	0.02014
#2	12.75625	0.06743	2.31340	0.06165	0.06006	38.84412	0.00422	0.01526	0.02260
Mean	**12.83680**	**0.06771**	**2.31687**	**0.06197**	**0.06040**	**38.91580**	**0.00360**	**0.01777**	**0.02137**
%RSD	0.88745	0.57983	0.21205	0.74881	0.80138	0.26049	24.50776	20.03660	8.14781

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.18566	0.00810	5.18597	0.00918	0.25014	-0.00234	1.06485	0.08967	0.21270
#2	7.10731	0.00605	5.14995	0.00846	0.25094	-0.00310	1.07362	0.08898	0.21199
Mean	**7.14648**	**0.00708**	**5.16796**	**0.00882**	**0.25054**	**-0.00272**	**1.06923**	**0.08932**	**0.21235**
%RSD	0.77525	20.47565	0.49285	5.79313	0.22664	19.67124	0.58008	0.54711	0.23714

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.02759	0.06126	0.02019
#2	0.02747	0.06059	0.02016
Mean	**0.02753**	**0.06093**	**0.02017**
%RSD	0.29378	0.78357	0.12065

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:06
SampleId1 : 1003063-6 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 13:28:51
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE59

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00124	29.69116	0.02745	0.01717	0.55613	0.00275	-0.00418	83.57416	-0.00019
#2	-0.00179	29.76137	0.02909	0.01674	0.55807	0.00275	0.00083	83.61299	-0.00015
Mean	**-0.00152**	**29.72626**	**0.02827**	**0.01695**	**0.55710**	**0.00275**	**-0.00168**	**83.59357**	**-0.00017**
%RSD	25.55987	0.16701	4.09007	1.78712	0.24602	0.05726	211.16546	0.03284	17.75121

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02798	0.03065	0.03759	86.11636	6.07932	0.04524	28.75494	0.81180	0.00155
#2	0.02853	0.03015	0.03786	86.21147	6.08564	0.04535	28.77675	0.81344	0.00163
Mean	**0.02825**	**0.03040**	**0.03773**	**86.16391**	**6.08248**	**0.04530**	**28.76584**	**0.81262**	**0.00159**
%RSD	1.38893	1.15005	0.51430	0.07805	0.07352	0.18042	0.05363	0.14271	3.45294

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	2.55322	0.04325	1.81277	0.07935	0.07888	10.25316	0.00003	0.01705	0.02341
#2	2.56231	0.04345	1.80961	0.07863	0.08083	10.29526	0.00098	0.00518	0.02034
Mean	**2.55777**	**0.04335**	**1.81119**	**0.07899**	**0.07986**	**10.27421**	**0.00051**	**0.01111**	**0.02187**
%RSD	0.25120	0.31496	0.12344	0.65171	1.73335	0.28977	134.25120	75.50489	9.90809

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.36878	0.00952	0.43610	0.01872	0.89409	-0.00316	1.04949	0.19192	0.15632
#2	5.36763	0.00807	0.43711	0.01896	0.89632	-0.00476	1.06917	0.19120	0.15632
Mean	**5.36821**	**0.00880**	**0.43660**	**0.01884**	**0.89521**	**-0.00396**	**1.05933**	**0.19156**	**0.15632**
%RSD	0.01506	11.64278	0.16401	0.90768	0.17679	28.58077	1.31316	0.26354	0.00000

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.06147	0.07904	0.02129
#2	0.06147	0.08010	0.01529
Mean	**0.06147**	**0.07957**	**0.01829**
%RSD	0.00757	0.94489	23.18104

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:06
SampleId1 : 1003063-8 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 13:30:38
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE60

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00082	41.02295	0.03972	0.02425	0.75854	0.00410	-0.00018	101.70087	0.00024
#2	-0.00084	40.97913	0.03533	0.02414	0.75494	0.00409	0.00933	101.27749	0.00038
Mean	**-0.00083**	**41.00104**	**0.03752**	**0.02420**	**0.75674**	**0.00409**	**0.00457**	**101.48918**	**0.00031**
%RSD	1.57800	0.07557	8.26425	0.34147	0.33641	0.20046	147.13602	0.29498	33.53271

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03828	0.04161	0.06620	145.94846	8.01391	0.06238	29.33426	1.66417	0.00178
#2	0.03815	0.04171	0.06611	145.30204	8.01648	0.06236	29.21892	1.65759	0.00212
Mean	**0.03822**	**0.04166**	**0.06616**	**145.62525**	**8.01520**	**0.06237**	**29.27659**	**1.66088**	**0.00195**
%RSD	0.23322	0.17005	0.09989	0.31388	0.02265	0.02873	0.27857	0.28027	12.18583

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.11292	0.06925	2.92423	0.06421	0.06598	3.10323	0.00176	0.00268	0.00777
#2	2.11358	0.06949	2.90519	0.06538	0.06548	3.06854	0.00349	0.00145	0.00941
Mean	**2.11325**	**0.06937**	**2.91471**	**0.06479**	**0.06573**	**3.08588**	**0.00263**	**0.00207**	**0.00859**
%RSD	0.02182	0.24605	0.46201	1.27414	0.53535	0.79479	46.57531	41.84864	13.46182

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	8.99503	0.00828	0.47580	0.03278	1.33772	-0.01165	0.01296	0.11883	0.27631

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#2	9.01188	0.00865	0.47357	0.03714	1.33221	-0.00596	0.04005	0.11863	0.27232
Mean	**9.00346**	**0.00847**	**0.47469**	**0.03496**	**1.33496**	**-0.00881**	**0.02651**	**0.11873**	**0.27432**
%RSD	0.13232	3.07253	0.33284	8.81371	0.29212	45.67886	72.26058	0.11935	1.02854

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.04781	0.06539	0.00608
#2	0.04773	0.06545	0.00676
Mean	**0.04777**	**0.06542**	**0.00642**
%RSD	0.11426	0.06143	7.53259

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:07
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/9/2010 13:32:26
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19947	49.65693	0.51022	0.96302	0.96963	0.49898	0.50892	50.16044	0.49322
#2	0.19946	50.00499	0.50821	0.97165	0.97814	0.50082	0.50973	50.29573	0.49495
Mean	**0.19947**	**49.83096**	**0.50921**	**0.96733**	**0.97388**	**0.49990**	**0.50932**	**50.22808**	**0.49409**
%RSD	0.00426	0.49390	0.27959	0.63053	0.61759	0.26112	0.11195	0.19047	0.24827

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.50080	0.99352	1.00483	20.28310	49.33104	0.50723	51.10352	0.97530	0.98446
#2	0.50280	0.99594	1.01376	20.36713	49.53591	0.51016	51.32562	0.97985	0.98893
Mean	**0.50180**	**0.99473**	**1.00929**	**20.32511**	**49.43347**	**0.50869**	**51.21457**	**0.97757**	**0.98669**
%RSD	0.28184	0.17234	0.62585	0.29236	0.29306	0.40690	0.30665	0.32890	0.32045

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.65195	1.00089	5.04828	0.97271	0.96501	4.90647	0.49072	1.00537	0.98284
#2	48.88658	1.00482	5.07984	0.97754	0.96761	4.96290	0.49574	1.00769	0.98257
Mean	**48.76927**	**1.00285**	**5.06406**	**0.97512**	**0.96631**	**4.93468**	**0.49323**	**1.00653**	**0.98271**
%RSD	0.34018	0.27653	0.44071	0.35029	0.19052	0.80860	0.71921	0.16306	0.01966

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.71200	1.00779	0.48494	0.13103	0.47622	0.51470	4.79317	0.48378	1.02067
#2	4.74676	1.01166	0.48848	0.13082	0.47863	0.51942	4.83307	0.48616	1.02346
Mean	**4.72938**	**1.00972**	**0.48671**	**0.13092**	**0.47743**	**0.51706**	**4.81312**	**0.48497**	**1.02206**
%RSD	0.21970	0.27069	0.51355	0.11350	0.35652	0.64490	0.58620	0.34754	0.19357

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.96959	0.96757	0.99035
#2	0.97468	0.97092	0.99094

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Mean	**0.97214**	**0.96925**	**0.99064CH**
%RSD	0.37022	0.24405	0.04216

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:07
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/9/2010 13:34:19
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00080	0.09153	-0.00008	0.00050	-0.00022	0.00031	-0.00518	0.03822	-0.00053
#2	0.00041	0.08837	0.00103	0.00011	-0.00017	0.00029	-0.00316	0.03627	-0.00020
Mean	**-0.00019**	**0.08995**	**0.00047**	**0.00030**	**-0.00020**	**0.00030**	**-0.00417**	**0.03724**	**-0.00036**
%RSD	437.04952	2.48778	166.21278	91.30371	20.09406	4.92189	34.30098	3.70730	64.67828

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00022	0.00006	-0.00149	0.02836	-0.35288	0.00124	0.03365	0.00045	-0.00044
#2	0.00015	0.00024	-0.00106	0.02793	-0.36925	0.00122	0.02857	0.00045	-0.00078
Mean	**-0.00004**	**0.00015**	**-0.00128**	**0.02815**	**-0.36106**	**0.00123**	**0.03111**	**0.00045**	**-0.00061**
%RSD	673.03740	81.05394	23.62290	1.07354	3.20606	1.62699	11.55279	0.00000	39.00929

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.17890	-0.00100	-0.00221	-0.00101	0.00139	-0.00382	-0.00253	-0.00189	-0.00157
#2	-0.18200	-0.00068	0.00012	-0.00113	0.00121	-0.00094	-0.00176	-0.00411	0.00013
Mean	**-0.18045**	**-0.00084**	**-0.00105**	**-0.00107**	**0.00130**	**-0.00238**	**-0.00215**	**-0.00300**	**-0.00072**
%RSD	1.21433	26.40616	157.48028	7.34676	10.09886	85.67317	25.32608	52.22070	167.68116

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.01399	-0.00317	-0.00147	0.00005	-0.00049	-0.00121	-0.01450	-0.00005	0.00055
#2	-0.00944	-0.00028	-0.00147	-0.00407	-0.00067	-0.00117	-0.00365	-0.00012	-0.00023
Mean	**-0.01171**	**-0.00173**	**-0.00147**	**-0.00201**	**-0.00058**	**-0.00119**	**-0.00907**	**-0.00008**	**0.00016**
%RSD	27.44334	118.34665	0.00000	145.23195	22.13306	2.52741	84.59913	63.07312	340.53286

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00011	0.00059	-0.00167
#2	0.00022	0.00043	-0.00128
Mean	**0.00006**	**0.00051**	**-0.00148**
%RSD	431.50165	22.28415	18.91314

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:07
SampleId1 : 1003063-9 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 13:36:12
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE61

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Final concentrations:**40** **User: ROY FRENCH**

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00120	36.86593	0.03463	0.02098	0.40743	0.00315	0.00072	275.73960	0.00007
#2	-0.00080	36.64710	0.03574	0.02207	0.40474	0.00311	0.00472	274.15572	0.00038
Mean	**-0.00100**	**36.75651**	**0.03518**	**0.02153**	**0.40609**	**0.00313**	**0.00272**	**274.94766**	**0.00023**
%RSD	27.95846	0.42098	2.24087	3.58203	0.46912	0.83171	103.86348	0.40734	95.45673

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03778	0.05652	0.05518	126.84355	6.93142	0.06948	33.68589	1.29042	0.00290
#2	0.03797	0.05629	0.05467	126.06862	6.90056	0.06909	33.55550	1.28402	0.00347
Mean	**0.03788**	**0.05640**	**0.05492**	**126.45609**	**6.91599**	**0.06928**	**33.62069**	**1.28722**	**0.00318**
%RSD	0.36333	0.28642	0.65120	0.43332	0.31560	0.39053	0.27425	0.35173	12.65418

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.21160	0.07699	3.60418	0.05239	0.05265	3.63082	0.00066	0.00160	0.00463
#2	2.19891	0.07664	3.58766	0.05498	0.05229	3.61926	0.00281	0.00459	0.00965
Mean	**2.20526**	**0.07681**	**3.59592**	**0.05369**	**0.05247**	**3.62504**	**0.00174**	**0.00309**	**0.00714**
%RSD	0.40701	0.32221	0.32491	3.39904	0.48899	0.22560	87.51001	68.28909	49.64040

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.98816	0.00898	1.10972	0.02158	2.91713	-0.00321	0.03979	0.12977	0.21028
#2	5.96787	0.00864	1.10299	0.01902	2.89848	-0.00438	0.03834	0.12830	0.21021
Mean	**5.97802**	**0.00881**	**1.10636**	**0.02030**	**2.90780**	**-0.00379**	**0.03907**	**0.12904**	**0.21025**
%RSD	0.23998	2.72843	0.43057	8.93248	0.45343	21.80374	2.61777	0.80258	0.02395

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.04676	0.05257	0.00362
#2	0.04643	0.05319	0.00796
Mean	**0.04659**	**0.05288**	**0.00579**
%RSD	0.49753	0.82552	52.95554

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:08
SampleId1 : 1003063-12 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 13:38:00
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE62

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00087	35.02308	0.03188	0.02211	0.49069	0.00307	0.00310	114.51166	-0.00007
#2	-0.00066	34.97468	0.03262	0.02254	0.49022	0.00304	0.00060	114.12249	0.00029
Mean	**-0.00076**	**34.99888**	**0.03225**	**0.02233**	**0.49045**	**0.00306**	**0.00185**	**114.31708**	**0.00011**
%RSD	19.32687	0.09777	1.62990	1.35690	0.06882	0.72264	95.43102	0.24072	227.91388

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ted: 3/9/2010 17:10:40 User: ROY FRENCH

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02828	0.04461	0.04360	100.05036	7.68711	0.04887	27.25426	1.35589	0.00241
#2	0.02810	0.04430	0.04388	99.76690	7.66586	0.04884	27.16925	1.35309	0.00303
Mean	**0.02819**	**0.04445**	**0.04374**	**99.90863**	**7.67649**	**0.04886**	**27.21176**	**1.35449**	**0.00272**
%RSD	0.45587	0.49308	0.45811	0.20063	0.19573	0.04079	0.22090	0.14622	16.17249

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.39246	0.05205	2.25098	0.06470	0.06000	2.40678	0.00233	-0.00056	0.00086
#2	1.39276	0.05234	2.24944	0.06345	0.06104	2.39667	0.00353	-0.00169	0.00234
Mean	**1.39261**	**0.05220**	**2.25021**	**0.06407**	**0.06052**	**2.40172**	**0.00293**	**-0.00113**	**0.00160**
%RSD	0.01526	0.39238	0.04815	1.38386	1.21944	0.29772	28.95041	70.96008	65.19958

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	6.40463	0.00715	0.52338	0.02771	1.07041	-0.00468	0.02300	0.10035	0.18778
#2	6.40740	0.00667	0.52271	0.02553	1.06824	-0.00727	0.03108	0.10058	0.18792
Mean	**6.40601**	**0.00691**	**0.52304**	**0.02662**	**1.06932**	**-0.00597**	**0.02704**	**0.10047**	**0.18785**
%RSD	0.03064	4.90763	0.09084	5.79258	0.14368	30.63433	21.15205	0.15956	0.05360

	Zr	Pb	Se
	ppm	calc	calc
#1	0.03874	0.06156	0.00039
#2	0.03870	0.06184	0.00100
Mean	**0.03872**	**0.06170**	**0.00069**
%RSD	0.06607	0.31926	62.08352

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:08
SampleId1 : 1003063-13 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:39:48
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE63

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00077	35.28147	0.03544	0.02192	0.62055	0.00331	0.00361	135.96579	0.00002
#2	-0.00098	35.43935	0.03552	0.02125	0.62401	0.00330	0.00371	136.20306	-0.00001
Mean	**-0.00087**	**35.36041**	**0.03548**	**0.02159**	**0.62228**	**0.00331**	**0.00366**	**136.08443**	**0.00001**
%RSD	16.87799	0.31571	0.14814	2.16892	0.39278	0.18661	2.00104	0.12329	506.85843

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03242	0.04000	0.04403	114.32286	7.61052	0.05097	27.37755	1.62233	0.00279
#2	0.03228	0.04052	0.04469	114.66927	7.63551	0.05118	27.47681	1.63018	0.00253
Mean	**0.03235**	**0.04026**	**0.04436**	**114.49606**	**7.62301**	**0.05107**	**27.42718**	**1.62626**	**0.00266**
%RSD	0.29872	0.90233	1.04905	0.21393	0.23179	0.29647	0.25590	0.34134	6.86946

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	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.50941	0.05944	2.34937	0.05738	0.05920	2.69717	0.00274	-0.00247	0.00844
#2	1.51893	0.06030	2.36193	0.05680	0.05967	2.69572	0.00357	-0.00524	0.00502
Mean	**1.51417**	**0.05987**	**2.35565**	**0.05709**	**0.05944**	**2.69645**	**0.00315**	**-0.00386**	**0.00673**
%RSD	0.44465	1.01211	0.37730	0.71815	0.55930	0.03789	18.53864	50.88310	35.88361

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	6.89512	0.00731	0.53954	0.02615	1.03147	-0.00186	0.03203	0.10569	0.19547
#2	6.92736	0.00767	0.54296	0.02692	1.03570	-0.00364	0.02390	0.10557	0.19632
Mean	**6.91124**	**0.00749**	**0.54125**	**0.02654**	**1.03359**	**-0.00275**	**0.02796**	**0.10563**	**0.19590**
%RSD	0.32986	3.36544	0.44753	2.06628	0.28892	45.89799	20.56164	0.08075	0.30841

	Zr	Pb	Se
	ppm	calc	calc
#1	0.03900	0.05859	0.00481
#2	0.03892	0.05871	0.00160
Mean	**0.03896**	**0.05865**	**0.00320**
%RSD	0.15393	0.14527	70.65768

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:08
SampleId1 : 1003063-14 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:41:36
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE64

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00105	19.20147	0.02816	0.00871	0.52287	0.00325	-0.00493	9.23399	-0.00006
#2	-0.00074	19.29495	0.02920	0.00906	0.52602	0.00327	-0.00118	9.27080	-0.00035
Mean	**-0.00090**	**19.24821**	**0.02868**	**0.00889**	**0.52445**	**0.00326**	**-0.00306**	**9.25240**	**-0.00020**
%RSD	24.71090	0.34340	2.56568	2.78825	0.42411	0.34031	86.83377	0.28126	98.95071

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01708	0.00938	0.03223	34.08261	3.48271	0.02359	7.74642	0.15540	0.00010
#2	0.01668	0.00889	0.03186	34.25636	3.49590	0.02373	7.77233	0.15600	0.00015
Mean	**0.01688**	**0.00914**	**0.03204**	**34.16949**	**3.48931**	**0.02366**	**7.75937**	**0.15570**	**0.00013**
%RSD	1.65662	3.79261	0.81913	0.35957	0.26716	0.40501	0.23610	0.27512	28.65441

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.07426	0.01623	0.40358	0.05576	0.05246	2.89946	0.00279	0.01555	0.01710
#2	0.07501	0.01575	0.41444	0.05517	0.05298	2.90669	-0.00125	0.01154	0.01787
Mean	**0.07463**	**0.01599**	**0.40901**	**0.05547**	**0.05272**	**2.90307**	**0.00077**	**0.01355**	**0.01748**
%RSD	0.71060	2.13411	1.87754	0.75761	0.69842	0.17599	370.37826	20.91537	3.11162

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.23575	0.01272	0.25443	0.00988	0.11522	-0.00268	0.49081	0.29259	0.04847
#2	4.27865	0.01019	0.25599	0.01276	0.11620	-0.00503	0.50254	0.29382	0.04875
Mean	**4.25720**	**0.01145**	**0.25521**	**0.01132**	**0.11571**	**-0.00386**	**0.49667**	**0.29320**	**0.04861**
%RSD	0.71243	15.63202	0.43059	18.00325	0.59568	43.14603	1.66922	0.29802	0.41374

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.02976	0.05356	0.01658
#2	0.02976	0.05371	0.01576
Mean	**0.02976**	**0.05363**	**0.01617**
%RSD	0.01149	0.19701	3.58999

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:09
SampleId1 : 1003063-16 SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:43:26
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE65

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00074	43.74413	0.03883	0.02375	0.75100	0.00402	0.00555	154.14616	-0.00019
#2	-0.00154	43.95177	0.03938	0.02363	0.75564	0.00403	0.00555	154.11037	0.00004
Mean	**-0.00114**	**43.84795**	**0.03910**	**0.02369**	**0.75332**	**0.00402**	**0.00555**	**154.12827**	**-0.00007**
%RSD	49.73210	0.33485	1.00812	0.34877	0.43560	0.12147	0.00579	0.01642	220.23283

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03674	0.04371	0.06359	119.05603	9.42339	0.06948	35.46643	1.47100	0.00305
#2	0.03661	0.04401	0.06440	119.19617	9.45760	0.06975	35.53065	1.47515	0.00251
Mean	**0.03667**	**0.04386**	**0.06399**	**119.12610**	**9.44049**	**0.06962**	**35.49854**	**1.47307**	**0.00278**
%RSD	0.25217	0.47386	0.90230	0.08319	0.25625	0.27721	0.12794	0.19917	13.82164

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.88417	0.06797	2.46118	0.07439	0.07345	3.56143	0.00044	-0.00212	0.00774
#2	1.89846	0.06731	2.46210	0.07228	0.07460	3.59468	0.00013	0.00123	0.00652
Mean	**1.89132**	**0.06764**	**2.46164**	**0.07333**	**0.07402**	**3.57806**	**0.00029**	**-0.00045**	**0.00713**
%RSD	0.53431	0.69395	0.02643	2.04048	1.09999	0.65711	75.40352	530.99134	12.06856

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	9.81287	0.00860	0.64563	0.03661	0.65445	-0.00437	0.02733	0.10740	0.24981
#2	9.85379	0.00715	0.64935	0.03692	0.65666	-0.00577	0.00157	0.10714	0.25002
Mean	**9.83333**	**0.00787**	**0.64749**	**0.03677**	**0.65555**	**-0.00507**	**0.01445**	**0.10727**	**0.24992**
%RSD	0.29761	13.01247	0.40571	0.59594	0.23873	19.53333	126.05256	0.16775	0.06047

	Zr	**Pb**	**Se**
	ppm	calc	calc

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#1	0.04180	0.07376	0.00446	**CH**
#2	0.04173	0.07383	0.00476	
Mean	**0.04177**	**0.07380**	**0.00461**	
%RSD	0.12684	0.06074	4.62503	

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:09
SampleId1 : 1003063-16D SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:45:13
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE66

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00148	43.59423	0.03953	0.02285	0.72381	0.00380	0.00098	145.61159	0.00032
#2	-0.00109	43.99366	0.03975	0.02453	0.72943	0.00380	0.00454	146.21913	0.00017
Mean	**-0.00129**	**43.79395**	**0.03964**	**0.02369**	**0.72662**	**0.00380**	**0.00276**	**145.91536**	**0.00024**
%RSD	21.74780	0.64493	0.39777	4.99904	0.54732	0.09924	91.32404	0.29441	41.76806

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03578	0.04272	0.06395	112.98184	9.34262	0.06913	33.95361	1.43174	0.00292
#2	0.03626	0.04303	0.06374	113.52933	9.41384	0.06957	34.13820	1.44015	0.00354
Mean	**0.03602**	**0.04288**	**0.06384**	**113.25559**	**9.37823**	**0.06935**	**34.04591**	**1.43595**	**0.00323**
%RSD	0.93511	0.50789	0.23690	0.34182	0.53702	0.45038	0.38337	0.41415	13.58357

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.84802	0.06626	2.34865	0.07169	0.07175	3.44145	0.00247	-0.00046	0.00371
#2	1.87038	0.06736	2.35580	0.06889	0.07050	3.47036	0.00224	0.00783	0.00895
Mean	**1.85920**	**0.06681**	**2.35223**	**0.07029**	**0.07112**	**3.45590**	**0.00236**	**0.00368**	**0.00633**
%RSD	0.85054	1.16248	0.21503	2.82271	1.23995	0.59155	7.08988	159.19566	58.63655

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.47064	0.00670	0.63529	0.03567	0.62354	-0.00483	0.02209	0.10547	0.23442
#2	7.51425	0.00875	0.64022	0.03348	0.62778	-0.00389	0.01777	0.10531	0.23585
Mean	**7.49244**	**0.00773**	**0.63775**	**0.03457**	**0.62566**	**-0.00436**	**0.01993**	**0.10539**	**0.23514**
%RSD	0.41159	18.70408	0.54695	4.49379	0.47978	15.23177	15.33240	0.10518	0.42839

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.04125	0.07173	0.00232
#2	0.04129	0.06996	0.00858
Mean	**0.04127**	**0.07085**	**0.00545**
%RSD	0.06404	1.76289	81.27912

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Method : Paragon File : 100309A Printed : 3/9/2010 17:10:09
SampleId1 : 1003063-16L 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:47:00

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE67

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00054	8.69629	0.01002	0.00338	0.14873	0.00076	-0.00653	29.56665	-0.00025
#2	-0.00097	8.76225	0.00661	0.00244	0.15027	0.00076	-0.00519	29.74056	-0.00043
Mean	**-0.00076**	**8.72927**	**0.00831**	**0.00291**	**0.14950**	**0.00076**	**-0.00586**	**29.65360**	**-0.00034**
%RSD	39.91062	0.53427	29.07348	22.70482	0.72885	0.17090	16.24687	0.41470	37.80654

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00718	0.00823	0.01046	21.96931	1.23649	0.01209	7.04253	0.29700	-0.00018
#2	0.00724	0.00848	0.01068	22.12701	1.23153	0.01215	7.08681	0.29973	-0.00067
Mean	**0.00721**	**0.00835**	**0.01057**	**22.04816**	**1.23401**	**0.01212**	**7.06467**	**0.29837**	**-0.00043**
%RSD	0.54149	2.15654	1.45433	0.50574	0.28457	0.32984	0.44320	0.64710	81.10689

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.14291	0.01271	0.49352	0.01594	0.01536	0.71464	0.00102	0.00028	0.00069
#2	0.14506	0.01260	0.49992	0.01689	0.01370	0.74061	-0.00143	0.00153	0.00196
Mean	**0.14399**	**0.01266**	**0.49672**	**0.01641**	**0.01453**	**0.72762**	**-0.00021**	**0.00090**	**0.00132**
%RSD	1.05597	0.60675	0.91055	4.11872	8.07810	2.52422	835.84255	97.47084	67.42773

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.98236	0.00053	0.12768	0.00694	0.13266	-0.00228	-0.01168	0.02090	0.04975
#2	1.99351	0.00233	0.12884	0.00699	0.13266	0.00022	-0.01178	0.02125	0.05089
Mean	**1.98793**	**0.00143**	**0.12826**	**0.00697**	**0.13266**	**-0.00103**	**-0.01173**	**0.02107**	**0.05032**
%RSD	0.39668	89.33349	0.64328	0.48199	0.00285	171.74289	0.64721	1.17364	1.59884

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00782	0.01555	0.00056
#2	0.00781	0.01476	0.00181
Mean	**0.00782**	**0.01515**	**0.00118**
%RSD	0.04617	3.67932	75.06998

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:09
SampleId1 : 1003063-16MS SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:48:48
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE68

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09361	69.36443	1.92175	0.84013	2.61581	0.04911	0.00717	186.96848	0.04612
#2	0.09356	69.62754	1.92318	0.84341	2.62600	0.04913	0.00227	187.09555	0.04681

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09358	69.49599	1.92246	0.84177	2.62090	0.04912	0.00472	187.03202	0.04646
#2	0.09358	69.49599	1.92246	0.84177	2.62090	0.04912	0.00472	187.03202	0.04646
Mean	**0.09358**	**69.49599**	**1.92246**	**0.84177**	**2.62090**	**0.04912**	**0.00472**	**187.03202**	**0.04646**
%RSD	0.04069	0.26771	0.05261	0.27533	0.27486	0.03006	73.39833	0.04804	1.04740

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48750	0.23607	0.32002	118.47910	49.99097	0.61721	74.83315	1.89483	0.90040
#2	0.48854	0.23634	0.32069	118.64687	50.15078	0.61884	74.86896	1.89939	0.90180
Mean	**0.48802**	**0.23620**	**0.32035**	**118.56298**	**50.07088**	**0.61803**	**74.85105**	**1.89711**	**0.90110**
%RSD	0.15095	0.08029	0.14813	0.10006	0.22568	0.18646	0.03383	0.16975	0.11012

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	40.99712	0.51960	2.32239	0.50216	0.50307	3.39085	0.22741	1.78325	1.77806
#2	41.06699	0.52086	2.33363	0.50506	0.50592	3.39953	0.22980	1.80456	1.78692
Mean	**41.03206**	**0.52023**	**2.32801**	**0.50361**	**0.50450**	**3.39519**	**0.22861**	**1.79391**	**1.78249**
%RSD	0.12041	0.17085	0.34140	0.40803	0.39985	0.18063	0.73981	0.84012	0.35133

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	11.53865	0.48601	1.12204	0.02897	1.09777	1.91836	0.03611	0.58263	0.65490
#2	11.56239	0.48950	1.12696	0.02993	1.10198	1.91533	0.01083	0.58245	0.65619
Mean	**11.55052**	**0.48775**	**1.12450**	**0.02945**	**1.09987**	**1.91684**	**0.02347**	**0.58254**	**0.65554**
%RSD	0.14539	0.50668	0.30919	2.28741	0.27076	0.11164	76.17654	0.02114	0.13883

	Zr	Pb	Se
	ppm	calc	calc
#1	0.05143	0.50276	1.77979
#2	0.05146	0.50564	1.79280
Mean	**0.05145**	**0.50420**	**1.78629**
%RSD	0.05046	0.40257	0.51479

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:10
SampleId1 : 1003063-16MSD SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 13:50:36
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE69

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09582	72.84061	1.95748	0.85566	2.65864	0.05047	0.00763	197.61066	0.04814
#2	0.09508	73.06858	1.95947	0.85878	2.67122	0.05060	0.00514	197.67210	0.04776
Mean	**0.09545**	**72.95459**	**1.95847**	**0.85722**	**2.66493**	**0.05053**	**0.00639**	**197.64138**	**0.04795**
%RSD	0.54410	0.22096	0.07205	0.25750	0.33384	0.17815	27.61710	0.02198	0.56128

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49894	0.24395	0.32494	127.17182	50.69025	0.62233	78.37580	1.95502	0.91137
#2	0.49866	0.24465	0.32611	127.39610	50.84227	0.62511	78.54915	1.96024	0.91209
Mean	**0.49880**	**0.24430**	**0.32552**	**127.28396**	**50.76626**	**0.62372**	**78.46248**	**1.95763**	**0.91173**

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%RSD	0.04010	0.20190	0.25467	0.12459	0.21174	0.31584	0.15622	0.18833	0.05644

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	41.20379	0.53754	2.45024	0.52138	0.51162	3.58023	0.21867	1.82254	1.77837
#2	41.34180	0.53796	2.47007	0.51760	0.51945	3.58023	0.21396	1.80803	1.79140
Mean	**41.27280**	**0.53775**	**2.46016**	**0.51949**	**0.51553**	**3.58023**	**0.21631**	**1.81529**	**1.78489**
%RSD	0.23645	0.05563	0.57002	0.51482	1.07427	0.00000	1.53861	0.56536	0.51616

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	14.89223	0.50558	1.15665	0.03039	1.18340	1.95287	0.03808	0.59993	0.68651
#2	14.94376	0.49918	1.16181	0.02838	1.18727	1.95736	0.01967	0.59978	0.68522
Mean	**14.91799**	**0.50238**	**1.15923**	**0.02939**	**1.18533**	**1.95512**	**0.02888**	**0.59985**	**0.68587**
%RSD	0.24425	0.90098	0.31483	4.82755	0.23111	0.16256	45.07994	0.01703	0.13273

	Zr	Pb	Se
	ppm	calc	calc
#1	0.05264	0.51487	1.79308
#2	0.05214	0.51883	1.79694
Mean	**0.05239**	**0.51685**	**1.79501**
%RSD	0.68654	0.54239	0.15194

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:10
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/9/2010 13:52:24
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19914	49.69719	0.50921	0.96263	0.97211	0.49250	0.50163	49.77652	0.49382
#2	0.20012	49.87394	0.50798	0.96786	0.97507	0.49298	0.51239	49.79315	0.49534
Mean	**0.19963**	**49.78557**	**0.50860**	**0.96525**	**0.97359**	**0.49274**	**0.50701**	**49.78483**	**0.49458**
%RSD	0.34991	0.25105	0.17107	0.38313	0.21479	0.06829	1.50041	0.02362	0.21762

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49601	0.98534	1.00860	20.08503	49.57031	0.50875	50.61704	0.96479	0.97861
#2	0.49729	0.98579	1.01315	20.10919	49.67196	0.50977	50.71375	0.96708	0.98123
Mean	**0.49665**	**0.98556**	**1.01087**	**20.09711**	**49.62114**	**0.50926**	**50.66539**	**0.96594**	**0.97992**
%RSD	0.18194	0.03262	0.31818	0.08501	0.14485	0.14240	0.13497	0.16781	0.18947

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.76171	1.00057	5.02095	0.96169	0.95813	4.86162	0.49332	0.97893	0.97076
#2	48.86237	1.00140	5.04075	0.96126	0.95227	4.87608	0.49346	0.98558	0.97814
Mean	**48.81204**	**1.00098**	**5.03085**	**0.96147**	**0.95520**	**4.86885**	**0.49339**	**0.98226**	**0.97445**
%RSD	0.14582	0.05900	0.27832	0.03140	0.43359	0.21013	0.01959	0.47907	0.53603

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ted: 3/9/2010 17:10:40 User: ROY FRENCH

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.67130	1.00139	0.48531	0.13016	0.47112	0.51248	4.77998	0.48085	1.00230
#2	4.69353	1.00187	0.48665	0.12957	0.47204	0.50981	4.78736	0.48194	0.99979
Mean	**4.68241**	**1.00163**	**0.48598**	**0.12987**	**0.47158**	**0.51114**	**4.78367**	**0.48139**	**1.00105**
%RSD	0.33566	0.03406	0.19429	0.32379	0.13796	0.36988	0.10914	0.16075	0.17733

	Zr	Pb	Se
	ppm	calc	calc
#1	0.96712	0.95931	0.97348
#2	0.96856	0.95526	0.98062
Mean	**0.96784**	**0.95729**	**0.97705**
%RSD	0.10525	0.29907	0.51696

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:11
SampleId1 : CCB SampleId2 : [CB]
Analysis commenced : 3/9/2010 13:55:31
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00023	0.07919	0.00174	0.00139	-0.00014	0.00019	-0.00470	0.03741	-0.00007
#2	0.00076	0.08395	0.00133	0.00081	0.00011	0.00022	-0.00171	0.05062	0.00018
Mean	**0.00026**	**0.08157**	**0.00153**	**0.00110**	**-0.00002**	**0.00020**	**-0.00321**	**0.04402**	**0.00005**
%RSD	261.77362	4.12322	18.85049	37.55277	1182.97578	10.06202	65.90723	21.21810	317.74251

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00009	0.00018	-0.00069	0.02628	-0.31658	0.00131	0.02658	0.00033	-0.00104
#2	0.00041	0.00043	-0.00056	0.03477	-0.31753	0.00133	0.04006	0.00064	-0.00062
Mean	**0.00025**	**0.00031**	**-0.00063**	**0.03052**	**-0.31705**	**0.00132**	**0.03332**	**0.00048**	**-0.00083**
%RSD	88.96709	58.68056	14.24973	19.67533	0.21164	1.21232	28.60786	44.12517	35.28406

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.18365	-0.00057	0.00346	-0.00056	-0.00045	0.00339	-0.00057	-0.00792	-0.00068
#2	-0.18085	-0.00029	-0.00292	0.00303	-0.00087	-0.00815	0.00002	0.00583	-0.00206
Mean	**-0.18225**	**-0.00043**	**0.00027**	**0.00124**	**-0.00066**	**-0.00238**	**-0.00028**	**-0.00104**	**-0.00137**
%RSD	1.08598	47.63937	1666.65985	205.18810	45.95630	342.69413	152.71296	931.96298	71.15417

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00998	-0.00197	-0.00154	-0.00236	-0.00066	-0.00476	-0.01598	-0.00005	0.00027
#2	-0.00600	-0.00064	-0.00140	-0.00325	-0.00043	0.00406	0.00770	0.00054	0.00020
Mean	**-0.00799**	**-0.00131**	**-0.00147**	**-0.00280**	**-0.00054**	**-0.00035**	**-0.00414**	**0.00024**	**0.00023**
%RSD	35.19860	71.73276	6.76127	22.49694	29.22412	1773.55793	404.34300	168.63763	21.53117

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	Zr	Pb	SeCH
	ppm	calc	calc
#1	-0.00002	-0.00048	-0.00309
#2	0.00048	0.00043	0.00057
Mean	**0.00023**	**-0.00003**	**-0.00126**
%RSD	152.23296	2251.96283	205.01246

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:11
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/9/2010 14:17:09
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19426	49.30443	0.48282	0.92306	0.95414	0.49019	0.48104	47.94527	0.46015
#2	0.19266	49.20266	0.49072	0.92520	0.95341	0.48939	0.47125	47.84447	0.46077
Mean	**0.19346**	**49.25355**	**0.48677**	**0.92413**	**0.95378**	**0.48979**	**0.47614**	**47.89487**	**0.46046**
%RSD	0.58249	0.14611	1.14808	0.16424	0.05428	0.11533	1.45391	0.14881	0.09540

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48576	0.97254	0.97743	19.84012	48.70983	0.50614	49.85464	0.96670	0.94336
#2	0.48568	0.97214	0.97722	19.80555	48.61141	0.50483	49.81704	0.96628	0.94365
Mean	**0.48572**	**0.97234**	**0.97732**	**19.82284**	**48.66062**	**0.50549**	**49.83584**	**0.96649**	**0.94350**
%RSD	0.01128	0.02934	0.01525	0.12330	0.14301	0.18424	0.05335	0.03075	0.02143

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.55068	0.92438	4.96568	0.94278	0.96296	4.91660	0.46426	0.96690	0.98884
#2	48.45004	0.92351	4.97248	0.94222	0.95745	4.88621	0.46665	0.97131	0.98106
Mean	**48.50036**	**0.92394**	**4.96908**	**0.94250**	**0.96021**	**4.90140**	**0.46546**	**0.96910**	**0.98495**
%RSD	0.14673	0.06668	0.09684	0.04239	0.40575	0.43835	0.36299	0.32164	0.55865

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.73205	0.96113	0.47294	0.13098	0.47940	0.48889	4.79347	0.47400	1.01643
#2	4.72407	0.95799	0.47243	0.12768	0.47784	0.48648	4.78560	0.47318	1.01428
Mean	**4.72806**	**0.95956**	**0.47268**	**0.12933**	**0.47862**	**0.48768**	**4.78953**	**0.47359**	**1.01536**
%RSD	0.11926	0.23143	0.07689	1.80343	0.22998	0.34853	0.11618	0.12162	0.14987

	Zr	Pb	Se
	ppm	calc	calc
#1	0.94470	0.95624	0.98153
#2	0.94320	0.95238	0.97781
Mean	**0.94395**	**0.95431**	**0.97967**
%RSD	0.11231	0.28625	0.26868

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:11

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SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/9/2010 14:19:01
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00016	0.04258	0.00296	0.00003	0.00003	0.00015	-0.00133	0.03328	-0.00014
#2	0.00019	0.02403	0.00029	0.00054	-0.00025	0.00003	-0.00440	0.01835	0.00013
Mean	**0.00017**	**0.03330**	**0.00163**	**0.00028**	**-0.00011**	**0.00009**	**-0.00287**	**0.02581**	**0.00000**
%RSD	13.97713	39.40280	116.33609	126.88681	175.11472	98.36553	75.87622	40.90025	4311.09232

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00028	0.00048	0.00024	0.02291	-0.33342	0.00133	0.03630	0.00060	0.00044
#2	0.00049	0.00025	0.00031	0.01752	-0.34291	0.00126	0.02194	0.00033	-0.00011
Mean	**0.00039**	**0.00036**	**0.00028**	**0.02021**	**-0.33817**	**0.00130**	**0.02912**	**0.00047**	**0.00017**
%RSD	38.78913	44.72466	18.06908	18.87091	1.98432	3.85040	34.87905	40.17646	230.74242

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.16970	0.00008	-0.00181	0.00134	0.00091	0.00339	-0.00211	0.00804	-0.00114
#2	-0.18380	-0.00073	-0.00241	0.00134	-0.00043	0.00483	-0.00110	-0.00346	-0.00075
Mean	**-0.17675**	**-0.00033**	**-0.00211**	**0.00134**	**0.00024**	**0.00411**	**-0.00161**	**0.00229**	**-0.00095**
%RSD	5.63885	174.67183	20.37050	0.20069	397.76044	24.81695	44.41521	354.46419	28.98689

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00522	-0.00173	-0.00147	-0.00529	-0.00066	0.00336	-0.00463	0.00008	0.00084
#2	-0.00391	-0.00040	-0.00161	-0.00449	-0.00049	0.00311	-0.00265	0.00012	0.00041
Mean	**-0.00456**	**-0.00107**	**-0.00154**	**-0.00489**	**-0.00057**	**0.00324**	**-0.00364**	**0.00010**	**0.00062**
%RSD	20.28149	87.96646	6.14413	11.45978	21.78289	5.54402	38.40804	25.32479	48.29916

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00056	0.00106	0.00192
#2	0.00053	0.00016	-0.00165
Mean	**0.00055**	**0.00061**	**0.00013**
%RSD	3.74075	104.90916	1912.84756

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:12
SampleId1 : 1003063-7 100X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 14:20:53
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE1

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	0.00013	0.04568	-0.00183	0.00377	-0.00028	-0.00019	-0.00322	7.47499	-0.00041
#2	-0.00001	0.04989	-0.00008	0.00388	-0.00039	-0.00017	-0.00352	7.46155	-0.00040
Mean	**0.00006**	**0.04779**	**-0.00096**	**0.00383**	**-0.00034**	**-0.00018**	**-0.00337**	**7.46827**	**-0.00040**
%RSD	174.90252	6.23701	129.12762	2.15923	23.49587	7.13933	6.12131	0.12725	2.61047

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00006	-0.00050	-0.00004	0.13266	0.02611	0.00648	19.30816	0.01591	-0.00155
#2	-0.00028	-0.00042	-0.00048	0.13394	0.01591	0.00646	19.23065	0.01572	-0.00137
Mean	**-0.00011**	**-0.00046**	**-0.00026**	**0.13330**	**0.02101**	**0.00647**	**19.26940**	**0.01581**	**-0.00146**
%RSD	221.90397	11.42019	117.98098	0.68045	34.31060	0.18542	0.28443	0.84525	8.75058

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	13.87376	0.00000	-0.00079	0.00070	-0.00070	34.94422	-0.00081	-0.00252	-0.00279
#2	13.92427	-0.00090	-0.00211	0.00082	-0.00009	35.02089	-0.00081	-0.00376	0.00071
Mean	**13.89902**	**-0.00045**	**-0.00145**	**0.00076**	**-0.00040**	**34.98256**	**-0.00081**	**-0.00314**	**-0.00104**
%RSD	0.25696	142.85771	64.15981	11.04320	108.25914	0.15497	0.06712	28.01471	238.69206

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.14773	-0.00209	0.21282	-0.01221	0.00180	0.00210	0.08313	0.00014	-0.00009
#2	0.15443	-0.00137	0.21297	-0.01503	0.00009	0.00518	0.08708	-0.00012	-0.00002
Mean	**0.15108**	**-0.00173**	**0.21290**	**-0.01362**	**0.00095**	**0.00364**	**0.08511**	**0.00001**	**-0.00005**
%RSD	3.13765	29.63508	0.04708	14.64014	127.48843	59.93079	3.27925	1658.79610	98.77316

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00053	-0.00023	-0.00270
#2	0.00050	0.00021	-0.00078
Mean	**0.00052**	**-0.00001**	**-0.00174**
%RSD	4.46914	2884.45787	78.19152

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:12
SampleId1 : 1002238-2A SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 14:22:40
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.11353	2.29320	2.27672	1.09613	2.18966	0.08018	-0.00746	44.80066	0.07925
#2	0.11284	2.20674	2.18740	1.05050	2.10029	0.07823	-0.00242	43.15008	0.07785
Mean	**0.11319**	**2.24997**	**2.23206**	**1.07331**	**2.14498**	**0.07920**	**-0.00494**	**43.97537**	**0.07855**
%RSD	0.43007	2.71704	2.82962	3.00661	2.94636	1.74095	72.01213	2.65407	1.26271

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.56383	0.24188	0.30864	1.11932	42.38194	0.57851	46.45160	0.56354	1.08748

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#2	0.54421	0.23407	0.29821	1.08105	40.81240	0.55529	44.73609	0.54445	1.04696
Mean	**0.55402**	**0.23798**	**0.30343**	**1.10019**	**41.59717**	**0.56690**	**45.59385**	**0.55399**	**1.06722**
%RSD	2.50403	2.32175	2.43132	2.45969	2.66805	2.89666	2.66056	2.43685	2.68465

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	42.43357	0.53789	0.03387	0.54754	0.59270	0.00772	0.52005	2.31419	2.46505
#2	40.88909	0.51637	0.03205	0.53266	0.58140	-0.00094	0.49977	2.23690	2.42678
Mean	**41.66133**	**0.52713**	**0.03296**	**0.54010**	**0.58705**	**0.00339**	**0.50991**	**2.27554**	**2.44592**
%RSD	2.62140	2.88600	3.91443	1.94778	1.36138	180.59209	2.81208	2.40179	1.10618

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.22271	0.55834	0.56112	-0.01447	0.55184	2.25823	-0.04337	0.57362	0.56620
#2	2.14356	0.53736	0.53925	-0.01461	0.53084	2.17196	-0.03101	0.55281	0.54727
Mean	**2.18313**	**0.54785**	**0.55018**	**-0.01454**	**0.54134**	**2.21510**	**-0.03719**	**0.56321**	**0.55674**
%RSD	2.56385	2.70775	2.81044	0.68049	2.74262	2.75389	23.50471	2.61253	2.40439

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00127	0.57766	2.41481
#2	-0.00079	0.56517	2.36355
Mean	**-0.00103**	**0.57141**	**2.38918**
%RSD	33.27356	1.54595	1.51710

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:12
SampleId1 : 1003039-1 2X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 14:24:27
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE3

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00019	43.65099	0.00073	0.20559	0.15352	0.00059	0.00242	49.42103	-0.00019
#2	-0.00067	43.50871	0.00177	0.20637	0.15248	0.00058	0.00121	49.27834	-0.00048
Mean	**-0.00024**	**43.57985**	**0.00125**	**0.20598**	**0.15300**	**0.00058**	**0.00182**	**49.34968**	**-0.00033**
%RSD	254.80260	0.23085	58.64187	0.26751	0.47911	1.70113	46.96432	0.20446	62.32795

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.05766	0.04660	0.33662	111.25535	0.51730	0.03236	49.54489	1.06284	0.00018
#2	0.05764	0.04683	0.33436	110.82396	0.51185	0.03215	49.45201	1.05921	-0.00091
Mean	**0.05765**	**0.04671**	**0.33549**	**111.03965**	**0.51458**	**0.03226**	**49.49845**	**1.06102**	**-0.00036**
%RSD	0.02821	0.33640	0.47507	0.27471	0.74852	0.47009	0.13268	0.24214	211.15814

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.74611	0.11461	1.41515	0.00873	0.00770	0.34959	0.00146	0.00300	0.00401
#2	4.72056	0.11442	1.41312	0.01015	0.00659	0.34671	0.00127	0.00383	0.00087

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Mean	**4.73333**	**0.11451**	**1.41414**	**0.00944**	**0.00714**	**0.34815**	**0.00136**	**0.00342**	**0.00244**
%RSD	0.38174	0.11926	0.10186	10.61441	11.00322	0.58603	9.87600	17.10950	91.15761

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.93645	0.00702	0.13401	-0.00587	5.63984	-0.00852	0.00352	0.18196	0.09605
#2	3.93929	0.00669	0.13323	-0.00410	5.61227	-0.00469	0.01665	0.18129	0.09598
Mean	**3.93787**	**0.00685**	**0.13362**	**-0.00498**	**5.62605**	**-0.00661**	**0.01008**	**0.18162**	**0.09601**
%RSD	0.05112	3.40064	0.41172	25.00980	0.34651	41.02436	92.02102	0.25920	0.05239

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.05418	0.00804	0.00367
#2	0.05366	0.00777	0.00185
Mean	**0.05392**	**0.00791**	**0.00276**
%RSD	0.68303	2.40942	46.60159

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:12
SampleId1 : 1003039-1D 2X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 14:26:14
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE4

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00007	50.14411	0.00229	0.19320	0.13974	0.00059	0.00532	59.02407	-0.00024
#2	0.00041	49.85797	-0.00053	0.19152	0.13948	0.00058	0.00271	58.90776	0.00035
Mean	**0.00017**	**50.00104**	**0.00088**	**0.19236**	**0.13961**	**0.00058**	**0.00402**	**58.96591**	**0.00005**
%RSD	203.05094	0.40466	226.15245	0.61585	0.12771	1.04196	45.88412	0.13948	769.91732

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.06063	0.05002	0.35269	118.50270	0.47940	0.03104	51.14180	1.24350	-0.00005
#2	0.06067	0.05070	0.35159	118.32220	0.47419	0.03097	51.01083	1.24220	-0.00101
Mean	**0.06065**	**0.05036**	**0.35214**	**118.41245**	**0.47680**	**0.03100**	**51.07631**	**1.24285**	**-0.00053**
%RSD	0.04661	0.95193	0.22087	0.10779	0.77276	0.15446	0.18132	0.07413	127.22331

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.46358	0.11862	1.51682	0.00948	0.00992	0.30343	0.00327	-0.00034	-0.00062
#2	4.44242	0.11763	1.52406	0.01010	0.00653	0.29622	0.00188	0.00412	-0.00316
Mean	**4.45300**	**0.11812**	**1.52044**	**0.00979**	**0.00823**	**0.29982**	**0.00257**	**0.00189**	**-0.00189**
%RSD	0.33597	0.59253	0.33645	4.47050	29.11038	1.70117	38.05588	167.25028	94.77963

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.17192	0.00619	0.13826	-0.00408	6.03575	-0.00372	0.00056	0.22146	0.12386
#2	4.15051	0.00825	0.13795	-0.00588	6.02919	-0.00531	0.01894	0.22118	0.12507
Mean	**4.16121**	**0.00722**	**0.13810**	**-0.00498**	**6.03247**	**-0.00451**	**0.00975**	**0.22132**	**0.12447**

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%RSD	0.36381	20.13497	0.15573	25.57123	0.07688	24.81460	133.27338	0.08918	0.68719

	Zr	Pb	Se
	ppm	calc	calc
#1	0.05883	0.00977	-0.00053
#2	0.05909	0.00772	-0.00074
Mean	**0.05896**	**0.00875**	**-0.00064**
%RSD	0.30906	16.59469	23.06741

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:13
SampleId1 : 1003039-1L 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 14:28:00
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE5

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00030	8.57453	0.00025	0.04081	0.02962	-0.00019	-0.00250	9.67735	-0.00017
#2	0.00041	8.58360	-0.00101	0.03952	0.02967	-0.00019	-0.00240	9.69385	-0.00034
Mean	**0.00036**	**8.57906**	**-0.00038**	**0.04016**	**0.02964**	**-0.00019**	**-0.00245**	**9.68560**	**-0.00025**
%RSD	20.48925	0.07475	234.84334	2.26286	0.13356	2.27505	2.91820	0.12041	44.80869

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01123	0.00878	0.06710	20.32963	-0.27127	0.00612	9.61402	0.21240	-0.00099
#2	0.01141	0.00858	0.06673	20.37569	-0.27459	0.00614	9.62776	0.21297	-0.00119
Mean	**0.01132**	**0.00868**	**0.06691**	**20.35266**	**-0.27293**	**0.00613**	**9.62089**	**0.21268**	**-0.00109**
%RSD	1.13135	1.58628	0.38828	0.16004	0.86041	0.26091	0.10095	0.18894	13.44799

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.65932	0.02273	0.27360	0.00008	0.00120	0.06541	-0.00156	-0.00096	-0.00040
#2	0.65957	0.02140	0.27562	0.00216	0.00105	0.06397	0.00041	0.00056	-0.00043
Mean	**0.65945**	**0.02206**	**0.27461**	**0.00112**	**0.00113**	**0.06469**	**-0.00057**	**-0.00020**	**-0.00042**
%RSD	0.02683	4.25429	0.52245	131.62311	9.48204	1.57666	242.37283	538.08855	4.81446

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.78831	-0.00015	0.02523	-0.00552	1.13043	-0.00023	-0.01648	0.03530	0.01839
#2	0.79203	0.00069	0.02531	-0.00591	1.13264	0.00134	-0.00961	0.03555	0.01889
Mean	**0.79017**	**0.00027**	**0.02527**	**-0.00571**	**1.13154**	**0.00056**	**-0.01304**	**0.03542**	**0.01864**
%RSD	0.33320	221.17046	0.21708	4.88049	0.13808	199.36762	37.28163	0.50502	1.88733

	Zr	Pb	Se
	ppm	calc	calc
#1	0.01069	0.00083	-0.00059
#2	0.01048	0.00142	-0.00010
Mean	**0.01058**	**0.00113**	**-0.00035**
%RSD	1.39640	37.29340	99.82765

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ted: 3/9/2010 17:10:40 User: ROY FRENCH
Method : Paragon File : 100309A Printed : 3/9/2010 17:10:13
SampleId1 : 1003039-1MS 2X SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 14:29:47
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.04962	63.20268	0.98687	0.80888	1.18648	0.02501	0.00350	127.90192	0.02436
#2	0.04943	62.57584	0.97565	0.80361	1.17585	0.02481	0.00156	126.91292	0.02417
Mean	**0.04953**	**62.88926**	**0.98126**	**0.80625**	**1.18116**	**0.02491**	**0.00253**	**127.40742**	**0.02427**
%RSD	0.27075	0.70480	0.80864	0.46195	0.63650	0.57317	54.09363	0.54889	0.53187

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.31915	0.29505	0.52723	144.88652	21.54383	0.31464	84.15780	2.15413	0.48358
#2	0.31630	0.29330	0.52013	143.54035	21.30195	0.31157	83.45897	2.13904	0.47822
Mean	**0.31772**	**0.29418**	**0.52368**	**144.21344**	**21.42289**	**0.31311**	**83.80838**	**2.14658**	**0.48090**
%RSD	0.63568	0.42174	0.95937	0.66005	0.79837	0.69221	0.58961	0.49717	0.78942

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	26.78916	0.38589	1.69305	0.24000	0.24693	0.32651	0.16316	0.96874	0.96739
#2	26.50889	0.38320	1.68173	0.23793	0.24595	0.33661	0.15920	0.95661	0.97171
Mean	**26.64902**	**0.38454**	**1.68739**	**0.23896**	**0.24644**	**0.33156**	**0.16118**	**0.96268**	**0.96955**
%RSD	0.74366	0.49540	0.47423	0.61026	0.27898	2.15370	1.73673	0.89108	0.31544

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.43935	0.25297	0.46187	-0.00264	6.55780	0.98107	0.00974	0.52341	0.39102
#2	4.39511	0.25568	0.45769	-0.00311	6.50723	0.98187	0.02793	0.51802	0.38902
Mean	**4.41723**	**0.25432**	**0.45978**	**-0.00287**	**6.53251**	**0.98147**	**0.01883**	**0.52071**	**0.39002**
%RSD	0.70821	0.75406	0.64310	11.62044	0.54743	0.05697	68.29242	0.73197	0.36209

	Zr	Pb	Se
	ppm	calc	calc
#1	0.07173	0.24462	0.96784
#2	0.07135	0.24328	0.96668
Mean	**0.07154**	**0.24395**	**0.96726**
%RSD	0.37883	0.38704	0.08443

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:13
SampleId1 : 1003039-1MSD 2X SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 14:31:34
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE7

Final concentrations

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.04677	43.89321	0.95762	0.60670	1.11088	0.02377	-0.00473	68.68817	0.02271
#2	0.04755	43.66172	0.95171	0.60456	1.10818	0.02366	0.00311	68.51427	0.02297
Mean	**0.04716**	**43.77747**	**0.95467**	**0.60563**	**1.10953**	**0.02372**	**-0.00081**	**68.60122**	**0.02284**
%RSD	1.17163	0.37391	0.43767	0.25043	0.17247	0.31557	683.15927	0.17925	0.78983

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.28132	0.14357	0.41414	93.81763	20.07174	0.28258	62.09654	1.25193	0.47098
#2	0.28072	0.14355	0.41189	93.58104	19.98880	0.28179	61.88933	1.24829	0.46818
Mean	**0.28102**	**0.14356**	**0.41302**	**93.69934**	**20.03027**	**0.28218**	**61.99294**	**1.25011**	**0.46958**
%RSD	0.15167	0.00748	0.38471	0.17854	0.29279	0.19767	0.23635	0.20594	0.42178

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	24.29274	0.32274	1.18973	0.23004	0.24136	0.27458	0.15789	0.94102	0.94875
#2	24.20150	0.32269	1.18118	0.23199	0.23694	0.27746	0.16001	0.93999	0.94985
Mean	**24.24712**	**0.32271**	**1.18546**	**0.23101**	**0.23915**	**0.27602**	**0.15895**	**0.94051**	**0.94930**
%RSD	0.26610	0.01059	0.50994	0.59696	1.30445	0.73914	0.94344	0.07747	0.08232

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.50871	0.24876	0.35930	-0.00799	5.40426	0.96122	-0.00878	0.39812	0.31330
#2	4.46863	0.24782	0.35780	-0.00573	5.38608	0.96095	-0.00418	0.39691	0.31166
Mean	**4.48867**	**0.24829**	**0.35855**	**-0.00686**	**5.39517**	**0.96108**	**-0.00648**	**0.39752**	**0.31248**
%RSD	0.63131	0.26874	0.29612	23.33387	0.23833	0.01949	50.19902	0.21533	0.37097

	Zr	Pb	Se
	ppm	calc	calc
#1	0.05566	0.23759	0.94617
#2	0.05578	0.23529	0.94657
Mean	**0.05572**	**0.23644**	**0.94637**
%RSD	0.15035	0.68582	0.02944

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:14
SampleId1 : 1003039-1A **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 14:33:20
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE8

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00016	85.43187	3.88094	2.21444	4.12467	0.09293	0.01191	169.67967	0.09423
#2	-0.00087	85.88432	3.90043	2.22524	4.15472	0.09328	0.00386	169.82260	0.09485
Mean	**-0.00036**	**85.65810**	**3.89069**	**2.21984**	**4.13969**	**0.09310**	**0.00789**	**169.75113**	**0.09454**
%RSD	202.79770	0.37350	0.35414	0.34411	0.51322	0.26582	72.24478	0.05954	0.46293

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.01920	0.45040	1.12020	203.20927	80.92233	1.17309	173.47394	2.77251	1.90105
#2	1.02150	0.45108	1.12765	203.76598	81.08897	1.17600	174.06771	2.78482	1.91225
Mean	**1.02035**	**0.45074**	**1.12393**	**203.48763**	**81.00565**	**1.17455**	**173.77083**	**2.77866**	**1.90665**
%RSD	0.15954	0.10676	0.46886	0.19345	0.14546	0.17493	0.24162	0.31331	0.41538

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	85.92204	1.07963	2.60096	0.91363	0.91114	0.64104	0.93316	3.83050	3.80237
#2	85.89994	1.08444	2.60208	0.90936	0.91348	0.62950	0.93546	3.83557	3.81679
Mean	**85.91099**	**1.08203**	**2.60152**	**0.91150**	**0.91231**	**0.63527**	**0.93431**	**3.83303**	**3.80958**
%RSD	0.01819	0.31412	0.03058	0.33160	0.18175	1.28489	0.17349	0.09350	0.26760

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.95411	0.98820	1.19202	0.00270	10.97803	3.82389	0.03566	1.26432	1.05475
#2	11.03716	0.98197	1.19958	-0.00084	11.03065	3.85557	0.02541	1.26797	1.05683
Mean	**10.99563**	**0.98509**	**1.19580**	**0.00093**	**11.00434**	**3.83973**	**0.03053**	**1.26615**	**1.05579**
%RSD	0.53410	0.44690	0.44705	269.98991	0.33813	0.58331	23.73382	0.20352	0.13938

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.09439	0.91197	3.81174
#2	0.09490	0.91211	3.82304
Mean	**0.09464**	**0.91204**	**3.81739**
%RSD	0.38565	0.01091	0.20939

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:14
SampleId1 : 1003055-5 10X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 14:35:07
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE9

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00048	6.18635	0.01619	0.01670	0.11634	0.00012	-0.00108	1.30363	0.00466
#2	-0.00045	6.02593	0.01619	0.01701	0.11382	0.00008	0.00110	1.26383	0.00448
Mean	**0.00002**	**6.10614**	**0.01619**	**0.01685**	**0.11508**	**0.00010**	**0.00001**	**1.28373**	**0.00457**
%RSD	3472.25598	1.85776	0.00000	1.30723	1.54899	26.28211	15518.63412	2.19222	2.76577

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01130	0.04257	0.12123	15.85288	-0.01301	0.00984	2.63325	0.35956	0.03364
#2	0.01133	0.04139	0.11891	15.47694	-0.03340	0.00959	2.56602	0.35125	0.03281
Mean	**0.01131**	**0.04198**	**0.12007**	**15.66491**	**-0.02321**	**0.00972**	**2.59963**	**0.35540**	**0.03323**
%RSD	0.19095	1.99842	1.36621	1.69697	62.12750	1.80999	1.82862	1.65345	1.76249

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	-0.11717	0.41977	0.33691	1.90954	1.98867	0.16494	0.01977	-0.00292	0.00221
#2	-0.12287	0.41091	0.33610	1.86275	1.94024	0.16494	0.02007	-0.00004	0.00534
Mean	**-0.12002**	**0.41534**	**0.33650**	**1.88615**	**1.96446**	**0.16494**	**0.01992**	**-0.00148**	**0.00377**
%RSD	3.35735	1.50779	0.17058	1.75403	1.74319	0.00000	1.07567	137.51307	58.62971

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.63258	0.03798	0.00375	-0.00191	0.67670	0.00019	0.01667	0.01520	0.72213
#2	0.61957	0.03341	0.00359	-0.00018	0.66051	-0.00187	0.02038	0.01478	0.70353
Mean	**0.62607**	**0.03570**	**0.00367**	**-0.00104**	**0.66861**	**-0.00084**	**0.01852**	**0.01499**	**0.71283**
%RSD	1.46836	9.03480	3.25847	116.91213	1.71191	174.15640	14.16404	2.02639	1.84507

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00445	1.96232	0.00050
#2	0.00425	1.91444	0.00355
Mean	**0.00435**	**1.93838**	**0.00202**
%RSD	3.16809	1.74671	106.44807

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:14
SampleId1 : 1003055-6 2X SampleId2 : [SAMPLE]
Analysis commenced : 3/9/2010 14:36:54
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE10

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00044	40.28911	0.00750	0.03341	0.58360	0.00324	0.00895	11.87902	0.00063
#2	0.00093	40.40962	0.01192	0.03376	0.58509	0.00324	0.00377	11.90510	0.00086
Mean	**0.00025**	**40.34936**	**0.00971**	**0.03358**	**0.58435**	**0.00324**	**0.00636**	**11.89206**	**0.00075**
%RSD	395.15065	0.21118	32.20833	0.73810	0.18019	0.11402	57.54329	0.15510	21.60765

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.05298	0.08482	0.02761	105.50650	6.81472	0.17189	25.27791	4.13083	0.00173
#2	0.05316	0.08596	0.02810	105.73558	6.83554	0.17245	25.36710	4.14395	0.00150
Mean	**0.05307**	**0.08539**	**0.02786**	**105.62104**	**6.82513**	**0.17217**	**25.32250**	**4.13739**	**0.00162**
%RSD	0.24245	0.93790	1.23651	0.15336	0.21566	0.23158	0.24907	0.22423	10.19291

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.26184	0.11048	2.25986	0.08813	0.09038	0.78968	0.00161	-0.00109	0.00303
#2	0.26409	0.11082	2.26374	0.08901	0.08968	0.79401	0.00219	0.00245	0.00448
Mean	**0.26296**	**0.11065**	**2.26180**	**0.08857**	**0.09003**	**0.79184**	**0.00190**	**0.00068**	**0.00376**
%RSD	0.60521	0.21599	0.12136	0.69856	0.54983	0.38660	21.63858	369.76516	27.26575

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	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.39030	0.00424	0.04619	0.01682	1.29423	-0.00248	0.00053	0.09737	0.30525

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#2	3.40357	0.00580	0.04632	0.01783	1.29699	-0.00329	0.02603	0.09802	0.30589
Mean	**3.39693**	**0.00502**	**0.04625**	**0.01733**	**1.29561**	**-0.00289**	**0.01328**	**0.09770**	**0.30557**
%RSD	0.27640	22.02698	0.19415	4.10471	0.15022	19.81039	135.79346	0.46701	0.14844

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.01557	0.08963	0.00166
#2	0.01610	0.08946	0.00381
Mean	**0.01584**	**0.08955**	**0.00273**
%RSD	2.37249	0.13866	55.56102

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:15
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/9/2010 14:38:44
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19721	49.66874	0.50004	0.94706	0.96197	0.50438	0.48808	49.67662	0.47305
#2	0.19814	49.75949	0.50590	0.95026	0.96442	0.50515	0.49099	49.71170	0.47555
Mean	**0.19767**	**49.71411**	**0.50297**	**0.94866**	**0.96320**	**0.50477**	**0.48953**	**49.69416**	**0.47430**
%RSD	0.33113	0.12908	0.82294	0.23855	0.17988	0.10772	0.42055	0.04991	0.37270

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.50117	0.99928	0.98718	20.35203	48.72571	0.50495	51.45705	0.98951	0.97073
#2	0.50179	1.00052	0.99445	20.37397	48.77161	0.50592	51.53139	0.99089	0.97650
Mean	**0.50148**	**0.99990**	**0.99081**	**20.36300**	**48.74866**	**0.50544**	**51.49422**	**0.99020**	**0.97362**
%RSD	0.08620	0.08756	0.51871	0.07617	0.06657	0.13629	0.10208	0.09824	0.41913

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.53868	0.96169	5.10346	0.97381	0.98056	4.99329	0.48018	0.99988	0.99816
#2	48.63164	0.96500	5.09954	0.97674	0.97731	5.02078	0.48290	1.00673	1.00358
Mean	**48.58516**	**0.96335**	**5.10150**	**0.97528**	**0.97893**	**5.00703**	**0.48154**	**1.00330**	**1.00087**
%RSD	0.13528	0.24342	0.05433	0.21293	0.23493	0.38826	0.39894	0.48262	0.38331

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.79341	0.99207	0.47849	0.13419	0.48447	0.49595	4.80742	0.48364	1.05920
#2	4.81636	0.99787	0.47963	0.13021	0.48606	0.50812	4.85033	0.48472	1.05955
Mean	**4.80488**	**0.99497**	**0.47906**	**0.13220**	**0.48526**	**0.50204**	**4.82888**	**0.48418**	**1.05938**
%RSD	0.33779	0.41221	0.16756	2.12838	0.23150	1.71458	0.62825	0.15702	0.02395

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.96192	0.97831	0.99873
#2	0.96380	0.97712	1.00463

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Mean	**0.96286**	**0.97772**	**1.00168CH**
%RSD	0.13817	0.08616	0.41643

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:15
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/9/2010 14:40:37
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00044	0.04794	0.00033	0.00268	-0.00009	0.00021	-0.00825	0.03110	-0.00007
#2	-0.00020	0.05653	0.00025	0.00221	0.00000	0.00026	0.00040	0.03305	-0.00008
Mean	**-0.00032**	**0.05224**	**0.00029**	**0.00244**	**-0.00004**	**0.00024**	**-0.00393**	**0.03207**	**-0.00007**
%RSD	52.83844	11.63785	18.21815	13.52357	137.93044	14.63015	155.90731	4.30469	8.36910

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00009	0.00010	0.00011	0.02120	-0.30021	0.00139	0.03166	0.00048	-0.00039
#2	0.00009	0.00043	-0.00012	0.02302	-0.30780	0.00140	0.03387	0.00064	0.00077
Mean	**0.00000**	**0.00027**	**-0.00001**	**0.02211**	**-0.30400**	**0.00140**	**0.03277**	**0.00056**	**0.00019**
%RSD	13004.60606	86.23929	2050.06166	5.80787	1.76572	0.42932	4.76889	19.08520	427.94770

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.16865	-0.00038	-0.00191	-0.00216	0.00121	-0.00238	-0.00057	-0.00547	0.00077
#2	-0.16965	-0.00010	-0.00110	0.00093	0.00050	-0.00094	-0.00044	0.00072	-0.00213
Mean	**-0.16915**	**-0.00024**	**-0.00150**	**-0.00062**	**0.00086**	**-0.00166**	**-0.00051**	**-0.00238**	**-0.00068**
%RSD	0.41788	80.82038	38.15152	354.78451	58.54494	61.44975	17.58354	184.38255	300.97975

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00527	0.00273	-0.00149	-0.00400	-0.00074	-0.00020	-0.01647	-0.00007	0.00126
#2	-0.00515	-0.00052	-0.00149	-0.00386	-0.00049	0.00583	-0.00216	0.00020	0.00183
Mean	**-0.00521**	**0.00110**	**-0.00149**	**-0.00393**	**-0.00061**	**0.00282**	**-0.00932**	**0.00006**	**0.00155**
%RSD	1.64503	208.45455	0.00000	2.54884	28.37726	151.34160	108.60069	287.46080	25.96798

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00048	0.00009	-0.00131
#2	0.00043	0.00065	-0.00118
Mean	**0.00046**	**0.00037**	**-0.00125**
%RSD	7.04052	106.60386	7.26541

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:15
SampleId1 : 1003055-7 2X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 14:42:24
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE11

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Final concentrations:**40** **User: ROY FRENCH**

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00538	38.66439	0.05904	0.02601	0.41742	0.00318	-0.01855	9.37878	-0.00013
#2	-0.00223	38.66912	0.06235	0.02651	0.41728	0.00322	-0.00852	9.39538	0.00088
Mean	**-0.00381**	**38.66675**	**0.06070**	**0.02626**	**0.41735**	**0.00320**	**-0.01353**	**9.38708**	**0.00038**
%RSD	58.55108	0.00866	3.85398	1.36340	0.02378	0.84425	52.38452	0.12508	189.93543

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03781	0.10046	0.18808	110.16546	4.00390	0.11612	18.53379	2.19106	-0.00088
#2	0.04004	0.10275	0.19033	110.15892	4.01095	0.11590	18.60174	2.19183	0.00145
Mean	**0.03892**	**0.10161**	**0.18921**	**110.16219**	**4.00742**	**0.11601**	**18.56777**	**2.19145**	**0.00028**
%RSD	4.04926	1.59280	0.84306	0.00420	0.12449	0.13328	0.25876	0.02499	581.95265

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.25083	0.08567	2.06563	0.20330	0.25254	0.94410	-0.01233	-0.02132	0.01712
#2	0.25523	0.08722	2.07563	0.21912	0.23663	0.94554	-0.00412	-0.00938	0.00837
Mean	**0.25303**	**0.08644**	**2.07063**	**0.21121**	**0.24458**	**0.94482**	**-0.00822**	**-0.01535**	**0.01275**
%RSD	1.22994	1.27364	0.34165	5.29597	4.60048	0.10801	70.63512	55.01910	48.50307

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.10368	0.00347	0.03951	0.02352	1.43672	-0.01548	-0.09591	0.11687	0.35772
#2	3.13430	0.01010	0.03970	0.02162	1.43625	-0.00489	-0.01744	0.11981	0.35722
Mean	**3.11899**	**0.00678**	**0.03961**	**0.02257**	**1.43648**	**-0.01018**	**-0.05668**	**0.11834**	**0.35747**
%RSD	0.69411	69.09936	0.34006	5.95443	0.02310	73.54624	97.89600	1.76073	0.09874

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00910	0.23614	0.00432
#2	0.01082	0.23080	0.00246
Mean	**0.00996**	**0.23347**	**0.00339**
%RSD	12.21319	1.61917	38.67532

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:16
SampleId1 : CRI **SampleId2 :** **[FLEXQC]**
Analysis commenced : 3/9/2010 14:44:12
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD3

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01951	0.44143	0.00727	0.41109	0.42304	0.01049	0.04515	5.35323	0.00993
#2	0.02069	0.44270	0.01095	0.41234	0.42281	0.01052	0.04746	5.36710	0.01017
Mean	**0.02010**	**0.44206**	**0.00911**	**0.41172**	**0.42292**	**0.01050**	**0.04630**	**5.36016**	**0.01005**
%RSD	4.14173	0.20175	28.54314	0.21424	0.03754	0.17398	3.52789	0.18296	1.71047

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	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10539	0.02064	0.05353	0.23740	3.73431	0.01720	5.46053	0.03133	0.02013
#2	0.10547	0.02101	0.05476	0.23210	3.74631	0.01723	5.45964	0.03126	0.02049
Mean	**0.10543**	**0.02083**	**0.05414**	**0.23475**	**3.74031**	**0.01722**	**5.46008**	**0.03129**	**0.02031**
%RSD	0.05320	1.25384	1.60780	1.59481	0.22686	0.15084	0.01146	0.17087	1.26125

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.28064	0.08196	0.22196	0.00292	0.00806	0.22264	0.12114	0.00930	0.00908
#2	4.27384	0.08214	0.22328	0.00660	0.00592	0.21399	0.12257	0.00794	0.00809
Mean	**4.27724**	**0.08205**	**0.22262**	**0.00476**	**0.00699**	**0.21832**	**0.12186**	**0.00862**	**0.00858**
%RSD	0.11239	0.15603	0.41882	54.62325	21.67076	2.80341	0.82910	11.12965	8.16959

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10565	0.10551	0.01918	0.09018	0.02051	0.02279	0.20248	0.10595	0.04107
#2	0.10551	0.10780	0.01921	0.09059	0.02048	0.02108	0.20249	0.10594	0.04185
Mean	**0.10558**	**0.10666**	**0.01920**	**0.09039**	**0.02050**	**0.02193**	**0.20248**	**0.10594**	**0.04146**
%RSD	0.09163	1.51843	0.12986	0.31832	0.07394	5.49533	0.00126	0.00068	1.33377

	Zr	Pb	Se
	ppm	calc	calc
#1	0.05216	0.00635	0.00915
#2	0.05225	0.00615	0.00804
Mean	**0.05221**	**0.00625**	**0.00859**
%RSD	0.12287	2.31283	9.15789

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:16
SampleId1 : ICSA SampleId2 : [FLEXQC]
Analysis commenced : 3/9/2010 14:46:05
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD4

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00020	270.01370	-0.00302	-0.00017	-0.00036	0.00037	0.00357	269.44611	-0.00031
#2	0.00027	270.09746	0.00085	0.00034	-0.00042	0.00037	0.00511	269.56430	-0.00066
Mean	**0.00024**	**270.05558**	**-0.00109**	**0.00009**	**-0.00039**	**0.00037**	**0.00434**	**269.50520**	**-0.00049**
%RSD	23.27539	0.02193	251.52673	409.54082	10.07419	1.48144	25.03973	0.03101	50.62911

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00150	-0.00084	-0.00464	110.29128	-0.46511	0.00268	280.55346	-0.00144	-0.00026
#2	0.00139	-0.00077	-0.00449	110.41334	-0.46724	0.00267	280.79817	-0.00133	-0.00132
Mean	**0.00145**	**-0.00080**	**-0.00456**	**110.35231**	**-0.46618**	**0.00268**	**280.67581**	**-0.00139**	**-0.00079**
%RSD	5.17770	6.01549	2.35284	0.07821	0.32396	0.14939	0.06165	5.78328	94.85275

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	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.19064	0.00110	0.01005	0.00064	-0.00100	0.00916	0.00153	0.00618	-0.00381
#2	-0.19044	0.00093	0.00539	0.00110	0.00008	0.00772	0.00319	0.00601	-0.00624
Mean	**-0.19054**	**0.00102**	**0.00772**	**0.00087**	**-0.00046**	**0.00844**	**0.00236**	**0.00609**	**-0.00503**
%RSD	0.07419	11.73247	42.70206	37.43483	165.02375	12.08879	49.75445	1.98048	34.09093

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00921	0.00333	0.01104	-0.00529	-0.00134	-0.00202	0.03132	-0.00132	0.00027
#2	-0.00872	0.00129	0.01111	-0.00747	-0.00142	0.00093	0.02235	-0.00098	-0.00037
Mean	**-0.00897**	**0.00231**	**0.01107**	**-0.00638**	**-0.00138**	**-0.00055**	**0.02684**	**-0.00115**	**-0.00005**
%RSD	3.89004	62.71357	0.40506	24.15339	4.10913	383.04667	23.62246	21.13943	888.96657

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00215	-0.00046	-0.00049
#2	0.00215	0.00042	-0.00216
Mean	**0.00215**	**-0.00002**	**-0.00132**
%RSD	0.01566	3190.74572	89.38540

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:16
SampleId1 : ICSAB SampleId2 : [FLEXQC]
Analysis commenced : 3/9/2010 14:47:58
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD5

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.20692	273.25569	0.10920	1.00607	0.51630	0.49865	0.53262	273.14599	1.00434
#2	0.20917	273.62240	0.11065	1.01275	0.51883	0.49904	0.54386	273.06385	1.00526
Mean	**0.20804**	**273.43904**	**0.10992**	**1.00941**	**0.51757**	**0.49884**	**0.53824**	**273.10492**	**1.00480**
%RSD	0.76239	0.09483	0.93287	0.46758	0.34531	0.05603	1.47667	0.02127	0.06512

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48673	0.48759	0.53738	112.03215	-0.43307	1.08196	285.68586	0.48271	1.01628
#2	0.48736	0.48844	0.53872	112.11371	-0.44399	1.08414	285.91760	0.48343	1.02117
Mean	**0.48704**	**0.48802**	**0.53805**	**112.07293**	**-0.43853**	**1.08305**	**285.80173**	**0.48307**	**1.01873**
%RSD	0.09232	0.12395	0.17619	0.05146	1.76007	0.14263	0.05734	0.10569	0.33930

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.19784	0.94764	1.10253	0.05525	0.05746	1.09276	0.61448	0.05545	0.06053
#2	-0.19839	0.95008	1.09612	0.05938	0.05709	1.08843	0.61791	0.05663	0.06065
Mean	**-0.19812**	**0.94886**	**1.09932**	**0.05732**	**0.05727**	**1.09059**	**0.61619**	**0.05604**	**0.06059**
%RSD	0.19623	0.18219	0.41229	5.09482	0.46480	0.28075	0.39340	1.48210	0.13758

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.98096	1.03947	1.00722	-0.02409	0.99216	0.11194	10.32680	0.49384	0.94787
#2	0.98991	1.04357	1.01176	-0.02694	0.99476	0.11162	10.37063	0.49547	0.95060
Mean	**0.98544**	**1.04152**	**1.00949**	**-0.02551**	**0.99346**	**0.11178**	**10.34872**	**0.49465**	**0.94924**
%RSD	0.64211	0.27886	0.31802	7.89105	0.18509	0.20339	0.29950	0.23324	0.20294

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.51023	0.05673	0.05884
#2	0.51248	0.05785	0.05931
Mean	**0.51135**	**0.05729**	**0.05907**
%RSD	0.31152	1.38748	0.56232

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:16
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/9/2010 14:49:52
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.20178	51.58343	0.51783	0.98468	1.00233	0.51621	0.50494	51.05819	0.48966
#2	0.20206	51.53371	0.52245	0.98394	1.00332	0.51544	0.50438	50.93944	0.48939
Mean	**0.20192**	**51.55857**	**0.52014**	**0.98431**	**1.00283**	**0.51582**	**0.50466**	**50.99881**	**0.48952**
%RSD	0.09512	0.06820	0.62858	0.05328	0.06952	0.10658	0.07905	0.16465	0.03971

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.51500	1.02325	1.02826	20.96955	49.97863	0.52287	52.92750	1.01428	1.01152
#2	0.51447	1.02364	1.03019	20.95172	49.99935	0.52268	52.84821	1.01382	1.01007
Mean	**0.51473**	**1.02345**	**1.02922**	**20.96064**	**49.98899**	**0.52278**	**52.88785**	**1.01405**	**1.01079**
%RSD	0.07288	0.02646	0.13291	0.06013	0.02931	0.02536	0.10601	0.03199	0.10186

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	49.83026	1.00350	5.31832	0.99813	1.00382	5.22916	0.49773	1.05250	1.04253
#2	49.75400	1.00511	5.32410	0.99843	0.99980	5.19009	0.49510	1.05339	1.04031
Mean	**49.79213**	**1.00430**	**5.32121**	**0.99828**	**1.00181**	**5.20962**	**0.49642**	**1.05295**	**1.04142**
%RSD	0.10831	0.11335	0.07682	0.02090	0.28331	0.53035	0.37568	0.05979	0.15044

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.95423	1.02469	0.49834	0.14451	0.49658	0.51668	4.97177	0.49795	1.08446
#2	4.94904	1.02312	0.49828	0.13984	0.49673	0.51796	4.99398	0.49764	1.07972
Mean	**4.95163**	**1.02390**	**0.49831**	**0.14218**	**0.49666**	**0.51732**	**4.98288**	**0.49779**	**1.08209**
%RSD	0.07399	0.10854	0.00811	2.32625	0.02056	0.17474	0.31519	0.04319	0.30957

	Zr	**Pb**	**Se**
	ppm	calc	calc

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#1	0.99444	1.00193	1.04585**CH**
#2	0.99398	0.99935	1.04467
Mean	**0.99421**	**1.00064**	**1.04526**
%RSD	0.03282	0.18224	0.07992

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:17
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/9/2010 14:54:10
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00005	0.05034	-0.00164	0.00061	-0.00045	0.00002	-0.00326	0.02949	-0.00021
#2	0.00013	0.05620	0.00189	0.00108	-0.00039	0.00001	-0.00277	0.03064	-0.00019
Mean	**0.00004**	**0.05327**	**0.00012**	**0.00085**	**-0.00042**	**0.00001**	**-0.00301**	**0.03006**	**-0.00020**
%RSD	326.91069	7.77357	2058.72031	39.02259	9.40428	33.80797	11.28308	2.70146	7.10567

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00038	-0.00008	-0.00077	0.02035	-0.42240	0.00108	0.03012	0.00022	-0.00065
#2	-0.00025	0.00033	-0.00026	0.02110	-0.42690	0.00107	0.03454	0.00014	-0.00096
Mean	**-0.00032**	**0.00013**	**-0.00051**	**0.02072**	**-0.42465**	**0.00107**	**0.03233**	**0.00018**	**-0.00080**
%RSD	29.46587	229.09566	70.44358	2.55173	0.75073	0.74510	9.66818	29.34027	27.31492

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.19404	-0.00061	-0.00323	-0.00425	0.00112	-0.00527	-0.00361	-0.00438	-0.00266
#2	-0.19464	-0.00090	-0.00029	0.00045	0.00053	-0.00815	-0.00248	-0.00488	0.00017
Mean	**-0.19434**	**-0.00076**	**-0.00176**	**-0.00190**	**0.00082**	**-0.00671**	**-0.00304**	**-0.00463**	**-0.00125**
%RSD	0.21822	27.09956	118.34548	174.73965	50.87214	30.40851	26.13070	7.51796	160.40141

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00715	-0.00028	-0.00166	-0.00413	-0.00076	-0.00045	-0.00956	-0.00014	0.00112
#2	-0.00611	-0.00040	-0.00164	-0.00236	-0.00061	-0.00451	-0.01450	-0.00001	0.00148
Mean	**-0.00663**	**-0.00034**	**-0.00165**	**-0.00325**	**-0.00069**	**-0.00248**	**-0.01203**	**-0.00008**	**0.00130**
%RSD	11.13085	24.93776	0.60394	38.43679	16.00499	115.89601	29.00828	121.87071	19.33676

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00005	-0.00067	-0.00324
#2	0.00016	0.00050	-0.00151
Mean	**0.00005**	**-0.00008**	**-0.00237**
%RSD	278.40933	991.60655	51.35701

Method : Paragon File : 100309A Printed : 3/9/2010 17:10:17
SampleId1 : AS100219-3MMB **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/9/2010 14:56:05

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HEADER INFROMATION FOR ANALYTICAL SEQUENCE 100310A
STANDARD SOLUTION CODES

Stock A (ST100301-49) Exp. 5-31-15

Element	ug/ml
Al, Ca, Mg	1000
Na, K	500
Fe	400
Li	20

Standard	Dilution	Procedure
A1	1/2 of Stock A	5ml of Stock A to 10ml final volume.
A2	1/2.5 of Stock A	2ml of Stock A to a 5ml final volume.
A3	1/5 of Stock A	1ml of Stock A to a 5ml final volume.
A4	1/10 of A1	1ml of Standard A1 up to a 10ml final volume.
A5	1/10 of A2	1ml of Standard A2 up to a 10ml final volume.

Stock B (ST100301-50) Exp. 2-28-15

Element	ug/ml
P, Si	100
B, Ba, Cr, Cu, Mn, Mo, Ni, Pb, Sn, Sr, Ti ,Zn	20
As, Cd, Co, Se, Tl, V	10
Ag, Sb	4
Be	2

Stock Ag- 1000 ug/ml (ST090107-6) Exp. 4-06-10
Stock Th – 1000 ug/ml (ST090107-7) Exp. 4-06-10

The following dilutions of Stock Ag and Stock Th are made to provide the daily calibration Standards.

Standard	Dilution	Procedure
B1	1/2 of Stock B 1/500 Ag and 1/500 Th	5ml of Stock B and 0.02ml of Stock Ag and Stock Th up to a 10ml final volume.
B2	1/10 of B1	1.0ml of Standard B1 up to a 10ml final volume.
B3	1/10 of B2	1.0ml of Standard B2 up to a 10ml final volume.

Stock C (ST100301-51) Exp. 6-30-15

Element	ug/ml
S, U	100
Bi, Zr	10

Standard	Dilution	Procedure
C1	1/2 of Stock C	5ml of Stock C up to a 10ml final volume.
C2	1/10 of C1	1.0ml of Standard C1 up to a 10ml final volume.
C3	1/10 of C2	1.0ml of Standard C2 up to a 10ml final volume.

RL STD (Reporting Limit Standard) Intermediate.
(ST100301-54) Exp. 2-28-15

Element	ug/ml
K, Na	500
Ca, Mg	200
Al, U	100
B, Fe, P, S, Si	50
Li, Mo, Sn, Sr, Ti	10
Sb	8
Ni, As, Bi, Se, Tl, Zn, Zr	5
Pb	3
Ag, Ba, Co, Cr, Cu, Mn, V, Th	2
Be, Cd	1

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RL STD (working standard) made daily by diluting the intermediate above 1000 fold. This working standard has concentration levels at the normal ALS-FC reporting limits for all elements except Ca, Mg and Na, K which are at 0.2ppm and 0.5ppm; this is below the normal ALS-FC reporting limit.

RL2 (working standard) made daily by diluting the intermediate above 333 fold.

Blank Solution

Double D.I. water, 3% HNO_3 and 5%HCl
Used for Std. Blank, ICB and CCB

CCV (ST100304-2) Exp. 1-1-11

Element	ug/ml
Al, Ca, Mg, K, Na	50
Fe	20
U, P, S, Si	5
B, Ba, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sn, Zn, Zr	1
As, Be, Bi, Cd, Co, Li, Sb, Sr, Ti, Tl, V	0.5
Ag, Th	0.2

ICV (ST100304-2) Exp. 1-1-11
Prepared daily by diluting the CCV (described above) ½.
The 1/2 dilution is made by diluting 5ml of the CCV to a 10ml final volume.
The resulting concentrations are:

Element	ug/ml
Al, Ca, Mg, K, Na	25
Fe	10
U, P, S, Si	2.5
B, Ba, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sn, Zn, Zr	0.5
As, Be, Bi, Cd, Co, Li, Sb, Sr, Ti, Tl, V	0.25
Ag, Th	0.1

CRI (ST100111-17) Exp. 1-1-11
Made By diluting
1.0ml of CRI Stock (ST100111-16) Exp. 1-10-10
to a 100ml final volume.

Element	ug/ml
Ca, Mg, K, Na	5.0
Al, B, Ba	0.4
Fe, U, P, S	0.2
Sb	0.12
Co, Si,, Sn, V, Th	0.1
Ni	0.08
Cu, Bi, Zr	0.05
Zn	0.04
Mn	0.03
Ag, Cr, Li, Mo, Sr, Ti, Tl	0.02
Be, Cd, As, Se,	0.01
Pb	0.006

ICSA (ST100111-7) Exp. 1-1-11

Element	ug/ml
Ca, Mg, Al	250
Fe	100

ICSAB (ST100111-8) Exp. 1-1-11

Element	ug/ml
Ca, Mg, Al	250
Fe	100
U	10
B, Si, Li, Mo, Sn, Sr, Ti, Cd, Zn, Ni, P, S	1.0
Sb	0.6
Ba, Be, Co, V, Cr, Cu, Mn, Bi, Zr	0.5
Ag	0.2
As, Tl	0.1
Se, Pb, Th	0.05

Pipette ID Numbers

1.0ml to 5.0ml --- M-55
0.1ml to 1.0ml --- M-61
0.01ml to 0.1ml --- M-57

Acid Lot Numbers

HCl – H19031
HNO_3 – H14024

Inter Element Correction Information

The following table summarizes spectral interferences that have been identified and for which IEC's are used. If a sample contains a concentration of an interfering element that exceeds the upper analytical range, and an affected element is being determined, it is necessary to dilute the sample to bring the interfering element into analytical range.

Interfering Element (ug/ml)	Affected Element
Al (500)	Pb
Mg (500)	Th
Fe (200)	Se, Tl, V, Pb, U
Si (50)	Zr
U (50)	Al, Cr, Cu, Bi, Pb, Mg, Se, Ag, Tl, Si
Ba (10)	Co
Cr (10)	Sb
Cu (10)	Bi
Mn (10)	Tl
Mo (10)	Al, Si, Pb,, Sb
Ti (10)	Co, Bi, Si, Sn, Tl, Pb, Zr
As (5)	Cd
V (5)	Al, Be, Tl
Zr (5)	Ag

The following table lists element concentrations (ug/ml) that no significant spectral interferences have been observed.

Element	Concentration	Element	Concentration	Element	Concentration
K	500	Se	10		
Na	500	Pb	10	Li	5
Ca	500	Zn	10	Cd	5
P	50	Sr	10	Co	5
S	50	Sn	10	Ag	2
Ni	10	Bi	5	Sb	2
B	10	Tl	5	Be	1

2X – Dilution made by diluting 2.5ml of sample up to a 5ml final volume.
3X - Dilution made by diluting 2.0ml of sample up to a 6ml final volume.
4X - Dilution made by diluting 2.0ml of sample up to a 8ml final volume.
5X - Dilution made by diluting 1.0ml of sample to a 5ml final volume.
10X - Dilution made by diluting 0.5ml of sample to a 5ml final volume.
20X – Dilution made by diluting 0.25ml of sample to a 5ml final volume.
25X – Dilution made by diluting 0.2ml of sample to a 5ml final volume.
50X – Dilution made by diluting 0.1ml of sample to a 5ml final volume.
100X – Dilution made by diluting 0.05ml of sample to a 5ml final volume.
500X – Dilution made by diluting 0.02ml of sample to a 10ml final volume.
1000X – Dilution made by diluting a 10X dilution 100X.

Analytical Spikes

1002174-8 – Post spiked for all requested elements by diluting 0.1ml of Z spike (ST100302-16), 0.1ml ml of Cation spike (ST100108-2) and 0.05ml of C spike (ST100208-20) up to a 5ml final volume with a 50 fold dilution with sample digestate.

1003063-16 – Post spike for Ca at 80ppm and Sc at 0.5ppm by diluting 0.1ml of Z spike (ST100302-16) and 0.2ml ml of Cation spike (ST100108-2) up to a 5ml final volume with sample digestate.

1002239-2MS/MSD – Spiked for all requested elements by diluting 0.1ml of Z spike (ST100302-16)and 0.1ml ml of Cation spike (ST100108-2) up to a 5ml final volume with sample digestate.

Comments

1. Please see run log and work orders for elements of interest.

Daily Maintenance

1. Check/ Change Peristaltic pump tubing.
2. Check the torch for deposits, clean if necessary.
3. Check/ Empty drain water.

Daily Maintenance done by RF .

Monthly Maintenance

1. Check/Clean nebulizer and spray chamber.
2. Clean air filters
3. Check/Clean entrance slit.
4. Fill water recirculating reservoir.

Monthly maintenance done by: RF 03-04-10.

Major problems / adjustments / repairs recorded in the ICP Maintenance Log (3716).

ICPTrace2 Run Log -- 3/10/2010

Instrument ID: ICPTrace2
File Name: 100310A.
AnalRunID: IT100310-2A1
CalibRefID: IT100310-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
	MIXBHIGH	MIXBHIGH	1	3/10/2010	10:32
	MIXAHIGH	MIXAHIGH	1	3/10/2010	10:34
	MIXCHIGH	MIXCHIGH	1	3/10/2010	10:36
	ICV	ICV	1	3/10/2010	10:42
	ICB	ICB	1	3/10/2010	10:44
	CRI	CRI1	1	3/10/2010	10:46
	ICSA	ICSA1	1	3/10/2010	10:48
	ICSAB	ICSAB1	1	3/10/2010	10:50
	CCV	CCV1	1	3/10/2010	10:51
	CCB	CCB1	1	3/10/2010	10:53
	IP100309-1MB	IP100309-1MB	1	3/10/2010	10:55
	IP100309-1RVS	IP100309-1RVS	1	3/10/2010	10:57
	IP100309-1LCS	IP100309-1LCS	1	3/10/2010	10:59
	IP100309-1LCSD	IP100309-1LCSD	1	3/10/2010	11:01
	1002108-1 50X	1002108-1	50	3/10/2010	11:02
	1002108-3 50X	1002108-3	50	3/10/2010	11:05
	1002174-8 50X	1002174-8	50	3/10/2010	11:06
	1002174-9 50X	1002174-9	50	3/10/2010	11:08
	IP100309-3MB	IP100309-3MB	1	3/10/2010	11:10
	IP100309-3RVS	IP100309-3RVS	1	3/10/2010	11:12
	CCV	CCV2	1	3/10/2010	11:13
	CCB	CCB2	1	3/10/2010	11:15
	IP100309-3LCS	IP100309-3LCS	1	3/10/2010	11:17
- Fe,Pb,S,Se,Th,Tl,U,V	1002155-2 10X	1002155-2	10	3/10/2010	11:19
- Fe,Pb,S,Se,Th,Tl,U,V	1002155-3 10X	1002155-3	10	3/10/2010	11:21
- Fe,Pb,S,Se,Th,Tl,U,V	1002155-4 10X	1002155-4	10	3/10/2010	11:23
- Fe,Pb,S,Se,Th,Tl,U,V	1002155-5 10X	1002155-5	10	3/10/2010	11:24
	1002163-2 10X	1002163-2	10	3/10/2010	11:26
	1002163-3 10X	1002163-3	10	3/10/2010	11:28
- Fe,Pb,S,Se,Th,Tl,U,V	1002163-4 10X	1002163-4	10	3/10/2010	11:30
- S	1002163-5 10X	1002163-5	10	3/10/2010	11:32
	1002163-6 10X	1002163-6	10	3/10/2010	11:34
	CCV	CCV3	1	3/10/2010	11:35
	CCB	CCB3	1	3/10/2010	11:37
	1002163-7 10X	1002163-7	10	3/10/2010	11:39

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Data Package ID: 200001016

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Date Printed: Wednesday, March 10, 2010

#Name?

ICPTrace2 Run Log -- 3/10/2010

Instrument ID: ICPTrace2
File Name: 100310A.
AnalRunID: IT100310-2A1
CalibRefID: IT100310-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
- Fe,Pb,S,Se,Th,Tl,U,V	1002163-8 10X	1002163-8	10	3/10/2010	11:41
- S	1002163-9 10X	1002163-9	10	3/10/2010	11:43
	1002172-2 10X	1002172-2	10	3/10/2010	11:44
	1002172-3 10X	1002172-3	10	3/10/2010	11:46
	1002172-4 10X	1002172-4	10	3/10/2010	11:48
	1002172-5 10X	1002172-5	10	3/10/2010	11:50
	1002189-2 10X	1002189-2	10	3/10/2010	11:52
	1002189-3 10X	1002189-3	10	3/10/2010	11:53
	1002189-4 10X	1002189-4	10	3/10/2010	11:55
	CCV	CCV4	1	3/10/2010	11:57
	CCB	CCB4	1	3/10/2010	11:59
	1002189-5 10X	1002189-5	10	3/10/2010	12:01
	1002189-5D 10X	1002189-5DUP	10	3/10/2010	12:02
	1002189-5L 50X	1002189-5SER	50	3/10/2010	12:04
	1002189-5MS 10X	1002189-5MS	10	3/10/2010	12:06
	1002189-5MSD 10X	1002189-5MSD	10	3/10/2010	12:08
	CRI	CRI2	1	3/10/2010	12:09
	ICSA	ICSA2	1	3/10/2010	12:11
	ICSAB	ICSAB2	1	3/10/2010	12:13
	CCV	CCV5	1	3/10/2010	12:15
	CCB	CCB5	1	3/10/2010	12:17
	CCV	CCV6	1	3/10/2010	13:37
	CCB	CCB6	1	3/10/2010	13:39
	1002174-8A 50X	1002174-8A	50	3/10/2010	13:41
+ Fe,Pb,S,Se,Th,Tl,U,V	1002155-2 100X	1002155-2	100	3/10/2010	13:43
+ Fe,Pb,S,Se,Th,Tl,U,V	1002155-3 100X	1002155-3	100	3/10/2010	13:44
+ Fe,Pb,S,Se,Th,Tl,U,V	1002155-4 100X	1002155-4	100	3/10/2010	13:46
+ Fe,Pb,S,Se,Th,Tl,U,V	1002155-5 100X	1002155-5	100	3/10/2010	13:48
+ Fe,Pb,S,Se,Th,Tl,U,V	1002163-4 50X	1002163-4	50	3/10/2010	13:50
+ Fe,Pb,S,Se,Th,Tl,U,V	1002163-8 50X	1002163-8	50	3/10/2010	13:51
	1002189-3	1002189-3	1	3/10/2010	13:53
	1002189-5	1002189-5	1	3/10/2010	13:55
	1002189-5D	1002189-5DUP	1	3/10/2010	13:57
	CCV	CCV7	1	3/10/2010	13:58
	CCB	CCB7	1	3/10/2010	14:00

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Data Package ID: 200001017

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Date Printed: Wednesday, March 10, 2010

#Name?

ICPTrace2 Run Log -- 3/10/2010

Instrument ID: ICPTrace2
File Name: 100310A.
AnalRunID: IT100310-2A1
CalibRefID: IT100310-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
	1002189-5L 5X	1002189-5SER	5	3/10/2010	14:02
	1002189-5MS	1002189-5MS	1	3/10/2010	14:04
	1002189-5MSD	1002189-5MSD	1	3/10/2010	14:06
	EX100309-1MB	EX100309-1MB	1	3/10/2010	14:08
	EX100309-1RVS	EX100309-1RVS	1	3/10/2010	14:09
	EX100309-1LCS	EX100309-1LCS	1	3/10/2010	14:11
	EX100309-1LCSD	EX100309-1LCSD	1	3/10/2010	14:13
-Zn	1002224-9	1002224-9	1	3/10/2010	14:15
-Zn	1002224-10	1002224-10	1	3/10/2010	14:16
-Zn	1002224-10D	1002224-10DUP	1	3/10/2010	14:18
	CCV	CCV8	1	3/10/2010	14:20
	CCB	CCB8	1	3/10/2010	14:22
-Zn	1002224-10L 5X	1002224-10SER	5	3/10/2010	14:24
-Zn	1002224-10MS	1002224-10MS	1	3/10/2010	14:25
-Zn	1002224-10MSD	1002224-10MSD	1	3/10/2010	14:27
-Zn	1002224-11	1002224-11	1	3/10/2010	14:29
-Zn	1002224-12	1002224-12	1	3/10/2010	14:31
	1002224-13	1002224-13	1	3/10/2010	14:33
-Zn	1002224-14	1002224-14	1	3/10/2010	14:34
	1002224-15	1002224-15	1	3/10/2010	14:36
-Zn	1002224-16	1002224-16	1	3/10/2010	14:38
	1002230-4	1002230-4	1	3/10/2010	14:40
	CCV	CCV9	1	3/10/2010	14:42
	CCB	CCB9	1	3/10/2010	14:43
	1002230-5	1002230-5	1	3/10/2010	14:45
	1002230-6	1002230-6	1	3/10/2010	14:47
	1003025-2	1003025-2	1	3/10/2010	14:49
	1003025-2D	1003025-2DUP	1	3/10/2010	14:51
	1003025-2L 5X	1003025-2SER	5	3/10/2010	14:52
	1003025-2MS	1003025-2MS	1	3/10/2010	14:54
	1003025-2MSD	1003025-2MSD	1	3/10/2010	14:56
	1003055-10	1003055-10	1	3/10/2010	14:58
	1003063-16A	1003063-16A	1	3/10/2010	15:00
	TEST	TEST	1	3/10/2010	15:01
	CCV	CCV10	1	3/10/2010	15:03

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Data Package ID: 200001018

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

#Name?

ICPTrace2 Run Log -- 3/10/2010

Instrument ID: ICPTrace2
File Name: 100310A.
AnalRunID: IT100310-2A1
CalibRefID: IT100310-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
	CCB	CCB10	1	3/10/2010	15:05
	1002239-1	1002239-1	1	3/10/2010	15:07
	1002239-2	1002239-2	1	3/10/2010	15:09
	1002239-2L 5X	1002239-2SER	5	3/10/2010	15:11
	1002239-2MS	1002239-2MS	1	3/10/2010	15:12
	1002239-2MSD	1002239-2MSD	1	3/10/2010	15:14
- S	1002239-3	1002239-3	1	3/10/2010	15:16
	1002239-4 2X	1002239-4	2	3/10/2010	15:18
	1002239-5	1002239-5	1	3/10/2010	15:20
	1002239-6	1002239-6	1	3/10/2010	15:21
	1002239-7	1002239-7	1	3/10/2010	15:23
	CCV	CCV11	1	3/10/2010	15:25
	CCB	CCB11	1	3/10/2010	15:28
+ S	1003007-1 2X	1003007-1	2	3/10/2010	15:30
	1003007-2	1003007-2	1	3/10/2010	15:32
+ S	1003007-3 2X	1003007-3	2	3/10/2010	15:34
+ S	1003009-1 2X	1003009-1	2	3/10/2010	15:36
+ S,Sr	1003010-1 5X	1003010-1	5	3/10/2010	15:37
	1002239-4	1002239-4	1	3/10/2010	15:39
- S	1003007-1	1003007-1	1	3/10/2010	15:41
- S	1003007-3	1003007-3	1	3/10/2010	15:43
- S	1003009-1	1003009-1	1	3/10/2010	15:45
- S,Sr	1003010-1	1003010-1	1	3/10/2010	15:46
	CCV	CCV12	1	3/10/2010	15:48
	CCB	CCB12	1	3/10/2010	15:50
	CRI	CRI3	1	3/10/2010	15:52
	ICSA	ICSA3	1	3/10/2010	15:54
	ICSAB	ICSAB3	1	3/10/2010	15:56
	CCV	CCV13	1	3/10/2010	15:58
	CCB	CCB13	1	3/10/2010	16:00

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Data Package ID:

ALS Laboratory Group -- FC
LIMS Version: 6.335A

Date Printed: Wednesday, March 10, 2010

#Name?

Sample Id1	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
MIXBHIGH	H2.00316	0.05101	4.99858	9.98477	9.97206	0.99274	0.00191	-0.02835	4.98006	4.98764	9.96820	H10.00347
MIXAHIGH	-0.00016	H510.69369	0.00338	0.01215	0.00135	0.00093	0.01198	H514.86898	-0.00005	0.00090	0.00450	-0.00742
MIXCHIGH	-0.00028	0.11615	-0.00198	0.01933	-0.00148	0.00414	H5.27183	0.04013	-0.00132	0.00476	-0.00896	0.00051
ICV	0.10116	25.04412	0.25357	0.49707	0.50481	0.25670	0.26714	24.70234	0.25074	0.25824	0.51441	0.49422
ICB	-0.00011	0.04034	0.00012	0.00275	-0.00052	0.00014	-0.00096	0.00400	-0.00032	-0.00048	-0.00048	-0.00029
CRI	0.02054	0.43650	0.01048	0.41714	0.42600	0.01027	0.05212	5.15912	0.01036	0.10333	0.02032	0.05181
ICSA	0.00022	262.36606	-0.00157	0.00171	-0.00029	0.00031	0.00607	258.28519	-0.00044	0.00100	0.00012	-0.00447
ICSAB	0.20452	266.95458	0.10985	1.00450	0.51450	0.48335	0.54898	261.21648	1.00641	0.47361	0.47660	0.50960
CCV	0.19586	49.13280	0.49447	0.96423	0.97521	0.49587	0.51057	48.24721	0.48719	0.49710	0.99037	0.95586
CCB	-0.00011	0.06913	-0.00048	0.00385	0.00006	0.00038	-0.00289	0.03497	0.00000	0.00009	0.00029	-0.00029
IP100309-1MB	0.00033	0.04488	0.00078	0.00255	-0.00039	-0.00007	0.00251	0.02178	-0.00013	-0.00009	0.00042	0.00069
IP100309-1RVS	0.00152	0.13303	0.00327	0.00621	0.00438	0.00094	0.00620	0.51200	0.00140	0.00124	0.00488	0.00502
IP100309-1LCS	0.09989	2.07667	2.02407	0.96275	2.03339	0.04878	-0.00016	40.29298	0.05067	0.49796	0.20015	0.25498
IP100309-1LCSD	0.09708	2.04910	1.99047	0.95208	2.01481	0.04759	-0.00156	39.24727	0.05035	0.48665	0.19531	0.25364
1002108-1 50X	-0.00119	0.06182	0.01062	-0.00025	0.01360	-0.00002	0.00171	-0.00203	-0.00077	0.01134	0.04888	0.36220
1002108-3 50X	-0.00018	0.06335	0.01551	-0.00243	0.00980	0.00003	0.00704	0.00182	-0.00056	0.01681	0.07975	0.32059
1002174-8 50X	-0.00018	0.04795	-0.00298	0.00027	-0.00052	-0.00007	0.00093	0.22967	0.00139	0.00240	0.01916	0.03515
1002174-9 50X	0.00011	0.04283	-0.00193	-0.00267	0.00013	-0.00006	0.01005	0.13203	0.00067	0.00558	0.04453	0.03718
IP100309-3MB	-0.00022	0.03116	-0.00095	0.00119	-0.00085	-0.00013	0.00087	-0.01046	-0.00053	-0.00029	-0.00050	-0.00100
IP100309-3RVS	0.00193	0.13385	0.00521	0.00665	0.00418	0.00095	0.01033	0.50115	0.00143	0.00182	0.00454	0.00409
CCV	0.19839	49.46843	0.49864	0.97718	0.98572	0.49916	0.52341	48.80227	0.49526	0.50209	0.99703	0.96920
CCB	0.00083	0.07651	0.00263	0.00341	0.00006	0.00038	0.00022	0.02998	-0.00004	0.00025	0.00046	-0.00051
IP100309-3LCS	-0.00028	2.14063	2.10799	1.01723	2.04400	0.05064	-0.00224	41.30220	0.05261	0.50626	0.20209	0.25467
1002155-2 10X	-0.00001	0.62646	L-0.01541	0.12284	0.01622	0.00063	0.03104	65.03419	-0.00061	0.01879	0.12752	-0.00420
1002155-3 10X	-0.00165	0.50875	L-0.01656	0.10326	0.01220	0.00044	0.02376	53.10699	-0.00067	0.01419	0.10270	-0.00959
1002155-4 10X	0.00023	0.59754	-0.00715	0.05943	0.01161	0.00045	0.02020	47.24356	-0.00063	0.01121	0.06496	-0.00996
1002155-5 10X	0.00025	0.58865	-0.00822	0.05745	0.01150	0.00046	0.01842	46.55131	-0.00034	0.01128	0.06309	-0.00883
1002163-2 10X	-0.00011	0.07179	-0.00357	0.03395	0.01745	0.00013	-0.00075	23.33600	-0.00071	-0.00030	0.01949	-0.00385
1002163-3 10X	-0.00077	0.07566	-0.00279	0.03361	0.01648	0.00009	-0.00040	23.24630	-0.00076	-0.00052	0.01940	-0.00306
1002163-4 10X	0.00011	0.72983	-0.00767	0.01797	0.01199	0.00018	0.00846	29.09765	-0.00060	0.01046	0.01726	0.00804
1002163-5 10X	0.00029	0.45167	-0.00353	0.01821	0.00586	0.00017	0.00481	17.72896	-0.00046	0.00489	0.02092	0.00276
1002163-6 10X	-0.00029	0.07045	-0.00488	0.03329	0.01600	0.00007	-0.00100	22.07547	-0.00062	-0.00022	0.01926	-0.00406
CCV	0.19680	49.07221	0.49898	0.96978	0.98006	0.49324	0.52404	48.66826	0.49612	0.49866	0.98905	0.96749
CCB	0.00009	0.09123	0.00048	0.00237	-0.00004	0.00033	0.00174	0.02671	0.00013	-0.00022	0.00045	-0.00062
1002163-7 10X	0.00035	0.03176	-0.00008	0.03391	0.01602	-0.00014	0.00501	21.43946	-0.00032	-0.00005	0.01994	-0.00173
1002163-8 10X	0.00012	0.65635	-0.00619	0.01997	0.01062	0.00001	0.01389	29.35632	-0.00039	0.01055	0.01733	0.00074
1002163-9 10X	-0.00101	0.41397	-0.00345	0.01763	0.00591	-0.00004	0.00568	17.54438	-0.00049	0.00485	0.02100	0.00425
1002172-2 10X	-0.00005	0.05603	-0.00057	0.00209	0.00255	-0.00030	0.00309	7.83531	-0.00065	-0.00059	0.00088	0.01061
1002172-3 10X	0.00021	0.04810	0.00163	0.00211	0.02537	-0.00019	-0.00058	32.72999	-0.00047	-0.00027	0.00122	0.00413
1002172-4 10X	-0.00015	0.01778	-0.00121	0.00235	0.00244	-0.00019	-0.00233	8.10102	-0.00062	-0.00062	-0.00019	0.00031
1002172-5 10X	-0.00022	0.02056	0.00238	0.00187	0.02521	-0.00014	0.00128	32.73972	-0.00067	-0.00011	0.00081	-0.00093
1002189-2 10X	0.00018	0.03974	0.00020	0.00495	0.01428	-0.00012	-0.00298	13.87590	-0.00045	-0.00046	0.00048	0.00389
1002189-3 10X	0.00005	0.11232	-0.00151	0.00501	0.00337	-0.00013	-0.00157	8.66407	-0.00038	-0.00050	-0.00051	-0.00036
1002189-4 10X	-0.00016	0.03155	-0.00161	0.00417	0.01349	-0.00012	-0.00020	14.03648	-0.00054	-0.00042	0.00004	-0.00032
CCV	0.19753	49.70170	0.50121	0.97188	0.98830	0.50105	0.51572	48.67963	0.48965	0.50235	0.99964	0.96892
CCB	-0.00067	0.06065	-0.00310	0.00133	-0.00012	0.00023	-0.00590	0.02396	-0.00036	-0.00029	-0.00005	-0.00061
1002189-5 10X	-0.00024	0.01850	-0.00264	0.00559	0.00295	-0.00008	-0.00096	8.49400	-0.00057	-0.00065	-0.00081	-0.00065
1002189-5D 10X	0.00050	0.01923	0.00112	0.00607	0.00282	-0.00021	0.00210	8.25187	-0.00053	-0.00015	-0.00014	-0.00065
1002189-5L 50X	-0.00005	0.01227	-0.00118	0.00055	-0.00017	-0.00024	-0.00504	1.64698	-0.00056	-0.00073	-0.00083	-0.00131
1002189-5MS 10X	0.00031	0.21135	0.20174	0.10204	0.20416	0.00465	0.00001	12.21190	0.00465	0.04921	0.01936	0.02370

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Sample Id1	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
1002189-5MSD 10X	0.00034	0.21175	0.20271	0.10268	0.20480	0.00474	0.00327	12.36609	0.00443	0.04977	0.01947	0.02381
CRI	0.01974	0.42255	0.01088	0.40547	0.41738	0.01011	0.04972	5.11010	0.00967	0.10166	0.01982	0.04998
ICSA	0.00025	263.31504	0.00150	0.00025	-0.00038	0.00031	0.00780	263.37937	-0.00031	0.00131	0.00049	-0.00391
ICSAB	0.20743	269.43884	0.11133	1.00784	0.51794	0.48903	0.54556	264.73735	1.01055	0.48060	0.48185	0.51533
CCV	0.19935	49.85481	0.50933	0.98018	0.99186	0.50568	0.52095	49.17240	0.49399	0.50722	1.00851	0.97564
CCB	0.00021	0.07362	-0.00022	0.00293	-0.00020	0.00038	0.00306	0.02442	-0.00013	-0.00002	0.00035	-0.00026
CCV	0.19454	48.66479	0.48530	0.93879	0.95953	0.49340	0.49942	47.84064	0.47425	0.49397	0.98509	0.94552
CCB	0.00078	0.05860	0.00261	0.00195	0.00020	0.00024	0.00093	0.02941	0.00031	0.00061	0.00052	0.00026
1002174-8A 50X	0.09493	2.53310	2.47890	1.18687	2.44840	0.05940	0.00348	53.25778	0.06417	0.60124	0.25817	0.34294
1002155-2 100X	0.00002	0.08405	-0.00067	0.01399	0.00091	-0.00004	0.00359	6.61887	-0.00037	0.00178	0.01293	-0.00052
1002155-3 100X	-0.00039	0.06817	-0.00323	0.01005	0.00031	-0.00003	0.00383	5.40828	-0.00047	0.00090	0.00992	-0.00174
1002155-4 100X	0.00008	0.07887	-0.00093	0.00557	0.00034	-0.00006	0.00011	4.65740	-0.00028	0.00051	0.00602	-0.00217
1002155-5 100X	-0.00013	0.07576	-0.00176	0.00477	0.00029	-0.00007	-0.00300	4.58436	-0.00063	0.00035	0.00558	-0.00189
1002163-4 50X	-0.00005	0.15177	-0.00247	0.00319	0.00155	-0.00011	-0.00079	5.71639	-0.00073	0.00149	0.00285	0.00069
1002163-8 50X	0.00024	0.14324	-0.00159	0.00321	0.00133	-0.00008	0.00078	5.84489	-0.00036	0.00147	0.00270	-0.00094
1002189-3	-0.00003	1.00586	0.00146	0.05465	0.04153	-0.00007	-0.00122	87.94635	-0.00074	0.00034	0.00047	0.00002
1002189-5	0.00089	0.02502	-0.00165	0.05431	0.03636	-0.00008	0.00240	88.53568	-0.00024	-0.00006	-0.00005	-0.00090
1002189-5D	-0.00005	0.02358	-0.00086	0.05271	0.03561	-0.00015	-0.00213	86.01724	-0.00056	-0.00035	-0.00030	-0.00128
CCV	0.19454	48.58864	0.48961	0.93623	0.95931	0.49018	0.49677	47.80904	0.47625	0.49248	0.98115	0.94848
CCB	-0.00003	0.05746	0.00082	0.00153	-0.00008	0.00018	-0.00131	0.02625	-0.00004	-0.00025	0.00007	-0.00062
1002189-5L 5X	0.00080	0.02860	0.00071	0.01133	0.00671	-0.00008	0.00327	17.16249	-0.00015	-0.00018	-0.00002	-0.00058
1002189-5MS	0.00004	2.02240	1.98111	1.00672	1.99770	0.04761	0.00009	124.22026	0.05041	0.47479	0.19005	0.24543
1002189-5MSD	0.00031	2.05866	2.02005	1.02776	2.03363	0.04846	-0.00314	126.35899	0.05121	0.48353	0.19326	0.25112
EX100309-1MB	-0.00007	0.02684	0.00120	0.00345	0.00391	-0.00017	-0.00086	0.02006	-0.00067	-0.00029	0.00080	-0.00086
EX100309-1RVS	0.00173	0.12104	0.00578	0.00529	0.00405	0.00079	0.00681	0.46987	0.00141	0.00129	0.00440	0.00370
EX100309-1LCS	0.09798	2.09361	2.02356	0.95839	2.02385	0.04820	-0.00138	-0.00151	0.05197	0.50363	0.20004	0.25756
EX100309-1LCSD	0.09801	2.10185	2.05285	0.96756	2.03427	0.04863	-0.00066	0.00165	0.05142	0.50941	0.20201	0.25905
1002224-9	0.00001	0.03773	-0.00298	0.00517	0.00576	0.00001	-0.00238	1.17690	-0.00029	0.00568	-0.00020	-0.00005
1002224-10	0.00041	0.04008	-0.00087	0.00299	0.00487	-0.00014	-0.00188	0.17253	-0.00034	-0.00019	0.00029	-0.00093
1002224-10D	-0.00055	0.03629	-0.00089	0.00235	0.00470	-0.00021	-0.00539	0.16478	-0.00071	-0.00071	-0.00038	-0.00124
CCV	0.19726	49.43055	0.49386	0.95679	0.98026	0.49159	0.50598	48.01799	0.48471	0.49526	0.98645	0.97179
CCB	-0.00029	0.05335	0.00099	0.00091	-0.00032	0.00013	-0.00076	0.00996	-0.00013	-0.00046	-0.00039	-0.00132
1002224-10L 5X	0.00005	0.03050	-0.00054	0.00103	0.00033	-0.00017	-0.00254	0.02923	-0.00030	-0.00033	-0.00047	-0.00125
1002224-10MS	0.09702	2.07093	1.97894	0.94202	1.99071	0.04715	-0.00177	0.17970	0.05132	0.49443	0.19669	0.25209
1002224-10MSD	0.09549	2.04414	1.95252	0.93093	1.97194	0.04624	-0.00199	0.16633	0.05030	0.48518	0.19279	0.24914
1002224-11	-0.00004	0.03182	-0.00046	0.00743	0.00681	-0.00018	0.00067	0.06870	-0.00023	0.00166	-0.00018	-0.00129
1002224-12	-0.00011	0.03151	0.00069	0.01589	0.02017	-0.00017	-0.00381	51.50775	0.00738	0.00234	-0.00031	-0.00004
1002224-13	-0.00116	0.04465	-0.00468	0.00737	0.02126	-0.00010	-0.00393	0.29841	-0.00037	0.00031	-0.00104	-0.00382
1002224-14	-0.00006	0.60725	0.00035	0.27083	0.01956	-0.00016	-0.00084	2.30778	0.05058	0.00327	0.00048	0.00590
1002224-15	-0.00019	0.03920	-0.00200	0.00441	0.00600	-0.00008	-0.00339	0.02333	-0.00038	-0.00032	0.00022	0.00349
1002224-16	-0.00078	0.04035	-0.00159	0.05697	0.01220	-0.00004	-0.00336	2.70325	-0.00028	0.00085	-0.00071	-0.00252
1002230-4	-0.00014	0.05397	-0.00227	0.00307	0.03641	-0.00001	0.00331	1.80011	-0.00014	0.00606	0.00696	-0.00406
CCV	0.99961	50.02542	0.50194	0.97660	0.99580	0.49724	0.52556	48.64192	0.49099	0.50226	0.99664	0.98687
CCB	0.00082	0.07517	-0.00091	0.00109	-0.00014	0.00026	-0.00024	0.01662	-0.00016	0.00015	0.00063	-0.00048
1002230-5	-0.00035	0.05028	-0.00082	0.03187	0.00844	-0.00002	-0.00212	0.93315	0.00188	0.03509	0.00696	0.00307
1002230-6	0.00032	0.03811	-0.00330	0.00485	0.04431	-0.00003	0.00244	1.30811	-0.00045	-0.00056	-0.00103	-0.00584
1003025-2	-0.00020	0.09436	0.00054	0.01405	0.06492	-0.00004	-0.00274	5.41232	0.00038	-0.00028	0.00003	0.00052
1003025-2D	0.00243	0.10482	0.00368	0.01543	0.06493	-0.00010	0.00542	5.30704	0.00115	0.00105	0.00152	0.00251
1003025-2L 5X	0.00059	0.04302	0.00003	0.00187	0.01225	-0.00016	-0.00254	1.07219	-0.00017	-0.00043	-0.00041	-0.00072
1003025-2MS	0.09672	2.09425	1.94917	0.93970	2.02391	0.04645	-0.00330	5.24035	0.05091	0.48587	0.19333	0.25474

20100102I

Sample Id1	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
1003025-2MSD	0.09493	2.06608	1.91915	0.92985	1.99854	0.04589	-0.00042	5.18435	0.05007	0.47952	0.19113	0.24931
1003055-10	-0.00004	0.06544	0.00333	0.01077	0.03710	-0.00015	0.00083	2.15944	-0.00020	0.00006	0.00014	0.00034
1003063-16A	-0.00032	42.54213	1.94949	0.95501	2.62917	0.04911	0.00647	218.89943	0.04941	0.49177	0.22333	0.30224
TEST	-0.00016	0.04115	0.00005	0.00165	-0.00080	-0.00018	-0.00234	0.02493	-0.00038	-0.00053	-0.00026	-0.00153
CCV	0.19731	49.17013	0.49375	0.95414	0.97596	0.48844	0.51172	47.82660	0.48371	0.49382	0.98010	0.96984
CCB	0.00032	0.08303	-0.00046	0.00225	-0.00015	0.00038	-0.00075	0.01931	0.00000	-0.00002	0.00004	-0.00072
1002239-1	-0.00210	0.04961	-0.00082	0.15413	0.03484	0.00009	-0.00667	80.89368	-0.00103	-0.00060	-0.00171	-0.00133
1002239-2	-0.00219	0.05078	-0.00387	0.22412	0.12856	0.00011	-0.00489	62.72443	-0.00088	-0.00085	-0.00031	-0.00090
1002239-2L 5X	-0.00025	0.04491	-0.00407	0.04227	0.02333	-0.00002	-0.00560	11.77657	-0.00075	-0.00057	-0.00066	-0.00160
1002239-2MS	-0.00078	2.36474	2.38624	1.34594	2.37560	0.05341	-0.00307	107.28762	0.05930	0.54351	0.21701	0.28160
1002239-2MSD	-0.00119	2.39920	2.43745	1.37047	2.42082	0.05431	-0.00222	108.44794	0.05941	0.55186	0.22016	0.28698
1002239-3	-0.00159	0.04445	-0.00477	0.24573	0.03988	0.00004	-0.00651	73.88639	-0.00085	-0.00084	-0.00136	0.00128
1002239-4 2X	-0.00005	0.04005	-0.00251	0.16349	0.02732	-0.00009	0.00041	49.87798	-0.00065	-0.00038	-0.00068	-0.00050
1002239-5	-0.00111	0.03989	-0.00042	0.11880	0.03114	-0.00005	-0.00214	65.95715	-0.00102	-0.00037	-0.00062	0.00008
1002239-6	-0.00529	0.01536	-0.00645	0.20622	0.03099	-0.00008	L-0.02116	74.00151	-0.00183	-0.00322	-0.00358	-0.00343
1002239-7	-0.00032	0.03848	-0.00219	0.22086	0.04544	0.00001	-0.00498	94.61444	-0.00065	0.00030	-0.00044	0.00130
CCV	0.19518	48.30404	0.48653	0.94438	0.96271	0.48277	0.50775	47.11126	0.47803	0.48674	0.96792	0.95964
CCB	-0.00004	0.06865	-0.00150	0.00131	-0.00034	0.00010	-0.00081	0.01581	-0.00017	-0.00010	-0.00003	-0.00079
1003007-1 2X	-0.00209	0.03858	-0.00394	0.09584	0.01769	0.00011	-0.00881	90.63401	-0.00093	-0.00189	-0.00221	-0.00033
1003007-2	-0.00129	0.05113	-0.00108	0.21574	0.07858	0.00011	-0.00325	118.95276	-0.00065	-0.00053	-0.00079	0.00081
1003007-3 2X	-0.00093	0.05280	-0.00264	0.08083	0.02057	0.00007	-0.00178	58.73425	-0.00070	-0.00073	-0.00017	-0.00085
1003009-1 2X	-0.00110	0.05828	-0.00178	0.11880	0.01014	0.00010	-0.00713	35.90520	-0.00069	-0.00107	-0.00094	-0.00166
1003010-1 5X	0.00010	0.05174	-0.00027	0.13648	0.00445	0.00000	-0.00340	26.00745	-0.00065	0.00121	-0.00074	-0.00090
1002239-4	-0.00193	0.04389	-0.00385	0.35047	0.05945	0.00007	-0.00840	108.73267	-0.00099	-0.00081	-0.00142	-0.00079
1003007-1	-0.00035	0.05016	-0.00587	0.19891	0.03846	0.00023	-0.00655	191.19612	-0.00048	0.00000	-0.00050	0.00392
1003007-3	-0.00083	0.04822	-0.00274	0.16895	0.04361	0.00003	-0.00356	120.66954	-0.00074	-0.00050	0.00030	0.00086
1003009-1	-0.00172	0.06161	-0.00101	0.24598	0.02180	0.00004	-0.00489	72.77115	-0.00074	-0.00049	-0.00062	-0.00133
1003010-1	-0.00441	0.02845	-0.00553	0.70203	0.02524	0.00006	-0.01228	131.67959	-0.00171	0.00490	-0.00321	-0.00253
CCV	0.19758	48.82970	0.49796	0.95639	0.96624	0.49350	0.51165	48.45375	0.48748	0.49876	0.99096	0.96677
CCB	-0.00008	0.06996	0.00071	0.00287	-0.00035	0.00018	0.00016	0.01524	-0.00034	-0.00011	-0.00014	-0.00111
CRI	0.01997	0.44208	0.01067	0.40103	0.41305	0.00997	0.04870	5.03483	0.00985	0.10082	0.01971	0.05033
ICSA	0.00065	265.51354	0.00178	0.00089	-0.00034	0.00037	0.00683	261.89182	-0.00023	0.00140	0.00043	-0.00511
ICSAB	0.21035	270.72442	0.11326	1.01727	0.51949	0.49132	0.55930	268.50306	1.02731	0.48518	0.48593	0.52544
CCV	0.20152	49.90675	0.50502	0.97956	0.99172	0.50095	0.52221	49.03797	0.49752	0.50589	1.00378	0.99186
CCB	0.00027	0.07972	0.00029	0.00231	-0.00041	0.00032	-0.00055	0.01254	-0.00016	-0.00013	-0.00003	-0.00114

Sample Id1	Fe	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Pb I	Pb II
MIXBHIGH	-0.01191	-0.27091	0.00304	-0.04421	9.95404	H10.00613	-0.08474	H10.01884	49.75007	9.94587	9.98860	9.92454
MIXAHIGH	H202.00324	H253.54223	H10.16687	H512.65423	-0.00613	0.00322	H253.36753	0.00131	0.01671	0.00117	L-0.00305	0.00328
MIXCHIGH	0.00545	-0.23294	0.00352	-0.32201	0.00365	-0.00096	-0.12781	-0.00100	0.01126	0.00102	-0.00255	0.00280
ICV	10.19410	24.04541	0.23832	25.20050	0.51105	0.50337	24.39599	0.51585	2.50082	0.49677	0.50521	0.49256
ICB	0.00739	-0.20906	0.00302	0.00920	-0.00039	-0.00081	-0.14504	-0.00041	-0.00447	-0.00098	0.00015	-0.00154
CRI	0.21841	3.71862	0.01855	5.20231	0.03062	0.01981	4.24327	0.08332	0.21104	0.00529	0.00585	0.00502
ICSA	106.96551	-0.38967	0.00433	268.09448	-0.00113	-0.00172	-0.14242	0.00065	0.00190	0.00002	-0.00064	0.00035
ICSAB	108.28374	-0.39129	1.05874	272.14281	0.47594	0.98801	-0.15517	0.93006	1.02982	0.05455	0.04979	0.05692
CCV	19.97901	48.89544	0.49987	49.55100	0.98623	0.97169	48.35542	0.97949	4.81560	0.97102	0.96797	0.97254
CCB	0.01860	-0.19394	0.00316	0.04174	0.00014	0.00001	-0.12397	0.00010	0.00037	0.00042	0.00102	0.00012
IP100309-1MB	0.39106	-0.34708	0.00258	0.00592	0.00140	-0.00112	-0.15092	0.00026	0.01982	-0.00071	0.00253	-0.00233
IP100309-1RVS	0.46705	0.37707	0.00569	0.48723	0.00606	0.00938	0.61187	0.00496	0.12614	0.00428	0.00484	0.00400
IP100309-1LCS	1.54680	37.78120	0.49387	40.83122	0.49809	1.02723	36.94882	0.50275	0.02399	0.48534	0.48428	0.48587
IP100309-1LCSD	1.52230	37.56424	0.48979	39.83397	0.48744	1.00648	36.62693	0.49359	0.02297	0.47251	0.47368	0.47192
1002108-1 50X	107.42618	-0.36047	0.00267	-0.03918	0.40581	0.02283	-0.13226	0.13283	0.00449	0.00153	-0.00149	0.00304
1002108-3 50X	179.57070	-0.29676	0.00272	-0.05993	0.60018	0.02494	-0.14456	0.13513	0.00714	0.03214	0.02964	0.03338
1002174-8 50X	82.72270	-0.29999	0.00267	-0.02761	0.36671	0.00233	-0.14487	0.02152	-0.00197	0.03564	0.03573	0.03559
1002174-9 50X	199.80051	-0.30565	0.00267	-0.05513	0.74766	0.00349	-0.14201	0.02527	0.01075	0.02502	0.02531	0.02488
IP100309-3MB	0.04611	-0.32723	0.00260	-0.01232	-0.00054	-0.00122	-0.16557	0.00205	0.00195	-0.00125	-0.00013	-0.00180
IP100309-3RVS	0.17224	0.40058	0.00592	0.49083	0.00453	0.00894	0.61680	0.00468	0.10526	0.00392	0.00524	0.00326
CCV	20.06885	49.16024	0.50338	49.87437	0.99046	0.98598	48.55739	1.00014	4.90099	0.97321	0.97775	0.97095
CCB	0.01706	-0.18621	0.00314	0.03781	0.00014	0.00020	-0.12486	0.00037	-0.00462	-0.00052	0.00226	-0.00191
IP100309-3LCS	1.05648	38.27559	0.51401	41.96964	0.50255	1.03875	38.16920	0.50792	0.00317	0.49559	0.49595	0.49541
1002155-2 10X	H593.80437	37.80071	0.00429	7.04762	3.27309	-0.00102	6.06746	0.02386	0.81290	0.00416	-0.00087	0.00667
1002155-3 10X	H507.74143	30.93225	0.00366	5.84858	2.70732	-0.00169	4.89617	0.01856	0.62627	0.00279	L-0.00466	0.00652
1002155-4 10X	H375.10400	32.20402	0.00397	6.01315	1.99738	-0.00148	8.46701	0.01829	0.39173	0.00043	0.00022	0.00054
1002155-5 10X	H368.17708	31.82921	0.00399	5.97649	1.95162	-0.00145	8.53768	0.01851	0.37450	0.00048	0.00142	0.00000
1002163-2 10X	70.13865	38.15972	0.01098	3.09608	1.04736	-0.00129	25.28200	0.00069	0.24146	-0.00042	-0.00131	0.00002
1002163-3 10X	70.17541	38.59671	0.01097	3.08209	1.04759	-0.00130	25.56559	0.00187	0.24518	-0.00063	-0.00280	0.00046
1002163-4 10X	H250.31983	21.29310	0.00316	4.14146	1.46505	-0.00157	3.61138	0.01825	0.21369	0.00118	0.00132	0.00111
1002163-5 10X	124.73150	14.01669	0.00363	2.35029	0.63336	-0.00116	3.48661	0.01286	0.23616	0.00043	0.00149	-0.00010
1002163-6 10X	69.12027	38.81208	0.01004	3.12265	1.04114	-0.00146	25.94283	0.00154	0.23937	-0.00055	-0.00127	-0.00019
CCV	19.83480	48.80594	0.49925	49.44944	0.97858	0.98408	48.18474	1.00427	4.82567	0.96657	0.96621	0.96675
CCB	0.01667	-0.31199	0.00289	0.03246	0.00011	-0.00052	-0.13257	0.00014	-0.00401	0.00001	0.00191	-0.00095
1002163-7 10X	68.02840	38.86009	0.00995	3.11511	1.04711	-0.00086	26.16314	0.00156	0.24156	-0.00008	0.00159	-0.00091
1002163-8 10X	H255.64449	21.33661	0.00329	4.24710	1.50610	-0.00188	3.74174	0.01505	0.17345	-0.00022	0.00082	-0.00074
1002163-9 10X	126.81098	14.04051	0.00364	2.38723	0.65129	-0.00088	3.54600	0.01256	0.23427	-0.00065	-0.00218	0.00011
1002172-2 10X	1.26975	2.26266	0.00289	1.19159	0.03899	-0.00141	0.88845	0.00044	0.09232	0.00052	0.00099	0.00028
1002172-3 10X	4.62880	23.00343	0.00322	5.67078	0.13487	-0.00114	4.16993	0.00051	0.10072	0.00020	0.00162	-0.00050
1002172-4 10X	1.11571	2.41513	0.00279	1.20950	0.03855	-0.00138	0.91160	-0.00016	0.08453	-0.00157	-0.00151	-0.00159
1002172-5 10X	4.58371	22.93655	0.00315	5.65863	0.13409	-0.00136	4.13850	0.00061	0.08479	-0.00129	-0.00067	-0.00160
1002189-2 10X	3.66584	5.30406	0.00288	2.14975	0.46154	-0.00126	1.00214	0.00019	0.10424	0.00013	0.00083	-0.00022
1002189-3 10X	0.26866	0.05455	0.00278	1.42353	0.01599	-0.00145	0.37018	0.00002	-0.00269	-0.00142	0.00032	-0.00229
1002189-4 10X	3.35388	5.37965	0.00291	2.14778	0.44031	-0.00112	0.98041	-0.00047	0.10342	-0.00136	-0.00102	-0.00153
CCV	20.04859	48.94935	0.50490	50.02491	0.99461	0.98385	48.58363	0.99015	4.88968	0.97937	0.97662	0.98075
CCB	0.01584	-0.30103	0.00288	0.02700	-0.00003	-0.00032	-0.13649	0.00008	-0.00182	-0.00009	-0.00020	-0.00004
1002189-5 10X	0.12275	0.09873	0.00282	1.41457	0.01422	-0.00118	0.37600	-0.00029	-0.00416	-0.00134	-0.00197	-0.00102
1002189-5D 10X	0.11832	0.02583	0.00263	1.38202	0.01380	-0.00101	0.35797	-0.00009	-0.00574	-0.00126	0.00209	-0.00293
1002189-5L 50X	0.02040	-0.26421	0.00258	0.26431	0.00211	-0.00175	-0.05202	-0.00036	-0.00605	-0.00065	0.00037	-0.00116
1002189-5MS 10X	0.21722	3.17601	0.04169	5.37406	0.06354	0.09893	3.82722	0.04875	-0.00488	0.04750	0.04846	0.04702

Sample Id1	Fe	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Pb I	Pb II
1002189-5MSD 10X	0.21953	3.19907	0.04170	5.43566	0.06426	0.09948	3.82426	0.04949	-0.00533	0.04767	0.04918	0.04692
CRI	0.21265	3.65144	0.01830	5.15953	0.03008	0.02048	4.15587	0.08074	0.20274	0.00584	0.00448	0.00653
ICSA	107.63815	-0.35366	0.00434	272.70437	-0.00115	-0.00062	-0.14523	0.00104	0.00612	-0.00021	0.00595	L-0.00328
ICSAB	108.73484	-0.40860	1.06443	275.94700	0.48009	0.99982	-0.15633	0.93893	1.02481	0.05675	0.05541	0.05741
CCV	20.22439	49.07929	0.50519	50.59638	1.00138	0.99356	48.53440	1.00136	4.87965	0.98709	0.98670	0.98728
CCB	0.01661	-0.25475	0.00300	0.03115	-0.00001	0.00016	-0.13500	0.00030	-0.00325	0.00020	0.00153	-0.00047
CCV	19.71029	47.96382	0.49395	49.28794	0.97869	0.96062	47.77962	0.95537	4.61655	0.96467	0.95898	0.96751
CCB	0.01688	-0.27830	0.00297	0.04119	0.00020	-0.00001	-0.12380	0.00103	-0.00055	0.00033	0.00523	-0.00212
1002174-8A 50X	80.06624	51.82534	0.70784	54.73688	0.94716	1.23015	50.94372	0.61274	0.00108	0.60710	0.61529	0.60301
1002155-2 100X	60.90503	2.74626	0.00280	0.74217	0.34171	-0.00126	0.34394	0.00226	0.07537	-0.00029	0.00011	-0.00049
1002155-3 100X	49.25477	2.18015	0.00270	0.60072	0.28028	-0.00146	0.25146	0.00154	0.05872	-0.00045	-0.00165	0.00015
1002155-4 100X	32.90401	2.28438	0.00275	0.59930	0.20145	-0.00105	0.53444	0.00136	0.03158	-0.00074	0.00017	-0.00120
1002155-5 100X	32.17605	2.26887	0.00273	0.59329	0.19721	-0.00182	0.54565	0.00054	0.02837	-0.00170	-0.00188	-0.00161
1002163-4 50X	44.61532	3.24784	0.00268	0.81852	0.29280	-0.00137	0.44116	0.00309	0.03382	-0.00100	-0.00118	-0.00091
1002163-8 50X	45.35101	3.29648	0.00272	0.83873	0.29833	-0.00142	0.44888	0.00236	0.02328	-0.00063	-0.00078	-0.00055
1002189-3	2.63781	4.40942	0.00465	14.16743	0.16068	-0.00100	6.08376	0.00139	0.04334	-0.00017	0.00121	-0.00085
1002189-5	1.21741	4.14048	0.00295	14.44537	0.14705	-0.00058	6.11472	0.00039	0.01238	-0.00132	0.00159	-0.00278
1002189-5D	1.18193	3.99565	0.00283	14.05892	0.14306	-0.00145	5.98973	-0.00006	0.00887	-0.00137	-0.00187	-0.00111
CCV	19.62316	47.94376	0.49363	49.10136	0.97256	0.96166	47.79533	0.95936	4.61650	0.95803	0.95596	0.95907
CCB	0.01566	-0.31615	0.00285	0.02907	0.00003	-0.00049	-0.13437	-0.00015	-0.00584	-0.00089	0.00027	-0.00147
1002189-5L 5X	0.24668	0.46306	0.00283	2.87887	0.02917	-0.00044	0.93578	-0.00002	-0.00314	-0.00112	0.00215	-0.00275
1002189-5MS	2.11676	43.05064	0.52411	53.74998	0.61423	0.97625	44.42559	0.46486	0.00857	0.46534	0.46641	0.46481
1002189-5MSD	2.15972	43.59063	0.53120	54.67802	0.62437	0.99437	44.88384	0.47310	0.01320	0.47394	0.47308	0.47437
EX100309-1MB	0.01637	-0.32019	0.00270	-0.00107	-0.00054	-0.00016	133.08242	0.00046	0.00032	-0.00067	0.00141	-0.00171
EX100309-1RVS	0.10102	0.25740	0.00545	0.47128	0.00405	0.00858	0.62571	0.00501	0.08825	0.00387	0.00295	0.00433
EX100309-1LCS	1.00826	-0.34154	0.00265	-0.01679	0.49313	1.02328	134.09040	0.50267	-0.00126	0.48500	0.48675	0.48413
EX100309-1LCSD	1.02112	-0.30853	0.00276	-0.01734	0.49788	1.03444	134.33304	0.50899	-0.00060	0.48985	0.49172	0.48892
1002224-9	14.68273	-0.27125	0.00276	0.74654	0.12523	-0.00125	136.97455	0.00436	0.00490	0.00166	0.00155	0.00171
1002224-10	8.63423	-0.15125	0.00249	-0.01090	0.04484	-0.00102	138.27961	0.00072	0.00220	0.00541	0.00488	0.00568
1002224-10D	8.49826	-0.17236	0.00247	-0.01494	0.04408	-0.00222	137.42745	0.00011	0.00230	0.00462	0.00369	0.00508
CCV	19.75983	48.71433	0.50268	49.33478	0.97671	0.97481	48.16268	0.97673	4.67917	0.95754	0.95986	0.95638
CCB	0.01142	-0.30992	0.00295	0.01346	-0.00026	-0.00088	-0.13202	-0.00027	-0.00615	-0.00100	-0.00041	-0.00130
1002224-10L 5X	1.73788	-0.29364	0.00274	-0.00970	0.00857	-0.00116	27.25018	-0.00029	-0.00574	0.00042	0.00164	-0.00019
1002224-10MS	9.80122	-0.09091	0.00273	-0.01734	0.53187	1.00192	139.43265	0.49035	-0.00243	0.48455	0.48143	0.48611
1002224-10MSD	9.62761	-0.14190	0.00264	-0.01374	0.52280	0.98518	137.84404	0.47971	-0.00248	0.47090	0.47148	0.47062
1002224-11	14.59665	-0.30126	0.00267	0.00232	0.06945	-0.00074	134.79543	0.00424	0.00129	0.00716	0.00806	0.00670
1002224-12	0.19923	0.06378	0.00395	1.15422	0.04954	-0.00093	138.08751	0.00289	-0.00116	0.00056	0.00094	0.00037
1002224-13	33.73925	-0.26341	0.00285	-0.01963	0.11508	-0.00218	135.79152	0.00360	0.00261	-0.00014	L-0.00494	0.00225
1002224-14	0.02390	0.64387	0.00639	1.55836	0.39996	-0.00001	132.78093	0.00929	0.21741	0.00037	0.00188	-0.00039
1002224-15	0.00983	-0.29861	0.00274	-0.01133	0.00024	-0.00141	136.40558	0.00197	0.00510	0.00023	0.00285	-0.00107
1002224-16	23.83018	-0.18159	0.00339	0.55036	0.13372	-0.00114	121.90664	0.00847	0.01610	0.00087	-0.00032	0.00147
1002230-4	57.02535	-0.31061	0.00325	0.00712	0.29754	-0.00002	138.70172	0.00610	0.00846	0.01276	0.01335	0.01246
CCV	20.01751	49.03568	0.50774	49.91267	0.98517	0.98887	48.22332	1.00398	4.74857	0.96720	0.97025	0.96568
CCB	0.01587	-0.32088	0.00303	0.02339	-0.00003	-0.00072	-0.11873	0.00015	-0.00518	0.00005	0.00298	-0.00141
1002230-5	3.27663	-0.21829	0.00312	0.08291	0.05694	0.00654	138.39873	0.03899	0.12889	0.07579	0.07641	0.07548
1002230-6	90.23792	-0.18598	0.00547	0.01204	0.56827	0.00008	122.17844	-0.00004	0.04069	0.00013	0.00072	-0.00017
1003025-2	0.08254	0.41372	0.00321	0.21113	0.01870	-0.00094	118.71623	0.00151	0.25593	0.12116	0.12220	0.12063
1003025-2D	0.06998	0.35620	0.00307	0.22019	0.01361	0.00008	117.92113	0.00320	0.25766	0.11836	0.12970	0.11269
1003025-2L 5X	0.01720	-0.22094	0.00294	0.03115	0.00216	-0.00104	23.12962	-0.00036	0.04644	0.02332	0.02530	0.02233
1003025-2MS	1.03597	0.29072	0.00312	0.19999	0.48913	0.98506	116.98861	0.48235	0.25017	0.58799	0.58559	0.58919

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Sample Id1	Fe	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb	Pb I	Pb II
1003025-2MSD	1.01762	0.28300	0.00317	0.20141	0.48319	0.97534	115.69631	0.47527	0.24156	0.57776	0.57882	0.57723
1003055-10	0.03848	0.56782	0.00265	0.39122	0.09914	-0.00137	123.27254	0.00003	0.03137	0.00282	0.00516	0.00165
1003063-16A	106.54030	84.06436	1.12583	110.82996	1.79878	0.95690	76.38728	0.51201	2.10050	0.51019	0.51208	0.50924
TEST	0.03535	-0.38044	0.00274	-0.00904	-0.00050	-0.00121	-0.14566	0.00008	0.02318	0.00035	0.00097	0.00004
CCV	19.63158	48.46550	0.49956	49.07217	0.96746	0.97075	47.83401	0.97746	4.62223	0.94755	0.95249	0.94507
CCB	0.01563	-0.28141	0.00307	0.02536	-0.00005	-0.00004	-0.12181	-0.00010	-0.00421	-0.00021	0.00167	-0.00115
1002239-1	0.00458	3.59766	0.01415	49.67077	0.00363	0.01390	38.77566	-0.00113	-0.03023	-0.00108	L-0.00537	0.00107
1002239-2	0.01187	3.03497	0.02291	16.09598	0.00154	0.00016	49.76182	0.01913	-0.00584	-0.00150	L-0.00541	0.00046
1002239-2L 5X	-0.00006	0.08385	0.00583	3.05509	-0.00033	-0.00070	8.81114	0.00302	-0.00747	-0.00088	-0.00267	0.00002
1002239-2MS	1.10443	58.04785	0.67446	65.03824	0.53875	1.12582	95.35565	0.55844	-0.00701	0.53211	0.53167	0.53233
1002239-2MSD	1.12284	58.85335	0.68563	66.08706	0.54752	1.15168	95.93943	0.56804	-0.01032	0.53558	0.53737	0.53469
1002239-3	-0.00252	2.86280	0.01132	60.01336	0.00049	0.00587	72.64976	-0.00080	0.02588	-0.00065	-0.00277	0.00041
1002239-4 2X	-0.00268	0.84433	0.00930	26.75672	-0.00026	0.00115	31.64717	-0.00010	-0.00192	-0.00120	-0.00005	-0.00177
1002239-5	-0.00186	3.57175	0.00679	43.24087	0.00009	0.00208	26.47928	0.00018	0.07262	-0.00030	-0.00139	0.00024
1002239-6	-0.00369	1.44944	0.00980	31.58190	-0.00026	-0.00164	43.47391	-0.00128	0.02710	-0.00060	L-0.02070	0.00943
1002239-7	-0.00123	4.59456	0.04153	52.11667	0.13710	0.00029	72.55551	0.00012	0.00627	-0.00103	0.00119	-0.00214
CCV	19.37787	47.82528	0.49137	48.42620	0.95543	0.95871	47.17231	0.96157	4.56829	0.93186	0.94292	0.92634
CCB	0.01052	-0.38921	0.00276	0.02001	-0.00022	-0.00082	-0.13632	0.00013	-0.00411	-0.00052	0.00008	-0.00082
1003007-1 2X	0.64938	2.19589	0.02654	51.26676	0.08651	-0.00255	35.27633	-0.00043	-0.04015	-0.00035	L-0.00933	0.00413
1003007-2	0.00090	2.82801	0.03922	41.19065	-0.00045	-0.00178	44.70298	-0.00046	0.03158	-0.00051	-0.00066	-0.00043
1003007-3 2X	-0.00017	0.77602	0.01790	16.80368	0.00064	0.00192	42.15603	0.00604	-0.00900	-0.00180	-0.00203	-0.00169
1003009-1 2X	0.04102	7.41829	0.01714	15.43993	0.01950	0.00012	40.35935	-0.00083	1.70291	-0.00175	L-0.00400	-0.00063
1003010-1 5X	-0.00138	5.00668	0.00390	41.86855	0.05089	0.05760	13.29562	0.01462	-0.01231	-0.00117	0.00068	-0.00209
1002239-4	-0.00316	2.86727	0.01807	57.92583	0.00014	0.00330	69.72116	-0.00127	0.00974	-0.00048	L-0.00557	0.00206
1003007-1	1.32152	6.19049	0.05645	106.43528	0.17704	-0.00214	74.32703	0.00208	-0.02636	-0.00070	0.00079	-0.00144
1003007-3	0.00267	2.56676	0.03703	34.13337	0.00211	0.00642	90.37978	0.01216	-0.01343	-0.00011	-0.00078	0.00023
1003009-1	0.08382	18.74303	0.03498	31.22548	0.04019	0.00133	85.32145	-0.00071	3.56869	-0.00109	-0.00213	-0.00057
1003010-1	0.00248	35.96038	0.00994	223.76211	0.25223	0.28676	73.50215	0.06960	-0.00864	-0.00094	L-0.01555	0.00636
CCV	19.79550	47.88425	0.49154	49.75270	0.97409	0.97877	47.39822	0.98866	4.64349	0.95899	0.96614	0.95542
CCB	0.01250	-0.31373	0.00298	0.02066	-0.00018	-0.00060	-0.12962	-0.00009	-0.00498	-0.00052	0.00001	-0.00078
CRI	0.21035	3.55982	0.01818	5.08197	0.02945	0.01893	4.11678	0.08054	0.19113	0.00514	0.00597	0.00473
ICSA	106.90786	-0.42407	0.00435	272.22310	-0.00155	-0.00142	-0.13711	0.00082	0.00276	0.00040	0.00424	-0.00152
ICSAB	109.44597	-0.40052	1.06209	279.28565	0.47852	1.02034	-0.14643	0.96248	0.99346	0.05605	0.05768	0.05523
CCV	20.09854	48.93894	0.50429	50.47013	0.98736	0.99629	48.44623	1.01129	4.71185	0.96878	0.97810	0.96414
CCB	0.01250	-0.28914	0.00295	0.01837	-0.00020	-0.00082	-0.13533	0.00014	-0.00488	-0.00052	0.00121	-0.00139

Sample Id1	S	Sb	Se	Se I	Se II	Si	Sn	Sr	Th	Ti	Tl	U
MIXBHIGH	-0.00930	1.98730	4.93963	4.97574	4.92160	49.74139	H10.01095	H10.00459	1.98384	9.96682	H5.02021	-0.05027
MIXAHIGH	0.02827	0.00871	-0.00259	0.01060	L-0.00917	0.00476	0.00441	0.00459	0.00516	-0.00099	-0.00287	0.10526
MIXCHIGH	H52.24774	0.00154	-0.00353	L-0.00938	-0.00061	-0.02916	0.01830	-0.00011	L-0.43355	0.00836	0.00404	H51.63248
ICV	2.53939	0.25182	0.50815	0.51761	0.50343	2.46381	0.50834	0.25224	0.08330	0.24492	0.26099	2.56082
ICB	-0.00561	-0.00071	-0.00162	L-0.00520	0.00017	-0.00502	-0.00026	-0.00175	-0.00261	-0.00080	0.00041	0.00085
CRI	0.21243	0.12213	0.00838	0.00880	0.00817	0.10402	0.10571	0.01956	0.09280	0.01999	0.02227	0.21222
ICSA	-0.00856	0.00215	-0.00107	0.00424	-0.00372	-0.01065	-0.00082	0.01108	-0.01110	-0.00142	-0.00187	0.05073
ICSAB	1.03050	0.60060	0.05751	0.06086	0.05583	0.96588	1.01211	1.00650	0.04967	0.96647	0.10622	10.38865
CCV	4.97163	0.48030	0.98964	0.99236	0.98827	4.77048	0.99200	0.48816	0.16921	0.47613	0.49748	4.91145
CCB	-0.01372	0.00061	0.00052	0.00051	0.00053	-0.00529	-0.00176	-0.00145	-0.00428	-0.00061	-0.00094	-0.00415
IP100309-1MB	-0.02182	0.00018	0.00081	0.00240	0.00001	0.00816	0.00080	-0.00169	-0.00451	-0.00048	-0.00031	0.00732
IP100309-1RVS	0.07836	0.00975	0.00412	0.00629	0.00304	0.03623	0.01207	0.00314	-0.00399	0.00437	0.00824	0.04194
IP100309-1LCS	-0.02035	0.49012	1.96401	1.96162	1.96519	1.73206	0.52505	0.50780	-0.01496	0.49651	2.06953	-0.00370
IP100309-1LCSD	-0.02403	0.48170	1.91986	1.93408	1.91276	1.70347	0.51360	0.50263	-0.01568	0.48766	2.03448	-0.01590
1002108-1 50X	0.01354	0.00518	0.00205	-0.00255	0.00435	0.00292	0.05046	-0.00161	0.01088	0.00189	0.00029	0.00852
1002108-3 50X	0.03342	0.00880	0.00209	-0.00259	0.00442	-0.00134	0.12169	-0.00184	0.01348	-0.00001	-0.00343	0.03023
1002174-8 50X	-0.00635	-0.00008	-0.00070	-0.00497	0.00144	0.00220	0.00223	0.00100	0.00876	0.00104	-0.00195	0.01661
1002174-9 50X	0.00028	0.00282	0.00224	0.00015	0.00328	0.00408	0.00535	-0.00032	0.01089	0.00076	-0.00062	0.05063
IP100309-3MB	-0.02108	0.00085	0.00101	0.00158	0.00073	-0.00134	-0.00095	-0.00193	-0.00196	-0.00070	-0.00089	0.00082
IP100309-3RVS	0.08867	0.00951	0.00296	0.00091	0.00398	0.03115	0.00927	0.00311	-0.00487	0.00395	0.01013	0.05436
CCV	5.02862	0.48594	0.99641	1.00065	0.99429	4.78481	1.00552	0.49373	0.16996	0.47758	0.50769	4.96642
CCB	-0.01298	0.00067	0.00000	-0.00233	0.00117	-0.00537	0.00049	-0.00148	-0.00231	-0.00062	0.00380	0.00932
IP100309-3LCS	-0.01003	0.50830	2.10404	2.12235	2.09490	2.02545	0.52854	0.51097	-0.01894	0.50008	2.12865	-0.01284
1002155-2 10X	H270.29730	0.01022	0.00610	0.00398	0.00716	2.45214	0.00501	0.16882	0.05247	0.07259	L-0.02189	0.20572
1002155-3 10X	H222.64870	0.00819	0.00790	0.00488	0.00940	2.00428	0.00453	0.14014	0.03521	0.05769	L-0.01238	0.16377
1002155-4 10X	H162.55259	0.00619	0.00696	0.00398	0.00844	1.68096	0.00258	0.14232	0.01748	0.01803	-0.00221	0.10240
1002155-5 10X	H157.67110	0.00761	0.00778	0.00981	0.00677	1.65844	0.00414	0.14008	0.01612	0.01717	0.00046	0.09664
1002163-2 10X	22.57478	0.00058	0.00170	-0.00348	0.00429	1.29729	-0.00027	0.17849	0.01548	0.00474	-0.00130	0.02343
1002163-3 10X	22.65232	-0.00080	0.00050	-0.00303	0.00226	1.30532	-0.00289	0.18025	0.00624	0.00421	-0.00321	0.00619
1002163-4 10X	H117.22162	0.00386	0.00470	0.00139	0.00635	0.90186	0.00232	0.10078	0.01311	0.03032	-0.00499	0.07261
1002163-5 10X	H53.87833	0.00272	0.00218	0.00343	0.00156	0.87189	-0.00092	0.06692	0.00842	0.02755	-0.00168	0.03839
1002163-6 10X	21.80567	-0.00104	0.00222	0.00016	0.00324	1.31489	-0.00114	0.15999	0.01142	0.00452	-0.00368	0.02013
CCV	4.93536	0.48586	0.99516	0.99591	0.99479	4.71903	0.99949	0.49149	0.16913	0.47037	0.50350	4.89429
CCB	-0.01666	-0.00042	-0.00017	0.00126	-0.00089	-0.00790	-0.00082	-0.00152	-0.00398	-0.00085	-0.00108	0.01281
1002163-7 10X	21.61460	0.00208	-0.00161	0.00124	-0.00304	1.33878	-0.00139	0.15579	0.00433	0.00425	-0.00165	0.02736
1002163-8 10X	H118.64999	0.00509	0.00258	0.00501	0.00136	0.98977	0.00612	0.09997	0.01344	0.03165	-0.00085	0.08221
1002163-9 10X	H54.69377	0.00066	0.00058	0.00153	0.00010	0.91186	-0.00086	0.06601	0.00938	0.02820	-0.00253	0.03099
1002172-2 10X	0.12697	-0.00231	-0.00208	-0.00224	-0.00200	0.39558	-0.00114	0.01960	-0.00606	0.00120	-0.00086	-0.00575
1002172-3 10X	0.11298	0.00035	-0.00198	-0.00091	-0.00251	0.71155	0.00079	0.12114	-0.00877	0.00376	-0.00200	0.00019
1002172-4 10X	0.05626	-0.00072	-0.00116	-0.00103	-0.00122	0.34198	-0.00201	0.02035	-0.00402	-0.00022	0.00170	0.00059
1002172-5 10X	0.09603	-0.00013	-0.00308	-0.00354	-0.00286	0.68260	0.00036	0.12165	-0.00902	0.00208	0.00075	-0.00551
1002189-2 10X	0.13949	-0.00195	-0.00174	0.00068	-0.00294	0.45807	0.00036	0.04273	-0.00441	0.00050	0.00185	-0.00414
1002189-3 10X	0.040767	-0.00272	-0.00119	-0.00084	-0.00137	0.33668	-0.00095	0.01670	-0.00479	0.00085	0.00057	-0.00682
1002189-4 10X	0.011371	-0.00030	-0.00119	-0.00063	-0.00147	0.45273	-0.00045	0.04258	-0.00300	0.00004	-0.00149	-0.00767
CCV	5.007303	0.48127	1.00999	1.00294	1.01351	4.83236	0.99935	0.49370	0.17114	0.47934	0.50675	4.96268
CCB	-0.02256	-0.00209	-0.00137	0.00078	-0.00244	-0.00614	-0.00163	-0.00158	-0.00376	-0.00071	-0.00092	-0.00714
1002189-5 10X	0.42314	-0.00239	-0.00164	-0.00214	-0.00139	0.21123	-0.00226	0.01643	-0.00465	-0.00101	-0.00072	-0.00148
1002189-5D 10X	0.39735	0.00049	0.00066	0.00552	-0.00176	0.20709	0.00011	0.01613	-0.00607	-0.00111	-0.00173	0.00825
1002189-5L 50X	0.06215	-0.00158	-0.00103	-0.00305	-0.00003	0.03506	-0.00132	0.00163	-0.00329	-0.00106	-0.00148	-0.00740
1002189-5MS 10X	0.40914	0.04747	0.20190	0.20000	0.20284	0.40849	0.05227	0.06640	-0.00593	0.04871	0.20249	-0.00279

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Sample Id1	S	Sb	Se	Se I	Se II	Si	Sn	Sr	Th	Ti	Tl	U
1002189-5MSD 10X	0.41430	0.04840	0.20477	0.20629	0.20400	0.41128	0.05283	0.06656	-0.00514	0.04929	0.20622	-0.00479
CRI	0.18885	0.11758	0.00990	0.00926	0.01022	0.10066	0.10397	0.01902	0.08971	0.01951	0.02019	0.20250
ICSA	-0.01445	0.00593	0.00138	0.00987	-0.00285	-0.01030	0.00086	0.01104	-0.01188	-0.00153	-0.00017	0.05327
ICSAB	1.04893	0.60760	0.05903	0.06415	0.05647	0.97707	1.02662	1.01335	0.04641	0.97408	0.10766	10.47516
CCV	5.09672	0.48787	1.02136	1.01909	1.02250	4.85618	1.01791	0.49631	0.17373	0.48277	0.51309	4.99508
CCB	-0.02624	0.00016	0.00057	0.00018	0.00076	-0.00360	0.00005	-0.00156	-0.00235	-0.00081	-0.00084	0.00059
CCV	4.93462	0.46754	0.98637	0.98050	0.98930	4.74302	0.97892	0.47957	0.16837	0.47332	0.48707	4.86311
CCB	-0.03213	0.00171	-0.00065	0.00293	-0.00244	-0.00425	0.00130	-0.00143	-0.00339	-0.00071	0.00163	0.01431
1002174-8A 50X	-0.01961	0.58837	2.46377	2.50010	2.44563	2.39976	0.63016	0.61173	0.01052	0.59979	2.46090	-0.01002
1002155-2 100X	27.34793	0.00167	-0.00017	0.00187	-0.00118	0.24959	0.00129	0.01523	0.00449	0.00648	-0.00167	0.01725
1002155-3 100X	22.62296	-0.00085	-0.00122	-0.00192	-0.00087	0.20196	-0.00164	0.01201	0.00434	0.00488	0.00094	-0.00026
1002155-4 100X	15.98338	0.00036	-0.00022	-0.00096	0.00016	0.17022	0.00017	0.01200	0.00201	0.00079	-0.00020	0.00414
1002155-5 100X	15.56826	-0.00033	-0.00030	-0.00178	0.00044	0.16053	-0.00164	0.01186	0.00231	0.00070	-0.00049	0.00388
1002163-4 50X	23.08457	0.00024	0.00070	-0.00080	0.00145	0.17407	-0.00139	0.01758	0.00219	0.00504	-0.00327	0.00788
1002163-8 50X	23.24350	0.00099	0.00139	-0.00061	0.00238	0.15735	-0.00002	0.01796	0.00364	0.00495	-0.00068	0.00938
1002189-3	4.23913	-0.00141	-0.00122	-0.00081	-0.00142	3.42082	-0.00004	0.18141	-0.00927	0.02436	-0.00213	0.00304
1002189-5	4.48989	0.00124	-0.00216	-0.00004	-0.00323	2.18254	-0.00089	0.18291	-0.01194	-0.00100	0.00030	0.00950
1002189-5D	4.37893	0.00063	-0.00167	-0.00396	-0.00053	2.13397	-0.00001	0.17953	-0.00879	-0.00090	-0.00044	-0.00320
CCV	4.87911	0.46765	0.98642	0.98198	0.98863	4.71698	0.97874	0.47975	0.16629	0.46994	0.49026	4.86592
CCB	-0.03287	0.00064	0.00164	0.00166	0.00163	-0.00827	-0.00076	-0.00154	-0.00414	-0.00080	-0.00024	0.00658
1002189-5L 5X	0.86093	0.00007	-0.00121	0.00167	-0.00264	0.43230	0.00092	0.03483	-0.00652	-0.00107	-0.00011	0.00941
1002189-5MS	4.38411	0.47549	1.98440	1.98756	1.98283	4.03183	0.50121	0.66585	-0.01934	0.47930	1.99788	-0.00932
1002189-5MSD	4.44329	0.48474	2.02738	2.03252	2.02481	4.09794	0.50949	0.67738	-0.01855	0.48747	2.03134	-0.00486
EX100309-1MB	-0.03949	-0.00006	0.00016	0.00097	-0.00024	0.01559	0.00267	-0.00158	-0.00396	-0.00110	-0.00019	-0.00340
EX100309-1RVS	0.05036	0.00912	0.00419	0.00197	0.00529	0.02781	0.00833	0.00294	-0.00378	0.00352	0.00870	0.05241
EX100309-1LCS	-0.03287	0.48095	1.97341	1.97992	1.97016	1.95040	0.52580	0.50141	-0.00136	0.49225	2.08336	-0.00632
EX100309-1LCSD	-0.03949	0.48373	1.99857	2.01077	1.99248	1.95479	0.53353	0.50461	-0.00078	0.49545	2.10115	-0.00932
1002224-9	0.20064	0.00111	0.00063	-0.00019	0.00105	0.23907	0.00049	-0.00049	-0.00083	-0.00102	-0.00188	0.00158
1002224-10	0.26621	-0.00117	-0.00153	-0.00281	-0.00089	0.01182	0.00055	-0.00154	-0.00195	-0.00122	-0.00108	0.00220
1002224-10D	0.26400	-0.00153	-0.00132	-0.00115	-0.00141	0.00743	-0.00057	-0.00161	-0.00176	-0.00136	-0.00242	-0.01117
CCV	4.94646	0.47733	0.99171	0.99314	0.99100	4.76086	0.99145	0.48948	0.16730	0.47257	0.50138	4.95137
CCB	-0.03949	-0.00239	-0.00129	L-0.00657	0.00135	-0.00915	-0.00238	-0.00170	-0.00584	-0.00100	0.00049	-0.00140
1002224-10L 5X	0.02237	-0.00149	-0.00164	0.00056	-0.00274	-0.00495	-0.00070	-0.00183	-0.00531	-0.00130	0.00123	-0.00083
1002224-10MS	0.26547	0.47137	1.94457	1.94626	1.94373	1.91134	0.51790	0.49311	-0.00002	0.48591	2.04904	-0.01605
1002224-10MSD	0.25515	0.46799	1.90283	1.91184	1.89834	1.87914	0.50912	0.48806	-0.00103	0.47946	2.02162	-0.00421
1002224-11	0.15570	0.00181	0.00131	0.00265	0.00064	0.02358	0.00061	-0.00135	-0.00005	-0.00105	-0.00026	0.00164
1002224-12	1.44863	-0.00047	0.00008	0.00015	0.00005	1.75739	-0.00132	0.01939	-0.00399	-0.00149	-0.00173	-0.00353
1002224-13	0.10414	-0.00314	0.00084	-0.00399	0.00325	0.01147	-0.00157	-0.00096	0.00345	-0.00112	-0.00497	-0.01863
1002224-14	17.44697	0.00465	0.00512	0.00532	0.00501	0.06500	0.00105	0.00481	-0.00444	-0.00080	-0.00034	-0.00191
1002224-15	-0.03581	0.00039	0.00247	0.00782	-0.00019	0.01458	0.00117	-0.00167	-0.00454	-0.00122	-0.00106	0.00433
1002224-16	0.78869	-0.00107	-0.00057	0.00001	-0.00086	0.12488	0.00024	0.00156	0.00061	-0.00134	-0.00268	0.00059
1002230-4	0.54252	0.00231	0.00053	0.00071	0.00045	0.02032	0.00099	0.00623	0.00397	-0.00123	-0.00101	0.01440
CCV	5.08044	0.48501	1.01722	1.01789	1.01689	4.81188	1.00633	0.49767	0.17377	0.47677	0.51022	5.00422
CCB	-0.03802	0.00174	0.00022	0.00265	-0.00099	-0.00600	-0.00089	-0.00159	-0.00191	-0.00075	0.00034	0.01156
1002230-5	5.17075	-0.00165	0.00095	0.00202	0.00041	0.02375	-0.00057	0.00184	-0.00125	-0.00108	-0.00144	-0.00462
1002230-6	0.73193	0.00014	0.00207	-0.00010	0.00315	0.70742	0.00117	0.00134	0.00846	-0.00115	-0.00319	0.02596
1003025-2	0.30452	0.00216	-0.00098	-0.00133	-0.00081	0.18794	0.00229	0.01081	-0.00244	-0.00098	-0.00210	-0.00345
1003025-2D	0.31410	0.00524	-0.00116	0.01024	L-0.00685	0.19789	0.00429	0.01082	-0.00305	-0.00082	0.00167	0.03198
1003025-2L 5X	0.03711	-0.00161	-0.00188	-0.00089	-0.00237	0.02954	-0.00145	0.00056	-0.00334	-0.00115	-0.00082	-0.00340
1003025-2MS	0.30378	0.46567	1.90978	1.90579	1.91176	2.06532	0.50844	0.49924	-0.00384	0.47925	2.02077	-0.01108

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Sample Id1	S	Sb	Se	Se I	Se II	Si	Sn	Sr	Th	Ti	Tl	U
1003025-2MSD	0.30599	0.46323	1.86430	1.86869	1.86211	2.06181	0.50427	0.49305	-0.00505	0.47316	1.98549	0.00240
1003055-10	-0.01372	0.00222	0.00035	0.00070	0.00017	0.06240	-0.00007	0.00587	-0.00428	-0.00046	-0.00181	0.00257
1003063-16A	3.35417	0.46037	1.87418	1.89049	1.86603	14.59598	0.49677	1.07356	0.02530	1.02793	1.93181	0.03107
TEST	-0.03949	-0.00059	-0.00330	-0.00242	-0.00374	0.00026	0.05669	-0.00189	-0.00290	-0.00112	0.00002	-0.00391
CCV	4.94202	0.47613	0.98889	0.99790	0.98439	4.72358	0.98665	0.48763	0.16744	0.46901	0.50191	4.91844
CCB	-0.02918	0.00025	0.00002	0.00144	-0.00069	-0.00537	0.00049	-0.00160	-0.00336	-0.00081	0.00230	0.00308
1002239-1	47.60200	-0.00315	0.01219	0.00781	0.01438	10.37774	0.01145	0.61207	-0.02044	-0.00145	-0.00271	-0.03881
1002239-2	20.98599	-0.00142	0.01463	0.01585	0.01402	11.31878	0.01388	0.28331	-0.00938	-0.00101	-0.00451	-0.04281
1002239-2L 5X	3.72965	-0.00056	0.00147	0.00042	0.00199	2.07417	0.00036	0.05184	-0.00099	-0.00100	-0.00066	-0.00838
1002239-2MS	19.08893	0.55089	2.60308	2.64165	2.58383	12.49642	0.58781	0.82038	-0.01782	0.53781	2.32345	-0.03707
1002239-2MSD	19.32231	0.56704	2.63358	2.69948	2.60068	12.62874	0.60094	0.83397	-0.01334	0.54843	2.36750	-0.03433
1002239-3	H52.68958	0.00256	0.03462	0.03933	0.03226	11.66496	0.02884	0.37758	-0.02086	-0.00112	-0.00650	-0.02384
1002239-4 2X	18.68982	0.00129	0.00456	0.00411	0.00478	5.00562	0.00503	0.28085	-0.01227	-0.00096	0.00081	-0.00913
1002239-5	40.58381	-0.00137	0.01380	0.01454	0.01343	10.78676	0.01245	0.39360	-0.01506	-0.00095	-0.00312	-0.03058
1002239-6	32.54905	-0.01380	0.01734	-0.00333	0.02765	11.35552	0.00747	0.37113	-0.01400	-0.00136	L-0.01104	-0.11313
1002239-7	48.57709	0.00310	0.02835	0.03667	0.02420	10.41091	0.03233	0.49894	-0.01914	-0.00136	L-0.01037	0.00110
CCV	4.86875	0.46918	0.96440	0.97610	0.95855	4.66417	0.97146	0.48193	0.16299	0.46382	0.49098	4.86284
CCB	-0.02550	0.00007	-0.00055	0.00141	-0.00153	-0.00809	0.00123	-0.00165	-0.00430	-0.00100	-0.00151	0.00059
1003007-1 2X	39.41388	-0.00550	0.00882	0.00323	0.01161	7.75888	0.00809	0.63638	-0.00028	-0.00033	-0.00691	-0.04648
1003007-2	21.60934	0.00243	0.02207	0.03037	0.01793	17.34759	0.02709	0.66020	-0.01759	-0.00161	-0.00625	-0.00838
1003007-3 2X	25.64250	-0.00141	0.00342	0.00335	0.00345	6.44091	0.00373	0.28782	-0.00866	-0.00128	-0.00201	-0.00963
1003009-1 2X	42.15203	-0.00234	0.00507	0.00271	0.00625	6.28631	0.00628	0.67095	-0.00558	-0.00089	-0.00367	-0.02437
1003010-1 5X	32.46394	0.00156	-0.00034	0.00115	-0.00109	1.64568	0.00036	7.00478	-0.01595	-0.00113	-0.00018	0.00908
1002239-4	41.53273	-0.00291	0.01634	0.01295	0.01804	10.85934	0.01158	0.60318	-0.01412	-0.00120	-0.00425	-0.04404
1003007-1	H82.09617	0.00425	0.03208	0.04297	0.02664	16.06305	0.03719	1.30912	-0.01332	-0.00152	L-0.01160	-0.00429
1003007-3	H53.90467	-0.00170	0.01361	0.01515	0.01284	13.40479	0.01382	0.58821	-0.01472	-0.00151	-0.00087	-0.02260
1003009-1	H88.34058	0.00039	0.01805	0.02297	0.01560	13.08661	0.02261	1.36844	-0.01370	-0.00112	-0.00533	-0.03188
1003010-1	H173.56057	-0.00881	0.01170	0.00010	0.01748	8.49844	0.00666	H31.21570	-0.01462	-0.00143	-0.00831	-0.03507
CCV	4.96496	0.47750	0.98182	0.98896	0.97825	4.72216	1.00011	0.48518	0.16855	0.46900	0.50247	4.86856
CCB	-0.02108	-0.00020	-0.00097	-0.00107	-0.00092	-0.01133	0.00167	-0.00132	-0.00404	-0.00081	0.00004	0.00284
CRI	0.18148	0.11487	0.00883	0.00814	0.00917	0.09503	0.10241	0.01883	0.08800	0.01902	0.01809	0.20474
ICSA	-0.01961	0.00700	-0.00457	0.00033	L-0.00702	-0.01220	0.00130	0.01115	-0.01411	-0.00162	-0.00085	0.05177
ICSAB	1.04229	0.60824	0.05419	0.05789	0.05234	0.97016	1.04014	1.01514	0.04819	0.97003	0.11006	10.51758
CCV	5.05823	0.48773	0.99994	1.01016	0.99483	4.80709	1.01449	0.49525	0.17046	0.47658	0.51853	4.99091
CCB	-0.03287	0.00159	-0.00165	0.00108	-0.00301	-0.00960	0.00055	-0.00158	-0.00202	-0.00088	-0.00075	-0.00415

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Sample Id1	V	Zn	Zr
MIXBHIGH	4.98804	9.94539	L-0.03443
MIXAHIGH	-0.00267	0.02504	0.00280
MIXCHIGH	-0.00697	-0.00193	H5.22893
ICV	0.25098	0.53315	0.50652
ICB	-0.00020	-0.00099	-0.00011
CRI	0.10533	0.03932	0.05276
ICSA	-0.00228	-0.00139	0.00228
ICSAB	0.48520	0.90690	0.50369
CCV	0.48412	1.02744	0.97606
CCB	0.00028	-0.00031	0.00042
IP100309-1MB	0.00028	0.00499	0.00010
IP100309-1RVS	0.00463	0.00856	0.00460
IP100309-1LCS	0.50728	0.49002	-0.00039
IP100309-1LCSD	0.49760	0.47301	-0.00069
1002108-1 50X	-0.00217	0.00222	0.00038
1002108-3 50X	-0.00168	0.01437	0.00125
1002174-8 50X	-0.00200	4.97987	0.00043
1002174-9 50X	-0.00184	2.90592	0.00209
IP100309-3MB	0.00010	0.00070	-0.00056
IP100309-3RVS	0.00478	0.00575	0.00457
CCV	0.48793	1.03044	0.98768
CCB	0.00055	-0.00024	0.00047
IP100309-3LCS	0.51408	0.49790	-0.00030
1002155-2 10X	L-0.01095	0.14877	0.00971
1002155-3 10X	-0.00095	0.07548	0.00775
1002155-4 10X	0.00414	0.05121	0.00508
1002155-5 10X	0.00536	0.05457	0.00507
1002163-2 10X	-0.00056	0.02515	-0.00070
1002163-3 10X	-0.00077	0.08800	0.00000
1002163-4 10X	0.01250	0.18672	0.00281
1002163-5 10X	0.00206	0.12951	0.00149
1002163-6 10X	-0.00056	0.01927	-0.00015
CCV	0.48439	1.01803	0.98341
CCB	0.00041	-0.00034	0.00051
1002163-7 10X	-0.00069	0.02900	0.00066
1002163-8 10X	0.01097	0.07642	0.00361
1002163-9 10X	0.00105	0.17485	0.00128
1002172-2 10X	-0.00004	0.04552	-0.00047
1002172-3 10X	0.00037	0.00442	-0.00004
1002172-4 10X	-0.00019	0.00232	-0.00058
1002172-5 10X	0.00044	-0.00142	-0.00012
1002189-2 10X	-0.00015	0.01314	-0.00047
1002189-3 10X	-0.00013	-0.00052	-0.00046
1002189-4 10X	-0.00014	0.00067	-0.00070
CCV	0.48865	1.04134	0.98673
CCB	-0.00002	-0.00049	0.00008
1002189-5 10X	-0.00039	-0.00056	-0.00053
1002189-5D 10X	0.00019	-0.00088	-0.00013
1002189-5L 50X	-0.00031	-0.00121	-0.00064
1002189-5MS 10X	0.05026	0.04653	-0.00038

Sample Id1	V	Zn	Zr
1002189-5MSD 10X	0.05102	0.04797	-0.00062
CRI	0.10367	0.03932	0.05167
ICSA	-0.00186	-0.00132	0.00249
ICSAB	0.49113	0.91847	0.50927
CCV	0.49314	1.04825	0.99596
CCB	0.00021	-0.00027	0.00027
CCV	0.48054	1.03019	0.96664
CCB	0.00081	0.00009	0.00066
1002174-8A 50X	0.60792	5.37170	-0.00036
1002155-2 100X	-0.00015	0.01610	0.00033
1002155-3 100X	-0.00098	0.00708	0.00004
1002155-4 100X	-0.00037	0.00380	-0.00021
1002155-5 100X	-0.00112	0.00593	-0.00044
1002163-4 50X	0.00102	0.03737	-0.00012
1002163-8 50X	0.00152	0.01487	-0.00011
1002189-3	0.00235	0.00658	0.00034
1002189-5	0.00078	0.00139	-0.00005
1002189-5D	0.00030	0.00150	-0.00054
CCV	0.47940	1.02273	0.96575
CCB	0.00018	0.00020	0.00027
1002189-5L 5X	0.00035	-0.00088	0.00005
1002189-5MS	0.48829	0.46293	-0.00079
1002189-5MSD	0.49614	0.47189	-0.00107
EX100309-1MB	-0.00017	0.00413	-0.00019
EX100309-1RVS	0.00452	0.00474	0.00447
EX100309-1LCS	0.50590	0.50487	-0.00166
EX100309-1LCSD	0.50979	0.51285	-0.00189
1002224-9	-0.00083	H28.03748	-0.00049
1002224-10	-0.00050	H43.34901	-0.00052
1002224-10D	-0.00087	H42.52668	-0.00080
CCV	0.48335	1.03185	0.97931
CCB	-0.00011	0.00146	0.00013
1002224-10L 5X	-0.00022	9.22435	-0.00040
1002224-10MS	0.49713	H44.75946	-0.00184
1002224-10MSD	0.49045	H43.55142	-0.00176
1002224-11	-0.00079	H31.00384	-0.00036
1002224-12	-0.00033	H10.52872	-0.00077
1002224-13	-0.00217	0.60072	-0.00098
1002224-14	0.00175	H17.78367	0.00011
1002224-15	-0.00016	0.14614	-0.00027
1002224-16	-0.00120	H53.24303	-0.00062
1002230-4	-0.00197	1.34583	0.00004
CCV	0.48936	1.02610	0.99521
CCB	0.00057	0.00186	0.00033
1002230-5	-0.00019	0.18604	0.00117
1002230-6	-0.00209	0.03748	0.00049
1003025-2	0.00000	0.06943	-0.00052
1003025-2D	0.00168	0.06968	0.00044
1003025-2L 5X	0.00000	0.01242	-0.00052
1003025-2MS	0.49111	0.54378	-0.00149

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Sample Id1	V	Zn	Zr
1003025-2MSD	0.48486	0.53641	-0.00115
1003055-10	0.00006	0.02886	-0.00028
1003063-16A	0.56698	0.66342	0.03701
TEST	-0.00034	0.00092	-0.00037
CCV	0.48076	1.00192	0.97734
CCB	0.00007	0.00085	0.00028
1002239-1	-0.00041	0.00240	-0.00235
1002239-2	0.00001	0.00211	-0.00314
1002239-2L 5X	-0.00031	-0.00009	-0.00142
1002239-2MS	0.55637	0.52654	-0.00334
1002239-2MSD	0.56581	0.53637	-0.00403
1002239-3	-0.00020	0.00856	-0.00250
1002239-4 2X	0.00052	0.00214	-0.00122
1002239-5	0.00271	0.00568	-0.00254
1002239-6	0.00130	0.00312	-0.00469
1002239-7	0.00009	0.00802	-0.00185
CCV	0.47487	0.98741	0.96554
CCB	0.00026	0.00002	0.00008
1003007-1 2X	-0.00185	0.01163	-0.00342
1003007-2	0.00009	0.00809	-0.00347
1003007-3 2X	-0.00045	0.00056	-0.00200
1003009-1 2X	0.00161	0.00517	-0.00218
1003010-1 5X	-0.00007	-0.00052	-0.00016
1002239-4	0.00054	0.00586	-0.00300
1003007-1	0.00005	0.02298	-0.00321
1003007-3	-0.00032	0.00251	-0.00310
1003009-1	0.00424	0.01011	-0.00333
1003010-1	-0.00233	0.00207	-0.00397
CCV	0.48436	1.02349	0.97782
CCB	0.00005	0.00041	0.00000
CRI	0.10259	0.03813	0.05159
ICSA	-0.00144	-0.00124	0.00269
ICSAB	0.49584	0.92039	0.51555
CCV	0.49193	1.03117	0.99884
CCB	0.00017	0.00074	0.00003

Method : Paragon File : 100310A Printed : 3/10/2010 16:01:54
SampleId1 : BLANK **SampleId2 :** **[STD]**
Analysis commenced : 3/10/2010 10:03:34
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE1

Raw intensities

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.884	2.304	4.245	1.382	0.338	5.276	2.943	0.817	2.117
#2	1.870	2.298	4.288	1.391	0.337	5.263	2.963	0.808	2.110
Mean	**1.877**	**2.301**	**4.267**	**1.386**	**0.338**	**5.270**	**2.953**	**0.813**	**2.114**
%RSD	0.527	0.184	0.713	0.459	0.210	0.174	0.479	0.783	0.234

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.968	3.572	0.992	0.887	10.322	1.651	2.016	0.217	1.559
#2	1.958	3.581	0.988	0.873	10.308	1.643	2.001	0.216	1.570
Mean	**1.963**	**3.577**	**0.990**	**0.880**	**10.315**	**1.647**	**2.008**	**0.217**	**1.565**
%RSD	0.360	0.178	0.286	1.125	0.096	0.343	0.528	0.327	0.497

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.302	4.122	1.288	46.351	13.065	0.168	3.729	8.189	5.996
#2	2.270	4.129	1.286	46.207	12.924	0.167	3.731	8.159	6.054
Mean	**2.286**	**4.126**	**1.287**	**46.279**	**12.994**	**0.168**	**3.730**	**8.174**	**6.025**
%RSD	0.990	0.120	0.110	0.220	0.767	0.422	0.038	0.260	0.681

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	4.802	1.440	0.561	9.551	3.458	5.234	2.602	2.468	0.437
#2	4.805	1.430	0.560	9.526	3.445	5.259	2.584	2.469	0.436
Mean	**4.803**	**1.435**	**0.561**	**9.538**	**3.452**	**5.247**	**2.593**	**2.468**	**0.437**
%RSD	0.044	0.493	0.126	0.185	0.266	0.337	0.491	0.029	0.162

	Zr	Pb	Se
	Reading	Reading	Reading
#1	4.332		
#2	4.325		
Mean	**4.329**	**0.000**	**0.000**
%RSD	0.114	0.000	0.000

Method : Paragon File : 100310A Printed : 3/10/2010 16:01:54
SampleId1 : RL **SampleId2 :** **[STD]**
Analysis commenced : 3/10/2010 10:05:28
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE2

Raw intensities

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.914	2.628	4.401	2.828	0.433	6.783	2.933	2.731	2.242
#2	1.901	2.628	4.383	2.832	0.430	6.764	2.952	2.722	2.200
Mean	**1.908**	**2.628**	**4.392**	**2.830**	**0.432**	**6.774**	**2.943**	**2.726**	**2.221**
%RSD	0.482	0.000	0.290	0.100	0.492	0.198	0.457	0.233	1.337

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.005	3.670	1.014	1.845	13.968	5.435	3.037	0.269	1.967
#2	1.991	3.654	1.009	1.838	13.922	5.458	3.014	0.269	1.979
Mean	**1.998**	**3.662**	**1.011**	**1.842**	**13.945**	**5.447**	**3.026**	**0.269**	**1.973**
%RSD	0.495	0.309	0.350	0.269	0.233	0.299	0.538	0.000	0.430

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	15.035	4.478	1.780	45.778	12.991	0.204	3.833	8.112	6.079
#2	15.150	4.507	1.794	45.357	12.940	0.210	3.794	7.995	6.065
Mean	**15.093**	**4.493**	**1.787**	**45.567**	**12.965**	**0.207**	**3.814**	**8.054**	**6.072**
%RSD	0.539	0.456	0.554	0.653	0.278	2.050	0.723	1.027	0.163

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	5.538	1.515	2.567	9.637	5.441	5.228	2.773	2.534	0.512
#2	5.519	1.501	2.580	9.577	5.424	5.114	2.752	2.502	0.508
Mean	**5.529**	**1.508**	**2.574**	**9.607**	**5.433**	**5.171**	**2.763**	**2.518**	**0.510**
%RSD	0.243	0.656	0.357	0.442	0.221	1.559	0.538	0.899	0.555

	Zr	Pb	Se
	Reading	Reading	Reading
#1	4.990		
#2	4.949		
Mean	**4.970**	**0.000**	**0.000**
%RSD	0.583	0.000	0.000

Method : Paragon File : 100310A Printed : 3/10/2010 16:01:55
SampleId1 : RL2 **SampleId2 :** **[STD]**
Analysis commenced : 3/10/2010 10:07:32
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE3

Raw intensities

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.047	3.332	4.629	5.634	0.604	9.823	3.075	6.453	2.537
#2	2.050	3.328	4.654	5.604	0.602	9.768	3.124	6.398	2.530
Mean	**2.048**	**3.330**	**4.642**	**5.619**	**0.603**	**9.796**	**3.100**	**6.426**	**2.534**
%RSD	0.104	0.085	0.381	0.378	0.235	0.397	1.118	0.605	0.195

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

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	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.175	4.072	1.090	3.718	19.004	12.773	5.109	0.382	2.799
#2	2.168	4.046	1.089	3.703	18.956	12.755	5.070	0.380	2.808
Mean	**2.172**	**4.059**	**1.090**	**3.711**	**18.980**	**12.764**	**5.090**	**0.381**	**2.803**
%RSD	0.228	0.453	0.065	0.286	0.179	0.100	0.542	0.371	0.227

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	38.519	5.461	2.826	46.978	13.608	0.277	4.144	8.299	6.371
#2	38.482	5.455	2.800	46.822	13.456	0.274	4.136	8.310	6.384
Mean	**38.501**	**5.458**	**2.813**	**46.900**	**13.532**	**0.276**	**4.140**	**8.305**	**6.378**
%RSD	0.068	0.078	0.654	0.235	0.794	0.770	0.137	0.094	0.144

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	7.069	1.677	5.846	10.317	9.424	5.547	3.234	2.797	0.660
#2	7.042	1.674	5.830	10.231	9.375	5.593	3.191	2.763	0.658
Mean	**7.056**	**1.676**	**5.838**	**10.274**	**9.400**	**5.570**	**3.213**	**2.780**	**0.659**
%RSD	0.271	0.127	0.194	0.592	0.369	0.584	0.946	0.865	0.215

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	6.512		
#2	6.496		
Mean	**6.504**	**0.000**	**0.000**
%RSD	0.174	0.000	0.000

Method : Paragon File : 100310A Printed : 3/10/2010 16:01:55
SampleId1 : B3 **SampleId2 :** **[STD]**
Analysis commenced : 3/10/2010 10:09:23
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE4

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.508	2.344	5.858	4.316	4.409	18.981	3.027	0.790	8.636
#2	2.501	2.340	5.764	4.312	4.441	19.088	2.962	0.783	8.712
Mean	**2.505**	**2.342**	**5.811**	**4.314**	**4.425**	**19.035**	**2.995**	**0.787**	**8.674**
%RSD	0.198	0.121	1.144	0.066	0.511	0.397	1.535	0.629	0.620

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	3.948	11.754	2.586	0.840	10.449	1.662	2.022	2.947	5.842
#2	3.943	11.749	2.590	0.836	10.399	1.658	2.016	2.962	5.834
Mean	**3.946**	**11.752**	**2.588**	**0.838**	**10.424**	**1.660**	**2.019**	**2.955**	**5.838**
%RSD	0.090	0.030	0.109	0.338	0.339	0.170	0.210	0.359	0.097

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading

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#1	2.217	13.740	6.476	61.129	20.646	0.170	4.214	9.316	7.641
#2	2.215	13.823	6.464	61.028	20.641	0.169	4.212	9.251	7.601
Mean	**2.216**	**13.782**	**6.470**	**61.079**	**20.644**	**0.170**	**4.213**	**9.284**	**7.621**
%RSD	0.064	0.426	0.131	0.117	0.017	0.417	0.034	0.495	0.371

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	12.409	2.313	16.928	10.602	23.375	6.827	2.638	5.262	1.964
#2	12.439	2.322	17.038	10.509	23.484	6.861	2.624	5.276	1.963
Mean	**12.424**	**2.318**	**16.983**	**10.556**	**23.430**	**6.844**	**2.631**	**5.269**	**1.964**
%RSD	0.171	0.275	0.458	0.623	0.329	0.351	0.376	0.188	0.036

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	4.581		
#2	4.544		
Mean	**4.563**	**0.000**	**0.000**
%RSD	0.573	0.000	0.000

Method : Paragon File : 100310A Printed : 3/10/2010 16:01:55
SampleId1 : B2 **SampleId2 :** **[STD]**
Analysis commenced : 3/10/2010 10:11:14
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE5

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	7.740	2.464	18.664	30.040	40.197	139.557	3.018	0.794	65.608
#2	7.748	2.452	18.745	30.126	40.343	139.784	3.036	0.796	65.787
Mean	**7.744**	**2.458**	**18.705**	**30.083**	**40.270**	**139.671**	**3.027**	**0.795**	**65.698**
%RSD	0.073	0.345	0.306	0.202	0.256	0.115	0.420	0.178	0.193

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	20.899	82.276	16.513	0.870	10.143	1.606	1.978	26.741	42.675
#2	20.925	82.412	16.581	0.873	10.087	1.597	1.973	26.800	42.819
Mean	**20.912**	**82.344**	**16.547**	**0.872**	**10.115**	**1.602**	**1.976**	**26.771**	**42.747**
%RSD	0.088	0.117	0.291	0.243	0.391	0.397	0.179	0.156	0.238

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.344	97.497	50.821	181.789	84.156	0.172	7.781	17.453	20.439
#2	2.337	98.016	51.085	181.902	84.414	0.174	7.822	17.541	20.499
Mean	**2.341**	**97.757**	**50.953**	**181.846**	**84.285**	**0.173**	**7.802**	**17.497**	**20.469**
%RSD	0.211	0.375	0.366	0.044	0.216	0.817	0.372	0.356	0.207

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	78.481	9.746	159.228	17.503	198.026	20.464	2.564	29.357	15.103

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#2	78.662	9.772	159.657	17.477	198.403	20.530	2.547	29.405	15.073
Mean	**78.572**	**9.759**	**159.443**	**17.490**	**198.215**	**20.497**	**2.556**	**29.381**	**15.088**
%RSD	0.163	0.188	0.190	0.105	0.134	0.228	0.470	0.116	0.141

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	5.905		
#2	5.891		
Mean	**5.898**	**0.000**	**0.000**
%RSD	0.168	0.000	0.000

Method : Paragon File : 100310A Printed : 3/10/2010 16:01:56
SampleId1 : B1 **SampleId2 :** **[STD]**
Analysis commenced : 3/10/2010 10:13:05
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE6

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	61.120	4.180	146.825	286.446	388.242	1340.932	4.196	0.996	621.593
#2	61.441	4.184	147.585	288.233	389.864	1346.217	4.221	0.996	623.981
Mean	**61.281**	**4.182**	**147.205**	**287.340**	**389.053**	**1343.575**	**4.209**	**0.996**	**622.787**
%RSD	0.370	0.068	0.365	0.440	0.295	0.278	0.420	0.000	0.271

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	191.952	796.840	157.693	1.346	10.231	1.734	2.275	255.672	409.054
#2	192.573	800.544	158.311	1.338	10.171	1.732	2.261	256.640	409.997
Mean	**192.263**	**798.692**	**158.002**	**1.342**	**10.201**	**1.733**	**2.268**	**256.156**	**409.525**
%RSD	0.228	0.328	0.277	0.422	0.416	0.082	0.436	0.267	0.163

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	3.443	939.062	467.671	1409.448	734.714	0.245	44.718	101.711	151.340
#2	3.450	944.002	468.990	1413.728	734.400	0.245	44.891	102.384	152.152
Mean	**3.447**	**941.532**	**468.331**	**1411.588**	**734.557**	**0.245**	**44.805**	**102.048**	**151.746**
%RSD	0.144	0.371	0.199	0.214	0.030	0.000	0.273	0.466	0.378

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	728.407	84.483	1431.327	91.212	1987.436	159.369	2.868	273.218	144.229
#2	731.719	84.891	1437.078	91.560	1995.347	160.083	2.875	274.062	144.774
Mean	**730.063**	**84.687**	**1434.202**	**91.386**	**1991.392**	**159.726**	**2.872**	**273.640**	**144.502**
%RSD	0.321	0.341	0.284	0.269	0.281	0.316	0.172	0.218	0.267

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	20.849		
#2	20.915		

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Mean	**20.882**	**0.000**	**0.000NCH**
%RSD	0.223	0.000	0.000

Method : Paragon File : 100310A Printed : 3/10/2010 16:01:56
SampleId1 : A5 **SampleId2 :** **[STD]**
Analysis commenced : 3/10/2010 10:14:56
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE7

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.831	18.763	4.431	1.794	0.486	5.757	2.896	44.901	2.273
#2	1.845	18.789	4.463	1.732	0.452	5.650	2.901	44.920	2.236
Mean	**1.838**	**18.776**	**4.447**	**1.763**	**0.469**	**5.704**	**2.899**	**44.911**	**2.255**
%RSD	0.539	0.098	0.509	2.487	5.126	1.327	0.122	0.030	1.160

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.976	3.818	1.030	37.950	23.434	37.825	25.747	0.306	1.785
#2	1.959	3.744	1.016	38.016	23.468	37.905	25.766	0.284	1.749
Mean	**1.968**	**3.781**	**1.023**	**37.983**	**23.451**	**37.865**	**25.757**	**0.295**	**1.767**
%RSD	0.611	1.384	0.968	0.123	0.103	0.149	0.052	5.273	1.441

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	60.524	4.326	1.463	46.160	13.071	0.171	3.754	8.216	6.016
#2	60.737	4.229	1.444	46.073	13.106	0.172	3.741	8.275	6.122
Mean	**60.631**	**4.278**	**1.454**	**46.117**	**13.089**	**0.172**	**3.748**	**8.246**	**6.069**
%RSD	0.248	1.603	0.924	0.133	0.189	0.412	0.245	0.506	1.235

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	5.345	1.474	1.455	10.324	4.169	5.313	2.555	2.522	0.497
#2	5.221	1.485	1.314	10.321	3.991	5.189	2.559	2.499	0.477
Mean	**5.283**	**1.480**	**1.385**	**10.323**	**4.080**	**5.251**	**2.557**	**2.511**	**0.487**
%RSD	1.660	0.526	7.201	0.021	3.085	1.670	0.111	0.648	2.904

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	4.156		
#2	4.172		
Mean	**4.164**	**0.000**	**0.000**
%RSD	0.272	0.000	0.000

Method : Paragon File : 100310A Printed : 3/10/2010 16:01:56
SampleId1 : A4 **SampleId2 :** **[STD]**
Analysis commenced : 3/10/2010 10:16:47
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE8

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Raw intensities **16:01:58** **User: ROY FRENCH**

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.978	166.304	5.164	1.704	0.373	5.669	3.104	450.456	2.272
#2	1.987	168.138	5.134	1.693	0.373	5.665	3.063	453.747	2.279
Mean	**1.983**	**167.221**	**5.149**	**1.699**	**0.373**	**5.667**	**3.084**	**452.102**	**2.276**
%RSD	0.321	0.776	0.412	0.458	0.000	0.050	0.940	0.515	0.218

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.077	4.178	1.044	370.336	117.879	365.919	244.977	0.276	1.980
#2	2.069	4.152	1.042	373.410	119.056	369.798	247.133	0.278	2.001
Mean	**2.073**	**4.165**	**1.043**	**371.873**	**118.468**	**367.859**	**246.055**	**0.277**	**1.991**
%RSD	0.273	0.441	0.136	0.585	0.703	0.746	0.620	0.511	0.746

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	497.608	4.393	1.495	55.680	15.778	0.188	4.754	9.974	7.357
#2	503.369	4.341	1.535	55.975	15.827	0.189	4.764	9.984	7.280
Mean	**500.489**	**4.367**	**1.515**	**55.828**	**15.803**	**0.189**	**4.759**	**9.979**	**7.319**
%RSD	0.814	0.842	1.867	0.374	0.219	0.375	0.149	0.071	0.744

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	5.575	1.726	0.794	16.659	4.087	6.203	3.203	2.868	0.612
#2	5.581	1.747	0.800	16.659	4.081	6.128	3.171	2.853	0.608
Mean	**5.578**	**1.737**	**0.797**	**16.659**	**4.084**	**6.166**	**3.187**	**2.861**	**0.610**
%RSD	0.076	0.855	0.532	0.000	0.104	0.860	0.710	0.371	0.464

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	4.639		
#2	4.615		
Mean	**4.627**	**0.000**	**0.000**
%RSD	0.367	0.000	0.000

Method : Paragon File : 100310A Printed : 3/10/2010 16:01:56
SampleId1 : A3 **SampleId2 :** **[STD]**
Analysis commenced : 3/10/2010 10:18:39
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE9

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.963	329.757	5.713	1.714	0.356	5.729	3.076	874.768	2.302
#2	1.962	330.387	5.665	1.711	0.352	5.697	3.039	874.966	2.296
Mean	**1.963**	**330.072**	**5.689**	**1.713**	**0.354**	**5.713**	**3.058**	**874.867**	**2.299**
%RSD	0.036	0.135	0.597	0.124	0.799	0.396	0.856	0.016	0.185

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ted: 3/10/2010 16:01:58 User: ROY FRENCH

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.077	4.273	1.029	707.493	237.693	790.788	480.698	0.298	2.278
#2	2.072	4.276	1.032	708.402	237.948	791.699	481.238	0.295	2.243
Mean	**2.075**	**4.275**	**1.031**	**707.948**	**237.821**	**791.244**	**480.968**	**0.297**	**2.261**
%RSD	0.170	0.050	0.206	0.091	0.076	0.081	0.079	0.715	1.095

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	960.507	4.317	1.612	63.172	18.173	0.204	5.562	11.347	8.390
#2	961.284	4.328	1.606	63.105	18.125	0.203	5.537	11.347	8.377
Mean	**960.896**	**4.323**	**1.609**	**63.138**	**18.149**	**0.204**	**5.550**	**11.347**	**8.384**
%RSD	0.057	0.180	0.264	0.075	0.187	0.347	0.319	0.000	0.110

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	5.767	1.923	0.825	19.709	4.141	6.978	3.452	2.971	0.732
#2	5.763	1.922	0.813	19.629	4.139	6.848	3.442	2.966	0.730
Mean	**5.765**	**1.923**	**0.819**	**19.669**	**4.140**	**6.913**	**3.447**	**2.969**	**0.731**
%RSD	0.049	0.037	1.036	0.288	0.034	1.330	0.205	0.119	0.193

	Zr	Pb	Se
	Reading	Reading	Reading
#1	4.670		
#2	4.654		
Mean	**4.662**	**0.000**	**0.000**
%RSD	0.243	0.000	0.000

Method : Paragon File : 100310A Printed : 3/10/2010 16:01:57
SampleId1 : A2 **SampleId2 :** **[STD]**
Analysis commenced : 3/10/2010 10:20:29
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE10

Raw intensities

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.971	633.945	6.800	1.867	0.351	5.835	3.113	1641.240	2.361
#2	1.959	634.634	6.846	1.854	0.348	5.824	3.102	1638.862	2.395
Mean	**1.965**	**634.290**	**6.823**	**1.861**	**0.350**	**5.830**	**3.108**	**1640.051**	**2.378**
%RSD	0.432	0.077	0.477	0.494	0.607	0.133	0.250	0.103	1.011

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.153	4.537	1.040	1291.808	461.019	1644.809	926.161	0.357	2.845
#2	2.149	4.520	1.034	1291.505	461.946	1647.197	925.712	0.356	2.836
Mean	**2.151**	**4.528**	**1.037**	**1291.657**	**461.483**	**1646.003**	**925.937**	**0.357**	**2.841**
%RSD	0.131	0.265	0.409	0.017	0.142	0.103	0.034	0.198	0.224

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	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1711.322	4.460	1.818	77.956	22.539	0.229	7.207	13.996	10.339
#2	1711.887	4.414	1.792	77.849	22.432	0.228	7.178	14.007	10.329
Mean	**1711.605**	**4.437**	**1.805**	**77.903**	**22.486**	**0.229**	**7.193**	**14.002**	**10.334**
%RSD	0.023	0.733	1.019	0.097	0.336	0.309	0.285	0.056	0.068

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	6.108	2.297	0.967	23.355	4.341	8.334	3.882	3.195	0.997
#2	6.095	2.307	0.965	23.231	4.324	8.321	3.863	3.202	0.998
Mean	**6.102**	**2.302**	**0.966**	**23.293**	**4.332**	**8.328**	**3.873**	**3.199**	**0.998**
%RSD	0.151	0.307	0.146	0.376	0.277	0.110	0.347	0.155	0.071

	Zr	Pb	Se
	Reading	Reading	Reading
#1	4.768		
#2	4.742		
Mean	**4.755**	**0.000**	**0.000**
%RSD	0.387	0.000	0.000

Method : Paragon File : 100310A Printed : 3/10/2010 16:01:57
SampleId1 : A1 **SampleId2 :** **[STD]**
Analysis commenced : 3/10/2010 10:22:20
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE11

Raw intensities

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.026	1453.390	10.280	2.479	0.381	6.341	3.419	3624.812	2.790
#2	2.030	1457.222	10.236	2.460	0.381	6.346	3.403	3622.550	2.779
Mean	**2.028**	**1455.306**	**10.258**	**2.470**	**0.381**	**6.344**	**3.411**	**3623.681**	**2.785**
%RSD	0.139	0.186	0.303	0.544	0.000	0.056	0.332	0.044	0.279

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.440	5.338	1.084	2645.542	1034.395	4055.859	2173.573	0.538	4.667
#2	2.436	5.323	1.084	2646.247	1036.649	4068.263	2178.247	0.538	4.672
Mean	**2.438**	**5.331**	**1.084**	**2645.895**	**1035.522**	**4062.061**	**2175.910**	**0.538**	**4.669**
%RSD	0.116	0.199	0.000	0.019	0.154	0.216	0.152	0.000	0.076

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	3233.846	4.915	2.471	122.077	35.407	0.309	12.053	22.097	16.193
#2	3233.335	4.949	2.446	122.031	35.398	0.314	12.073	22.187	16.172
Mean	**3233.591**	**4.932**	**2.459**	**122.054**	**35.403**	**0.312**	**12.063**	**22.142**	**16.183**
%RSD	0.011	0.487	0.719	0.027	0.018	1.135	0.117	0.287	0.092

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn

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	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	6.870	3.440	1.478	30.721	5.015	12.813	5.122	3.915	1.770
#2	6.864	3.435	1.476	30.628	5.009	12.798	5.108	3.917	1.773
Mean	**6.867**	**3.438**	**1.477**	**30.675**	**5.012**	**12.806**	**5.115**	**3.916**	**1.772**
%RSD	0.062	0.103	0.096	0.214	0.085	0.083	0.194	0.036	0.120

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	5.170		
#2	5.155		
Mean	**5.162**	**0.000**	**0.000**
%RSD	0.205	0.000	0.000

Method : Paragon File : 100310A Printed : 3/10/2010 16:01:57
SampleId1 : C3 **SampleId2 :** **[STD]**
Analysis commenced : 3/10/2010 10:24:11
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE12

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.983	2.615	4.404	1.463	0.341	5.387	3.652	1.416	2.183
#2	1.973	2.510	4.410	1.453	0.341	5.390	3.646	1.159	2.168
Mean	**1.978**	**2.563**	**4.407**	**1.458**	**0.341**	**5.388**	**3.649**	**1.288**	**2.176**
%RSD	0.357	2.897	0.096	0.485	0.000	0.039	0.116	14.115	0.488

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.014	3.756	1.028	1.452	10.582	2.028	2.467	0.222	1.605
#2	2.022	3.756	1.029	1.218	10.525	1.901	2.318	0.221	1.605
Mean	**2.018**	**3.756**	**1.029**	**1.335**	**10.554**	**1.965**	**2.393**	**0.222**	**1.605**
%RSD	0.280	0.000	0.069	12.394	0.382	4.571	4.404	0.319	0.000

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.876	4.255	1.285	47.783	13.554	0.538	3.830	8.442	6.250
#2	2.644	4.255	1.310	47.746	13.598	0.529	3.859	8.344	6.252
Mean	**2.760**	**4.255**	**1.297**	**47.765**	**13.576**	**0.534**	**3.845**	**8.393**	**6.251**
%RSD	5.944	0.000	1.362	0.055	0.229	1.193	0.533	0.826	0.023

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	4.978	1.484	0.570	10.710	3.586	5.336	3.765	2.567	0.445
#2	4.968	1.484	0.566	10.695	3.571	5.372	3.726	2.565	0.445
Mean	**4.973**	**1.484**	**0.568**	**10.703**	**3.579**	**5.354**	**3.746**	**2.566**	**0.445**
%RSD	0.142	0.000	0.498	0.099	0.296	0.475	0.736	0.055	0.000

	Zr	**Pb**	**Se**
	Reading	Reading	Reading

200001041
200001041

#1	11.534		**NCH**
#2	11.533		
Mean	**11.534**	**0.000**	**0.000**
%RSD	0.006	0.000	0.000

Method : Paragon File : 100310A Printed : 3/10/2010 16:01:57
SampleId1 : C2 **SampleId2 :** **[STD]**
Analysis commenced : 3/10/2010 10:26:02
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE13

Raw intensities

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.230	2.515	4.289	1.470	0.326	5.668	8.749	0.930	2.087
#2	2.210	2.510	4.251	1.462	0.325	5.694	8.720	0.929	2.072
Mean	**2.220**	**2.513**	**4.270**	**1.466**	**0.326**	**5.681**	**8.735**	**0.930**	**2.080**
%RSD	0.637	0.141	0.629	0.386	0.217	0.324	0.235	0.076	0.510

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1.976	4.350	1.115	0.938	10.040	1.644	2.635	0.240	1.525
#2	1.968	4.342	1.109	0.944	9.995	1.642	2.632	0.239	1.528
Mean	**1.972**	**4.346**	**1.112**	**0.941**	**10.017**	**1.643**	**2.633**	**0.240**	**1.527**
%RSD	0.287	0.130	0.382	0.451	0.318	0.086	0.081	0.295	0.139

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.248	4.112	1.282	46.521	13.394	3.612	3.662	8.048	6.005
#2	2.248	4.102	1.272	46.494	13.249	3.632	3.674	8.047	5.937
Mean	**2.248**	**4.107**	**1.277**	**46.508**	**13.322**	**3.622**	**3.668**	**8.048**	**5.971**
%RSD	0.000	0.172	0.554	0.041	0.770	0.390	0.231	0.009	0.805

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	5.372	1.442	0.572	17.838	3.824	5.133	13.040	2.710	0.431
#2	5.367	1.431	0.570	17.766	3.808	5.189	13.114	2.686	0.434
Mean	**5.370**	**1.437**	**0.571**	**17.802**	**3.816**	**5.161**	**13.077**	**2.698**	**0.433**
%RSD	0.066	0.541	0.248	0.286	0.296	0.767	0.400	0.629	0.490

	Zr	**Pb**	**Se**
	Reading	Reading	Reading
#1	73.358		
#2	73.743		
Mean	**73.551**	**0.000**	**0.000**
%RSD	0.370	0.000	0.000

Method : Paragon File : 100310A Printed : 3/10/2010 16:01:58
SampleId1 : C1 **SampleId2 :** **[STD]**
Analysis commenced : 3/10/2010 10:27:53

2000010422
2000010422

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE14

Raw intensities

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	5.831	4.828	4.780	2.613	0.357	10.584	61.244	1.994	2.582
#2	5.860	4.817	4.755	2.598	0.358	10.586	61.269	1.998	2.548
Mean	**5.846**	**4.823**	**4.768**	**2.606**	**0.358**	**10.585**	**61.257**	**1.996**	**2.565**
%RSD	0.351	0.161	0.371	0.407	0.198	0.013	0.029	0.142	0.937

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.626	12.583	2.363	2.053	10.210	1.751	8.965	0.542	1.712
#2	2.631	12.562	2.353	2.056	10.240	1.759	8.967	0.542	1.723
Mean	**2.628**	**12.573**	**2.358**	**2.055**	**10.225**	**1.755**	**8.966**	**0.542**	**1.718**
%RSD	0.135	0.118	0.300	0.103	0.207	0.322	0.016	0.000	0.453

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	2.234	5.446	1.590	62.783	18.964	33.963	4.180	9.377	6.631
#2	2.244	5.429	1.538	62.864	19.052	33.935	4.177	9.382	6.678
Mean	**2.239**	**5.438**	**1.564**	**62.824**	**19.008**	**33.949**	**4.178**	**9.380**	**6.655**
%RSD	0.316	0.221	2.351	0.091	0.327	0.058	0.051	0.038	0.499

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	11.781	1.768	0.890	94.321	8.371	5.858	106.874	5.560	0.492
#2	11.758	1.769	0.892	94.235	8.356	5.834	106.799	5.586	0.490
Mean	**11.770**	**1.769**	**0.891**	**94.278**	**8.364**	**5.846**	**106.837**	**5.573**	**0.491**
%RSD	0.138	0.040	0.159	0.065	0.127	0.290	0.050	0.330	0.288

	Zr	Pb	Se
	Reading	Reading	Reading
#1	697.367		
#2	697.126		
Mean	**697.247**	**0.000**	**0.000**
%RSD	0.024	0.000	0.000

200001043

Line calibration information

Analyte	Reporting name	C0	C1	C2	C3	Correlation coefficient	Low limit	High limit	Date of last regression
Ag 328.068	Ag	0.0006809	0.0361279	-0.0000051	0	1.0000	-0.027	55.777	3/10/2010 10:31:35
Al 308.215	Al	-0.0192679	0.3111325	0.0000323	0	0.99999	0.067	1395.861	3/10/2010 10:31:35
As 189.042/2	As	0.0050777	0.0376684	0.0000041	0	1.0000	-0.148	130.726	3/10/2010 10:31:35
B 249.678/2	B	-0.0026326	0.0400026	0.0000006	0	1.0000	0.062	249.194	3/10/2010 10:31:36
Ba 493.409	Ba	-0.0009027	0.0283046	0.0000024	0	1.0000	0.005	343.423	3/10/2010 10:31:36
Be 313.042	Be	-0.0041098	0.0007451	0.0	0	1.0000	5.270	1343.575	3/10/2010 10:31:36
Bi 223.061	Bi	0.0013348	0.1018126	0.0000083	0	1.0000	-0.017	48.901	3/10/2010 10:31:37
Ca 317.933	Ca	-0.0247952	0.1147087	0.0000084	0	0.99999	0.126	3455.033	3/10/2010 10:31:37
Cd 226.502/2	Cd	-0.0007905	0.0093717	0.0000005	0	1.0000	0.039	520.103	3/10/2010 10:31:37
Co 228.616	Co	0.0003054	0.0270359	-0.0000005	0	1.0000	-0.027	185.507	3/10/2010 10:31:38
Cr 267.716	Cr	-0.0006397	0.0129296	-0.0000002	0	1.0000	-0.007	781.015	3/10/2010 10:31:38
Cu 324.753	Cu	-0.0127159	0.0707827	-0.0000055	0	1.0000	0.170	143.056	3/10/2010 10:31:39
Fe 259.94	Fe	-0.0048826	0.0530029	0.0000087	0	0.99994	0.081	2595.159	3/10/2010 10:31:39
K 766.491	K	-2.646823	0.2317552	-0.0000471	5.687056401	0.99999	10.315	1035.522	3/10/2010 10:31:39
Li 670.784	Li	-0.001764	0.0027414	-0.0000003	5.026125189	0.99999	1.647	4062.061	3/10/2010 10:31:40
Mg 279.078	Mg	-0.0120984	0.2184108	0.000008	0	0.99999	0.011	2107.826	3/10/2010 10:31:40
Mn 257.61	Mn	-0.0009238	0.0381323	0.0000063	0	1.0000	0.006	251.729	3/10/2010 10:31:40
Mo 202.03/2	Mo	-0.0015291	0.0266268	0.0000007	0	1.0000	0.026	372.169	3/10/2010 10:31:41
Na 588.995	Na	-0.252608	0.0480271	0.0000028	1.933570042	1.0000	2.286	3233.591	3/10/2010 10:31:41
Ni 231.604	Ni	-0.0013258	0.0127697	0.0000000	0	1.0000	0.083	785.054	3/10/2010 10:31:41
P 178.287/2	P	-0.0100164	0.1018131	0.0000158	0	1.0000	0.052	458.542	3/10/2010 10:31:42
Pb 220.351	Pb I	0.0025685	0.0075925	0.0	0	1.0000	-0.401	1318.662	3/10/2010 10:31:42
Pb 220.352/2	Pb II	-0.0040875	0.0147311	-0.0000003	0	1.0000	0.160	687.132	3/10/2010 10:31:42
S 182.04/2	S	-0.0549618	1.4730142	0.0010743	0	1.0000	0.030	33.179	3/10/2010 10:31:43
Sb 206.838/2	Sb	-0.0005865	0.0598977	0.0000137	0	1.0000	0.008	33.148	3/10/2010 10:31:43
Se 196.021	Se I	0.0009753	0.0546965	0.0000013	0	1.0000	-0.005	91.204	3/10/2010 10:31:43
Se 196.021/2	Se II	-0.0034093	0.0357454	-0.0000021	0	1.0000	0.049	141.116	3/10/2010 10:31:44
Si 288.158	Si	-0.10059	0.0689033	0.0000019	0	1.0000	1.401	713.159	3/10/2010 10:31:44
Sn 189.989	Sn	0.0001734	0.1246303	-0.0000027	0	1.0000	-0.014	80.377	3/10/2010 10:31:44
Sr 421.552	Sr	-0.0019768	0.0071792	0.0000007	0	1.0000	0.010	1244.748	3/10/2010 10:31:45

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Th 283.73/2	Th	-0.0156857	0.0271401	-0.0000089	0	0.99999	0.444	76.183	3/10/2010 10:31:45
Ti 334.941	Ti	-0.0006683	0.0052649	-0.0000001	0	1.0000	-0.040	1944.748	3/10/2010 10:31:46
Tl 190.864/2	Tl	0.0058648	0.037367	-0.0000027	0	1.0000	-0.099	134.959	3/10/2010 10:31:46
U 385.958	U	0.0098287	0.4988411	0.0000711	0	1.0000	-0.028	98.822	3/10/2010 10:31:46
V 292.402	V	-0.0000758	0.0191295	-0.0000005	0	1.0000	-0.002	263.098	3/10/2010 10:31:47
Zn 206.2	Zn	-0.0020014	0.0721014	0.0000102	0	1.0000	0.013	136.108	3/10/2010 10:31:47
Zr 339.198	Zr	-0.0009938	0.0075004	0.0	0	1.0000	0.059	666.906	3/10/2010 10:31:47

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:08
SampleId1 : MIXBHIGH SampleId2 : [CV]
Analysis commenced : 3/10/2010 10:32:33
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.00111	0.04789	4.99382	9.97331	9.94557	0.99181	0.00365	-0.02858	4.97587
#2	2.00520	0.05413	5.00335	9.99623	9.99855	0.99368	0.00017	-0.02812	4.98425
Mean	**2.00316**	**0.05101**	**4.99859**	**9.98477**	**9.97206**	**0.99274**	**0.00191**	**-0.02835**	**4.98006**
%RSD	0.14440	8.65218	0.13485	0.16230	0.37569	0.13281	128.49570	1.14437	0.11905

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.98276	9.95574	9.99499	-0.01204	-0.27114	0.00304	-0.04508	9.93761	9.98914
#2	4.99251	9.98066	10.01194	-0.01177	-0.27068	0.00305	-0.04333	9.97046	10.02312
Mean	**4.98764**	**9.96820**	**10.00347**	**-0.01191**	**-0.27091**	**0.00304**	**-0.04420**	**9.95404**	**10.00613**
%RSD	0.13832	0.17676	0.11984	1.57397	0.12049	0.25467	2.79497	0.23330	0.24014

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.08477	10.00036	49.71956	9.98017	9.95047	-0.01077	1.98297	4.97302	4.92257
#2	-0.08472	10.03731	49.78059	9.99703	9.89861	-0.00782	1.99163	4.97846	4.92064
Mean	**-0.08474**	**10.01884**	**49.75007**	**9.98860**	**9.92454**	**-0.00930**	**1.98730**	**4.97574**	**4.92160**
%RSD	0.04009	0.26076	0.08674	0.11937	0.36954	22.40700	0.30834	0.07727	0.02780

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	49.63599	10.00183	9.95978	1.97889	9.95648	5.01378	-0.05002	4.98143	9.93356
#2	49.84678	10.02007	10.04941	1.98879	9.97714	5.02664	-0.05052	4.99465	9.95722
Mean	**49.74139**	**10.01095**	**10.00459**	**1.98384**	**9.96681**	**5.02021**	**-0.05027**	**4.98804**	**9.94539**
%RSD	0.29966	0.12878	0.63351	0.35293	0.14658	0.18118	0.70187	0.18736	0.16818

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.03432	9.96036	4.93937
#2	-0.03453	9.93138	4.93989
Mean	**-0.03443**	**9.94587**	**4.93963**
%RSD	0.42572	0.20603	0.00745

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:09
SampleId1 : MIXAHIGH SampleId2 : [CV]
Analysis commenced : 3/10/2010 10:34:27
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE11

Final concentrations

200001046

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00041	509.65167	0.00496	0.01277	0.00181	0.00097	0.00979	513.22126	0.00038
#2	0.00009	511.73570	0.00180	0.01153	0.00088	0.00089	0.01417	516.51671	-0.00048
Mean	**-0.00016**	**510.69369**	**0.00338**	**0.01215**	**0.00135**	**0.00093**	**0.01198**	**514.86898**	**-0.00005**
%RSD	216.38042	0.28855	66.14209	7.21805	49.01577	5.86744	25.85204	0.45259	1112.70395

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00107	0.00462	-0.00734	201.49229	253.09186	10.14582	510.69850	-0.00573	0.00308
#2	0.00074	0.00437	-0.00749	202.51419	253.99261	10.18791	514.60996	-0.00653	0.00337
Mean	**0.00090**	**0.00450**	**-0.00742**	**202.00324**	**253.54223**	**10.16686**	**512.65423**	**-0.00613**	**0.00322**
%RSD	25.37773	3.97548	1.44767	0.35771	0.25121	0.29270	0.53951	9.23866	6.42445

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	253.45849	0.00188	0.01768	-0.00566	0.00460	0.03342	0.00682	0.00450	-0.00932
#2	253.27656	0.00073	0.01574	-0.00044	0.00197	0.02311	0.01060	0.01670	-0.00902
Mean	**253.36752**	**0.00130**	**0.01671**	**-0.00305**	**0.00328**	**0.02827**	**0.00871**	**0.01060**	**-0.00917**
%RSD	0.05077	62.28314	8.18623	121.22222	56.60109	25.79567	30.68303	81.40781	2.29406

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00739	0.00292	0.00501	0.00482	-0.00069	-0.00255	0.09862	-0.00290	0.02511
#2	0.00213	0.00591	0.00418	0.00551	-0.00128	-0.00320	0.11190	-0.00244	0.02497
Mean	**0.00476**	**0.00441**	**0.00459**	**0.00516**	**-0.00099**	**-0.00287**	**0.10526**	**-0.00267**	**0.02504**
%RSD	78.06151	47.94924	12.82409	9.42882	42.14056	16.13248	8.91691	12.34426	0.40729

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00277	0.00118	-0.00472
#2	0.00282	0.00117	-0.00045
Mean	**0.00280**	**0.00117**	**-0.00258**
%RSD	1.37797	0.68687	116.59028

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:09
SampleId1 : MIXCHIGH SampleId2 : [CV]
Analysis commenced : 3/10/2010 10:36:20
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE14

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00030	0.10629	0.00071	0.01913	-0.00136	0.00412	5.23104	0.04529	-0.00101
#2	-0.00026	0.12600	-0.00468	0.01953	-0.00161	0.00417	5.31263	0.03497	-0.00162
Mean	**-0.00028**	**0.11615**	**-0.00198**	**0.01933**	**-0.00148**	**0.00414**	**5.27183**	**0.04013**	**-0.00132**
%RSD	10.73877	12.00349	191.88251	1.46343	12.14638	0.72018	1.09427	18.19125	32.76701

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00499	-0.00884	0.00080	0.00784	-0.21944	0.00360	-0.32375	0.00369	-0.00089
#2	0.00453	-0.00908	0.00023	0.00307	-0.24644	0.00343	-0.32026	0.00361	-0.00102
Mean	**0.00476**	**-0.00896**	**0.00051**	**0.00545**	**-0.23294**	**0.00351**	**-0.32201**	**0.00365**	**-0.00096**
%RSD	6.83098	1.86659	78.09868	61.85751	8.19673	3.52823	0.76731	1.47662	9.84057

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.12493	-0.00057	0.01330	-0.00155	0.00256	51.95141	0.00171	-0.00674	0.00121
#2	-0.13070	-0.00143	0.00923	-0.00356	0.00305	52.54407	0.00136	-0.01202	-0.00244
Mean	**-0.12781**	**-0.00100**	**0.01126**	**-0.00255**	**0.00281**	**52.24774**	**0.00153**	**-0.00938**	**-0.00061**
%RSD	3.18938	60.48888	25.56892	55.66462	12.14061	0.80209	16.49870	39.81406	421.59321

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.03105	0.01824	-0.00005	-0.42741	0.00838	0.00505	51.31370	-0.00709	-0.00164
#2	-0.02726	0.01836	-0.00018	-0.43969	0.00833	0.00303	51.95127	-0.00685	-0.00222
Mean	**-0.02916**	**0.01830**	**-0.00011**	**-0.43355**	**0.00836**	**0.00404**	**51.63249**	**-0.00697**	**-0.00193**
%RSD	9.19645	0.48187	84.76629	2.00171	0.44553	35.38898	0.87315	2.51322	21.14026

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	5.20349	0.00119	-0.00143
#2	5.25436	0.00085	-0.00563
Mean	**5.22893**	**0.00102**	**-0.00353**
%RSD	0.68793	24.09138	84.01292

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:09
SampleId1 : ICV **SampleId2 :** **[CV]**
Analysis commenced : 3/10/2010 10:42:17
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10189	25.06242	0.25572	0.49861	0.50438	0.25653	0.27132	24.71447	0.25127
#2	0.10043	25.02582	0.25142	0.49553	0.50523	0.25688	0.26296	24.69022	0.25022
Mean	**0.10116**	**25.04412**	**0.25357**	**0.49707**	**0.50481**	**0.25670**	**0.26714**	**24.70234**	**0.25074**
%RSD	1.02469	0.10333	1.19923	0.43833	0.11930	0.09641	2.21239	0.06941	0.29644

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.25843	0.51443	0.49457	10.18772	24.04675	0.23823	25.20171	0.51069	0.50465
#2	0.25805	0.51440	0.49387	10.20048	24.04408	0.23841	25.19929	0.51142	0.50209
Mean	**0.25824**	**0.51441**	**0.49422**	**10.19410**	**24.04541**	**0.23832**	**25.20050**	**0.51105**	**0.50337**
%RSD	0.10360	0.00386	0.09894	0.08856	0.00787	0.05436	0.00680	0.10069	0.35942

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	24.40461	0.51687	2.49636	0.50865	0.48644	2.55121	0.25277	0.51972	0.49652
#2	24.38737	0.51483	2.50528	0.50177	0.49868	2.52758	0.25088	0.51549	0.51033
Mean	**24.39599**	**0.51585**	**2.50082**	**0.50521**	**0.49256**	**2.53939**	**0.25183**	**0.51761**	**0.50343**
%RSD	0.04996	0.28000	0.25236	0.96227	1.75710	0.65795	0.52841	0.57782	1.94019

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.46290	0.50908	0.25215	0.08367	0.24464	0.26411	2.57081	0.25134	0.53362
#2	2.46472	0.50759	0.25234	0.08293	0.24520	0.25786	2.55082	0.25062	0.53268
Mean	**2.46381**	**0.50833**	**0.25224**	**0.08330**	**0.24492**	**0.26099**	**2.56081**	**0.25098**	**0.53315**
%RSD	0.05207	0.20809	0.05471	0.62424	0.16094	1.69138	0.55202	0.20397	0.12457

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.50653	0.49384	0.50425
#2	0.50650	0.49971	0.51205
Mean	**0.50652**	**0.49677**	**0.50815**
%RSD	0.00501	0.83618	1.08608

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:10
SampleId1 : ICB **SampleId2 :** **[CB]**
Analysis commenced : 3/10/2010 10:44:13
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00005	0.03574	0.00014	0.00281	-0.00062	0.00010	-0.00080	-0.00059	-0.00028
#2	-0.00018	0.04494	0.00011	0.00269	-0.00042	0.00018	-0.00111	0.00859	-0.00037
Mean	**-0.00011**	**0.04034**	**0.00012**	**0.00275**	**-0.00052**	**0.00014**	**-0.00096**	**0.00400**	**-0.00032**
%RSD	82.75963	16.12594	21.40949	3.08831	26.91001	40.81370	22.90612	162.34224	20.47207

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00004	-0.00040	-0.00012	0.00556	-0.20075	0.00300	0.00800	-0.00047	-0.00116
#2	-0.00099	-0.00056	-0.00047	0.00922	-0.21736	0.00303	0.01040	-0.00031	-0.00046
Mean	**-0.00048**	**-0.00048**	**-0.00029**	**0.00739**	**-0.20906**	**0.00302**	**0.00920**	**-0.00039**	**-0.00081**
%RSD	152.07207	23.57987	82.04545	35.00544	5.62025	0.64247	18.47234	27.66163	60.42034

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.14818	-0.00007	-0.00493	0.00124	-0.00194	-0.00930	0.00055	-0.00312	-0.00033
#2	-0.14189	-0.00075	-0.00401	-0.00095	-0.00113	-0.00193	-0.00196	-0.00729	0.00067
Mean	**-0.14504**	**-0.00041**	**-0.00447**	**0.00015**	**-0.00154**	**-0.00561**	**-0.00071**	**-0.00520**	**0.00017**
%RSD	3.06817	115.94745	14.50352	1057.65739	37.34140	92.76067	250.41182	56.65023	425.70982

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00552	-0.00120	-0.00179	-0.00163	-0.00086	0.00105	0.00883	-0.00002	-0.00099

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#2	-0.00453	0.00067	-0.00171	-0.00358	-0.00075	-0.00023	-0.00714	-0.00038	-0.00099
Mean	**-0.00502**	**-0.00026**	**-0.00175**	**-0.00261**	**-0.00080**	**0.00041**	**0.00084**	**-0.00020**	**-0.00099**
%RSD	13.96263	504.82896	3.18967	52.88339	9.74149	220.07387	1336.70664	129.11687	0.00000

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00013	-0.00088	-0.00126
#2	-0.00009	-0.00107	-0.00198
Mean	**-0.00011**	**-0.00098**	**-0.00162**
%RSD	26.86899	13.76348	31.40359

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:10
SampleId1 : CRI **SampleId2 :** **[FLEXQC]**
Analysis commenced : 3/10/2010 10:46:22
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD3

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02045	0.43996	0.00964	0.41822	0.42571	0.01028	0.05258	5.16616	0.01044
#2	0.02063	0.43303	0.01133	0.41606	0.42630	0.01026	0.05166	5.15207	0.01028
Mean	**0.02054**	**0.43650**	**0.01048**	**0.41714**	**0.42600**	**0.01027**	**0.05212**	**5.15912**	**0.01036**
%RSD	0.62628	1.12236	11.43387	0.36628	0.09891	0.15692	1.24518	0.19308	1.03876

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10313	0.02023	0.05188	0.21825	3.73513	0.01858	5.20964	0.03062	0.01964
#2	0.10354	0.02041	0.05174	0.21857	3.70211	0.01853	5.19498	0.03062	0.01999
Mean	**0.10333**	**0.02032**	**0.05181**	**0.21841**	**3.71862**	**0.01855**	**5.20231**	**0.03062**	**0.01981**
%RSD	0.27824	0.63537	0.19001	0.10310	0.62783	0.16692	0.19925	0.00000	1.23544

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.24913	0.08205	0.21303	0.00665	0.00461	0.21169	0.12246	0.01017	0.00999
#2	4.23741	0.08459	0.20906	0.00504	0.00542	0.21316	0.12180	0.00743	0.00634
Mean	**4.24327**	**0.08332**	**0.21104**	**0.00585**	**0.00502**	**0.21243**	**0.12213**	**0.00880**	**0.00817**
%RSD	0.19520	2.15660	1.33129	19.43656	11.45230	0.49046	0.38123	21.98678	31.56904

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10519	0.10621	0.01957	0.09385	0.02005	0.02062	0.21372	0.10547	0.03917
#2	0.10285	0.10521	0.01955	0.09175	0.01992	0.02391	0.21072	0.10518	0.03946
Mean	**0.10402**	**0.10571**	**0.01956**	**0.09280**	**0.01999**	**0.02227**	**0.21222**	**0.10533**	**0.03932**
%RSD	1.58870	0.66681	0.05194	1.60365	0.46560	10.43757	0.99745	0.19254	0.51879

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.05266	0.00529	0.01005
#2	0.05286	0.00530	0.00671

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Mean	**0.05276**	**0.00529**	**0.00838NCH**
%RSD	0.27129	0.08784	28.21632

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:10
SampleId1 : ICSA SampleId2 : [FLEXQC]
Analysis commenced : 3/10/2010 10:48:13
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD4

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00035	262.02098	-0.00148	0.00173	-0.00022	0.00031	0.00968	257.98526	-0.00037
#2	0.00010	262.71114	-0.00166	0.00169	-0.00036	0.00030	0.00245	258.58511	-0.00052
Mean	**0.00022**	**262.36606**	**-0.00157**	**0.00171**	**-0.00029**	**0.00031**	**0.00607**	**258.28519**	**-0.00044**
%RSD	80.47102	0.18601	8.47902	1.65643	34.01617	2.32736	84.26175	0.16422	23.76047

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00115	0.00013	-0.00419	106.83186	-0.39094	0.00433	267.74899	-0.00111	-0.00164
#2	0.00085	0.00011	-0.00476	107.09915	-0.38840	0.00432	268.43997	-0.00115	-0.00180
Mean	**0.00100**	**0.00012**	**-0.00447**	**106.96551**	**-0.38967**	**0.00432**	**268.09448**	**-0.00113**	**-0.00172**
%RSD	21.09579	14.62768	8.93547	0.17669	0.46080	0.22402	0.18225	2.37881	6.58507

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.14179	0.00092	0.00098	-0.00018	-0.00081	-0.00782	0.00407	0.00142	-0.00322
#2	-0.14304	0.00037	0.00281	-0.00110	0.00151	-0.00930	0.00024	0.00705	-0.00422
Mean	**-0.14242**	**0.00065**	**0.00190**	**-0.00064**	**0.00035**	**-0.00856**	**0.00215**	**0.00424**	**-0.00372**
%RSD	0.62015	59.99774	68.35056	102.13468	470.65451	12.16742	125.94166	93.94225	18.92056

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00923	-0.00007	0.01108	-0.01014	-0.00141	-0.00354	0.05133	-0.00212	-0.00106
#2	-0.01206	-0.00157	0.01108	-0.01206	-0.00143	-0.00020	0.05015	-0.00245	-0.00171
Mean	**-0.01065**	**-0.00082**	**0.01108**	**-0.01110**	**-0.00142**	**-0.00187**	**0.05074**	**-0.00228**	**-0.00139**
%RSD	18.75604	128.65815	0.04583	12.27533	0.78733	126.43203	1.64423	10.25084	33.04473

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00234	-0.00060	-0.00168
#2	0.00222	0.00064	-0.00047
Mean	**0.00228**	**0.00002**	**-0.00107**
%RSD	3.60548	4491.33351	79.88436

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:10
SampleId1 : ICSAB SampleId2 : [FLEXQC]
Analysis commenced : 3/10/2010 10:50:05
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD5

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Final concentrations **2:48** **User: ROY FRENCH**

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.20375	266.54537	0.10949	1.00242	0.51290	0.48276	0.54697	261.17499	1.00587
#2	0.20528	267.36378	0.11020	1.00658	0.51611	0.48394	0.55098	261.25798	1.00694
Mean	**0.20452**	**266.95458**	**0.10985**	**1.00450**	**0.51450**	**0.48335**	**0.54897**	**261.21648**	**1.00641**
%RSD	0.52691	0.21678	0.46099	0.29306	0.44092	0.17269	0.51562	0.02246	0.07552

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.47290	0.47544	0.50896	108.19581	-0.38355	1.05697	271.89429	0.47527	0.98662
#2	0.47433	0.47776	0.51024	108.37166	-0.39902	1.06051	272.39133	0.47661	0.98940
Mean	**0.47362**	**0.47660**	**0.50960**	**108.28374**	**-0.39129**	**1.05874**	**272.14281**	**0.47594**	**0.98801**
%RSD	0.21358	0.34466	0.17813	0.11483	2.79512	0.23674	0.12915	0.19911	0.19855

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.15486	0.92874	1.02634	0.04593	0.05616	1.02386	0.59395	0.05924	0.05623
#2	-0.15549	0.93138	1.03329	0.05365	0.05768	1.03713	0.60725	0.06247	0.05544
Mean	**-0.15517**	**0.93006**	**1.02982**	**0.04979**	**0.05692**	**1.03050**	**0.60060**	**0.06085**	**0.05583**
%RSD	0.28458	0.20088	0.47688	10.96107	1.88812	0.91066	1.56554	3.75730	1.00883

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.96290	1.01025	1.00428	0.05153	0.96504	0.10399	10.35032	0.48437	0.90607
#2	0.96886	1.01398	1.00872	0.04782	0.96790	0.10844	10.42698	0.48603	0.90773
Mean	**0.96588**	**1.01211**	**1.00650**	**0.04967**	**0.96647**	**0.10622**	**10.38865**	**0.48520**	**0.90690**
%RSD	0.43645	0.26089	0.31221	5.27426	0.20901	2.96187	0.52177	0.24165	0.12976

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.50247	0.05275	0.05723
#2	0.50491	0.05634	0.05778
Mean	**0.50369**	**0.05455**	**0.05751**
%RSD	0.34262	4.64612	0.67072

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:11
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/10/2010 10:51:57
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19487	48.91861	0.49222	0.96051	0.97192	0.49451	0.50546	48.13942	0.48558
#2	0.19684	49.34699	0.49671	0.96796	0.97849	0.49721	0.51568	48.35500	0.48880
Mean	**0.19586**	**49.13280**	**0.49446**	**0.96423**	**0.97521**	**0.49586**	**0.51057**	**48.24721**	**0.48719**
%RSD	0.71249	0.61651	0.64285	0.54600	0.47683	0.38496	1.41517	0.31595	0.46725

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ted: 3/10/2010 16:02:48 User: ROY FRENCH

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49597	0.98759	0.95294	19.93161	48.70273	0.49782	49.40248	0.98392	0.96910
#2	0.49822	0.99316	0.95878	20.02642	49.08816	0.50192	49.69952	0.98854	0.97427
Mean	**0.49710**	**0.99037**	**0.95586**	**19.97901**	**48.89544**	**0.49987**	**49.55100**	**0.98623**	**0.97169**
%RSD	0.31966	0.39765	0.43169	0.33556	0.55740	0.57956	0.42389	0.33090	0.37659

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.17114	0.97496	4.79597	0.96339	0.97036	4.95830	0.47748	0.98436	0.98843
#2	48.53970	0.98402	4.83523	0.97255	0.97471	4.98495	0.48312	1.00037	0.98812
Mean	**48.35542**	**0.97949**	**4.81560**	**0.96797**	**0.97254**	**4.97163**	**0.48030**	**0.99236**	**0.98827**
%RSD	0.53896	0.65422	0.57640	0.66901	0.31653	0.37898	0.82996	1.14094	0.02196

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.75355	0.98702	0.48658	0.16836	0.47504	0.49383	4.89423	0.48314	1.02461
#2	4.78741	0.99698	0.48975	0.17006	0.47722	0.50114	4.92868	0.48509	1.03026
Mean	**4.77048**	**0.99200**	**0.48817**	**0.16921**	**0.47613**	**0.49748**	**4.91145**	**0.48412**	**1.02744**
%RSD	0.50190	0.71027	0.45929	0.70979	0.32301	1.03922	0.49601	0.28453	0.38861

	Zr	Pb	Se
	ppm	calc	calc
#1	0.97318	0.96804	0.98707
#2	0.97894	0.97399	0.99220
Mean	**0.97606**	**0.97102**	**0.98964**
%RSD	0.41710	0.43354	0.36635

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:11
SampleId1 : CCB SampleId2 : [CB]
Analysis commenced : 3/10/2010 10:53:49
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00004	0.06538	0.00014	0.00373	-0.00003	0.00037	-0.00305	0.03382	-0.00040
#2	-0.00026	0.07289	-0.00110	0.00397	0.00014	0.00039	-0.00274	0.03612	0.00039
Mean	**-0.00011**	**0.06913**	**-0.00048**	**0.00385**	**0.00006**	**0.00038**	**-0.00289**	**0.03497**	**0.00000**
%RSD	187.57926	7.68321	183.77671	4.41075	201.42409	2.71480	7.60800	4.63922	11765.84623

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00026	-0.00005	-0.00067	0.01754	-0.19198	0.00315	0.04010	0.00007	-0.00049
#2	0.00044	0.00063	0.00009	0.01966	-0.19590	0.00316	0.04338	0.00022	0.00052
Mean	**0.00009**	**0.00029**	**-0.00029**	**0.01860**	**-0.19394**	**0.00316**	**0.04174**	**0.00014**	**0.00002**
%RSD	549.20270	167.13470	187.10094	8.06136	1.43040	0.12280	5.55012	74.92675	4698.37697

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	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.12320	-0.00027	0.00118	-0.00093	0.00092	-0.00930	0.00163	-0.00106	0.00149
#2	-0.12474	0.00047	-0.00045	0.00298	-0.00068	-0.01814	-0.00041	0.00207	-0.00044
Mean	**-0.12397**	**0.00010**	**0.00037**	**0.00103**	**0.00012**	**-0.01372**	**0.00061**	**0.00051**	**0.00053**
%RSD	0.87688	501.50097	312.39692	269.16439	933.62061	45.56341	236.44081	436.36207	259.66506

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00659	-0.00294	-0.00148	-0.00489	-0.00072	-0.00045	-0.01064	0.00010	-0.00056
#2	-0.00398	-0.00057	-0.00142	-0.00367	-0.00051	-0.00142	0.00233	0.00046	-0.00005
Mean	**-0.00529**	**-0.00176**	**-0.00145**	**-0.00428**	**-0.00061**	**-0.00094**	**-0.00415**	**0.00028**	**-0.00031**
%RSD	34.81681	95.25597	3.15276	20.15808	24.39707	72.86508	220.88555	91.32068	116.23013

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00032	0.00031	0.00064
#2	0.00052	0.00054	0.00040
Mean	**0.00042**	**0.00042**	**0.00052**
%RSD	34.69975	38.80999	33.45129

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:11
SampleId1 : IP100309-1MB SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 10:55:40
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE1

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00010	0.04145	0.00225	0.00209	-0.00048	-0.00009	0.00419	0.01971	-0.00035
#2	0.00056	0.04830	-0.00069	0.00301	-0.00031	-0.00006	0.00083	0.02384	0.00010
Mean	**0.00033**	**0.04488**	**0.00078**	**0.00255**	**-0.00039**	**-0.00007**	**0.00251**	**0.02178**	**-0.00013**
%RSD	97.75751	10.79214	265.12817	25.53586	30.53645	28.64407	94.56953	13.40892	248.29868

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00029	0.00017	0.00031	0.38941	-0.34131	0.00259	0.00275	0.00133	-0.00185
#2	0.00012	0.00066	0.00108	0.39270	-0.35285	0.00257	0.00909	0.00148	-0.00038
Mean	**-0.00009**	**0.00042**	**0.00069**	**0.39105**	**-0.34708**	**0.00258**	**0.00592**	**0.00140**	**-0.00112**
%RSD	333.18909	82.34782	78.69596	0.59566	2.35141	0.45059	75.64821	7.69123	92.75603

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.15150	0.00007	0.01768	0.00140	-0.00155	-0.02108	0.00077	0.00152	-0.00035
#2	-0.15035	0.00046	0.02195	0.00365	-0.00312	-0.02255	-0.00042	0.00328	0.00037
Mean	**-0.15092**	**0.00026**	**0.01982**	**0.00253**	**-0.00233**	**-0.02182**	**0.00018**	**0.00240**	**0.00001**
%RSD	0.54018	106.00844	15.26006	63.18111	47.60579	4.77400	472.02791	51.81127	5130.99255

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00641	0.00254	-0.00173	-0.00336	-0.00042	0.00071	0.00158	0.00023	0.00521
#2	0.00991	-0.00095	-0.00165	-0.00566	-0.00054	-0.00134	0.01305	0.00033	0.00478
Mean	**0.00816**	**0.00080**	**-0.00169**	**-0.00451**	**-0.00048**	**-0.00031**	**0.00732**	**0.00028**	**0.00499**
%RSD	30.34371	309.53631	3.31191	35.99415	17.10746	460.05679	110.84565	24.54229	6.12738

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00021	-0.00057	0.00027
#2	0.00042	-0.00086	0.00134
Mean	**0.00010**	**-0.00071**	**0.00081**
%RSD	429.98452	29.27840	93.22902

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:12
SampleId1 : IP100309-1RVS SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 10:57:26
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00139	0.13392	0.00500	0.00537	0.00439	0.00095	0.00554	0.51131	0.00138
#2	0.00164	0.13215	0.00154	0.00705	0.00436	0.00093	0.00687	0.51269	0.00142
Mean	**0.00152**	**0.13304**	**0.00327**	**0.00621**	**0.00438**	**0.00094**	**0.00620**	**0.51200**	**0.00140**
%RSD	11.66884	0.94566	74.94492	19.13705	0.45737	1.20585	15.10708	0.19024	2.14764

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00122	0.00474	0.00481	0.46684	0.37914	0.00569	0.48461	0.00609	0.00925
#2	0.00125	0.00503	0.00523	0.46726	0.37499	0.00569	0.48985	0.00602	0.00949
Mean	**0.00124**	**0.00488**	**0.00502**	**0.46705**	**0.37707**	**0.00569**	**0.48723**	**0.00605**	**0.00937**
%RSD	1.55322	4.09454	5.95196	0.06438	0.77823	0.03405	0.76087	0.89073	1.80759

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.61372	0.00537	0.12868	0.00466	0.00436	0.07762	0.01005	0.00358	0.00427
#2	0.61002	0.00456	0.12359	0.00503	0.00365	0.07909	0.00945	0.00899	0.00181
Mean	**0.61187**	**0.00496**	**0.12614**	**0.00485**	**0.00400**	**0.07835**	**0.00975**	**0.00629**	**0.00304**
%RSD	0.42829	11.46134	2.85496	5.44423	12.53689	1.32949	4.35293	60.94864	57.34389

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03451	0.01101	0.00313	-0.00407	0.00440	0.00934	0.04044	0.00482	0.00838
#2	0.03795	0.01313	0.00314	-0.00392	0.00434	0.00714	0.04343	0.00443	0.00874
Mean	**0.03623**	**0.01207**	**0.00314**	**-0.00399**	**0.00437**	**0.00824**	**0.04194**	**0.00462**	**0.00856**
%RSD	6.71787	12.41208	0.32389	2.66740	1.02223	18.90361	5.04640	5.84807	2.97756

	Zr	**Pb**	**Se**
	ppm	calc	calc

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#1	0.00458	0.00446	0.00404	**NCH**
#2	0.00462	0.00411	0.00420	
Mean	**0.00460**	**0.00428**	**0.00412**	
%RSD	0.64952	5.76483	2.72663	

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:12
SampleId1 : IP100309-1LCS SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 10:59:12
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE3

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09982	2.06586	2.01605	0.95931	2.02415	0.04865	-0.00154	40.18448	0.05039
#2	0.09996	2.08748	2.03210	0.96619	2.04262	0.04891	0.00122	40.40147	0.05095
Mean	**0.09989**	**2.07667**	**2.02407**	**0.96275**	**2.03339**	**0.04878**	**-0.00016**	**40.29298**	**0.05067**
%RSD	0.09928	0.73637	0.56049	0.50568	0.64249	0.37432	1237.90909	0.38080	0.77579

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49643	0.19911	0.25392	1.54206	37.63434	0.49191	40.71655	0.49648	1.02312
#2	0.49948	0.20119	0.25604	1.55154	37.92806	0.49583	40.94590	0.49970	1.03134
Mean	**0.49796**	**0.20015**	**0.25498**	**1.54680**	**37.78120**	**0.49387**	**40.83122**	**0.49809**	**1.02723**
%RSD	0.43242	0.73382	0.58703	0.43296	0.54973	0.56222	0.39718	0.45670	0.56562

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	36.82679	0.50088	0.02287	0.48208	0.48600	-0.02108	0.48965	1.94992	1.96674
#2	37.07085	0.50462	0.02511	0.48648	0.48574	-0.01961	0.49060	1.97332	1.96365
Mean	**36.94882**	**0.50275**	**0.02399**	**0.48428**	**0.48587**	**-0.02035**	**0.49012**	**1.96162**	**1.96519**
%RSD	0.46708	0.52611	6.60250	0.64312	0.03797	5.11966	0.13706	0.84349	0.11114

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.72626	0.52212	0.50561	-0.01516	0.49487	2.06139	-0.00718	0.50568	0.48854
#2	1.73787	0.52798	0.50999	-0.01477	0.49814	2.07767	-0.00021	0.50889	0.49150
Mean	**1.73206**	**0.52505**	**0.50780**	**-0.01496**	**0.49651**	**2.06953**	**-0.00370**	**0.50728**	**0.49002**
%RSD	0.47408	0.78821	0.60995	1.87327	0.46608	0.55621	133.50456	0.44764	0.42740

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00030	0.48470	1.96114
#2	-0.00048	0.48599	1.96687
Mean	**-0.00039**	**0.48534**	**1.96401**
%RSD	33.40932	0.18834	0.20637

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Method : Paragon File : 100310A Printed : 3/10/2010 16:02:12
SampleId1 : IP100309-1LCSD SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:01:00

Dilution ratio : 1.00000 to 1.00000   Tray :   Position : TUBE4

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09755	2.03676	1.97742	0.94574	1.99854	0.04743	0.00058	39.12067	0.05024
#2	0.09662	2.06144	2.00352	0.95843	2.03108	0.04775	-0.00369	39.37387	0.05045
Mean	**0.09708**	**2.04910**	**1.99047**	**0.95208**	**2.01481**	**0.04759**	**-0.00156**	**39.24727**	**0.05034**
%RSD	0.67421	0.85150	0.92718	0.94242	1.14188	0.47903	193.81151	0.45617	0.30209

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48507	0.19519	0.25222	1.51451	37.35466	0.48668	39.68227	0.48507	1.00151
#2	0.48824	0.19544	0.25507	1.53008	37.77383	0.49290	39.98568	0.48982	1.01146
Mean	**0.48665**	**0.19531**	**0.25364**	**1.52229**	**37.56424**	**0.48979**	**39.83397**	**0.48744**	**1.00649**
%RSD	0.46051	0.09228	0.79263	0.72316	0.78903	0.89722	0.53859	0.68884	0.69907

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	36.44622	0.49132	0.02226	0.47389	0.47104	-0.02403	0.48145	1.92467	1.91210
#2	36.80764	0.49585	0.02369	0.47348	0.47279	-0.02403	0.48195	1.94350	1.91342
Mean	**36.62693**	**0.49359**	**0.02297**	**0.47368**	**0.47192**	**-0.02403**	**0.48170**	**1.93408**	**1.91276**
%RSD	0.69775	0.64927	4.38781	0.06086	0.26227	0.00000	0.07378	0.68851	0.04869

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.69326	0.51130	0.49878	-0.01364	0.48517	2.01942	-0.00717	0.49604	0.47236
#2	1.71368	0.51590	0.50647	-0.01772	0.49015	2.04955	-0.02464	0.49916	0.47366
Mean	**1.70347**	**0.51360**	**0.50263**	**-0.01568**	**0.48766**	**2.03448**	**-0.01590**	**0.49760**	**0.47301**
%RSD	0.84754	0.63396	1.08286	18.39829	0.72211	1.04736	77.69048	0.44295	0.19437

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00059	0.47199	1.91629
#2	-0.00078	0.47302	1.92344
Mean	**-0.00069**	**0.47251**	**1.91986**
%RSD	19.86061	0.15440	0.26333

Method : Paragon   File : 100310A   Printed : 3/10/2010 16:02:12
SampleId1 : 1002108-1 50X   SampleId2 :   [SAMPLE]
Analysis commenced : 3/10/2010 11:02:49
Dilution ratio : 1.00000 to 1.00000   Tray :   Position : TUBE5

Final concentrations

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00124	0.06175	0.01137	-0.00003	0.01362	-0.00002	0.00363	-0.00059	-0.00092
#2	-0.00113	0.06188	0.00986	-0.00047	0.01359	-0.00002	-0.00022	-0.00346	-0.00061

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Mean	**-0.00119**	**0.06182**	**0.01062**	**-0.00025**	**0.01360**	**-0.00002**	**0.00170**	**-0.00203**	**-0.00076**
%RSD	6.34900	0.15031	10.03721	123.24298	0.14713	26.07217	159.86024	100.12954	27.81288

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01143	0.04866	0.35980	107.24103	-0.35147	0.00270	-0.03547	0.40506	0.02307
#2	0.01124	0.04911	0.36460	107.61133	-0.36947	0.00263	-0.04289	0.40656	0.02260
Mean	**0.01134**	**0.04888**	**0.36220**	**107.42618**	**-0.36047**	**0.00267**	**-0.03918**	**0.40581**	**0.02283**
%RSD	1.18713	0.65093	0.93817	0.24374	3.53204	1.88836	13.40158	0.26005	1.48421

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.13089	0.13350	0.00546	-0.00005	0.00276	0.01869	0.00551	-0.00294	0.00438
#2	-0.13363	0.13216	0.00353	-0.00293	0.00332	0.00838	0.00485	-0.00217	0.00433
Mean	**-0.13226**	**0.13283**	**0.00449**	**-0.00149**	**0.00304**	**0.01354**	**0.00518**	**-0.00255**	**0.00435**
%RSD	1.46404	0.71370	30.45022	136.59980	13.05288	53.86897	9.11165	21.26857	0.83278

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00333	0.05065	-0.00160	0.01002	0.00164	0.00062	0.00615	-0.00229	0.00211
#2	0.00250	0.05027	-0.00163	0.01175	0.00214	-0.00005	0.01089	-0.00206	0.00232
Mean	**0.00292**	**0.05046**	**-0.00161**	**0.01088**	**0.00189**	**0.00029**	**0.00852**	**-0.00217**	**0.00222**
%RSD	20.28130	0.52476	1.26070	11.25179	18.73427	166.07655	39.32465	7.31374	6.90056

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00057	0.00182	0.00194
#2	0.00018	0.00124	0.00217
Mean	**0.00038**	**0.00153**	**0.00205**
%RSD	72.82454	27.04582	7.62205

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:13
SampleId1 : 1002108-3 50X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:05:07
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00047	0.06409	0.01453	-0.00259	0.00977	0.00004	0.00455	0.00159	-0.00042
#2	-0.00082	0.06260	0.01649	-0.00227	0.00983	0.00002	0.00954	0.00205	-0.00071
Mean	**-0.00018**	**0.06335**	**0.01551**	**-0.00243**	**0.00980**	**0.00003**	**0.00704**	**0.00182**	**-0.00056**
%RSD	519.74945	1.66363	8.92933	9.30231	0.40862	54.35919	50.07290	17.85038	35.74911

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01703	0.07955	0.32045	179.54056	-0.29561	0.00273	-0.05753	0.59970	0.02483
#2	0.01660	0.07996	0.32074	179.60084	-0.29791	0.00272	-0.06233	0.60066	0.02505
Mean	**0.01681**	**0.07975**	**0.32060**	**179.57070**	**-0.29676**	**0.00272**	**-0.05993**	**0.60018**	**0.02494**

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%RSD	1.81588	0.35958	0.06395	0.02374	0.54998	0.35566	5.66932	0.11290	0.60401

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.14463	0.13496	0.01014	0.03183	0.03188	0.03195	0.01012	-0.00349	0.00406
#2	-0.14448	0.13529	0.00414	0.02745	0.03488	0.03490	0.00748	-0.00169	0.00478
Mean	**-0.14456**	**0.13513**	**0.00714**	**0.02964**	**0.03338**	**0.03342**	**0.00880**	**-0.00259**	**0.00442**
%RSD	0.07050	0.17373	59.49620	10.43569	6.34758	6.23326	21.19066	49.11559	11.58462

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00020	0.12156	-0.00182	0.01411	0.00017	-0.00263	0.03474	-0.00138	0.01393
#2	-0.00289	0.12181	-0.00186	0.01285	-0.00019	-0.00423	0.02572	-0.00198	0.01480
Mean	**-0.00134**	**0.12169**	**-0.00184**	**0.01348**	**-0.00001**	**-0.00343**	**0.03023**	**-0.00168**	**0.01437**
%RSD	162.35228	0.14509	1.65498	6.61062	2560.31133	32.97339	21.09839	25.29555	4.25891

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00131	0.03187	0.00155
#2	0.00119	0.03241	0.00263
Mean	**0.00125**	**0.03214**	**0.00209**
%RSD	6.88666	1.19264	36.64991

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:13
SampleId1 : 1002174-8 50X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:06:52
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE7

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00044	0.04620	-0.00231	0.00033	-0.00053	-0.00006	0.00012	0.23013	0.00149
#2	-0.00081	0.04970	-0.00366	0.00021	-0.00051	-0.00007	0.00174	0.22921	0.00128
Mean	**-0.00018**	**0.04795**	**-0.00298**	**0.00027**	**-0.00052**	**-0.00006**	**0.00093**	**0.22967**	**0.00139**
%RSD	487.05937	5.16091	32.14208	31.71476	3.84429	1.10576	123.82642	0.28262	11.00599

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00265	0.01931	0.03539	82.55279	-0.28545	0.00271	-0.02630	0.36577	0.00244
#2	0.00214	0.01901	0.03491	82.89261	-0.31453	0.00263	-0.02892	0.36764	0.00223
Mean	**0.00240**	**0.01916**	**0.03515**	**82.72270**	**-0.29999**	**0.00267**	**-0.02761**	**0.36671**	**0.00233**
%RSD	15.15497	1.10647	0.96579	0.29047	6.85513	2.03154	6.71339	0.36145	6.45968

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.14434	0.02199	-0.00330	0.03703	0.03537	-0.00488	-0.00101	-0.00455	0.00154
#2	-0.14540	0.02105	-0.00065	0.03444	0.03580	-0.00782	0.00085	-0.00539	0.00134
Mean	**-0.14487**	**0.02152**	**-0.00197**	**0.03573**	**0.03559**	**-0.00635**	**-0.00008**	**-0.00497**	**0.00144**
%RSD	0.51586	3.10505	94.87223	5.11783	0.83934	32.80123	1723.82365	11.92683	9.75498

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	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00267	0.00291	0.00100	0.00881	0.00098	-0.00035	0.02645	-0.00177	4.97674
#2	0.00173	0.00154	0.00100	0.00871	0.00110	-0.00355	0.00676	-0.00222	4.98299
Mean	**0.00220**	**0.00223**	**0.00100**	**0.00876**	**0.00104**	**-0.00195**	**0.01661**	**-0.00200**	**4.97987**
%RSD	30.06513	43.50188	0.50817	0.80516	8.23186	115.85821	83.82268	15.95812	0.08870

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00059	0.03592	-0.00049
#2	0.00028	0.03535	-0.00090
Mean	**0.00043**	**0.03563**	**-0.00069**
%RSD	50.29071	1.14993	41.88312

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:13
SampleId1 : 1002174-9 50X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:08:38
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE8

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00070	0.04234	-0.00133	-0.00275	0.00009	-0.00005	0.01255	0.13145	0.00056
#2	0.00093	0.04332	-0.00253	-0.00259	0.00017	-0.00006	0.00756	0.13260	0.00078
Mean	**0.00011**	**0.04283**	**-0.00193**	**-0.00267**	**0.00013**	**-0.00006**	**0.01005**	**0.13203**	**0.00067**
%RSD	1015.80515	1.61330	44.19634	4.23346	46.05238	8.01656	35.09572	0.61448	23.59915

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00528	0.04432	0.03700	200.02210	-0.31084	0.00267	-0.05775	0.74837	0.00268
#2	0.00587	0.04473	0.03736	199.57892	-0.30045	0.00268	-0.05250	0.74695	0.00430
Mean	**0.00558**	**0.04453**	**0.03718**	**199.80051**	**-0.30565**	**0.00267**	**-0.05513**	**0.74766**	**0.00349**
%RSD	7.53253	0.64423	0.68659	0.15684	2.40299	0.29022	6.72381	0.13431	32.90839

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.14227	0.02467	0.00963	0.02555	0.02556	0.00101	0.00101	-0.00073	0.00505
#2	-0.14175	0.02586	0.01187	0.02508	0.02420	-0.00046	0.00462	0.00102	0.00151
Mean	**-0.14201**	**0.02527**	**0.01075**	**0.02531**	**0.02488**	**0.00028**	**0.00282**	**0.00015**	**0.00328**
%RSD	0.26312	3.32346	14.72862	1.33470	3.87651	375.02688	90.49480	842.01294	76.18426

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00387	0.00528	-0.00033	0.01122	0.00054	-0.00227	0.05522	-0.00204	2.90759
#2	0.00430	0.00541	-0.00032	0.01056	0.00098	0.00104	0.04604	-0.00165	2.90424
Mean	**0.00408**	**0.00534**	**-0.00032**	**0.01089**	**0.00076**	**-0.00062**	**0.05063**	**-0.00184**	**2.90592**
%RSD	7.50495	1.64214	1.57662	4.32628	40.59700	378.20928	12.81634	15.05896	0.08162

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	Zr	Pb	SeNCH
	ppm	calc	calc
#1	0.00192	0.02556	0.00313
#2	0.00227	0.02449	0.00135
Mean	**0.00209**	**0.02502**	**0.00224**
%RSD	11.82087	3.02024	56.15328

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:13
SampleId1 : IP100309-3MB SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:10:23
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE9

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00051	0.02961	-0.00027	0.00145	-0.00085	-0.00013	-0.00071	-0.01057	-0.00074
#2	0.00007	0.03272	-0.00163	0.00093	-0.00085	-0.00014	0.00245	-0.01034	-0.00031
Mean	**-0.00022**	**0.03116**	**-0.00095**	**0.00119**	**-0.00085**	**-0.00013**	**0.00087**	**-0.01046**	**-0.00053**
%RSD	184.94918	7.04979	101.02624	30.96254	0.00000	6.00774	255.88632	1.55143	57.90694

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00010	-0.00058	-0.00139	0.05057	-0.33023	0.00261	-0.01341	-0.00054	-0.00158
#2	-0.00048	-0.00042	-0.00061	0.04166	-0.32423	0.00260	-0.01122	-0.00054	-0.00086
Mean	**-0.00029**	**-0.00050**	**-0.00100**	**0.04611**	**-0.32723**	**0.00260**	**-0.01232**	**-0.00054**	**-0.00122**
%RSD	92.66815	22.03452	54.93825	13.65825	1.29687	0.29786	12.53893	0.00000	41.56902

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.16577	0.00155	0.00190	-0.00109	-0.00110	-0.01961	0.00126	0.00409	0.00085
#2	-0.16538	0.00254	0.00200	0.00084	-0.00251	-0.02255	0.00043	-0.00094	0.00060
Mean	**-0.16557**	**0.00205**	**0.00195**	**-0.00013**	**-0.00180**	**-0.02108**	**0.00085**	**0.00158**	**0.00073**
%RSD	0.16412	34.43316	3.69796	1084.62714	55.38170	9.88159	69.73184	225.57702	24.49204

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00089	-0.00232	-0.00193	-0.00259	-0.00079	0.00027	0.00082	0.00001	0.00088
#2	-0.00178	0.00042	-0.00192	-0.00134	-0.00061	-0.00205	0.00082	0.00020	0.00052
Mean	**-0.00134**	**-0.00095**	**-0.00193**	**-0.00196**	**-0.00070**	**-0.00089**	**0.00082**	**0.00011**	**0.00070**
%RSD	47.25062	204.62365	0.52699	44.94331	18.08552	184.26646	0.52417	127.23537	36.29385

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00067	-0.00110	0.00193
#2	-0.00046	-0.00139	0.00009
Mean	**-0.00056**	**-0.00125**	**0.00101**
%RSD	26.68427	16.89018	129.10057

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:14

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SampleId1 : IP100309-3RVS **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 11:12:08
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE10

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00207	0.13523	0.00470	0.00725	0.00425	0.00096	0.00992	0.50270	0.00130
#2	0.00178	0.13247	0.00572	0.00605	0.00411	0.00094	0.01073	0.49960	0.00156
Mean	**0.00193**	**0.13385**	**0.00521**	**0.00665**	**0.00418**	**0.00095**	**0.01033**	**0.50115**	**0.00143**
%RSD	10.66529	1.45653	13.80462	12.76455	2.39528	1.61167	5.57206	0.43729	12.61038

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00193	0.00468	0.00430	0.17272	0.40243	0.00592	0.49269	0.00449	0.00923
#2	0.00171	0.00440	0.00387	0.17177	0.39874	0.00591	0.48898	0.00457	0.00864
Mean	**0.00182**	**0.00454**	**0.00409**	**0.17224**	**0.40058**	**0.00592**	**0.49083**	**0.00453**	**0.00894**
%RSD	8.42590	4.44084	7.36607	0.39209	0.65112	0.16372	0.53499	1.19069	4.63581

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.61805	0.00473	0.10251	0.00558	0.00315	0.08793	0.00903	0.00304	0.00355
#2	0.61555	0.00462	0.10801	0.00491	0.00338	0.08940	0.00998	-0.00122	0.00441
Mean	**0.61680**	**0.00468**	**0.10526**	**0.00524**	**0.00326**	**0.08867**	**0.00951**	**0.00091**	**0.00398**
%RSD	0.28693	1.54484	3.69477	9.01222	5.06294	1.17487	7.11471	331.79915	15.24045

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03098	0.01039	0.00311	-0.00462	0.00394	0.00996	0.05361	0.00476	0.00571
#2	0.03132	0.00815	0.00310	-0.00513	0.00395	0.01030	0.05511	0.00480	0.00579
Mean	**0.03115**	**0.00927**	**0.00311**	**-0.00487**	**0.00395**	**0.01013**	**0.05436**	**0.00478**	**0.00575**
%RSD	0.77170	17.11789	0.32689	7.39265	0.18854	2.35173	1.94761	0.56343	0.88676

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00452	0.00396	0.00338
#2	0.00462	0.00389	0.00253
Mean	**0.00457**	**0.00392**	**0.00296**
%RSD	1.54615	1.20386	20.28297

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:14
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/10/2010 11:13:54
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	0.19778	49.36554	0.49603	0.97384	0.98288	0.49785	0.52356	48.66345	0.49476
#2	0.19900	49.57131	0.50125	0.98052	0.98857	0.50048	0.52327	48.94110	0.49577
Mean	**0.19839**	**49.46843**	**0.49864**	**0.97718**	**0.98572**	**0.49916**	**0.52341**	**48.80227**	**0.49526**
%RSD	0.43533	0.29414	0.73927	0.48373	0.40846	0.37333	0.03813	0.40229	0.14421

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.50058	0.99405	0.96710	20.01387	49.09714	0.50255	49.74659	0.98757	0.98465
#2	0.50361	1.00001	0.97131	20.12382	49.22335	0.50421	50.00215	0.99334	0.98732
Mean	**0.50209**	**0.99703**	**0.96920**	**20.06885**	**49.16025**	**0.50338**	**49.87437**	**0.99046**	**0.98598**
%RSD	0.42670	0.42256	0.30739	0.38741	0.18153	0.23364	0.36232	0.41187	0.19131

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.50826	0.99564	4.87160	0.97348	0.97320	4.98643	0.48572	0.99962	0.99150
#2	48.60652	1.00463	4.93039	0.98201	0.96869	5.07081	0.48616	1.00167	0.99708
Mean	**48.55739**	**1.00014**	**4.90099**	**0.97775**	**0.97095**	**5.02862**	**0.48594**	**1.00065**	**0.99429**
%RSD	0.14308	0.63620	0.84826	0.61693	0.32905	1.18657	0.06431	0.14489	0.39645

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.77753	1.00184	0.49230	0.16904	0.47656	0.50883	4.95070	0.48664	1.02693
#2	4.79209	1.00919	0.49515	0.17089	0.47859	0.50656	4.98214	0.48922	1.03395
Mean	**4.78481**	**1.00552**	**0.49373**	**0.16996**	**0.47758**	**0.50769**	**4.96642**	**0.48793**	**1.03044**
%RSD	0.21512	0.51675	0.40731	0.77102	0.30024	0.31658	0.44765	0.37411	0.48186

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.98522	0.97330	0.99421
#2	0.99013	0.97312	0.99861
Mean	**0.98768**	**0.97321**	**0.99641**
%RSD	0.35160	0.01257	0.31232

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:15
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/10/2010 11:15:50
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00081	0.08004	0.00270	0.00337	0.00017	0.00041	0.00256	0.03428	0.00031
#2	0.00086	0.07298	0.00255	0.00345	-0.00005	0.00033	-0.00213	0.02568	-0.00038
Mean	**0.00084**	**0.07651**	**0.00263**	**0.00341**	**0.00006**	**0.00037**	**0.00021**	**0.02998**	**-0.00004**
%RSD	3.34745	6.52531	4.05206	1.66010	268.56538	15.08215	1543.38525	20.29270	1364.99252

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00050	0.00092	-0.00020	0.01860	-0.17352	0.00319	0.04338	0.00026	0.00060

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#2	0.00001	0.00000	-0.00083	0.01552	-0.19890	0.00310	0.03224	0.00003	-0.00020
Mean	**0.00025**	**0.00046**	**-0.00051**	**0.01706**	**-0.18621**	**0.00314**	**0.03781**	**0.00014**	**0.00020**
%RSD	136.13660	140.20832	86.91002	12.74203	9.63964	1.97340	20.83256	112.39011	280.15709

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.12109	-0.00002	-0.00269	0.00323	-0.00231	-0.01372	0.00175	-0.00219	0.00042
#2	-0.12863	0.00077	-0.00655	0.00128	-0.00151	-0.01224	-0.00041	-0.00247	0.00192
Mean	**-0.12486**	**0.00037**	**-0.00462**	**0.00225**	**-0.00191**	**-0.01298**	**0.00067**	**-0.00233**	**0.00117**
%RSD	4.27155	150.25288	59.21294	60.95931	29.69440	8.02481	227.88340	8.50786	90.82263

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00462	0.00055	-0.00141	-0.00013	-0.00053	0.00348	0.01331	0.00079	-0.00005
#2	-0.00613	0.00042	-0.00155	-0.00449	-0.00072	0.00411	0.00533	0.00031	-0.00042
Mean	**-0.00537**	**0.00049**	**-0.00148**	**-0.00231**	**-0.00062**	**0.00380**	**0.00932**	**0.00055**	**-0.00023**
%RSD	19.82648	18.10984	6.52650	133.39284	22.09091	11.73003	60.55080	61.64350	108.49939

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00049	-0.00047	-0.00045
#2	0.00044	-0.00058	0.00046
Mean	**0.00047**	**-0.00052**	**0.00000**
%RSD	7.70655	15.27537	13546.34600

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:15
SampleId1 : IP100309-3LCS **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 11:17:53
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE11

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00007	2.14117	2.10216	1.01383	2.03618	0.05055	-0.00275	41.24502	0.05297
#2	-0.00050	2.14009	2.11382	1.02063	2.05182	0.05072	-0.00173	41.35937	0.05224
Mean	**-0.00028**	**2.14063**	**2.10799**	**1.01723**	**2.04400**	**0.05064**	**-0.00224**	**41.30220**	**0.05261**
%RSD	104.99317	0.03550	0.39136	0.47305	0.54108	0.24394	32.29012	0.19578	0.98986

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.50514	0.20203	0.25371	1.05416	38.19177	0.51284	41.90597	0.50150	1.03606
#2	0.50737	0.20215	0.25563	1.05880	38.35940	0.51517	42.03331	0.50360	1.04145
Mean	**0.50626**	**0.20209**	**0.25467**	**1.05648**	**38.27559**	**0.51401**	**41.96964**	**0.50255**	**1.03875**
%RSD	0.31184	0.03897	0.53356	0.31065	0.30968	0.32133	0.21454	0.29639	0.36685

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	38.11150	0.50731	0.00414	0.49714	0.49454	-0.01224	0.50884	2.12000	2.09976
#2	38.22690	0.50853	0.00220	0.49476	0.49628	-0.00782	0.50775	2.12470	2.09003

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Mean	**38.16920**	**0.50792**	**0.00317**	**0.49595**	**0.49541**	**-0.01003**	**0.50830**	**2.12235**	**2.09490**
%RSD	0.21378	0.17062	43.16969	0.33969	0.24842	31.14329	0.15272	0.15660	0.32833

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.02188	0.52548	0.50936	-0.01881	0.49894	2.11511	-0.00536	0.51351	0.49793
#2	2.02903	0.53159	0.51259	-0.01906	0.50122	2.14220	-0.02032	0.51466	0.49786
Mean	**2.02545**	**0.52854**	**0.51098**	**-0.01894**	**0.50008**	**2.12865**	**-0.01284**	**0.51408**	**0.49790**
%RSD	0.24966	0.81651	0.44811	0.96234	0.32161	0.89969	82.43384	0.15779	0.01026

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00020	0.49541	2.10650
#2	-0.00039	0.49577	2.10158
Mean	**-0.00030**	**0.49559**	**2.10404**
%RSD	44.70683	0.05243	0.16544

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:15
SampleId1 : 1002155-2 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:19:39
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE12

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00036	0.62911	-0.01545	0.12062	0.01636	0.00065	0.03114	64.87059	-0.00054
#2	-0.00037	0.62381	-0.01537	0.12506	0.01608	0.00061	0.03094	65.19779	-0.00068
Mean	**-0.00001**	**0.62646**	**-0.01541**	**0.12284**	**0.01622**	**0.00063**	**0.03104**	**65.03419**	**-0.00061**
%RSD	8092.19168	0.59855	0.34559	2.55617	1.23387	4.41823	0.45240	0.35577	15.26931

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01856	0.12701	-0.00445	593.26407	37.70684	0.00436	7.02332	3.26286	-0.00044
#2	0.01902	0.12804	-0.00396	594.34466	37.89457	0.00422	7.07192	3.28333	-0.00161
Mean	**0.01879**	**0.12752**	**-0.00420**	**593.80437**	**37.80071**	**0.00429**	**7.04762**	**3.27309**	**-0.00102**
%RSD	1.72485	0.57009	8.18523	0.12868	0.35118	2.25807	0.48763	0.44213	80.96334

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	6.05290	0.02414	0.80928	-0.00136	0.00646	269.64477	0.01121	0.00299	0.00666
#2	6.08202	0.02359	0.81652	-0.00039	0.00688	270.94982	0.00922	0.00496	0.00765
Mean	**6.06746**	**0.02386**	**0.81290**	**-0.00087**	**0.00667**	**270.29730**	**0.01021**	**0.00397**	**0.00715**
%RSD	0.33940	1.62711	0.63037	78.42742	4.44282	0.34140	13.82682	35.09537	9.74160

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.44449	0.00433	0.16823	0.05003	0.07239	-0.02419	0.20010	-0.01170	0.14830
#2	2.45980	0.00570	0.16940	0.05491	0.07280	-0.01960	0.21134	-0.01021	0.14924
Mean	**2.45215**	**0.00501**	**0.16882**	**0.05247**	**0.07259**	**-0.02189**	**0.20572**	**-0.01095**	**0.14877**

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%RSD	0.44135	19.33507	0.48936	6.56686	0.40500	14.82973	3.86370	9.63042	0.44577

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00989	0.00386	0.00544
#2	0.00953	0.00446	0.00675
Mean	**0.00971**	**0.00416**	**0.00610**
%RSD	2.61574	10.24315	15.24698

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:15
SampleId1 : 1002155-3 10X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 11:21:25
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE13

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00313	0.50000	-0.01861	0.10130	0.01198	0.00044	0.01794	52.90813	-0.00109
#2	-0.00017	0.51750	-0.01451	0.10522	0.01243	0.00045	0.02957	53.30585	-0.00025
Mean	**-0.00165**	**0.50875**	**-0.01656**	**0.10326**	**0.01220**	**0.00044**	**0.02376**	**53.10699**	**-0.00067**
%RSD	126.90513	2.43261	17.52819	2.68477	2.62444	1.26134	34.60379	0.52956	88.69801

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01299	0.10129	-0.01056	505.99927	30.87321	0.00366	5.80503	2.69657	-0.00270
#2	0.01539	0.10411	-0.00862	509.48358	30.99128	0.00365	5.89213	2.71807	-0.00068
Mean	**0.01419**	**0.10270**	**-0.00959**	**507.74143**	**30.93225**	**0.00365**	**5.84858**	**2.70732**	**-0.00169**
%RSD	11.98646	1.94011	14.33693	0.48524	0.26992	0.10604	1.05303	0.56159	84.72594

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.88794	0.01771	0.62673	-0.01183	0.01061	221.47281	0.00631	-0.00281	0.01312
#2	4.90440	0.01940	0.62581	0.00251	0.00243	223.82460	0.01007	0.01258	0.00568
Mean	**4.89617**	**0.01856**	**0.62627**	**-0.00466**	**0.00652**	**222.64871**	**0.00819**	**0.00488**	**0.00940**
%RSD	0.23770	6.42301	0.10366	217.53702	88.76952	0.74690	32.48020	222.92213	56.01061

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.99306	0.00185	0.13942	0.03472	0.05744	-0.01680	0.13926	-0.00287	0.07480
#2	2.01549	0.00721	0.14085	0.03569	0.05793	-0.00795	0.18828	0.00098	0.07617
Mean	**2.00428**	**0.00453**	**0.14014**	**0.03521**	**0.05769**	**-0.01238**	**0.16377**	**-0.00095**	**0.07548**
%RSD	0.79147	83.63028	0.71996	1.94126	0.60649	50.56618	21.16671	287.53558	1.28370

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00722	0.00314	0.00782
#2	0.00829	0.00245	0.00798
Mean	**0.00775**	**0.00280**	**0.00790**
%RSD	9.79536	17.23878	1.42270

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ted: 3/10/2010 16:02:48 User: ROY FRENCH
Method : Paragon File : 100310A Printed : 3/10/2010 16:02:16
SampleId1 : 1002155-4 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:23:11
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE14

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00008	0.59821	-0.00720	0.05961	0.01152	0.00045	0.02102	47.26002	-0.00071
#2	0.00037	0.59688	-0.00709	0.05925	0.01169	0.00045	0.01939	47.22710	-0.00055
Mean	**0.00023**	**0.59754**	**-0.00715**	**0.05943**	**0.01161**	**0.00045**	**0.02020**	**47.24356**	**-0.00063**
%RSD	89.87490	0.15699	1.11824	0.42836	1.03456	0.82826	5.70269	0.04926	17.68774

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01129	0.06502	-0.00997	375.26659	32.19528	0.00399	6.02300	1.99686	-0.00142
#2	0.01112	0.06489	-0.00996	374.94141	32.21276	0.00395	6.00330	1.99791	-0.00153
Mean	**0.01121**	**0.06496**	**-0.00996**	**375.10400**	**32.20402**	**0.00397**	**6.01315**	**1.99738**	**-0.00148**
%RSD	1.02542	0.13883	0.01803	0.06130	0.03838	0.63431	0.23162	0.03708	5.10287

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	8.46947	0.01872	0.39351	0.00061	-0.00003	162.54751	0.00693	0.00245	0.00854
#2	8.46455	0.01785	0.38995	-0.00016	0.00110	162.55768	0.00544	0.00551	0.00835
Mean	**8.46701**	**0.01829**	**0.39173**	**0.00022**	**0.00054**	**162.55259**	**0.00619**	**0.00398**	**0.00844**
%RSD	0.04111	3.35734	0.64402	246.22258	148.89709	0.00442	17.11293	54.41973	1.60931

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.68075	0.00277	0.14221	0.01848	0.01790	-0.00289	0.10403	0.00453	0.05121
#2	1.68117	0.00240	0.14243	0.01647	0.01815	-0.00153	0.10076	0.00376	0.05121
Mean	**1.68096**	**0.00258**	**0.14232**	**0.01748**	**0.01803**	**-0.00221**	**0.10240**	**0.00414**	**0.05121**
%RSD	0.01760	10.24441	0.10742	8.11752	0.99121	43.43755	2.25892	13.16039	0.00000

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00494	0.00018	0.00651
#2	0.00522	0.00068	0.00740
Mean	**0.00508**	**0.00043**	**0.00696**
%RSD	3.97443	81.33427	9.06174

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:16
SampleId1 : 1002155-5 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:24:57
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE15

Final concentrations

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00006	0.58999	-0.00637	0.05705	0.01150	0.00046	0.01715	46.52589	-0.00048
#2	0.00044	0.58731	-0.01006	0.05785	0.01150	0.00046	0.01970	46.57674	-0.00019
Mean	**0.00025**	**0.58865**	**-0.00822**	**0.05745**	**0.01150**	**0.00046**	**0.01842**	**46.55131**	**-0.00034**
%RSD	108.66797	0.32115	31.75791	0.98472	0.00000	0.55733	9.78298	0.07724	62.52840

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01102	0.06310	-0.00861	367.87073	31.87105	0.00398	5.97047	1.95179	-0.00188
#2	0.01153	0.06308	-0.00905	368.48343	31.78737	0.00400	5.98251	1.95144	-0.00102
Mean	**0.01128**	**0.06309**	**-0.00883**	**368.17708**	**31.82921**	**0.00399**	**5.97649**	**1.95162**	**-0.00145**
%RSD	3.21896	0.02408	3.50190	0.11767	0.18589	0.38887	0.14241	0.01264	41.57298

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	8.54874	0.01852	0.37629	-0.00160	0.00006	157.84406	0.00617	0.01275	0.00613
#2	8.52663	0.01849	0.37272	0.00445	-0.00006	157.49813	0.00905	0.00686	0.00741
Mean	**8.53768**	**0.01851**	**0.37450**	**0.00143**	**0.00000**	**157.67110**	**0.00761**	**0.00981**	**0.00677**
%RSD	0.18311	0.09759	0.67361	299.79485	5208.11362	0.15514	26.77430	42.52638	13.28936

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.65814	0.00476	0.14025	0.01655	0.01708	-0.00067	0.08861	0.00507	0.05497
#2	1.65874	0.00352	0.13991	0.01570	0.01726	0.00159	0.10466	0.00566	0.05417
Mean	**1.65844**	**0.00414**	**0.14008**	**0.01612**	**0.01717**	**0.00046**	**0.09664**	**0.00536**	**0.05457**
%RSD	0.02559	21.28194	0.16733	3.73283	0.75877	344.47425	11.74255	7.87143	1.02796

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00490	-0.00049	0.00834
#2	0.00524	0.00144	0.00722
Mean	**0.00507**	**0.00048**	**0.00778**
%RSD	4.73121	287.48654	10.13542

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:16
SampleId1 : 1002163-2 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:26:42
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE16

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00051	0.07686	-0.00347	0.03473	0.01750	0.00015	0.00186	23.49831	-0.00036
#2	-0.00073	0.06671	-0.00366	0.03317	0.01741	0.00011	-0.00335	23.17369	-0.00105
Mean	**-0.00011**	**0.07179**	**-0.00357**	**0.03395**	**0.01745**	**0.00013**	**-0.00075**	**23.33600**	**-0.00071**
%RSD	797.93473	9.99153	3.73347	3.24942	0.34405	19.04378	492.64739	0.98366	68.46998

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00032	0.02022	-0.00291	70.57648	38.13604	0.01102	3.12265	1.05282	-0.00132
#2	-0.00092	0.01877	-0.00479	69.70083	38.18340	0.01094	3.06952	1.04189	-0.00126
Mean	**-0.00030**	**0.01949**	**-0.00385**	**70.13865**	**38.15972**	**0.01098**	**3.09608**	**1.04736**	**-0.00129**
%RSD	290.92959	5.26898	34.51669	0.88279	0.08776	0.47627	1.21340	0.73780	2.92023

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	25.26918	0.00146	0.23972	0.00295	-0.00175	22.69147	0.00183	0.00001	0.00348
#2	25.29482	-0.00007	0.24319	-0.00557	0.00178	22.45809	-0.00067	-0.00697	0.00510
Mean	**25.28200**	**0.00069**	**0.24146**	**-0.00131**	**0.00002**	**22.57478**	**0.00058**	**-0.00348**	**0.00429**
%RSD	0.07171	156.61890	1.01452	460.85543	14087.06654	0.73100	305.64485	141.75871	26.70199

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.30230	0.00092	0.17886	0.01877	0.00506	-0.00103	0.04359	-0.00021	0.02590
#2	1.29229	-0.00145	0.17812	0.01218	0.00442	-0.00156	0.00327	-0.00091	0.02439
Mean	**1.29729**	**-0.00027**	**0.17849**	**0.01548**	**0.00474**	**-0.00130**	**0.02343**	**-0.00056**	**0.02515**
%RSD	0.54558	623.92702	0.29435	30.06895	9.50057	28.85854	121.65469	88.76438	4.25816

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00062	-0.00018	0.00232
#2	-0.00077	-0.00066	0.00108
Mean	**-0.00070**	**-0.00042**	**0.00170**
%RSD	15.74333	80.32620	51.60104

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:17
SampleId1 : 1002163-3 10X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 11:28:28
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE17

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00059	0.07666	-0.00261	0.03461	0.01653	0.00012	-0.00141	23.27582	-0.00095
#2	-0.00094	0.07467	-0.00298	0.03261	0.01642	0.00007	0.00062	23.21678	-0.00057
Mean	**-0.00077**	**0.07566**	**-0.00279**	**0.03361**	**0.01648**	**0.00009**	**-0.00039**	**23.24630**	**-0.00076**
%RSD	32.15971	1.85905	9.53002	4.20807	0.48592	38.68871	363.66404	0.17958	35.02461

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00028	0.01976	-0.00275	70.21593	38.62545	0.01100	3.08220	1.04770	-0.00105
#2	-0.00076	0.01904	-0.00337	70.13490	38.56798	0.01094	3.08198	1.04747	-0.00156
Mean	**-0.00052**	**0.01940**	**-0.00306**	**70.17541**	**38.59672**	**0.01097**	**3.08209**	**1.04759**	**-0.00130**
%RSD	66.34715	2.60938	14.44900	0.08165	0.10531	0.35302	0.00502	0.01558	27.45868

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	25.59656	0.00201	0.24828	-0.00089	-0.00006	22.61618	0.00058	-0.00477	0.00021
#2	25.53462	0.00174	0.24207	-0.00472	0.00098	22.68846	-0.00217	-0.00128	0.00431
Mean	**25.56559**	**0.00187**	**0.24518**	**-0.00280**	**0.00046**	**22.65232**	**-0.00080**	**-0.00303**	**0.00226**
%RSD	0.17133	10.12370	1.79258	96.71850	160.90899	0.22562	243.75997	81.45816	128.38900

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.30966	-0.00394	0.18003	0.00684	0.00428	-0.00243	0.01390	-0.00091	0.08807
#2	1.30099	-0.00183	0.18047	0.00563	0.00414	-0.00399	-0.00151	-0.00062	0.08792
Mean	**1.30532**	**-0.00288**	**0.18025**	**0.00624**	**0.00421**	**-0.00321**	**0.00619**	**-0.00077**	**0.08800**
%RSD	0.46967	51.93488	0.17263	13.79338	2.29788	34.32445	175.90520	26.83330	0.11592

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00013	-0.00034	-0.00145
#2	-0.00012	-0.00092	0.00245
Mean	**0.00000**	**-0.00063**	**0.00050**
%RSD	33105.93012	65.28585	553.92024

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:17
SampleId1 : 1002163-4 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:30:13
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE18

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00047	0.73098	-0.00592	0.01861	0.01200	0.00019	0.00897	29.16204	-0.00059
#2	0.00070	0.72868	-0.00942	0.01733	0.01198	0.00016	0.00795	29.03326	-0.00061
Mean	**0.00011**	**0.72983**	**-0.00767**	**0.01797**	**0.01199**	**0.00018**	**0.00846**	**29.09765**	**-0.00060**
%RSD	727.67995	0.22354	32.28298	5.03743	0.16693	12.57777	8.55767	0.31295	2.68486

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01083	0.01734	0.00817	250.82937	21.31346	0.00316	4.15262	1.46754	-0.00145
#2	0.01010	0.01717	0.00790	249.81029	21.27274	0.00315	4.13031	1.46255	-0.00169
Mean	**0.01046**	**0.01725**	**0.00804**	**250.31983**	**21.29310**	**0.00316**	**4.14146**	**1.46504**	**-0.00157**
%RSD	4.92893	0.70732	2.38303	0.28787	0.13522	0.18412	0.38090	0.24044	10.79952

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.61962	0.01812	0.21446	0.00077	0.00082	117.59034	0.00443	0.00572	0.00562
#2	3.60313	0.01838	0.21293	0.00187	0.00141	116.85289	0.00329	-0.00293	0.00708
Mean	**3.61138**	**0.01825**	**0.21369**	**0.00132**	**0.00111**	**117.22162**	**0.00386**	**0.00139**	**0.00635**
%RSD	0.32299	0.98953	0.50569	59.14604	37.01941	0.44485	20.83314	438.89701	16.20445

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.90620	-0.00073	0.10092	0.01319	0.03046	-0.00300	0.08049	0.01255	0.18784

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#2	0.89753	0.00537	0.10065	0.01304	0.03019	-0.00698	0.06472	0.01245	0.18560
Mean	**0.90187**	**0.00232**	**0.10078**	**0.01311**	**0.03032**	**-0.00499**	**0.07261**	**0.01250**	**0.18672**
%RSD	0.67943	186.20445	0.19193	0.81201	0.63831	56.39179	15.35762	0.57606	0.84706

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00284	0.00080	0.00565
#2	0.00279	0.00156	0.00374
Mean	**0.00282**	**0.00118**	**0.00470**
%RSD	1.22478	45.22594	28.74787

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:17
SampleId1 : 1002163-5 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:32:21
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE19

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00008	0.45020	-0.00351	0.01801	0.00583	0.00018	0.00323	17.71108	-0.00057
#2	0.00050	0.45314	-0.00355	0.01841	0.00589	0.00017	0.00640	17.74685	-0.00035
Mean	**0.00029**	**0.45167**	**-0.00353**	**0.01821**	**0.00586**	**0.00017**	**0.00481**	**17.72896**	**-0.00046**
%RSD	103.65370	0.46016	0.75466	1.55345	0.68286	5.09901	46.45026	0.14268	33.04554

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00466	0.02077	0.00241	124.54289	13.96780	0.00362	2.34876	0.63236	-0.00073
#2	0.00512	0.02107	0.00310	124.92011	14.06557	0.00363	2.35182	0.63436	-0.00158
Mean	**0.00489**	**0.02092**	**0.00276**	**124.73150**	**14.01669**	**0.00362**	**2.35029**	**0.63336**	**-0.00116**
%RSD	6.63884	1.01966	17.84059	0.21385	0.49323	0.21384	0.09207	0.22260	52.10311

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.47177	0.01248	0.23636	0.00190	0.00042	53.76288	0.00327	0.00351	0.00121
#2	3.50145	0.01323	0.23595	0.00108	-0.00063	53.99379	0.00218	0.00335	0.00191
Mean	**3.48661**	**0.01285**	**0.23616**	**0.00149**	**-0.00010**	**53.87833**	**0.00272**	**0.00343**	**0.00156**
%RSD	0.60197	4.14424	0.12203	39.19066	721.82849	0.30304	28.28652	3.15027	31.80762

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.87042	0.00064	0.06668	0.00860	0.02746	-0.00006	0.03029	0.00178	0.13012
#2	0.87336	-0.00248	0.06716	0.00825	0.02763	-0.00330	0.04649	0.00235	0.12890
Mean	**0.87189**	**-0.00092**	**0.06692**	**0.00842**	**0.02755**	**-0.00168**	**0.03839**	**0.00206**	**0.12951**
%RSD	0.23820	240.02256	0.50921	2.93170	0.44592	136.34820	29.85059	19.57912	0.66958

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00129	0.00092	0.00197
#2	0.00168	-0.00006	0.00239

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Mean	**0.00149**	**0.00043**	**0.00218NCH**
%RSD	18.16983	162.09972	13.49447

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:17
SampleId1 : 1002163-6 10X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 11:34:06
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE20

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00051	0.07682	-0.00053	0.03425	0.01614	0.00011	-0.00049	22.24762	-0.00018
#2	-0.00109	0.06408	-0.00924	0.03233	0.01585	0.00003	-0.00152	21.90332	-0.00106
Mean	**-0.00029**	**0.07045**	**-0.00489**	**0.03329**	**0.01600**	**0.00007**	**-0.00100**	**22.07547**	**-0.00062**
%RSD	388.09514	12.77761	125.94038	4.07858	1.25134	80.17919	72.85091	1.10283	100.96154

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00037	0.02010	-0.00341	69.62405	38.80449	0.01010	3.15151	1.04647	-0.00108
#2	-0.00082	0.01842	-0.00472	68.61648	38.81968	0.00999	3.09379	1.03581	-0.00185
Mean	**-0.00022**	**0.01926**	**-0.00406**	**69.12027**	**38.81208**	**0.01004**	**3.12265**	**1.04114**	**-0.00146**
%RSD	377.86157	6.17891	22.82039	1.03075	0.02768	0.79075	1.30706	0.72387	37.33256

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	25.94254	0.00215	0.24197	0.00389	-0.00242	21.91023	0.00141	0.00701	0.00112
#2	25.94312	0.00093	0.23677	-0.00643	0.00204	21.70110	-0.00349	-0.00669	0.00536
Mean	**25.94283**	**0.00154**	**0.23937**	**-0.00127**	**-0.00019**	**21.80567**	**-0.00104**	**0.00016**	**0.00324**
%RSD	0.00158	55.66481	1.53505	573.20466	1651.26488	0.67817	333.88776	6034.25268	92.60266

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.32286	0.00092	0.16025	0.01427	0.00483	-0.00081	0.04224	0.00014	0.01992
#2	1.30692	-0.00320	0.15974	0.00856	0.00420	-0.00656	-0.00197	-0.00126	0.01862
Mean	**1.31489**	**-0.00114**	**0.15999**	**0.01142**	**0.00452**	**-0.00368**	**0.02013**	**-0.00056**	**0.01927**
%RSD	0.85717	254.96146	0.22625	35.37875	9.88873	110.39460	155.28117	177.34480	4.76288

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00027	-0.00032	0.00308
#2	-0.00056	-0.00078	0.00135
Mean	**-0.00014**	**-0.00055**	**0.00222**
%RSD	406.41113	59.84193	55.28969

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:18
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/10/2010 11:35:53
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

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Final concentrations **2:48** **User: ROY FRENCH**

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19651	48.98911	0.49822	0.96683	0.97807	0.49250	0.51873	48.59107	0.49533
#2	0.19709	49.15530	0.49973	0.97272	0.98205	0.49398	0.52935	48.74545	0.49691
Mean	**0.19680**	**49.07221**	**0.49898**	**0.96978**	**0.98006**	**0.49324**	**0.52404**	**48.66826**	**0.49612**
%RSD	0.20958	0.23947	0.21413	0.42905	0.28756	0.21199	1.43270	0.22429	0.22546

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49813	0.98700	0.96581	19.80993	48.76080	0.49861	49.35253	0.97696	0.98422
#2	0.49918	0.99109	0.96918	19.85967	48.85108	0.49988	49.54634	0.98019	0.98393
Mean	**0.49866**	**0.98905**	**0.96749**	**19.83480**	**48.80594**	**0.49925**	**49.44944**	**0.97857**	**0.98408**
%RSD	0.14961	0.29229	0.24613	0.17731	0.13080	0.18020	0.27713	0.23342	0.02108

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.14336	1.00261	4.82366	0.96367	0.96767	4.93166	0.48639	0.99836	0.99140
#2	48.22612	1.00592	4.82769	0.96874	0.96583	4.93906	0.48532	0.99346	0.99818
Mean	**48.18474**	**1.00426**	**4.82567**	**0.96621**	**0.96675**	**4.93536**	**0.48586**	**0.99591**	**0.99479**
%RSD	0.12145	0.23366	0.05903	0.37142	0.13504	0.10604	0.15527	0.34816	0.48171

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.71082	0.99762	0.49065	0.16835	0.46936	0.50166	4.87980	0.48394	1.01600
#2	4.72724	1.00135	0.49232	0.16992	0.47137	0.50534	4.90878	0.48485	1.02005
Mean	**4.71903**	**0.99948**	**0.49149**	**0.16913**	**0.47037**	**0.50350**	**4.89429**	**0.48439**	**1.01803**
%RSD	0.24597	0.26426	0.23962	0.65672	0.30328	0.51709	0.41869	0.13249	0.28157

	Zr	Pb	Se
	ppm	calc	calc
#1	0.98217	0.96634	0.99372
#2	0.98466	0.96680	0.99661
Mean	**0.98341**	**0.96657**	**0.99516**
%RSD	0.17860	0.03355	0.20516

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:18
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/10/2010 11:37:45
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00033	0.09085	-0.00023	0.00257	-0.00008	0.00033	0.00286	0.02683	0.00001
#2	0.00051	0.09162	0.00120	0.00217	0.00000	0.00032	0.00063	0.02660	0.00024
Mean	**0.00009**	**0.09123**	**0.00048**	**0.00237**	**-0.00004**	**0.00033**	**0.00174**	**0.02671**	**0.00012**
%RSD	650.49895	0.60057	209.87650	11.94665	152.21022	2.35936	90.56859	0.60737	132.73338

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	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00067	0.00028	-0.00082	0.01680	-0.31107	0.00289	0.03071	0.00007	-0.00084
#2	0.00023	0.00063	-0.00042	0.01653	-0.31292	0.00288	0.03421	0.00014	-0.00020
Mean	**-0.00022**	**0.00045**	**-0.00062**	**0.01666**	**-0.31199**	**0.00289**	**0.03246**	**0.00011**	**-0.00052**
%RSD	286.69528	54.24514	45.80303	1.12465	0.41851	0.06715	7.61320	50.96406	87.35054

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.13151	-0.00021	-0.00309	0.00034	-0.00078	-0.02108	-0.00054	-0.00105	-0.00048
#2	-0.13363	0.00050	-0.00493	0.00348	-0.00111	-0.01224	-0.00030	0.00357	-0.00130
Mean	**-0.13257**	**0.00014**	**-0.00401**	**0.00191**	**-0.00095**	**-0.01666**	**-0.00042**	**0.00126**	**-0.00089**
%RSD	1.12747	354.25274	32.32188	116.04237	24.99170	37.50719	41.04448	259.30951	65.58556

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00977	-0.00219	-0.00153	-0.00277	-0.00086	0.00228	-0.00116	0.00020	-0.00034
#2	-0.00602	0.00055	-0.00151	-0.00519	-0.00084	-0.00443	0.02678	0.00062	-0.00034
Mean	**-0.00790**	**-0.00082**	**-0.00152**	**-0.00398**	**-0.00085**	**-0.00108**	**0.01281**	**0.00041**	**-0.00034**
%RSD	33.57769	235.68488	1.00131	43.03894	1.31406	441.21619	154.19659	73.33905	0.00000

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00024	-0.00040	-0.00067
#2	0.00078	0.00042	0.00032
Mean	**0.00051**	**0.00001**	**-0.00017**
%RSD	74.27086	9626.12004	405.81153

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:18
SampleId1 : 1002163-7 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:39:38
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE21

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00015	0.03222	-0.00136	0.03385	0.01611	-0.00013	0.00583	21.42414	-0.00014
#2	0.00055	0.03130	0.00120	0.03397	0.01594	-0.00014	0.00419	21.45478	-0.00049
Mean	**0.00035**	**0.03176**	**-0.00008**	**0.03391**	**0.01602**	**-0.00013**	**0.00501**	**21.43946**	**-0.00032**
%RSD	79.98972	2.05410	2188.48714	0.25025	0.74948	5.94782	23.02738	0.10103	77.15294

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00011	0.01985	-0.00127	68.00373	38.82034	0.00994	3.11346	1.04632	-0.00012
#2	0.00002	0.02003	-0.00219	68.05306	38.89983	0.00996	3.11674	1.04789	-0.00161
Mean	**-0.00005**	**0.01994**	**-0.00173**	**68.02839**	**38.86009**	**0.00995**	**3.11510**	**1.04711**	**-0.00086**
%RSD	207.36613	0.64188	37.59687	0.05127	0.14464	0.15576	0.07444	0.10654	122.11003

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	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	26.12511	0.00151	0.23993	0.00170	-0.00173	21.59128	0.00094	0.00165	-0.00395
#2	26.20116	0.00161	0.24319	0.00149	-0.00009	21.63792	0.00321	0.00083	-0.00212
Mean	**26.16314**	**0.00156**	**0.24156**	**0.00160**	**-0.00091**	**21.61460**	**0.00207**	**0.00124**	**-0.00304**
%RSD	0.20553	4.63001	0.95444	9.26141	127.84915	0.15256	77.07617	46.86355	42.62779

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.33696	-0.00158	0.15569	0.00472	0.00431	-0.00128	0.02738	-0.00042	0.02857
#2	1.34061	-0.00120	0.15589	0.00394	0.00419	-0.00202	0.02734	-0.00097	0.02944
Mean	**1.33878**	**-0.00139**	**0.15579**	**0.00433**	**0.00425**	**-0.00165**	**0.02736**	**-0.00069**	**0.02900**
%RSD	0.19279	19.03552	0.09162	12.64010	1.92750	31.65731	0.08680	55.59223	2.10962

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00077	-0.00059	-0.00209
#2	0.00054	0.00044	-0.00114
Mean	**0.00066**	**-0.00008**	**-0.00161**
%RSD	25.46201	952.24625	41.54487

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:19
SampleId1 : 1002163-8 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:41:24
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE22

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00032	0.64973	-0.00566	0.02049	0.01056	0.00001	0.01333	29.26705	-0.00029
#2	-0.00008	0.66296	-0.00671	0.01945	0.01067	0.00002	0.01445	29.44559	-0.00048
Mean	**0.00012**	**0.65634**	**-0.00618**	**0.01997**	**0.01062**	**0.00001**	**0.01389**	**29.35632**	**-0.00039**
%RSD	233.20326	1.42434	12.05784	3.68296	0.75406	71.13262	5.71569	0.43004	34.60695

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01069	0.01737	0.00053	254.68140	21.24544	0.00330	4.23201	1.50021	-0.00169
#2	0.01042	0.01730	0.00095	256.60759	21.42778	0.00328	4.26220	1.51199	-0.00206
Mean	**0.01055**	**0.01733**	**0.00074**	**255.64449**	**21.33661**	**0.00329**	**4.24711**	**1.50610**	**-0.00188**
%RSD	1.81136	0.27606	40.18220	0.53278	0.60427	0.41278	0.50253	0.55317	14.05615

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.72148	0.01469	0.17371	0.00082	-0.00115	118.10240	0.00575	0.00832	0.00234
#2	3.76201	0.01540	0.17320	0.00083	-0.00033	119.19757	0.00443	0.00170	0.00038
Mean	**3.74174**	**0.01504**	**0.17345**	**0.00082**	**-0.00074**	**118.64999**	**0.00509**	**0.00501**	**0.00136**
%RSD	0.76587	3.36094	0.20765	0.53055	78.25738	0.65268	18.34767	93.43102	101.79181

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.98261	0.00761	0.09947	0.01343	0.03161	-0.00169	0.07937	0.01047	0.07581
#2	0.99694	0.00462	0.10047	0.01345	0.03169	-0.00001	0.08504	0.01147	0.07703
Mean	**0.98977**	**0.00612**	**0.09997**	**0.01344**	**0.03165**	**-0.00085**	**0.08221**	**0.01097**	**0.07642**
%RSD	1.02405	34.56697	0.70267	0.09138	0.17639	140.00433	4.87995	6.47569	1.13449

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00361	-0.00049	0.00433
#2	0.00361	0.00005	0.00082
Mean	**0.00361**	**-0.00022**	**0.00258**
%RSD	0.07388	176.55411	96.37786

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:19
SampleId1 : 1002163-9 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:43:10
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE23

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00079	0.41057	-0.00377	0.01713	0.00589	-0.00003	0.00324	17.51137	-0.00046
#2	-0.00123	0.41737	-0.00313	0.01813	0.00592	-0.00004	0.00813	17.57738	-0.00053
Mean	**-0.00101**	**0.41397**	**-0.00345**	**0.01763**	**0.00590**	**-0.00004**	**0.00568**	**17.54438**	**-0.00049**
%RSD	30.83840	1.16129	13.10912	4.01140	0.33897	11.60902	60.82805	0.26608	10.09135

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00490	0.02085	0.00439	126.57930	13.99513	0.00365	2.37915	0.64962	-0.00017
#2	0.00480	0.02115	0.00410	127.04265	14.08589	0.00364	2.39532	0.65296	-0.00158
Mean	**0.00485**	**0.02100**	**0.00425**	**126.81098**	**14.04051**	**0.00364**	**2.38723**	**0.65129**	**-0.00088**
%RSD	1.58001	1.02835	4.83164	0.25837	0.45713	0.15960	0.47912	0.36223	113.81355

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.53313	0.01268	0.23392	-0.00153	-0.00013	54.56117	0.00063	-0.00077	0.00048
#2	3.55888	0.01243	0.23463	-0.00282	0.00036	54.82636	0.00068	0.00383	-0.00027
Mean	**3.54601**	**0.01255**	**0.23427**	**-0.00218**	**0.00011**	**54.69377**	**0.00066**	**0.00153**	**0.00010**
%RSD	0.51364	1.43841	0.21527	42.04527	296.74924	0.34285	4.82327	212.91737	521.38852

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.90898	-0.00173	0.06576	0.00987	0.02814	-0.00307	0.02641	0.00112	0.17471
#2	0.91475	0.00002	0.06625	0.00890	0.02827	-0.00200	0.03557	0.00098	0.17500
Mean	**0.91186**	**-0.00086**	**0.06601**	**0.00938**	**0.02821**	**-0.00253**	**0.03099**	**0.00105**	**0.17485**
%RSD	0.44766	144.05084	0.52392	7.30714	0.32994	29.77096	20.90987	9.43269	0.11671

	Zr	**Pb**	**Se**
	ppm	calc	calc

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#1	0.00134	-0.00059	0.00006**NCH**
#2	0.00121	-0.00070	0.00109
Mean	**0.00128**	**-0.00065**	**0.00058**
%RSD	7.00562	11.99585	126.28002

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:19
SampleId1 : 1002172-2 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:44:55
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE24

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00003	0.05653	-0.00155	0.00225	0.00249	-0.00031	0.00197	7.83253	-0.00068
#2	-0.00008	0.05552	0.00041	0.00193	0.00261	-0.00030	0.00422	7.83809	-0.00062
Mean	**-0.00005**	**0.05603**	**-0.00057**	**0.00209**	**0.00255**	**-0.00030**	**0.00309**	**7.83531**	**-0.00065**
%RSD	65.75964	1.27900	241.94987	10.83923	3.13901	2.74372	51.30149	0.05019	5.67043

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00069	0.00113	0.01058	1.26914	2.26829	0.00290	1.19006	0.03897	-0.00134
#2	-0.00048	0.00063	0.01064	1.27037	2.25703	0.00288	1.19312	0.03901	-0.00148
Mean	**-0.00059**	**0.00088**	**0.01061**	**1.26975**	**2.26266**	**0.00289**	**1.19159**	**0.03899**	**-0.00141**
%RSD	26.10022	40.49043	0.37098	0.06842	0.35194	0.40268	0.18152	0.06918	6.67987

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.88797	-0.00021	0.09436	0.00096	0.00159	0.13213	-0.00241	-0.00402	-0.00157
#2	0.88894	0.00109	0.09028	0.00102	-0.00102	0.12182	-0.00222	-0.00045	-0.00243
Mean	**0.88845**	**0.00044**	**0.09232**	**0.00099**	**0.00028**	**0.12697**	**-0.00231**	**-0.00224**	**-0.00200**
%RSD	0.07667	211.02794	3.12018	3.85292	653.88867	5.74329	5.61353	112.96099	30.30879

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.39349	-0.00008	0.01958	-0.00595	0.00114	-0.00275	-0.01548	-0.00015	0.04537
#2	0.39767	-0.00220	0.01962	-0.00617	0.00125	0.00104	0.00398	0.00007	0.04566
Mean	**0.39558**	**-0.00114**	**0.01960**	**-0.00606**	**0.00120**	**-0.00086**	**-0.00575**	**-0.00004**	**0.04552**
%RSD	0.74625	131.82235	0.15547	2.63884	6.85098	312.73940	239.16609	405.33668	0.44811

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00052	0.00138	-0.00239
#2	-0.00042	-0.00034	-0.00177
Mean	**-0.00047**	**0.00052**	**-0.00208**
%RSD	15.59804	235.07554	20.97513

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:19
SampleId1 : 1002172-3 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:46:42

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Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE25

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00010	0.04578	0.00331	0.00181	0.02525	-0.00018	-0.00119	32.69308	-0.00045
#2	0.00032	0.05042	-0.00005	0.00241	0.02548	-0.00019	0.00003	32.76689	-0.00050
Mean	**0.00021**	**0.04810**	**0.00163**	**0.00211**	**0.02537**	**-0.00019**	**-0.00058**	**32.72999**	**-0.00047**
%RSD	72.38376	6.82319	145.33131	20.13069	0.63132	3.60782	148.85981	0.15945	7.76318

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00026	0.00121	0.00363	4.61926	22.94359	0.00323	5.66257	0.13449	-0.00118
#2	-0.00029	0.00124	0.00463	4.63834	23.06328	0.00321	5.67898	0.13525	-0.00110
Mean	**-0.00028**	**0.00122**	**0.00413**	**4.62880**	**23.00343**	**0.00322**	**5.67078**	**0.13487**	**-0.00114**
%RSD	6.84239	1.52743	16.97940	0.29139	0.36791	0.42085	0.20465	0.40032	4.94156

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.15684	0.00074	0.10016	0.00033	-0.00084	0.11445	-0.00019	0.00019	-0.00350
#2	4.18303	0.00027	0.10128	0.00291	-0.00017	0.11150	0.00089	-0.00200	-0.00153
Mean	**4.16993**	**0.00051**	**0.10072**	**0.00162**	**-0.00050**	**0.11298**	**0.00035**	**-0.00091**	**-0.00251**
%RSD	0.44415	65.93835	0.78649	112.27602	93.21986	1.84420	218.22960	170.65087	55.41580

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.71045	0.00117	0.12071	-0.00762	0.00378	-0.00088	0.00070	0.00048	0.00442
#2	0.71266	0.00042	0.12156	-0.00991	0.00374	-0.00312	-0.00031	0.00027	0.00442
Mean	**0.71155**	**0.00079**	**0.12114**	**-0.00877**	**0.00376**	**-0.00200**	**0.00019**	**0.00037**	**0.00442**
%RSD	0.21944	66.74094	0.49192	18.45829	0.69269	79.12413	372.19670	39.31604	0.00000

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00020	-0.00045	-0.00227
#2	0.00012	0.00085	-0.00169
Mean	**-0.00004**	**0.00020**	**-0.00198**
%RSD	608.95324	451.35562	20.89425

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:20
SampleId1 : 1002172-4 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:48:29
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE26

Final concentrations

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00019	0.01843	-0.00200	0.00249	0.00249	-0.00019	-0.00040	8.09175	-0.00063
#2	-0.00011	0.01714	-0.00042	0.00221	0.00238	-0.00019	-0.00426	8.11029	-0.00061

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Mean	**-0.00015**	**0.01778**	**-0.00121**	**0.00235**	**0.00244**	**-0.00019**	**-0.00233**	**8.10102**	**-0.00062**
%RSD	35.72351	5.13326	92.23908	8.43390	3.28483	0.36333	117.42514	0.16186	1.97610

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00039	-0.00030	0.00031	1.11440	2.41008	0.00280	1.20710	0.03844	-0.00086
#2	-0.00085	-0.00008	0.00031	1.11702	2.42019	0.00278	1.21191	0.03866	-0.00190
Mean	**-0.00062**	**-0.00019**	**0.00031**	**1.11571**	**2.41513**	**0.00279**	**1.20950**	**0.03855**	**-0.00138**
%RSD	52.17937	80.53360	0.35669	0.16573	0.29600	0.41693	0.28103	0.41981	53.10637

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.90859	0.00009	0.08672	-0.00046	-0.00236	0.05552	0.00019	-0.00078	-0.00067
#2	0.91461	-0.00042	0.08234	-0.00255	-0.00083	0.05699	-0.00162	-0.00127	-0.00177
Mean	**0.91160**	**-0.00016**	**0.08453**	**-0.00151**	**-0.00160**	**0.05626**	**-0.00072**	**-0.00103**	**-0.00122**
%RSD	0.46703	220.58985	3.66326	98.02181	67.93996	1.85167	178.54243	34.03388	64.15603

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.34081	-0.00157	0.02030	-0.00438	-0.00029	0.00011	0.00159	0.00006	0.00182
#2	0.34315	-0.00244	0.02040	-0.00366	-0.00015	0.00328	-0.00041	-0.00043	0.00283
Mean	**0.34198**	**-0.00201**	**0.02035**	**-0.00402**	**-0.00022**	**0.00170**	**0.00059**	**-0.00018**	**0.00232**
%RSD	0.48430	30.73760	0.34945	12.65561	44.99277	132.40469	239.87623	190.19951	30.70440

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00042	-0.00173	-0.00070
#2	-0.00073	-0.00140	-0.00161
Mean	**-0.00058**	**-0.00157**	**-0.00116**
%RSD	38.86427	14.74451	55.25221

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:20
SampleId1 : 1002172-5 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:50:14
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE27

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00011	0.02167	0.00206	0.00205	0.02514	-0.00014	-0.00131	32.72366	-0.00052
#2	-0.00033	0.01945	0.00270	0.00169	0.02528	-0.00013	0.00388	32.75578	-0.00082
Mean	**-0.00022**	**0.02056**	**0.00238**	**0.00187**	**0.02521**	**-0.00014**	**0.00128**	**32.73972**	**-0.00067**
%RSD	69.86119	7.61829	18.98953	13.63062	0.39701	2.27242	285.87312	0.06938	31.07844

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00028	0.00103	-0.00075	4.57589	22.89468	0.00317	5.65404	0.13395	-0.00174
#2	-0.00050	0.00058	-0.00110	4.59153	22.97842	0.00313	5.66323	0.13422	-0.00097
Mean	**-0.00011**	**0.00080**	**-0.00093**	**4.58371**	**22.93655**	**0.00315**	**5.65863**	**0.13409**	**-0.00136**

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%RSD	504.32069	39.68450	26.92325	0.24122	0.25817	0.86111	0.11485	0.14093	40.26474

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.12788	0.00102	0.08438	0.00173	-0.00241	0.10119	0.00148	-0.00315	-0.00365
#2	4.14911	0.00019	0.08519	-0.00306	-0.00079	0.09088	-0.00174	-0.00392	-0.00207
Mean	**4.13849**	**0.00061**	**0.08479**	**-0.00067**	**-0.00160**	**0.09603**	**-0.00013**	**-0.00354**	**-0.00286**
%RSD	0.36280	96.40094	0.67949	509.04189	71.71816	7.59333	1791.99076	15.33558	38.96356

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.68267	0.00092	0.12132	-0.00660	0.00229	0.00232	-0.00476	0.00075	-0.00135
#2	0.68254	-0.00020	0.12199	-0.01144	0.00187	-0.00082	-0.00627	0.00013	-0.00150
Mean	**0.68260**	**0.00036**	**0.12165**	**-0.00902**	**0.00208**	**0.00075**	**-0.00551**	**0.00044**	**-0.00142**
%RSD	0.01368	221.47315	0.38935	37.96546	14.31866	294.94802	19.32783	101.05829	7.15745

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00008	-0.00103	-0.00348
#2	-0.00016	-0.00154	-0.00269
Mean	**-0.00012**	**-0.00129**	**-0.00308**
%RSD	51.68648	28.18072	18.23048

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:20
SampleId1 : 1002189-2 10X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 11:52:00
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE28

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00010	0.04328	-0.00020	0.00481	0.01430	-0.00011	-0.00436	13.91010	-0.00019
#2	0.00046	0.03620	0.00060	0.00509	0.01427	-0.00013	-0.00161	13.84169	-0.00070
Mean	**0.00018**	**0.03974**	**0.00020**	**0.00495**	**0.01428**	**-0.00012**	**-0.00298**	**13.87590**	**-0.00045**
%RSD	222.91959	12.60004	280.02739	4.00178	0.14014	9.24832	65.26089	0.34859	81.24755

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00073	0.00028	0.00393	3.67334	5.33574	0.00287	2.16013	0.46236	-0.00116
#2	-0.00019	0.00068	0.00384	3.65833	5.27239	0.00288	2.13937	0.46072	-0.00137
Mean	**-0.00046**	**0.00048**	**0.00389**	**3.66584**	**5.30406**	**0.00288**	**2.14975**	**0.46154**	**-0.00126**
%RSD	83.21435	57.83544	1.48564	0.28955	0.84457	0.06740	0.68298	0.25222	11.92720

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.00869	-0.00037	0.10302	-0.00033	0.00095	0.13949	-0.00306	0.00188	-0.00346
#2	0.99559	0.00074	0.10546	0.00200	-0.00139	0.13949	-0.00084	-0.00052	-0.00243
Mean	**1.00214**	**0.00019**	**0.10424**	**0.00084**	**-0.00022**	**0.13949**	**-0.00195**	**0.00068**	**-0.00294**
%RSD	0.92466	419.12226	1.65816	196.86722	748.24010	0.00000	80.15329	248.90022	24.83921

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	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.46111	-0.00070	0.04287	-0.00372	0.00057	0.00441	-0.01113	-0.00038	0.01314
#2	0.45502	0.00142	0.04260	-0.00510	0.00043	-0.00071	0.00285	0.00008	0.01314
Mean	**0.45807**	**0.00036**	**0.04273**	**-0.00441**	**0.00050**	**0.00185**	**-0.00414**	**-0.00015**	**0.01314**
%RSD	0.93980	416.41777	0.45196	22.20726	20.82638	195.72311	238.69768	215.64092	0.00000

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00065	0.00052	-0.00168
#2	-0.00030	-0.00026	-0.00179
Mean	**-0.00047**	**0.00013**	**-0.00174**
%RSD	51.36535	425.97234	4.39081

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:20
SampleId1 : 1002189-3 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:53:46
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE29

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00035	0.10871	-0.00136	0.00513	0.00331	-0.00013	-0.00295	8.64974	-0.00046
#2	0.00046	0.11593	-0.00166	0.00489	0.00343	-0.00014	-0.00019	8.67839	-0.00030
Mean	**0.00006**	**0.11232**	**-0.00151**	**0.00501**	**0.00337**	**-0.00013**	**-0.00157**	**8.66407**	**-0.00038**
%RSD	1042.13238	4.54930	14.07269	3.38900	2.37473	3.42737	124.27531	0.23379	29.88318

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00072	-0.00073	-0.00031	0.26789	0.06182	0.00279	1.42146	0.01589	-0.00161
#2	-0.00029	-0.00028	-0.00040	0.26943	0.04729	0.00277	1.42561	0.01608	-0.00129
Mean	**-0.00050**	**-0.00051**	**-0.00036**	**0.26866**	**0.05455**	**0.00278**	**1.42353**	**0.01599**	**-0.00145**
%RSD	60.76593	63.09342	17.74929	0.40524	18.83713	0.41858	0.20623	0.84331	15.58987

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.36968	-0.00038	-0.00167	-0.00143	-0.00138	0.40914	-0.00371	-0.00391	-0.00090
#2	0.37069	0.00042	-0.00370	0.00206	-0.00319	0.40620	-0.00173	0.00224	-0.00183
Mean	**0.37018**	**0.00002**	**-0.00269**	**0.00032**	**-0.00229**	**0.40767**	**-0.00272**	**-0.00084**	**-0.00137**
%RSD	0.19295	2654.98727	53.61232	776.78585	55.78633	0.51122	51.33455	519.52350	48.08944

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.33567	-0.00107	0.01663	-0.00535	0.00068	0.00120	-0.01929	-0.00035	-0.00034
#2	0.33770	-0.00082	0.01677	-0.00423	0.00101	-0.00006	0.00565	0.00009	-0.00070
Mean	**0.33668**	**-0.00095**	**0.01670**	**-0.00479**	**0.00085**	**0.00057**	**-0.00682**	**-0.00013**	**-0.00052**
%RSD	0.42659	18.53960	0.57794	16.60016	27.74400	155.22412	258.74553	241.53222	48.70833

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	Zr	Pb	SeNCH
	ppm	calc	calc
#1	-0.00047	-0.00140	-0.00190
#2	-0.00044	-0.00144	-0.00048
Mean	**-0.00046**	**-0.00142**	**-0.00119**
%RSD	5.06327	2.13288	84.76006

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:21
SampleId1 : 1002189-4 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 11:55:33
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE30

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00011	0.03188	-0.00261	0.00429	0.01342	-0.00011	-0.00233	14.01505	-0.00060
#2	-0.00021	0.03122	-0.00061	0.00405	0.01356	-0.00013	0.00194	14.05790	-0.00047
Mean	**-0.00016**	**0.03155**	**-0.00161**	**0.00417**	**0.01349**	**-0.00012**	**-0.00020**	**14.03648**	**-0.00054**
%RSD	46.93616	1.49820	87.77280	4.07208	0.74184	11.90533	1548.47780	0.21586	17.98195

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00043	-0.00016	-0.00011	3.34866	5.36135	0.00292	2.14505	0.43928	-0.00118
#2	-0.00041	0.00024	-0.00053	3.35910	5.39794	0.00290	2.15051	0.44135	-0.00105
Mean	**-0.00042**	**0.00004**	**-0.00032**	**3.35388**	**5.37965**	**0.00291**	**2.14778**	**0.44031**	**-0.00112**
%RSD	4.47900	657.24884	92.68657	0.22010	0.48093	0.53236	0.17990	0.33195	8.43236

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.97463	-0.00075	0.10261	-0.00016	-0.00229	0.11592	0.00042	-0.00096	-0.00290
#2	0.98619	-0.00019	0.10424	-0.00189	-0.00077	0.11150	-0.00102	-0.00031	-0.00004
Mean	**0.98041**	**-0.00047**	**0.10342**	**-0.00102**	**-0.00153**	**0.11371**	**-0.00030**	**-0.00063**	**-0.00147**
%RSD	0.83391	84.49462	1.11414	120.00181	70.19051	2.74839	343.01004	73.11410	137.45590

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.45125	-0.00008	0.04244	-0.00290	-0.00013	-0.00235	-0.00692	-0.00029	0.00074
#2	0.45421	-0.00082	0.04272	-0.00309	0.00020	-0.00063	-0.00842	0.00000	0.00059
Mean	**0.45273**	**-0.00045**	**0.04258**	**-0.00299**	**0.00003**	**-0.00149**	**-0.00767**	**-0.00014**	**0.00067**
%RSD	0.46336	117.62587	0.46553	4.62643	656.84780	81.76159	13.86284	142.78905	15.30300

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00055	-0.00158	-0.00226
#2	-0.00084	-0.00114	-0.00013
Mean	**-0.00070**	**-0.00136**	**-0.00119**
%RSD	28.53638	22.53439	126.07480

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:21

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SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/10/2010 11:57:19
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19727	49.60115	0.49819	0.97076	0.98692	0.50084	0.51256	48.61674	0.48921
#2	0.19779	49.80226	0.50423	0.97300	0.98968	0.50127	0.51888	48.74253	0.49008
Mean	**0.19753**	**49.70170**	**0.50121**	**0.97188**	**0.98830**	**0.50105**	**0.51572**	**48.67963**	**0.48965**
%RSD	0.18874	0.28611	0.85274	0.16310	0.19759	0.06163	0.86674	0.18272	0.12463

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.50177	0.99887	0.96907	20.02831	48.85217	0.50410	49.95286	0.99373	0.98268
#2	0.50293	1.00041	0.96878	20.06887	49.04653	0.50571	50.09696	0.99550	0.98502
Mean	**0.50235**	**0.99964**	**0.96892**	**20.04859**	**48.94935**	**0.50490**	**50.02491**	**0.99461**	**0.98385**
%RSD	0.16383	0.10909	0.02130	0.14304	0.28076	0.22514	0.20369	0.12578	0.16872

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.50377	0.99047	4.88647	0.97610	0.98182	5.08266	0.47838	1.00045	1.01527
#2	48.66348	0.98983	4.89288	0.97713	0.97967	5.06341	0.48415	1.00544	1.01175
Mean	**48.58363**	**0.99015**	**4.88968**	**0.97662**	**0.98075**	**5.07303**	**0.48127**	**1.00294**	**1.01351**
%RSD	0.23246	0.04558	0.09264	0.07481	0.15491	0.26826	0.84856	0.35189	0.24567

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.82725	0.99773	0.49306	0.17081	0.47892	0.50511	4.95669	0.48807	1.03880
#2	4.83747	1.00097	0.49434	0.17147	0.47976	0.50840	4.96867	0.48923	1.04387
Mean	**4.83236**	**0.99935**	**0.49370**	**0.17114**	**0.47934**	**0.50676**	**4.96268**	**0.48865**	**1.04134**
%RSD	0.14967	0.22913	0.18335	0.27612	0.12400	0.46000	0.17068	0.16702	0.34411

	Zr	Pb	Se
	ppm	calc	calc
#1	0.98604	0.97992	1.01033
#2	0.98743	0.97883	1.00965
Mean	**0.98673**	**0.97937**	**1.00999**
%RSD	0.09999	0.07863	0.04808

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:21
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/10/2010 11:59:12
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	-0.00101	0.06063	-0.00264	0.00105	-0.00011	0.00024	-0.00865	0.02545	-0.00037
#2	-0.00033	0.06068	-0.00355	0.00161	-0.00014	0.00022	-0.00315	0.02247	-0.00035
Mean	**-0.00067**	**0.06065**	**-0.00310**	**0.00133**	**-0.00012**	**0.00023**	**-0.00590**	**0.02396**	**-0.00036**
%RSD	71.59388	0.06094	20.64597	29.82788	16.09373	8.48718	65.96347	8.80320	3.04315

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00050	-0.00002	-0.00081	0.01643	-0.29791	0.00290	0.02874	0.00003	-0.00025
#2	-0.00007	-0.00008	-0.00040	0.01526	-0.30415	0.00287	0.02525	-0.00008	-0.00038
Mean	**-0.00029**	**-0.00005**	**-0.00061**	**0.01584**	**-0.30103**	**0.00288**	**0.02700**	**-0.00003**	**-0.00032**
%RSD	106.07751	76.71770	48.32799	5.20509	1.46389	0.67241	9.15299	292.56556	29.64035

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.13459	-0.00014	-0.00034	-0.00108	0.00137	-0.02697	-0.00257	0.00168	-0.00219
#2	-0.13838	0.00031	-0.00330	0.00069	-0.00144	-0.01814	-0.00161	-0.00012	-0.00269
Mean	**-0.13649**	**0.00009**	**-0.00182**	**-0.00020**	**-0.00004**	**-0.02255**	**-0.00209**	**0.00078**	**-0.00244**
%RSD	1.96623	370.60710	114.69733	642.23520	5068.23778	27.70864	32.46656	163.10119	14.50363

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00624	-0.00294	-0.00155	-0.00490	-0.00081	-0.00098	-0.01363	-0.00003	-0.00056
#2	-0.00605	-0.00032	-0.00161	-0.00262	-0.00062	-0.00086	-0.00066	-0.00002	-0.00042
Mean	**-0.00614**	**-0.00163**	**-0.00158**	**-0.00376**	**-0.00071**	**-0.00092**	**-0.00714**	**-0.00002**	**-0.00049**
%RSD	2.14565	113.32886	2.56717	42.95644	18.27378	9.19295	128.40622	53.77611	20.92471

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00011	0.00055	-0.00090
#2	0.00005	-0.00073	-0.00184
Mean	**0.00008**	**-0.00009**	**-0.00137**
%RSD	49.37151	993.58148	48.10138

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:22
SampleId1 : 1002189-5 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 12:01:04
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE31

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00025	0.01754	-0.00215	0.00517	0.00292	-0.00007	-0.00305	8.49076	-0.00054
#2	-0.00022	0.01946	-0.00313	0.00601	0.00298	-0.00008	0.00113	8.49725	-0.00060
Mean	**-0.00024**	**0.01850**	**-0.00264**	**0.00559**	**0.00295**	**-0.00008**	**-0.00096**	**8.49400**	**-0.00057**
%RSD	7.84404	7.35487	26.18998	10.63026	1.35844	9.79916	307.65901	0.05406	7.29389

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00096	-0.00104	-0.00046	0.12301	0.10449	0.00285	1.41250	0.01418	-0.00161

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#2	-0.00034	-0.00058	-0.00083	0.12248	0.09296	0.00279	1.41665	0.01425	-0.00076
Mean	**-0.00065**	**-0.00081**	**-0.00065**	**0.12275**	**0.09873**	**0.00282**	**1.41457**	**0.01422**	**-0.00118**
%RSD	67.84404	40.15642	39.85706	0.30558	8.26033	1.37490	0.20754	0.37940	50.93036

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.37660	-0.00027	-0.00197	-0.00342	-0.00044	0.42388	-0.00388	-0.00395	-0.00057
#2	0.37540	-0.00030	-0.00635	-0.00052	-0.00159	0.42241	-0.00089	-0.00033	-0.00221
Mean	**0.37600**	**-0.00029**	**-0.00416**	**-0.00197**	**-0.00102**	**0.42314**	**-0.00239**	**-0.00214**	**-0.00139**
%RSD	0.22615	9.50323	74.38019	103.86592	79.63952	0.24627	88.86008	119.40576	83.72551

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.21083	-0.00207	0.01639	-0.00495	-0.00102	-0.00185	-0.00821	-0.00061	-0.00063
#2	0.21164	-0.00244	0.01647	-0.00434	-0.00099	0.00040	0.00526	-0.00017	-0.00049
Mean	**0.21123**	**-0.00226**	**0.01643**	**-0.00465**	**-0.00101**	**-0.00072**	**-0.00148**	**-0.00039**	**-0.00056**
%RSD	0.27120	11.72143	0.34001	9.30609	1.48137	219.69909	644.04871	80.42846	18.22773

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00058	-0.00143	-0.00169
#2	-0.00048	-0.00123	-0.00159
Mean	**-0.00053**	**-0.00133**	**-0.00164**
%RSD	13.78349	10.58052	4.69052

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:22
SampleId1 : 1002189-5D 10X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 12:02:50
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE32

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00025	0.01812	0.00033	0.00645	0.00281	-0.00022	-0.00030	8.24868	-0.00057
#2	0.00074	0.02035	0.00191	0.00569	0.00283	-0.00020	0.00449	8.25506	-0.00049
Mean	**0.00049**	**0.01923**	**0.00112**	**0.00607**	**0.00282**	**-0.00021**	**0.00210**	**8.25187**	**-0.00053**
%RSD	71.05098	8.17739	99.65024	8.85699	0.70991	6.97464	161.55159	0.05463	11.13191

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00031	-0.00027	-0.00090	0.11792	0.02145	0.00263	1.37907	0.01380	-0.00140
#2	0.00001	-0.00001	-0.00041	0.11871	0.03022	0.00264	1.38497	0.01380	-0.00062
Mean	**-0.00015**	**-0.00014**	**-0.00065**	**0.11832**	**0.02583**	**0.00263**	**1.38202**	**0.01380**	**-0.00101**
%RSD	154.85398	127.26825	52.48229	0.47551	23.99530	0.22095	0.30186	0.00000	54.06566

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.35587	-0.00025	-0.00554	0.00181	-0.00274	0.40325	0.00054	0.00453	-0.00253
#2	0.36006	0.00007	-0.00594	0.00235	-0.00312	0.39146	0.00043	0.00651	-0.00100

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Mean	**0.35797**	**-0.00009**	**-0.00574**	**0.00208**	**-0.00293**	**0.39735**	**0.00048**	**0.00552**	**-0.00177**
%RSD	0.82662	241.42866	5.01682	18.33326	9.16205	2.09796	16.90728	25.35252	61.57298

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.20620	-0.00145	0.01613	-0.00742	-0.00123	-0.00203	0.00177	0.00006	-0.00070
#2	0.20797	0.00167	0.01613	-0.00472	-0.00099	-0.00143	0.01474	0.00031	-0.00106
Mean	**0.20709**	**0.00011**	**0.01613**	**-0.00607**	**-0.00111**	**-0.00173**	**0.00825**	**0.00019**	**-0.00088**
%RSD	0.60618	1959.73615	0.00000	31.38749	15.12113	24.76820	111.13821	94.44761	28.84127

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00005	-0.00122	-0.00018
#2	-0.00021	-0.00129	0.00150
Mean	**-0.00013**	**-0.00126**	**0.00066**
%RSD	89.32779	4.09944	180.11497

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:22
SampleId1 : 1002189-5L 50X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 12:04:36
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE33

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00039	0.01258	-0.00110	0.00009	-0.00022	-0.00023	-0.00489	1.64646	-0.00057
#2	0.00028	0.01196	-0.00125	0.00101	-0.00011	-0.00025	-0.00519	1.64749	-0.00055
Mean	**-0.00005**	**0.01227**	**-0.00118**	**0.00055**	**-0.00017**	**-0.00024**	**-0.00504**	**1.64698**	**-0.00056**
%RSD	909.94304	3.56992	9.06625	118.80894	47.99085	4.41141	4.18955	0.04442	2.50792

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00099	-0.00089	-0.00152	0.02035	-0.26468	0.00257	0.26093	0.00213	-0.00204
#2	-0.00048	-0.00077	-0.00111	0.02045	-0.26375	0.00259	0.26770	0.00209	-0.00148
Mean	**-0.00073**	**-0.00083**	**-0.00131**	**0.02040**	**-0.26422**	**0.00258**	**0.26431**	**0.00211**	**-0.00176**
%RSD	49.52993	9.99911	21.91138	0.36746	0.24707	0.67553	1.81152	1.27927	22.52335

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.05229	-0.00025	-0.00808	-0.00110	-0.00067	0.06289	-0.00251	-0.00287	0.00010
#2	-0.05176	-0.00047	-0.00401	0.00184	-0.00165	0.06141	-0.00065	-0.00323	-0.00015
Mean	**-0.05202**	**-0.00036**	**-0.00605**	**0.00037**	**-0.00116**	**0.06215**	**-0.00158**	**-0.00305**	**-0.00003**
%RSD	0.71845	42.44322	47.63353	560.07781	59.70456	1.67611	83.19630	8.45332	629.81563

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03435	-0.00157	0.00163	-0.00336	-0.00107	-0.00199	-0.01862	-0.00038	-0.00142
#2	0.03577	-0.00107	0.00163	-0.00322	-0.00104	-0.00097	0.00383	-0.00024	-0.00099
Mean	**0.03506**	**-0.00132**	**0.00163**	**-0.00329**	**-0.00106**	**-0.00148**	**-0.00740**	**-0.00031**	**-0.00121**

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%RSD	2.85498	26.68536	0.31130	3.07185	1.76395	48.89032	214.63947	30.45870	25.31618

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00069	-0.00081	-0.00089
#2	-0.00058	-0.00049	-0.00118
Mean	**-0.00064**	**-0.00065**	**-0.00103**
%RSD	11.45770	35.66361	19.71971

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:23
SampleId1 : 1002189-5MS 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 12:06:22
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE34

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00014	0.20830	0.20069	0.10094	0.20293	0.00464	0.00291	12.17655	0.00458
#2	0.00075	0.21440	0.20280	0.10314	0.20539	0.00467	-0.00289	12.24726	0.00473
Mean	**0.00030**	**0.21135**	**0.20174**	**0.10204**	**0.20416**	**0.00465**	**0.00001**	**12.21190**	**0.00465**
%RSD	207.97364	2.03805	0.74020	1.52477	0.85392	0.35731	32653.69270	0.40944	2.20055

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.04893	0.01933	0.02367	0.21634	3.17429	0.04158	5.35382	0.06319	0.09838
#2	0.04948	0.01940	0.02374	0.21809	3.17773	0.04179	5.39430	0.06388	0.09948
Mean	**0.04921**	**0.01936**	**0.02370**	**0.21722**	**3.17601**	**0.04169**	**5.37406**	**0.06354**	**0.09893**
%RSD	0.77957	0.26968	0.19497	0.57016	0.07664	0.34767	0.53261	0.76430	0.78044

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.80593	0.04859	-0.00605	0.04933	0.04782	0.40030	0.04756	0.19811	0.20241
#2	3.84851	0.04891	-0.00370	0.04758	0.04622	0.41799	0.04738	0.20189	0.20327
Mean	**3.82722**	**0.04875**	**-0.00487**	**0.04846**	**0.04702**	**0.40914**	**0.04747**	**0.20000**	**0.20284**
%RSD	0.78661	0.46304	33.96800	2.54732	2.39910	3.05630	0.25509	1.33653	0.29892

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.40501	0.05134	0.06593	-0.00451	0.04832	0.20312	-0.00628	0.04976	0.04646
#2	0.41196	0.05321	0.06686	-0.00736	0.04911	0.20185	0.00070	0.05077	0.04660
Mean	**0.40848**	**0.05227**	**0.06640**	**-0.00593**	**0.04871**	**0.20248**	**-0.00279**	**0.05026**	**0.04653**
%RSD	1.20399	2.52751	0.98045	34.01345	1.13845	0.44191	176.95477	1.42658	0.21920

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00055	0.04832	0.20098
#2	-0.00022	0.04667	0.20281
Mean	**-0.00038**	**0.04750**	**0.20190**
%RSD	60.89978	2.44945	0.64120

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ted: 3/10/2010 16:02:49 User: ROY FRENCH
Method : Paragon File : 100310A Printed : 3/10/2010 16:02:23
SampleId1 : 1002189-5MSD 10X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 12:08:09
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE35

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00043	0.21374	0.20431	0.10262	0.20537	0.00477	0.00292	12.38602	0.00450
#2	0.00026	0.20976	0.20110	0.10274	0.20423	0.00472	0.00363	12.34617	0.00435
Mean	**0.00034**	**0.21175**	**0.20271**	**0.10268**	**0.20480**	**0.00474**	**0.00327**	**12.36609**	**0.00443**
%RSD	36.20340	1.32937	1.11819	0.08265	0.39138	0.66516	15.32220	0.22785	2.34330

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.04964	0.01932	0.02402	0.21979	3.20274	0.04176	5.44704	0.06434	0.10004
#2	0.04991	0.01963	0.02360	0.21926	3.19540	0.04164	5.42428	0.06419	0.09892
Mean	**0.04977**	**0.01947**	**0.02381**	**0.21953**	**3.19907**	**0.04170**	**5.43566**	**0.06426**	**0.09948**
%RSD	0.38233	1.09712	1.24043	0.17096	0.16231	0.19462	0.29603	0.16793	0.79509

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.83157	0.04979	-0.00411	0.04878	0.04728	0.41799	0.04679	0.20528	0.20445
#2	3.81695	0.04919	-0.00655	0.04958	0.04657	0.41062	0.05001	0.20730	0.20356
Mean	**3.82426**	**0.04949**	**-0.00533**	**0.04918**	**0.04692**	**0.41430**	**0.04840**	**0.20629**	**0.20400**
%RSD	0.27018	0.85749	32.39966	1.15508	1.07735	1.25761	4.70850	0.69132	0.30952

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.41079	0.05159	0.06674	-0.00606	0.04938	0.20581	-0.00030	0.05106	0.04790
#2	0.41177	0.05408	0.06639	-0.00422	0.04921	0.20663	-0.00928	0.05098	0.04804
Mean	**0.41128**	**0.05283**	**0.06656**	**-0.00514**	**0.04929**	**0.20622**	**-0.00479**	**0.05102**	**0.04797**
%RSD	0.16749	3.33619	0.37438	25.34507	0.24918	0.27983	132.62464	0.10618	0.21261

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00081	0.04778	0.20473
#2	-0.00043	0.04757	0.20480
Mean	**-0.00062**	**0.04768**	**0.20477**
%RSD	42.81243	0.31052	0.02624

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:23
SampleId1 : CRI SampleId2 : [FLEXQC]
Analysis commenced : 3/10/2010 12:09:56
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD3

Final concentrations

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01977	0.42517	0.01137	0.40489	0.41770	0.01014	0.04992	5.11397	0.00946
#2	0.01971	0.41993	0.01039	0.40605	0.41705	0.01009	0.04951	5.10624	0.00988
Mean	**0.01974**	**0.42255**	**0.01088**	**0.40547**	**0.41738**	**0.01011**	**0.04972**	**5.11010**	**0.00967**
%RSD	0.22983	0.87742	6.36606	0.20236	0.11056	0.35180	0.58432	0.10704	3.06491

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10155	0.01978	0.05012	0.21236	3.66520	0.01832	5.16457	0.03012	0.02009
#2	0.10177	0.01986	0.04984	0.21295	3.63768	0.01828	5.15450	0.03004	0.02086
Mean	**0.10166**	**0.01982**	**0.04998**	**0.21265**	**3.65144**	**0.01830**	**5.15953**	**0.03008**	**0.02048**
%RSD	0.15004	0.29475	0.39011	0.19413	0.53287	0.16924	0.13793	0.17932	2.66639

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.16534	0.08131	0.20692	0.00532	0.00660	0.18222	0.11917	0.01066	0.01006
#2	4.14639	0.08017	0.19856	0.00364	0.00645	0.19548	0.11600	0.00786	0.01038
Mean	**4.15587**	**0.08074**	**0.20274**	**0.00448**	**0.00653**	**0.18885**	**0.11758**	**0.00926**	**0.01022**
%RSD	0.32244	0.99533	2.91370	26.58027	1.66271	4.96500	1.90738	21.35918	2.22721

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10217	0.10546	0.01904	0.08968	0.01960	0.02088	0.20724	0.10384	0.03939
#2	0.09915	0.10247	0.01900	0.08974	0.01943	0.01949	0.19776	0.10350	0.03924
Mean	**0.10066**	**0.10397**	**0.01902**	**0.08971**	**0.01951**	**0.02019**	**0.20250**	**0.10367**	**0.03932**
%RSD	2.11770	2.03415	0.13354	0.04515	0.62952	4.86132	3.31016	0.23472	0.25939

	Zr	Pb	Se
	ppm	calc	calc
#1	0.05186	0.00618	0.01026
#2	0.05148	0.00551	0.00954
Mean	**0.05167**	**0.00584**	**0.00990**
%RSD	0.51747	8.02062	5.11887

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:24
SampleId1 : ICSA **SampleId2 :** **[FLEXQC]**
Analysis commenced : 3/10/2010 12:11:48
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD4

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00012	262.95441	0.00327	0.00057	-0.00031	0.00031	0.01009	263.29098	-0.00036
#2	0.00038	263.67567	-0.00027	-0.00007	-0.00045	0.00031	0.00551	263.46777	-0.00026
Mean	**0.00025**	**263.31504**	**0.00150**	**0.00025**	**-0.00038**	**0.00031**	**0.00780**	**263.37937**	**-0.00031**
%RSD	72.28177	0.19369	166.99320	182.81091	26.39701	0.44466	41.56885	0.04746	22.38280

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00123	0.00074	-0.00384	107.57841	-0.35331	0.00435	272.55212	-0.00108	-0.00049
#2	0.00139	0.00024	-0.00398	107.69789	-0.35400	0.00433	272.85662	-0.00123	-0.00076
Mean	**0.00131**	**0.00049**	**-0.00391**	**107.63815**	**-0.35366**	**0.00434**	**272.70437**	**-0.00115**	**-0.00062**
%RSD	8.77624	71.89460	2.37708	0.07849	0.13846	0.31283	0.07895	9.35784	30.18197

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.14516	0.00099	0.00851	0.00565	-0.00414	-0.01961	0.00707	0.00575	-0.00315
#2	-0.14530	0.00109	0.00373	0.00626	-0.00242	-0.00930	0.00480	0.01400	-0.00256
Mean	**-0.14523**	**0.00104**	**0.00612**	**0.00595**	**-0.00328**	**-0.01445**	**0.00593**	**0.00987**	**-0.00285**
%RSD	0.07017	6.96846	55.27846	7.28073	37.11583	50.44836	27.09812	59.08289	14.62976

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00890	0.00304	0.01105	-0.01011	-0.00144	0.00072	0.05980	-0.00199	-0.00121
#2	-0.01170	-0.00132	0.01104	-0.01365	-0.00162	-0.00106	0.04674	-0.00172	-0.00142
Mean	**-0.01030**	**0.00086**	**0.01104**	**-0.01188**	**-0.00153**	**-0.00017**	**0.05327**	**-0.00186**	**-0.00132**
%RSD	19.26363	358.35293	0.04598	21.06400	8.26365	750.88913	17.32517	10.36256	11.61818

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00227	-0.00088	-0.00019
#2	0.00271	0.00047	0.00295
Mean	**0.00249**	**-0.00021**	**0.00138**
%RSD	12.40101	465.53431	160.40178

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:24
SampleId1 : ICSAB **SampleId2 :** **[FLEXQC]**
Analysis commenced : 3/10/2010 12:13:40
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD5

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.20804	269.98058	0.11115	1.00779	0.51784	0.48899	0.54449	265.16736	1.01083
#2	0.20681	268.89710	0.11152	1.00791	0.51804	0.48908	0.54663	264.30734	1.01028
Mean	**0.20743**	**269.43884**	**0.11134**	**1.00785**	**0.51794**	**0.48903**	**0.54556**	**264.73735**	**1.01055**
%RSD	0.41826	0.28435	0.23939	0.00843	0.02713	0.01325	0.27726	0.22971	0.03862

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48094	0.48204	0.51522	108.78640	-0.41033	1.06589	276.09273	0.48001	1.00196
#2	0.48027	0.48166	0.51543	108.68328	-0.40687	1.06297	275.80127	0.48017	0.99767
Mean	**0.48060**	**0.48185**	**0.51533**	**108.73484**	**-0.40860**	**1.06443**	**275.94700**	**0.48009**	**0.99982**
%RSD	0.09902	0.05517	0.02883	0.06706	0.59927	0.19413	0.07469	0.02256	0.30375

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	-0.15616	0.93815	1.02348	0.05534	0.05732	1.04598	0.60767	0.06229	0.05493
#2	-0.15649	0.93972	1.02614	0.05549	0.05751	1.05188	0.60752	0.06601	0.05802
Mean	**-0.15633**	**0.93893**	**1.02481**	**0.05541**	**0.05741**	**1.04893**	**0.60760**	**0.06415**	**0.05647**
%RSD	0.15210	0.11823	0.18323	0.18866	0.23302	0.39763	0.01780	4.10280	3.87378

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.97587	1.02456	1.01436	0.04721	0.97461	0.10862	10.47387	0.49062	0.91757
#2	0.97826	1.02868	1.01233	0.04561	0.97355	0.10670	10.47645	0.49163	0.91938
Mean	**0.97707**	**1.02662**	**1.01335**	**0.04641**	**0.97408**	**0.10766**	**10.47516**	**0.49112**	**0.91848**
%RSD	0.17321	0.28326	0.14196	2.44919	0.07686	1.26395	0.01741	0.14567	0.13927

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.50942	0.05666	0.05738
#2	0.50913	0.05683	0.06068
Mean	**0.50927**	**0.05675**	**0.05903**
%RSD	0.04099	0.21859	3.95666

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:24
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/10/2010 12:15:33
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19883	49.82598	0.50604	0.97796	0.99042	0.50496	0.51677	49.07168	0.49334
#2	0.19986	49.88363	0.51262	0.98241	0.99330	0.50639	0.52513	49.27312	0.49465
Mean	**0.19935**	**49.85481**	**0.50933**	**0.98018**	**0.99186**	**0.50568**	**0.52095**	**49.17240**	**0.49399**
%RSD	0.36652	0.08176	0.91261	0.32054	0.20500	0.20020	1.13453	0.28968	0.18640

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.50595	1.00742	0.97554	20.19360	49.09999	0.50553	50.50866	0.99969	0.99145
#2	0.50850	1.00960	0.97575	20.25517	49.05858	0.50485	50.68410	1.00307	0.99567
Mean	**0.50723**	**1.00851**	**0.97564**	**20.22439**	**49.07929**	**0.50519**	**50.59638**	**1.00138**	**0.99356**
%RSD	0.35449	0.15269	0.01502	0.21526	0.05966	0.09437	0.24519	0.23902	0.29997

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.57634	0.99795	4.86385	0.98275	0.99170	5.08414	0.48552	1.01564	1.02085
#2	48.49245	1.00476	4.89546	0.99064	0.98286	5.10931	0.49022	1.02254	1.02414
Mean	**48.53440**	**1.00135**	**4.87965**	**0.98670**	**0.98728**	**5.09672**	**0.48787**	**1.01909**	**1.02250**
%RSD	0.12223	0.48130	0.45815	0.56515	0.63244	0.34918	0.68161	0.47891	0.22731

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.84874	1.01729	0.49569	0.17288	0.48254	0.51336	4.99210	0.49231	1.04409

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#2	4.86362	1.01853	0.49693	0.17458	0.48299	0.51282	4.99806	0.49398	1.05241
Mean	**4.85618**	**1.01791**	**0.49631**	**0.17373**	**0.48277**	**0.51309**	**4.99508**	**0.49314**	**1.04825**
%RSD	0.21667	0.08651	0.17722	0.68875	0.06540	0.07503	0.08439	0.24004	0.56162

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.99486	0.98872	1.01912
#2	0.99706	0.98545	1.02361
Mean	**0.99596**	**0.98709**	**1.02136**
%RSD	0.15613	0.23380	0.31091

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:24
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/10/2010 12:17:25
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00025	0.07379	0.00210	0.00313	-0.00022	0.00040	0.00133	0.02614	-0.00004
#2	0.00017	0.07346	-0.00253	0.00273	-0.00017	0.00035	0.00479	0.02270	-0.00022
Mean	**0.00021**	**0.07362**	**-0.00021**	**0.00293**	**-0.00020**	**0.00037**	**0.00306**	**0.02442**	**-0.00013**
%RSD	24.18341	0.31666	1526.71503	9.66142	20.51463	8.79024	79.90087	9.96665	101.25240

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00002	0.00029	-0.00040	0.01701	-0.24691	0.00302	0.03224	0.00003	0.00012
#2	-0.00002	0.00041	-0.00012	0.01621	-0.26260	0.00298	0.03006	-0.00005	0.00020
Mean	**-0.00002**	**0.00035**	**-0.00026**	**0.01661**	**-0.25475**	**0.00300**	**0.03115**	**-0.00001**	**0.00016**
%RSD	2.85705	23.62299	77.48158	3.38473	4.35622	0.90522	4.95845	628.32897	34.93673

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.13377	0.00045	-0.00452	0.00226	-0.00043	-0.02403	0.00031	-0.00094	-0.00162
#2	-0.13622	0.00014	-0.00197	0.00080	-0.00052	-0.02845	0.00001	0.00130	0.00313
Mean	**-0.13500**	**0.00030**	**-0.00325**	**0.00153**	**-0.00047**	**-0.02624**	**0.00016**	**0.00018**	**0.00076**
%RSD	1.28335	73.21875	55.45316	67.20122	13.19684	11.90971	132.63662	868.42040	443.73623

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00447	-0.00157	-0.00155	-0.00186	-0.00066	-0.00071	0.00084	0.00004	-0.00034
#2	-0.00274	0.00167	-0.00157	-0.00284	-0.00096	-0.00097	0.00034	0.00039	-0.00020
Mean	**-0.00360**	**0.00005**	**-0.00156**	**-0.00235**	**-0.00081**	**-0.00084**	**0.00059**	**0.00021**	**-0.00027**
%RSD	33.82260	4605.76842	0.97823	29.70708	26.09876	22.09541	59.83839	113.50601	37.62631

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00029	0.00047	-0.00139
#2	0.00025	-0.00008	0.00252

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Mean	**0.00027**	**0.00020**	**0.00057NCH**
%RSD	11.17938	196.26012	489.34500

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:25
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/10/2010 13:37:31
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19453	48.56193	0.48217	0.93585	0.95825	0.49332	0.49381	47.79348	0.47391
#2	0.19455	48.76764	0.48844	0.94174	0.96082	0.49349	0.50503	47.88779	0.47459
Mean	**0.19454**	**48.66479**	**0.48530**	**0.93879**	**0.95953**	**0.49340**	**0.49942**	**47.84064**	**0.47425**
%RSD	0.01004	0.29891	0.91363	0.44320	0.18879	0.02410	1.58868	0.13940	0.10174

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49391	0.98434	0.94386	19.69554	47.87516	0.49313	49.23355	0.97769	0.95899
#2	0.49404	0.98585	0.94717	19.72503	48.05248	0.49478	49.34232	0.97969	0.96224
Mean	**0.49397**	**0.98509**	**0.94552**	**19.71029**	**47.96382**	**0.49395**	**49.28794**	**0.97869**	**0.96062**
%RSD	0.01970	0.10802	0.24771	0.10581	0.26142	0.23561	0.15605	0.14448	0.23955

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	47.67967	0.95395	4.62393	0.96010	0.97198	4.91538	0.46420	0.97782	0.99399
#2	47.87957	0.95680	4.60917	0.95785	0.96303	4.95386	0.47089	0.98319	0.98462
Mean	**47.77962**	**0.95537**	**4.61655**	**0.95898**	**0.96751**	**4.93462**	**0.46754**	**0.98050**	**0.98930**
%RSD	0.29584	0.21067	0.22613	0.16553	0.65414	0.55150	1.01097	0.38743	0.66949

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.73448	0.97643	0.47889	0.16857	0.47307	0.48477	4.85837	0.47985	1.02845
#2	4.75156	0.98142	0.48025	0.16818	0.47358	0.48937	4.86785	0.48123	1.03193
Mean	**4.74302**	**0.97892**	**0.47957**	**0.16837**	**0.47332**	**0.48707**	**4.86311**	**0.48054**	**1.03019**
%RSD	0.25468	0.35993	0.20048	0.16368	0.07691	0.66760	0.13790	0.20326	0.23851

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.96640	0.96803	0.98860
#2	0.96688	0.96131	0.98414
Mean	**0.96664**	**0.96467**	**0.98637**
%RSD	0.03451	0.49239	0.31963

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:25
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/10/2010 13:39:24
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

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Final concentrations **2:49** **User: ROY FRENCH**

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00103	0.04533	0.00402	0.00201	-0.00017	0.00008	0.00256	0.01180	0.00014
#2	0.00053	0.07186	0.00120	0.00189	0.00057	0.00040	-0.00070	0.04702	0.00049
Mean	**0.00078**	**0.05860**	**0.00261**	**0.00195**	**0.00020**	**0.00024**	**0.00093**	**0.02941**	**0.00031**
%RSD	45.67411	32.01430	76.52406	4.35690	258.70979	95.45631	247.57603	84.68440	78.85311

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00047	0.00042	0.00001	0.01128	-0.28730	0.00287	0.02372	-0.00005	-0.00009
#2	0.00074	0.00061	0.00051	0.02247	-0.26929	0.00308	0.05867	0.00045	0.00007
Mean	**0.00060**	**0.00052**	**0.00026**	**0.01688**	**-0.27829**	**0.00297**	**0.04119**	**0.00020**	**-0.00001**
%RSD	31.71594	25.37223	135.67146	46.86392	4.57433	4.88736	59.98590	174.26570	991.02131

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.13982	0.00064	-0.00065	0.00531	-0.00252	-0.02845	0.00127	0.00411	-0.00380
#2	-0.10778	0.00142	-0.00045	0.00515	-0.00172	-0.03581	0.00216	0.00175	-0.00108
Mean	**-0.12380**	**0.00103**	**-0.00055**	**0.00523**	**-0.00212**	**-0.03213**	**0.00171**	**0.00293**	**-0.00244**
%RSD	18.30229	53.46385	26.29417	2.14576	26.85330	16.20928	37.04123	56.94723	78.72249

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00470	0.00167	-0.00160	-0.00218	-0.00076	0.00184	0.01830	0.00062	-0.00042
#2	-0.00379	0.00092	-0.00125	-0.00460	-0.00066	0.00143	0.01031	0.00100	0.00059
Mean	**-0.00425**	**0.00130**	**-0.00143**	**-0.00339**	**-0.00071**	**0.00163**	**0.01431**	**0.00081**	**0.00009**
%RSD	15.12816	40.80813	17.42402	50.44641	10.48086	17.89607	39.48580	33.69315	797.42529

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00047	0.00008	-0.00117
#2	0.00085	0.00057	-0.00014
Mean	**0.00066**	**0.00033**	**-0.00065**
%RSD	40.42143	105.09599	111.21677

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:25
SampleId1 : 1002174-8A 50X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 13:41:16
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE1

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.08585	2.51636	2.45525	1.17556	2.42165	0.05878	0.00447	55.46052	0.06371
#2	0.10401	2.54984	2.50255	1.19818	2.47515	0.06002	0.00249	51.05503	0.06462
Mean	**0.09493**	**2.53310**	**2.47890**	**1.18687**	**2.44840**	**0.05940**	**0.00348**	**53.25778**	**0.06417**
%RSD	13.52757	0.93465	1.34926	1.34764	1.54489	1.47554	40.34045	5.84920	0.99698

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	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.59405	0.25522	0.33866	79.48367	53.84240	0.73829	56.99135	0.93755	1.21873
#2	0.60844	0.26112	0.34722	80.64880	49.80829	0.67740	52.48242	0.95677	1.24157
Mean	**0.60124**	**0.25817**	**0.34294**	**80.06624**	**51.82534**	**0.70784**	**54.73688**	**0.94716**	**1.23015**
%RSD	1.69213	1.61717	1.76413	1.02899	5.50416	6.08234	5.82477	1.43512	1.31316

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	52.98828	0.60608	0.00129	0.60896	0.58811	-0.02108	0.58232	2.46426	2.38293
#2	48.89917	0.61941	0.00088	0.62162	0.61791	-0.01814	0.59442	2.53595	2.50833
Mean	**50.94372**	**0.61274**	**0.00108**	**0.61529**	**0.60301**	**-0.01961**	**0.58837**	**2.50010**	**2.44563**
%RSD	5.67575	1.53802	26.62912	1.45545	3.49472	10.62393	1.45483	2.02763	3.62575

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.36872	0.62381	0.60539	0.00802	0.59211	2.42862	-0.01137	0.60088	5.33276
#2	2.43080	0.63651	0.61806	0.01301	0.60748	2.49318	-0.00867	0.61497	5.41063
Mean	**2.39976**	**0.63016**	**0.61173**	**0.01052**	**0.59979**	**2.46090**	**-0.01002**	**0.60792**	**5.37170**
%RSD	1.82902	1.42413	1.46403	33.58378	1.81242	1.85494	19.04666	1.63917	1.02506

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00013	0.59505	2.41001
#2	-0.00085	0.61915	2.51753
Mean	**-0.00036**	**0.60710**	**2.46377**
%RSD	193.13939	2.80648	3.08573

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:25
SampleId1 : 1002155-2 100X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 13:43:03
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00016	0.08302	-0.00084	0.01409	0.00091	-0.00005	0.00481	6.64797	-0.00038
#2	0.00020	0.08509	-0.00050	0.01389	0.00091	-0.00003	0.00237	6.58978	-0.00036
Mean	**0.00002**	**0.08405**	**-0.00067**	**0.01399**	**0.00091**	**-0.00004**	**0.00359**	**6.61887**	**-0.00037**
%RSD	1491.53858	1.74587	35.96015	1.01106	0.00000	21.30567	48.16238	0.62162	4.94349

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00175	0.01304	-0.00041	61.21002	2.74638	0.00280	0.74763	0.34324	-0.00196
#2	0.00181	0.01282	-0.00062	60.60003	2.74615	0.00281	0.73671	0.34018	-0.00057
Mean	**0.00178**	**0.01293**	**-0.00052**	**60.90503**	**2.74626**	**0.00281**	**0.74217**	**0.34171**	**-0.00126**
%RSD	2.15462	1.19126	28.52976	0.70820	0.00591	0.13816	1.04072	0.63315	77.52686

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	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.34457	0.00215	0.07460	-0.00017	0.00030	27.46061	0.00052	0.00047	-0.00119
#2	0.34332	0.00236	0.07613	0.00038	-0.00127	27.23525	0.00281	0.00326	-0.00118
Mean	**0.34394**	**0.00226**	**0.07537**	**0.00011**	**-0.00049**	**27.34793**	**0.00166**	**0.00187**	**-0.00118**
%RSD	0.25710	6.80380	1.43325	359.22505	228.22595	0.58268	97.27173	105.66860	0.89674

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.25034	0.00116	0.01535	0.00414	0.00652	-0.00025	0.01903	-0.00007	0.01653
#2	0.24884	0.00141	0.01511	0.00484	0.00644	-0.00310	0.01546	-0.00023	0.01566
Mean	**0.24959**	**0.00129**	**0.01523**	**0.00449**	**0.00648**	**-0.00167**	**0.01725**	**-0.00015**	**0.01610**
%RSD	0.42644	13.69392	1.10031	11.02633	0.86122	120.43449	14.66035	73.04784	3.80106

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00032	0.00014	-0.00064
#2	0.00035	-0.00072	0.00030
Mean	**0.00033**	**-0.00029**	**-0.00017**
%RSD	4.87887	211.80546	396.70559

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:26
SampleId1 : 1002155-3 100X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 13:44:49
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE3

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00029	0.07005	-0.00099	0.01029	0.00031	-0.00002	0.00775	5.38339	-0.00032
#2	-0.00047	0.06630	-0.00547	0.00981	0.00031	-0.00004	-0.00009	5.43317	-0.00062
Mean	**-0.00038**	**0.06817**	**-0.00323**	**0.01005**	**0.00031**	**-0.00003**	**0.00383**	**5.40828**	**-0.00047**
%RSD	33.08596	3.88649	98.18905	3.37806	0.00000	62.51837	144.65120	0.65088	44.42436

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00086	0.01001	-0.00132	48.90388	2.17567	0.00270	0.59820	0.27851	-0.00150
#2	0.00094	0.00983	-0.00217	49.60566	2.18463	0.00269	0.60323	0.28206	-0.00142
Mean	**0.00090**	**0.00992**	**-0.00174**	**49.25477**	**2.18015**	**0.00270**	**0.60072**	**0.28028**	**-0.00146**
%RSD	6.36512	1.28795	34.41352	1.00747	0.29076	0.43134	0.59143	0.89686	3.86199

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.24978	0.00169	0.05749	-0.00160	-0.00001	22.50476	-0.00058	-0.00452	-0.00134
#2	0.25315	0.00139	0.05994	-0.00170	0.00030	22.74116	-0.00112	0.00068	-0.00041
Mean	**0.25146**	**0.00154**	**0.05871**	**-0.00165**	**0.00015**	**22.62296**	**-0.00085**	**-0.00192**	**-0.00087**
%RSD	0.94654	13.47674	2.94337	4.45291	146.99387	0.73889	44.55935	191.31881	75.27641

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.20103	-0.00046	0.01192	0.00478	0.00494	0.00121	-0.00002	-0.00097	0.00672
#2	0.20289	-0.00282	0.01210	0.00390	0.00482	0.00067	-0.00050	-0.00100	0.00744
Mean	**0.20196**	**-0.00164**	**0.01201**	**0.00434**	**0.00488**	**0.00094**	**-0.00026**	**-0.00098**	**0.00708**
%RSD	0.65194	102.13076	1.05735	14.41800	1.75333	40.40529	128.37341	2.59800	7.19774

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00007	-0.00054	-0.00239
#2	0.00002	-0.00037	-0.00005
Mean	**0.00005**	**-0.00045**	**-0.00122**
%RSD	88.21676	26.72651	136.02589

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:26
SampleId1 : 1002155-4 100X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 13:46:34
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE4

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00000	0.07721	-0.00298	0.00561	0.00034	-0.00006	0.00235	4.65411	-0.00023
#2	0.00017	0.08052	0.00112	0.00553	0.00034	-0.00006	-0.00213	4.66069	-0.00034
Mean	**0.00008**	**0.07887**	**-0.00093**	**0.00557**	**0.00034**	**-0.00006**	**0.00011**	**4.65740**	**-0.00028**
%RSD	149.18361	2.97039	312.08139	1.01604	0.00000	2.89219	2884.97790	0.09986	28.12412

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00036	0.00582	-0.00210	32.89776	2.27634	0.00274	0.59296	0.20128	-0.00140
#2	0.00066	0.00622	-0.00225	32.91027	2.29242	0.00276	0.60563	0.20162	-0.00070
Mean	**0.00051**	**0.00602**	**-0.00217**	**32.90401**	**2.28438**	**0.00275**	**0.59930**	**0.20145**	**-0.00105**
%RSD	41.42421	4.65857	4.79636	0.02688	0.49797	0.28183	1.49498	0.12067	46.62856

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.53412	0.00124	0.03326	-0.00016	-0.00064	15.94897	0.00090	-0.00559	0.00125
#2	0.53475	0.00148	0.02990	0.00050	-0.00176	16.01780	-0.00018	0.00366	-0.00093
Mean	**0.53443**	**0.00136**	**0.03158**	**0.00017**	**-0.00120**	**15.98338**	**0.00036**	**-0.00096**	**0.00016**
%RSD	0.08277	12.59401	7.52468	276.43284	66.40678	0.30449	211.14685	681.12950	980.54983

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.16953	-0.00008	0.01197	0.00142	0.00070	0.00267	0.00040	-0.00059	0.00391
#2	0.17090	0.00042	0.01202	0.00259	0.00088	-0.00308	0.00787	-0.00014	0.00369
Mean	**0.17022**	**0.00017**	**0.01200**	**0.00201**	**0.00079**	**-0.00020**	**0.00414**	**-0.00037**	**0.00380**
%RSD	0.56900	204.23738	0.25399	41.14153	16.54692	1995.41349	127.79371	85.61804	4.02214

	Zr	**Pb**	**Se**
	ppm	calc	calc

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#1	-0.00033	-0.00048	-0.00103	**NCH**
#2	-0.00010	-0.00101	0.00060	
Mean	**-0.00021**	**-0.00074**	**-0.00021**	
%RSD	77.40016	50.49620	535.16423	

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:26
SampleId1 : 1002155-5 100X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 13:48:19
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE5

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00066	0.07479	-0.00279	0.00489	0.00029	-0.00006	-0.00142	4.58395	-0.00053
#2	0.00039	0.07673	-0.00072	0.00465	0.00029	-0.00007	-0.00457	4.58476	-0.00074
Mean	**-0.00013**	**0.07576**	**-0.00176**	**0.00477**	**0.00029**	**-0.00007**	**-0.00299**	**4.58436**	**-0.00063**
%RSD	555.44965	1.81686	83.28277	3.55960	0.00000	7.52360	74.46984	0.01246	23.56143

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00020	0.00553	-0.00210	32.16233	2.26852	0.00275	0.59340	0.19715	-0.00174
#2	0.00049	0.00563	-0.00168	32.18978	2.26921	0.00271	0.59318	0.19727	-0.00190
Mean	**0.00034**	**0.00558**	**-0.00189**	**32.17605**	**2.26887**	**0.00273**	**0.59329**	**0.19721**	**-0.00182**
%RSD	60.96645	1.29127	15.80861	0.06031	0.02149	1.13525	0.02604	0.04109	6.20013

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.54302	0.00041	0.02470	-0.00215	-0.00136	15.54957	0.00000	-0.00219	-0.00269
#2	0.54827	0.00067	0.03204	-0.00160	-0.00186	15.58696	-0.00066	-0.00137	0.00357
Mean	**0.54565**	**0.00054**	**0.02837**	**-0.00187**	**-0.00161**	**15.56826**	**-0.00033**	**-0.00178**	**0.00044**
%RSD	0.67975	33.52973	18.27348	20.85172	22.15630	0.16983	141.57098	32.73139	1005.57608

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.15878	-0.00220	0.01183	0.00239	0.00069	-0.00143	0.00240	-0.00128	0.00579
#2	0.16229	-0.00107	0.01189	0.00223	0.00071	0.00044	0.00537	-0.00095	0.00607
Mean	**0.16053**	**-0.00163**	**0.01186**	**0.00231**	**0.00070**	**-0.00049**	**0.00388**	**-0.00112**	**0.00593**
%RSD	1.54591	48.52357	0.34255	5.02465	2.12557	268.54031	54.16463	20.89339	3.43922

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00058	-0.00162	-0.00252
#2	-0.00030	-0.00177	0.00193
Mean	**-0.00044**	**-0.00170**	**-0.00030**
%RSD	44.60175	6.33946	1054.77186

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Method : Paragon File : 100310A Printed : 3/10/2010 16:02:27
SampleId1 : 1002163-4 50X SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 13:50:05

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00019	0.15049	-0.00140	0.00329	0.00159	-0.00010	0.00023	5.73505	-0.00042
#2	0.00010	0.15304	-0.00355	0.00309	0.00150	-0.00013	-0.00181	5.69773	-0.00105
Mean	**-0.00005**	**0.15177**	**-0.00247**	**0.00319**	**0.00155**	**-0.00012**	**-0.00079**	**5.71639**	**-0.00073**
%RSD	434.94916	1.18577	61.34939	4.43668	3.88477	17.59346	182.25639	0.46167	61.09349

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00159	0.00316	0.00080	44.74946	3.25231	0.00268	0.81951	0.29357	-0.00158
#2	0.00138	0.00254	0.00058	44.48119	3.24336	0.00268	0.81754	0.29204	-0.00116
Mean	**0.00149**	**0.00285**	**0.00069**	**44.61532**	**3.24783**	**0.00268**	**0.81852**	**0.29280**	**-0.00137**
%RSD	10.30549	15.44256	21.89788	0.42518	0.19483	0.14466	0.16986	0.36929	21.99905

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.44294	0.00303	0.03468	-0.00104	-0.00310	23.19152	-0.00033	0.00049	0.00118
#2	0.43938	0.00316	0.03295	-0.00132	0.00128	22.97761	0.00081	-0.00208	0.00171
Mean	**0.44116**	**0.00309**	**0.03382**	**-0.00118**	**-0.00091**	**23.08457**	**0.00024**	**-0.00080**	**0.00145**
%RSD	0.57063	2.91978	3.61959	16.76457	340.68580	0.65522	337.01658	228.14204	25.97400

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.17469	-0.00108	0.01763	0.00181	0.00498	-0.00071	0.00680	0.00087	0.03759
#2	0.17345	-0.00170	0.01753	0.00257	0.00510	-0.00584	0.00897	0.00118	0.03715
Mean	**0.17407**	**-0.00139**	**0.01758**	**0.00219**	**0.00504**	**-0.00327**	**0.00788**	**0.00102**	**0.03737**
%RSD	0.50461	31.70033	0.40454	24.29772	1.62540	110.87487	19.53409	21.50016	0.81872

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00016	-0.00241	0.00095
#2	-0.00009	0.00041	0.00045
Mean	**-0.00012**	**-0.00100**	**0.00070**
%RSD	41.30223	200.03145	50.59112

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:27
SampleId1 : 1002163-8 50X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 13:51:52
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE7

Final concentrations

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00038	0.14491	-0.00065	0.00341	0.00139	-0.00009	0.00287	5.84414	-0.00007
#2	0.00010	0.14158	-0.00253	0.00301	0.00128	-0.00007	-0.00131	5.84564	-0.00064

200001099

	Mean	%RSD
Ag	0.00024	80.58013
Al	0.14324	1.64161
As	-0.00159	83.78568
B	0.00321	8.81804
Ba	0.00133	6.00437
Be	-0.00008	14.65299
Bi	0.00078	377.03013
Ca	5.84489	0.01818
Cd	-0.00036	112.24077

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00170	0.00294	-0.00077	45.31433	3.29132	0.00273	0.83786	0.29796	-0.00118
#2	0.00124	0.00246	-0.00111	45.38768	3.30164	0.00270	0.83961	0.29869	-0.00166
Mean	**0.00147**	**0.00270**	**-0.00094**	**45.35100**	**3.29648**	**0.00272**	**0.83873**	**0.29833**	**-0.00142**
%RSD	22.06750	12.58288	25.56661	0.11437	0.22147	0.78481	0.14735	0.17217	23.82249

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.44881	0.00202	0.01971	0.00080	-0.00115	23.18098	0.00063	-0.00087	0.00216
#2	0.44896	0.00270	0.02684	-0.00236	0.00004	23.30603	0.00135	-0.00034	0.00260
Mean	**0.44888**	**0.00236**	**0.02328**	**-0.00078**	**-0.00055**	**23.24350**	**0.00099**	**-0.00061**	**0.00238**
%RSD	0.02274	20.29298	21.65115	285.77714	152.38136	0.38042	51.37050	61.90842	13.08326

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.15834	-0.00083	0.01794	0.00344	0.00497	-0.00078	0.01888	0.00174	0.01473
#2	0.15637	0.00079	0.01798	0.00384	0.00492	-0.00059	-0.00012	0.00130	0.01502
Mean	**0.15735**	**-0.00002**	**0.01796**	**0.00364**	**0.00495**	**-0.00068**	**0.00938**	**0.00152**	**0.01487**
%RSD	0.88610	5948.31536	0.16970	7.76348	0.67732	19.71014	143.29628	20.68491	1.37146

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00000	-0.00050	0.00115
#2	-0.00022	-0.00076	0.00162
Mean	**-0.00011**	**-0.00063**	**0.00139**
%RSD	143.88572	28.59024	24.02150

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:27
SampleId1 : 1002189-3 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 13:53:37
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE8

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00016	1.00325	0.00067	0.05465	0.04133	-0.00006	-0.00320	87.75551	-0.00100
#2	0.00010	1.00846	0.00225	0.05465	0.04173	-0.00007	0.00077	88.13719	-0.00047
Mean	**-0.00003**	**1.00586**	**0.00146**	**0.05465**	**0.04153**	**-0.00007**	**-0.00122**	**87.94635**	**-0.00073**
%RSD	671.11820	0.36601	76.53725	0.00000	0.67485	6.87020	231.31582	0.30688	51.25361

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00026	0.00044	0.00002	2.63382	4.39991	0.00466	14.12420	0.16030	-0.00070
#2	0.00042	0.00050	0.00002	2.64179	4.41892	0.00465	14.21066	0.16106	-0.00129
Mean	**0.00034**	**0.00047**	**0.00002**	**2.63781**	**4.40942**	**0.00465**	**14.16743**	**0.16068**	**-0.00100**

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%RSD	32.76033	8.01067	7.32532	0.21369	0.30484	0.16650	0.43154	0.33609	41.56324

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	6.05915	0.00132	0.04100	0.00157	-0.00060	4.22877	-0.00185	0.00004	0.00006
#2	6.10836	0.00147	0.04568	0.00085	-0.00110	4.24948	-0.00096	-0.00166	-0.00290
Mean	**6.08376**	**0.00139**	**0.04334**	**0.00121**	**-0.00085**	**4.23913**	**-0.00141**	**-0.00081**	**-0.00142**
%RSD	0.57195	7.77198	7.64272	41.93589	41.22211	0.34545	44.82838	147.71883	147.72450

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.40828	-0.00073	0.18081	-0.00937	0.02304	-0.00234	0.00454	0.00218	0.00672
#2	3.43336	0.00064	0.18202	-0.00918	0.02569	-0.00193	0.00154	0.00252	0.00643
Mean	**3.42082**	**-0.00004**	**0.18141**	**-0.00927**	**0.02436**	**-0.00213**	**0.00304**	**0.00235**	**0.00658**
%RSD	0.51846	2311.42468	0.46959	1.42737	7.68557	13.65083	69.64845	10.41423	3.09998

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00059	0.00012	0.00005
#2	0.00009	-0.00045	-0.00249
Mean	**0.00034**	**-0.00017**	**-0.00122**
%RSD	102.29818	243.05830	147.72324

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:27
SampleId1 : 1002189-5 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 13:55:22
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE9

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00061	0.02454	-0.00310	0.05441	0.03618	-0.00007	0.00367	88.35450	-0.00040
#2	0.00117	0.02549	-0.00020	0.05421	0.03655	-0.00008	0.00113	88.71685	-0.00007
Mean	**0.00089**	**0.02502**	**-0.00165**	**0.05431**	**0.03636**	**-0.00008**	**0.00240**	**88.53568**	**-0.00024**
%RSD	44.57320	2.69760	124.60096	0.26041	0.71566	6.16768	74.77521	0.28940	100.87502

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00001	-0.00006	-0.00068	1.21477	4.13143	0.00294	14.41431	0.14674	-0.00065
#2	-0.00013	-0.00004	-0.00112	1.22005	4.14953	0.00295	14.47642	0.14735	-0.00052
Mean	**-0.00006**	**-0.00005**	**-0.00090**	**1.21741**	**4.14048**	**0.00294**	**14.44537**	**0.14705**	**-0.00058**
%RSD	157.48663	19.27074	34.66318	0.30707	0.30913	0.26321	0.30402	0.29376	16.12329

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	6.09590	0.00023	0.01075	0.00211	-0.00218	4.46992	0.00067	-0.00182	-0.00215
#2	6.13353	0.00054	0.01401	0.00108	-0.00337	4.50987	0.00181	0.00175	-0.00430
Mean	**6.11472**	**0.00039**	**0.01238**	**0.00160**	**-0.00278**	**4.48989**	**0.00124**	**-0.00003**	**-0.00323**
%RSD	0.43516	56.23508	18.60512	45.39835	30.16988	0.62917	65.16925	7239.87986	47.01191

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	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.17631	0.00017	0.18248	-0.01215	-0.00109	0.00059	-0.00197	0.00083	0.00132
#2	2.18877	-0.00194	0.18333	-0.01172	-0.00090	0.00001	0.02097	0.00073	0.00146
Mean	**2.18254**	**-0.00088**	**0.18291**	**-0.01194**	**-0.00100**	**0.00030**	**0.00950**	**0.00078**	**0.00139**
%RSD	0.40368	169.34766	0.32632	2.53992	13.81120	137.26412	170.79545	8.55714	7.34986

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00008	-0.00075	-0.00204
#2	-0.00002	-0.00189	-0.00228
Mean	**-0.00005**	**-0.00132**	**-0.00216**
%RSD	83.42290	60.56613	7.85175

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:28
SampleId1 : 1002189-5D SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 13:57:07
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE10

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00022	0.02563	0.00142	0.05181	0.03584	-0.00014	-0.00488	86.23095	-0.00065
#2	-0.00033	0.02153	-0.00313	0.05361	0.03539	-0.00016	0.00062	85.80354	-0.00048
Mean	**-0.00006**	**0.02358**	**-0.00085**	**0.05271**	**0.03561**	**-0.00015**	**-0.00213**	**86.01724**	**-0.00056**
%RSD	699.53759	12.28306	376.96774	2.41486	0.89936	12.16615	182.37283	0.35136	21.52188

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00051	-0.00047	-0.00138	1.18412	4.00493	0.00283	14.08426	0.14327	-0.00118
#2	-0.00018	-0.00014	-0.00118	1.17974	3.98637	0.00284	14.03357	0.14285	-0.00172
Mean	**-0.00035**	**-0.00030**	**-0.00128**	**1.18193**	**3.99565**	**0.00283**	**14.05891**	**0.14306**	**-0.00145**
%RSD	66.23662	77.57599	11.30490	0.26192	0.32852	0.34190	0.25495	0.20759	25.98311

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	6.00893	-0.00001	0.00872	-0.00148	-0.00079	4.37967	0.00097	-0.00434	-0.00130
#2	5.97053	-0.00011	0.00902	-0.00225	-0.00144	4.37819	0.00030	-0.00357	0.00024
Mean	**5.98973**	**-0.00006**	**0.00887**	**-0.00187**	**-0.00111**	**4.37893**	**0.00063**	**-0.00396**	**-0.00053**
%RSD	0.45331	117.31080	2.43493	29.00695	40.78274	0.02389	74.58468	13.82526	204.33807

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.13905	0.00042	0.18005	-0.00874	-0.00088	0.00006	-0.00794	0.00000	0.00153
#2	2.12888	-0.00045	0.17902	-0.00884	-0.00093	-0.00095	0.00154	0.00059	0.00146
Mean	**2.13397**	**-0.00001**	**0.17953**	**-0.00879**	**-0.00090**	**-0.00044**	**-0.00320**	**0.00030**	**0.00150**
%RSD	0.33677	4951.92418	0.40346	0.83835	3.71222	160.45163	209.65402	141.08548	3.40916

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	Zr	Pb	SeNCH
	ppm	calc	calc
#1	-0.00049	-0.00102	-0.00231
#2	-0.00058	-0.00171	-0.00103
Mean	**-0.00054**	**-0.00137**	**-0.00167**
%RSD	10.75343	35.41850	54.23109

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:28
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/10/2010 13:58:53
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19461	48.34962	0.48659	0.93177	0.95492	0.48975	0.49778	47.74390	0.47502
#2	0.19447	48.82766	0.49263	0.94070	0.96369	0.49061	0.49577	47.87418	0.47748
Mean	**0.19454**	**48.58864**	**0.48961**	**0.93623**	**0.95931**	**0.49018**	**0.49677**	**47.80904**	**0.47625**
%RSD	0.05191	0.69568	0.87288	0.67418	0.64624	0.12402	0.28680	0.19269	0.36447

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49180	0.97971	0.94612	19.58617	47.77191	0.49168	49.02756	0.97085	0.95771
#2	0.49316	0.98259	0.95084	19.66014	48.11560	0.49558	49.17517	0.97427	0.96560
Mean	**0.49248**	**0.98115**	**0.94848**	**19.62316**	**47.94376**	**0.49363**	**49.10136**	**0.97256**	**0.96166**
%RSD	0.19510	0.20741	0.35141	0.26654	0.50690	0.55833	0.21258	0.24883	0.58057

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	47.63140	0.95761	4.60039	0.95434	0.96429	4.85765	0.46761	0.97847	0.99443
#2	47.95926	0.96111	4.63260	0.95757	0.95385	4.90057	0.46770	0.98550	0.98283
Mean	**47.79533**	**0.95936**	**4.61650**	**0.95596**	**0.95907**	**4.87911**	**0.46765**	**0.98198**	**0.98863**
%RSD	0.48506	0.25777	0.49337	0.23955	0.77009	0.62210	0.01472	0.50592	0.83004

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.70633	0.97781	0.47782	0.16727	0.46889	0.48986	4.85394	0.47920	1.02201
#2	4.72763	0.97967	0.48168	0.16530	0.47100	0.49067	4.87790	0.47961	1.02346
Mean	**4.71698**	**0.97874**	**0.47975**	**0.16628**	**0.46994**	**0.49026**	**4.86592**	**0.47940**	**1.02273**
%RSD	0.31926	0.13484	0.56905	0.83422	0.31699	0.11716	0.34819	0.06129	0.10010

	Zr	Pb	Se
	ppm	calc	calc
#1	0.96346	0.96098	0.98912
#2	0.96804	0.95509	0.98372
Mean	**0.96575**	**0.95803**	**0.98642**
%RSD	0.33561	0.43461	0.38717

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:28

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SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/10/2010 14:00:45
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00005	0.05324	0.00026	0.00165	-0.00017	0.00014	-0.00131	0.02235	-0.00019
#2	-0.00001	0.06167	0.00139	0.00141	0.00000	0.00022	-0.00132	0.03015	0.00011
Mean	**-0.00003**	**0.05746**	**0.00082**	**0.00153**	**-0.00008**	**0.00018**	**-0.00131**	**0.02625**	**-0.00004**
%RSD	105.71576	10.37124	97.29602	11.10967	146.61758	32.00316	0.23316	21.01160	510.75274

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00009	0.00019	-0.00034	0.01441	-0.31569	0.00285	0.02722	0.00003	-0.00030
#2	-0.00059	-0.00005	-0.00090	0.01690	-0.31661	0.00286	0.03093	0.00003	-0.00068
Mean	**-0.00025**	**0.00007**	**-0.00062**	**0.01566**	**-0.31615**	**0.00285**	**0.02907**	**0.00003**	**-0.00049**
%RSD	193.18836	228.16864	63.93157	11.25173	0.20651	0.33960	9.03097	0.00000	53.71952

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.13675	0.00024	-0.00533	0.00106	-0.00244	-0.02992	0.00097	0.00224	-0.00005
#2	-0.13199	-0.00053	-0.00635	-0.00052	-0.00050	-0.03581	0.00031	0.00109	0.00331
Mean	**-0.13437**	**-0.00014**	**-0.00584**	**0.00027**	**-0.00147**	**-0.03287**	**0.00064**	**0.00166**	**0.00163**
%RSD	2.50279	380.96707	12.32346	416.57872	93.07222	12.67681	73.27989	49.16415	145.50854

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00683	-0.00107	-0.00155	-0.00355	-0.00078	-0.00227	0.01181	0.00046	-0.00005
#2	-0.00971	-0.00045	-0.00152	-0.00472	-0.00082	0.00180	0.00134	-0.00011	0.00045
Mean	**-0.00827**	**-0.00076**	**-0.00154**	**-0.00414**	**-0.00080**	**-0.00024**	**0.00658**	**0.00018**	**0.00020**
%RSD	24.63096	57.95471	1.65325	19.94351	3.26861	1207.07400	112.66863	230.41575	180.55373

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00030	-0.00128	0.00072
#2	0.00023	-0.00051	0.00257
Mean	**0.00027**	**-0.00089**	**0.00164**
%RSD	17.93604	60.68810	79.86343

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:29
SampleId1 : 1002189-5L 5X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:02:40
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE11

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	0.00107	0.03076	0.00014	0.01153	0.00668	-0.00009	0.00256	17.17210	-0.00023
#2	0.00053	0.02644	0.00127	0.01113	0.00674	-0.00008	0.00398	17.15288	-0.00008
Mean	**0.00080**	**0.02860**	**0.00071**	**0.01133**	**0.00671**	**-0.00008**	**0.00327**	**17.16249**	**-0.00015**
%RSD	48.00454	10.67579	112.81963	2.49695	0.59646	1.72456	30.82665	0.07919	69.85657

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00058	-0.00019	-0.00034	0.24623	0.46905	0.00282	2.88128	0.02909	-0.00062
#2	0.00021	0.00014	-0.00083	0.24713	0.45706	0.00284	2.87647	0.02924	-0.00025
Mean	**-0.00018**	**-0.00002**	**-0.00058**	**0.24668**	**0.46306**	**0.00283**	**2.87887**	**0.02917**	**-0.00044**
%RSD	302.62884	984.65872	60.12123	0.25869	1.83046	0.27391	0.11814	0.36988	60.25947

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.93739	-0.00027	-0.00269	0.00067	-0.00187	0.85872	0.00007	0.00218	-0.00244
#2	0.93416	0.00023	-0.00360	0.00363	-0.00363	0.86314	0.00007	0.00115	-0.00284
Mean	**0.93578**	**-0.00002**	**-0.00314**	**0.00215**	**-0.00275**	**0.86093**	**0.00007**	**0.00167**	**-0.00264**
%RSD	0.24388	2085.84551	20.60964	97.28731	45.07903	0.36328	0.31494	44.07413	10.53135

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.43192	0.00042	0.03482	-0.00739	-0.00115	-0.00103	0.00866	0.00026	-0.00099
#2	0.43268	0.00142	0.03485	-0.00565	-0.00098	0.00080	0.01016	0.00043	-0.00078
Mean	**0.43230**	**0.00092**	**0.03483**	**-0.00652**	**-0.00107**	**-0.00011**	**0.00941**	**0.00035**	**-0.00088**
%RSD	0.12388	76.41222	0.05835	18.87734	11.52705	1151.79014	11.23933	35.31412	17.30476

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00002	-0.00103	-0.00090
#2	0.00012	-0.00121	-0.00151
Mean	**0.00005**	**-0.00112**	**-0.00121**
%RSD	187.07081	11.74859	35.64455

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:29
SampleId1 : 1002189-5MS SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 14:04:26
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE12

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00010	2.00428	1.97265	0.99726	1.98196	0.04743	0.00299	123.85605	0.05019
#2	-0.00002	2.04051	1.98957	1.01619	2.01344	0.04779	-0.00281	124.58446	0.05063
Mean	**0.00004**	**2.02240**	**1.98111**	**1.00672**	**1.99770**	**0.04761**	**0.00009**	**124.22026**	**0.05041**
%RSD	219.75958	1.26676	0.60378	1.32992	1.11404	0.52611	4638.59420	0.41464	0.62675

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.47342	0.18943	0.24408	2.10575	42.72709	0.51999	53.52723	0.61162	0.97243

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#2	0.47615	0.19067	0.24679	2.12777	43.37420	0.52823	53.97273	0.61684	0.98006
Mean	**0.47479**	**0.19005**	**0.24543**	**2.11676**	**43.05064**	**0.52411**	**53.74998**	**0.61423**	**0.97625**
%RSD	0.40751	0.46229	0.78063	0.73538	1.06289	1.11254	0.58608	0.60021	0.55259

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	44.12676	0.46315	0.00587	0.46717	0.46364	4.35304	0.47170	1.97820	1.97751
#2	44.72442	0.46658	0.01126	0.46565	0.46598	4.41518	0.47927	1.99691	1.98814
Mean	**44.42559**	**0.46486**	**0.00857**	**0.46641**	**0.46481**	**4.38411**	**0.47549**	**1.98756**	**1.98283**
%RSD	0.95128	0.52239	44.55112	0.23099	0.35483	1.00221	1.12516	0.66583	0.37884

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.00349	0.49897	0.66111	-0.01752	0.47696	1.98463	0.00440	0.48626	0.46348
#2	4.06017	0.50345	0.67058	-0.02117	0.48165	2.01113	-0.02305	0.49031	0.46239
Mean	**4.03183**	**0.50121**	**0.66584**	**-0.01934**	**0.47930**	**1.99788**	**-0.00932**	**0.48829**	**0.46293**
%RSD	0.99415	0.63210	1.00476	13.36621	0.69210	0.93791	208.24017	0.58716	0.16550

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00071	0.46482	1.97774
#2	-0.00086	0.46587	1.99106
Mean	**-0.00078**	**0.46534**	**1.98440**
%RSD	13.02468	0.15931	0.47456

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:29
SampleId1 : 1002189-5MSD **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:06:14
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE13

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00032	2.05536	2.02188	1.02732	2.03208	0.04841	-0.00573	126.31650	0.05101
#2	0.00029	2.06196	2.01822	1.02820	2.03518	0.04850	-0.00054	126.40149	0.05140
Mean	**0.00031**	**2.05866**	**2.02005**	**1.02776**	**2.03363**	**0.04846**	**-0.00314**	**126.35899**	**0.05121**
%RSD	6.80225	0.22644	0.12806	0.06059	0.10757	0.12951	116.98835	0.04756	0.53967

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48279	0.19292	0.25101	2.15773	43.56131	0.53093	54.63599	0.62408	0.99329
#2	0.48428	0.19360	0.25123	2.16171	43.61994	0.53148	54.72005	0.62466	0.99545
Mean	**0.48353**	**0.19326**	**0.25112**	**2.15972**	**43.59063**	**0.53120**	**54.67802**	**0.62437**	**0.99437**
%RSD	0.21782	0.24756	0.06161	0.13012	0.09511	0.07413	0.10870	0.06513	0.15366

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	44.85856	0.47354	0.01544	0.47308	0.47368	4.42849	0.48537	2.03178	2.01883
#2	44.90911	0.47267	0.01096	0.47308	0.47506	4.45808	0.48412	2.03325	2.03080

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Mean	**44.88383**	**0.47310**	**0.01320**	**0.47308**	**0.47437**	**4.44329**	**0.48474**	**2.03252**	**2.02481**
%RSD	0.07965	0.12975	24.00319	0.00087	0.20552	0.47092	0.18250	0.05123	0.41796

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.09351	0.50830	0.67747	-0.01825	0.48725	2.03262	-0.00062	0.49546	0.47063
#2	4.10238	0.51067	0.67728	-0.01885	0.48769	2.03006	-0.00910	0.49682	0.47316
Mean	**4.09794**	**0.50949**	**0.67738**	**-0.01855**	**0.48747**	**2.03134**	**-0.00486**	**0.49614**	**0.47189**
%RSD	0.15306	0.32852	0.01907	2.28255	0.06325	0.08922	123.39463	0.19343	0.37884

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00101	0.47348	2.02314
#2	-0.00113	0.47440	2.03161
Mean	**-0.00107**	**0.47394**	**2.02738**
%RSD	8.02422	0.13692	0.29553

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:29
SampleId1 : EX100309-1MB SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 14:08:01
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE14

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00083	0.02664	0.00124	0.00309	0.00394	-0.00017	-0.00244	0.02247	-0.00077
#2	0.00068	0.02704	0.00116	0.00381	0.00388	-0.00017	0.00072	0.01765	-0.00057
Mean	**-0.00007**	**0.02684**	**0.00120**	**0.00345**	**0.00391**	**-0.00017**	**-0.00086**	**0.02006**	**-0.00067**
%RSD	1433.34027	1.06177	4.44684	14.76752	1.02402	0.20109	259.83833	16.98580	20.75589

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00036	0.00062	-0.00096	0.01632	-0.31707	0.00272	-0.00161	-0.00054	-0.00017
#2	-0.00023	0.00098	-0.00075	0.01643	-0.32330	0.00268	-0.00052	-0.00054	-0.00014
Mean	**-0.00030**	**0.00080**	**-0.00086**	**0.01637**	**-0.32019**	**0.00270**	**-0.00107**	**-0.00054**	**-0.00016**
%RSD	32.24631	31.94175	17.29102	0.45787	1.37634	0.93221	72.25990	0.00000	11.92803

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	133.38175	0.00068	0.00129	0.00107	-0.00144	-0.03581	-0.00065	0.00409	-0.00087
#2	132.78308	0.00023	-0.00065	0.00174	-0.00198	-0.04318	0.00054	-0.00214	0.00038
Mean	**133.08242**	**0.00046**	**0.00032**	**0.00141**	**-0.00171**	**-0.03950**	**-0.00006**	**0.00097**	**-0.00024**
%RSD	0.31809	69.36715	430.39113	33.57248	22.04082	13.18640	1480.52059	453.19728	363.63806

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01477	0.00192	-0.00159	-0.00543	-0.00122	-0.00030	-0.00515	-0.00040	0.00377
#2	0.01642	0.00341	-0.00157	-0.00248	-0.00097	-0.00007	-0.00166	0.00006	0.00449
Mean	**0.01559**	**0.00267**	**-0.00158**	**-0.00396**	**-0.00109**	**-0.00019**	**-0.00340**	**-0.00017**	**0.00413**

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%RSD	7.47593	39.63995	0.64179	52.81011	15.64300	85.07772	72.58324	192.98743	12.35316

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00027	-0.00061	0.00078
#2	-0.00010	-0.00074	-0.00046
Mean	**-0.00019**	**-0.00067**	**0.00016**
%RSD	62.43218	14.00514	543.14272

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:30
SampleId1 : EX100309-1RVS SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 14:09:46
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE15

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00150	0.11951	0.00572	0.00537	0.00402	0.00080	0.00900	0.46884	0.00119
#2	0.00196	0.12258	0.00583	0.00521	0.00408	0.00079	0.00462	0.47090	0.00162
Mean	**0.00173**	**0.12104**	**0.00577**	**0.00529**	**0.00405**	**0.00079**	**0.00681**	**0.46987**	**0.00141**
%RSD	18.94504	1.79153	1.38377	2.13969	0.98824	0.84314	45.41600	0.31092	22.12832

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00147	0.00460	0.00374	0.10121	0.25509	0.00545	0.46866	0.00403	0.00827
#2	0.00111	0.00420	0.00366	0.10084	0.25971	0.00544	0.47391	0.00407	0.00888
Mean	**0.00129**	**0.00440**	**0.00370**	**0.10103**	**0.25740**	**0.00545**	**0.47128**	**0.00405**	**0.00858**
%RSD	19.27901	6.31371	1.49333	0.25986	1.26697	0.24906	0.78661	0.66537	5.04968

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.62441	0.00489	0.08886	0.00271	0.00408	0.05257	0.00962	0.00107	0.00540
#2	0.62701	0.00512	0.08764	0.00319	0.00457	0.04815	0.00861	0.00288	0.00518
Mean	**0.62571**	**0.00501**	**0.08825**	**0.00295**	**0.00432**	**0.05036**	**0.00911**	**0.00197**	**0.00529**
%RSD	0.29373	3.24544	0.97925	11.47456	8.06307	6.20492	7.82837	64.92069	2.86872

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02795	0.00827	0.00294	-0.00375	0.00341	0.00935	0.04767	0.00463	0.00478
#2	0.02766	0.00839	0.00294	-0.00380	0.00363	0.00805	0.05715	0.00440	0.00470
Mean	**0.02780**	**0.00833**	**0.00294**	**-0.00378**	**0.00352**	**0.00870**	**0.05241**	**0.00452**	**0.00474**
%RSD	0.73153	1.05548	0.00000	0.91106	4.33631	10.58702	12.78786	3.59559	1.07560

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00449	0.00362	0.00396
#2	0.00446	0.00411	0.00442
Mean	**0.00447**	**0.00387**	**0.00419**
%RSD	0.54281	8.93027	7.77631

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Method : Paragon File : 100310A Printed : 3/10/2010 16:02:30

SampleId1 : EX100309-1LCS SampleId2 : [SAMPLE]

Analysis commenced : 3/10/2010 14:11:32

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE16

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09824	2.09457	2.02135	0.95691	2.02621	0.04818	-0.00072	-0.00151	0.05202
#2	0.09773	2.09264	2.02577	0.95987	2.02148	0.04822	-0.00204	-0.00151	0.05191
Mean	**0.09798**	**2.09361**	**2.02356**	**0.95839**	**2.02385**	**0.04820**	**-0.00138**	**-0.00151**	**0.05197**
%RSD	0.36334	0.06506	0.15447	0.21855	0.16512	0.06939	67.72123	0.00000	0.14330

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.50293	0.19989	0.25739	1.00850	-0.34893	0.00262	-0.01734	0.49269	1.02384
#2	0.50432	0.20020	0.25774	1.00802	-0.33415	0.00269	-0.01625	0.49357	1.02272
Mean	**0.50362**	**0.20004**	**0.25756**	**1.00826**	**-0.34154**	**0.00265**	**-0.01679**	**0.49313**	**1.02328**
%RSD	0.19629	0.11002	0.09753	0.03366	3.05860	1.82605	4.59799	0.12630	0.07743

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	134.04992	0.50248	0.00078	0.48568	0.48350	-0.02845	0.48063	1.98165	1.96946
#2	134.13087	0.50286	-0.00330	0.48783	0.48475	-0.03729	0.48127	1.97820	1.97085
Mean	**134.09040**	**0.50267**	**-0.00126**	**0.48675**	**0.48413**	**-0.03287**	**0.48095**	**1.97992**	**1.97016**
%RSD	0.04269	0.05388	228.49721	0.31185	0.18280	19.01523	0.09535	0.12333	0.04971

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.94874	0.52375	0.50168	-0.00250	0.49217	2.08197	-0.00532	0.50571	0.50393
#2	1.95206	0.52786	0.50115	-0.00023	0.49232	2.08475	-0.00732	0.50609	0.50581
Mean	**1.95040**	**0.52580**	**0.50141**	**-0.00136**	**0.49225**	**2.08336**	**-0.00632**	**0.50590**	**0.50487**
%RSD	0.12004	0.55297	0.07489	117.30872	0.02113	0.09431	22.31454	0.05339	0.26308

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00159	0.48423	1.97352
#2	-0.00173	0.48578	1.97330
Mean	**-0.00166**	**0.48500**	**1.97341**
%RSD	5.86465	0.22593	0.00810

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:30

SampleId1 : EX100309-1LCSD SampleId2 : [SAMPLE]

Analysis commenced : 3/10/2010 14:13:18

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE17

Final concentrations

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09770	2.09668	2.05092	0.96784	2.03154	0.04863	-0.00112	0.00113	0.05129
#2	0.09831	2.10702	2.05477	0.96727	2.03701	0.04863	-0.00020	0.00216	0.05155
Mean	**0.09800**	**2.10185**	**2.05285**	**0.96756**	**2.03427**	**0.04863**	**-0.00066**	**0.00165**	**0.05142**
%RSD	0.43544	0.34803	0.13260	0.04096	0.19017	0.00469	98.76308	44.36301	0.36351

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.50887	0.20218	0.25888	1.02120	-0.30484	0.00277	-0.01843	0.49763	1.03528
#2	0.50996	0.20184	0.25922	1.02104	-0.31222	0.00275	-0.01625	0.49813	1.03360
Mean	**0.50941**	**0.20201**	**0.25905**	**1.02112**	**-0.30853**	**0.00276**	**-0.01734**	**0.49788**	**1.03444**
%RSD	0.15103	0.12005	0.09380	0.01108	1.69282	0.56142	8.90641	0.07071	0.11489

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	134.60006	0.51015	0.00179	0.49028	0.49054	-0.04023	0.48316	2.01221	1.99202
#2	134.06602	0.50783	-0.00299	0.49316	0.48729	-0.03876	0.48430	2.00932	1.99294
Mean	**134.33304**	**0.50899**	**-0.00060**	**0.49172**	**0.48891**	**-0.03950**	**0.48373**	**2.01077**	**1.99248**
%RSD	0.28111	0.32279	565.36341	0.41521	0.46991	2.63728	0.16540	0.10175	0.03276

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.95163	0.53720	0.50388	-0.00108	0.49537	2.10580	-0.01581	0.51003	0.51296
#2	1.95796	0.52985	0.50533	-0.00049	0.49553	2.09650	-0.00284	0.50955	0.51274
Mean	**1.95479**	**0.53353**	**0.50460**	**-0.00078**	**0.49545**	**2.10115**	**-0.00932**	**0.50979**	**0.51285**
%RSD	0.22872	0.97439	0.20391	53.77661	0.02249	0.31282	98.36387	0.06625	0.02988

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00203	0.49045	1.99874
#2	-0.00174	0.48925	1.99840
Mean	**-0.00189**	**0.48985**	**1.99857**
%RSD	10.88312	0.17404	0.01230

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:31
SampleId1 : 1002224-9 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:15:04
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE18

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00011	0.03564	-0.00253	0.00521	0.00575	0.00002	-0.00284	1.17609	-0.00042
#2	0.00013	0.03982	-0.00344	0.00513	0.00578	-0.00001	-0.00192	1.17770	-0.00016
Mean	**0.00001**	**0.03773**	**-0.00298**	**0.00517**	**0.00576**	**0.00001**	**-0.00238**	**1.17690**	**-0.00029**
%RSD	1278.34602	7.84798	21.42805	1.09469	0.34730	261.41362	27.33411	0.09664	63.76591

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00534	-0.00051	-0.00011	14.69054	-0.27160	0.00276	0.74370	0.12521	-0.00124
#2	0.00602	0.00010	0.00002	14.67492	-0.27091	0.00276	0.74938	0.12525	-0.00126
Mean	**0.00568**	**-0.00020**	**-0.00005**	**14.68273**	**-0.27126**	**0.00276**	**0.74654**	**0.12523**	**-0.00125**
%RSD	8.40895	215.32586	193.06945	0.07519	0.18050	0.07021	0.53801	0.02155	1.50679

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	136.89506	0.00404	0.00515	0.00026	0.00215	0.20138	-0.00023	-0.00134	0.00217
#2	137.05405	0.00469	0.00465	0.00285	0.00127	0.19990	0.00246	0.00097	-0.00008
Mean	**136.97456**	**0.00436**	**0.00490**	**0.00155**	**0.00171**	**0.20064**	**0.00111**	**-0.00019**	**0.00105**
%RSD	0.08207	10.55450	7.34714	117.89516	36.57601	0.51926	170.97629	862.97401	152.36649

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.23674	0.00042	-0.00048	-0.00185	-0.00107	-0.00317	-0.00666	-0.00113	28.06750
#2	0.24140	0.00055	-0.00049	0.00019	-0.00097	-0.00059	0.00981	-0.00052	28.00747
Mean	**0.23907**	**0.00049**	**-0.00049**	**-0.00083**	**-0.00102**	**-0.00188**	**0.00158**	**-0.00083**	**28.03748**
%RSD	1.37877	18.10954	1.04216	173.80005	6.56306	97.31018	738.52030	52.11424	0.15141

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00057	0.00152	0.00100
#2	-0.00040	0.00179	0.00027
Mean	**-0.00049**	**0.00166**	**0.00063**
%RSD	25.61637	11.65908	81.79477

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:31
SampleId1 : 1002224-10 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:16:51
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE19

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00006	0.04281	-0.00020	0.00285	0.00487	-0.00014	-0.00274	0.17207	-0.00031
#2	0.00076	0.03734	-0.00155	0.00313	0.00487	-0.00015	-0.00101	0.17299	-0.00036
Mean	**0.00041**	**0.04008**	**-0.00087**	**0.00299**	**0.00487**	**-0.00014**	**-0.00188**	**0.17253**	**-0.00033**
%RSD	119.10967	9.65639	109.73647	6.62717	0.00000	4.50197	65.19819	0.37620	9.91655

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00014	0.00015	-0.00111	8.62816	-0.15229	0.00250	-0.01166	0.04477	-0.00092
#2	-0.00023	0.00043	-0.00075	8.64031	-0.15021	0.00248	-0.01013	0.04492	-0.00113
Mean	**-0.00019**	**0.00029**	**-0.00093**	**8.63423**	**-0.15125**	**0.00249**	**-0.01090**	**0.04484**	**-0.00102**
%RSD	31.61073	70.18500	27.22141	0.09955	0.97095	0.31131	9.92075	0.24061	14.72060

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	138.03437	0.00076	0.00241	0.00469	0.00548	0.27210	-0.00203	-0.00486	-0.00178
#2	138.52484	0.00069	0.00200	0.00506	0.00587	0.26031	-0.00030	-0.00076	0.00001
Mean	**138.27961**	**0.00072**	**0.00220**	**0.00488**	**0.00568**	**0.26621**	**-0.00117**	**-0.00281**	**-0.00089**
%RSD	0.25080	6.23794	13.08155	5.28785	4.83196	3.13113	104.93699	103.02280	142.53929

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01075	0.00080	-0.00155	-0.00220	-0.00127	-0.00334	0.00545	-0.00058	43.33395
#2	0.01290	0.00030	-0.00153	-0.00170	-0.00118	0.00118	-0.00104	-0.00041	43.36407
Mean	**0.01182**	**0.00055**	**-0.00154**	**-0.00195**	**-0.00122**	**-0.00108**	**0.00220**	**-0.00050**	**43.34901**
%RSD	12.82755	64.25135	0.98733	17.99040	5.17174	296.90600	208.34983	24.82748	0.04914

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00047	0.00522	-0.00281
#2	-0.00056	0.00560	-0.00025
Mean	**-0.00052**	**0.00541**	**-0.00153**
%RSD	12.55928	4.96879	118.32933

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:31
SampleId1 : 1002224-10D SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 14:18:36
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE20

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00089	0.03340	-0.00061	0.00145	0.00465	-0.00020	-0.00865	0.16415	-0.00087
#2	-0.00022	0.03917	-0.00118	0.00325	0.00476	-0.00021	-0.00213	0.16541	-0.00055
Mean	**-0.00055**	**0.03629**	**-0.00089**	**0.00235**	**0.00470**	**-0.00021**	**-0.00539**	**0.16478**	**-0.00071**
%RSD	85.76531	11.24150	44.75873	54.21793	1.70280	5.07221	85.48224	0.54158	32.14414

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00071	-0.00047	-0.00130	8.49417	-0.17213	0.00247	-0.01647	0.04400	-0.00243
#2	-0.00071	-0.00029	-0.00118	8.50236	-0.17259	0.00246	-0.01341	0.04416	-0.00201
Mean	**-0.00071**	**-0.00038**	**-0.00124**	**8.49826**	**-0.17236**	**0.00247**	**-0.01494**	**0.04408**	**-0.00222**
%RSD	0.07292	34.21313	7.29635	0.06815	0.18934	0.23568	14.47443	0.24477	13.56100

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	137.31118	-0.00030	0.00220	0.00174	0.00562	0.26473	-0.00126	0.00185	-0.00162
#2	137.54373	0.00053	0.00241	0.00563	0.00453	0.26326	-0.00180	-0.00416	-0.00119
Mean	**137.42745**	**0.00011**	**0.00230**	**0.00369**	**0.00508**	**0.26400**	**-0.00153**	**-0.00115**	**-0.00141**
%RSD	0.11965	529.64428	6.25164	74.56260	15.18274	0.39467	24.83750	367.84758	21.58490

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00679	0.00055	-0.00163	-0.00099	-0.00123	-0.00143	-0.01990	-0.00118	42.58199

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#2	0.00807	-0.00169	-0.00160	-0.00252	-0.00150	-0.00340	-0.00245	-0.00055	42.47136
Mean	**0.00743**	**-0.00057**	**-0.00161**	**-0.00176**	**-0.00136**	**-0.00242**	**-0.01117**	**-0.00087**	**42.52668**
%RSD	12.22908	276.91648	0.94342	61.56412	14.20044	57.58074	110.46590	51.57114	0.18395

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00101	0.00433	-0.00047
#2	-0.00060	0.00490	-0.00218
Mean	**-0.00080**	**0.00462**	**-0.00132**
%RSD	35.61683	8.68697	91.46288

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:31
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/10/2010 14:20:23
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19642	49.09350	0.49479	0.95262	0.97573	0.49049	0.50275	47.85449	0.48285
#2	0.19810	49.76760	0.49293	0.96095	0.98478	0.49268	0.50921	48.18149	0.48656
Mean	**0.19726**	**49.43055**	**0.49386**	**0.95679**	**0.98026**	**0.49159**	**0.50598**	**48.01799**	**0.48471**
%RSD	0.60248	0.96430	0.26503	0.61533	0.65305	0.31425	0.90282	0.48153	0.54194

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49385	0.98322	0.96669	19.69406	48.42726	0.49972	49.14387	0.97342	0.97049
#2	0.49667	0.98969	0.97690	19.82560	49.00139	0.50563	49.52569	0.98000	0.97913
Mean	**0.49526**	**0.98645**	**0.97179**	**19.75983**	**48.71433**	**0.50268**	**49.33478**	**0.97671**	**0.97481**
%RSD	0.40219	0.46408	0.74337	0.47072	0.83337	0.83065	0.54726	0.47608	0.62693

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	47.88510	0.97330	4.68412	0.95600	0.95781	4.94498	0.47537	0.98992	0.98964
#2	48.44025	0.98017	4.67421	0.96373	0.95496	4.94794	0.47929	0.99635	0.99237
Mean	**48.16268**	**0.97673**	**4.67917**	**0.95986**	**0.95638**	**4.94646**	**0.47733**	**0.99314**	**0.99100**
%RSD	0.81506	0.49713	0.14980	0.56950	0.21051	0.04232	0.57981	0.45781	0.19461

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.73441	0.98840	0.48702	0.16628	0.47122	0.50182	4.93541	0.48206	1.02910
#2	4.78731	0.99450	0.49194	0.16831	0.47392	0.50093	4.96733	0.48463	1.03460
Mean	**4.76086**	**0.99145**	**0.48948**	**0.16730**	**0.47257**	**0.50138**	**4.95137**	**0.48335**	**1.03185**
%RSD	0.78569	0.43517	0.71022	0.85877	0.40484	0.12528	0.45594	0.37547	0.37703

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.97567	0.95721	0.98973
#2	0.98295	0.95788	0.99369

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Mean	**0.97931**	**0.95754**	**0.99171NCH**
%RSD	0.52547	0.04986	0.28238

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:32
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/10/2010 14:22:16
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00062	0.05190	0.00078	0.00109	-0.00039	0.00011	-0.00132	0.00721	-0.00017
#2	0.00003	0.05479	0.00120	0.00073	-0.00025	0.00015	-0.00020	0.01272	-0.00009
Mean	**-0.00029**	**0.05335**	**0.00099**	**0.00091**	**-0.00032**	**0.00013**	**-0.00076**	**0.00996**	**-0.00013**
%RSD	155.60419	3.82992	29.57177	28.04898	31.03064	26.25880	104.72415	39.08255	45.29158

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00050	-0.00035	-0.00167	0.01054	-0.31107	0.00293	0.00974	-0.00035	-0.00086
#2	-0.00042	-0.00042	-0.00097	0.01229	-0.30876	0.00297	0.01717	-0.00016	-0.00089
Mean	**-0.00046**	**-0.00039**	**-0.00132**	**0.01142**	**-0.30992**	**0.00295**	**0.01346**	**-0.00026**	**-0.00088**
%RSD	12.38921	12.15826	37.80267	10.83438	0.52664	1.05087	39.02414	52.57235	2.14742

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.13574	-0.00059	-0.00737	0.00063	-0.00169	-0.03876	-0.00370	-0.00559	0.00060
#2	-0.12829	0.00004	-0.00493	-0.00145	-0.00090	-0.04023	-0.00107	-0.00756	0.00210
Mean	**-0.13202**	**-0.00027**	**-0.00615**	**-0.00041**	**-0.00130**	**-0.03950**	**-0.00239**	**-0.00657**	**0.00135**
%RSD	3.98840	162.49909	28.10674	361.49967	43.18143	2.63728	78.08828	21.14917	78.84430

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.01032	-0.00244	-0.00174	-0.00599	-0.00102	-0.00090	-0.00315	-0.00046	0.00088
#2	-0.00798	-0.00232	-0.00166	-0.00569	-0.00097	0.00187	0.00034	0.00023	0.00204
Mean	**-0.00915**	**-0.00238**	**-0.00170**	**-0.00584**	**-0.00100**	**0.00049**	**-0.00140**	**-0.00011**	**0.00146**
%RSD	18.05873	3.70068	3.28394	3.56920	3.35948	403.43860	175.93120	435.78714	55.89397

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00004	-0.00092	-0.00146
#2	0.00022	-0.00108	-0.00112
Mean	**0.00013**	**-0.00100**	**-0.00129**
%RSD	101.78500	11.60531	18.99211

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:32
SampleId1 : 1002224-10L 5X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:24:10
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE21

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Final concentrations **2:49** **User: ROY FRENCH**

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00011	0.02881	0.00075	0.00053	0.00034	-0.00017	-0.00468	0.02923	-0.00031
#2	-0.00001	0.03218	-0.00182	0.00153	0.00031	-0.00017	-0.00040	0.02923	-0.00029
Mean	**0.00005**	**0.03050**	**-0.00053**	**0.00103**	**0.00033**	**-0.00017**	**-0.00254**	**0.02923**	**-0.00030**
%RSD	160.62843	7.80244	338.68316	68.81485	6.09243	3.08724	119.06336	0.00000	4.14213

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00042	-0.00062	-0.00096	1.73282	-0.29237	0.00274	-0.01057	0.00857	-0.00070
#2	-0.00023	-0.00031	-0.00154	1.74294	-0.29491	0.00274	-0.00882	0.00857	-0.00161
Mean	**-0.00033**	**-0.00046**	**-0.00125**	**1.73788**	**-0.29364**	**0.00274**	**-0.00970**	**0.00857**	**-0.00116**
%RSD	40.92077	48.45831	32.46333	0.41196	0.61139	0.07078	12.74271	0.00000	55.35956

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	27.17512	-0.00027	-0.00411	0.00107	-0.00034	0.02311	-0.00095	0.00430	-0.00275
#2	27.32523	-0.00032	-0.00737	0.00222	-0.00004	0.02164	-0.00203	-0.00319	-0.00272
Mean	**27.25018**	**-0.00029**	**-0.00574**	**0.00164**	**-0.00019**	**0.02237**	**-0.00149**	**0.00056**	**-0.00274**
%RSD	0.38951	12.39337	40.13456	49.62708	113.85198	4.65558	51.68659	952.31047	0.96019

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00529	-0.00132	-0.00183	-0.00552	-0.00133	0.00175	-0.00532	-0.00024	9.20464
#2	-0.00461	-0.00007	-0.00183	-0.00510	-0.00127	0.00071	0.00365	-0.00020	9.24406
Mean	**-0.00495**	**-0.00070**	**-0.00183**	**-0.00531**	**-0.00130**	**0.00123**	**-0.00083**	**-0.00022**	**9.22435**
%RSD	9.59520	126.34765	0.27745	5.58206	3.14355	59.71787	761.99457	13.09589	0.30218

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00049	0.00013	-0.00041
#2	-0.00031	0.00071	-0.00287
Mean	**-0.00040**	**0.00042**	**-0.00164**
%RSD	32.47950	97.87664	106.46270

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:32
SampleId1 : 1002224-10MS **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:25:57
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE22

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09734	2.07397	1.97921	0.94386	1.98809	0.04716	-0.00105	0.17964	0.05106
#2	0.09669	2.06788	1.97867	0.94018	1.99333	0.04715	-0.00248	0.17976	0.05158
Mean	**0.09702**	**2.07093**	**1.97894**	**0.94202**	**1.99071**	**0.04715**	**-0.00177**	**0.17970**	**0.05132**
%RSD	0.46910	0.20807	0.01906	0.27643	0.18615	0.01145	57.24673	0.04515	0.71574

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	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49492	0.19732	0.25279	9.80120	-0.08837	0.00272	-0.01603	0.53191	1.00204
#2	0.49395	0.19606	0.25138	9.80125	-0.09345	0.00273	-0.01865	0.53184	1.00180
Mean	**0.49443**	**0.19669**	**0.25209**	**9.80122**	**-0.09091**	**0.00273**	**-0.01734**	**0.53187**	**1.00192**
%RSD	0.13815	0.45411	0.39545	0.00040	3.94840	0.14219	10.68769	0.01019	0.01694

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	139.68153	0.49070	0.00047	0.48390	0.48811	0.26621	0.46995	1.95119	1.94756
#2	139.18377	0.48999	-0.00533	0.47895	0.48410	0.26473	0.47278	1.94133	1.93989
Mean	**139.43265**	**0.49035**	**-0.00243**	**0.48143**	**0.48611**	**0.26547**	**0.47137**	**1.94626**	**1.94373**
%RSD	0.25243	0.10126	168.79316	0.72689	0.58358	0.39248	0.42547	0.35848	0.27912

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.91265	0.51640	0.49244	0.00019	0.48576	2.05160	-0.01281	0.49740	44.82657
#2	1.91003	0.51939	0.49378	-0.00023	0.48606	2.04648	-0.01929	0.49686	44.69235
Mean	**1.91134**	**0.51790**	**0.49311**	**-0.00002**	**0.48591**	**2.04904**	**-0.01605**	**0.49713**	**44.75946**
%RSD	0.09670	0.40827	0.19191	1383.99029	0.04281	0.17667	28.56977	0.07609	0.21205

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00162	0.48671	1.94877
#2	-0.00205	0.48239	1.94037
Mean	**-0.00184**	**0.48455**	**1.94457**
%RSD	16.58420	0.63099	0.30557

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:33
SampleId1 : 1002224-10MSD SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 14:27:44
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE23

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09589	2.04135	1.95086	0.93085	1.96876	0.04617	-0.00128	0.16599	0.05062
#2	0.09509	2.04692	1.95418	0.93101	1.97512	0.04631	-0.00270	0.16668	0.04997
Mean	**0.09549**	**2.04414**	**1.95252**	**0.93093**	**1.97194**	**0.04624**	**-0.00199**	**0.16633**	**0.05030**
%RSD	0.58792	0.19252	0.12002	0.01216	0.22794	0.21491	50.50941	0.29266	0.90212

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48418	0.19253	0.24861	9.61884	-0.14098	0.00267	-0.01319	0.52241	0.98209
#2	0.48618	0.19305	0.24967	9.63639	-0.14283	0.00262	-0.01428	0.52318	0.98828
Mean	**0.48518**	**0.19279**	**0.24914**	**9.62761**	**-0.14190**	**0.00264**	**-0.01374**	**0.52279**	**0.98518**
%RSD	0.29220	0.18962	0.30117	0.12889	0.91989	1.17291	5.62151	0.10362	0.44420

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	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	137.87046	0.47916	-0.00411	0.47000	0.47205	0.25295	0.46796	1.90595	1.90221
#2	137.81763	0.48027	-0.00085	0.47296	0.46918	0.25737	0.46801	1.91773	1.89447
Mean	**137.84404**	**0.47971**	**-0.00248**	**0.47148**	**0.47061**	**0.25516**	**0.46799**	**1.91184**	**1.89834**
%RSD	0.02710	0.16372	92.81718	0.44311	0.43024	1.22502	0.00713	0.43564	0.28839

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.87626	0.50819	0.48738	-0.00220	0.47865	2.02069	-0.00420	0.48959	43.53810
#2	1.88201	0.51005	0.48875	0.00013	0.48028	2.02255	-0.00422	0.49131	43.56473
Mean	**1.87913**	**0.50912**	**0.48806**	**-0.00103**	**0.47946**	**2.02162**	**-0.00421**	**0.49045**	**43.55142**
%RSD	0.21643	0.25933	0.19808	159.22942	0.24018	0.06494	0.20073	0.24840	0.04324

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00172	0.47137	1.90345
#2	-0.00179	0.47044	1.90221
Mean	**-0.00176**	**0.47090**	**1.90283**
%RSD	2.70705	0.13906	0.04614

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:33
SampleId1 : 1002224-11 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:29:31
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE24

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00004	0.03287	-0.00121	0.00805	0.00688	-0.00017	0.00184	0.06893	-0.00016
#2	-0.00004	0.03076	0.00029	0.00681	0.00674	-0.00019	-0.00050	0.06847	-0.00029
Mean	**-0.00004**	**0.03182**	**-0.00046**	**0.00743**	**0.00681**	**-0.00018**	**0.00067**	**0.06870**	**-0.00023**
%RSD	8.98804	4.67674	231.89152	11.80490	1.46946	9.05065	248.27465	0.47233	38.57114

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00186	-0.00001	-0.00104	14.57621	-0.28960	0.00270	0.00210	0.06941	-0.00076
#2	0.00145	-0.00034	-0.00153	14.61710	-0.31292	0.00264	0.00254	0.06949	-0.00073
Mean	**0.00166**	**-0.00018**	**-0.00129**	**14.59665**	**-0.30126**	**0.00267**	**0.00232**	**0.06945**	**-0.00074**
%RSD	17.31864	133.92899	26.88256	0.19806	5.47184	1.67133	13.33259	0.07769	2.53188

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	134.27128	0.00455	0.00098	0.00971	0.00631	0.15717	0.00216	0.00249	0.00123
#2	135.31957	0.00392	0.00159	0.00641	0.00710	0.15423	0.00145	0.00282	0.00005
Mean	**134.79543**	**0.00424**	**0.00129**	**0.00806**	**0.00670**	**0.15570**	**0.00180**	**0.00266**	**0.00064**
%RSD	0.54991	10.44634	33.61426	28.91456	8.30423	1.33820	28.01669	8.55086	129.61373

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02371	0.00030	-0.00132	0.00060	-0.00098	-0.00140	0.00589	-0.00075	31.03623
#2	0.02344	0.00092	-0.00139	-0.00070	-0.00112	0.00088	-0.00262	-0.00082	30.97145
Mean	**0.02358**	**0.00061**	**-0.00135**	**-0.00005**	**-0.00105**	**-0.00026**	**0.00164**	**-0.00079**	**31.00384**
%RSD	0.78754	72.15154	3.75416	1838.74361	9.24170	620.02531	367.78809	6.17273	0.14775

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00044	0.00744	0.00165
#2	-0.00027	0.00687	0.00097
Mean	**-0.00036**	**0.00716**	**0.00131**
%RSD	34.29490	5.65825	36.43741

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:33
SampleId1 : 1002224-12 SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 14:31:18
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE25

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00036	0.03243	0.00007	0.01549	0.02016	-0.00017	-0.00111	51.48231	0.00732
#2	-0.00057	0.03059	0.00131	0.01629	0.02019	-0.00018	-0.00651	51.53320	0.00745
Mean	**-0.00011**	**0.03151**	**0.00069**	**0.01589**	**0.02017**	**-0.00017**	**-0.00381**	**51.50775**	**0.00738**
%RSD	607.91860	4.14231	127.49179	3.56058	0.09923	3.59184	100.15085	0.06986	1.26511

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00226	-0.00025	-0.00033	0.19952	0.06574	0.00396	1.15204	0.04950	-0.00065
#2	0.00242	-0.00036	0.00024	0.19894	0.06182	0.00393	1.15641	0.04957	-0.00121
Mean	**0.00234**	**-0.00031**	**-0.00004**	**0.19923**	**0.06378**	**0.00395**	**1.15422**	**0.04954**	**-0.00093**
%RSD	4.90273	25.42461	940.23518	0.20719	4.34760	0.63827	0.26771	0.10891	42.51370

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	138.10626	0.00276	-0.00167	0.00104	0.00102	1.44863	-0.00023	-0.00034	0.00152
#2	138.06877	0.00302	-0.00065	0.00084	-0.00028	1.44863	-0.00071	0.00064	-0.00141
Mean	**138.08751**	**0.00289**	**-0.00116**	**0.00094**	**0.00037**	**1.44863**	**-0.00047**	**0.00015**	**0.00005**
%RSD	0.01919	6.25266	62.14442	14.87010	249.61829	0.00000	72.41068	457.08430	3948.93759

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.75255	-0.00057	0.01937	-0.00417	-0.00154	-0.00235	0.00171	-0.00029	10.52996
#2	1.76222	-0.00207	0.01941	-0.00382	-0.00145	-0.00112	-0.00876	-0.00038	10.52748
Mean	**1.75739**	**-0.00132**	**0.01939**	**-0.00399**	**-0.00149**	**-0.00173**	**-0.00353**	**-0.00033**	**10.52872**
%RSD	0.38925	80.09738	0.15720	6.18520	4.24116	50.09326	210.05806	20.29487	0.01663

	Zr	**Pb**	**Se**
	ppm	calc	calc

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#1	-0.00085	0.00103	0.00090**NCH**
#2	-0.00068	0.00009	-0.00073
Mean	**-0.00076**	**0.00056**	**0.00009**
%RSD	15.80131	117.94320	1351.35210

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:33
SampleId1 : 1002224-13 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:33:05
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE26

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00057	0.04700	-0.00351	0.00837	0.02135	-0.00010	-0.00438	0.30036	-0.00017
#2	-0.00175	0.04230	-0.00585	0.00637	0.02118	-0.00010	-0.00347	0.29646	-0.00056
Mean	**-0.00116**	**0.04465**	**-0.00468**	**0.00737**	**0.02126**	**-0.00010**	**-0.00393**	**0.29841**	**-0.00036**
%RSD	71.81136	7.44791	35.29874	19.19522	0.56489	4.30027	16.40404	0.92455	76.81029

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00053	-0.00084	-0.00343	33.83505	-0.25452	0.00287	-0.01778	0.11555	-0.00156
#2	0.00009	-0.00125	-0.00420	33.64345	-0.27229	0.00282	-0.02149	0.11460	-0.00281
Mean	**0.00031**	**-0.00104**	**-0.00382**	**33.73925**	**-0.26341**	**0.00285**	**-0.01963**	**0.11508**	**-0.00218**
%RSD	98.53942	27.57288	14.23422	0.40155	4.77077	1.08933	13.37235	0.58637	40.56478

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	136.35012	0.00399	0.00210	-0.00289	0.00066	0.10266	-0.00269	-0.00051	0.00049
#2	135.23292	0.00321	0.00312	-0.00699	0.00384	0.10561	-0.00359	-0.00747	0.00601
Mean	**135.79152**	**0.00360**	**0.00261**	**-0.00494**	**0.00225**	**0.10414**	**-0.00314**	**-0.00399**	**0.00325**
%RSD	0.58176	15.31305	27.59821	58.76194	99.96924	2.00073	20.37760	123.23969	119.89382

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01264	-0.00007	-0.00093	0.00417	-0.00109	-0.00633	-0.01221	-0.00184	0.60300
#2	0.01031	-0.00307	-0.00099	0.00273	-0.00115	-0.00361	-0.02505	-0.00251	0.59844
Mean	**0.01147**	**-0.00157**	**-0.00096**	**0.00345**	**-0.00112**	**-0.00497**	**-0.01863**	**-0.00217**	**0.60072**
%RSD	14.35280	134.70658	4.24207	29.35101	3.64432	38.74786	48.72798	21.74198	0.53595

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00068	-0.00052	0.00016
#2	-0.00127	0.00023	0.00152
Mean	**-0.00098**	**-0.00014**	**0.00084**
%RSD	42.23111	373.50838	114.59505

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:34
SampleId1 : 1002224-14 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:34:52

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Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE27

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00000	0.60518	0.00101	0.27077	0.01951	-0.00017	-0.00486	2.30588	0.05025
#2	-0.00011	0.60932	-0.00031	0.27089	0.01962	-0.00016	0.00318	2.30968	0.05091
Mean	**-0.00006**	**0.60725**	**0.00035**	**0.27083**	**0.01956**	**-0.00016**	**-0.00084**	**2.30778**	**0.05058**
%RSD	134.51987	0.48226	266.03544	0.03134	0.40928	2.84069	676.99047	0.11633	0.91708

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00328	0.00046	0.00576	0.02501	0.64376	0.00640	1.55541	0.39974	-0.00020
#2	0.00325	0.00050	0.00604	0.02279	0.64399	0.00638	1.56131	0.40017	0.00017
Mean	**0.00327**	**0.00048**	**0.00590**	**0.02390**	**0.64387**	**0.00639**	**1.55836**	**0.39995**	**-0.00001**
%RSD	0.58397	5.44259	3.36000	6.58723	0.02531	0.24257	0.26772	0.07442	2312.38843

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	132.63319	0.00869	0.22108	0.00101	-0.00021	17.41476	0.00396	0.00431	0.00625
#2	132.92867	0.00989	0.21374	0.00275	-0.00058	17.47918	0.00534	0.00634	0.00378
Mean	**132.78093**	**0.00929**	**0.21741**	**0.00188**	**-0.00039**	**17.44697**	**0.00465**	**0.00532**	**0.00501**
%RSD	0.15735	9.14053	2.38584	65.38670	67.13138	0.26112	20.99448	26.92659	34.79943

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.06355	0.00192	0.00480	-0.00470	-0.00083	0.00059	-0.00366	0.00169	17.77509
#2	0.06644	0.00017	0.00482	-0.00419	-0.00077	-0.00127	-0.00016	0.00180	17.79225
Mean	**0.06500**	**0.00105**	**0.00481**	**-0.00444**	**-0.00080**	**-0.00034**	**-0.00191**	**0.00175**	**17.78367**
%RSD	3.14451	117.86800	0.21120	8.13247	4.65407	387.55610	129.30794	4.63034	0.06824

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00003	0.00020	0.00560
#2	0.00026	0.00053	0.00463
Mean	**0.00011**	**0.00037**	**0.00512**
%RSD	178.78212	64.14438	13.41474

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:34
SampleId1 : 1002224-15 SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 14:36:38
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE28

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00026	0.03814	-0.00174	0.00437	0.00598	-0.00008	-0.00507	0.02350	-0.00057
#2	-0.00012	0.04026	-0.00227	0.00445	0.00603	-0.00008	-0.00171	0.02315	-0.00018

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Mean	**-0.00019**	**0.03920**	**-0.00200**	**0.00441**	**0.00600**	**-0.00008**	**-0.00339**	**0.02333**	**-0.00038**
%RSD	54.23255	3.82061	18.60894	1.28345	0.66676	3.66794	70.06704	1.04323	72.45476

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00031	-0.00016	0.00328	0.00991	-0.29468	0.00274	-0.01341	0.00022	-0.00142
#2	-0.00033	0.00060	0.00370	0.00975	-0.30253	0.00274	-0.00926	0.00026	-0.00140
Mean	**-0.00032**	**0.00022**	**0.00349**	**0.00983**	**-0.29861**	**0.00274**	**-0.01133**	**0.00024**	**-0.00141**
%RSD	5.96366	247.98630	8.63653	1.14433	1.85837	0.21211	25.88992	11.26878	1.33597

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	136.85697	0.00159	0.00353	0.00140	-0.00017	-0.03434	0.00048	0.00503	-0.00133
#2	135.95418	0.00236	0.00668	0.00430	-0.00197	-0.03729	0.00029	0.01060	0.00095
Mean	**136.40558**	**0.00198**	**0.00510**	**0.00285**	**-0.00107**	**-0.03581**	**0.00039**	**0.00782**	**-0.00019**
%RSD	0.46799	27.88601	43.73459	72.06449	118.69684	5.81696	34.18674	50.46006	847.99658

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01426	0.00067	-0.00168	-0.00407	-0.00121	-0.00026	0.00533	-0.00032	0.14686
#2	0.01489	0.00167	-0.00165	-0.00502	-0.00124	-0.00187	0.00334	0.00000	0.14542
Mean	**0.01458**	**0.00117**	**-0.00166**	**-0.00454**	**-0.00122**	**-0.00106**	**0.00433**	**-0.00016**	**0.14614**
%RSD	3.02389	60.16163	1.52489	14.78274	1.52110	107.01241	32.54756	143.77039	0.69815

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00048	0.00035	0.00078
#2	-0.00007	0.00012	0.00417
Mean	**-0.00027**	**0.00023**	**0.00248**
%RSD	106.28741	69.96399	96.64083

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:34
SampleId1 : 1002224-16 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:38:29
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE29

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00090	0.03992	-0.00140	0.05753	0.01223	-0.00004	-0.00468	2.70417	-0.00049
#2	-0.00066	0.04078	-0.00178	0.05641	0.01217	-0.00003	-0.00203	2.70233	-0.00008
Mean	**-0.00078**	**0.04035**	**-0.00159**	**0.05697**	**0.01220**	**-0.00004**	**-0.00336**	**2.70325**	**-0.00028**
%RSD	21.57738	1.52165	16.75711	1.39022	0.32805	15.07512	55.84134	0.04818	103.69394

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00057	-0.00069	-0.00237	23.84462	-0.18136	0.00339	0.54971	0.13384	-0.00097
#2	0.00114	-0.00072	-0.00267	23.81574	-0.18182	0.00338	0.55102	0.13361	-0.00132
Mean	**0.00085**	**-0.00070**	**-0.00252**	**23.83018**	**-0.18159**	**0.00338**	**0.55036**	**0.13372**	**-0.00114**

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%RSD	47.07808	3.66385	8.36736	0.08571	0.17972	0.05725	0.16840	0.12112	21.41343

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	121.93977	0.00870	0.01432	-0.00102	0.00124	0.79238	-0.00107	-0.00396	0.00016
#2	121.87351	0.00824	0.01788	0.00038	0.00169	0.78501	-0.00107	0.00398	-0.00188
Mean	**121.90664**	**0.00847**	**0.01610**	**-0.00032**	**0.00146**	**0.78869**	**-0.00107**	**0.00001**	**-0.00086**
%RSD	0.03843	3.83846	15.65209	307.15586	21.90443	0.66087	0.16951	50230.15122	168.25330

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.12379	0.00142	0.00155	0.00068	-0.00136	-0.00380	-0.00940	-0.00133	53.29855
#2	0.12596	-0.00095	0.00156	0.00055	-0.00132	-0.00155	0.01057	-0.00107	53.18750
Mean	**0.12488**	**0.00024**	**0.00156**	**0.00061**	**-0.00134**	**-0.00268**	**0.00059**	**-0.00120**	**53.24303**
%RSD	1.23085	705.57963	0.65278	14.20792	2.21896	59.41994	2407.94175	15.50093	0.14749

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00073	0.00049	-0.00121
#2	-0.00051	0.00125	0.00007
Mean	**-0.00062**	**0.00087**	**-0.00057**
%RSD	24.75961	62.20222	159.68054

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:35
SampleId1 : 1002230-4 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:40:15
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE30

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00041	0.05294	-0.00279	0.00261	0.03635	-0.00001	0.00071	1.79787	-0.00022
#2	0.00013	0.05500	-0.00174	0.00353	0.03646	-0.00001	0.00591	1.80235	-0.00006
Mean	**-0.00014**	**0.05397**	**-0.00227**	**0.00307**	**0.03641**	**-0.00001**	**0.00331**	**1.80011**	**-0.00014**
%RSD	266.72786	2.69752	32.89000	21.20712	0.21995	24.41951	110.93770	0.17614	82.89581

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00604	0.00694	-0.00409	56.93878	-0.31015	0.00324	0.00537	0.29701	0.00041
#2	0.00609	0.00698	-0.00402	57.11191	-0.31107	0.00325	0.00887	0.29808	-0.00046
Mean	**0.00606**	**0.00696**	**-0.00406**	**57.02535**	**-0.31061**	**0.00325**	**0.00712**	**0.29754**	**-0.00002**
%RSD	0.63616	0.35679	1.14093	0.21468	0.21019	0.23856	34.69700	0.25440	2514.22144

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	138.66820	0.00602	0.00831	0.01240	0.01226	0.54621	0.00234	-0.00072	0.00163
#2	138.73523	0.00618	0.00862	0.01429	0.01266	0.53884	0.00227	0.00213	-0.00074
Mean	**138.70171**	**0.00610**	**0.00846**	**0.01335**	**0.01246**	**0.54252**	**0.00231**	**0.00071**	**0.00045**
%RSD	0.03417	1.92439	2.55210	9.97942	2.27758	0.96051	2.07645	284.74124	375.22647

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	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01998	0.00092	0.00622	0.00487	-0.00116	0.00082	0.01097	-0.00211	1.34623
#2	0.02066	0.00105	0.00625	0.00306	-0.00131	-0.00284	0.01783	-0.00184	1.34543
Mean	**0.02032**	**0.00098**	**0.00623**	**0.00397**	**-0.00123**	**-0.00101**	**0.01440**	**-0.00197**	**1.34583**
%RSD	2.34993	8.95990	0.40728	32.27168	8.74712	256.53259	33.71594	9.42185	0.04189

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00006	0.01231	0.00085
#2	0.00013	0.01320	0.00022
Mean	**0.00004**	**0.01276**	**0.00053**
%RSD	344.20328	4.96065	83.70514

Method : Paragon   File : 100310A   Printed : 3/10/2010 16:02:35
SampleId1 : CCV   SampleId2 :   [CV]
Analysis commenced : 3/10/2010 14:42:02
Dilution ratio : 1.00000 to 1.00000   Tray :   Position : STD6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19897	50.00523	0.49747	0.97608	0.99304	0.49630	0.52382	48.64460	0.49051
#2	0.20026	50.04562	0.50642	0.97712	0.99856	0.49817	0.52730	48.63924	0.49148
Mean	**0.19961**	**50.02542**	**0.50194**	**0.97660**	**0.99580**	**0.49724**	**0.52556**	**48.64192**	**0.49099**
%RSD	0.45469	0.05709	1.26127	0.07536	0.39222	0.26620	0.46790	0.00778	0.13906

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.50181	0.99668	0.98556	20.00381	48.99767	0.50711	49.92488	0.98427	0.98702
#2	0.50271	0.99660	0.98817	20.03121	49.07370	0.50837	49.90046	0.98607	0.99071
Mean	**0.50226**	**0.99664**	**0.98687**	**20.01751**	**49.03568**	**0.50774**	**49.91267**	**0.98517**	**0.98887**
%RSD	0.12601	0.00583	0.18674	0.09681	0.10964	0.17487	0.03460	0.12974	0.26324

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.22548	1.00554	4.75022	0.97112	0.96353	5.05749	0.48487	1.01302	1.01381
#2	48.22117	1.00241	4.74691	0.96938	0.96784	5.10338	0.48514	1.02277	1.01997
Mean	**48.22333**	**1.00398**	**4.74857**	**0.97025**	**0.96568**	**5.08044**	**0.48501**	**1.01789**	**1.01689**
%RSD	0.00632	0.22024	0.04921	0.12695	0.31530	0.63878	0.03974	0.67741	0.42888

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.80728	1.00708	0.49667	0.17136	0.47576	0.50979	4.99973	0.48856	1.02635
#2	4.81648	1.00558	0.49866	0.17619	0.47779	0.51065	5.00872	0.49015	1.02584
Mean	**4.81188**	**1.00633**	**0.49766**	**0.17377**	**0.47677**	**0.51022**	**5.00422**	**0.48936**	**1.02610**
%RSD	0.13519	0.10522	0.28320	1.96377	0.30153	0.12031	0.12698	0.22990	0.03492

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	Zr	Pb	SeNCH
	ppm	calc	calc
#1	0.99410	0.96606	1.01354
#2	0.99632	0.96835	1.02090
Mean	**0.99521**	**0.96720**	**1.01722**
%RSD	0.15807	0.16757	0.51170

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:35
SampleId1 : CCB SampleId2 : [CB]
Analysis commenced : 3/10/2010 14:43:56
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00001	0.07710	-0.00166	0.00057	-0.00017	0.00030	-0.00009	0.01891	-0.00031
#2	0.00164	0.07325	-0.00016	0.00161	-0.00011	0.00022	-0.00039	0.01432	0.00000
Mean	**0.00082**	**0.07517**	**-0.00091**	**0.00109**	**-0.00014**	**0.00026**	**-0.00024**	**0.01662**	**-0.00016**
%RSD	143.43724	3.62130	116.89045	67.61908	28.89878	20.95007	87.56644	19.52744	139.40097

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00032	0.00036	-0.00104	0.01722	-0.32192	0.00305	0.02285	0.00003	-0.00169
#2	0.00060	0.00089	0.00008	0.01452	-0.31984	0.00301	0.02394	-0.00008	0.00025
Mean	**0.00014**	**0.00063**	**-0.00048**	**0.01587**	**-0.32088**	**0.00303**	**0.02339**	**-0.00003**	**-0.00072**
%RSD	449.92120	59.26663	166.11332	12.04620	0.45779	0.76748	3.30094	292.56556	191.69124

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.11484	-0.00006	-0.00207	0.00110	-0.00098	-0.03434	0.00047	-0.00148	0.00142
#2	-0.12263	0.00036	-0.00829	0.00484	-0.00184	-0.04170	0.00300	0.00679	-0.00341
Mean	**-0.11873**	**0.00015**	**-0.00518**	**0.00297**	**-0.00141**	**-0.03802**	**0.00174**	**0.00265**	**-0.00099**
%RSD	4.63504	199.81796	84.77718	88.91261	43.12739	13.69728	102.86736	220.31208	343.23947

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00765	-0.00157	-0.00159	-0.00185	-0.00063	0.00042	0.00782	0.00025	0.00211
#2	-0.00435	-0.00020	-0.00158	-0.00196	-0.00086	0.00027	0.01531	0.00088	0.00160
Mean	**-0.00600**	**-0.00089**	**-0.00159**	**-0.00191**	**-0.00074**	**0.00034**	**0.01156**	**0.00057**	**0.00186**
%RSD	38.93043	109.55084	0.32017	3.79743	21.49823	30.06850	45.76614	78.49980	19.22879

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00016	-0.00029	0.00045
#2	0.00050	0.00039	-0.00001
Mean	**0.00033**	**0.00005**	**0.00022**
%RSD	72.94951	951.70926	149.84700

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SampleId1 : 1002230-5 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:45:48
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE31

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00031	0.04817	-0.00020	0.03229	0.00838	-0.00004	-0.00293	0.93200	0.00201
#2	-0.00101	0.05239	-0.00144	0.03145	0.00849	-0.00001	-0.00131	0.93430	0.00175
Mean	**-0.00035**	**0.05028**	**-0.00082**	**0.03187**	**0.00844**	**-0.00003**	**-0.00212**	**0.93315**	**0.00188**
%RSD	265.85159	5.92684	107.54600	1.86389	0.94882	109.96230	53.92871	0.17406	9.89512

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03536	0.00731	0.00370	3.27495	-0.21736	0.00311	0.08291	0.05682	0.00646
#2	0.03482	0.00661	0.00245	3.27830	-0.21921	0.00313	0.08291	0.05705	0.00662
Mean	**0.03509**	**0.00696**	**0.00307**	**3.27663**	**-0.21829**	**0.00312**	**0.08291**	**0.05694**	**0.00654**
%RSD	1.08899	7.07715	28.83518	0.07234	0.59807	0.37294	0.00000	0.28428	1.72767

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	138.64060	0.03897	0.12787	0.07758	0.07539	5.18334	0.00047	-0.00166	0.00070
#2	138.15686	0.03900	0.12990	0.07523	0.07556	5.15816	-0.00377	0.00570	0.00013
Mean	**138.39873**	**0.03899**	**0.12889**	**0.07641**	**0.07548**	**5.17075**	**-0.00165**	**0.00202**	**0.00041**
%RSD	0.24715	0.04632	1.11763	2.17306	0.16183	0.34421	181.74520	257.44020	98.26680

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02559	0.00030	0.00184	-0.00124	-0.00104	-0.00066	0.00910	0.00000	0.18669
#2	0.02191	-0.00145	0.00184	-0.00125	-0.00113	-0.00221	-0.01834	-0.00038	0.18539
Mean	**0.02375**	**-0.00057**	**0.00184**	**-0.00125**	**-0.00108**	**-0.00144**	**-0.00462**	**-0.00019**	**0.18604**
%RSD	10.95249	215.27600	0.00000	0.65647	5.49389	76.09543	419.60056	144.60546	0.49365

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00134	0.07612	-0.00009
#2	0.00101	0.07545	0.00198
Mean	**0.00117**	**0.07579**	**0.00095**
%RSD	19.79127	0.62206	154.54459

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:36
SampleId1 : 1002230-6 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:47:35
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE32

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	0.00037	0.03955	-0.00204	0.00453	0.04419	-0.00005	0.00387	1.31075	-0.00056
#2	0.00027	0.03667	-0.00457	0.00517	0.04442	-0.00002	0.00102	1.30547	-0.00035
Mean	**0.00032**	**0.03811**	**-0.00330**	**0.00485**	**0.04431**	**-0.00003**	**0.00244**	**1.30811**	**-0.00045**
%RSD	22.32606	5.34866	54.02196	9.33563	0.36148	78.26819	82.62309	0.28572	33.34827

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00041	-0.00089	-0.00573	90.53512	-0.17675	0.00545	0.01171	0.56961	0.00020
#2	-0.00071	-0.00117	-0.00594	89.94071	-0.19521	0.00548	0.01236	0.56693	-0.00004
Mean	**-0.00056**	**-0.00103**	**-0.00583**	**90.23791**	**-0.18598**	**0.00547**	**0.01204**	**0.56827**	**0.00008**
%RSD	37.26136	19.04105	2.44101	0.46577	7.01935	0.31893	3.84945	0.33378	207.16746

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	122.40006	0.00000	0.03947	0.00095	-0.00059	0.73636	0.00026	0.00236	0.00343
#2	121.95681	-0.00009	0.04191	0.00049	0.00026	0.72751	0.00002	-0.00257	0.00287
Mean	**122.17844**	**-0.00004**	**0.04069**	**0.00072**	**-0.00017**	**0.73193**	**0.00014**	**-0.00010**	**0.00315**
%RSD	0.25653	148.99415	4.24692	45.47106	357.50610	0.85449	117.58792	3409.09045	12.45425

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.70738	0.00192	0.00133	0.00970	-0.00104	-0.00210	0.03299	-0.00212	0.03737
#2	0.70746	0.00042	0.00135	0.00722	-0.00125	-0.00428	0.01893	-0.00206	0.03759
Mean	**0.70742**	**0.00117**	**0.00134**	**0.00846**	**-0.00114**	**-0.00319**	**0.02596**	**-0.00209**	**0.03748**
%RSD	0.00893	90.23160	1.51539	20.77298	13.33350	48.27164	38.30748	1.92767	0.40818

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00027	-0.00008	0.00307
#2	0.00071	0.00033	0.00106
Mean	**0.00049**	**0.00013**	**0.00207**
%RSD	64.42055	232.33103	68.87363

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:36
SampleId1 : 1003025-2 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:49:22
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE33

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00047	0.09366	0.00048	0.01401	0.06458	-0.00004	0.00021	5.40037	0.00044
#2	-0.00087	0.09507	0.00060	0.01409	0.06526	-0.00004	-0.00569	5.42428	0.00031
Mean	**-0.00020**	**0.09436**	**0.00054**	**0.01405**	**0.06492**	**-0.00004**	**-0.00274**	**5.41232**	**0.00038**
%RSD	471.32764	1.05607	14.83155	0.40270	0.74021	9.29280	152.50024	0.31237	24.73883

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00028	0.00007	0.00059	0.08154	0.41926	0.00321	0.21200	0.01868	-0.00116

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#2	-0.00028	-0.00002	0.00045	0.08355	0.40819	0.00320	0.21025	0.01872	-0.00073
Mean	**-0.00028**	**0.00003**	**0.00052**	**0.08254**	**0.41373**	**0.00321**	**0.21113**	**0.01870**	**-0.00094**
%RSD	0.32428	220.96027	18.56346	1.72633	1.89129	0.12091	0.58525	0.14424	31.93425

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	118.60670	0.00166	0.25980	0.12391	0.12094	0.30157	0.00312	-0.00307	-0.00254
#2	118.82577	0.00137	0.25205	0.12050	0.12033	0.30746	0.00120	0.00042	0.00093
Mean	**118.71623**	**0.00152**	**0.25593**	**0.12220**	**0.12063**	**0.30452**	**0.00216**	**-0.00133**	**-0.00081**
%RSD	0.13048	13.70386	2.13964	1.97245	0.35942	1.36866	62.58579	186.55249	304.52834

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.18801	0.00292	0.01076	-0.00194	-0.00090	-0.00152	-0.00070	0.00034	0.06953
#2	0.18788	0.00167	0.01086	-0.00294	-0.00105	-0.00268	-0.00619	-0.00035	0.06932
Mean	**0.18794**	**0.00229**	**0.01081**	**-0.00244**	**-0.00098**	**-0.00210**	**-0.00345**	**0.00000**	**0.06943**
%RSD	0.04804	38.42268	0.65758	28.81203	11.05850	39.15568	112.59894	20580.34173	0.22037

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00046	0.12193	-0.00272
#2	-0.00058	0.12038	0.00076
Mean	**-0.00052**	**0.12116**	**-0.00098**
%RSD	15.82675	0.90119	251.31516

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:36
SampleId1 : 1003025-2D **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:51:10
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE34

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00414	0.11427	0.00677	0.01609	0.06475	-0.00009	0.01032	5.30912	0.00133
#2	0.00071	0.09537	0.00060	0.01477	0.06512	-0.00011	0.00052	5.30497	0.00098
Mean	**0.00243**	**0.10482**	**0.00368**	**0.01543**	**0.06493**	**-0.00010**	**0.00542**	**5.30705**	**0.00115**
%RSD	99.78310	12.74329	118.57116	6.05012	0.40086	9.38027	127.74470	0.05540	21.55746

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00194	0.00248	0.00345	0.07082	0.36231	0.00308	0.22991	0.01376	0.00049
#2	0.00016	0.00056	0.00158	0.06913	0.35009	0.00305	0.21047	0.01345	-0.00033
Mean	**0.00105**	**0.00152**	**0.00251**	**0.06997**	**0.35620**	**0.00307**	**0.22019**	**0.01361**	**0.00008**
%RSD	120.46598	89.38873	52.61303	1.71472	2.42576	0.56866	6.24287	1.58565	713.57555

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	117.93124	0.00443	0.26122	0.13583	0.10831	0.31925	0.00856	0.01590	-0.01058
#2	117.91101	0.00196	0.25409	0.12357	0.11708	0.30894	0.00192	0.00459	-0.00311

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Mean	**117.92113**	**0.00319**	**0.25766**	**0.12970**	**0.11269**	**0.31410**	**0.00524**	**0.01024**	**-0.00685**
%RSD	0.01213	54.83243	1.95748	6.68466	5.49926	2.32213	89.57323	78.06961	77.14101

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19950	0.00653	0.01089	-0.00414	-0.00074	0.00576	0.05867	0.00273	0.06910
#2	0.19627	0.00204	0.01074	-0.00197	-0.00089	-0.00241	0.00529	0.00063	0.07025
Mean	**0.19789**	**0.00429**	**0.01082**	**-0.00305**	**-0.00082**	**0.00168**	**0.03198**	**0.00168**	**0.06968**
%RSD	1.15446	73.99816	0.98605	50.38661	13.19289	345.07831	118.01882	88.65485	1.17106

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00121	0.11747	-0.00177
#2	-0.00033	0.11924	-0.00055
Mean	**0.00044**	**0.11836**	**-0.00116**
%RSD	245.75414	1.05328	74.40207

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:37
SampleId1 : 1003025-2L 5X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 14:52:57
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE35

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00036	0.04235	0.00086	0.00177	0.01229	-0.00016	0.00011	1.07293	-0.00026
#2	0.00083	0.04370	-0.00080	0.00197	0.01220	-0.00016	-0.00519	1.07144	-0.00008
Mean	**0.00059**	**0.04302**	**0.00003**	**0.00187**	**0.01225**	**-0.00016**	**-0.00254**	**1.07219**	**-0.00017**
%RSD	56.36651	2.21630	3875.39635	7.57257	0.49038	0.89561	147.52329	0.09848	73.92540

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00046	-0.00030	-0.00054	0.01701	-0.22267	0.00295	0.03115	0.00216	-0.00105
#2	-0.00041	-0.00051	-0.00089	0.01738	-0.21921	0.00294	0.03115	0.00216	-0.00102
Mean	**-0.00043**	**-0.00041**	**-0.00072**	**0.01719**	**-0.22094**	**0.00294**	**0.03115**	**0.00216**	**-0.00104**
%RSD	8.84293	35.41013	34.39079	1.52598	1.10792	0.19750	0.00000	0.00000	1.81644

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	23.06594	-0.00007	0.04568	0.02620	0.02172	0.03932	-0.00143	-0.00438	-0.00080
#2	23.19330	-0.00064	0.04721	0.02441	0.02294	0.03490	-0.00179	0.00261	-0.00394
Mean	**23.12962**	**-0.00036**	**0.04644**	**0.02530**	**0.02233**	**0.03711**	**-0.00161**	**-0.00089**	**-0.00237**
%RSD	0.38937	111.82725	2.32555	5.00910	3.84685	8.42192	15.68769	557.49255	93.84636

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02943	-0.00007	0.00058	-0.00272	-0.00113	-0.00101	0.00034	0.00010	0.01235
#2	0.02965	-0.00282	0.00054	-0.00395	-0.00117	-0.00064	-0.00714	-0.00009	0.01249
Mean	**0.02954**	**-0.00145**	**0.00056**	**-0.00334**	**-0.00115**	**-0.00082**	**-0.00340**	**0.00000**	**0.01242**

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%RSD	0.52218	134.13165	5.46380	26.20106	2.26603	31.76287	155.51854	3298.03720	0.82108

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00060	0.02321	-0.00199
#2	-0.00045	0.02343	-0.00176
Mean	**-0.00052**	**0.02332**	**-0.00188**
%RSD	20.79296	0.64710	8.71980

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:37
SampleId1 : 1003025-2MS SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 14:54:43
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE36

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09744	2.09379	1.94945	0.93881	2.02114	0.04647	-0.00197	5.24480	0.05082
#2	0.09601	2.09472	1.94888	0.94058	2.02667	0.04643	-0.00462	5.23591	0.05100
Mean	**0.09672**	**2.09425**	**1.94917**	**0.93969**	**2.02391**	**0.04645**	**-0.00330**	**5.24035**	**0.05091**
%RSD	1.04342	0.03125	0.02073	0.13253	0.19314	0.06068	56.89562	0.11998	0.25291

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48652	0.19342	0.25505	1.03576	0.29960	0.00314	0.20326	0.48913	0.98382
#2	0.48523	0.19324	0.25443	1.03619	0.28184	0.00310	0.19671	0.48913	0.98630
Mean	**0.48587**	**0.19333**	**0.25474**	**1.03597**	**0.29072**	**0.00312**	**0.19999**	**0.48913**	**0.98506**
%RSD	0.18780	0.06653	0.17189	0.02913	4.31851	0.99276	2.31692	0.00000	0.17808

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	117.02314	0.48310	0.24329	0.58681	0.58790	0.30599	0.46460	1.90588	1.90517
#2	116.95407	0.48161	0.25705	0.58436	0.59048	0.30157	0.46673	1.90570	1.91835
Mean	**116.98861**	**0.48235**	**0.25017**	**0.58559**	**0.58919**	**0.30378**	**0.46567**	**1.90579**	**1.91176**
%RSD	0.04175	0.21897	3.88807	0.29571	0.30994	1.02898	0.32294	0.00677	0.48750

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.06619	0.51055	0.49872	-0.00120	0.47895	2.02152	0.00014	0.49129	0.54475
#2	2.06444	0.50632	0.49976	-0.00647	0.47954	2.02002	-0.02230	0.49092	0.54280
Mean	**2.06532**	**0.50844**	**0.49924**	**-0.00383**	**0.47925**	**2.02077**	**-0.01108**	**0.49111**	**0.54378**
%RSD	0.05995	0.58931	0.14734	97.13049	0.08759	0.05234	143.26342	0.05225	0.25369

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00135	0.58754	1.90541
#2	-0.00164	0.58845	1.91414
Mean	**-0.00149**	**0.58799**	**1.90978**
%RSD	13.52850	0.10908	0.32325

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ted: 3/10/2010 16:02:49 User: ROY FRENCH
Method : Paragon File : 100310A Printed : 3/10/2010 16:02:37
SampleId1 : 1003025-2MSD SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 14:56:33
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE37

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09486	2.05993	1.91136	0.92661	1.98978	0.04574	0.00116	5.17390	0.04980
#2	0.09499	2.07222	1.92694	0.93309	2.00731	0.04604	-0.00199	5.19480	0.05035
Mean	**0.09492**	**2.06608**	**1.91915**	**0.92985**	**1.99854**	**0.04589**	**-0.00042**	**5.18435**	**0.05007**
%RSD	0.09042	0.42067	0.57394	0.49312	0.62012	0.45630	531.73026	0.28506	0.77632

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.47782	0.19060	0.24832	1.01485	0.28715	0.00318	0.20020	0.48151	0.97275
#2	0.48121	0.19167	0.25031	1.02040	0.27885	0.00316	0.20261	0.48488	0.97793
Mean	**0.47951**	**0.19113**	**0.24931**	**1.01762**	**0.28300**	**0.00317**	**0.20141**	**0.48319**	**0.97534**
%RSD	0.50058	0.39514	0.56519	0.38544	2.07418	0.36681	0.84355	0.49314	0.37518

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	115.27700	0.47345	0.23657	0.57962	0.57745	0.31041	0.46033	1.86179	1.86733
#2	116.11562	0.47709	0.24655	0.57802	0.57701	0.30157	0.46614	1.87558	1.85689
Mean	**115.69631**	**0.47527**	**0.24156**	**0.57882**	**0.57723**	**0.30599**	**0.46323**	**1.86869**	**1.86211**
%RSD	0.51254	0.54134	2.92298	0.19601	0.05326	2.04310	0.88583	0.52191	0.39663

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.05551	0.50396	0.49105	-0.00591	0.47141	1.97851	0.01014	0.48356	0.53492
#2	2.06811	0.50458	0.49505	-0.00420	0.47491	1.99248	-0.00533	0.48614	0.53789
Mean	**2.06181**	**0.50427**	**0.49305**	**-0.00505**	**0.47316**	**1.98549**	**0.00240**	**0.48485**	**0.53641**
%RSD	0.43223	0.08679	0.57371	23.94166	0.52446	0.49758	455.44773	0.37631	0.39051

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00086	0.57817	1.86549
#2	-0.00144	0.57735	1.86311
Mean	**-0.00115**	**0.57776**	**1.86430**
%RSD	35.86046	0.10089	0.09004

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:37
SampleId1 : 1003055-10 SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 14:58:22
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE38

Final concentrations

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00047	0.06372	0.00319	0.01069	0.03697	-0.00016	-0.00050	2.16174	-0.00007
#2	0.00039	0.06716	0.00346	0.01085	0.03723	-0.00014	0.00215	2.15714	-0.00032
Mean	**-0.00004**	**0.06544**	**0.00333**	**0.01077**	**0.03710**	**-0.00015**	**0.00083**	**2.15944**	**-0.00019**
%RSD	1431.39482	3.71350	5.60548	1.05073	0.48563	9.62894	226.80518	0.15066	89.10619

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00014	-0.00002	0.00024	0.03837	0.57139	0.00268	0.39090	0.09918	-0.00177
#2	-0.00002	0.00029	0.00044	0.03859	0.56425	0.00262	0.39155	0.09910	-0.00097
Mean	**0.00006**	**0.00013**	**0.00034**	**0.03848**	**0.56782**	**0.00265**	**0.39122**	**0.09914**	**-0.00137**
%RSD	188.16434	159.66131	42.13910	0.38970	0.88975	1.46311	0.11844	0.05444	41.24822

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	123.45413	-0.00002	0.03204	0.00485	0.00214	-0.01519	0.00078	0.00119	0.00114
#2	123.09095	0.00008	0.03071	0.00548	0.00115	-0.01224	0.00366	0.00022	-0.00079
Mean	**123.27254**	**0.00003**	**0.03137**	**0.00517**	**0.00165**	**-0.01372**	**0.00222**	**0.00070**	**0.00017**
%RSD	0.20833	259.73995	2.98351	8.64290	42.18937	15.18779	91.87308	98.00247	797.98824

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.06127	0.00005	0.00583	-0.00463	-0.00051	-0.00222	-0.00317	0.00031	0.02872
#2	0.06353	-0.00020	0.00590	-0.00394	-0.00041	-0.00139	0.00831	-0.00020	0.02900
Mean	**0.06240**	**-0.00008**	**0.00587**	**-0.00428**	**-0.00046**	**-0.00181**	**0.00257**	**0.00006**	**0.02886**
%RSD	2.56084	234.21693	0.77886	11.46860	16.26783	32.44966	315.75587	651.55634	0.70672

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00046	0.00304	0.00115
#2	-0.00010	0.00260	-0.00046
Mean	**-0.00028**	**0.00282**	**0.00035**
%RSD	90.44080	11.15677	327.21947

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:38
SampleId1 : 1003063-16A SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 15:00:08
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE39

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00068	42.37257	1.94183	0.94962	2.61655	0.04894	0.00396	218.33219	0.04929
#2	0.00005	42.71169	1.95715	0.96039	2.64179	0.04927	0.00897	219.46667	0.04952
Mean	**-0.00032**	**42.54213**	**1.94949**	**0.95501**	**2.62917**	**0.04911**	**0.00647**	**218.89943**	**0.04941**
%RSD	162.40878	0.56365	0.55544	0.79727	0.67873	0.48214	54.75953	0.36647	0.33305

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49004	0.22261	0.30100	106.22209	83.80037	1.12134	110.49798	1.79260	0.95288
#2	0.49349	0.22405	0.30348	106.85850	84.32835	1.13032	111.16193	1.80496	0.96091
Mean	**0.49177**	**0.22333**	**0.30224**	**106.54030**	**84.06436**	**1.12583**	**110.82996**	**1.79878**	**0.95689**
%RSD	0.49592	0.45529	0.58036	0.42239	0.44411	0.56419	0.42360	0.48563	0.59331

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	76.16755	0.51033	2.09056	0.51094	0.50851	3.34604	0.45538	1.88496	1.85895
#2	76.60701	0.51369	2.11044	0.51323	0.50997	3.36230	0.46536	1.89602	1.87311
Mean	**76.38728**	**0.51201**	**2.10050**	**0.51208**	**0.50924**	**3.35417**	**0.46037**	**1.89049**	**1.86603**
%RSD	0.40680	0.46370	0.66919	0.31598	0.20341	0.34274	1.53147	0.41361	0.53684

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	14.54592	0.49472	1.06923	0.02450	1.02368	1.92704	0.03428	0.56530	0.66161
#2	14.64605	0.49882	1.07789	0.02609	1.03217	1.93658	0.02786	0.56867	0.66523
Mean	**14.59598**	**0.49677**	**1.07356**	**0.02530**	**1.02793**	**1.93181**	**0.03107**	**0.56698**	**0.66342**
%RSD	0.48509	0.58391	0.57037	4.43808	0.58433	0.34929	14.61037	0.42038	0.38525

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.03684	0.50932	1.86761
#2	0.03718	0.51105	1.88074
Mean	**0.03701**	**0.51019**	**1.87418**
%RSD	0.64433	0.24104	0.49545

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:38
SampleId1 : TEST **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:01:56
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE40

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00029	0.04041	0.00014	0.00233	-0.00076	-0.00017	-0.00234	0.02648	-0.00063
#2	-0.00004	0.04189	-0.00005	0.00097	-0.00085	-0.00019	-0.00234	0.02338	-0.00012
Mean	**-0.00016**	**0.04115**	**0.00005**	**0.00165**	**-0.00080**	**-0.00018**	**-0.00234**	**0.02493**	**-0.00038**
%RSD	109.60174	2.54830	271.38512	58.36944	7.47108	6.38121	0.03375	8.78427	94.77896

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00050	-0.00022	-0.00188	0.03615	-0.37501	0.00276	-0.00948	-0.00047	-0.00145
#2	-0.00056	-0.00029	-0.00117	0.03456	-0.38586	0.00271	-0.00860	-0.00054	-0.00097
Mean	**-0.00053**	**-0.00026**	**-0.00153**	**0.03535**	**-0.38044**	**0.00274**	**-0.00904**	**-0.00050**	**-0.00121**
%RSD	7.13912	17.47745	32.81687	3.18130	2.01664	1.34608	6.83313	10.69340	28.01769

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	-0.14405	0.00018	0.02175	0.00177	0.00034	-0.04318	-0.00114	-0.00176	-0.00330
#2	-0.14727	-0.00002	0.02460	0.00018	-0.00027	-0.03581	-0.00005	-0.00308	-0.00419
Mean	**-0.14566**	**0.00008**	**0.02318**	**0.00097**	**0.00004**	**-0.03950**	**-0.00059**	**-0.00242**	**-0.00374**
%RSD	1.56248	183.13220	8.69851	115.34804	1201.59983	13.18640	128.87481	38.42717	16.88400

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00019	0.05838	-0.00188	-0.00275	-0.00108	0.00023	-0.00267	-0.00039	0.00124
#2	0.00071	0.05501	-0.00191	-0.00305	-0.00116	-0.00019	-0.00516	-0.00028	0.00059
Mean	**0.00026**	**0.05669**	**-0.00189**	**-0.00290**	**-0.00112**	**0.00002**	**-0.00391**	**-0.00034**	**0.00092**
%RSD	249.02724	4.19677	0.80397	7.42613	4.64912	1381.86553	45.04678	24.03883	49.94709

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00044	0.00081	-0.00279
#2	-0.00030	-0.00012	-0.00382
Mean	**-0.00037**	**0.00035**	**-0.00330**
%RSD	26.37598	189.12245	22.13926

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:38
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/10/2010 15:03:44
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19702	49.01263	0.49195	0.95034	0.97183	0.48748	0.50824	47.75593	0.48238
#2	0.19759	49.32762	0.49554	0.95795	0.98009	0.48940	0.51520	47.89728	0.48503
Mean	**0.19731**	**49.17013**	**0.49375**	**0.95415**	**0.97596**	**0.48844**	**0.51172**	**47.82660**	**0.48370**
%RSD	0.20417	0.45299	0.51394	0.56364	0.59815	0.27860	0.96207	0.20897	0.38751

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49239	0.97843	0.96593	19.58594	48.35428	0.49808	48.96518	0.96527	0.96827
#2	0.49524	0.98176	0.97375	19.67722	48.57672	0.50104	49.17916	0.96965	0.97323
Mean	**0.49382**	**0.98010**	**0.96984**	**19.63158**	**48.46550**	**0.49956**	**49.07217**	**0.96746**	**0.97075**
%RSD	0.40733	0.23984	0.56967	0.32878	0.32454	0.41857	0.30833	0.32040	0.36141

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	47.73458	0.97409	4.60865	0.95133	0.94520	4.92278	0.47222	0.99236	0.98456
#2	47.93343	0.98082	4.63580	0.95365	0.94494	4.96126	0.48004	1.00344	0.98422
Mean	**47.83401**	**0.97745**	**4.62223**	**0.95249**	**0.94507**	**4.94202**	**0.47613**	**0.99790**	**0.98439**
%RSD	0.29395	0.48661	0.41538	0.17248	0.01938	0.55068	1.16179	0.78547	0.02464

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.70596	0.98553	0.48586	0.16679	0.46808	0.49917	4.90146	0.47941	1.00232

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#2	4.74120	0.98777	0.48939	0.16809	0.46995	0.50465	4.93542	0.48212	1.00152
Mean	**4.72358**	**0.98665**	**0.48763**	**0.16744**	**0.46901**	**0.50191**	**4.91844**	**0.48076**	**1.00192**
%RSD	0.52758	0.16056	0.51252	0.54611	0.28119	0.77235	0.48815	0.39882	0.05619

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.97480	0.94724	0.98716
#2	0.97988	0.94784	0.99062
Mean	**0.97734**	**0.94754**	**0.98889**
%RSD	0.36740	0.04484	0.24759

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:39
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/10/2010 15:05:41
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00022	0.08490	-0.00106	0.00269	-0.00014	0.00041	-0.00457	0.02155	-0.00024
#2	0.00085	0.08115	0.00014	0.00181	-0.00017	0.00035	0.00306	0.01707	0.00023
Mean	**0.00032**	**0.08303**	**-0.00046**	**0.00225**	**-0.00015**	**0.00038**	**-0.00075**	**0.01931**	**0.00000**
%RSD	240.37413	3.19492	185.51298	27.68590	13.10991	10.57397	715.50252	16.38152	6840.30495

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00034	-0.00016	-0.00096	0.01669	-0.28453	0.00307	0.02787	-0.00001	0.00031
#2	0.00031	0.00025	-0.00048	0.01457	-0.27829	0.00306	0.02285	-0.00008	-0.00038
Mean	**-0.00002**	**0.00004**	**-0.00072**	**0.01563**	**-0.28141**	**0.00307**	**0.02536**	**-0.00005**	**-0.00004**
%RSD	2616.90941	656.85347	47.81049	9.59217	1.56590	0.25285	14.00734	115.43888	1287.35558

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.11998	-0.00016	-0.00279	0.00157	0.00017	-0.03139	0.00098	0.00141	0.00092
#2	-0.12363	-0.00004	-0.00564	0.00177	-0.00247	-0.02697	-0.00047	0.00147	-0.00230
Mean	**-0.12181**	**-0.00010**	**-0.00421**	**0.00167**	**-0.00115**	**-0.02918**	**0.00025**	**0.00144**	**-0.00069**
%RSD	2.11956	90.39849	47.84831	8.68171	161.76647	10.70739	407.40961	3.09639	329.58938

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00653	0.00067	-0.00157	-0.00363	-0.00072	0.00381	-0.00215	-0.00002	0.00088
#2	-0.00420	0.00030	-0.00162	-0.00309	-0.00091	0.00079	0.00832	0.00016	0.00081
Mean	**-0.00537**	**0.00049**	**-0.00160**	**-0.00336**	**-0.00081**	**0.00230**	**0.00308**	**0.00007**	**0.00085**
%RSD	30.82963	54.37204	1.90805	11.30564	16.53697	92.85537	240.24367	171.65897	6.02233

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00014	0.00063	0.00108
#2	0.00043	-0.00105	-0.00104

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Mean	**0.00028**	**-0.00021**	**0.00002NCH**
%RSD	71.77037	565.74196	7528.48790

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:39
SampleId1 : 1002239-1 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:07:35
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE41

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00274	0.04850	-0.00035	0.15403	0.03476	0.00009	-0.00846	80.92658	-0.00097
#2	-0.00146	0.05072	-0.00129	0.15423	0.03491	0.00009	-0.00489	80.86079	-0.00110
Mean	**-0.00210**	**0.04961**	**-0.00082**	**0.15413**	**0.03484**	**0.00009**	**-0.00667**	**80.89368**	**-0.00103**
%RSD	42.85171	3.16618	81.47420	0.09177	0.28733	0.33782	37.85663	0.05751	9.17841

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00108	-0.00201	-0.00142	0.00461	3.59846	0.01416	49.67688	0.00361	0.01378
#2	-0.00013	-0.00140	-0.00123	0.00455	3.59686	0.01414	49.66467	0.00365	0.01402
Mean	**-0.00060**	**-0.00171**	**-0.00133**	**0.00458**	**3.59766**	**0.01415**	**49.67077**	**0.00363**	**0.01390**
%RSD	111.09029	24.95435	9.86221	0.81859	0.03155	0.10948	0.01738	0.74219	1.21900

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	38.77357	-0.00150	-0.02793	-0.00864	0.00200	47.71141	-0.00476	0.00651	0.01586
#2	38.77775	-0.00076	-0.03252	-0.00210	0.00013	47.49260	-0.00153	0.00911	0.01289
Mean	**38.77566**	**-0.00113**	**-0.03023**	**-0.00537**	**0.00107**	**47.60200**	**-0.00315**	**0.00781**	**0.01437**
%RSD	0.00762	46.17342	10.71764	86.21674	124.07510	0.32504	72.59797	23.53933	14.59602

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.39007	0.00990	0.61190	-0.02102	-0.00141	-0.00411	-0.05652	-0.00097	0.00218
#2	10.36542	0.01301	0.61224	-0.01986	-0.00149	-0.00132	-0.02110	0.00015	0.00261
Mean	**10.37774**	**0.01145**	**0.61207**	**-0.02044**	**-0.00145**	**-0.00271**	**-0.03881**	**-0.00041**	**0.00240**
%RSD	0.16794	19.23529	0.03961	4.03420	4.36434	72.57417	64.52719	194.82528	12.76317

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00270	-0.00154	0.01274
#2	-0.00199	-0.00061	0.01163
Mean	**-0.00234**	**-0.00108**	**0.01219**
%RSD	21.18674	61.15817	6.46042

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:39
SampleId1 : 1002239-2 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:09:22
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE42

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Final concentrations **2:49** **User: ROY FRENCH**

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00266	0.05036	-0.00498	0.22348	0.12822	0.00012	-0.00408	62.66276	-0.00108
#2	-0.00171	0.05120	-0.00276	0.22476	0.12890	0.00011	-0.00570	62.78609	-0.00068
Mean	**-0.00219**	**0.05078**	**-0.00387**	**0.22412**	**0.12856**	**0.00011**	**-0.00489**	**62.72442**	**-0.00088**
%RSD	30.81369	1.17028	40.62317	0.40393	0.37393	4.11266	23.40327	0.13904	32.03790

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00095	-0.00065	-0.00127	0.01192	3.02694	0.02284	16.06710	0.00152	-0.00046
#2	-0.00076	0.00002	-0.00052	0.01181	3.04301	0.02298	16.12486	0.00155	0.00079
Mean	**-0.00085**	**-0.00031**	**-0.00090**	**0.01187**	**3.03497**	**0.02291**	**16.09598**	**0.00154**	**0.00016**
%RSD	15.80491	151.13944	59.48361	0.63170	0.37436	0.43075	0.25370	1.75571	547.34091

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	49.62895	0.01913	-0.00462	-0.00685	0.00043	20.97773	-0.00262	0.01307	0.01468
#2	49.89469	0.01912	-0.00706	-0.00397	0.00048	20.99426	-0.00022	0.01862	0.01336
Mean	**49.76182**	**0.01912**	**-0.00584**	**-0.00541**	**0.00046**	**20.98599**	**-0.00142**	**0.01585**	**0.01402**
%RSD	0.37761	0.04721	29.57630	37.63053	7.28212	0.05572	119.44987	24.76242	6.67320

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	11.28894	0.01239	0.28250	-0.00905	-0.00102	-0.00616	-0.05802	-0.00028	0.00218
#2	11.34862	0.01538	0.28411	-0.00971	-0.00100	-0.00286	-0.02759	0.00031	0.00204
Mean	**11.31878**	**0.01388**	**0.28331**	**-0.00938**	**-0.00101**	**-0.00451**	**-0.04281**	**0.00001**	**0.00211**
%RSD	0.37285	15.23359	0.40261	4.91192	1.47365	51.84422	50.26406	3319.42270	4.83636

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00339	-0.00199	0.01414
#2	-0.00289	-0.00100	0.01511
Mean	**-0.00314**	**-0.00150**	**0.01463**
%RSD	11.15993	46.75942	4.66694

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:40
SampleId1 : 1002239-2L 5X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:11:10
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE43

Final concentrations

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00036	0.04403	-0.00223	0.04249	0.02327	-0.00002	-0.00773	11.77523	-0.00071
#2	-0.00014	0.04579	-0.00592	0.04205	0.02338	-0.00002	-0.00346	11.77791	-0.00079
Mean	**-0.00025**	**0.04491**	**-0.00408**	**0.04227**	**0.02333**	**-0.00002**	**-0.00560**	**11.77657**	**-0.00075**
%RSD	62.66329	2.77988	64.04583	0.73610	0.34324	1.75109	53.99756	0.01608	7.34916

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ted: 3/10/2010 16:02:49 User: ROY FRENCH

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00053	-0.00067	-0.00139	-0.00022	0.08673	0.00584	3.05662	-0.00028	-0.00073
#2	-0.00061	-0.00065	-0.00181	0.00010	0.08096	0.00582	3.05356	-0.00039	-0.00068
Mean	**-0.00057**	**-0.00066**	**-0.00160**	**-0.00006**	**0.08385**	**0.00583**	**3.05509**	**-0.00033**	**-0.00070**
%RSD	10.11015	2.96518	18.68841	379.61291	4.86313	0.23255	0.07084	24.31288	5.35117

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	8.80017	0.00314	-0.00839	-0.00163	-0.00040	3.72595	-0.00118	-0.00029	0.00260
#2	8.82210	0.00290	-0.00655	-0.00371	0.00043	3.73334	0.00007	0.00113	0.00138
Mean	**8.81114**	**0.00302**	**-0.00747**	**-0.00267**	**0.00002**	**3.72965**	**-0.00056**	**0.00042**	**0.00199**
%RSD	0.17600	5.67650	17.34540	54.88472	3070.33542	0.14016	160.07255	238.07789	43.21573

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.06975	0.00017	0.05178	-0.00020	-0.00098	0.00164	-0.00663	-0.00044	-0.00013
#2	2.07859	0.00055	0.05189	-0.00178	-0.00102	-0.00296	-0.01012	-0.00017	-0.00005
Mean	**2.07417**	**0.00036**	**0.05184**	**-0.00099**	**-0.00100**	**-0.00066**	**-0.00838**	**-0.00031**	**-0.00009**
%RSD	0.30138	73.13436	0.14711	112.53359	2.97834	492.00702	29.47010	62.03933	56.18314

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00145	-0.00081	0.00164
#2	-0.00139	-0.00095	0.00130
Mean	**-0.00142**	**-0.00088**	**0.00147**
%RSD	3.43604	11.12190	16.29283

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:40
SampleId1 : 1002239-2MS SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 15:12:57
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE44

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00140	2.35017	2.37436	1.33567	2.35535	0.05320	-0.00161	106.90018	0.05879
#2	-0.00015	2.37930	2.39811	1.35621	2.39585	0.05362	-0.00453	107.67505	0.05980
Mean	**-0.00078**	**2.36474**	**2.38624**	**1.34594**	**2.37560**	**0.05341**	**-0.00307**	**107.28762**	**0.05930**
%RSD	113.36147	0.87087	0.70386	1.07912	1.20542	0.55310	67.29706	0.51070	1.20406

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.54123	0.21623	0.27956	1.09946	57.79922	0.67124	64.78891	0.53624	1.11935
#2	0.54579	0.21777	0.28365	1.10939	58.29648	0.67767	65.28757	0.54126	1.13230
Mean	**0.54351**	**0.21700**	**0.28160**	**1.10443**	**58.04785**	**0.67446**	**65.03824**	**0.53875**	**1.12582**
%RSD	0.59258	0.50181	1.02621	0.63550	0.60573	0.67449	0.54216	0.65871	0.81281

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	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	95.07849	0.55486	-0.00757	0.52923	0.53622	19.00114	0.54452	2.61935	2.58188
#2	95.63280	0.56201	-0.00645	0.53410	0.52843	19.17672	0.55725	2.66394	2.58578
Mean	**95.35565**	**0.55844**	**-0.00701**	**0.53167**	**0.53233**	**19.08893**	**0.55089**	**2.64165**	**2.58383**
%RSD	0.41105	0.90524	11.29249	0.64727	1.03413	0.65039	1.63332	1.19341	0.10674

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	12.41708	0.58575	0.81388	-0.01740	0.53451	2.30326	-0.04729	0.55337	0.52466
#2	12.57577	0.58986	0.82688	-0.01825	0.54110	2.34364	-0.02684	0.55937	0.52842
Mean	**12.49642**	**0.58780**	**0.82038**	**-0.01782**	**0.53781**	**2.32345**	**-0.03707**	**0.55637**	**0.52654**
%RSD	0.89790	0.49373	1.12031	3.37458	0.86662	1.22885	39.00375	0.76255	0.50454

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00341	0.53389	2.59436
#2	-0.00328	0.53032	2.61180
Mean	**-0.00334**	**0.53211**	**2.60308**
%RSD	2.74396	0.47469	0.47396

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:40
SampleId1 : 1002239-2MSD SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 15:14:46
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE45

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00105	2.39288	2.43165	1.36522	2.40951	0.05423	-0.00330	108.40217	0.05931
#2	-0.00134	2.40551	2.44326	1.37571	2.43213	0.05440	-0.00115	108.49371	0.05950
Mean	**-0.00119**	**2.39920**	**2.43745**	**1.37047**	**2.42082**	**0.05431**	**-0.00222**	**108.44794**	**0.05940**
%RSD	17.47237	0.37233	0.33688	0.54127	0.66079	0.21524	68.41372	0.05969	0.22908

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.55082	0.22009	0.28606	1.12086	58.79133	0.68531	66.16149	0.54651	1.14753
#2	0.55290	0.22022	0.28789	1.12481	58.91536	0.68596	66.01262	0.54854	1.15583
Mean	**0.55186**	**0.22016**	**0.28698**	**1.12284**	**58.85334**	**0.68563**	**66.08706**	**0.54752**	**1.15168**
%RSD	0.26638	0.04014	0.45163	0.24872	0.14903	0.06678	0.15928	0.26225	0.50953

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	95.75867	0.56684	-0.00808	0.53713	0.53470	19.19023	0.56493	2.69413	2.59131
#2	96.12019	0.56924	-0.01256	0.53760	0.53467	19.45440	0.56915	2.70483	2.61006
Mean	**95.93943**	**0.56804**	**-0.01032**	**0.53737**	**0.53469**	**19.32231**	**0.56704**	**2.69948**	**2.60068**
%RSD	0.26645	0.29877	30.68920	0.06248	0.00362	0.96677	0.52621	0.28019	0.50983

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	12.55253	0.60281	0.82996	-0.01231	0.54700	2.36066	-0.03832	0.56468	0.53666
#2	12.70496	0.59907	0.83797	-0.01436	0.54987	2.37433	-0.03035	0.56693	0.53608
Mean	**12.62875**	**0.60094**	**0.83396**	**-0.01333**	**0.54843**	**2.36750**	**-0.03433**	**0.56581**	**0.53637**
%RSD	0.85353	0.44025	0.67938	10.89004	0.36903	0.40822	16.43159	0.28178	0.07620

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00410	0.53551	2.62555
#2	-0.00397	0.53565	2.64162
Mean	**-0.00403**	**0.53558**	**2.63358**
%RSD	2.19758	0.01847	0.43144

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:40
SampleId1 : 1002239-3 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:16:32
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE46

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00278	0.04462	-0.00347	0.24460	0.03963	0.00004	-0.00743	73.78231	-0.00100
#2	-0.00039	0.04429	-0.00607	0.24685	0.04012	0.00004	-0.00559	73.99047	-0.00069
Mean	**-0.00159**	**0.04445**	**-0.00477**	**0.24572**	**0.03987**	**0.00004**	**-0.00651**	**73.88639**	**-0.00085**
%RSD	106.64065	0.52090	38.50892	0.64474	0.85348	0.84141	20.04402	0.19921	25.74391

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00139	-0.00204	0.00055	-0.00313	2.85430	0.01132	59.91423	0.00037	0.00619
#2	-0.00028	-0.00067	0.00201	-0.00191	2.87129	0.01131	60.11248	0.00060	0.00555
Mean	**-0.00084**	**-0.00136**	**0.00128**	**-0.00252**	**2.86280**	**0.01132**	**60.01336**	**0.00049**	**0.00587**
%RSD	93.42884	71.13529	80.55096	34.15403	0.41967	0.05134	0.23359	33.21076	7.69393

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	72.52681	-0.00161	0.02684	-0.00676	0.00253	52.57348	0.00075	0.03901	0.03058
#2	72.77271	0.00002	0.02491	0.00121	-0.00170	52.80569	0.00438	0.03964	0.03394
Mean	**72.64976**	**-0.00080**	**0.02587**	**-0.00277**	**0.00041**	**52.68958**	**0.00256**	**0.03933**	**0.03226**
%RSD	0.23934	144.09423	5.28706	203.06881	722.46486	0.31163	100.29966	1.13039	7.36279

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	11.63912	0.02971	0.37738	-0.02046	-0.00110	-0.00630	-0.04055	-0.00103	0.00838
#2	11.69081	0.02797	0.37778	-0.02126	-0.00114	-0.00670	-0.00713	0.00063	0.00874
Mean	**11.66496**	**0.02884**	**0.37758**	**-0.02086**	**-0.00112**	**-0.00650**	**-0.02384**	**-0.00020**	**0.00856**
%RSD	0.31333	4.27791	0.07333	2.71325	2.65664	4.26895	99.12403	586.78209	2.97756

	Zr	**Pb**	**Se**
	ppm	calc	calc

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#1	-0.00302	-0.00056	0.03339	**NCH**
#2	-0.00198	-0.00073	0.03584	
Mean	**-0.00250**	**-0.00065**	**0.03461**	
%RSD	29.59599	18.41860	5.00492	

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:41
SampleId1 : 1002239-4 2X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:18:20
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE47

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00042	0.04226	-0.00532	0.16311	0.02721	-0.00008	0.00143	49.80063	-0.00090
#2	0.00033	0.03784	0.00029	0.16387	0.02743	-0.00009	-0.00060	49.95534	-0.00039
Mean	**-0.00005**	**0.04005**	**-0.00251**	**0.16349**	**0.02732**	**-0.00009**	**0.00041**	**49.87798**	**-0.00065**
%RSD	1092.80303	7.80907	157.96624	0.32877	0.58619	9.49991	347.90600	0.21932	56.24398

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00052	-0.00094	-0.00088	-0.00329	0.84836	0.00931	26.69668	-0.00031	0.00108
#2	-0.00025	-0.00042	-0.00011	-0.00207	0.84030	0.00930	26.81677	-0.00020	0.00121
Mean	**-0.00038**	**-0.00068**	**-0.00050**	**-0.00268**	**0.84433**	**0.00931**	**26.75672**	**-0.00026**	**0.00115**
%RSD	49.77728	54.62085	109.35851	32.12977	0.67526	0.02081	0.31738	31.54341	8.20846

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	31.58272	-0.00060	-0.00106	-0.00089	-0.00018	18.59907	-0.00009	0.00304	0.00588
#2	31.71161	0.00040	-0.00279	0.00078	-0.00336	18.78058	0.00266	0.00518	0.00367
Mean	**31.64717**	**-0.00010**	**-0.00192**	**-0.00005**	**-0.00177**	**18.68982**	**0.00129**	**0.00411**	**0.00478**
%RSD	0.28797	705.10781	63.67473	2152.53021	126.93744	0.68673	151.13743	36.79835	32.80992

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.99376	0.00454	0.27999	-0.01192	-0.00099	0.00152	-0.01361	0.00025	0.00196
#2	5.01748	0.00553	0.28170	-0.01263	-0.00093	0.00011	-0.00464	0.00078	0.00232
Mean	**5.00562**	**0.00504**	**0.28085**	**-0.01227**	**-0.00096**	**0.00081**	**-0.00913**	**0.00052**	**0.00214**
%RSD	0.33503	14.00078	0.43161	4.09157	5.03878	122.94513	69.57057	73.32677	11.88762

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00135	-0.00042	0.00494
#2	-0.00109	-0.00198	0.00417
Mean	**-0.00122**	**-0.00120**	**0.00456**
%RSD	15.61437	92.29854	11.88100

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Method : Paragon File : 100310A Printed : 3/10/2010 16:02:41
SampleId1 : 1002239-5 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:20:08

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Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE48

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00113	0.04102	0.00007	0.11774	0.03091	-0.00005	-0.00305	65.67674	-0.00103
#2	-0.00110	0.03875	-0.00091	0.11986	0.03137	-0.00005	-0.00122	66.23756	-0.00100
Mean	**-0.00111**	**0.03988**	**-0.00042**	**0.11880**	**0.03114**	**-0.00005**	**-0.00214**	**65.95715**	**-0.00102**
%RSD	1.88782	4.01220	164.19051	1.26202	1.02851	1.67562	60.66867	0.60124	2.42067

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00030	-0.00060	0.00033	-0.00181	3.54663	0.00678	43.03095	0.00007	0.00207
#2	-0.00043	-0.00065	-0.00017	-0.00191	3.59686	0.00679	43.45079	0.00011	0.00209
Mean	**-0.00037**	**-0.00062**	**0.00008**	**-0.00186**	**3.57175**	**0.00679**	**43.24087**	**0.00009**	**0.00208**
%RSD	25.96020	6.34930	422.37784	4.02705	0.99432	0.11418	0.68655	31.08266	0.90571

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	26.30946	0.00059	0.07043	-0.00057	0.00071	40.33423	-0.00062	0.01298	0.01264
#2	26.64911	-0.00024	0.07480	-0.00221	-0.00023	40.83338	-0.00212	0.01610	0.01421
Mean	**26.47928**	**0.00017**	**0.07262**	**-0.00139**	**0.00024**	**40.58381**	**-0.00137**	**0.01454**	**0.01343**
%RSD	0.90700	336.03096	4.26420	83.74641	275.77947	0.86969	77.18709	15.19062	8.28194

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.71872	0.01251	0.39053	-0.01267	-0.00086	-0.00230	-0.03457	0.00281	0.00586
#2	10.85479	0.01239	0.39667	-0.01745	-0.00104	-0.00394	-0.02659	0.00260	0.00550
Mean	**10.78675**	**0.01245**	**0.39360**	**-0.01506**	**-0.00095**	**-0.00312**	**-0.03058**	**0.00271**	**0.00568**
%RSD	0.89196	0.70663	1.10389	22.45155	13.28760	37.11423	18.45800	5.49663	4.49011

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00265	0.00028	0.01275
#2	-0.00243	-0.00089	0.01484
Mean	**-0.00254**	**-0.00030**	**0.01380**
%RSD	6.14356	273.64710	10.70666

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:41
SampleId1 : 1002239-6 SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 15:21:56
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE49

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00618	0.01185	-0.00423	0.20480	0.03069	-0.00009	-0.02529	73.76468	-0.00200
#2	-0.00440	0.01887	-0.00867	0.20764	0.03128	-0.00008	-0.01703	74.23834	-0.00166

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00029	0.03792	-0.00038	0.22020	0.04521	0.00001	-0.00508	94.40598	-0.00069
#2	-0.00036	0.03904	-0.00400	0.22152	0.04566	0.00001	-0.00487	94.82291	-0.00061
Mean	**-0.00032**	**0.03848**	**-0.00219**	**0.22086**	**0.04544**	**0.00001**	**-0.00498**	**94.61445**	**-0.00065**
%RSD	16.62044	2.05508	116.64149	0.42271	0.70495	30.36428	2.93771	0.31160	8.76212

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00048	-0.00037	0.00102	-0.00117	4.58082	0.04144	51.98136	0.13663	0.00060
#2	0.00013	-0.00051	0.00158	-0.00128	4.60830	0.04161	52.25199	0.13758	-0.00001
Mean	**0.00030**	**-0.00044**	**0.00130**	**-0.00123**	**4.59456**	**0.04153**	**52.11667**	**0.13710**	**0.00029**

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	43.36598	-0.00194	0.02847	-0.02385	0.01096	32.52625	-0.01535	-0.00564	0.02876
#2	43.58184	-0.00062	0.02572	-0.01755	0.00791	32.57185	-0.01225	-0.00101	0.02654
Mean	**43.47391**	**-0.00128**	**0.02710**	**-0.02070**	**0.00944**	**32.54905**	**-0.01380**	**-0.00333**	**0.02765**
%RSD	0.35109	72.59817	7.17442	21.50245	22.78854	0.09905	15.89740	98.32149	5.66748

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	11.32826	0.00678	0.37000	-0.01371	-0.00132	-0.01387	-0.13333	0.00052	0.00305
#2	11.38278	0.00815	0.37226	-0.01429	-0.00141	-0.00820	-0.09293	0.00209	0.00319
Mean	**11.35552**	**0.00747**	**0.37113**	**-0.01400**	**-0.00136**	**-0.01104**	**-0.11313**	**0.00130**	**0.00312**
%RSD	0.33951	12.98535	0.43099	2.92872	4.91554	36.29630	25.25336	85.27920	3.27053

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00512	-0.00063	0.01731
#2	-0.00425	-0.00057	0.01737
Mean	**-0.00469**	**-0.00060**	**0.01734**
%RSD	13.19597	8.03021	0.25487

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:42
SampleId1 : 1002239-7 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:23:44
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE50

Final concentrations

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%RSD	81.49948	23.41960	30.57169	6.11745	0.42285	0.27921	0.36718	0.49226	146.88958

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	72.44849	0.00045	0.00974	0.00211	-0.00301	48.48532	0.00397	0.04304	0.02075
#2	72.66253	-0.00020	0.00281	0.00028	-0.00127	48.66886	0.00223	0.03030	0.02765
Mean	**72.55551**	**0.00012**	**0.00627**	**0.00119**	**-0.00214**	**48.57709**	**0.00310**	**0.03667**	**0.02420**
%RSD	0.20859	372.62716	78.03043	108.00902	57.21871	0.26716	39.65209	24.56797	20.15368

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.40028	0.03420	0.49688	-0.01920	-0.00134	-0.00921	-0.00214	0.00013	0.00795
#2	10.42153	0.03046	0.50100	-0.01908	-0.00139	-0.01152	0.00434	0.00004	0.00809
Mean	**10.41091**	**0.03233**	**0.49894**	**-0.01914**	**-0.00136**	**-0.01037**	**0.00110**	**0.00009**	**0.00802**
%RSD	0.14432	8.17748	0.58353	0.44133	2.73085	15.77693	416.93762	78.10347	1.27132

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00178	-0.00130	0.02817
#2	-0.00193	-0.00076	0.02853
Mean	**-0.00185**	**-0.00103**	**0.02835**
%RSD	5.59367	37.62114	0.89491

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:42
SampleId1 : CCV SampleId2 : [CV]
Analysis commenced : 3/10/2010 15:25:31
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19484	48.10767	0.48504	0.94210	0.95942	0.48148	0.50106	46.97974	0.47680
#2	0.19551	48.50040	0.48802	0.94666	0.96600	0.48406	0.51444	47.24277	0.47925
Mean	**0.19518**	**48.30403**	**0.48653**	**0.94438**	**0.96271**	**0.48277**	**0.50775**	**47.11126**	**0.47803**
%RSD	0.24291	0.57489	0.43370	0.34168	0.48298	0.37837	1.86345	0.39478	0.36204

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48523	0.96506	0.95673	19.31718	47.66055	0.48957	48.27673	0.95235	0.95659
#2	0.48826	0.97079	0.96256	19.43856	47.99001	0.49318	48.57566	0.95850	0.96083
Mean	**0.48674**	**0.96792**	**0.95964**	**19.37787**	**47.82528**	**0.49137**	**48.42620**	**0.95543**	**0.95871**
%RSD	0.44000	0.41888	0.42959	0.44291	0.48711	0.51909	0.43649	0.45530	0.31282

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	47.00241	0.95870	4.54413	0.94066	0.92422	4.86357	0.46540	0.97545	0.95545
#2	47.34221	0.96444	4.59244	0.94518	0.92845	4.87393	0.47295	0.97674	0.96166
Mean	**47.17231**	**0.96157**	**4.56829**	**0.94292**	**0.92634**	**4.86875**	**0.46918**	**0.97610**	**0.95855**
%RSD	0.50936	0.42238	0.74776	0.33889	0.32253	0.15048	1.13802	0.09359	0.45871

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	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.64804	0.96698	0.48073	0.16314	0.46225	0.49088	4.84212	0.47376	0.98487
#2	4.68029	0.97594	0.48313	0.16283	0.46538	0.49107	4.88356	0.47598	0.98994
Mean	**4.66417**	**0.97146**	**0.48193**	**0.16299**	**0.46382**	**0.49098**	**4.86284**	**0.47487**	**0.98741**
%RSD	0.48895	0.65267	0.35314	0.13132	0.47818	0.02839	0.60252	0.33068	0.36283

	Zr	Pb	Se
	ppm	calc	calc
#1	0.96272	0.92970	0.96211
#2	0.96837	0.93402	0.96668
Mean	**0.96554**	**0.93186**	**0.96440**
%RSD	0.41400	0.32804	0.33565

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:42
SampleId1 : CCB SampleId2 : [CB]
Analysis commenced : 3/10/2010 15:28:51
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00040	0.06806	-0.00099	0.00113	-0.00039	0.00009	0.00072	0.01547	-0.00018
#2	0.00032	0.06923	-0.00200	0.00149	-0.00028	0.00010	-0.00233	0.01616	-0.00015
Mean	**-0.00004**	**0.06865**	**-0.00150**	**0.00131**	**-0.00034**	**0.00010**	**-0.00081**	**0.01581**	**-0.00017**
%RSD	1194.71581	1.19999	48.09356	19.46836	23.78091	2.39882	267.24560	3.07786	14.90350

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00021	-0.00006	-0.00110	0.01033	-0.38401	0.00276	0.01979	-0.00028	-0.00089
#2	0.00001	0.00000	-0.00047	0.01070	-0.39440	0.00276	0.02023	-0.00016	-0.00076
Mean	**-0.00010**	**-0.00003**	**-0.00079**	**0.01052**	**-0.38921**	**0.00276**	**0.02001**	**-0.00022**	**-0.00082**
%RSD	155.30212	164.49561	56.45801	2.49514	1.88734	0.07014	1.54379	37.05311	11.43145

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.13593	0.00017	-0.00523	-0.00055	-0.00103	-0.02255	-0.00023	0.00261	0.00049
#2	-0.13670	0.00009	-0.00299	0.00071	-0.00061	-0.02845	0.00037	0.00021	-0.00355
Mean	**-0.13632**	**0.00013**	**-0.00411**	**0.00008**	**-0.00082**	**-0.02550**	**0.00007**	**0.00141**	**-0.00153**
%RSD	0.39872	41.68487	38.52616	1131.80580	36.22797	16.33827	646.03428	120.06994	186.55231

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00874	0.00067	-0.00166	-0.00480	-0.00101	-0.00404	-0.00365	0.00004	0.00009
#2	-0.00744	0.00179	-0.00164	-0.00379	-0.00098	0.00101	0.00483	0.00048	-0.00005
Mean	**-0.00809**	**0.00123**	**-0.00165**	**-0.00430**	**-0.00099**	**-0.00151**	**0.00059**	**0.00026**	**0.00002**
%RSD	11.34002	64.27441	0.92290	16.65017	2.24558	235.92092	1011.19069	119.19488	585.77586

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	Zr	Pb	SeNCH
	ppm	calc	calc
#1	0.00009	-0.00087	0.00120
#2	0.00008	-0.00017	-0.00230
Mean	**0.00008**	**-0.00052**	**-0.00055**
%RSD	4.10209	95.49478	448.63910

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:42
SampleId1 : 1003007-1 2X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:30:44
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE51

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00053	0.05128	-0.00125	0.09706	0.01786	0.00015	-0.00223	91.97930	-0.00025
#2	-0.00366	0.02588	-0.00664	0.09462	0.01752	0.00006	-0.01539	89.28873	-0.00161
Mean	**-0.00209**	**0.03858**	**-0.00394**	**0.09584**	**0.01769**	**0.00011**	**-0.00881**	**90.63401**	**-0.00093**
%RSD	105.88323	46.55342	96.57911	1.80052	1.35749	58.99534	105.62354	2.09912	103.64076

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00094	-0.00112	0.00089	0.65598	2.24048	0.02658	51.92448	0.08750	-0.00124
#2	-0.00283	-0.00329	-0.00154	0.64278	2.15130	0.02650	50.60904	0.08552	-0.00387
Mean	**-0.00189**	**-0.00221**	**-0.00033**	**0.64938**	**2.19589**	**0.02654**	**51.26676**	**0.08651**	**-0.00255**
%RSD	70.89759	69.38807	522.82254	1.43710	2.87183	0.22595	1.81435	1.62200	72.97491

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	35.30504	0.00082	-0.03537	-0.00253	0.00001	39.66089	-0.00071	0.01398	0.00731
#2	35.24761	-0.00167	-0.04494	-0.01612	0.00825	39.16686	-0.01029	-0.00751	0.01592
Mean	**35.27633**	**-0.00043**	**-0.04015**	**-0.00933**	**0.00413**	**39.41388**	**-0.00550**	**0.00323**	**0.01161**
%RSD	0.11511	413.79650	16.85285	103.04664	141.09068	0.88631	123.27807	470.24447	52.44500

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.80567	0.01151	0.63827	0.00526	0.00013	-0.00312	-0.01456	-0.00077	0.01278
#2	7.71209	0.00466	0.63449	-0.00582	-0.00079	-0.01071	-0.07840	-0.00294	0.01047
Mean	**7.75888**	**0.00809**	**0.63638**	**-0.00028**	**-0.00033**	**-0.00691**	**-0.04648**	**-0.00185**	**0.01163**
%RSD	0.85287	59.91979	0.42019	2802.21308	195.50318	77.60984	97.11644	82.57336	14.03357

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00302	-0.00084	0.00953
#2	-0.00383	0.00014	0.00812
Mean	**-0.00342**	**-0.00035**	**0.00882**
%RSD	16.76291	196.39030	11.31758

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:43

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SampleId1 : 1003007-2 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:32:32
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE52

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00178	0.04835	-0.00159	0.21556	0.07865	0.00012	-0.00661	118.98984	-0.00085
#2	-0.00079	0.05391	-0.00057	0.21592	0.07851	0.00011	0.00011	118.91568	-0.00045
Mean	**-0.00129**	**0.05113**	**-0.00108**	**0.21574**	**0.07858**	**0.00011**	**-0.00325**	**118.95276**	**-0.00065**
%RSD	54.59512	7.69534	66.52851	0.11802	0.12741	4.47192	146.36794	0.04408	43.96958

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00050	-0.00112	0.00039	0.00052	2.82767	0.03927	41.22375	-0.00050	-0.00190
#2	-0.00055	-0.00046	0.00123	0.00127	2.82835	0.03918	41.15755	-0.00039	-0.00166
Mean	**-0.00053**	**-0.00079**	**0.00081**	**0.00089**	**2.82801**	**0.03922**	**41.19065**	**-0.00045**	**-0.00178**
%RSD	7.19232	59.12752	72.69826	58.63818	0.01722	0.15768	0.11364	18.09213	9.50864

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	44.76062	-0.00087	0.03030	-0.00252	0.00107	21.70411	0.00127	0.02645	0.01772
#2	44.64533	-0.00005	0.03285	0.00120	-0.00194	21.51457	0.00360	0.03429	0.01814
Mean	**44.70298**	**-0.00046**	**0.03158**	**-0.00066**	**-0.00043**	**21.60934**	**0.00243**	**0.03037**	**0.01793**
%RSD	0.18237	126.33214	5.70051	399.45141	493.99863	0.62022	67.79862	18.25293	1.69066

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	17.36308	0.02535	0.66027	-0.01711	-0.00146	-0.00894	-0.01910	-0.00046	0.00824
#2	17.33211	0.02884	0.66013	-0.01807	-0.00176	-0.00355	0.00235	0.00063	0.00795
Mean	**17.34759**	**0.02710**	**0.66020**	**-0.01759**	**-0.00161**	**-0.00625**	**-0.00838**	**0.00009**	**0.00809**
%RSD	0.12626	9.10774	0.01487	3.85229	12.94339	61.03709	181.00177	886.10580	2.51999

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00387	-0.00012	0.02062
#2	-0.00307	-0.00089	0.02352
Mean	**-0.00347**	**-0.00051**	**0.02207**
%RSD	16.19841	107.23318	9.27887

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:43
SampleId1 : 1003007-3 2X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:34:20
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE53

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	-0.00115	0.05388	-0.00140	0.07978	0.02053	0.00007	-0.00346	58.58654	-0.00079
#2	-0.00071	0.05172	-0.00389	0.08190	0.02061	0.00008	-0.00010	58.88195	-0.00061
Mean	**-0.00093**	**0.05280**	**-0.00264**	**0.08084**	**0.02057**	**0.00007**	**-0.00178**	**58.73425**	**-0.00070**
%RSD	32.89255	2.88456	66.48235	1.85470	0.29197	11.11510	133.64781	0.35564	17.75970

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00056	0.00010	-0.00082	-0.00017	0.77671	0.01786	16.75338	0.00060	0.00159
#2	-0.00091	-0.00044	-0.00089	-0.00017	0.77533	0.01795	16.85397	0.00068	0.00225
Mean	**-0.00073**	**-0.00017**	**-0.00085**	**-0.00017**	**0.77602**	**0.01790**	**16.80368**	**0.00064**	**0.00192**
%RSD	33.99639	227.31899	5.93563	0.00000	0.12596	0.35684	0.42330	8.43054	24.52787

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	41.99576	0.00635	-0.00818	-0.00161	-0.00138	25.50508	-0.00051	0.00704	0.00281
#2	42.31630	0.00574	-0.00981	-0.00245	-0.00200	25.77991	-0.00230	-0.00034	0.00410
Mean	**42.15603**	**0.00604**	**-0.00900**	**-0.00203**	**-0.00169**	**25.64250**	**-0.00141**	**0.00335**	**0.00345**
%RSD	0.53766	7.17301	12.80126	29.28896	25.97579	0.75785	89.73612	155.99186	26.34400

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	6.41507	0.00441	0.28649	-0.00815	-0.00131	-0.00259	-0.01012	-0.00052	0.00023
#2	6.46674	0.00304	0.28916	-0.00916	-0.00125	-0.00143	-0.00913	-0.00038	0.00088
Mean	**6.44091**	**0.00373**	**0.28782**	**-0.00865**	**-0.00128**	**-0.00201**	**-0.00963**	**-0.00045**	**0.00056**
%RSD	0.56725	26.01214	0.65405	8.17926	3.20839	40.83827	7.32877	21.09728	82.20664

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00201	-0.00145	0.00422
#2	-0.00199	-0.00215	0.00262
Mean	**-0.00200**	**-0.00180**	**0.00342**
%RSD	0.59659	27.21991	33.10474

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:44
SampleId1 : 1003009-1 2X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:36:09
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE54

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00124	0.06060	-0.00212	0.11918	0.01005	0.00011	-0.00295	35.88117	-0.00060
#2	-0.00096	0.05596	-0.00144	0.11842	0.01022	0.00009	-0.01130	35.92923	-0.00079
Mean	**-0.00110**	**0.05828**	**-0.00178**	**0.11880**	**0.01014**	**0.00010**	**-0.00713**	**35.90520**	**-0.00069**
%RSD	18.00094	5.63316	26.96739	0.45242	1.18478	12.84723	82.82448	0.09466	19.57012

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00114	-0.00091	-0.00158	0.04124	7.41122	0.01713	15.43345	0.01948	0.00084

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#2	-0.00100	-0.00098	-0.00173	0.04081	7.42535	0.01715	15.44641	0.01952	-0.00060
Mean	**-0.00107**	**-0.00094**	**-0.00165**	**0.04102**	**7.41829**	**0.01714**	**15.43993**	**0.01950**	**0.00012**
%RSD	8.97965	4.86519	6.06499	0.73106	0.13472	0.07907	0.05932	0.13831	835.18202

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	40.30279	-0.00061	1.69508	-0.00300	-0.00069	42.04853	-0.00021	0.00446	0.00603
#2	40.41590	-0.00104	1.71074	-0.00499	-0.00057	42.25553	-0.00447	0.00096	0.00646
Mean	**40.35935**	**-0.00083**	**1.70291**	**-0.00400**	**-0.00063**	**42.15203**	**-0.00234**	**0.00271**	**0.00625**
%RSD	0.19817	37.08863	0.65020	35.19297	13.01674	0.34725	128.70895	91.47442	4.85321

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	6.27748	0.00828	0.66881	-0.00464	-0.00075	-0.00352	-0.02462	0.00183	0.00506
#2	6.29513	0.00429	0.67309	-0.00652	-0.00103	-0.00382	-0.02412	0.00139	0.00528
Mean	**6.28631**	**0.00628**	**0.67095**	**-0.00558**	**-0.00089**	**-0.00367**	**-0.02437**	**0.00161**	**0.00517**
%RSD	0.19857	44.89210	0.45126	23.86100	21.76577	5.75463	1.44825	19.37504	2.95693

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00209	-0.00146	0.00551
#2	-0.00227	-0.00204	0.00463
Mean	**-0.00218**	**-0.00175**	**0.00507**
%RSD	5.68462	23.65729	12.26954

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:44
SampleId1 : 1003010-1 5X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:37:56
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE55

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00003	0.05029	-0.00057	0.13646	0.00445	0.00000	-0.00631	26.00254	-0.00069
#2	0.00016	0.05318	0.00003	0.13650	0.00445	0.00000	-0.00050	26.01237	-0.00061
Mean	**0.00010**	**0.05174**	**-0.00027**	**0.13648**	**0.00445**	**0.00000**	**-0.00340**	**26.00745**	**-0.00065**
%RSD	97.22281	3.95488	157.19542	0.02073	0.00000	5.77759	120.72487	0.02673	8.68904

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00134	-0.00085	-0.00104	-0.00128	4.99695	0.00390	41.85615	0.05083	0.05804
#2	0.00107	-0.00062	-0.00077	-0.00149	5.01640	0.00389	41.88095	0.05095	0.05716
Mean	**0.00121**	**-0.00074**	**-0.00090**	**-0.00138**	**5.00668**	**0.00390**	**41.86855**	**0.05089**	**0.05760**
%RSD	15.88631	21.64680	21.30564	10.82953	0.27469	0.19881	0.04189	0.15902	1.07883

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	13.27310	0.01428	-0.00991	0.00008	-0.00204	32.40467	0.00225	-0.00072	-0.00205
#2	13.31814	0.01496	-0.01470	0.00127	-0.00215	32.52321	0.00086	0.00301	-0.00012

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Mean	**13.29562**	**0.01462**	**-0.01231**	**0.00068**	**-0.00209**	**32.46394**	**0.00156**	**0.00115**	**-0.00109**
%RSD	0.23950	3.27398	27.49326	124.45366	3.94304	0.25819	63.00180	230.07237	125.64573

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.64438	-0.00057	6.98027	-0.01480	-0.00108	-0.00052	0.00185	-0.00021	-0.00034
#2	1.64698	0.00130	7.02928	-0.01710	-0.00118	0.00017	0.01631	0.00008	-0.00070
Mean	**1.64568**	**0.00036**	**7.00478**	**-0.01595**	**-0.00113**	**-0.00018**	**0.00908**	**-0.00007**	**-0.00052**
%RSD	0.11157	365.49321	0.49475	10.18513	6.57980	274.99123	112.64130	305.27807	48.70833

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00027	-0.00133	-0.00161
#2	-0.00004	-0.00101	0.00092
Mean	**-0.00016**	**-0.00117**	**-0.00034**
%RSD	103.47957	19.23467	522.10401

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:44
SampleId1 : 1002239-4 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:39:46
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE56

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00399	0.03405	-0.00411	0.34899	0.05903	0.00006	-0.01539	108.32775	-0.00131
#2	0.00012	0.05372	-0.00359	0.35195	0.05988	0.00008	-0.00142	109.13760	-0.00068
Mean	**-0.00193**	**0.04389**	**-0.00385**	**0.35047**	**0.05945**	**0.00007**	**-0.00840**	**108.73267**	**-0.00099**
%RSD	150.37529	31.68408	9.68655	0.59739	1.01028	17.30219	117.53851	0.52666	44.42034

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00161	-0.00250	-0.00190	-0.00403	2.85522	0.01802	57.69955	-0.00001	0.00257
#2	-0.00001	-0.00035	0.00032	-0.00229	2.87933	0.01812	58.15211	0.00030	0.00404
Mean	**-0.00081**	**-0.00142**	**-0.00079**	**-0.00316**	**2.86727**	**0.01807**	**57.92583**	**0.00014**	**0.00330**
%RSD	138.99967	106.92327	198.56096	39.13996	0.59454	0.38559	0.55244	149.85343	31.34553

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	69.46464	-0.00221	0.00577	-0.01127	0.00497	41.50898	-0.00743	0.00923	0.02140
#2	69.97768	-0.00033	0.01371	0.00013	-0.00085	41.55649	0.00161	0.01666	0.01468
Mean	**69.72116**	**-0.00127**	**0.00974**	**-0.00557**	**0.00206**	**41.53273**	**-0.00291**	**0.01295**	**0.01804**
%RSD	0.52033	104.65415	57.68051	144.60641	200.13599	0.08088	219.56124	40.59252	26.34505

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.82713	0.01015	0.60047	-0.01646	-0.00125	-0.00531	-0.07347	-0.00046	0.00586
#2	10.89154	0.01301	0.60589	-0.01177	-0.00114	-0.00319	-0.01461	0.00153	0.00586
Mean	**10.85934**	**0.01158**	**0.60318**	**-0.01412**	**-0.00120**	**-0.00425**	**-0.04404**	**0.00054**	**0.00586**

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%RSD	0.41944	17.50506	0.63534	23.51104	6.52907	35.36103	94.49980	262.60887	0.00000

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00362	-0.00044	0.01735
#2	-0.00238	-0.00053	0.01534
Mean	**-0.00300**	**-0.00048**	**0.01634**
%RSD	29.07052	13.17000	8.68727

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:45
SampleId1 : 1003007-1 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/10/2010 15:41:35
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE57

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00096	0.04908	-0.00453	0.19699	0.03822	0.00023	-0.00671	190.59894	-0.00039
#2	0.00026	0.05123	-0.00720	0.20083	0.03870	0.00022	-0.00639	191.79330	-0.00056
Mean	**-0.00035**	**0.05016**	**-0.00586**	**0.19891**	**0.03846**	**0.00023**	**-0.00655**	**191.19612**	**-0.00048**
%RSD	244.27751	3.02867	32.24448	1.36533	0.88489	0.87898	3.39741	0.44171	24.98636

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00029	-0.00089	0.00343	1.31594	6.16239	0.05621	106.02894	0.17622	-0.00230
#2	0.00028	-0.00010	0.00441	1.32711	6.21858	0.05668	106.84162	0.17787	-0.00198
Mean	**0.00000**	**-0.00050**	**0.00392**	**1.32152**	**6.19049**	**0.05645**	**106.43528**	**0.17704**	**-0.00214**
%RSD	15760.27427	112.84078	17.56933	0.59756	0.64176	0.59502	0.53991	0.65590	10.55012

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	74.10899	0.00150	-0.02620	-0.00119	-0.00039	81.79597	0.00408	0.04362	0.02510
#2	74.54507	0.00267	-0.02651	0.00277	-0.00249	82.39636	0.00443	0.04233	0.02817
Mean	**74.32703**	**0.00208**	**-0.02636**	**0.00079**	**-0.00144**	**82.09617**	**0.00425**	**0.04297**	**0.02664**
%RSD	0.41486	39.86679	0.81939	352.81913	102.99418	0.51712	5.88561	2.13169	8.16345

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	16.01041	0.03619	1.30164	-0.01883	-0.00177	-0.01068	-0.01501	-0.00022	0.02266
#2	16.11569	0.03819	1.31661	-0.00782	-0.00126	-0.01253	0.00643	0.00032	0.02331
Mean	**16.06305**	**0.03719**	**1.30913**	**-0.01332**	**-0.00152**	**-0.01160**	**-0.00429**	**0.00005**	**0.02298**
%RSD	0.46342	3.79023	0.80824	58.40989	23.78006	11.29771	353.39932	818.42223	1.99668

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00318	-0.00066	0.03127
#2	-0.00324	-0.00074	0.03289
Mean	**-0.00321**	**-0.00070**	**0.03208**
%RSD	1.37960	8.19719	3.57060

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ted: 3/10/2010 16:02:50 User: ROY FRENCH
Method : Paragon File : 100310A Printed : 3/10/2010 16:02:45
SampleId1 : 1003007-3 SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 15:43:23
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE58

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00188	0.04582	-0.00404	0.16875	0.04351	0.00003	-0.00570	120.62019	-0.00101
#2	0.00022	0.05063	-0.00144	0.16915	0.04371	0.00003	-0.00141	120.71888	-0.00048
Mean	**-0.00083**	**0.04822**	**-0.00274**	**0.16895**	**0.04361**	**0.00003**	**-0.00356**	**120.66954**	**-0.00074**
%RSD	179.69063	7.05328	67.11407	0.16744	0.32133	11.63786	85.22132	0.05783	49.99054

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00096	-0.00026	0.00034	0.00243	2.56722	0.03703	34.09858	0.00213	0.00630
#2	-0.00004	0.00085	0.00137	0.00291	2.56631	0.03704	34.16816	0.00209	0.00654
Mean	**-0.00050**	**0.00030**	**0.00086**	**0.00267**	**2.56677**	**0.03703**	**34.13337**	**0.00211**	**0.00642**
%RSD	131.24292	263.02249	85.16982	12.63143	0.02531	0.01566	0.14414	1.27927	2.63988

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	90.33612	0.01180	-0.01684	-0.00279	0.00168	53.85741	-0.00311	0.01467	0.01143
#2	90.42345	0.01252	-0.01002	0.00122	-0.00122	53.95194	-0.00030	0.01563	0.01425
Mean	**90.37978**	**0.01216**	**-0.01343**	**-0.00078**	**0.00023**	**53.90467**	**-0.00170**	**0.01515**	**0.01284**
%RSD	0.06833	4.15866	35.92342	363.34379	892.47634	0.12401	116.49155	4.48642	15.55088

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	13.38114	0.01364	0.58799	-0.01259	-0.00146	-0.00328	-0.04205	-0.00082	0.00247
#2	13.42844	0.01401	0.58842	-0.01685	-0.00156	0.00153	-0.00314	0.00017	0.00254
Mean	**13.40479**	**0.01382**	**0.58820**	**-0.01472**	**-0.00151**	**-0.00087**	**-0.02260**	**-0.00032**	**0.00250**
%RSD	0.24950	1.91328	0.05084	20.46880	4.43586	388.83128	121.75076	217.16958	2.03535

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00355	0.00019	0.01251
#2	-0.00264	-0.00040	0.01471
Mean	**-0.00310**	**-0.00011**	**0.01361**
%RSD	20.74941	392.56878	11.44861

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:45
SampleId1 : 1003009-1 SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 15:45:11
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE59

Final concentrations

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	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00217	0.05761	0.00063	0.24528	0.02157	0.00003	-0.00591	72.47391	-0.00093
#2	-0.00128	0.06561	-0.00264	0.24669	0.02203	0.00004	-0.00387	73.06839	-0.00056
Mean	**-0.00172**	**0.06161**	**-0.00101**	**0.24598**	**0.02180**	**0.00003**	**-0.00489**	**72.77115**	**-0.00074**
%RSD	36.43155	9.17811	230.43063	0.40254	1.46920	23.48913	29.57296	0.57764	35.20870

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00074	-0.00086	-0.00200	0.08323	18.60377	0.03477	31.06880	0.04000	0.00113
#2	-0.00023	-0.00037	-0.00067	0.08440	18.88228	0.03519	31.38217	0.04038	0.00153
Mean	**-0.00049**	**-0.00062**	**-0.00133**	**0.08382**	**18.74303**	**0.03498**	**31.22548**	**0.04019**	**0.00133**
%RSD	74.76301	56.67242	70.66334	0.98428	1.05070	0.84010	0.70963	0.67114	21.18277

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	84.81217	-0.00101	3.56056	-0.00383	0.00042	87.83601	0.00069	0.02353	0.01594
#2	85.83073	-0.00042	3.57682	-0.00044	-0.00156	88.84515	0.00009	0.02240	0.01526
Mean	**85.32145**	**-0.00071**	**3.56869**	**-0.00213**	**-0.00057**	**88.34058**	**0.00039**	**0.02296**	**0.01560**
%RSD	0.84414	58.26888	0.32220	112.29365	245.30099	0.80775	109.04570	3.48844	3.07841

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	13.00561	0.02373	1.35955	-0.01233	-0.00115	-0.00412	-0.04161	0.00369	0.00990
#2	13.16760	0.02149	1.37733	-0.01507	-0.00109	-0.00653	-0.02215	0.00480	0.01033
Mean	**13.08661**	**0.02261**	**1.36844**	**-0.01370**	**-0.00112**	**-0.00533**	**-0.03188**	**0.00424**	**0.01011**
%RSD	0.87525	7.01660	0.91885	14.12547	3.66148	32.10770	43.14699	18.48685	3.02530

	Zr	Pb	Se
	ppm	calc	calc
#1	-0.00360	-0.00099	0.01847
#2	-0.00305	-0.00119	0.01764
Mean	**-0.00333**	**-0.00109**	**0.01805**
%RSD	11.68665	12.34808	3.25209

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:45
SampleId1 : 1003010-1 SampleId2 : [SAMPLE]
Analysis commenced : 3/10/2010 15:46:59
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE60

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00465	0.02725	-0.00498	0.69618	0.02488	0.00006	-0.01365	131.03705	-0.00213
#2	-0.00417	0.02965	-0.00607	0.70787	0.02559	0.00006	-0.01090	132.32214	-0.00128
Mean	**-0.00441**	**0.02845**	**-0.00553**	**0.70202**	**0.02524**	**0.00006**	**-0.01228**	**131.67959**	**-0.00171**
%RSD	7.73398	5.96232	13.97829	1.17710	1.98283	0.91329	15.88487	0.69008	35.21584

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

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	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00451	-0.00356	-0.00270	0.00233	35.63837	0.00991	222.43992	0.25057	0.28465
#2	0.00529	-0.00285	-0.00237	0.00264	36.28239	0.00996	225.08429	0.25389	0.28886
Mean	**0.00490**	**-0.00321**	**-0.00253**	**0.00248**	**35.96038**	**0.00994**	**223.76211**	**0.25223**	**0.28676**
%RSD	11.33374	15.60150	9.21472	9.04961	1.26638	0.38983	0.83564	0.93209	1.03796

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	72.98032	0.06907	-0.00655	-0.01651	0.00722	172.18170	-0.00993	-0.00158	0.01872
#2	74.02399	0.07012	-0.01073	-0.01458	0.00550	174.93943	-0.00769	0.00178	0.01625
Mean	**73.50215**	**0.06960**	**-0.00864**	**-0.01555**	**0.00636**	**173.56057**	**-0.00881**	**0.00010**	**0.01748**
%RSD	1.00404	1.06385	34.15593	8.77639	19.10926	1.12353	18.01351	2397.69782	9.97596

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	8.43446	0.00753	31.29708	-0.01282	-0.00137	-0.00862	-0.05053	-0.00268	0.00232
#2	8.56243	0.00578	31.13432	-0.01641	-0.00148	-0.00800	-0.01960	-0.00199	0.00182
Mean	**8.49844**	**0.00666**	**31.21570**	**-0.01462**	**-0.00143**	**-0.00831**	**-0.03507**	**-0.00233**	**0.00207**
%RSD	1.06472	18.53521	0.36867	17.32250	5.74178	5.24251	62.36098	20.87855	17.22172

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	-0.00422	-0.00068	0.01196
#2	-0.00372	-0.00119	0.01143
Mean	**-0.00397**	**-0.00093**	**0.01169**
%RSD	8.85380	38.11625	3.17981

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:46
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/10/2010 15:48:48
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19763	48.73308	0.50106	0.95675	0.96625	0.49342	0.51536	48.42651	0.48783
#2	0.19753	48.92632	0.49486	0.95603	0.96622	0.49359	0.50794	48.48100	0.48713
Mean	**0.19758**	**48.82970**	**0.49796**	**0.95639**	**0.96624**	**0.49350**	**0.51165**	**48.45375**	**0.48748**
%RSD	0.03527	0.27983	0.87974	0.05327	0.00208	0.02418	1.02608	0.07951	0.10180

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49901	0.98975	0.96597	19.78705	47.81553	0.49070	49.73749	0.97377	0.97793
#2	0.49852	0.99217	0.96757	19.80396	47.95297	0.49238	49.76791	0.97442	0.97961
Mean	**0.49876**	**0.99096**	**0.96677**	**19.79550**	**47.88425**	**0.49154**	**49.75270**	**0.97409**	**0.97877**
%RSD	0.06911	0.17280	0.11697	0.06041	0.20295	0.24137	0.04323	0.04746	0.12141

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

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#1	47.29147	0.98887	4.62961	0.96474	0.95198	4.94054	0.47867	0.98657	0.97291
#2	47.50498	0.98844	4.65738	0.96753	0.95885	4.98939	0.47632	0.99136	0.98360
Mean	**47.39822**	**0.98865**	**4.64349**	**0.96614**	**0.95542**	**4.96497**	**0.47750**	**0.98896**	**0.97825**
%RSD	0.31853	0.03104	0.42294	0.20413	0.50854	0.69573	0.34880	0.34239	0.77284

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.72073	1.00335	0.48572	0.16756	0.46875	0.50168	4.85230	0.48430	1.02194
#2	4.72359	0.99687	0.48464	0.16954	0.46926	0.50327	4.88481	0.48442	1.02505
Mean	**4.72216**	**1.00011**	**0.48518**	**0.16855**	**0.46900**	**0.50247**	**4.86856**	**0.48436**	**1.02349**
%RSD	0.04286	0.45809	0.15791	0.83058	0.07683	0.22358	0.47208	0.01721	0.21505

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.97735	0.95623	0.97746
#2	0.97830	0.96174	0.98618
Mean	**0.97782**	**0.95899**	**0.98182**
%RSD	0.06891	0.40642	0.62846

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:46
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/10/2010 15:50:41
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00021	0.07321	0.00108	0.00317	-0.00028	0.00019	0.00011	0.01753	-0.00027
#2	-0.00037	0.06670	0.00033	0.00257	-0.00042	0.00016	0.00021	0.01294	-0.00040
Mean	**-0.00008**	**0.06996**	**0.00071**	**0.00287**	**-0.00035**	**0.00017**	**0.00016**	**0.01524**	**-0.00034**
%RSD	512.48714	6.58293	75.21314	14.79537	28.52689	14.92127	45.62609	21.29135	26.51137

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00004	-0.00018	-0.00132	0.01330	-0.30599	0.00299	0.02459	-0.00012	-0.00094
#2	-0.00026	-0.00010	-0.00090	0.01171	-0.32146	0.00296	0.01673	-0.00024	-0.00025
Mean	**-0.00011**	**-0.00014**	**-0.00111**	**0.01250**	**-0.31372**	**0.00298**	**0.02066**	**-0.00018**	**-0.00060**
%RSD	187.23510	39.78202	27.00808	8.99347	3.48569	0.91189	26.90697	44.89492	81.97200

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.12805	0.00040	-0.00472	-0.00012	-0.00053	-0.02108	0.00084	0.00021	0.00013
#2	-0.13118	-0.00057	-0.00523	0.00014	-0.00103	-0.02108	-0.00125	-0.00236	-0.00198
Mean	**-0.12962**	**-0.00009**	**-0.00498**	**0.00001**	**-0.00078**	**-0.02108**	**-0.00020**	**-0.00107**	**-0.00092**
%RSD	1.70356	787.73421	7.23327	1627.52878	45.25897	0.00000	736.27464	169.26034	161.56775

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.01123	0.00130	-0.00126	-0.00396	-0.00085	-0.00048	0.00234	-0.00011	0.00023

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#2	-0.01143	0.00204	-0.00137	-0.00412	-0.00077	0.00056	0.00334	0.00021	0.00059
Mean	**-0.01133**	**0.00167**	**-0.00132**	**-0.00404**	**-0.00081**	**0.00004**	**0.00284**	**0.00005**	**0.00041**
%RSD	1.28263	31.65957	6.17046	2.86901	6.91286	1886.11710	24.89878	450.33232	61.57941

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00006	-0.00039	0.00016
#2	-0.00006	-0.00064	-0.00210
Mean	**0.00000**	**-0.00052**	**-0.00097**
%RSD	5556.52882	34.08642	164.39362

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:46
SampleId1 : CRI SampleId2 : [FLEXQC]
Analysis commenced : 3/10/2010 15:52:35
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD3

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01987	0.44275	0.01208	0.40273	0.41470	0.01000	0.04748	5.04678	0.01001
#2	0.02007	0.44141	0.00926	0.39933	0.41140	0.00994	0.04992	5.02288	0.00969
Mean	**0.01997**	**0.44208**	**0.01067**	**0.40103**	**0.41305**	**0.00997**	**0.04870**	**5.03483**	**0.00985**
%RSD	0.68192	0.21367	18.72012	0.59970	0.56346	0.37734	3.54307	0.33563	2.28358

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10071	0.01982	0.05025	0.21082	3.55856	0.01820	5.09171	0.02955	0.01935
#2	0.10092	0.01959	0.05041	0.20987	3.56108	0.01815	5.07224	0.02936	0.01852
Mean	**0.10082**	**0.01971**	**0.05033**	**0.21035**	**3.55982**	**0.01818**	**5.08197**	**0.02945**	**0.01893**
%RSD	0.14839	0.80646	0.21520	0.32114	0.05011	0.20232	0.27093	0.45787	3.08277

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.11957	0.08151	0.19102	0.00586	0.00491	0.18517	0.11479	0.00837	0.01074
#2	4.11398	0.07957	0.19123	0.00607	0.00456	0.17780	0.11496	0.00792	0.00759
Mean	**4.11678**	**0.08054**	**0.19113**	**0.00597**	**0.00474**	**0.18148**	**0.11487**	**0.00814**	**0.00917**
%RSD	0.09597	1.70406	0.07538	2.49722	5.08715	2.87028	0.10783	3.90573	24.26530

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09437	0.10284	0.01894	0.08739	0.01900	0.01786	0.21223	0.10315	0.03802
#2	0.09570	0.10197	0.01873	0.08862	0.01904	0.01833	0.19726	0.10203	0.03823
Mean	**0.09503**	**0.10241**	**0.01883**	**0.08800**	**0.01902**	**0.01809**	**0.20474**	**0.10259**	**0.03813**
%RSD	0.98853	0.60239	0.80905	0.98778	0.13701	1.86620	5.16879	0.77784	0.40123

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.05179	0.00522	0.00995
#2	0.05139	0.00507	0.00770

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Mean	**0.05159**	**0.00515**	**0.00882NCH**
%RSD	0.53975	2.15835	18.01085

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:47
SampleId1 : ICSA **SampleId2 :** **[FLEXQC]**
Analysis commenced : 3/10/2010 15:54:28
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD4

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00067	264.37483	0.00105	0.00101	-0.00034	0.00035	0.00561	260.79125	-0.00049
#2	0.00063	266.65224	0.00252	0.00077	-0.00034	0.00039	0.00805	262.99239	0.00004
Mean	**0.00065**	**265.51354**	**0.00178**	**0.00089**	**-0.00034**	**0.00037**	**0.00683**	**261.89182**	**-0.00023**
%RSD	4.08470	0.60651	58.29951	19.12069	0.00000	6.63486	25.31218	0.59431	163.70693

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00161	0.00043	-0.00511	106.53016	-0.42234	0.00435	271.22709	-0.00157	-0.00137
#2	0.00120	0.00042	-0.00511	107.28556	-0.42580	0.00436	273.21910	-0.00153	-0.00148
Mean	**0.00140**	**0.00043**	**-0.00511**	**106.90786**	**-0.42407**	**0.00435**	**272.22310**	**-0.00155**	**-0.00142**
%RSD	20.43872	2.54668	0.04807	0.49964	0.57743	0.17803	0.51743	1.73628	5.29389

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.13685	0.00124	0.00241	0.00328	-0.00096	-0.01519	0.00581	-0.00700	-0.00670
#2	-0.13737	0.00040	0.00312	0.00520	-0.00208	-0.02403	0.00820	0.00766	-0.00734
Mean	**-0.13711**	**0.00082**	**0.00276**	**0.00424**	**-0.00152**	**-0.01961**	**0.00700**	**0.00033**	**-0.00702**
%RSD	0.27253	72.71825	18.25030	32.07950	51.95544	31.87182	24.18163	3148.78025	6.41052

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.01275	0.00217	0.01108	-0.01620	-0.00164	-0.00035	0.04954	-0.00193	-0.00135
#2	-0.01165	0.00042	0.01121	-0.01201	-0.00160	-0.00136	0.05401	-0.00096	-0.00114
Mean	**-0.01220**	**0.00130**	**0.01115**	**-0.01411**	**-0.00162**	**-0.00085**	**0.05177**	**-0.00144**	**-0.00124**
%RSD	6.34968	95.12819	0.81988	20.97173	1.61003	83.98282	6.11112	47.52395	12.29137

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.00289	0.00045	-0.00680
#2	0.00248	0.00034	-0.00234
Mean	**0.00268**	**0.00040**	**-0.00457**
%RSD	10.60046	18.77726	68.91163

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Method : Paragon File : 100310A Printed : 3/10/2010 16:02:47
SampleId1 : ICSAB **SampleId2 :** **[FLEXQC]**
Analysis commenced : 3/10/2010 15:56:22
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD5

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Final concentrations **2:50** **User: ROY FRENCH**

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.21058	270.44176	0.11533	1.01767	0.51960	0.49131	0.56317	268.31404	1.02871
#2	0.21011	271.00707	0.11118	1.01687	0.51937	0.49133	0.55543	268.69209	1.02590
Mean	**0.21035**	**270.72442**	**0.11326**	**1.01727**	**0.51949**	**0.49132**	**0.55930**	**268.50306**	**1.02731**
%RSD	0.15830	0.14765	2.58857	0.05565	0.03092	0.00299	0.97917	0.09956	0.19367

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48530	0.48598	0.52551	109.41293	-0.40271	1.06125	279.10932	0.47829	1.01986
#2	0.48506	0.48588	0.52537	109.47901	-0.39833	1.06294	279.46197	0.47875	1.02082
Mean	**0.48518**	**0.48593**	**0.52544**	**109.44597**	**-0.40052**	**1.06209**	**279.28564**	**0.47852**	**1.02034**
%RSD	0.03525	0.01550	0.01965	0.04270	0.77438	0.11221	0.08929	0.06790	0.06656

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.14660	0.96080	0.99693	0.05674	0.05563	1.04598	0.60953	0.05811	0.05162
#2	-0.14626	0.96415	0.98999	0.05861	0.05483	1.03861	0.60695	0.05767	0.05306
Mean	**-0.14643**	**0.96248**	**0.99346**	**0.05768**	**0.05523**	**1.04229**	**0.60824**	**0.05789**	**0.05234**
%RSD	0.16239	0.24569	0.49428	2.29220	1.02462	0.50020	0.29973	0.52900	1.94464

	Si	**Sn**	**Sr**	**Th**	**Ti**	**Tl**	**U**	**V**	**Zn**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.96954	1.03952	1.01496	0.04509	0.97042	0.11041	10.51459	0.49471	0.91909
#2	0.97078	1.04076	1.01531	0.05130	0.96963	0.10971	10.52057	0.49696	0.92170
Mean	**0.97016**	**1.04014**	**1.01514**	**0.04820**	**0.97003**	**0.11006**	**10.51758**	**0.49584**	**0.92039**
%RSD	0.09015	0.08476	0.02465	9.11636	0.05731	0.44659	0.04019	0.32061	0.20013

	Zr	**Pb**	**Se**
	ppm	calc	calc
#1	0.51583	0.05600	0.05378
#2	0.51528	0.05609	0.05460
Mean	**0.51555**	**0.05605**	**0.05419**
%RSD	0.07505	0.11200	1.06469

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:47
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/10/2010 15:58:15
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.20040	49.77018	0.50102	0.97584	0.98806	0.49975	0.52056	48.92905	0.49696
#2	0.20264	50.04333	0.50903	0.98329	0.99538	0.50215	0.52385	49.14689	0.49809
Mean	**0.20152**	**49.90675**	**0.50502**	**0.97956**	**0.99172**	**0.50095**	**0.52221**	**49.03797**	**0.49752**
%RSD	0.78597	0.38702	1.12137	0.53746	0.52171	0.33848	0.44653	0.31412	0.16092

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	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.50434	1.00182	0.98891	20.04311	48.80287	0.50271	50.35721	0.98473	0.99284
#2	0.50743	1.00573	0.99480	20.15397	49.07501	0.50586	50.58305	0.99000	0.99975
Mean	**0.50589**	**1.00378**	**0.99186**	**20.09854**	**48.93894**	**0.50429**	**50.47013**	**0.98736**	**0.99629**
%RSD	0.43114	0.27499	0.41959	0.39002	0.39322	0.44120	0.31642	0.37734	0.49037

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.35012	1.00845	4.69373	0.97581	0.96315	5.04120	0.48577	1.00653	0.99201
#2	48.54233	1.01413	4.72998	0.98038	0.96512	5.07525	0.48970	1.01380	0.99765
Mean	**48.44622**	**1.01129**	**4.71185**	**0.97810**	**0.96413**	**5.05823**	**0.48773**	**1.01016**	**0.99483**
%RSD	0.28054	0.39714	0.54397	0.33030	0.14503	0.47600	0.56921	0.50920	0.40128

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.79339	1.01331	0.49322	0.17022	0.47519	0.51477	4.96068	0.49107	1.02975
#2	4.82079	1.01567	0.49729	0.17070	0.47797	0.52228	5.02114	0.49280	1.03258
Mean	**4.80709**	**1.01449**	**0.49525**	**0.17046**	**0.47658**	**0.51853**	**4.99091**	**0.49193**	**1.03117**
%RSD	0.40298	0.16477	0.58054	0.20022	0.41312	1.02494	0.85654	0.24750	0.19360

	Zr	Pb	Se
	ppm	calc	calc
#1	0.99547	0.96736	0.99684
#2	1.00221	0.97020	1.00303
Mean	**0.99884**	**0.96878**	**0.99994**
%RSD	0.47741	0.20732	0.43758

Method : Paragon File : 100310A Printed : 3/10/2010 16:02:48
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/10/2010 16:00:09
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00053	0.08442	0.00007	0.00253	-0.00036	0.00032	-0.00264	0.01317	-0.00012
#2	0.00000	0.07501	0.00052	0.00209	-0.00045	0.00031	0.00153	0.01191	-0.00019
Mean	**0.00027**	**0.07972**	**0.00029**	**0.00231**	**-0.00041**	**0.00032**	**-0.00055**	**0.01254**	**-0.00016**
%RSD	140.05343	8.35156	108.74703	13.48301	14.73784	3.01212	531.74513	7.11347	35.55165

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00012	0.00008	-0.00111	0.01314	-0.28453	0.00296	0.02001	-0.00016	-0.00073
#2	-0.00037	-0.00014	-0.00117	0.01187	-0.29376	0.00293	0.01673	-0.00024	-0.00092
Mean	**-0.00013**	**-0.00003**	**-0.00114**	**0.01250**	**-0.28914**	**0.00295**	**0.01837**	**-0.00020**	**-0.00082**
%RSD	273.24711	534.87623	3.71805	7.19478	2.25784	0.59194	12.61085	27.06587	16.00403

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	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.13444	-0.00001	-0.00666	0.00172	-0.00121	-0.03287	0.00252	-0.00137	-0.00305
#2	-0.13622	0.00030	-0.00309	0.00070	-0.00157	-0.03287	0.00067	0.00354	-0.00298
Mean	**-0.13533**	**0.00014**	**-0.00487**	**0.00121**	**-0.00139**	**-0.03287**	**0.00159**	**0.00108**	**-0.00301**
%RSD	0.92874	151.82258	51.69046	59.94257	18.17168	0.00000	82.38621	321.19087	1.67760

	Si	Sn	Sr	Th	Ti	Tl	U	V	Zn
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00888	0.00155	-0.00157	-0.00243	-0.00082	-0.00134	0.00284	0.00012	0.00074
#2	-0.01031	-0.00045	-0.00159	-0.00161	-0.00095	-0.00016	-0.01113	0.00021	0.00074
Mean	**-0.00960**	**0.00055**	**-0.00158**	**-0.00202**	**-0.00088**	**-0.00075**	**-0.00415**	**0.00017**	**0.00074**
%RSD	10.51232	257.11859	0.64179	28.64215	10.55806	111.99068	238.12667	40.68886	0.00000

	Zr	Pb	Se
	ppm	calc	calc
#1	0.00016	-0.00023	-0.00249
#2	-0.00009	-0.00081	-0.00081
Mean	**0.00003**	**-0.00052**	**-0.00165**
%RSD	538.02051	78.13934	72.11810

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Header Information for Analytical Run:10030801

Analyst: SL

Standards:

Stock A: 10ppm (ST100112-7)
Stock B: 10ppm (ST100112-4)
Daily standards made by diluting stock solution 100X

Reagents:

See digestion log

Pipettes Used:

M-57 - 0.01 mL to 0.1 mL
M-1010 - 1.0 mL to 5.0 mL
M-61 - 0.1 mL to 1.0 mL

Method of Dilution:

2X - Dilution made by diluting 5ml of sample to 10ml final volume.
5X - Dilution made by diluting 2.0ml of sample to 10ml final volume.
10X - Dilution made by diluting 1.0ml of sample to 10ml final volume.
20X - Dilution made by diluting 0.5ml of sample to 10ml final volume.
50X - Dilution made by diluting 0.2ml of sample to 10ml final volume.
100X - Dilution made by diluting 0.1ml of sample to 10ml final volume.
500X - Dilution made by diluting a 5X dilution 100X
1000X – Dilution made by diluting a 10X dilution 100X

Daily Maintenance:

1. Check / Change peristaltic pump tubing
2. Check gas liquid separator for deposits, clean if necessary
3. Check / Refill rinse water and stannous chloride reservoirs

Daily Maintenance done by: SL

Monthly Maintenance:

1. Check / Clean sample and reference cells
2. Check / Change Nafion drying cartridge

Monthly Maintenance done by: SL 2-12-2009

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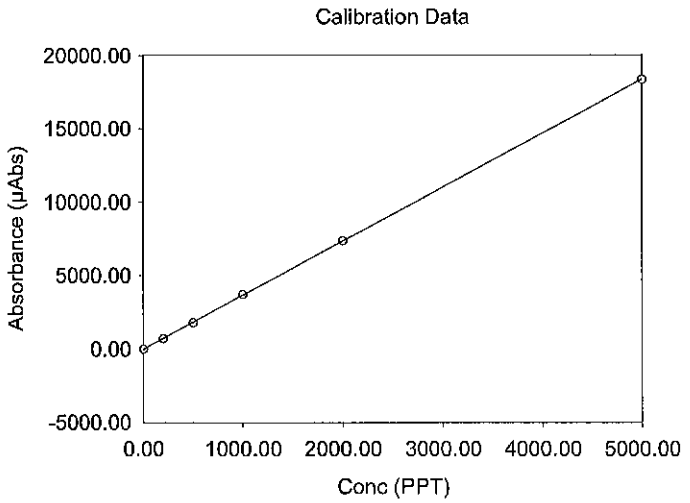
CETAC Hg Analysis Report - 10030801.DB - Monday, March 08, 2010, 3:32:06 PM

Analyst
Date Started Monday, March 08, 2010, 14:16:51
Worksheet PARAGON
Comment

Sample ID	Analysis Time	Conc (PPT)	%RSD	Avg. µAbs	Readings				Flags
Calibration Zero	08-Mar-2010, 14:16	0.00	23.90	1.40	1	1	2	2	
Standard #1	08-Mar-2010, 14:18	200.00	0.91	709.00	715	707	701	713	
Standard #2	08-Mar-2010, 14:20	500.00	1.64	1800.00	1763	1797	1817	1830	
Standard #3	08-Mar-2010, 14:21	1000.00	0.42	3720.00	3701	3716	3719	3740	
Standard #4	08-Mar-2010, 14:23	2000.00	1.05	7360.00	7398	7420	7385	7248	
Standard #5	08-Mar-2010, 14:24	5000.00	0.80	18400.00	18193	18361	18396	18550	



Int.	-4.799
Slope	3.678
Correlation	0.99999

Sample ID	Analysis Time	Conc (PPT)	%RSD	Avg. µAbs	Readings				Flags
IPC	08-Mar-2010, 14:26	2000.00	0.41	7340.00	7314	7312	7343	7375	
ICV	08-Mar-2010, 14:28	1010.00	1.23	3690.00	3631	3689	3720	3733	
ICB	08-Mar-2010, 14:29	1.54	20.20	0.87	0	-0	2	1	
CRA	08-Mar-2010, 14:31	185.00	0.34	676.00	676	677	672	676	
HG100308-1MB	08-Mar-2010, 14:32	5.09	9.39	13.90	13	13	14	16	
HG100308-1LCS	08-Mar-2010, 14:34	997.00	0.83	3660.00	3621	3655	3677	3691	
HG100308-1LCSD	08-Mar-2010, 14:36	995.00	0.38	3650.00	3633	3660	3662	3660	
1003006-4	08-Mar-2010, 14:37	27.20	3.21	95.30	97	99	94	91	
1003037-3	08-Mar-2010, 14:39	60.50	1.80	218.00	215	214	220	222	
1003037-3D	08-Mar-2010, 14:40	59.20	2.23	213.00	208	210	216	217	
1003037-3L 5X	08-Mar-2010, 14:42	15.80	2.25	53.20	54	51	54	53	
1003037-3MS	08-Mar-2010, 14:44	1970.00	0.98	7260.00	7165	7241	7289	7331	
1003037-3MSD	08-Mar-2010, 14:45	1950.00	4.38	7160.00	6833	6955	7351	7491	
CCV	08-Mar-2010, 14:47	1980.00	1.86	7290.00	7169	7194	7343	7458	
CCB	08-Mar-2010, 14:48	0.80	106.00	-1.87	-4	1	0	-5	
1003037-9	08-Mar-2010, 14:50	7.41	11.20	22.50	19	21	22	27	
1003037-15	08-Mar-2010, 14:52	3.97	21.20	9.82	10	11	13	5	
1003037-20	08-Mar-2010, 14:53	4.93	23.60	13.30	9	15	18	11	
1003037-25	08-Mar-2010, 14:55	3.54	16.50	8.24	10	9	9	5	
1003058-1	08-Mar-2010, 14:56	7.12	5.90	21.40	23	21	20	22	
1003063-4	08-Mar-2010, 14:58	4.60	5.05	12.10	12	13	11	12	
1003063-4D	08-Mar-2010, 15:00	6.18	15.60	17.90	13	18	19	21	
1003063-4L 5X	08-Mar-2010, 15:01	5.47	15.90	15.30	19	16	15	11	
1003063-4MS	08-Mar-2010, 15:03	1950.00	0.92	7170.00	7087	7157	7204	7240	
1003063-4MSD	08-Mar-2010, 15:05	1960.00	1.20	7210.00	7097	7178	7265	7286	
CCV	08-Mar-2010, 15:06	2020.00	0.39	7420.00	7379	7417	7445	7434	
CCB	08-Mar-2010, 15:08	0.50	139.00	-2.95	0	-6	-4	-2	
1003063-7	08-Mar-2010, 15:09	62.10	3.19	224.00	214	222	228	230	
1003063-10	08-Mar-2010, 15:11	4.43	4.35	11.50	11	12	11	11	
1003063-11	08-Mar-2010, 15:13	4.75	9.78	12.70	11	13	15	12	
1003063-15	08-Mar-2010, 15:14	5.13	9.83	14.10	16	12	13	14	
1003063-17	08-Mar-2010, 15:16	3.12	19.50	6.68	10	5	6	6	
1003063-18	08-Mar-2010, 15:17	2.72	8.39	5.21	4	6	6	5	
CRA	08-Mar-2010, 15:19	180.00	1.29	658.00	665	651	650	665	
CCV	08-Mar-2010, 15:21	1970.00	0.80	7260.00	7179	7253	7293	7309	
CCB	08-Mar-2010, 15:22	2.43	14.90	4.13	3	4	4	6	

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Header Information for Analytical Run:10030802

Analyst: SL

Standards:

Stock A: 10ppm (ST100112-7)
Stock B: 10ppm (ST100112-4)
Daily standards made by diluting stock solution 100X

Reagents:

See digestion log

Pipettes Used:

M-57 - 0.01 mL to 0.1 mL
M-1010 - 1.0 mL to 5.0 mL
M-61 - 0.1 mL to 1.0 mL

Method of Dilution:

2X - Dilution made by diluting 5ml of sample to 10ml final volume.
5X - Dilution made by diluting 2.0ml of sample to 10ml final volume.
10X - Dilution made by diluting 1.0ml of sample to 10ml final volume.
20X - Dilution made by diluting 0.5ml of sample to 10ml final volume.
50X - Dilution made by diluting 0.2ml of sample to 10ml final volume.
100X - Dilution made by diluting 0.1ml of sample to 10ml final volume.
500X - Dilution made by diluting a 5X dilution 100X
1000X – Dilution made by diluting a 10X dilution 100X

Daily Maintenance:

1. Check / Change peristaltic pump tubing
2. Check gas liquid separator for deposits, clean if necessary
3. Check / Refill rinse water and stannous chloride reservoirs

Daily Maintenance done by: SL

Monthly Maintenance:

1. Check / Clean sample and reference cells
2. Check / Change Nafion drying cartridge

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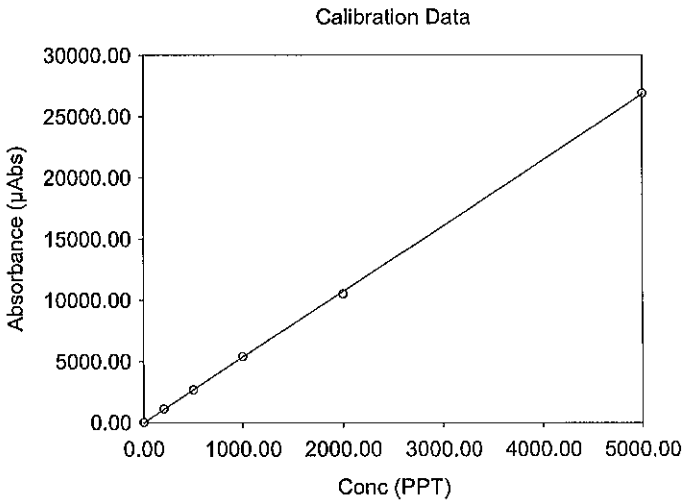
Monthly Maintenance done by: SL 2-12-2009

CETAC Hg Analysis Report - 10030802.DB - Monday, March 08, 2010, 4:51:38 PM

Analyst
Date Started Monday, March 08, 2010, 15:40:28
Worksheet PARAGON
Comment

Sample ID	Analysis Time	Conc (PPT)	%RSD	Avg. µAbs	Readings				Flags
Calibration Zero	08-Mar-2010, 15:40	0.00	7.37	45.40	43	42	48	48	
Standard #1	08-Mar-2010, 15:42	200.00	0.64	1130.00	1119	1131	1133	1134	
Standard #2	08-Mar-2010, 15:43	500.00	1.07	2700.00	2658	2688	2713	2722	
Standard #3	08-Mar-2010, 15:45	1000.00	0.61	5430.00	5388	5429	5450	5464	
Standard #4	08-Mar-2010, 15:46	2000.00	0.62	10600.00	10512	10514	10528	10649	
Standard #5	08-Mar-2010, 15:48	5000.00	1.56	26900.00	26330	26861	27164	27266	



Int.	13.265
Slope	5.365
Correlation	0.99995

Sample ID	Analysis Time	Conc (PPT)	%RSD	Avg. µAbs	Readings				Flags
ICV	08-Mar-2010, 15:50	1010.00	1.41	5410.00	5397	5334	5404	5517	
ICB	08-Mar-2010, 15:51	3.88	9.23	34.10	34	32	34	36	
CRA	08-Mar-2010, 15:53	211.00	1.18	1150.00	1127	1143	1155	1156	
HG100308-2MB	08-Mar-2010, 15:54	5.04	6.83	40.30	39	40	40	43	
HG100308-2LCS	08-Mar-2010, 15:56	995.00	0.31	5350.00	5334	5348	5346	5374	
HG100308-2LCSD	08-Mar-2010, 15:58	1020.00	0.95	5510.00	5449	5480	5531	5565	
1003039-1	08-Mar-2010, 15:59	9.72	4.08	65.40	64	64	68	67	
1003063-1	08-Mar-2010, 16:01	50.50	1.17	284.00	280	285	285	288	
1003063-2	08-Mar-2010, 16:02	16.90	1.89	104.00	103	103	103	106	
1003063-3	08-Mar-2010, 16:04	140.00	0.37	767.00	767	766	770	764	
1003063-5	08-Mar-2010, 16:06	74.70	0.71	414.00	410	414	416	416	
1003063-6	08-Mar-2010, 16:07	50.70	0.70	285.00	286	286	286	282	
CCV	08-Mar-2010, 16:09	2020.00	0.37	10800.00	10784	10876	10858	10851	
CCB	08-Mar-2010, 16:10	5.01	13.10	40.20	38	41	45	37	
1003063-8	08-Mar-2010, 16:12	90.60	0.95	499.00	497	498	496	506	
1003063-9	08-Mar-2010, 16:14	76.50	0.68	423.00	420	422	424	427	
1003063-12	08-Mar-2010, 16:15	55.60	0.37	312.00	312	313	312	310	
1003063-13	08-Mar-2010, 16:17	55.70	2.03	312.00	306	309	314	320	
1003063-14	08-Mar-2010, 16:18	78.60	0.85	435.00	430	434	438	438	
1003063-16	08-Mar-2010, 16:20	83.20	0.77	460.00	455	460	462	463	
1003063-16D	08-Mar-2010, 16:22	81.60	0.49	451.00	448	450	452	453	
1003063-16L 5X	08-Mar-2010, 16:23	27.30	2.78	160.00	157	157	158	166	
1003063-16MS	08-Mar-2010, 16:25	2120.00	0.61	11400.00	11315	11372	11434	11474	
1003063-16MSD	08-Mar-2010, 16:27	2090.00	0.77	11200.00	11092	11218	11290	11259	
CCV	08-Mar-2010, 16:28	2020.00	0.24	10800.00	10803	10836	10841	10867	
CCB	08-Mar-2010, 16:30	5.46	3.08	42.60	44	42	43	42	
CRA	08-Mar-2010, 16:31	212.00	0.97	1150.00	1139	1148	1158	1164	
CCV	08-Mar-2010, 16:33	1980.00	0.93	10600.00	10484	10625	10662	10714	
CCB	08-Mar-2010, 16:35	3.48	14.00	31.90	32	31	29	35	

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Miscellaneous

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METALS DIGESTION WORKSHEET

ALS Laboratory Group

Digestion Date 3/8/10 | HCl Lot No. H19031 | Method: 3050 | Beaker Lot No. 9114754 | Initial Prep [illegible] | Final Prep [illegible]

Digestion Batch IP100308-4 | HNO_3 Lot No. H14024 | SOP/Rev: 806rev14 | Avg. Beaker Wt. (g) 15.7 | Prep Start Time 1520 | Prep End Time 1845

Water Bath Temp 95 °C | Peroxide Lot No. H12J04 | Balance(s): #30 | Pipet(s): M-51 | Digestate Wt. (g) 104.11

Form 805r18.xls (3/13/09)

Note: Each Page is copied as completed and included with the workorder/run documentation; reviewed subsequently

QC Grp	Lab Sample ID	Instrument	Init Vol/Wt (mL/g)	Final Vol (mL)	Final Wt. (g)	pH	Texture	Before color	Before clarity	After color	After clarity	Comments, including metals list	LIMS QCA
1	1003063-1	TR	100 mL/g	100	121.8	NA	MEDIUM	GRAY	NA	YELLOW	CLOUDY	TAL	1
	-2						↓	BROWN		↓	CLEAR		
	-3						MUD	↓		GREEN	CLOUDY		
	-5						↓	BLACK		↓	↓		
	-6						MEDIUM	BROWN		YELLOW			
	-8						MUD			GREEN			
	-9						↓			↓			
	-12						↓			↓			
	-13						~~MEDIUM~~ SOLID			↓			
	-14						MEDIUM			YELLOW			
	-16						MUD			GREEN			

ICP	Lab Sample ID	Instrument	Init Vol/Wt (mL/g)	Final Vol (mL)	Final Wt (g)
LCS					
LCS 2					
ICP MS					
LCS	IP100308-4MS	TR		100	121.8
LCS 2	IP100308-4LCS	TR	100 mL/g	100	121.8
PB	↓ -4MB	↓	↓	↓	↓
#1 D	1003063-16D		100 mL/g	100	121.8
S	↓ -16MS	↓	↓	↓	↓
DS	↓ -16MSD	↓	↓	↓	↓

Lab Sample ID	Init Vol/Wt. (mL/g)	Final Vol. (mL)	Final Wt. (g)
#2 D			
S			
DS			
#3 D			
S			
DS			
#4 D			
S			
DS			

Spiking Information

QC	Amount
ST100308-3(1)	1.0mL
ST100302-16(2)	2.0mL
ST100108-2(LATIN)	2.0mL

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390612

METALS DIGESTION WORKSHEET

ALS Laboratory Group

Digestion Date 3/8/10 HCl Lot No. H19031 Method: 3005 Beaker Lot No. 9250577 Initial Prep [illegible] Final Prep [illegible]

Digestion Batch IP100308-1 HNO_3 Lot No. H14024 SOP/Rev: 806 rev 14 Avg. Beaker Wt. (g) 7.6 Prep Start Time 1125 Prep End Time 1710

Water Bath Temp 95 °C Peroxide Lot No. N/A Balance(s): #30 Pipet(s): M-91 Digestate Wt. (g) 51.18

Form 805r18.xls (3/13/09) Note: Each Page is copied as completed and included with the workorder/run documentation; reviewed subsequently

QC Grp	Lab Sample ID	Instrument	Init Vol/Wt (mL/g)	Final Vol (mL)	Final Wt. (g)	pH	Texture	Before color	Before clarity	After color	After clarity	Comments, including metals list	LIMS QCA
1	1003063-4	Tn	See LIMS Prep Batch	50.0	58.8	<2	N/A	Colorless	Cloudy	Colorless	Cloudy	TAL	1
	-7					7		Green/Brown		Yellow		~~[illegible]~~ EX 03-15-10	
	-10					<2		Colorless		Colorless			
	-11										Clear		
	-15								Clear				
	-17												
	-18												

3/8/10

[illegible]

ICP					
LCS	IP100308-1NVS	Tn	50.0	50.0	58.8
LCS 2					
ICP MS					
LCS					
LCS 2	IP100308-1LCS	Tn	See LIMS Prep Batch	50.0	58.8
PB	-1MB				
#1 D	1003063-4D				
S	-4MS				
DS	-4MSD				

	Lab Sample ID	Init Vol/Wt. (mL/g)	Final Vol. (mL)	Final Wt. (g)
#2 D				
S				
DS				
#3 D				
S				
DS				
#4 D				
S				
DS				

3/8/10

[illegible]

Spiking Information

QC	Amount
ST100208-20(C)	0.5mL
ST100302-16(Z)	1.0mL
ST100108-2(Cation)	1.0mL

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390609

ALS Laboratory Group - Fort Collins

MERCURY DIGESTION - WATER/TCLP

Method 7470 SOP 812/Rev 14 Date Analyzed 3/8/10 File 10030801 *** Init. ~~(prep.)~~ (analysis)

Digestion Date 3.8.10 Spike Witness N/A Time Start 1015 Time Finish 1215 Bath Temp 95 °C

Tube #	Solution ID	Spike * Solution	Spike Volume (mL)	Final ** Volume (mL)	Comments
STD 1	0 ppb	-	-	20.0	
2	0.2 ppb	A	0.04	20.0	
	0.5 ppb	A	0.1	20.0	
4	1.0 ppb	A	0.2	20.0	
5	2.0 ppb	A	0.4	20.0	
6	5.0 ppb	A	1.0	20.0	
	ICV	B	0.2	20.0	
	ICB	-	-	20.0	
	CRA-0.2 ppb	A	0.04	20.0	
	IPC (245.1 only)	A	0.04	20.0	
	SAMPLES -- **Prep. Batch ID(s)** HG100308-1				(see LIMs Prep. Batch report for sample info. (IDs, Aliquots, etc.)
	CCVs	A	0.4	20.0	___ # prepared
	CCBs	-	-	20.0	___ # prepared

*** See run report for run log information.

** Laboratory DI water used to make-up to final volume.

*A: 100 ppb Hg solution made from 100x dilution (1 mL/100 mL) of ST100112-7 ID

*B: 100 ppb Hg solution made from 100x dilution (1 mL/100 mL) of ST100112-4 ID (2nd source)

See run header for maintenance performed.

Digestion Cups: 940 cc

Reagents: H_2SO_4 49425 HNO_3 H140214 $KMnO_4$ RG100305-1 $K_2S_2O_8$ RG100211-3
SnCl RG100225-3 Hydroxylamine RG100305-2

Balance(s) Used: 29

Pipet(s) Used: M-57 M-61

200001167

Note: Each page is copied as completed and included with the workorder/run documentation; reviewed subsequently.

ALS – Fort Collins

MERCURY DIGESTION - SOIL

Method 7471 SOP 812/Rev 14 Date Analyzed 3/8/10 File 10030802 *** Init. AJ (prep.) ___ (analysis)

Digestion Date 3-8-10 Spike Witness N/A Time Start 1130 Time Finish 1200 Bath Temp 95 °C

Tube #	Solution ID	Spike * Solution	Spike Volume (mL)	Sample **** Aliquot (g)	Final ** Volume (mL)	Comments
STD 1	0 ppb	-	-	-	100.0	WO 1003063 Sediments containing standing water: #3, 8, 9, 12, 13, 16 water was stirred prior to aliquoting
2	0.2 ppb	A	0.2	-	100.0	
3	0.5 ppb	A	0.5	-	100.0	
4	1.0 ppb	A	1.0	-	100.0	
5	2.0 ppb	A	2.0	-	100.0	
6	5.0 ppb	A	5.0	-	100.0	
	ICV	B	1.0	-	100.0	
	ICB	-	-	-	100.0	
	CRA-0.2 ppb	A	0.2	-	100.0	
	SAMPLES -- **Prep. Batch ID(s)** HG100308-2					(see LIMs Prep. Batch report for sample info. (IDs, Aliquots, etc.)
	CCVs	A	2.0	-	100.0	2 # prepared
	CCBs	-	-	-	100.0	2 # prepared

**** Automated balance entry into LIMS.

*** See run report for run log information.

** Laboratory DI water used to make-up to final volume.

*A: 100 ppb Hg solution made from 100x dilution (1 mL/100 mL) of ST100112-7 ID

*B: 100 ppb Hg solution made from 100x dilution (1 mL/100 mL) of ST100112-4 ID (2nd source)

See run header for maintenance performed.

Digestion Cups: 9231322

Reagents: HNO_3 H14024 HCl H19031 SnCl- RG100305-225-2 SL 3.5.10 $KMnO_4$- RG100305-1 Hydroxylamine RG100305-2

Balance(s) Used: 29

Pipet(s) Used: M-57 M-61 M-1010

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Reviewed by _____ **Date** _____

388605

Percent Moisture

Method SOP642 Revision 8

Lab Name: ALS Laboratory Group -- FC

Date Extracted: 03/06/2010
Date Analyzed: 03/06/2010
Analyst: Mike Lundgreen

Balance ID: 31
Oven ID: 17
In Oven: 3/5/2010 @ 3:15:00 PM
Out of Oven: 3/6/2010 @ 12:20:00 PM

Validated By: bch
Validation Date: 03/06/2010
Validation Time: 12:36:41 PM

Run ID	Prep Batch ID	QC Batch ID	Lab ID	QC Type	Dish Wt	Wet Wt	Dry Wt	Dry Wt-Dish Wt	Percent Moisture	Percent Solids	RPD
EX100305-1A	EX100305-1	EX100305-1-1	1003063-1	SMP	1.33	10.12	11.1	9.77	3.5	96.5	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-12	SMP	1.323	11.18	9.454	8.13	27.3	72.7	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-13	SMP	1.328	11.26	9.563	8.23	26.9	73.1	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-14	DUP	1.319	10.51	11.59	10.27	2.3	97.7	3
EX100305-1A	EX100305-1	EX100305-1-2	1003063-14	SMP	1.32	10.48	11.55	10.23	2.4	97.6	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-16	SMP	1.315	11.81	9.28	7.97	32.5	67.5	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-2	SMP	1.323	10.52	11.65	10.32	1.9	98.1	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-3	SMP	1.321	12.58	9.409	8.09	35.7	64.3	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-5	SMP	1.32	13.17	8.869	7.55	42.7	57.3	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-6	SMP	1.328	10.57	11.45	10.13	4.2	95.8	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-8	SMP	1.326	10.53	8.517	7.19	31.7	68.3	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-9	SMP	1.322	11.08	9.404	8.08	27.1	72.9	
EX100305-1A	EX100305-1	EX100305-1-2	EX100305-1	MB	1.298	1.298	1.298	0.00	100.0	0.0	

QC Types

CAR	Carrier reference sample
LCS	Laboratory Control Sample
MB	Method Blank
MSD	Laboratory Matrix Spike Duplicate
RVS	Reporting Level Verification Standar
SYS	Sample Yield Spike

DUP	Laboratory Duplicate
LCSD	Laboratory Control Sample Duplicat
MS	Laboratory Matrix Spike
REP	Sample replicate
SMP	Field Sample

Comments:

DUP = Sample Duplicate
Wet Wt = Sample Wet Wt - Dish Wt
Dry Wt = Sample Dry Wt + Dish Wt
Dry Wt - Dish Wt = Sample Dry Wt - Dish Wt
All weight values shown above are expressed in grams.

$$RPD = \frac{(\text{Sample Value} - \text{Duplicate Value})}{2} \times 100$$

$$\%\ \text{Solids} = \frac{\text{Dry Weight}}{\text{Wet Weight}} \times 100$$

$$\%\ \text{Moisture} = \frac{(\text{Wet Weight} - \text{Dry Weight})}{\text{Wet Weight}} \times 100$$

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division
Fort Collins, Colorado

Total Uranium

Case Narrative

Weston Solution, Inc.

Paguate -- TO0019100202

Work Order Number: 1003063

1. This report consists of the analytical results and supporting documentation for six sediment samples, five soil samples, and seven water samples received by ALS on 03/05/2010.

2. The sediment and soil samples were prepared according to procedures SOP773R10 and SOP778R13. The water samples were prepared according to procedures SOP776R11 and SOP778R13. Due to potential matrix interference, the sediment and soil samples were prepared at a reduced aliquot of ~1 gram. Due to elevated alpha activity detected in prescreen, reduced aliquots were taken for samples 1003063-1, -2, and -7.

3. The samples were analyzed for the presence of isotopic and total uranium according to procedure SOP714R11. The analyses were completed on 03/07/2010.

4. The total uranium results were determined by converting standard activity units to a mass basis, and adding these results to create an analyte called 'URANIUM, TOTAL' for each sample. The MDC equation cannot accommodate the different specific activities of each nuclide. Therefore, the MDC is not evaluated for the 'URANIUM, TOTAL' analyte.

5. The analysis results for the sediment samples and the soil samples are reported on a 'Dry Weight' basis in units of ug/gram. The analysis results for the associated batch QC are reported on an 'As Received' basis in units of ug/gram.

6. The analysis results for the water samples are reported on a mass basis in units of ug/L. The water samples were not filtered prior to analysis.

7. This analytical method quantifies U-235 alpha activity in a specific region of interest corresponding to emission energies between those of U-234 and U-238. A potential limitation of this method is that measurable amounts of U-234 in the sample may cause a small amount of characteristic activity in the U-235 region of interest due to poorly resolved alpha activity at the boundary between the two regions. To minimize the potential for a high bias in the U-235 analytical results, the U-235 region of interest has been narrowed and limited to a lower energy

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region. An 85.1% abundance correction has been made to the final U-235 results.

8. ALS follows the convention outlined in ANSI N42.23 for reporting significant digits in the TPU and MDC results. ANSI N42.23 states that the TPU result should be rounded to two significant digits and that the MDC result should be rounded to the same decimal place as the TPU result. In practice, this could result in an MDC result with a reported value of 0 for samples with significant activity, including the batch laboratory control sample.

9. Various aliquot sizes were taken for the preparation of the samples in batch AS100305-2. By convention, the results for the batch blank and laboratory control sample are determined based on a 1.0 mL aliquot size. Therefore, the blank results are not directly comparable to the sample results. Mathematically dividing the reported blank activity and MDC by a given sample's 'final aliquot' will convert the blank results to a comparable form for that sample. Consequently, method blank AS100305-2 is identified with an 'M' and 'B' flag on the final reports. Results are submitted without further qualification.

10. The requested MDC of 0E-05 ug/g, 5E-02 ug/g, and 0E-01 ug/g was not met for U-234, U-235, and U-238 for sample 1003063-2REP2, and U-234 for samples 1003063-5DUP and -6REP2. The requested MDC of 0E-05 ug/l, 0E-02 ug/l, and 0E-01 ug/l was not met for U-234, U-235, and U-238 for sample 1003063-7REP2. The reported activity for these samples is greater than the achieved MDC. These samples are identified with an "M3" flag on the final reports.

11. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Jean Anderson
Radiochemistry Primary Data Reviewer

3/12/10
Date

Radiochemistry Final Data Reviewer

3/12/10
Date

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Section 1

CHAIN OF CUSTODY

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ALS Laboratory Group -- FC

Sample Number(s) Cross-Reference Table

Paragon OrderNum: 1003063
Client Name: Weston Solutions, Inc.
Client Project Name: Paguate
Client Project Number: TO0019100202
Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
JM-SS-04	1003063-1		SOIL	03-Mar-10	11:01
JM-SS-05	1003063-2		SOIL	03-Mar-10	10:40
RM-JM-SED	1003063-3		SEDIMEN	03-Mar-10	15:29
RP-SW-02	1003063-4		WATER	03-Mar-10	10:30
JM-SED-02	1003063-5		SOIL	03-Mar-10	15:35
JM-SS-03	1003063-6		SOIL	03-Mar-10	11:47
JM-SW-02	1003063-7		WATER	03-Mar-10	15:35
RP-JM-SED	1003063-8		SEDIMEN	03-Mar-10	14:32
RP-JM-SED-01	1003063-9		SEDIMEN	03-Mar-10	15:11
RP-JM-SW	1003063-10		WATER	03-Mar-10	14:32
RP-JM-SW-01	1003063-11		WATER	03-Mar-10	15:11
RP-SED-01	1003063-12		SEDIMEN	03-Mar-10	11:35
RP-SED-01D	1003063-13		SEDIMEN	03-Mar-10	11:35
JM-SS-01	1003063-14		SOIL	04-Mar-10	9:50
RM-JM-SW	1003063-15		WATER	03-Mar-10	15:29
RP-SED-02	1003063-16		SEDIMEN	03-Mar-10	10:30
RP-SW-01	1003063-17		WATER	03-Mar-10	11:35
RP-SW-01D	1003063-18		WATER	03-Mar-10	11:35

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1003063

CHAIN OF CUSTODY RECORD

No: TO0019100202-03/04/10-0006

Site #: TO0019100202

Contact Name: Weston Soloutions, Inc.

Lab: ALS

Contact Phone: Kristie Warr 832-444-7976

Lab Phone: 970.490.1511

Lab #	Sample #	Analyses	Analyses Turnaround Time	Analyses Turnaround Time Units	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
1	JM-SS-04	TAL Metals + Hg + CN + Iso U	3	Days	Soil	3/3/2010	11:01	1	16 oz	4 C	46 uR/hr	
2	JM-SS-05	TAL Metals + Hg + CN + Iso U	3	Days	Soil	3/3/2010	10:40	1	16 oz	4 C	109 uR/hr	
3	RM-JM-SED	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/3/2010	15:29	1	16 oz	4 C	26 uR/hr	
4	RP-SW-02	TAL Metals + Mercury	3	Days	Water	3/3/2010	10:30	1	1 L poly	HNO3 pH<2	8 uR/hr	Y
	RP-SW-02	Total Cyanide	3	Days	Water	3/3/2010	10:30	1	250 mL	NaOH	8 uR/hr	Y
↓	RP-SW-02	Isotopic Uranium	3	Days	Water	3/3/2010	10:30	1	1 L poly	HNO3 pH<2	8 uR/hr	Y

Special Instructions: please email preliminary results to kristie.warr@westonsolutions.com and michelle.brown@westonsolutions.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		03.04.10		3.5.10	0735						

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1003063

CHAIN OF CUSTODY RECORD

No: TO0019100202-03/04/10-0007

Site #: TO0019100202

Contact Name: Weston Soloutions, Inc.

Lab: ALS

Contact Phone: Kristie Warr 832-444-7976

Lab Phone: 970.490.1511

Lab #	Sample #	Analyses	Analyses Turnaround Time	Analyses Turnaround Time Units	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
5	JM-SED-02	TAL Metals + Hg + CN + Iso U	3	Days	Soil	3/3/2010	15:35	1	16 oz	4 C	20 uR/hr	
6	JM-SS-03	TAL Metals + Hg + CN + Iso U	3	Days	Soil	3/3/2010	11:47	1	16 oz	4 C	80 uR/hr	
7	JM-SW-02	TAL Metals + Mercury	3	Days	Water	3/3/2010	15:35	1	1 L poly	HNO3 pH<2	20 uR/hr	
↓	JM-SW-02	Total Cyanide	3	Days	Water	3/3/2010	15:35	1	250 mL	NaOH	20 uR/hr	
↓	JM-SW-02	Isotopic Uranium	3	Days	Water	3/3/2010	15:35	1	1 L poly	HNO3 pH<2	20 uR/hr	
8	RP-JM-SED	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/3/2010	14:32	1	16 oz	4 C	27 uR/hr	
9	RP-JM-SED-01	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/3/2010	15:11	1	16 oz	4 C	19 uR/hr	
10	RP-JM-SW	TAL Metals + Mercury	3	Days	Water	3/3/2010	14:32	1	1 L poly	HNO3 pH<2	27 uR/hr	
↓	RP-JM-SW	Total Cyanide	3	Days	Water	3/3/2010	14:32	1	250 mL	NaOH	27 uR/hr	
↓	RP-JM-SW	Isotopic Uranium	3	Days	Water	3/3/2010	14:32	1	1 L poly	HNO3 pH<2	27 uR/hr	
11	RP-JM-SW-01	TAL Metals + Mercury	3	Days	Water	3/3/2010	15:11	1	1 L poly	HNO3 pH<2	19 uR/hr	
↓	RP-JM-SW-01	Total Cyanide	3	Days	Water	3/3/2010	15:11	1	250 mL	NaOH	19 uR/hr	

Special Instructions: please email preliminary results to kristie.warr@westonsolutions.com and michelle.brown@westonsolutions.com

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		03.04.10		3.5.10	0735						

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1003063

CHAIN OF CUSTODY RECORD

No: TO0019100202-03/04/10-0007

Site #: TO0019100202

Contact Name: Weston Soloutions, Inc.

Lab: ALS

Contact Phone: Kristie Warr 832-444-7976

Lab Phone: 970.490.1511

Lab #	Sample #	Analyses	Analyses Turnaround Time	Analyses Turnaround Time Units	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
11	RP-JM-SW-01	Isotopic Uranium	3	Days	Water	3/3/2010	15:11	1	1 L poly	HNO3 pH<2	19 uR/hr	
12	RP-SED-01	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/3/2010	11:35	1	16 oz	4 C	18 uR/hr	
13	RP-SED-01D	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/3/2010	11:35	1	16 oz	4 C	8 uR/hr	

Special Instructions: please email preliminary results to kristie.warr@westonsolutions.com and michelle.brown@westonsolutions.com

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		03.04.10		3.5.10	0735						

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100363

CHAIN OF CUSTODY RECORD

No: TO0019100202-03/04/10-0008

Site #: TO0019100202

Contact Name: Weston Soloutions, Inc.

Lab: ALS

Contact Phone: Kristie Warr 832-444-7976

Lab Phone: 970.490.1511

Lab #	Sample #	Analyses	Analyses Turnaround Time	Analyses Turnaround Time Units	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
14	JM-SS-01	TAL Metals + Hg + CN + Iso U	3	Days	Soil	3/4/2010	09:50	1	16 oz	4 C	56 uR/hr	
15	RM-JM-SW	TAL Metals + Mercury	3	Days	Water	3/3/2010	15:29	1	1 L poly	HNO3 pH<2	26 uR/hr	
	RM-JM-SW	Total Cyanide	3	Days	Water	3/3/2010	15:29	1	250 mL	NaOH	26 uR/hr	
	RM-JM-SW	Isotopic Uranium	3	Days	Water	3/3/2010	15:29	1	1 L poly	HNO3 pH<2	26 uR/hr	
16	RP-SED-02	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/3/2010	10:30	1	16 oz	4 C	8 uR/hr	Y
17	RP-SW-01	TAL Metals + Mercury	3	Days	Water	3/3/2010	11:35	1	1 L poly	HNO3 pH<2	18 uR/hr	
	RP-SW-01	Total Cyanide	3	Days	Water	3/3/2010	11:35	1	250 mL	NaOH	18 uR/hr	
	RP-SW-01	Isotopic Uranium	3	Days	Water	3/3/2010	11:35	1	1 L poly	HNO3 pH<2	18 uR/hr	
18	RP-SW-01D	TAL Metals + Mercury	3	Days	Water	3/3/2010	11:35	1	1 L poly	HNO3 pH<2	18 uR/hr	
	RP-SW-01D	Total Cyanide	3	Days	Water	3/3/2010	11:35	1	250 mL	NaOH	18 uR/hr	
	RP-SW-01D	Isotopic Uranium	3	Days	Water	3/3/2010	11:35	1	1 L poly	HNO3 pH<2	18 uR/hr	

Special Instructions: please email preliminary results to kristie.warr@westonsolutions.com and michelle.brown@westonsolutions.com

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	Melinda Wuttke	03/04/10		3.5.10	0735						

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ALS Laboratory Group - Fort Collins

CONDITION OF SAMPLE UPON RECEIPT FORM

Client: Weston Workorder No: 1003063

Project Manager: LRS Initials: LAS Date: 3.5.10

1.	Does this project require any **special handling** in addition to standard Paragon procedures?		YES	(NO)
2.	Are custody **seals** on **shipping containers** intact?	(NONE)	YES	NO
3.	Are Custody seals on **sample containers** intact?	(NONE)	YES	NO
4.	Is there a **COC (Chain-of-Custody) present** or other representative documents?		(YES)	NO
5.	Are the **COC and bottle labels complete and legible**?		(YES)	NO
6.	Is the **COC in agreement** with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		YES	(NO) **
7.	Were **airbills / shipping documents** present and/or removable?	DROP OFF	(YES)	NO
8.	Are all aqueous **samples requiring preservation preserved correctly?** (excluding volatiles)	N/A	YES	(NO) *
9.	Are all aqueous **non-preserved samples pH 4-9**?	(N/A)	YES	NO
10.	Is there **sufficient sample** for the requested analyses?		(YES)	NO
11.	Were all samples placed in the **proper containers** for the requested analyses?		(YES)	NO
12.	Are all samples within **holding times** for the requested analyses?		(YES)	NO
13.	Were all sample containers received **intact**? (not broken or leaking, etc.)		(YES)	NO
14.	Are all samples requiring **no** headspace (**VOC, GRO, RSK/MEE, Rx CN/S, radon**) headspace free? **Size of bubble**: ____ < green pea ____ > green pea	(N/A)	YES	NO
15.	Do perchlorate LCMS-MS samples **have** headspace? (at least 1/3 of container required)	(N/A)	YES	NO
16.	Were samples checked for and free from the presence of **residual chlorine?** (Applicable when PM has indicated samples are from a chlorinated water source; note if field preservation with sodium thiosulfate was not observed.)	(N/A)	YES	NO
17.	Were the samples **shipped on ice**?		(YES)	NO
18.	Were cooler temperatures measured at 0.1-6.0°C? **IR gun used*:** (#2) #4	RAD ONLY	(YES)	NO

	Cooler #:	1	2	3						
	Temperature (°C):	2.6	2.8	1.8						
	No. of custody seals on cooler:	Ø	Ø	Ø						
DOT Survey/ Acceptance Information	External µR/hr reading:	14	14	13						
	Background µR/hr reading:	11								

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **YES / NO / NA** (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16

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If applicable, was the client contacted? **YES / NO / NA** Contact: _____ Date/Time: _____

Project Manager Signature / Date: 3/5/10

*IR Gun #2: Oakton, SN 29922500201-0066 *IR Gun #4: Oakton, SN 2372220101-0002

Form 201r22.xls (6/1/09)

CONDITION OF SAMPLE UPON RECEIPT FORM

Client: Weston Workorder No: 1003063

Project Manager: LRS Initials: LAS Date: 3/5/10

Additional Information:

(6)(*) Sample 1003063-4 (RP-SW-02) came with MS/MSD bottles which were not marked on COC
Sample 1003063-16 (RP-SED-02) came with MS/MSD bottles which were not marked on COC Noted in far Right column.

(*) 1003063-7 (JM-SW-02) has heavy dark dusting in all 3 bottles Noted/h Settled decanti; Suspended incl. /h

(*) Maximum added, pH still not met Noted./h

Was the laboratory directed to proceed with the analysis of any samples yielding the presence of residual chlorine? **YES / NO / NA**

NOTE:

No pH adjustments shall be made without prior consent of Project Manager. After pH adjustments, hold metals and radchem samples ≥ 24 hrs. before analysis.

Was the pH of any sample adjusted by the laboratory? **YES** (See Table below) / **NO**

pH Excursion:

Laboratory Sample ID	Client Sample ID	Initial pH LAS 3/5/10	Final pH	Reagent Used	Volume Added (mL)	Lot No. of Reagent	Requested Analysis	Initials / Date / Time
1003063-4-2	RP-SW-02	≤10	>12	NaOH	1.0		CYAN	LAS 3/5/10 @ 10/5
4-5	RP-SW-02 MS	10	↓	↓	↓	↓	↓	↓
4-8	RP-SW-02 MSD	↓	↓	↓	↓	↓	↓	↓
(*) 7-2	JM-SW-02	↓	10	↓	1.5	↓	↓	↓
10-2	RP-JM-SW	↓	>12	↓	1.0	↓	↓	↓
11-2	RP-JM-SW-01	↓	↓	↓	1.5	↓	↓	↓
15-2	RM-JM-SW	↓	↓	↓	1.0	↓	↓	↓
17-2	RP-SW-01	↓	↓	↓	↓	↓	↓	↓
18-2	RPSW-01D	↓	↓	↓	↓	↓	↓	↓ 200001179

If applicable, was the client contacted? **YES / NO / NA** Contact: _____ Date/Time: _____

Project Manager Signature / Date: _____ 3/5

1003063

From: Origin ID: ADSA (469) 374-7700
Michelle Brown
Weston Solutions, Inc
14160 Dallas Parkway, Suite 850

Dallas, TX 75254

FedEx Express

J18181882228224

Ship Date: 04MAR10
ActWgt: 13.3 LB
CAD: 2557564/INET3010

Delivery Address Bar Code

Ref # 20406.016.019.0514.01
Invoice #
PO #
Dept #

1.80 13 0-

SHIP TO: (970) 490-1511 BILL SENDER

Lance Steere
ALS Laboratory Group
225 Commerce Drive

Fort Collins, CO 80524

3 of 3

MPS# 0263 7933 2472 5196

Mstr# 7933 2472 4970 0201

FRI - 05 MAR A2
FIRST OVERNIGHT

80524
CO-US
DEN

X1 FTCA

505G1/F053/5FE8

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
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200001180

SGL

1003063

From: Origin ID: ADSA (469) 374-7700
Michelle Brown
Weston Solutions, Inc
14160 Dallas Parkway, Suite 850

Dallas, TX 75254

J1010102220224

Ship Date: 04MAR10
ActWgt: 13.3 LB
CAD: 2557564/INET3010

Delivery Address Bar Code

Ref # 20406.016.019.0514.01
Invoice #
PO #
Dept #

SHIP TO: (970) 490-1511 BILL SENDER

Lance Steere
ALS Laboratory Group
225 Commerce Drive

Fort Collins, CO 80524

1 of 3

TRK# 0201 7933 2472 4970

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CO-US
DEN

505G1/F853/5FE0

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200001181

735

1003063

From: Origin ID: ADSA (469) 374-7700
Michelle Brown
Weston Solutions, Inc
14160 Dallas Parkway, Suite 850

Dallas, TX 75254

FedEx Express

J1010102220224

Ship Date: 04MAR10
ActWgt: 13.3 LB
CAD: 2557564/INET3010

Delivery Address Bar Code

Ref # 20406.016.019.0514.01
Invoice #
PO #
Dept #

14.0

SHIP TO: (970) 490-1511 BILL SENDER

Lance Steere
ALS Laboratory Group
225 Commerce Drive

Fort Collins, CO 80524

2 of 3

MPS# 0263 7933 2472 5038

Mstr# 7933 2472 4970 0201

FRI - 05 MAR A2
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80524
CO-US
DEN

X1 FTCA

26

586G1/F653/5FE8

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200001182

Section 2

2

SAMPLE RESULTS SUMMARY

200001183

Total Uranium by Alpha Spectroscopy Sample Results Summary

Client Name: Weston Solutions, Inc.
Client Project Name: Paguate
Client Project Number: TO0019100202

Laboratory Name: **ALS Laboratory Group -- FC**
PAI Work Order: 1003063

Reported on: Thursday, March 11, 2010 12:20:17 PM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
1003063-1	JM-SS-04	Sample	U-234	6.6E-04 +/- 1.1E-04	0E+00	ug/g	SOIL	AS100305-1	3/6/2010	
1003063-1	JM-SS-04	Sample	U-235	8.4E-02 +/- 2.4E-02	8E-03	ug/g	SOIL	AS100305-1	3/6/2010	
1003063-1	JM-SS-04	Sample	U-238	1.25E+01 +/- 2E+00	1E-01	ug/g	SOIL	AS100305-1	3/6/2010	
1003063-1	JM-SS-04	Sample	URANIUM, TOTAL	1.25E+01 +/- 2E+00	NA	ug/g	SOIL	AS100305-1	3/6/2010	
1003063-2	JM-SS-05	Replicate	U-234	1.44E-02 +/- 2.3E-03	0E+00	ug/g	SOIL	AS100305-1	3/6/2010	M3
1003063-2	JM-SS-05	Replicate	U-235	2.06E+00 +/- 4.5E-01	1.3E-01	ug/g	SOIL	AS100305-1	3/6/2010	M3
1003063-2	JM-SS-05	Replicate	U-238	2.71E+02 +/- 4.3E+01	0E+00	ug/g	SOIL	AS100305-1	3/6/2010	M3
1003063-2	JM-SS-05	Replicate	URANIUM, TOTAL	2.73E+02 +/- 4.3E+01	NA	ug/g	SOIL	AS100305-1	3/6/2010	
1003063-3	RM-JM-SED	Sample	U-234	1.36E-04 +/- 2.7E-05	6E-06	ug/g	SEDIMENT	AS100305-1	3/6/2010	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

2000001184
15
2000001184

Total Uranium by Alpha Spectroscopy Sample Results Summary

Client Name: Weston Solutions, Inc.
Client Project Name: Paguate
Client Project Number: TO0019100202

Laboratory Name: **ALS Laboratory Group -- FC**
PAI Work Order: 1003063

Reported on: Thursday, March 11, 2010 12:20:17 PM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
1003063-3	RM-JM-SED	Sample	U-235	1.9E-02 +/- 1.5E-02	1.9E-02	ug/g	SEDIMENT	AS100305-1	3/6/2010	U
1003063-3	RM-JM-SED	Sample	U-238	2.51E+00 +/- 5E-01	3E-02	ug/g	SEDIMENT	AS100305-1	3/6/2010	
1003063-3	RM-JM-SED	Sample	URANIUM, TOTAL	2.52E+00 +/- 5E-01	NA	ug/g	SEDIMENT	AS100305-1	3/6/2010	
1003063-4	RP-SW-02	Sample	U-234	3.43E-03 +/- 5.4E-04	1E-05	ug/l	WATER	AS100305-2	3/6/2010	
1003063-4	RP-SW-02	Sample	U-235	4.05E-01 +/- 9.2E-02	2.3E-02	ug/l	WATER	AS100305-2	3/6/2010	
1003063-4	RP-SW-02	Sample	U-238	5.65E+01 +/- 9E+00	1E-01	ug/l	WATER	AS100305-2	3/6/2010	
1003063-4	RP-SW-02	Sample	URANIUM, TOTAL	5.69E+01 +/- 9E+00	NA	ug/l	WATER	AS100305-2	3/6/2010	
1003063-5	JM-SED-02	Sample	U-234	2.26E-02 +/- 3.6E-03	0E+00	ug/g	SOIL	AS100305-1	3/6/2010	
1003063-5	JM-SED-02	Sample	U-235	2.55E+00 +/- 4.5E-01	3E-02	ug/g	SOIL	AS100305-1	3/6/2010	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

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Y2 - Chemical Yield outside default limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001185
200001185
16

Total Uranium by Alpha Spectroscopy Sample Results Summary

Client Name: Weston Solutions, Inc.
Client Project Name: Paguate
Client Project Number: TO0019100202

Laboratory Name: **ALS Laboratory Group -- FC**
PAI Work Order: 1003063

Reported on: Thursday, March 11, 2010 12:20:17 PM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
1003063-5	JM-SED-02	Sample	U-238	3.62E+02 +/- 5.8E+01	0E+00	ug/g	SOIL	AS100305-1	3/6/2010	
1003063-5	JM-SED-02	Sample	URANIUM, TOTAL	3.64E+02 +/- 5.8E+01	NA	ug/g	SOIL	AS100305-1	3/6/2010	
1003063-6	JM-SS-03	Replicate	U-234	6.4E-03 +/- 1E-03	0E+00	ug/g	SOIL	AS100305-1	3/6/2010	M3
1003063-6	JM-SS-03	Replicate	U-235	9.4E-01 +/- 2E-01	4E-02	ug/g	SOIL	AS100305-1	3/6/2010	
1003063-6	JM-SS-03	Replicate	U-238	1.26E+02 +/- 2E+01	0E+00	ug/g	SOIL	AS100305-1	3/6/2010	
1003063-6	JM-SS-03	Replicate	URANIUM, TOTAL	1.27E+02 +/- 2E+01	NA	ug/g	SOIL	AS100305-1	3/6/2010	
1003063-7	JM-SW-02	Replicate	U-234	5.38E-01 +/- 8.5E-02	0E+00	ug/l	WATER	AS100305-2	3/6/2010	M3
1003063-7	JM-SW-02	Replicate	U-235	6.1E+01 +/- 1.1E+01	1E+00	ug/l	WATER	AS100305-2	3/6/2010	M3
1003063-7	JM-SW-02	Replicate	U-238	8.5E+03 +/- 1.3E+03	0E+00	ug/l	WATER	AS100305-2	3/6/2010	M3

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001186

17

200001186

Total Uranium by Alpha Spectroscopy Sample Results Summary

Client Name: Weston Solutions, Inc.
Client Project Name: Paguate
Client Project Number: TO0019100202

Laboratory Name: **ALS Laboratory Group -- FC**
PAI Work Order: 1003063

Reported on: Thursday, March 11, 2010 12:20:17 PM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
1003063-7	JM-SW-02	Replicate	URANIUM, TOTAL	8.5E+03 +/- 1.3E+03	NA	ug/l	WATER	AS100305-2	3/6/2010	
1003063-8	RP-JM-SED	Sample	U-234	1.69E-04 +/- 3.7E-05	1.3E-05	ug/g	SEDIMENT	AS100305-1	3/6/2010	
1003063-8	RP-JM-SED	Sample	U-235	3.2E-02 +/- 2.3E-02	2.7E-02	ug/g	SEDIMENT	AS100305-1	3/6/2010	LT
1003063-8	RP-JM-SED	Sample	U-238	3.3E+00 +/- 7.2E-01	2.6E-01	ug/g	SEDIMENT	AS100305-1	3/6/2010	
1003063-8	RP-JM-SED	Sample	URANIUM, TOTAL	3.33E+00 +/- 7.2E-01	NA	ug/g	SEDIMENT	AS100305-1	3/6/2010	
1003063-9	RP-JM-SED-01	Sample	U-234	2.38E-04 +/- 4.2E-05	4E-06	ug/g	SEDIMENT	AS100305-1	3/6/2010	
1003063-9	RP-JM-SED-01	Sample	U-235	2.2E-02 +/- 1.3E-02	1.3E-02	ug/g	SEDIMENT	AS100305-1	3/6/2010	LT
1003063-9	RP-JM-SED-01	Sample	U-238	3.9E+00 +/- 7E-01	9E-02	ug/g	SEDIMENT	AS100305-1	3/6/2010	
1003063-9	RP-JM-SED-01	Sample	URANIUM, TOTAL	3.92E+00 +/- 7E-01	NA	ug/g	SEDIMENT	AS100305-1	3/6/2010	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001187
18
200001187

Total Uranium by Alpha Spectroscopy Sample Results Summary

Client Name: Weston Solutions, Inc.
Client Project Name: Paguate
Client Project Number: TO0019100202

Laboratory Name: **ALS Laboratory Group -- FC**
PAI Work Order: 1003063

Reported on: Thursday, March 11, 2010 12:20:17 PM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
1003063-10	RP-JM-SW	Sample	U-234	1.48E-03 +/- 2.4E-04	1E-05	ug/l	WATER	AS100305-2	3/6/2010	
1003063-10	RP-JM-SW	Sample	U-235	1.6E-01 +/- 4.7E-02	7E-03	ug/l	WATER	AS100305-2	3/6/2010	
1003063-10	RP-JM-SW	Sample	U-238	2.27E+01 +/- 3.7E+00	2E-01	ug/l	WATER	AS100305-2	3/6/2010	
1003063-10	RP-JM-SW	Sample	URANIUM, TOTAL	2.29E+01 +/- 3.7E+00	NA	ug/l	WATER	AS100305-2	3/6/2010	
1003063-11	RP-JM-SW-01	Sample	U-234	1.26E-03 +/- 2E-04	1E-05	ug/l	WATER	AS100305-2	3/6/2010	
1003063-11	RP-JM-SW-01	Sample	U-235	1.53E-01 +/- 4.5E-02	1.6E-02	ug/l	WATER	AS100305-2	3/6/2010	
1003063-11	RP-JM-SW-01	Sample	U-238	1.84E+01 +/- 3E+00	2E-01	ug/l	WATER	AS100305-2	3/6/2010	
1003063-11	RP-JM-SW-01	Sample	URANIUM, TOTAL	1.86E+01 +/- 3E+00	NA	ug/l	WATER	AS100305-2	3/6/2010	
1003063-12	RP-SED-01	Sample	U-234	1.4E-04 +/- 2.7E-05	6E-06	ug/g	SEDIMENT	AS100305-1	3/6/2010	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

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M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001188
200001188
19

Total Uranium by Alpha Spectroscopy Sample Results Summary

Client Name: Weston Solutions, Inc.
Client Project Name: Paguate
Client Project Number: TO0019100202

Laboratory Name: **ALS Laboratory Group -- FC**
PAI Work Order: 1003063

Reported on: Thursday, March 11, 2010 12:20:17 PM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
1003063-12	RP-SED-01	Sample	U-235	2.1E-02 +/- 1.4E-02	1.8E-02	ug/g	SEDIMENT	AS100305-1	3/6/2010	LT
1003063-12	RP-SED-01	Sample	U-238	2.7E+00 +/- 5.2E-01	1.5E-01	ug/g	SEDIMENT	AS100305-1	3/6/2010	
1003063-12	RP-SED-01	Sample	URANIUM, TOTAL	2.72E+00 +/- 5.3E-01	NA	ug/g	SEDIMENT	AS100305-1	3/6/2010	
1003063-13	RP-SED-01D	Sample	U-234	1.9E-04 +/- 3.5E-05	1E-05	ug/g	SEDIMENT	AS100305-1	3/6/2010	
1003063-13	RP-SED-01D	Sample	U-235	1.6E-02 +/- 1.3E-02	1.8E-02	ug/g	SEDIMENT	AS100305-1	3/6/2010	U
1003063-13	RP-SED-01D	Sample	U-238	3.67E+00 +/- 6.7E-01	1.2E-01	ug/g	SEDIMENT	AS100305-1	3/6/2010	
1003063-13	RP-SED-01D	Sample	URANIUM, TOTAL	3.69E+00 +/- 6.7E-01	NA	ug/g	SEDIMENT	AS100305-1	3/6/2010	
1003063-14	JM-SS-01	Sample	U-234	1.73E-03 +/- 2.7E-04	0E+00	ug/g	SOIL	AS100305-1	3/7/2010	
1003063-14	JM-SS-01	Sample	U-235	3.43E-01 +/- 6.7E-02	1.5E-02	ug/g	SOIL	AS100305-1	3/7/2010	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

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Y2 - Chemical Yield outside default limits.

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M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001189

20

200001189

Total Uranium by Alpha Spectroscopy Sample Results Summary

Client Name: Weston Solutions, Inc.
Client Project Name: Paguate
Client Project Number: TO0019100202

Laboratory Name: **ALS Laboratory Group -- FC**
PAI Work Order: 1003063

Reported on: Thursday, March 11, 2010 12:20:17 PM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
1003063-14	JM-SS-01	Sample	U-238	4.08E+01 +/- 6.4E+00	1E-01	ug/g	SOIL	AS100305-1	3/7/2010	
1003063-14	JM-SS-01	Sample	URANIUM, TOTAL	4.11E+01 +/- 6.4E+00	NA	ug/g	SOIL	AS100305-1	3/7/2010	
1003063-15	RM-JM-SW	Sample	U-234	1.17E-03 +/- 1.9E-04	1E-05	ug/l	WATER	AS100305-2	3/6/2010	
1003063-15	RM-JM-SW	Sample	U-235	1.32E-01 +/- 4.1E-02	2E-02	ug/l	WATER	AS100305-2	3/6/2010	
1003063-15	RM-JM-SW	Sample	U-238	1.67E+01 +/- 2.7E+00	2E-01	ug/l	WATER	AS100305-2	3/6/2010	
1003063-15	RM-JM-SW	Sample	URANIUM, TOTAL	1.68E+01 +/- 2.7E+00	NA	ug/l	WATER	AS100305-2	3/6/2010	
1003063-16	RP-SED-02	Sample	U-234	2.27E-04 +/- 4.1E-05	6E-06	ug/g	SEDIMENT	AS100305-1	3/6/2010	
1003063-16	RP-SED-02	Sample	U-235	3.3E-02 +/- 1.6E-02	1.1E-02	ug/g	SEDIMENT	AS100305-1	3/6/2010	LT
1003063-16	RP-SED-02	Sample	U-238	4.67E+00 +/- 8.3E-01	8E-02	ug/g	SEDIMENT	AS100305-1	3/6/2010	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001190
200001190
21

Total Uranium by Alpha Spectroscopy Sample Results Summary

Client Name: Weston Solutions, Inc.
Client Project Name: Paguate
Client Project Number: TO0019100202

Laboratory Name: **ALS Laboratory Group -- FC**
PAI Work Order: 1003063

Reported on: Thursday, March 11, 2010 12:20:17 PM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
1003063-16	RP-SED-02	Sample	URANIUM, TOTAL	4.71E+00 +/- 8.3E-01	NA	ug/g	SEDIMENT	AS100305-1	3/6/2010	
1003063-17	RP-SW-01	Sample	U-234	3.56E-03 +/- 5.6E-04	1E-05	ug/l	WATER	AS100305-2	3/6/2010	
1003063-17	RP-SW-01	Sample	U-235	4.68E-01 +/- 9.9E-02	2.1E-02	ug/l	WATER	AS100305-2	3/6/2010	
1003063-17	RP-SW-01	Sample	U-238	5.98E+01 +/- 9.4E+00	2E-01	ug/l	WATER	AS100305-2	3/6/2010	
1003063-17	RP-SW-01	Sample	URANIUM, TOTAL	6.03E+01 +/- 9.4E+00	NA	ug/l	WATER	AS100305-2	3/6/2010	
1003063-18	RP-SW-01D	Sample	U-234	3.35E-03 +/- 5.3E-04	1E-05	ug/l	WATER	AS100305-2	3/6/2010	
1003063-18	RP-SW-01D	Sample	U-235	3.9E-01 +/- 8.7E-02	2.7E-02	ug/l	WATER	AS100305-2	3/6/2010	
1003063-18	RP-SW-01D	Sample	U-238	5.67E+01 +/- 8.9E+00	2E-01	ug/l	WATER	AS100305-2	3/6/2010	
1003063-18	RP-SW-01D	Sample	URANIUM, TOTAL	5.71E+01 +/- 8.9E+00	NA	ug/l	WATER	AS100305-2	3/6/2010	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

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2000001191

Section 3

QC RESULTS SUMMARY 3

200001192

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: AS100305-1MB

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 13
Date Collected: 05-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-1
Run ID: AS100305-1A
Count Time: 800 minutes

Final Aliquot: 1.00 g
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.1E-06 +/- 2.5E-06	3.2E-06	1.6E-05	U
15117-96-1	U-235	2.8E-03 +/- 5.6E-03	8.7E-03	4.63E-02	U
7440-61-1	U-238	3E-02 +/- 3.8E-02	5.9E-02	2.98E-01	U
7440-61-1	URANIUM, TOTAL	3.3E-02 +/- 3.8E-02	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	2.090E-07	1.79E-07	ug/g	85.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

200001193

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: AS100305-1MB

Sample Matrix: SEDIMENT
Prep SOP: PAI 778 Rev 13
Date Collected: 05-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-2
Run ID: AS100305-1A
Count Time: 800 minutes

Final Aliquot: 1.00 g
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.1E-06 +/- 2.5E-06	3.2E-06	1.6E-05	U
15117-96-1	U-235	2.8E-03 +/- 5.6E-03	8.7E-03	4.63E-02	U
7440-61-1	U-238	3E-02 +/- 3.8E-02	5.9E-02	2.98E-01	U
7440-61-1	URANIUM, TOTAL	3.3E-02 +/- 3.8E-02	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	2.090E-07	1.79E-07	ug/g	85.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

200001194

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Method Blank Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: AS100305-2MB

Sample Matrix: WATER
Prep SOP: PAI 778 Rev 13
Date Collected: 05-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 07-Mar-10

Prep Batch: AS100305-2
QCBatchID: AS100305-2-1
Run ID: AS100305-2A
Count Time: 800 minutes

Final Aliquot: 1.00 ml
Result Units: ug/l
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	0E+00 +/- 2E-03	4.4E-03	0E-05	U,M
15117-96-1	U-235	-1E+00 +/- 5.5E+00	8.5E+00	10E-02	U,M
7440-61-1	U-238	4.9E+01 +/- 4E+01	4.6E+01	10E-01	B,M
7440-61-1	URANIUM, TOTAL	4.8E+01 +/- 4.1E+01	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	2.090E-04	1.67E-04	ug/l	80.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

200001195

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: AS100305-1LCS

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 13
Date Collected: 05-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-1
Run ID: AS100305-1A
Count Time: 800 minutes

Final Aliquot: 1.00 g
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	7E-04 +/- 1.1E-04	0E+00	6.960E-04	101	82 - 122	P
15117-96-1	U-235	1.08E-01 +/- 3E-02	4E-03	9.600E-02	113	NA	
7440-61-1	U-238	1.39E+01 +/- 2.3E+00	1E-01	1.340E+01	104	82 - 122	P
7440-61-1	URANIUM, TOTAL	1.4E+01 +/- 2.3E+00	NA	1.350E+01	104	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	2.090E-07	1.53E-07	ug/g	73.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

200001196

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: AS100305-1LCS

Sample Matrix: SEDIMENT
Prep SOP: PAI 778 Rev 13
Date Collected: 05-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-2
Run ID: AS100305-1A
Count Time: 800 minutes

Final Aliquot: 1.00 g
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	7E-04 +/- 1.1E-04	0E+00	6.960E-04	101	82 - 122	P
15117-96-1	U-235	1.08E-01 +/- 3E-02	4E-03	9.600E-02	113	NA	
7440-61-1	U-238	1.39E+01 +/- 2.3E+00	1E-01	1.340E+01	104	82 - 122	P
7440-61-1	URANIUM, TOTAL	1.4E+01 +/- 2.3E+00	NA	1.350E+01	104	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	2.090E-07	1.53E-07	ug/g	73.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

200001197

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Laboratory Control Sample(s)

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Lab ID: AS100305-2LCS

Sample Matrix: WATER
Prep SOP: PAI 778 Rev 13
Date Collected: 05-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 07-Mar-10

Prep Batch: AS100305-2
QCBatchID: AS100305-2-1
Run ID: AS100305-2A
Count Time: 800 minutes

Final Aliquot: 1.00 ml
Result Units: ug/l
File Name: Spectrum #1

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13966-29-5	U-234	7E-01 +/- 1.1E-01	0E+00	6.960E-01	100	82 - 122	P,M3
15117-96-1	U-235	1.01E+02 +/- 2.6E+01	3E+00	9.600E+01	106	NA	M3
7440-61-1	U-238	1.38E+04 +/- 2.2E+03	1E+02	1.340E+04	103	82 - 122	P,M3
7440-61-1	URANIUM, TOTAL	1.39E+04 +/- 2.2E+03	NA	1.350E+04	103	82 - 122	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	2.090E-04	1.8E-04	ug/l	86.2	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

200001198

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SW-02
Lab ID: 1003063-4DUP

Sample Matrix: WATER
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-2
QCBatchID: AS100305-2-1
Run ID: AS100305-2A
Count Time: 800 minutes
Report Basis: Unfiltered

Final Aliquot: 500 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: ug/l
File Name: Spectrum #1

CASNO	Analyte	Sample			Duplicate			DER	DER Lim
		Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		
13966-29-5	U-234	3.43E-03 +/- 5.4E-04	1E-05		3.38E-03 +/- 5.3E-04	1E-05		0.0692	2.13
15117-96-1	U-235	4.05E-01 +/- 9.2E-02	2.3E-02		4.14E-01 +/- 9.1E-02	7E-03		0.072	2.13
7440-61-1	U-238	5.65E+01 +/- 9E+00	1E-01		5.55E+01 +/- 8.8E+00	1E-01		0.0802	2.13
7440-61-1	URANIUM, TOTAL	5.69E+01 +/- 9E+00	#Error		5.59E+01 +/- 8.8E+00	#Error		0.159	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty
DER - Duplicate Error Ratio
BDL - Below Detection Limit
NR - Not Reported

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Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: JM-SED-02
Lab ID: 1003063-5DUP

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-1
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: As Received
Moisture(%): 42.672
Result Units: ug/g
File Name: Spectrum #1

CASNO	Analyte	Sample			Duplicate			DER	DER Lim
		Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		
13966-29-5	U-234	2.26E-02 +/- 3.6E-03	0E+00		2.24E-02 +/- 3.6E-03	0E+00	M3	0.0422	2.13
15117-96-1	U-235	2.55E+00 +/- 4.5E-01	3E-02		2.62E+00 +/- 4.6E-01	3E-02		0.102	2.13
7440-61-1	U-238	3.62E+02 +/- 5.8E+01	0E+00		3.67E+02 +/- 5.9E+01	0E+00		0.0685	2.13
7440-61-1	URANIUM, TOTAL	3.64E+02 +/- 5.8E+01	#Error		3.7E+02 +/- 5.9E+01	#Error		0.139	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty
DER - Duplicate Error Ratio
BDL - Below Detection Limit
NR - Not Reported

200001200

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Duplicate Sample Results (DER)

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SED-02
Lab ID: 1003063-16DUP

Sample Matrix: SEDIMENT
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-2
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: As Received
Moisture(%): 32.534
Result Units: ug/g
File Name: Spectrum #1

CASNO	Analyte	Sample			Duplicate			DER	DER Lim
		Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		
13966-29-5	U-234	2.27E-04 +/- 4.1E-05	6E-06		2.61E-04 +/- 4.7E-05	4E-06		0.544	2.13
15117-96-1	U-235	3.3E-02 +/- 1.6E-02	1.1E-02	LT	4.5E-02 +/- 1.9E-02	5E-03	LT	0.484	2.13
7440-61-1	U-238	4.67E+00 +/- 8.3E-01	8E-02		4.67E+00 +/- 8.4E-01	1E-01		0.000343	2.13
7440-61-1	URANIUM, TOTAL	4.71E+00 +/- 8.3E-01	#Error		4.72E+00 +/- 8.4E-01	#Error		0.0197	

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

LT - Result is less than Request MDC, greater than sample specific MDC

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty

DER - Duplicate Error Ratio

BDL - Below Detection Limit

NR - Not Reported

200001201

Data Package ID: *UT1003063-1*

Section 4

INDIVIDUAL SAMPLE RESULTS

200001202

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: JM-SS-04
Lab ID: 1003063-1

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-1
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 1.00 g
Prep Basis: As Received
Moisture(%): 3.478
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	6.6E-04 +/- 1.1E-04	0E+00	2E-05	
15117-96-1	U-235	8.4E-02 +/- 2.4E-02	8E-03	4.6E-02	
7440-61-1	U-238	1.25E+01 +/- 2E+00	1E-01	3E-01	
7440-61-1	URANIUM, TOTAL	1.25E+01 +/- 2E+00	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	2.160E-07	1.86E-07	ug/g	86.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001203

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: JM-SS-05
Lab ID: 1003063-2REP2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-1
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 0.103 g
Prep Basis: As Received
Moisture(%): 1.882
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.44E-02 +/- 2.3E-03	0E+00	0E-05	M3
15117-96-1	U-235	2.06E+00 +/- 4.5E-01	1.3E-01	5E-02	M3
7440-61-1	U-238	2.71E+02 +/- 4.3E+01	0E+00	0E-01	M3
7440-61-1	URANIUM, TOTAL	2.73E+02 +/- 4.3E+01	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	2.060E-06	1.77E-06	ug/g	86.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001204

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RM-JM-SED
Lab ID: 1003063-3

Sample Matrix: SEDIMENT
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-2
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: As Received
Moisture(%): 35.723
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.36E-04 +/- 2.7E-05	6E-06	1.6E-05	
15117-96-1	U-235	1.9E-02 +/- 1.5E-02	1.9E-02	4.6E-02	U
7440-61-1	U-238	2.51E+00 +/- 5E-01	3E-02	3E-01	
7440-61-1	URANIUM, TOTAL	2.52E+00 +/- 5E-01	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	3.080E-07	2.6E-07	ug/g	84.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001205

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SW-02
Lab ID: 1003063-4

Sample Matrix: WATER
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-2
QCBatchID: AS100305-2-1
Run ID: AS100305-2A
Count Time: 800 minutes
Report Basis: Unfiltered

Final Aliquot: 500 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: ug/l
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.43E-03 +/- 5.4E-04	1E-05	3E-05	
15117-96-1	U-235	4.05E-01 +/- 9.2E-02	2.3E-02	9.3E-02	
7440-61-1	U-238	5.65E+01 +/- 9E+00	1E-01	6E-01	
7440-61-1	URANIUM, TOTAL	5.69E+01 +/- 9E+00	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.170E-07	3.21E-07	ug/l	76.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001206

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SW-02
Lab ID: 1003063-4DUP

Sample Matrix: WATER
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-2
QCBatchID: AS100305-2-1
Run ID: AS100305-2A
Count Time: 800 minutes
Report Basis: Unfiltered

Final Aliquot: 500 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: ug/l
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.38E-03 +/- 5.3E-04	1E-05	3E-05	
15117-96-1	U-235	4.14E-01 +/- 9.1E-02	7E-03	9.3E-02	
7440-61-1	U-238	5.55E+01 +/- 8.8E+00	1E-01	6E-01	
7440-61-1	URANIUM, TOTAL	5.59E+01 +/- 8.8E+00	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.170E-07	3.33E-07	ug/l	79.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001207

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: JM-SED-02
Lab ID: 1003063-5

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-1
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 1.03 g
Prep Basis: As Received
Moisture(%): 42.672
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.26E-02 +/- 3.6E-03	0E+00	0E-05	
15117-96-1	U-235	2.55E+00 +/- 4.5E-01	3E-02	5E-02	
7440-61-1	U-238	3.62E+02 +/- 5.8E+01	0E+00	0E-01	
7440-61-1	URANIUM, TOTAL	3.64E+02 +/- 5.8E+01	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	3.520E-07	1.55E-07	ug/g	44.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001208

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: JM-SED-02
Lab ID: 1003063-5DUP

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-1
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: As Received
Moisture(%): 42.672
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.24E-02 +/- 3.6E-03	0E+00	0E-05	M3
15117-96-1	U-235	2.62E+00 +/- 4.6E-01	3E-02	5E-02	
7440-61-1	U-238	3.67E+02 +/- 5.9E+01	0E+00	0E-01	
7440-61-1	URANIUM, TOTAL	3.7E+02 +/- 5.9E+01	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	3.520E-07	1.56E-07	ug/g	44.4	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001209

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: JM-SS-03
Lab ID: 1003063-6REP2

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-1
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 0.301 g
Prep Basis: As Received
Moisture(%): 4.237
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	6.4E-03 +/- 1E-03	0E+00	0E-05	M3
15117-96-1	U-235	9.4E-01 +/- 2E-01	4E-02	5E-02	
7440-61-1	U-238	1.26E+02 +/- 2E+01	0E+00	0E-01	
7440-61-1	URANIUM, TOTAL	1.27E+02 +/- 2E+01	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	7.230E-07	6.07E-07	ug/g	83.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001210

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: JM-SW-02
Lab ID: 1003063-7REP2

Sample Matrix: WATER
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-2
QCBatchID: AS100305-2-1
Run ID: AS100305-2A
Count Time: 800 minutes
Report Basis: Unfiltered

Final Aliquot: 15.0 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: ug/l
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	5.38E-01 +/- 8.5E-02	0E+00	0E-05	M3
15117-96-1	U-235	6.1E+01 +/- 1.1E+01	1E+00	0E-02	M3
7440-61-1	U-238	8.5E+03 +/- 1.3E+03	0E+00	0E-01	M3
7440-61-1	URANIUM, TOTAL	8.5E+03 +/- 1.3E+03	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	1.390E-05	8.4E-06	ug/l	60.7	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001211

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-JM-SED
Lab ID: 1003063-8

Sample Matrix: SEDIMENT
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-2
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 1.02 g
Prep Basis: As Received
Moisture(%): 31.677
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.69E-04 +/- 3.7E-05	1.3E-05	1.6E-05	
15117-96-1	U-235	3.2E-02 +/- 2.3E-02	2.7E-02	4.6E-02	LT
7440-61-1	U-238	3.3E+00 +/- 7.2E-01	2.6E-01	3E-01	
7440-61-1	URANIUM, TOTAL	3.33E+00 +/- 7.2E-01	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	3.000E-07	1.49E-07	ug/g	49.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001212

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-JM-SED-01
Lab ID: 1003063-9

Sample Matrix: SEDIMENT
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-2
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 1.05 g
Prep Basis: As Received
Moisture(%): 27.064
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.38E-04 +/- 4.2E-05	4E-06	1.6E-05	
15117-96-1	U-235	2.2E-02 +/- 1.3E-02	1.3E-02	4.6E-02	LT
7440-61-1	U-238	3.9E+00 +/- 7E-01	9E-02	3E-01	
7440-61-1	URANIUM, TOTAL	3.92E+00 +/- 7E-01	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	2.730E-07	2.52E-07	ug/g	92.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001213

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-JM-SW
Lab ID: 1003063-10

Sample Matrix: WATER
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-2
QCBatchID: AS100305-2-1
Run ID: AS100305-2A
Count Time: 800 minutes
Report Basis: Unfiltered

Final Aliquot: 500 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: ug/l
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.48E-03 +/- 2.4E-04	1E-05	3E-05	
15117-96-1	U-235	1.6E-01 +/- 4.7E-02	7E-03	9.3E-02	
7440-61-1	U-238	2.27E+01 +/- 3.7E+00	2E-01	6E-01	
7440-61-1	URANIUM, TOTAL	2.29E+01 +/- 3.7E+00	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.170E-07	3.36E-07	ug/l	80.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001214

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-JM-SW-01
Lab ID: 1003063-11

Sample Matrix: WATER
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-2
QCBatchID: AS100305-2-1
Run ID: AS100305-2A
Count Time: 800 minutes
Report Basis: Unfiltered

Final Aliquot: 500 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: ug/l
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.26E-03 +/- 2E-04	1E-05	3E-05	
15117-96-1	U-235	1.53E-01 +/- 4.5E-02	1.6E-02	9.3E-02	
7440-61-1	U-238	1.84E+01 +/- 3E+00	2E-01	6E-01	
7440-61-1	URANIUM, TOTAL	1.86E+01 +/- 3E+00	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.170E-07	3.61E-07	ug/l	86.5	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001215

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SED-01
Lab ID: 1003063-12

Sample Matrix: SEDIMENT
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-2
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 1.06 g
Prep Basis: As Received
Moisture(%): 27.298
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.4E-04 +/- 2.7E-05	6E-06	1.6E-05	
15117-96-1	U-235	2.1E-02 +/- 1.4E-02	1.8E-02	4.6E-02	LT
7440-61-1	U-238	2.7E+00 +/- 5.2E-01	1.5E-01	3E-01	
7440-61-1	URANIUM, TOTAL	2.72E+00 +/- 5.3E-01	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	2.720E-07	2.28E-07	ug/g	83.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001216

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SED-01D
Lab ID: 1003063-13

Sample Matrix: SEDIMENT
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-2
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 1.12 g
Prep Basis: As Received
Moisture(%): 26.891
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.9E-04 +/- 3.5E-05	1E-05	1.6E-05	
15117-96-1	U-235	1.6E-02 +/- 1.3E-02	1.8E-02	4.6E-02	U
7440-61-1	U-238	3.67E+00 +/- 6.7E-01	1.2E-01	3E-01	
7440-61-1	URANIUM, TOTAL	3.69E+00 +/- 6.7E-01	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	2.560E-07	2.07E-07	ug/g	81.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001217

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: JM-SS-01
Lab ID: 1003063-14

Sample Matrix: SOIL
Prep SOP: PAI 778 Rev 13
Date Collected: 04-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 07-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-1
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 1.04 g
Prep Basis: As Received
Moisture(%): 2.377
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.73E-03 +/- 2.7E-04	0E+00	2E-05	
15117-96-1	U-235	3.43E-01 +/- 6.7E-02	1.5E-02	4.6E-02	
7440-61-1	U-238	4.08E+01 +/- 6.4E+00	1E-01	3E-01	
7440-61-1	URANIUM, TOTAL	4.11E+01 +/- 6.4E+00	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	2.060E-07	1.64E-07	ug/g	79.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001218

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RM-JM-SW
Lab ID: 1003063-15

Sample Matrix: WATER
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-2
QCBatchID: AS100305-2-1
Run ID: AS100305-2A
Count Time: 800 minutes
Report Basis: Unfiltered

Final Aliquot: 500 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: ug/l
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	1.17E-03 +/- 1.9E-04	1E-05	3E-05	
15117-96-1	U-235	1.32E-01 +/- 4.1E-02	2E-02	9.3E-02	
7440-61-1	U-238	1.67E+01 +/- 2.7E+00	2E-01	6E-01	
7440-61-1	URANIUM, TOTAL	1.68E+01 +/- 2.7E+00	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.170E-07	3.7E-07	ug/l	88.6	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001219

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SED-02
Lab ID: 1003063-16

Sample Matrix: SEDIMENT
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-2
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 1.13 g
Prep Basis: As Received
Moisture(%): 32.534
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.27E-04 +/- 4.1E-05	6E-06	1.6E-05	
15117-96-1	U-235	3.3E-02 +/- 1.6E-02	1.1E-02	4.6E-02	LT
7440-61-1	U-238	4.67E+00 +/- 8.3E-01	8E-02	3E-01	
7440-61-1	URANIUM, TOTAL	4.71E+00 +/- 8.3E-01	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	2.730E-07	2.44E-07	ug/g	89.1	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001220

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Duplicate Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SED-02
Lab ID: 1003063-16DUP

Sample Matrix: SEDIMENT
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-1
QCBatchID: AS100305-1-2
Run ID: AS100305-1A
Count Time: 800 minutes
Report Basis: Dry Weight

Final Aliquot: 1.08 g
Prep Basis: As Received
Moisture(%): 32.534
Result Units: ug/g
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	2.61E-04 +/- 4.7E-05	4E-06	1.6E-05	
15117-96-1	U-235	4.5E-02 +/- 1.9E-02	5E-03	4.6E-02	LT
7440-61-1	U-238	4.67E+00 +/- 8.4E-01	1E-01	3E-01	
7440-61-1	URANIUM, TOTAL	4.72E+00 +/- 8.4E-01	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	2.870E-07	2.46E-07	ug/g	85.8	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001221

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SW-01
Lab ID: 1003063-17

Sample Matrix: WATER
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-2
QCBatchID: AS100305-2-1
Run ID: AS100305-2A
Count Time: 800 minutes
Report Basis: Unfiltered

Final Aliquot: 500 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: ug/l
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.56E-03 +/- 5.6E-04	1E-05	3E-05	
15117-96-1	U-235	4.68E-01 +/- 9.9E-02	2.1E-02	9.3E-02	
7440-61-1	U-238	5.98E+01 +/- 9.4E+00	2E-01	6E-01	
7440-61-1	URANIUM, TOTAL	6.03E+01 +/- 9.4E+00	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.170E-07	3.42E-07	ug/l	82.0	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001222

Data Package ID: *UT1003063-1*

Total Uranium by Alpha Spectroscopy

PAI 714 Rev 11

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SW-01D
Lab ID: 1003063-18

Sample Matrix: WATER
Prep SOP: PAI 778 Rev 13
Date Collected: 03-Mar-10
Date Prepared: 05-Mar-10
Date Analyzed: 06-Mar-10

Prep Batch: AS100305-2
QCBatchID: AS100305-2-1
Run ID: AS100305-2A
Count Time: 800 minutes
Report Basis: Unfiltered

Final Aliquot: 500 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: ug/l
File Name: Spectrum #1

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
13966-29-5	U-234	3.35E-03 +/- 5.3E-04	1E-05	3E-05	
15117-96-1	U-235	3.9E-01 +/- 8.7E-02	2.7E-02	9.3E-02	
7440-61-1	U-238	5.67E+01 +/- 8.9E+00	2E-01	6E-01	
7440-61-1	URANIUM, TOTAL	5.71E+01 +/- 8.9E+00	NA		

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
U-232	4.170E-07	3.5E-07	ug/l	83.9	30 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

BDL - Below Detection Limit

200001223

Data Package ID: *UT1003063-1*

Section 5

RAW DATA

5

200001224

Total Uranium by Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:51:14 AM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Alq Analy Alq	Inst ID Det ID	AnRunID File Name	Count Date/Time	Net Cnts Bkg Cnts	BaseEff Bkg(min)	CntDur(min) Yield	Activity +/- 2 s TPU	MDC DecLev	ReportUnits ReportBasis	DER RPD	%Spk. Recov Flags
1003063-1	U-232	3/3/2010	AS100305-1	NA	NA	SOIL	1* g	AlphaSpec2	AS100305-1A	3/6/2010	2259.894	31.64%	800	1.86E-07	1E-09	ug/g	NA	
SMP	Tracer	11:01:00 AM	AS100305-1-1	NA	NA	3.4776	1* g	13	Spectrum #1	4:30 PM	9.471	1000	86.4%	2.9E-08	NA	Dry Weight	NA	
1003063-1	U-234	3/3/2010	AS100305-1	NA	NA	SOIL	1* g	AlphaSpec2	AS100305-1A	3/6/2010	1926.123	31.64%	800	6.6E-04	0E+00	ug/g	NA	
SMP	Trg. Analyte	11:01:00 AM	AS100305-1-1	NA	NA	3.4776	1* g	13	Spectrum #1	4:30 PM	3.265	1000	86.4%	1.1E-04	NA	Dry Weight	NA	
1003063-1	U-235	3/3/2010	AS100305-1	NA	NA	SOIL	1* g	AlphaSpec2	AS100305-1A	3/6/2010	72.671	31.64%	800	8.4E-02	8E-03	ug/g	NA	
SMP	Trg. Analyte	11:01:00 AM	AS100305-1-1	NA	NA	3.4776	1* g	13	Spectrum #1	4:30 PM	1.000	1000	86.4%	2.4E-02	NA	Dry Weight	NA	
1003063-1	U-238	3/3/2010	AS100305-1	NA	NA	SOIL	1* g	AlphaSpec2	AS100305-1A	3/6/2010	1968.077	31.64%	800	1.25E+01	1E-01	ug/g	NA	
SMP	Trg. Analyte	11:01:00 AM	AS100305-1-1	NA	NA	3.4776	1* g	13	Spectrum #1	4:30 PM	2.000	1000	86.4%	2E+00	NA	Dry Weight	NA	
1003063-1	URANIUM, TOTAL	3/3/2010	AS100305-1	NA	NA	SOIL	1* g	AlphaSpec2	AS100305-1A	3/6/2010	3966.871	31.64%	800	1.25E+01		ug/g	NA	
SMP	Trg. Analyte	11:01:00 AM	AS100305-1-1	NA	NA	3.4776	1* g	13	Spectrum #1	4:30 PM	6.265	1000	86.4%	2E+00	NA	Dry Weight	NA	
1003063-2	U-232	3/3/2010	AS100305-1	NA	NA	SOIL	0.103* g	AlphaSpec2	AS100305-1A	3/6/2010	2147.400	30.21%	800	1.77E-06	1E-08	ug/g	NA	
REP	Tracer	10:40:00 AM	AS100305-1-1	NA	NA	1.8821	0.103* g	14	Spectrum #1	4:30 PM	7.000	1000	86.0%	2.7E-07	NA	Dry Weight	NA	
1003063-2	U-234	3/3/2010	AS100305-1	NA	NA	SOIL	0.103* g	AlphaSpec2	AS100305-1A	3/6/2010	4204.200	30.21%	800	1.44E-02	0E+00	ug/g	NA	
REP	Trg. Analyte	10:40:00 AM	AS100305-1-1	NA	NA	1.8821	0.103* g	14	Spectrum #1	4:30 PM	6.000	1000	86.0%	2.3E-03	NA	Dry Weight	NA	M3
1003063-2	U-235	3/3/2010	AS100305-1	NA	NA	SOIL	0.103* g	AlphaSpec2	AS100305-1A	3/6/2010	176.800	30.21%	800	2.06E+00	1.3E-01	ug/g	NA	
REP	Trg. Analyte	10:40:00 AM	AS100305-1-1	NA	NA	1.8821	0.103* g	14	Spectrum #1	4:30 PM	4.000	1000	86.0%	4.5E-01	NA	Dry Weight	NA	M3
1003063-2	U-238	3/3/2010	AS100305-1	NA	NA	SOIL	0.103* g	AlphaSpec2	AS100305-1A	3/6/2010	4263.200	30.21%	800	2.71E+02	0E+00	ug/g	NA	
REP	Trg. Analyte	10:40:00 AM	AS100305-1-1	NA	NA	1.8821	0.103* g	14	Spectrum #1	4:30 PM	1.000	1000	86.0%	4.3E+01	NA	Dry Weight	NA	M3
1003063-2	URANIUM, TOTAL	3/3/2010	AS100305-1	NA	NA	SOIL	0.103* g	AlphaSpec2	AS100305-1A	3/6/2010	8644.200	30.21%	800	2.73E+02		ug/g	NA	
REP	Trg. Analyte	10:40:00 AM	AS100305-1-1	NA	NA	1.8821	0.103* g	14	Spectrum #1	4:30 PM	11.000	1000	86.0%	4.3E+01	NA	Dry Weight	NA	
1003063-3	U-232	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.05* g	AlphaSpec2	AS100305-1A	3/6/2010	2139.200	30.65%	800	2.6E-07	2E-09	ug/g	NA	
SMP	Tracer	3:29:00 PM	AS100305-1-2	NA	NA	35.7228	1.05* g	16	Spectrum #1	4:30 PM	11.000	1000	84.5%	4E-08	NA	Dry Weight	NA	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

+ - Duplicate RPD not within limits.

LT - Result is less than Request MDC, greater than sample specific MDC

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).

2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

2000012255

56

2000012255

Total Uranium by Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:51:14 AM

Sample ID / QC Type	Nuclide / Type	Sample Date/Time	Prep Batch / QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix / %Moist.	Samp Alq / Analy Alq	Inst ID / Det ID	AnRunID / File Name	Count Date/Time	Net Cnts / Bkg Cnts	BaseEff / Bkg(min)	CntDur(min) / Yield	Activity +/- / 2 s TPU	MDC / DecLev	ReportUnits / ReportBasis	DER / RPD	%Spk. Recov / Flags
1003063-3	U-234	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.05* g	AlphaSpec2	AS100305-1A	3/6/2010	264.800	30.65%	800	1.36E-04	6E-06	ug/g	NA	
SMP	Trg. Analyte	3:29:00 PM	AS100305-1-2	NA	NA	35.7228	1.05* g	16	Spectrum #1	4:30 PM	4.000	1000	84.5%	2.7E-05	NA	Dry Weight	NA	
1003063-3	U-235	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.05* g	AlphaSpec2	AS100305-1A	3/6/2010	10.800	30.65%	800	1.9E-02	1.9E-02	ug/g	NA	
SMP	Trg. Analyte	3:29:00 PM	AS100305-1-2	NA	NA	35.7228	1.05* g	16	Spectrum #1	4:30 PM	4.000	1000	84.5%	1.5E-02	NA	Dry Weight	NA	U
1003063-3	U-238	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.05* g	AlphaSpec2	AS100305-1A	3/6/2010	262.000	30.65%	800	2.51E+00	3E-02	ug/g	NA	
SMP	Trg. Analyte	3:29:00 PM	AS100305-1-2	NA	NA	35.7228	1.05* g	16	Spectrum #1	4:30 PM	0.000	1000	84.5%	5E-01	NA	Dry Weight	NA	
1003063-3	URANIUM, TOTAL	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.05* g	AlphaSpec2	AS100305-1A	3/6/2010	537.600	30.65%	800	2.52E+00		ug/g	NA	
SMP	Trg. Analyte	3:29:00 PM	AS100305-1-2	NA	NA	35.7228	1.05* g	16	Spectrum #1	4:30 PM	8.000	1000	84.5%	5E-01	NA	Dry Weight	NA	
1003063-4	U-232	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	1884.000	29.64%	800	3.21E-07	4E-09	ug/l	NA	
SMP	Tracer	10:30:00 AM	AS100305-2-1	NA	NA	NA	500 ml	32	Spectrum #1	4:36 PM	25.000	1000	76.9%	5E-08	NA	Unfiltered	NA	
1003063-4	U-234	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	4337.000	29.64%	800	3.43E-03	1E-05	ug/l	NA	
SMP	Trg. Analyte	10:30:00 AM	AS100305-2-1	NA	NA	NA	500 ml	32	Spectrum #1	4:36 PM	5.000	1000	76.9%	5.4E-04	NA	Unfiltered	NA	
1003063-4	U-235	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	150.400	29.64%	800	4.05E-01	2.3E-02	ug/l	NA	
SMP	Trg. Analyte	10:30:00 AM	AS100305-2-1	NA	NA	NA	500 ml	32	Spectrum #1	4:36 PM	2.000	1000	76.9%	9.2E-02	NA	Unfiltered	NA	
1003063-4	U-238	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	3844.200	29.64%	800	5.65E+01	1E-01	ug/l	NA	
SMP	Trg. Analyte	10:30:00 AM	AS100305-2-1	NA	NA	NA	500 ml	32	Spectrum #1	4:36 PM	1.000	1000	76.9%	9E+00	NA	Unfiltered	NA	
1003063-4	URANIUM, TOTAL	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	8331.600	29.64%	800	5.69E+01		ug/l	NA	
SMP	Trg. Analyte	10:30:00 AM	AS100305-2-1	NA	NA	NA	500 ml	32	Spectrum #1	4:36 PM	8.000	1000	76.9%	9E+00	NA	Unfiltered	NA	
1003063-4	U-232	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	2016.973	30.63%	800	3.33E-07	2E-09	ug/l	NA	
DUP	Tracer	10:30:00 AM	AS100305-2-1	NA	NA	NA	500 ml	57	Spectrum #1	4:36 PM	4.144	1000	79.7%	5.2E-08	NA	Unfiltered	NA	
1003063-4	U-234	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	4571.814	30.63%	800	3.38E-03	1E-05	ug/l	0.07	
DUP	Trg. Analyte	10:30:00 AM	AS100305-2-1	NA	NA	NA	500 ml	57	Spectrum #1	4:36 PM	2.000	1000	79.7%	5.3E-04	NA	Unfiltered	NA	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

+ - Duplicate RPD not within limits.

LT - Result is less than Request MDC, greater than sample specific MDC

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).

2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

2000011226

57
2000011226

Total Uranium by Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:04:04 AM

Sample ID / QC Type	Nuclide / Type	Sample Date/Time	Prep Batch / QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix / %Moist.	Samp Alq / Analy Alq	Inst ID / Det ID	AnRunID / File Name	Count Date/Time	Net Cnts / Bkg Cnts	BaseEff / Bkg(min)	CntDur(min) / Yield	Activity +/- 2 s TPU	MDC / DecLev	ReportUnits / ReportBasis	DER / RPD	%Spk. Recov / Flags
1003063-4	U-235	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	164.712	30.63%	800	4.14E-01	7E-03	ug/l	0.07	
DUP	Trg. Analyte	10:30:00 AM	AS100305-2-1	NA	NA	NA	500 ml	57	Spectrum #1	4:36 PM	0.000	1000	79.7%	9.1E-02	NA	Unfiltered	NA	
1003063-4	U-238	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	4042.245	30.63%	800	5.55E+01	1E-01	ug/l	0.08	
DUP	Trg. Analyte	10:30:00 AM	AS100305-2-1	NA	NA	NA	500 ml	57	Spectrum #1	4:36 PM	1.000	1000	79.7%	8.8E+00	NA	Unfiltered	NA	
1003063-4	URANIUM, TOTAL	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	8778.771	30.63%	800	5.59E+01		ug/l	0.16	
DUP	Trg. Analyte	10:30:00 AM	AS100305-2-1	NA	NA	NA	500 ml	57	Spectrum #1	4:36 PM	3.000	1000	79.7%	8.8E+00	NA	Unfiltered	NA	
1003063-5	U-232	3/3/2010	AS100305-1	NA	NA	SOIL	1.03* g	AlphaSpec2	AS100305-1A	3/6/2010	1113.800	30.63%	800	1.55E-07	3E-09	ug/g	NA	
SMP	Tracer	3:35:00 PM	AS100305-1-1	NA	NA	42.6716	1.03* g	17a	Spectrum #1	4:30 PM	19.000	1000	44.0%	2.5E-08	NA	Dry Weight	NA	
1003063-5	U-234	3/3/2010	AS100305-1	NA	NA	SOIL	1.03* g	AlphaSpec2	AS100305-1A	3/6/2010	20047.800	30.63%	800	2.26E-02	0E+00	ug/g	NA	
SMP	Trg. Analyte	3:35:00 PM	AS100305-1-1	NA	NA	42.6716	1.03* g	17a	Spectrum #1	4:30 PM	4.000	1000	44.0%	3.6E-03	NA	Dry Weight	NA	
1003063-5	U-235	3/3/2010	AS100305-1	NA	NA	SOIL	1.03* g	AlphaSpec2	AS100305-1A	3/6/2010	664.200	30.63%	800	2.55E+00	3E-02	ug/g	NA	
SMP	Trg. Analyte	3:35:00 PM	AS100305-1-1	NA	NA	42.6716	1.03* g	17a	Spectrum #1	4:30 PM	1.000	1000	44.0%	4.5E-01	NA	Dry Weight	NA	
1003063-5	U-238	3/3/2010	AS100305-1	NA	NA	SOIL	1.03* g	AlphaSpec2	AS100305-1A	3/6/2010	17240.400	30.63%	800	3.62E+02	0E+00	ug/g	NA	
SMP	Trg. Analyte	3:35:00 PM	AS100305-1-1	NA	NA	42.6716	1.03* g	17a	Spectrum #1	4:30 PM	2.000	1000	44.0%	5.8E+01	NA	Dry Weight	NA	
1003063-5	URANIUM, TOTAL	3/3/2010	AS100305-1	NA	NA	SOIL	1.03* g	AlphaSpec2	AS100305-1A	3/6/2010	37952.400	30.63%	800	3.64E+02		ug/g	NA	
SMP	Trg. Analyte	3:35:00 PM	AS100305-1-1	NA	NA	42.6716	1.03* g	17a	Spectrum #1	4:30 PM	7.000	1000	44.0%	5.8E+01	NA	Dry Weight	NA	
1003063-5	U-232	3/3/2010	AS100305-1	NA	NA	SOIL	1.04* g	AlphaSpec2	AS100305-1A	3/6/2010	1114.800	30.38%	800	1.56E-07	3E-09	ug/g	NA	
DUP	Tracer	3:35:00 PM	AS100305-1-1	NA	NA	42.6716	1.04* g	18	Spectrum #1	4:30 PM	24.000	1000	44.4%	2.5E-08	NA	Dry Weight	NA	
1003063-5	U-234	3/3/2010	AS100305-1	NA	NA	SOIL	1.04* g	AlphaSpec2	AS100305-1A	3/6/2010	19909.000	30.38%	800	2.24E-02	0E+00	ug/g	0.04	
DUP	Trg. Analyte	3:35:00 PM	AS100305-1-1	NA	NA	42.6716	1.04* g	18	Spectrum #1	4:30 PM	10.000	1000	44.4%	3.6E-03	NA	Dry Weight	NA	M3
1003063-5	U-235	3/3/2010	AS100305-1	NA	NA	SOIL	1.04* g	AlphaSpec2	AS100305-1A	3/6/2010	683.200	30.38%	800	2.62E+00	3E-02	ug/g	0.10	
DUP	Trg. Analyte	3:35:00 PM	AS100305-1-1	NA	NA	42.6716	1.04* g	18	Spectrum #1	4:30 PM	1.000	1000	44.4%	4.6E-01	NA	Dry Weight	NA	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

+ - Duplicate RPD not within limits.

LT - Result is less than Request MDC, greater than sample specific MDC

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).

2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

2000001227

58
2000001227

Total Uranium by Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:51:14 AM

Sample ID / QC Type	Nuclide / Type	Sample Date/Time	Prep Batch / QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix / %Moist.	Samp Alq / Analy Alq	Inst ID / Det ID	AnRunID / File Name	Count Date/Time	Net Cnts / Bkg Cnts	BaseEff / Bkg(min)	CntDur(min) / Yield	Activity +/- 2 s TPU	MDC / DecLev	ReportUnits / ReportBasis	DER / RPD	%Spk. Recov / Flags
1003063-5	U-238	3/3/2010	AS100305-1	NA	NA	SOIL	1.04* g	AlphaSpec2	AS100305-1A	3/6/2010	17557.600	30.38%	800	3.67E+02	0E+00	ug/g	0.07	
DUP	Trg. Analyte	3:35:00 PM	AS100305-1-1	NA	NA	42.6716	1.04* g	18	Spectrum #1	4:30 PM	3.000	1000	44.4%	5.9E+01	NA	Dry Weight	NA	
1003063-5	URANIUM, TOTAL	3/3/2010	AS100305-1	NA	NA	SOIL	1.04* g	AlphaSpec2	AS100305-1A	3/6/2010	38149.800	30.38%	800	3.7E+02		ug/g	0.14	
DUP	Trg. Analyte	3:35:00 PM	AS100305-1-1	NA	NA	42.6716	1.04* g	18	Spectrum #1	4:30 PM	14.000	1000	44.4%	5.9E+01	NA	Dry Weight	NA	
1003063-6	U-232	3/3/2010	AS100305-1	NA	NA	SOIL	0.301* g	AlphaSpec2	AS100305-1A	3/6/2010	1886.457	27.21%	800	6.07E-07	6E-09	ug/g	NA	
REP	Tracer	11:47:00 AM	AS100305-1-1	NA	NA	4.2372	0.301* g	22	Spectrum #1	4:30 PM	12.286	1000	83.9%	9.4E-08	NA	Dry Weight	NA	
1003063-6	U-234	3/3/2010	AS100305-1	NA	NA	SOIL	0.301* g	AlphaSpec2	AS100305-1A	3/6/2010	4670.600	27.21%	800	6.4E-03	0E+00	ug/g	NA	
REP	Trg. Analyte	11:47:00 AM	AS100305-1-1	NA	NA	4.2372	0.301* g	22	Spectrum #1	4:30 PM	8.000	1000	83.9%	1E-03	NA	Dry Weight	NA	M3
1003063-6	U-235	3/3/2010	AS100305-1	NA	NA	SOIL	0.301* g	AlphaSpec2	AS100305-1A	3/6/2010	201.329	27.21%	800	9.4E-01	4E-02	ug/g	NA	
REP	Trg. Analyte	11:47:00 AM	AS100305-1-1	NA	NA	4.2372	0.301* g	22	Spectrum #1	4:30 PM	2.000	1000	83.9%	2E-01	NA	Dry Weight	NA	
1003063-6	U-238	3/3/2010	AS100305-1	NA	NA	SOIL	0.301* g	AlphaSpec2	AS100305-1A	3/6/2010	4944.201	27.21%	800	1.26E+02	0E+00	ug/g	NA	
REP	Trg. Analyte	11:47:00 AM	AS100305-1-1	NA	NA	4.2372	0.301* g	22	Spectrum #1	4:30 PM	1.000	1000	83.9%	2E+01	NA	Dry Weight	NA	
1003063-6	URANIUM, TOTAL	3/3/2010	AS100305-1	NA	NA	SOIL	0.301* g	AlphaSpec2	AS100305-1A	3/6/2010	9816.130	27.21%	800	1.27E+02		ug/g	NA	
REP	Trg. Analyte	11:47:00 AM	AS100305-1-1	NA	NA	4.2372	0.301* g	22	Spectrum #1	4:30 PM	11.000	1000	83.9%	2E+01	NA	Dry Weight	NA	
1003063-7	U-232	3/3/2010	AS100305-2	NA	NA	WATER	15 ml	AlphaSpec2	AS100305-2A	3/6/2010	1553.000	30.96%	800	8.4E-06	1E-07	ug/l	NA	
REP	Tracer	3:35:00 PM	AS100305-2-1	NA	NA	NA	15 ml	58	Spectrum #1	4:36 PM	5.000	1000	60.7%	1.3E-06	NA	Unfiltered	NA	
1003063-7	U-234	3/3/2010	AS100305-2	NA	NA	WATER	15 ml	AlphaSpec2	AS100305-2A	3/6/2010	16799.800	30.96%	800	5.38E-01	0E+00	ug/l	NA	
REP	Trg. Analyte	3:35:00 PM	AS100305-2-1	NA	NA	NA	15 ml	58	Spectrum #1	4:36 PM	4.000	1000	60.7%	8.5E-02	NA	Unfiltered	NA	M3
1003063-7	U-235	3/3/2010	AS100305-2	NA	NA	WATER	15 ml	AlphaSpec2	AS100305-2A	3/6/2010	557.400	30.96%	800	6.1E+01	1E+00	ug/l	NA	
REP	Trg. Analyte	3:35:00 PM	AS100305-2-1	NA	NA	NA	15 ml	58	Spectrum #1	4:36 PM	2.000	1000	60.7%	1.1E+01	NA	Unfiltered	NA	M3
1003063-7	U-238	3/3/2010	AS100305-2	NA	NA	WATER	15 ml	AlphaSpec2	AS100305-2A	3/6/2010	14216.400	30.96%	800	8.5E+03	0E+00	ug/l	NA	
REP	Trg. Analyte	3:35:00 PM	AS100305-2-1	NA	NA	NA	15 ml	58	Spectrum #1	4:36 PM	2.000	1000	60.7%	1.3E+03	NA	Unfiltered	NA	M3

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

+ - Duplicate RPD not within limits.

LT - Result is less than Request MDC, greater than sample specific MDC

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).

2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

2000001228

2000001228
59

Total Uranium by Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:04:04 AM

Sample ID / QC Type	Nuclide / Type	Sample Date/Time	Prep Batch / QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix / %Moist.	Samp Alq / Analy Alq	Inst ID / Det ID	AnRunID / File Name	Count Date/Time	Net Cnts / Bkg Cnts	BaseEff / Bkg(min)	CntDur(min) / Yield	Activity +/- 2 s TPU	MDC / DecLev	ReportUnits / ReportBasis	DER / RPD	%Spk. Recov / Flags
1003063-7	URANIUM, TOTAL	3/3/2010	AS100305-2	NA	NA	WATER	15 ml	AlphaSpec2	AS100305-2A	3/6/2010	31573.600	30.96%	800	8.5E+03		ug/l	NA	
REP	Trg. Analyte	3:35:00 PM	AS100305-2-1	NA	NA	NA	15 ml	58	Spectrum #1	4:36 PM	8.000	1000	60.7%	1.3E+03	NA	Unfiltered	NA	
1003063-8	U-232	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.02* g	AlphaSpec2	AS100305-1A	3/6/2010	1169.600	28.56%	800	1.49E-07	3E-09	ug/g	NA	
SMP	Tracer	2:32:00 PM	AS100305-1-2	NA	NA	31.677	1.02* g	23	Spectrum #1	4:30 PM	18.000	1000	49.6%	2.4E-08	NA	Dry Weight	NA	
1003063-8	U-234	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.02* g	AlphaSpec2	AS100305-1A	3/6/2010	184.600	28.56%	800	1.69E-04	1.3E-05	ug/g	NA	
SMP	Trg. Analyte	2:32:00 PM	AS100305-1-2	NA	NA	31.677	1.02* g	23	Spectrum #1	4:30 PM	8.000	1000	49.6%	3.7E-05	NA	Dry Weight	NA	
1003063-8	U-235	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.02* g	AlphaSpec2	AS100305-1A	3/6/2010	10.400	28.56%	800	3.2E-02	2.7E-02	ug/g	NA	
SMP	Trg. Analyte	2:32:00 PM	AS100305-1-2	NA	NA	31.677	1.02* g	23	Spectrum #1	4:30 PM	2.000	1000	49.6%	2.3E-02	NA	Dry Weight	NA	LT
1003063-8	U-238	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.02* g	AlphaSpec2	AS100305-1A	3/6/2010	193.800	28.56%	800	3.3E+00	2.6E-01	ug/g	NA	
SMP	Trg. Analyte	2:32:00 PM	AS100305-1-2	NA	NA	31.677	1.02* g	23	Spectrum #1	4:30 PM	9.000	1000	49.6%	7.2E-01	NA	Dry Weight	NA	
1003063-8	URANIUM, TOTAL	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.02* g	AlphaSpec2	AS100305-1A	3/6/2010	388.800	28.56%	800	3.33E+00		ug/g	NA	
SMP	Trg. Analyte	2:32:00 PM	AS100305-1-2	NA	NA	31.677	1.02* g	23	Spectrum #1	4:30 PM	19.000	1000	49.6%	7.2E-01	NA	Dry Weight	NA	
1003063-9	U-232	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.05* g	AlphaSpec2	AS100305-1A	3/6/2010	2155.600	28.18%	800	2.52E-07	2E-09	ug/g	NA	
SMP	Tracer	3:11:00 PM	AS100305-1-2	NA	NA	27.0644	1.05* g	24	Spectrum #1	4:30 PM	13.000	1000	92.6%	3.9E-08	NA	Dry Weight	NA	
1003063-9	U-234	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.05* g	AlphaSpec2	AS100305-1A	3/6/2010	526.400	28.18%	800	2.38E-04	4E-06	ug/g	NA	
SMP	Trg. Analyte	3:11:00 PM	AS100305-1-2	NA	NA	27.0644	1.05* g	24	Spectrum #1	4:30 PM	2.000	1000	92.6%	4.2E-05	NA	Dry Weight	NA	
1003063-9	U-235	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.05* g	AlphaSpec2	AS100305-1A	3/6/2010	14.400	28.18%	800	2.2E-02	1.3E-02	ug/g	NA	
SMP	Trg. Analyte	3:11:00 PM	AS100305-1-2	NA	NA	27.0644	1.05* g	24	Spectrum #1	4:30 PM	2.000	1000	92.6%	1.3E-02	NA	Dry Weight	NA	LT
1003063-9	U-238	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.05* g	AlphaSpec2	AS100305-1A	3/6/2010	464.800	28.18%	800	3.9E+00	9E-02	ug/g	NA	
SMP	Trg. Analyte	3:11:00 PM	AS100305-1-2	NA	NA	27.0644	1.05* g	24	Spectrum #1	4:30 PM	4.000	1000	92.6%	7E-01	NA	Dry Weight	NA	
1003063-9	URANIUM, TOTAL	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.05* g	AlphaSpec2	AS100305-1A	3/6/2010	1005.600	28.18%	800	3.92E+00		ug/g	NA	
SMP	Trg. Analyte	3:11:00 PM	AS100305-1-2	NA	NA	27.0644	1.05* g	24	Spectrum #1	4:30 PM	8.000	1000	92.6%	7E-01	NA	Dry Weight	NA	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

+ - Duplicate RPD not within limits.

LT - Result is less than Request MDC, greater than sample specific MDC

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).

2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

2000011229

60 2000011229

Total Uranium by Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:04:04 AM

Sample ID / QC Type	Nuclide / Type	Sample Date/Time	Prep Batch / QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix / %Moist.	Samp Alq / Analy Alq	Inst ID / Det ID	AnRunID / File Name	Count Date/Time	Net Cnts / Bkg Cnts	BaseEff / Bkg(min)	CntDur(min) / Yield	Activity +/- 2 s TPU	MDC / DecLev	ReportUnits / ReportBasis	DER / RPD	%Spk. Recov / Flags
1003063-10	U-232	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	2090.200	31.43%	800	3.36E-07	3E-09	ug/l	NA	
SMP	Tracer	2:32:00 PM	AS100305-2-1	NA	NA	NA	500 ml	59	Spectrum #1	4:36 PM	21.000	1000	80.5%	5.2E-08	NA	Unfiltered	NA	
1003063-10	U-234	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	2072.200	31.43%	800	1.48E-03	1E-05	ug/l	NA	
SMP	Trg. Analyte	2:32:00 PM	AS100305-2-1	NA	NA	NA	500 ml	59	Spectrum #1	4:36 PM	6.000	1000	80.5%	2.4E-04	NA	Unfiltered	NA	
1003063-10	U-235	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	66.000	31.43%	800	1.6E-01	7E-03	ug/l	NA	
SMP	Trg. Analyte	2:32:00 PM	AS100305-2-1	NA	NA	NA	500 ml	59	Spectrum #1	4:36 PM	0.000	1000	80.5%	4.7E-02	NA	Unfiltered	NA	
1003063-10	U-238	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	1715.000	31.43%	800	2.27E+01	2E-01	ug/l	NA	
SMP	Trg. Analyte	2:32:00 PM	AS100305-2-1	NA	NA	NA	500 ml	59	Spectrum #1	4:36 PM	5.000	1000	80.5%	3.7E+00	NA	Unfiltered	NA	
1003063-10	URANIUM, TOTAL	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	3853.200	31.43%	800	2.29E+01		ug/l	NA	
SMP	Trg. Analyte	2:32:00 PM	AS100305-2-1	NA	NA	NA	500 ml	59	Spectrum #1	4:36 PM	11.000	1000	80.5%	3.7E+00	NA	Unfiltered	NA	
1003063-11	U-232	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	2165.400	30.31%	800	3.61E-07	4E-09	ug/l	NA	
SMP	Tracer	3:11:00 PM	AS100305-2-1	NA	NA	NA	500 ml	60	Spectrum #1	4:36 PM	22.000	1000	86.5%	5.6E-08	NA	Unfiltered	NA	
1003063-11	U-234	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	1833.600	30.31%	800	1.26E-03	1E-05	ug/l	NA	
SMP	Trg. Analyte	3:11:00 PM	AS100305-2-1	NA	NA	NA	500 ml	60	Spectrum #1	4:36 PM	8.000	1000	86.5%	2E-04	NA	Unfiltered	NA	
1003063-11	U-235	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	65.200	30.31%	800	1.53E-01	1.6E-02	ug/l	NA	
SMP	Trg. Analyte	3:11:00 PM	AS100305-2-1	NA	NA	NA	500 ml	60	Spectrum #1	4:36 PM	1.000	1000	86.5%	4.5E-02	NA	Unfiltered	NA	
1003063-11	U-238	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	1441.000	30.31%	800	1.84E+01	2E-01	ug/l	NA	
SMP	Trg. Analyte	3:11:00 PM	AS100305-2-1	NA	NA	NA	500 ml	60	Spectrum #1	4:36 PM	5.000	1000	86.5%	3E+00	NA	Unfiltered	NA	
1003063-11	URANIUM, TOTAL	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	3339.800	30.31%	800	1.86E+01		ug/l	NA	
SMP	Trg. Analyte	3:11:00 PM	AS100305-2-1	NA	NA	NA	500 ml	60	Spectrum #1	4:36 PM	14.000	1000	86.5%	3E+00	NA	Unfiltered	NA	
1003063-12	U-232	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.06* g	AlphaSpec2	AS100305-1A	3/6/2010	2032.600	29.36%	800	2.28E-07	3E-09	ug/g	NA	
SMP	Tracer	11:35:00 AM	AS100305-1-2	NA	NA	27.2979	1.06* g	25	Spectrum #1	4:33 PM	28.000	1000	83.8%	3.5E-08	NA	Dry Weight	NA	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

+ - Duplicate RPD not within limits.

LT - Result is less than Request MDC, greater than sample specific MDC

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).

2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

2000012300

61
2000012300

Total Uranium by Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:51:14 AM

Sample ID / QC Type	Nuclide / Type	Sample Date/Time	Prep Batch / QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix / %Moist.	Samp Alq / Analy Alq	Inst ID / Det ID	AnRunID / File Name	Count Date/Time	Net Cnts / Bkg Cnts	BaseEff / Bkg(min)	CntDur(min) / Yield	Activity +/- 2 s TPU	MDC / DecLev	ReportUnits / ReportBasis	DER / RPD	%Spk. Recov / Flags
1003063-12	U-234	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.06* g	AlphaSpec2	AS100305-1A	3/6/2010	293.200	29.36%	800	1.4E-04	6E-06	ug/g	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-1-2	NA	NA	27.2979	1.06* g	25	Spectrum #1	4:33 PM	6.000	1000	83.8%	2.7E-05	NA	Dry Weight	NA	
1003063-12	U-235	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.06* g	AlphaSpec2	AS100305-1A	3/6/2010	12.800	29.36%	800	2.1E-02	1.8E-02	ug/g	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-1-2	NA	NA	27.2979	1.06* g	25	Spectrum #1	4:33 PM	4.000	1000	83.8%	1.4E-02	NA	Dry Weight	NA	LT
1003063-12	U-238	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.06* g	AlphaSpec2	AS100305-1A	3/6/2010	304.200	29.36%	800	2.7E+00	1.5E-01	ug/g	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-1-2	NA	NA	27.2979	1.06* g	25	Spectrum #1	4:33 PM	11.000	1000	83.8%	5.2E-01	NA	Dry Weight	NA	
1003063-12	URANIUM, TOTAL	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.06* g	AlphaSpec2	AS100305-1A	3/6/2010	610.200	29.36%	800	2.72E+00		ug/g	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-1-2	NA	NA	27.2979	1.06* g	25	Spectrum #1	4:33 PM	21.000	1000	83.8%	5.3E-01	NA	Dry Weight	NA	
1003063-13	U-232	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.12* g	AlphaSpec2	AS100305-1A	3/6/2010	2078.800	31.01%	800	2.07E-07	3E-09	ug/g	NA	
SMP	Tracer	11:35:00 AM	AS100305-1-2	NA	NA	26.891	1.12* g	26	Spectrum #1	4:33 PM	29.000	1000	81.1%	3.2E-08	NA	Dry Weight	NA	
1003063-13	U-234	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.12* g	AlphaSpec2	AS100305-1A	3/6/2010	432.000	31.01%	800	1.9E-04	1E-05	ug/g	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-1-2	NA	NA	26.891	1.12* g	26	Spectrum #1	4:33 PM	25.000	1000	81.1%	3.5E-05	NA	Dry Weight	NA	
1003063-13	U-235	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.12* g	AlphaSpec2	AS100305-1A	3/6/2010	11.000	31.01%	800	1.6E-02	1.8E-02	ug/g	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-1-2	NA	NA	26.891	1.12* g	26	Spectrum #1	4:33 PM	5.000	1000	81.1%	1.3E-02	NA	Dry Weight	NA	U
1003063-13	U-238	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.12* g	AlphaSpec2	AS100305-1A	3/6/2010	449.600	31.01%	800	3.67E+00	1.2E-01	ug/g	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-1-2	NA	NA	26.891	1.12* g	26	Spectrum #1	4:33 PM	8.000	1000	81.1%	6.7E-01	NA	Dry Weight	NA	
1003063-13	URANIUM, TOTAL	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.12* g	AlphaSpec2	AS100305-1A	3/6/2010	892.600	31.01%	800	3.69E+00		ug/g	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-1-2	NA	NA	26.891	1.12* g	26	Spectrum #1	4:33 PM	38.000	1000	81.1%	6.7E-01	NA	Dry Weight	NA	
1003063-14	U-232	3/4/2010	AS100305-1	NA	NA	SOIL	1.04* g	AlphaSpec2	AS100305-1A	3/7/2010	2096.400	31.76%	800	1.64E-07	1E-09	ug/g	NA	
SMP	Tracer	9:50:00 AM	AS100305-1-1	NA	NA	2.3771	1.04* g	11	Spectrum #1	8:52 PM	12.000	1000	79.9%	2.5E-08	NA	Dry Weight	NA	
1003063-14	U-234	3/4/2010	AS100305-1	NA	NA	SOIL	1.04* g	AlphaSpec2	AS100305-1A	3/7/2010	4936.000	31.76%	800	1.73E-03	0E+00	ug/g	NA	
SMP	Trg. Analyte	9:50:00 AM	AS100305-1-1	NA	NA	2.3771	1.04* g	11	Spectrum #1	8:52 PM	5.000	1000	79.9%	2.7E-04	NA	Dry Weight	NA	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

+ - Duplicate RPD not within limits.

LT - Result is less than Request MDC, greater than sample specific MDC

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).

2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

2000011231

62
2000011231

Total Uranium by Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:51:14 AM

Sample ID / QC Type	Nuclide / Type	Sample Date/Time	Prep Batch / QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix / %Moist.	Samp Alq / Analy Alq	Inst ID / Det ID	AnRunID / File Name	Count Date/Time	Net Cnts / Bkg Cnts	BaseEff / Bkg(min)	CntDur(min) / Yield	Activity +/- 2 s TPU	MDC / DecLev	ReportUnits / ReportBasis	DER / RPD	%Spk. Recov / Flags
1003063-14	U-235	3/4/2010	AS100305-1	NA	NA	SOIL	1.04* g	AlphaSpec2	AS100305-1A	3/7/2010	287.200	31.76%	800	3.43E-01	1.5E-02	ug/g	NA	
SMP	Trg. Analyte	9:50:00 AM	AS100305-1-1	NA	NA	2.3771	1.04* g	11	Spectrum #1	8:52 PM	6.000	1000	79.9%	6.7E-02	NA	Dry Weight	NA	
1003063-14	U-238	3/4/2010	AS100305-1	NA	NA	SOIL	1.04* g	AlphaSpec2	AS100305-1A	3/7/2010	6255.600	31.76%	800	4.08E+01	1E-01	ug/g	NA	
SMP	Trg. Analyte	9:50:00 AM	AS100305-1-1	NA	NA	2.3771	1.04* g	11	Spectrum #1	8:52 PM	3.000	1000	79.9%	6.4E+00	NA	Dry Weight	NA	
1003063-14	URANIUM, TOTAL	3/4/2010	AS100305-1	NA	NA	SOIL	1.04* g	AlphaSpec2	AS100305-1A	3/7/2010	11478.800	31.76%	800	4.11E+01		ug/g	NA	
SMP	Trg. Analyte	9:50:00 AM	AS100305-1-1	NA	NA	2.3771	1.04* g	11	Spectrum #1	8:52 PM	14.000	1000	79.9%	6.4E+00	NA	Dry Weight	NA	
1003063-15	U-232	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	2194.200	29.98%	800	3.7E-07	3E-09	ug/l	NA	
SMP	Tracer	3:29:00 PM	AS100305-2-1	NA	NA	NA	500 ml	62	Spectrum #1	4:36 PM	16.000	1000	88.6%	5.7E-08	NA	Unfiltered	NA	
1003063-15	U-234	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	1718.251	29.98%	800	1.17E-03	1E-05	ug/l	NA	
SMP	Trg. Analyte	3:29:00 PM	AS100305-2-1	NA	NA	NA	500 ml	62	Spectrum #1	4:36 PM	6.000	1000	88.6%	1.9E-04	NA	Unfiltered	NA	
1003063-15	U-235	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	57.329	29.98%	800	1.32E-01	2E-02	ug/l	NA	
SMP	Trg. Analyte	3:29:00 PM	AS100305-2-1	NA	NA	NA	500 ml	62	Spectrum #1	4:36 PM	2.025	1000	88.6%	4.1E-02	NA	Unfiltered	NA	
1003063-15	U-238	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	1320.395	29.98%	800	1.67E+01	2E-01	ug/l	NA	
SMP	Trg. Analyte	3:29:00 PM	AS100305-2-1	NA	NA	NA	500 ml	62	Spectrum #1	4:36 PM	6.975	1000	88.6%	2.7E+00	NA	Unfiltered	NA	
1003063-15	URANIUM, TOTAL	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	3095.975	29.98%	800	1.68E+01		ug/l	NA	
SMP	Trg. Analyte	3:29:00 PM	AS100305-2-1	NA	NA	NA	500 ml	62	Spectrum #1	4:36 PM	15.000	1000	88.6%	2.7E+00	NA	Unfiltered	NA	
1003063-16	U-232	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.13* g	AlphaSpec2	AS100305-1A	3/6/2010	2121.600	28.81%	800	2.44E-07	2E-09	ug/g	NA	
SMP	Tracer	10:30:00 AM	AS100305-1-2	NA	NA	32.5343	1.13* g	28	Spectrum #1	4:33 PM	18.000	1000	89.1%	3.8E-08	NA	Dry Weight	NA	
1003063-16	U-234	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.13* g	AlphaSpec2	AS100305-1A	3/6/2010	494.000	28.81%	800	2.27E-04	6E-06	ug/g	NA	
SMP	Trg. Analyte	10:30:00 AM	AS100305-1-2	NA	NA	32.5343	1.13* g	28	Spectrum #1	4:33 PM	5.000	1000	89.1%	4.1E-05	NA	Dry Weight	NA	
1003063-16	U-235	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.13* g	AlphaSpec2	AS100305-1A	3/6/2010	21.200	28.81%	800	3.3E-02	1.1E-02	ug/g	NA	
SMP	Trg. Analyte	10:30:00 AM	AS100305-1-2	NA	NA	32.5343	1.13* g	28	Spectrum #1	4:33 PM	1.000	1000	89.1%	1.6E-02	NA	Dry Weight	NA	LT

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

+ - Duplicate RPD not within limits.

LT - Result is less than Request MDC, greater than sample specific MDC

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).

2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

2000001232

63
2000001232

Total Uranium by Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:51:14 AM

Sample ID / QC Type	Nuclide / Type	Sample Date/Time	Prep Batch / QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix / %Moist.	Samp Alq / Analy Alq	Inst ID / Det ID	AnRunID / File Name	Count Date/Time	Net Cnts / Bkg Cnts	BaseEff / Bkg(min)	CntDur(min) / Yield	Activity +/- 2 s TPU	MDC / DecLev	ReportUnits / ReportBasis	DER / RPD	%Spk. Recov / Flags
1003063-16	U-238	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.13* g	AlphaSpec2	AS100305-1A	3/6/2010	546.600	28.81%	800	4.67E+00	8E-02	ug/g	NA	
SMP	Trg. Analyte	10:30:00 AM	AS100305-1-2	NA	NA	32.5343	1.13* g	28	Spectrum #1	4:33 PM	3.000	1000	89.1%	8.3E-01	NA	Dry Weight	NA	
1003063-16	URANIUM, TOTAL	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.13* g	AlphaSpec2	AS100305-1A	3/6/2010	1061.800	28.81%	800	4.71E+00		ug/g	NA	
SMP	Trg. Analyte	10:30:00 AM	AS100305-1-2	NA	NA	32.5343	1.13* g	28	Spectrum #1	4:33 PM	9.000	1000	89.1%	8.3E-01	NA	Dry Weight	NA	
1003063-16	U-232	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.08* g	AlphaSpec2	AS100305-1A	3/6/2010	2008.800	28.34%	800	2.46E-07	2E-09	ug/g	NA	
DUP	Tracer	10:30:00 AM	AS100305-1-2	NA	NA	32.5343	1.08* g	29	Spectrum #1	4:33 PM	14.000	1000	85.8%	3.8E-08	NA	Dry Weight	NA	
1003063-16	U-234	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.08* g	AlphaSpec2	AS100305-1A	3/6/2010	511.400	28.34%	800	2.61E-04	4E-06	ug/g	0.54	
DUP	Trg. Analyte	10:30:00 AM	AS100305-1-2	NA	NA	32.5343	1.08* g	29	Spectrum #1	4:33 PM	2.000	1000	85.8%	4.7E-05	NA	Dry Weight	NA	
1003063-16	U-235	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.08* g	AlphaSpec2	AS100305-1A	3/6/2010	26.000	28.34%	800	4.5E-02	5E-03	ug/g	0.48	
DUP	Trg. Analyte	10:30:00 AM	AS100305-1-2	NA	NA	32.5343	1.08* g	29	Spectrum #1	4:33 PM	0.000	1000	85.8%	1.9E-02	NA	Dry Weight	NA	LT
1003063-16	U-238	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.08* g	AlphaSpec2	AS100305-1A	3/6/2010	492.800	28.34%	800	4.67E+00	1E-01	ug/g	0.00	
DUP	Trg. Analyte	10:30:00 AM	AS100305-1-2	NA	NA	32.5343	1.08* g	29	Spectrum #1	4:33 PM	4.000	1000	85.8%	8.4E-01	NA	Dry Weight	NA	
1003063-16	URANIUM, TOTAL	3/3/2010	AS100305-1	NA	NA	SEDIMENT	1.08* g	AlphaSpec2	AS100305-1A	3/6/2010	1030.200	28.34%	800	4.72E+00		ug/g	0.02	
DUP	Trg. Analyte	10:30:00 AM	AS100305-1-2	NA	NA	32.5343	1.08* g	29	Spectrum #1	4:33 PM	6.000	1000	85.8%	8.4E-01	NA	Dry Weight	NA	
1003063-17	U-232	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	2103.200	31.04%	800	3.42E-07	3E-09	ug/l	NA	
SMP	Tracer	11:35:00 AM	AS100305-2-1	NA	NA	NA	500 ml	63	Spectrum #1	4:36 PM	16.000	1000	82.0%	5.3E-08	NA	Unfiltered	NA	
1003063-17	U-234	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	5020.800	31.04%	800	3.56E-03	1E-05	ug/l	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-2-1	NA	NA	NA	500 ml	63	Spectrum #1	4:36 PM	4.000	1000	82.0%	5.6E-04	NA	Unfiltered	NA	
1003063-17	U-235	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	194.400	31.04%	800	4.68E-01	2.1E-02	ug/l	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-2-1	NA	NA	NA	500 ml	63	Spectrum #1	4:36 PM	2.000	1000	82.0%	9.9E-02	NA	Unfiltered	NA	
1003063-17	U-238	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	4542.000	31.04%	800	5.98E+01	2E-01	ug/l	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-2-1	NA	NA	NA	500 ml	63	Spectrum #1	4:36 PM	5.000	1000	82.0%	9.4E+00	NA	Unfiltered	NA	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

+ - Duplicate RPD not within limits.

LT - Result is less than Request MDC, greater than sample specific MDC

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).

2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

2000012333

64
2000012333

Total Uranium by Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:04:04 AM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Alq Analy Alq	Inst ID Det ID	AnRunID File Name	Count Date/Time	Net Cnts Bkg Cnts	BaseEff Bkg(min)	CntDur(min) Yield	Activity +/- 2 s TPU	MDC DecLev	ReportUnits ReportBasis	DER RPD	%Spk. Recov Flags
1003063-17	URANIUM, TOTAL	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	9757.200	31.04%	800	6.03E+01		ug/l	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-2-1	NA	NA	NA	500 ml	63	Spectrum #1	4:36 PM	11.000	1000	82.0%	9.4E+00	NA	Unfiltered	NA	
1003063-18	U-232	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	2101.200	30.31%	800	3.5E-07	3E-09	ug/l	NA	
SMP	Tracer	11:35:00 AM	AS100305-2-1	NA	NA	NA	500 ml	64	Spectrum #1	4:36 PM	16.000	1000	83.9%	5.4E-08	NA	Unfiltered	NA	
1003063-18	U-234	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	4714.800	30.31%	800	3.35E-03	1E-05	ug/l	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-2-1	NA	NA	NA	500 ml	64	Spectrum #1	4:36 PM	4.000	1000	83.9%	5.3E-04	NA	Unfiltered	NA	
1003063-18	U-235	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	161.800	30.31%	800	3.9E-01	2.7E-02	ug/l	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-2-1	NA	NA	NA	500 ml	64	Spectrum #1	4:36 PM	4.000	1000	83.9%	8.7E-02	NA	Unfiltered	NA	
1003063-18	U-238	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	4298.400	30.31%	800	5.67E+01	2E-01	ug/l	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-2-1	NA	NA	NA	500 ml	64	Spectrum #1	4:36 PM	7.000	1000	83.9%	8.9E+00	NA	Unfiltered	NA	
1003063-18	URANIUM, TOTAL	3/3/2010	AS100305-2	NA	NA	WATER	500 ml	AlphaSpec2	AS100305-2A	3/6/2010	9175.000	30.31%	800	5.71E+01		ug/l	NA	
SMP	Trg. Analyte	11:35:00 AM	AS100305-2-1	NA	NA	NA	500 ml	64	Spectrum #1	4:36 PM	15.000	1000	83.9%	8.9E+00	NA	Unfiltered	NA	
AS100305-1	U-232	3/5/2010	AS100305-1	NA	NA	SEDIMENT	1 g	AlphaSpec2	AS100305-1A	3/6/2010	2002.800	28.28%	800	1.79E-07	2E-09	ug/g	NA	
MB	Tracer	2:20:34 PM	AS100305-1-2	NA	NA	NA	1 g	30	Spectrum #1	4:33 PM	19.000	1000	85.7%	2.8E-08	NA	As Received	NA	
AS100305-1	U-232	3/5/2010	AS100305-1	NA	NA	SOIL	1 g	AlphaSpec2	AS100305-1A	3/6/2010	2002.800	28.28%	800	1.79E-07	2E-09	ug/g	NA	
MB	Tracer	2:20:34 PM	AS100305-1-1	NA	NA	NA	1 g	30	Spectrum #1	4:33 PM	19.000	1000	85.7%	2.8E-08	NA	As Received	NA	
AS100305-1	U-234	3/5/2010	AS100305-1	NA	NA	SOIL	1 g	AlphaSpec2	AS100305-1A	3/6/2010	8.400	28.28%	800	3.1E-06	3.2E-06	ug/g	NA	
MB	Trg. Analyte	2:20:34 PM	AS100305-1-1	NA	NA	NA	1 g	30	Spectrum #1	4:33 PM	2.000	1000	85.7%	2.5E-06	NA	As Received	NA	U
AS100305-1	U-234	3/5/2010	AS100305-1	NA	NA	SEDIMENT	1 g	AlphaSpec2	AS100305-1A	3/6/2010	8.400	28.28%	800	3.1E-06	3.2E-06	ug/g	NA	
MB	Trg. Analyte	2:20:34 PM	AS100305-1-2	NA	NA	NA	1 g	30	Spectrum #1	4:33 PM	2.000	1000	85.7%	2.5E-06	NA	As Received	NA	U
AS100305-1	U-235	3/5/2010	AS100305-1	NA	NA	SOIL	1 g	AlphaSpec2	AS100305-1A	3/6/2010	2.200	28.28%	800	2.8E-03	8.7E-03	ug/g	NA	
MB	Trg. Analyte	2:20:34 PM	AS100305-1-1	NA	NA	NA	1 g	30	Spectrum #1	4:33 PM	1.000	1000	85.7%	5.6E-03	NA	As Received	NA	U

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

+ - Duplicate RPD not within limits.

LT - Result is less than Request MDC, greater than sample specific MDC

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).

2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

65 2000012345 2000012345

Total Uranium by Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:51:14 AM

Sample ID QC Type	Nuclide Type	Sample Date/Time	Prep Batch QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix %Moist.	Samp Alq Analy Alq	Inst ID Det ID	AnRunID File Name	Count Date/Time	Net Cnts Bkg Cnts	BaseEff Bkg(min)	CntDur(min) Yield	Activity +/- 2 s TPU	MDC DecLev	ReportUnits ReportBasis	DER RPD	%Spk. Recov Flags
AS100305-1	U-235	3/5/2010	AS100305-1	NA	NA	SEDIMENT	1 g	AlphaSpec2	AS100305-1A	3/6/2010	2.200	28.28%	800	2.8E-03	8.7E-03	ug/g	NA	
MB	Trg. Analyte	2:20:34 PM	AS100305-1-2	NA	NA	NA	1 g	30	Spectrum #1	4:33 PM	1.000	1000	85.7%	5.6E-03	NA	As Received	NA	U
AS100305-1	U-238	3/5/2010	AS100305-1	NA	NA	SEDIMENT	1 g	AlphaSpec2	AS100305-1A	3/6/2010	4.400	28.28%	800	3E-02	5.9E-02	ug/g	NA	
MB	Trg. Analyte	2:20:34 PM	AS100305-1-2	NA	NA	NA	1 g	30	Spectrum #1	4:33 PM	2.000	1000	85.7%	3.8E-02	NA	As Received	NA	U
AS100305-1	U-238	3/5/2010	AS100305-1	NA	NA	SOIL	1 g	AlphaSpec2	AS100305-1A	3/6/2010	4.400	28.28%	800	3E-02	5.9E-02	ug/g	NA	
MB	Trg. Analyte	2:20:34 PM	AS100305-1-1	NA	NA	NA	1 g	30	Spectrum #1	4:33 PM	2.000	1000	85.7%	3.8E-02	NA	As Received	NA	U
AS100305-1	URANIUM, TOTAL	3/5/2010	AS100305-1	NA	NA	SOIL	1 g	AlphaSpec2	AS100305-1A	3/6/2010	15.000	28.28%	800	3.3E-02		ug/g	NA	
MB	Trg. Analyte	2:20:34 PM	AS100305-1-1	NA	NA	NA	1 g	30	Spectrum #1	4:33 PM	5.000	1000	85.7%	3.8E-02	NA	As Received	NA	
AS100305-1	URANIUM, TOTAL	3/5/2010	AS100305-1	NA	NA	SEDIMENT	1 g	AlphaSpec2	AS100305-1A	3/6/2010	15.000	28.28%	800	3.3E-02		ug/g	NA	
MB	Trg. Analyte	2:20:34 PM	AS100305-1-2	NA	NA	NA	1 g	30	Spectrum #1	4:33 PM	5.000	1000	85.7%	3.8E-02	NA	As Received	NA	
AS100305-1	U-232	3/5/2010	AS100305-1	NA	NA	SEDIMENT	1 g	AlphaSpec2	AS100305-1A	3/6/2010	1799.000	29.66%	800	1.53E-07	3E-09	ug/g	NA	
LCS	Tracer	2:20:34 PM	AS100305-1-2	NA	NA	NA	1 g	31	Spectrum #1	4:33 PM	45.000	1000	73.4%	2.4E-08	NA	As Received	NA	
AS100305-1	U-232	3/5/2010	AS100305-1	NA	NA	SOIL	1 g	AlphaSpec2	AS100305-1A	3/6/2010	1799.000	29.66%	800	1.53E-07	3E-09	ug/g	NA	
LCS	Tracer	2:20:34 PM	AS100305-1-1	NA	NA	NA	1 g	31	Spectrum #1	4:33 PM	45.000	1000	73.4%	2.4E-08	NA	As Received	NA	
AS100305-1	U-234	3/5/2010	AS100305-1	NA	NA	SOIL	1 g	AlphaSpec2	AS100305-1A	3/6/2010	1687.000	29.66%	800	7E-04	0E+00	ug/g	NA	101
LCS	Trg. Analyte	2:20:34 PM	AS100305-1-1	NA	NA	NA	1 g	31	Spectrum #1	4:33 PM	5.000	1000	73.4%	1.1E-04	NA	As Received	NA	P
AS100305-1	U-234	3/5/2010	AS100305-1	NA	NA	SEDIMENT	1 g	AlphaSpec2	AS100305-1A	3/6/2010	1687.000	29.66%	800	7E-04	0E+00	ug/g	NA	101
LCS	Trg. Analyte	2:20:34 PM	AS100305-1-2	NA	NA	NA	1 g	31	Spectrum #1	4:33 PM	5.000	1000	73.4%	1.1E-04	NA	As Received	NA	P
AS100305-1	U-235	3/5/2010	AS100305-1	NA	NA	SOIL	1 g	AlphaSpec2	AS100305-1A	3/6/2010	77.000	29.66%	800	1.08E-01	4E-03	ug/g	NA	113
LCS	Trg. Analyte	2:20:34 PM	AS100305-1-1	NA	NA	NA	1 g	31	Spectrum #1	4:33 PM	0.000	1000	73.4%	3E-02	NA	As Received	NA	
AS100305-1	U-235	3/5/2010	AS100305-1	NA	NA	SEDIMENT	1 g	AlphaSpec2	AS100305-1A	3/6/2010	77.000	29.66%	800	1.08E-01	4E-03	ug/g	NA	113
LCS	Trg. Analyte	2:20:34 PM	AS100305-1-2	NA	NA	NA	1 g	31	Spectrum #1	4:33 PM	0.000	1000	73.4%	3E-02	NA	As Received	NA	

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

+ - Duplicate RPD not within limits.

LT - Result is less than Request MDC, greater than sample specific MDC

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).

2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

2000001235

2000001235
96

Total Uranium by Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:51:14 AM

Sample ID / QC Type	Nuclide / Type	Sample Date/Time	Prep Batch / QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix / %Moist.	Samp Alq / Analy Alq	Inst ID / Det ID	AnRunID / File Name	Count Date/Time	Net Cnts / Bkg Cnts	BaseEff / Bkg(min)	CntDur(min) / Yield	Activity +/- 2 s TPU	MDC / DecLev	ReportUnits / ReportBasis	DER / RPD	%Spk. Recov / Flags
AS100305-1	U-238	3/5/2010	AS100305-1	NA	NA	SEDIMENT	1 g	AlphaSpec2	AS100305-1A	3/6/2010	1808.000	29.66%	800	1.39E+01	1E-01	ug/g	NA	104
LCS	Trg. Analyte	2:20:34 PM	AS100305-1-2	NA	NA	NA	1 g	31	Spectrum #1	4:33 PM	10.000	1000	73.4%	2.3E+00	NA	As Received	NA	P
AS100305-1	U-238	3/5/2010	AS100305-1	NA	NA	SOIL	1 g	AlphaSpec2	AS100305-1A	3/6/2010	1808.000	29.66%	800	1.39E+01	1E-01	ug/g	NA	104
LCS	Trg. Analyte	2:20:34 PM	AS100305-1-1	NA	NA	NA	1 g	31	Spectrum #1	4:33 PM	10.000	1000	73.4%	2.3E+00	NA	As Received	NA	P
AS100305-1	URANIUM, TOTAL	3/5/2010	AS100305-1	NA	NA	SOIL	1 g	AlphaSpec2	AS100305-1A	3/6/2010	3572.000	29.66%	800	1.4E+01		ug/g	NA	104
LCS	Trg. Analyte	2:20:34 PM	AS100305-1-1	NA	NA	NA	1 g	31	Spectrum #1	4:33 PM	15.000	1000	73.4%	2.3E+00	NA	As Received	NA	P
AS100305-1	URANIUM, TOTAL	3/5/2010	AS100305-1	NA	NA	SEDIMENT	1 g	AlphaSpec2	AS100305-1A	3/6/2010	3572.000	29.66%	800	1.4E+01		ug/g	NA	104
LCS	Trg. Analyte	2:20:34 PM	AS100305-1-2	NA	NA	NA	1 g	31	Spectrum #1	4:33 PM	15.000	1000	73.4%	2.3E+00	NA	As Received	NA	P
AS100305-2	U-232	3/5/2010	AS100305-2	NA	NA	WATER	1 ml	AlphaSpec2	AS100305-2A	3/7/2010	2047.600	30.99%	800	1.67E-04	1E-06	ug/l	NA	
MB	Tracer	2:27:08 PM	AS100305-2-1	NA	NA	NA	1 ml	9	Spectrum #1	8:05 PM	13.000	1000	80.0%	2.6E-05	NA	Unfiltered	NA	
AS100305-2	U-234	3/5/2010	AS100305-2	NA	NA	WATER	1 ml	AlphaSpec2	AS100305-2A	3/7/2010	0.000	30.99%	800	0E+00	4.4E-03	ug/l	NA	
MB	Trg. Analyte	2:27:08 PM	AS100305-2-1	NA	NA	NA	1 ml	9	Spectrum #1	8:05 PM	5.000	1000	80.0%	2E-03	NA	Unfiltered	NA	U,M
AS100305-2	U-235	3/5/2010	AS100305-2	NA	NA	WATER	1 ml	AlphaSpec2	AS100305-2A	3/7/2010	-0.800	30.99%	800	-1E+00	8.5E+00	ug/l	NA	
MB	Trg. Analyte	2:27:08 PM	AS100305-2-1	NA	NA	NA	1 ml	9	Spectrum #1	8:05 PM	1.000	1000	80.0%	5.5E+00	NA	Unfiltered	NA	U,M
AS100305-2	U-238	3/5/2010	AS100305-2	NA	NA	WATER	1 ml	AlphaSpec2	AS100305-2A	3/7/2010	7.200	30.99%	800	4.9E+01	4.6E+01	ug/l	NA	
MB	Trg. Analyte	2:27:08 PM	AS100305-2-1	NA	NA	NA	1 ml	9	Spectrum #1	8:05 PM	1.000	1000	80.0%	4E+01	NA	Unfiltered	NA	B,M
AS100305-2	URANIUM, TOTAL	3/5/2010	AS100305-2	NA	NA	WATER	1 ml	AlphaSpec2	AS100305-2A	3/7/2010	6.400	30.99%	800	4.8E+01		ug/l	NA	
MB	Trg. Analyte	2:27:08 PM	AS100305-2-1	NA	NA	NA	1 ml	9	Spectrum #1	8:05 PM	7.000	1000	80.0%	4.1E+01	NA	Unfiltered	NA	
AS100305-2	U-232	3/5/2010	AS100305-2	NA	NA	WATER	1 ml	AlphaSpec2	AS100305-2A	3/7/2010	2248.600	31.56%	800	1.8E-04	1E-06	ug/l	NA	
LCS	Tracer	2:27:08 PM	AS100305-2-1	NA	NA	NA	1 ml	10a	Spectrum #1	8:05 PM	13.000	1000	86.2%	2.8E-05	NA	Unfiltered	NA	
AS100305-2	U-234	3/5/2010	AS100305-2	NA	NA	WATER	1 ml	AlphaSpec2	AS100305-2A	3/7/2010	2098.600	31.56%	800	7E-01	0E+00	ug/l	NA	100
LCS	Trg. Analyte	2:27:08 PM	AS100305-2-1	NA	NA	NA	1 ml	10a	Spectrum #1	8:05 PM	3.000	1000	86.2%	1.1E-01	NA	Unfiltered	NA	P,M3

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

+ - Duplicate RPD not within limits.

LT - Result is less than Request MDC, greater than sample specific MDC

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).

2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

2000012367

67 2000012367

Total Uranium by Alpha Spectroscopy Raw Data Report

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:04:04 AM

Sample ID / QC Type	Nuclide / Type	Sample Date/Time	Prep Batch / QCBatchID	Ingrowth Date /Time	Decay Date/Time	Matrix / %Moist.	Samp Alq / Analy Alq	Inst ID / Det ID	AnRunID / File Name	Count Date/Time	Net Cnts / Bkg Cnts	BaseEff / Bkg(min)	CntDur(min) / Yield	Activity +/- 2 s TPU	MDC / DecLev	ReportUnits / ReportBasis	DER / RPD	%Spk. Recov / Flags
AS100305-2	U-235	3/5/2010	AS100305-2	NA	NA	WATER	1 ml	AlphaSpec2	AS100305-2A	3/7/2010	90.000	31.56%	800	1.01E+02	3E+00	ug/l	NA	106
LCS	Trg. Analyte	2:27:08 PM	AS100305-2-1	NA	NA	NA	1 ml	10a	Spectrum #1	8:05 PM	0.000	1000	86.2%	2.6E+01	NA	Unfiltered	NA	M3
AS100305-2	U-238	3/5/2010	AS100305-2	NA	NA	WATER	1 ml	AlphaSpec2	AS100305-2A	3/7/2010	2232.400	31.56%	800	1.38E+04	1E+02	ug/l	NA	103
LCS	Trg. Analyte	2:27:08 PM	AS100305-2-1	NA	NA	NA	1 ml	10a	Spectrum #1	8:05 PM	2.000	1000	86.2%	2.2E+03	NA	Unfiltered	NA	P,M3
AS100305-2	URANIUM, TOTAL	3/5/2010	AS100305-2	NA	NA	WATER	1 ml	AlphaSpec2	AS100305-2A	3/7/2010	4421.000	31.56%	800	1.39E+04		ug/l	NA	103
LCS	Trg. Analyte	2:27:08 PM	AS100305-2-1	NA	NA	NA	1 ml	10a	Spectrum #1	8:05 PM	5.000	1000	86.2%	2.2E+03	NA	Unfiltered	NA	P

Comments:

Data Package ID: *UT1003063-1*

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

D - DER is greater than Control Limit of 2.13

+ - Duplicate RPD not within limits.

LT - Result is less than Request MDC, greater than sample specific MDC

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'

M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Notes:

1) The Tracer results are not yield corrected (i.e. activity measured not activity added).

2) Where sample time is not available, 12:00 PM (Mountain) is used for decay correction.

Abbreviations:

TR- Tracer TA - Target Analyte

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

DER - Duplicate Error Ratio

BDL - Below Detection Limit

200001237

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200001237

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-1
Spectrum #1 Analysis #1

Sample Size : 1.00

Acquisition

Detector: 13
Batch Name: UAS100305-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:30:08PM
Live Time: 800.00 min.
Real Time: 800.03 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030213; Det: 13; Spectrum #1; Mar-02-2010 15:02

Calibration Date: 3/2/2010 11:31:52AM

Efficiency Calibration: C10030213

Efficiency: 31.64% +/- 0.13% TPU(2 sigma)

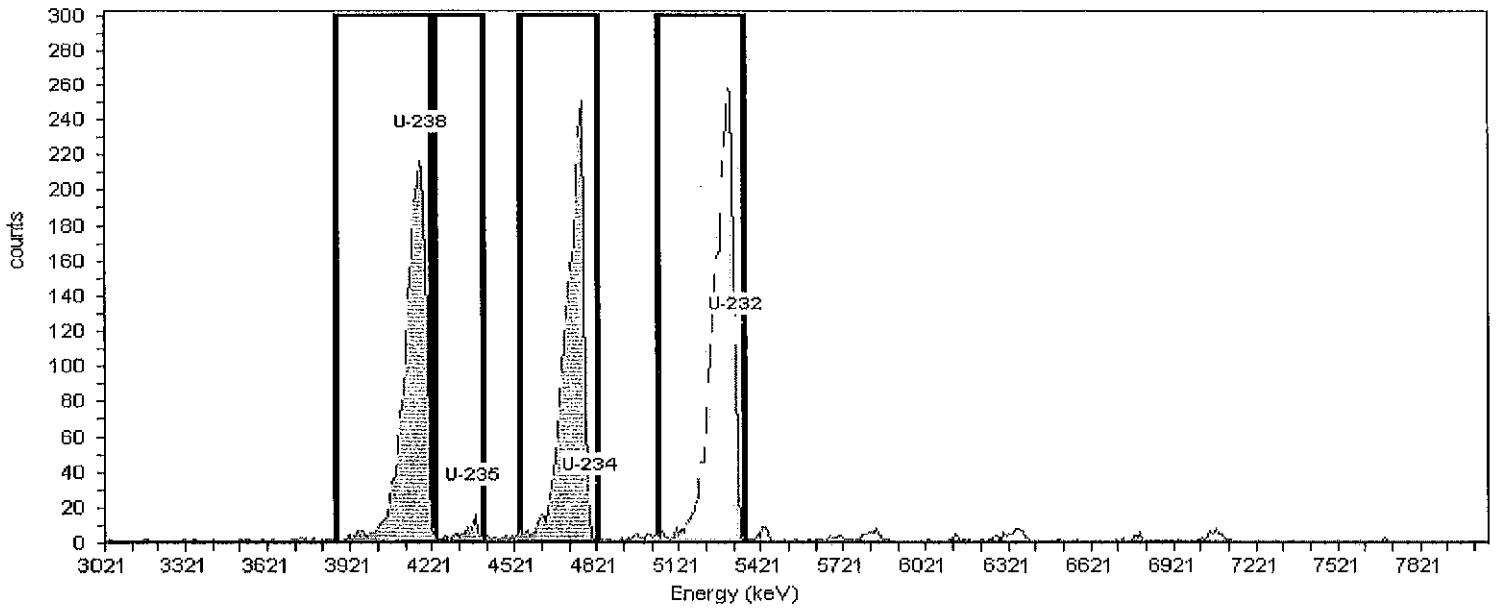
Energy Calibration: C10030213

Energy Cal: Gain = 9.9003 keV / Ch
Offset = 3,011.38 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 86.26%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4152.5	3865.4	4221.8	84.9	100.2	1,969.68	1.60	1,968.08	4.1E+000	4.8E-001	5.7E-003	1.7E-002
U-235	4340.6	4231.7	4409.9	34.4	99.7	73.47	0.80	72.67	1.5E-001	3.9E-002	2.0E-003	1.4E-002
U-234	4766.4	4538.6	4825.8	74.5	100.0	1,928.74	2.61	1,926.12	4.0E+000	4.7E-001	7.4E-003	2.0E-002
U-232	5301.0	5043.6	5360.4	94.2	100.1	2,267.47	7.58	2,259.89	4.1E+000	1.8E-001	1.3E-002	3.2E-002

Reviewed By: JMF JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001238

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-2R2
Spectrum #1 Analysis #1

Sample Size : ~~1.00~~ 0.1
JP 3/8/10

Acquisition

Detector: 14
Batch Name: UAS100305-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute Interactive ROI Analysis
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:30:09PM
Live Time: 800.00 min.
Real Time: 800.03 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030214; Det: 14; Spectrum #1; Mar-02-2010 15:02

Calibration Date: 3/2/2010 11:32:21AM

Efficiency Calibration: C10030214

Efficiency: 30.21% +/- 0.15% TPU(2 sigma)

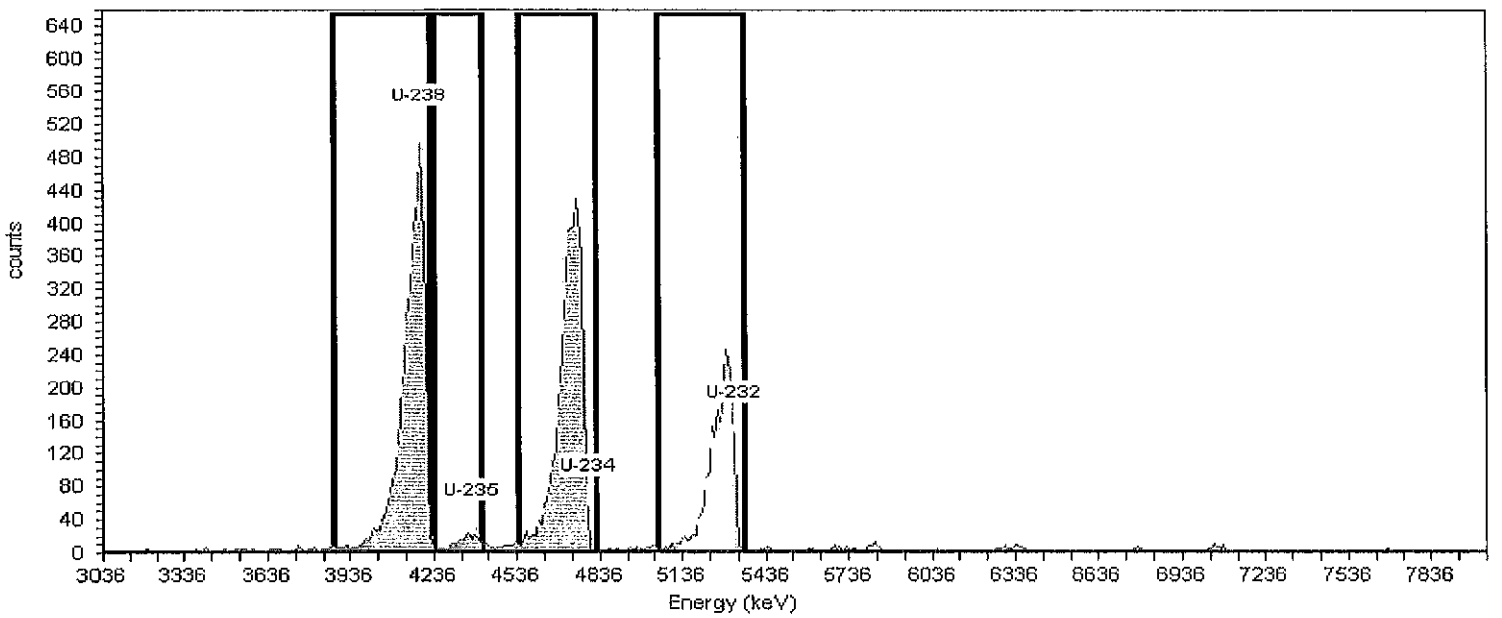
Energy Calibration: C10030214

Energy Cal: Gain = 9.8047 keV / Ch
Offset = 3,026.20 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 85.85%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4183.2	3869.4	4222.4	41.0	100.2	4,264.00	0.80	4,263.20	9.2E+000	1.0E+000	4.3E-003	1.4E-002
U-235	4369.5	4232.2	4408.7	65.0	99.7	180.00	3.20	176.80	3.9E-001	7.2E-002	2.0E-002	2.3E-002
U-234	4791.1	4536.1	4820.5	89.3	100.0	4,209.00	4.80	4,204.20	9.1E+000	1.0E+000	1.0E-002	2.7E-002
U-232	5320.5	5046.0	5359.7	50.2	100.1	2,153.00	5.60	2,147.40	4.1E+000	1.8E-001	1.2E-002	2.9E-002

200001239

Reviewed By: MF JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001239

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-3
Spectrum #1 Analysis #1

Sample Size : 1.00

Acquisition

Detector: 16
Batch Name: UAS100305-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:30:10PM
Live Time: 800.00 min.
Real Time: 800.03 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030216; Det: 16; Spectrum #1; Mar-02-2010 15:02

Calibration Date: 3/2/2010 11:32:47AM

Efficiency Calibration: C10030216

Efficiency: 30.65% +/- 0.12% TPU(2 sigma)

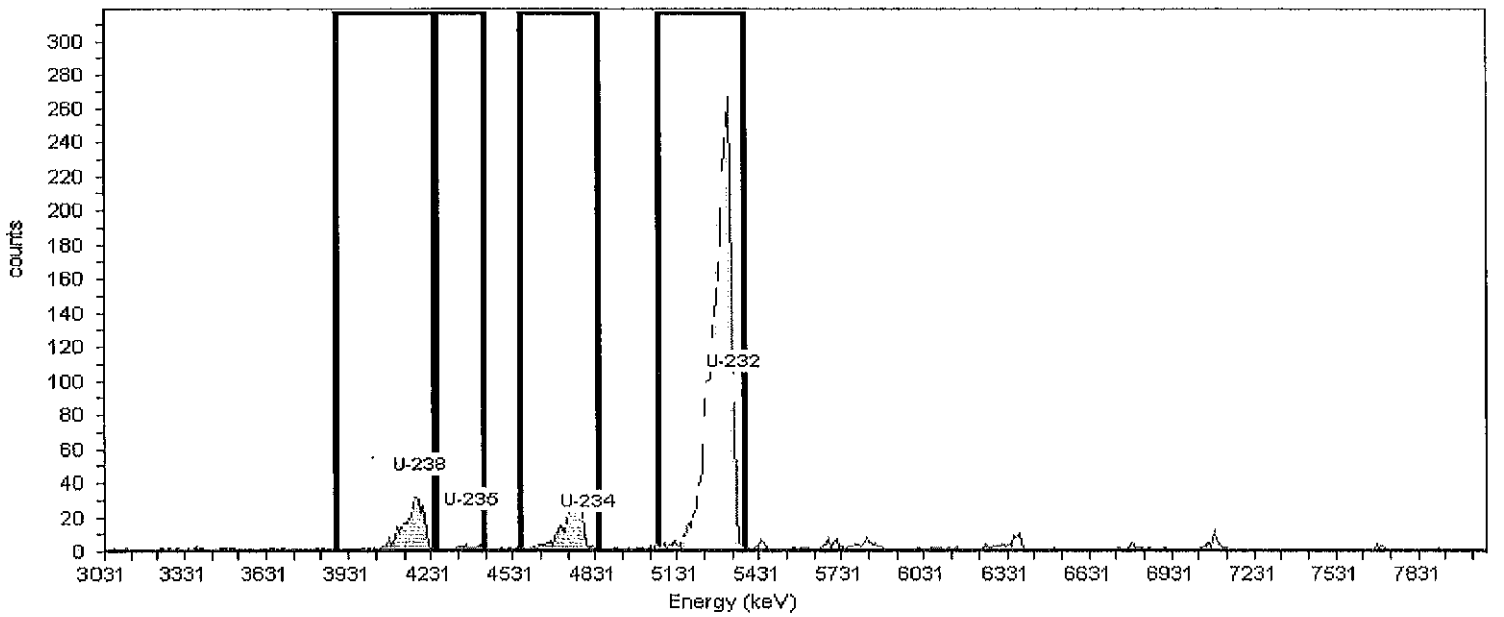
Energy Calibration: C10030216

Energy Cal: Gain = 9.9003 keV / Ch
Offset = 3,021.28 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 84.28%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4169.7	3882.6	4239.0	93.7	100.2	262.00	0.00	262.00	5.7E-001	9.4E-002	0.0E+000	5.9E-003
U-235	4357.8	4248.9	4427.1	47.8	99.7	14.00	3.20	10.80	2.4E-002	1.8E-002	8.6E-003	2.3E-002
U-234	4783.5	4555.8	4842.9	61.4	100.0	268.00	3.20	264.80	5.8E-001	9.5E-002	8.6E-003	2.3E-002
U-232	5318.1	5060.7	5377.5	85.4	100.1	2,148.00	8.80	2,139.20	4.0E+000	1.8E-001	1.5E-002	3.5E-002

200001240

Reviewed By: BMC JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001240

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-4
Spectrum #1 Analysis #1

Sample Size : 0.50

Acquisition

Detector: 32
Batch Name: UAS100305-2_A
Nuclide Library: Uranium Default
Analysis Method: Absolute Interactive ROI Analysis
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:36:15PM
Live Time: 800.00 min.
Real Time: 800.02 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030332; Det: 32; Spectrum #1; Mar-03-2010 14:43

Calibration Date: 3/3/2010 1:37:46PM

Efficiency Calibration: C1003032

Efficiency: 29.64% +/- 0.12% TPU(2 sigma)

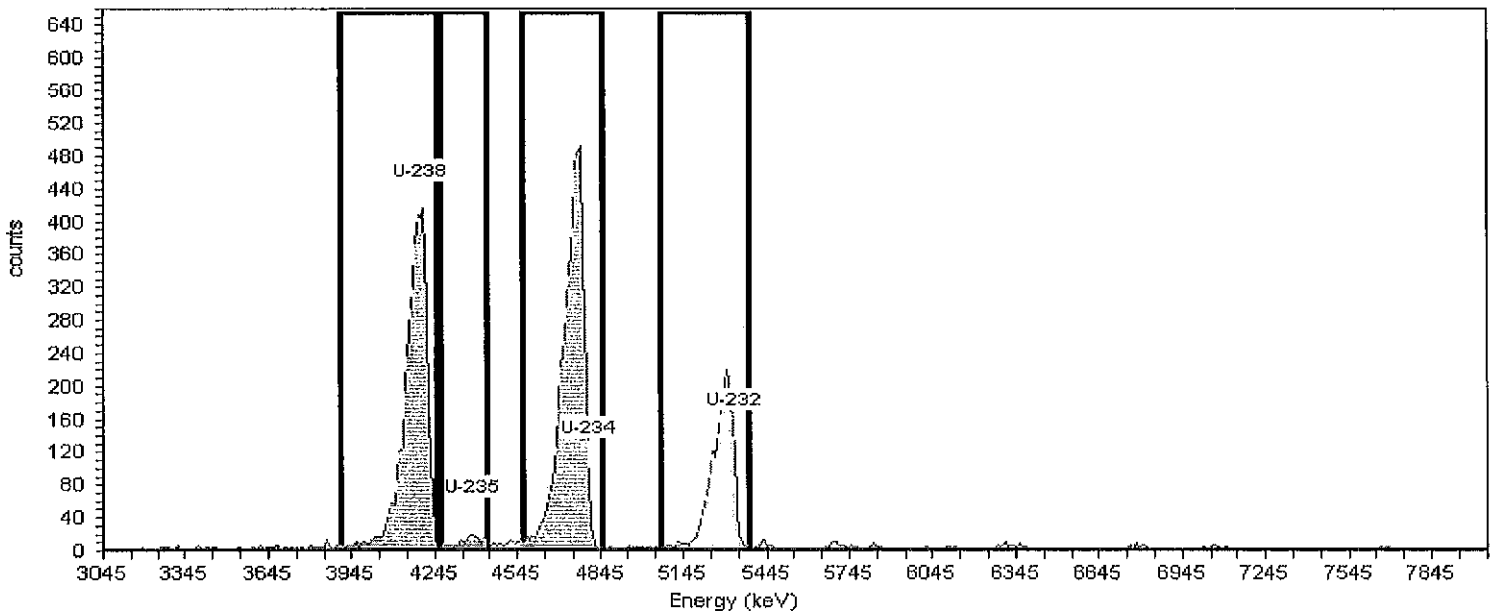
Energy Calibration: C1003032

Energy Cal: Gain = 9.8047 keV / Ch
Offset = 3,036.00 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 76.77%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/L	2.00Sigma TPU pCi/L	Critical Level pCi/L	MDA pCi/L
U-238	4193.0	3898.8	4251.8	47.7	100.2	3,845.00	0.80	3,844.20	1.9E+001	2.2E+000	9.7E-003	3.3E-002
U-235	4379.3	4261.6	4428.3	94.3	99.7	152.00	1.60	150.40	7.5E-001	1.5E-001	1.5E-002	4.1E-002
U-234	4800.9	4565.5	4849.9	78.3	100.0	4,341.00	4.00	4,337.00	2.1E+001	2.5E+000	2.2E-002	5.7E-002
U-232	5330.3	5065.6	5379.3	80.6	100.1	1,904.00	20.00	1,884.00	7.4E+000	3.4E-001	5.0E-002	1.1E-001

200001241

Reviewed By: EMP JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001241

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-4D
Spectrum #1 Analysis #1

Sample Size : 0.50

Acquisition

Detector: 57
Batch Name: UAS100305-2_A
Nuclide Library: Uranium Default
Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:36:06PM
Live Time: 800.00 min.
Real Time: 800.06 min.
Dead Time: 0.01 %

Calibration

Bkgd Info: Sample: B10030357; Det: 57; Spectrum #1; Mar-03-2010 14:44

Calibration Date: 3/3/2010 1:42:55PM

Efficiency Calibration: C10030357

Efficiency: 30.63% +/- 0.13% TPU(2 sigma)

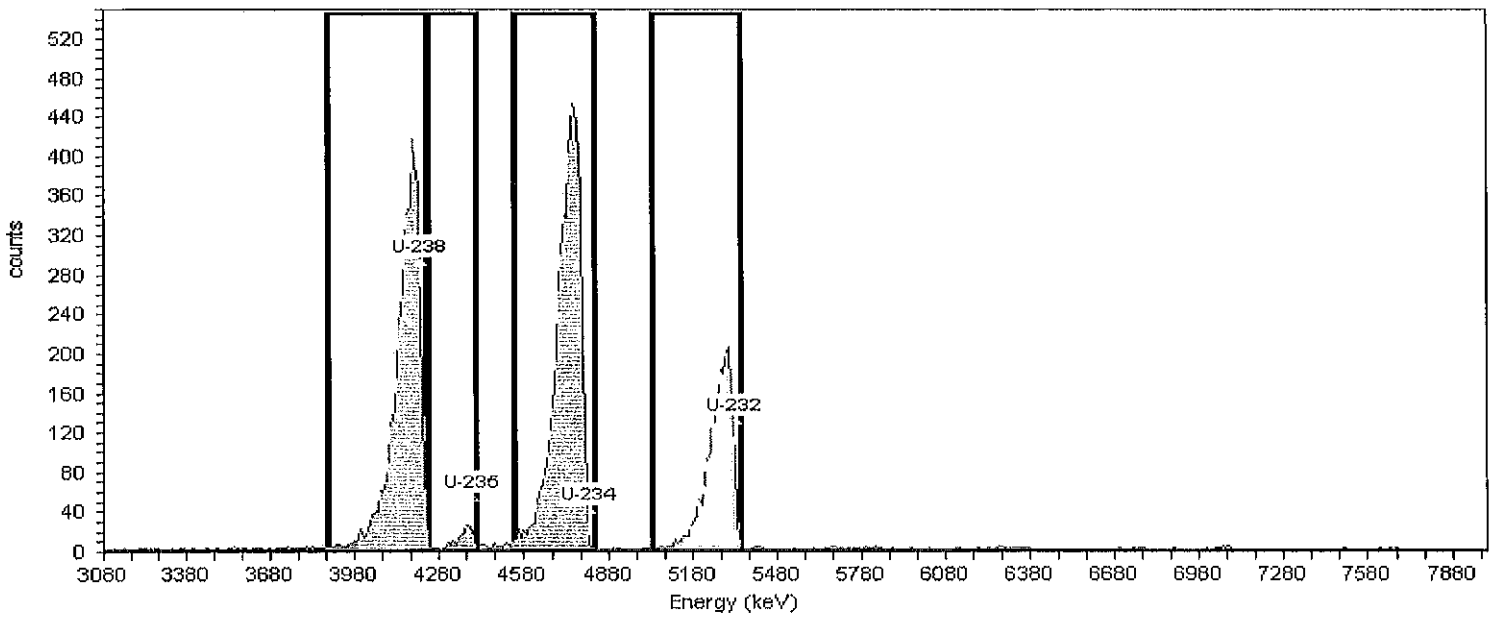
Energy Calibration: C10030357

Energy Cal: Gain = 9.6533 keV / Ch
Offset = 3,071.01 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 79.54%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/L	2.00Sigma TPU pCi/L	Critical Level pCi/L	MDA pCi/L
U-238	4179.8	3890.2	4237.7	100.2	100.2	4,043.05	0.80	4,042.25	1.9E+001	2.1E+000	9.1E-003	3.1E-002
U-235	4363.2	4247.3	4421.1	47.7	99.7	164.71	0.00	164.71	7.6E-001	1.5E-001	0.0E+000	1.3E-002
U-234	4778.3	4556.2	4836.2	89.8	100.0	4,573.42	1.60	4,571.82	2.1E+001	2.4E+000	1.3E-002	3.8E-002
U-232	5299.5	5048.5	5357.5	94.0	100.1	2,020.29	3.32	2,016.97	7.6E+000	3.4E-001	1.9E-002	5.1E-002

200001242

Reviewed By: EMF JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001242

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-5
Spectrum #1 Analysis #1

Sample Size : 1.00

Acquisition

Detector: 17a
Batch Name: UAS100305-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute Interactive ROI Analysis
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:30:14PM
Live Time: 800.00 min.
Real Time: 800.03 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030217; Det: 17a; Spectrum #1; Mar-02-2010 15:03

Calibration Date: 3/2/2010 11:33:19AM

Efficiency Calibration: C10030217

Efficiency: 30.63% +/- 0.20% TPU(2 sigma)

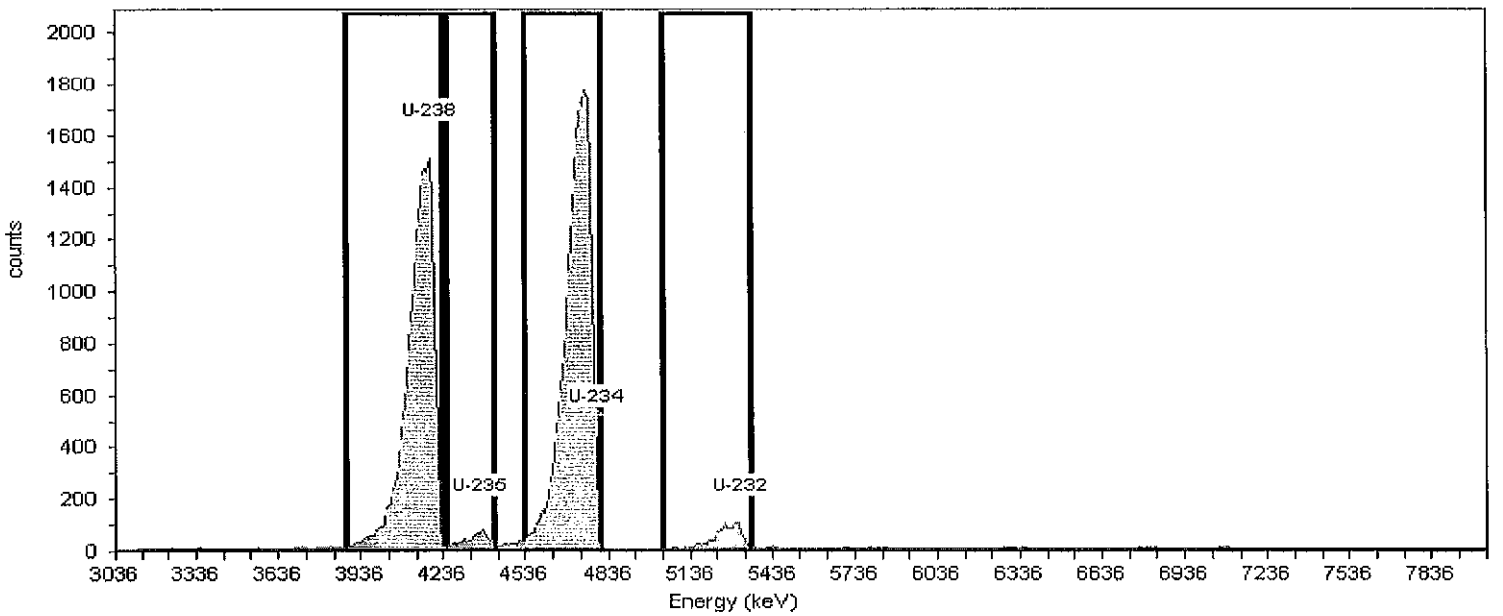
Energy Calibration: C10030217

Energy Cal: Gain = 9.8047 keV / Ch
Offset = 3,026.20 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 43.91%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4183.2	3879.2	4232.2	50.0	100.2	17,242.00	1.60	17,240.40	7.2E+001	8.5E+000	1.2E-002	3.5E-002
U-235	4369.5	4242.0	4418.5	80.5	99.7	665.00	0.80	664.20	2.8E+000	3.9E-001	8.3E-003	2.8E-002
U-234	4791.1	4526.3	4810.7	106.0	100.0	20,051.00	3.20	20,047.80	8.4E+001	9.9E+000	1.7E-002	4.4E-002
U-232	5320.5	5036.2	5359.7	65.0	100.1	1,129.00	15.20	1,113.80	2.1E+000	1.3E-001	3.7E-002	8.6E-002

200001243

Reviewed By: JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001243

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-5D
Spectrum #1 Analysis #1

Sample Size : 1.00

Acquisition

Detector: 18
Batch Name: UAS100305-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute Interactive ROI Analysis
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:30:10PM
Live Time: 800.00 min.
Real Time: 800.03 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030218; Det: 18; Spectrum #1; Mar-02-2010 15:03

Calibration Date: 3/2/2010 11:33:40AM

Efficiency Calibration: C10030218

Efficiency: 30.38% +/- 0.15% TPU(2 sigma)

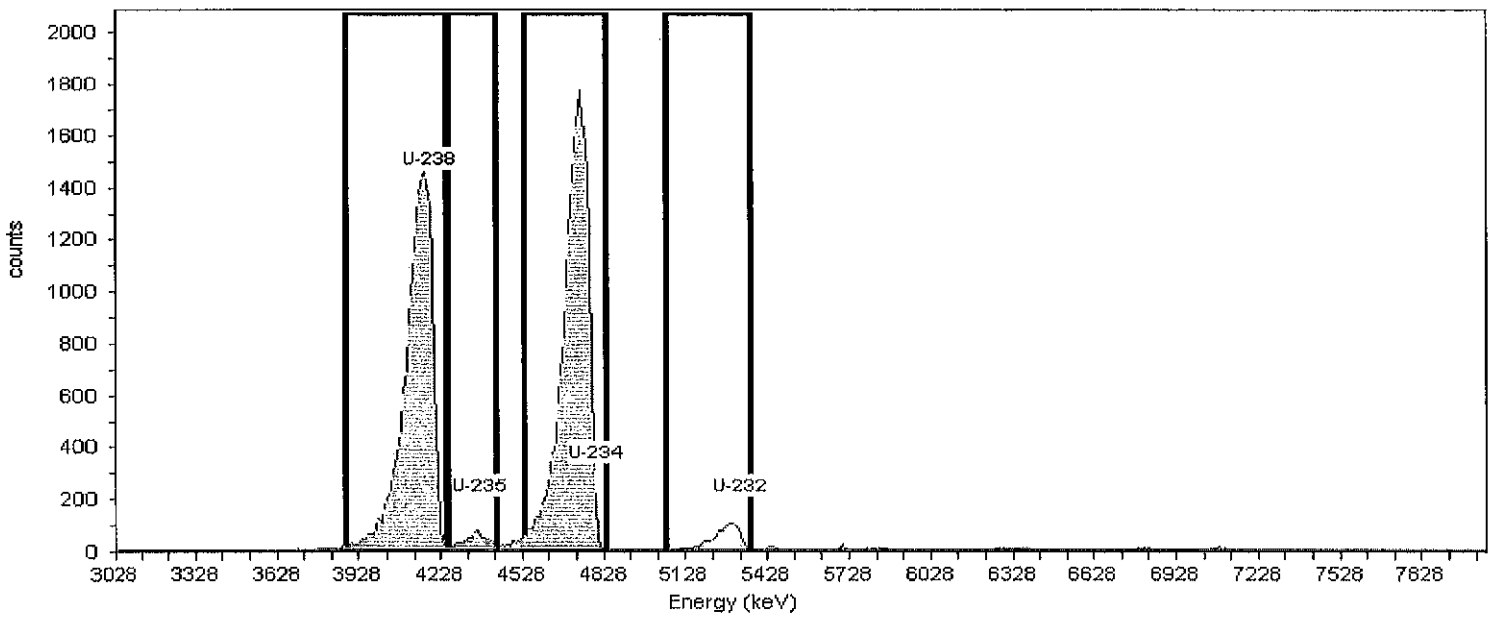
Energy Calibration: C10030218

Energy Cal: Gain = 9.8810 keV / Ch
Offset = 3,018.33 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 44.32%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4184.3	3878.0	4243.6	91.1	100.2	17,560.00	2.40	17,557.60	7.3E+001	8.7E+000	1.4E-002	4.0E-002
U-235	4372.0	4253.5	4431.3	78.7	99.7	684.00	0.80	683.20	2.9E+000	4.0E-001	6.3E-003	2.8E-002
U-234	4796.9	4530.1	4836.4	103.1	100.0	19,917.00	8.00	19,909.00	8.3E+001	9.8E+000	2.6E-002	6.4E-002
U-232	5330.5	5053.8	5370.0	78.7	100.1	1,134.00	19.20	1,114.80	2.1E+000	1.3E-001	4.2E-002	9.5E-002

200001244

Reviewed By:

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001244

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-6R2
Spectrum #1 Analysis #1

Sample Size : 1.03
JP 3/8/10

Acquisition

Detector: 22
Batch Name: UAS100305-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:30:11PM
Live Time: 800.00 min.
Real Time: 800.03 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030222; Det: 22; Spectrum #1; Mar-02-2010 15:03

Calibration Date: 3/2/2010 11:35:09AM

Efficiency Calibration: C10030222

Efficiency: 27.21% +/- 0.14% TPU(2 sigma)

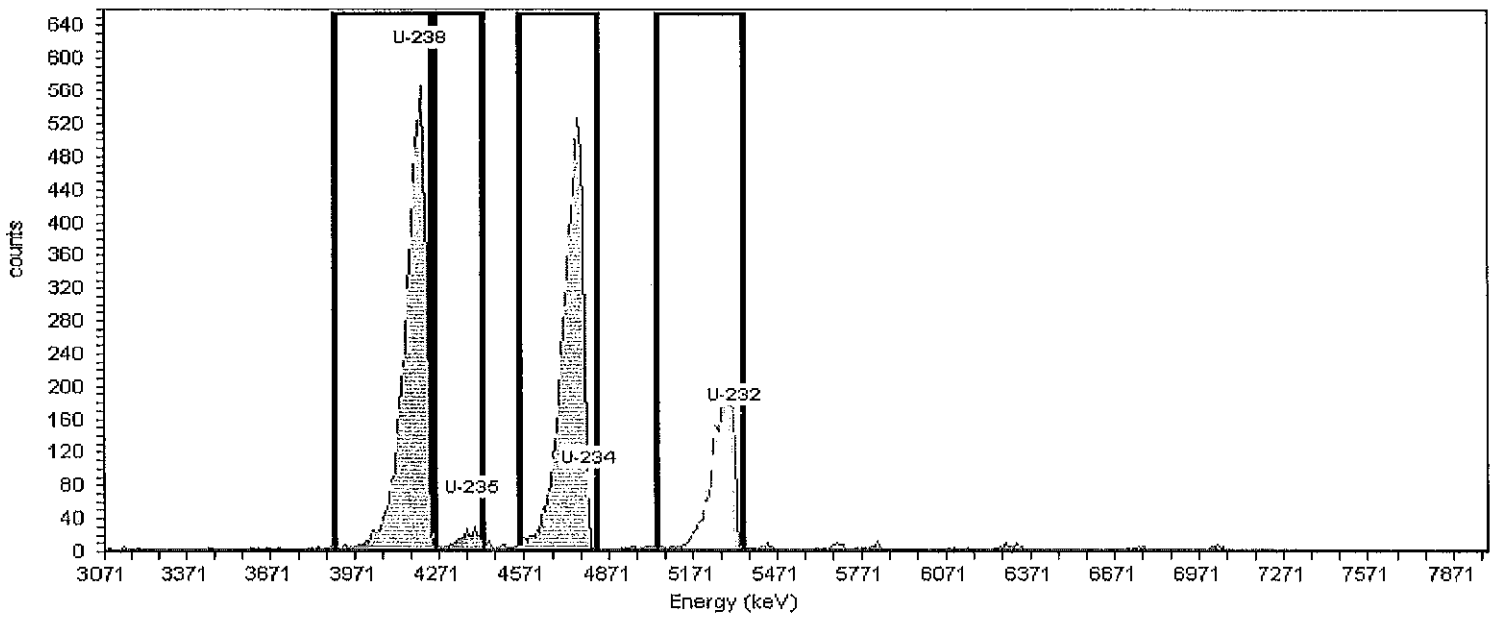
Energy Calibration: C10030222

Energy Cal: Gain = 9.6533 keV / Ch
Offset = 3,061.36 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 83.73%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4174.9	3895.0	4242.5	76.1	100.2	4,945.00	0.80	4,944.20	1.2E+001	1.4E+000	4.9E-003	1.6E-002
U-235	4358.3	4252.2	4425.9	73.5	99.7	202.93	1.60	201.33	5.0E-001	9.0E-002	6.9E-003	2.1E-002
U-234	4773.4	4551.4	4831.4	81.7	100.0	4,677.00	6.40	4,670.60	1.2E+001	1.3E+000	1.4E-002	3.4E-002
U-232	5294.7	5043.7	5352.6	95.6	100.1	1,896.29	9.83	1,886.46	4.0E+000	1.9E-001	1.8E-002	4.2E-002

200001245

Reviewed By: QMC JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001245

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-7R2
Spectrum #1 Analysis #1

Sample Size : 0.02

Acquisition

Detector: 58
Batch Name: UAS100305-2_A
Nuclide Library: Uranium Default
Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:36:06PM
Live Time: 800.00 min.
Real Time: 800.06 min.
Dead Time: 0.01 %

Calibration

Bkgd Info: Sample: B10030358; Det: 58; Spectrum #1; Mar-03-2010 14:44

Calibration Date: 3/3/2010 1:43:38PM

Efficiency Calibration: C10030358

Efficiency: 30.96% +/- 0.15% TPU(2 sigma)

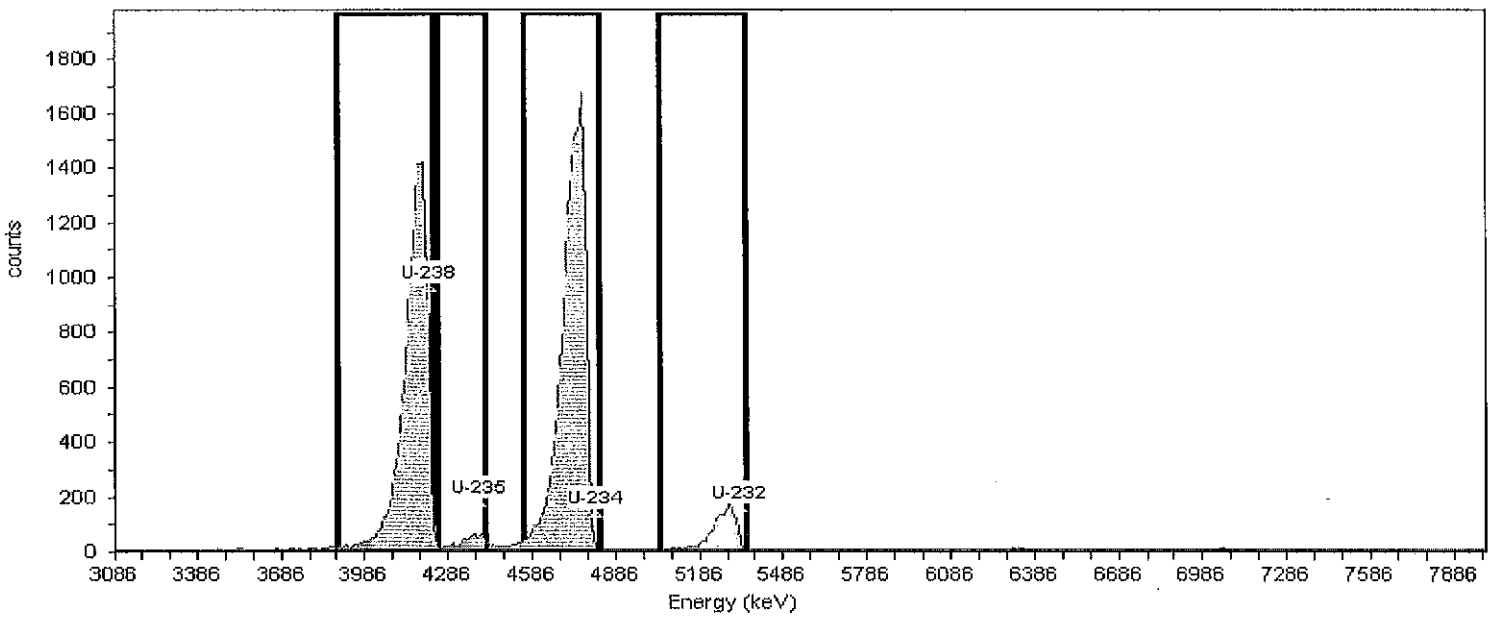
Energy Calibration: C10030358

Energy Cal: Gain = 9.6368 keV / Ch
Offset = 3,077.33 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 60.58%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/L	2.00Sigma TPU pCi/L	Critical Level pCi/L	MDA pCi/L
U-238	4175.9	3886.8	4233.7	97.8	100.2	14,218.00	1.60	14,216.40	2.8E+003	3.2E+002	5.6E-001	1.7E+000
U-235	4359.0	4243.4	4416.8	91.6	99.7	559.00	1.60	557.40	1.1E+002	1.6E+001	5.6E-001	1.7E+000
U-234	4773.4	4551.8	4831.2	90.1	100.0	16,803.00	3.20	16,799.80	3.4E+003	3.8E+002	7.9E-001	2.1E+000
U-232	5293.8	5043.2	5351.6	93.1	100.1	1,557.00	4.00	1,553.00	1.9E+002	9.9E+000	9.1E-001	2.4E+000

200001246

Reviewed By: EMF JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001246

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-8
Spectrum #1 Analysis #1

Sample Size : 1.00

Acquisition

Detector: 23
Batch Name: UAS100305-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:30:12PM
Live Time: 800.00 min.
Real Time: 800.03 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030223; Det: 23; Spectrum #1; Mar-02-2010 15:03

Calibration Date: 3/2/2010 11:35:40AM

Efficiency Calibration: C10030223

Efficiency: 28.56% +/- 0.18% TPU(2 sigma)

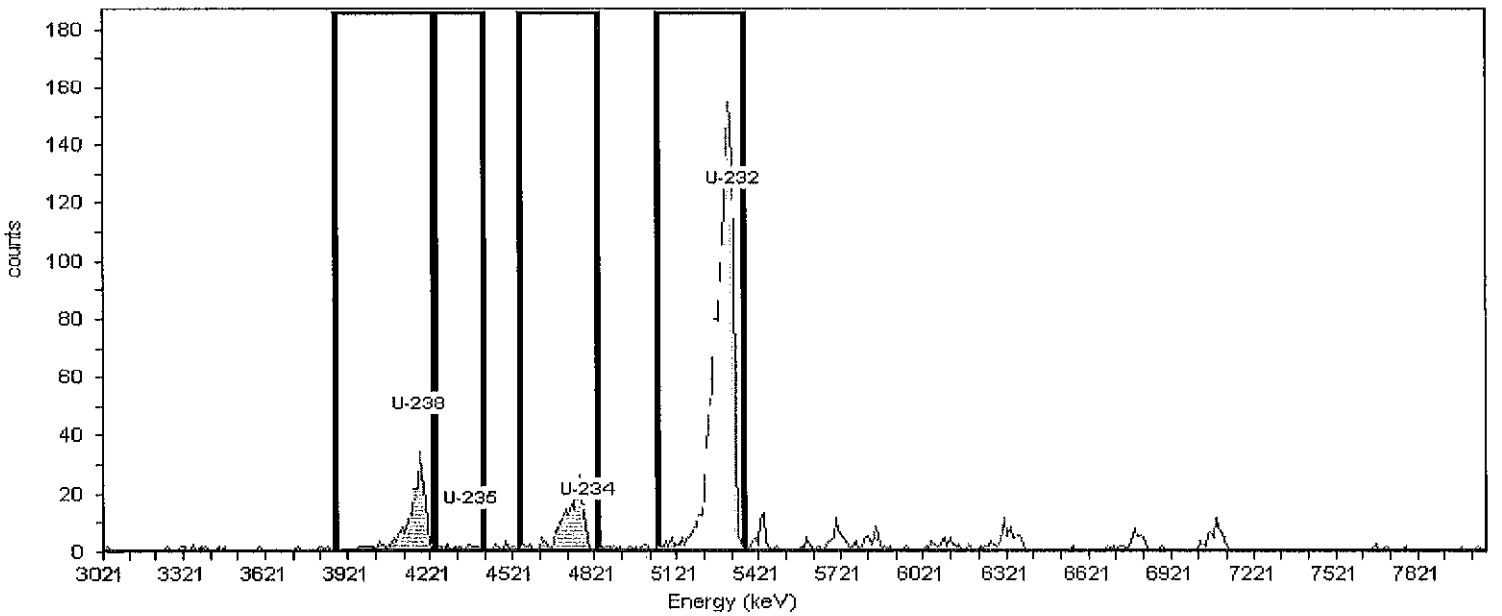
Energy Calibration: C10030223

Energy Cal: Gain = 9.9003 keV / Ch
Offset = 3,011.38 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 49.45%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4159.8	3872.7	4229.1	59.1	100.2	201.00	7.20	193.80	7.7E-001	1.5E-001	2.4E-002	5.8E-002
U-235	4347.9	4239.0	4417.2	46.5	99.7	12.00	1.60	10.40	4.2E-002	3.0E-002	1.5E-002	3.3E-002
U-234	4773.6	4545.9	4833.0	75.3	100.0	191.00	6.40	184.60	7.4E-001	1.4E-001	2.2E-002	5.5E-002
U-232	5308.2	5050.8	5367.6	85.8	100.1	1,184.00	14.40	1,169.60	2.4E+000	1.4E-001	3.4E-002	8.0E-002

2000001247

Reviewed By: GMF JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001247

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-9
Spectrum #1 Analysis #1

Sample Size : 1.00

Acquisition

Detector: 24
Batch Name: UAS100305-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:30:12PM
Live Time: 800.00 min.
Real Time: 800.03 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030224; Det: 24; Spectrum #1; Mar-02-2010 15:03

Calibration Date: 3/2/2010 11:36:03AM

Efficiency Calibration: C10030224

Efficiency: 28.18% +/- 0.12% TPU(2 sigma)

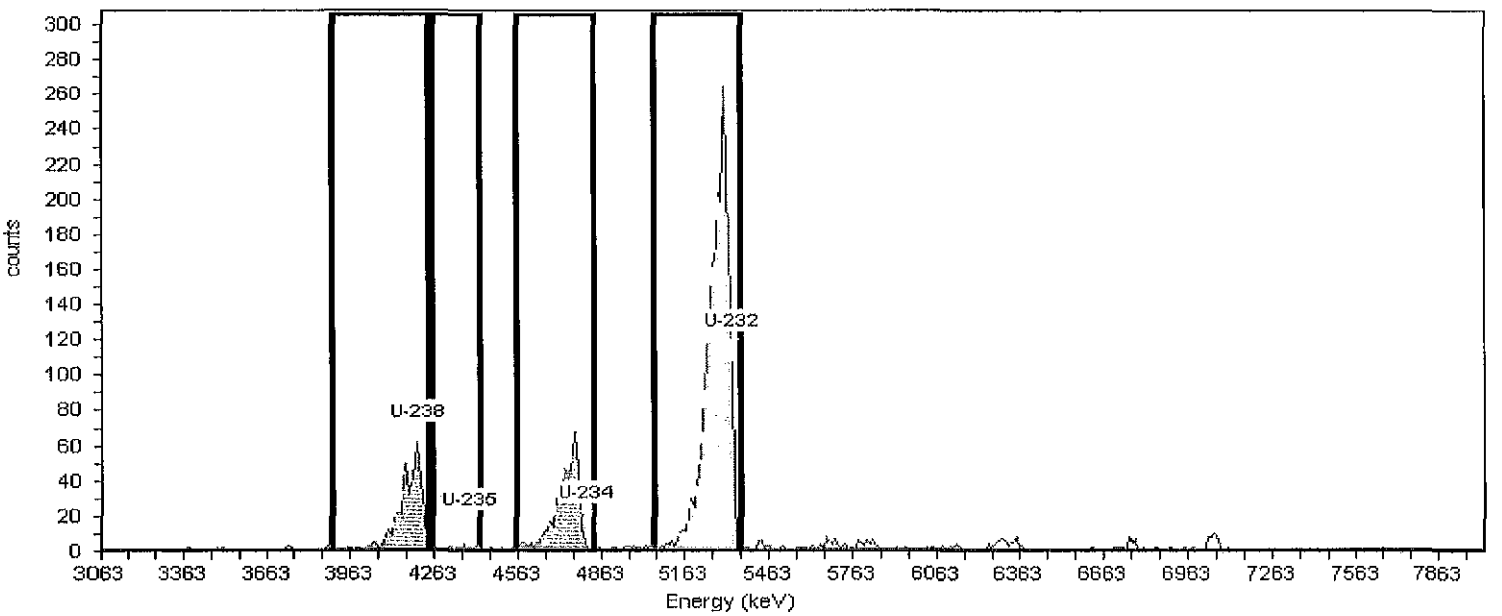
Energy Calibration: C10030224

Energy Cal: Gain = 9.7289 keV / Ch
Offset = 3,053.57 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 92.37%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4172.4	3890.2	4240.5	99.2	100.2	468.00	3.20	464.80	1.0E+000	1.4E-001	8.5E-003	2.3E-002
U-235	4357.2	4250.2	4425.3	121.2	99.7	16.00	1.60	14.40	3.1E-002	1.9E-002	6.1E-003	1.8E-002
U-234	4775.6	4551.8	4833.9	78.2	100.0	528.00	1.60	526.40	1.1E+000	1.6E-001	6.0E-003	1.8E-002
U-232	5300.9	5048.0	5359.3	90.3	100.1	2,166.00	10.40	2,155.60	4.4E+000	1.9E-001	1.6E-002	3.8E-002

200001248

Reviewed By: GMF JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001248

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-10
Spectrum #1 Analysis #1

Sample Size : 0.50

Acquisition

Detector: 59
Batch Name: UAS100305-2_A
Nuclide Library: Uranium Default
Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:36:07PM
Live Time: 800.00 min.
Real Time: 800.06 min.
Dead Time: 0.01 %

Calibration

Bkgd Info: Sample: B10030359; Det: 59; Spectrum #1; Mar-03-2010 14:44

Calibration Date: 3/3/2010 1:44:14PM

Efficiency Calibration: C10030359

Efficiency: 31.43% +/- 0.16% TPU(2 sigma)

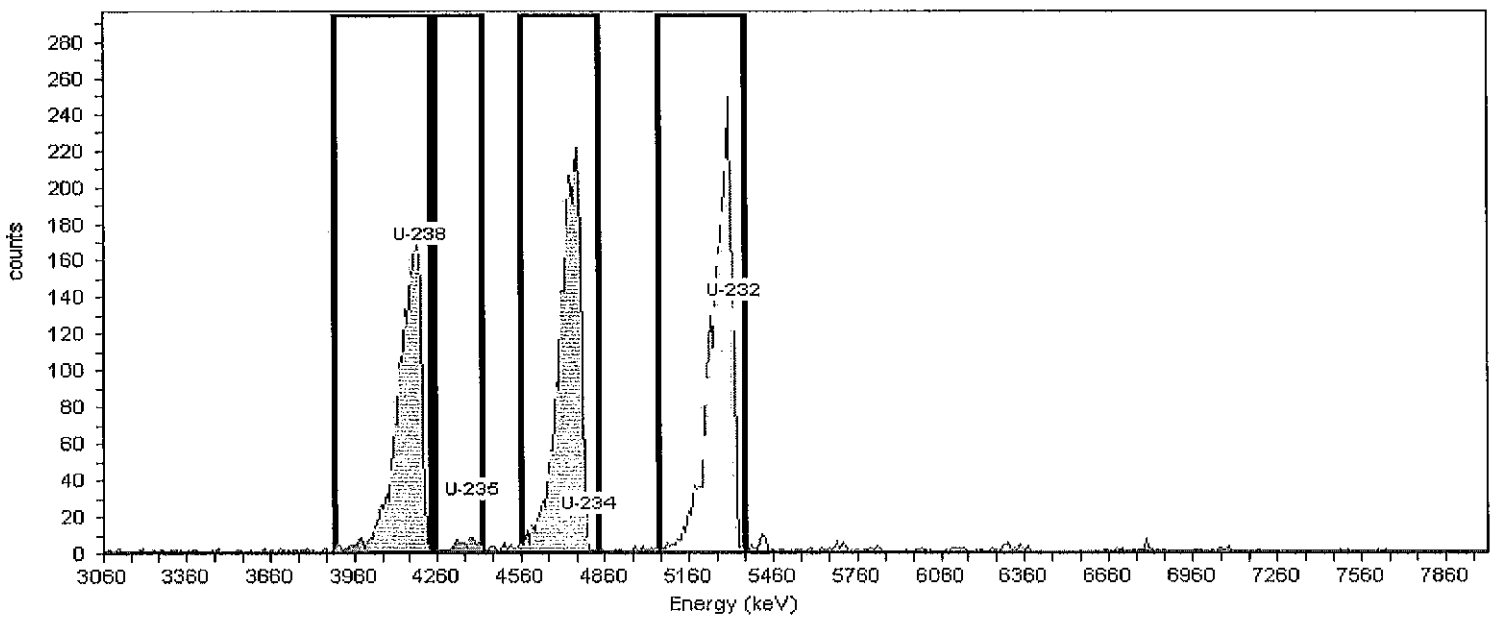
Energy Calibration: C10030359

Energy Cal: Gain = 9.7108 keV / Ch
Offset = 3,050.49 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 80.32%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/L	2.00Sigma TPU pCi/L	Critical Level pCi/L	MDA pCi/L
U-238	4176.9	3885.6	4235.2	100.6	100.2	1,719.00	4.00	1,715.00	7.6E+000	9.1E-001	2.0E-002	5.1E-002
U-235	4361.4	4244.9	4419.7	108.6	99.7	66.00	0.00	66.00	3.0E-001	8.0E-002	2.0E-002	1.2E-002
U-234	4779.0	4555.7	4837.3	85.2	100.0	2,077.00	4.80	2,072.20	9.2E+000	1.1E+000	2.2E-002	5.5E-002
U-232	5303.4	5050.9	5361.7	97.8	100.1	2,107.00	16.80	2,090.20	7.7E+000	3.4E-001	4.2E-002	9.5E-002

Reviewed By: EMF JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001249

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-11
Spectrum #1 Analysis #1

Sample Size : 0.50

Acquisition

Detector: 60
Batch Name: UAS100305-2_A
Nuclide Library: Uranium Default
Analysis Method: Absolute Interactive ROI Analysis
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:36:07PM
Live Time: 800.00 min.
Real Time: 800.06 min.
Dead Time: 0.01 %

Calibration

Bkgd Info: Sample: B10030360; Det: 60; Spectrum #1; Mar-03-2010 14:44

Calibration Date: 3/3/2010 1:44:44PM

Efficiency Calibration: C10030360

Efficiency: 30.31% +/- 0.21% TPU(2 sigma)

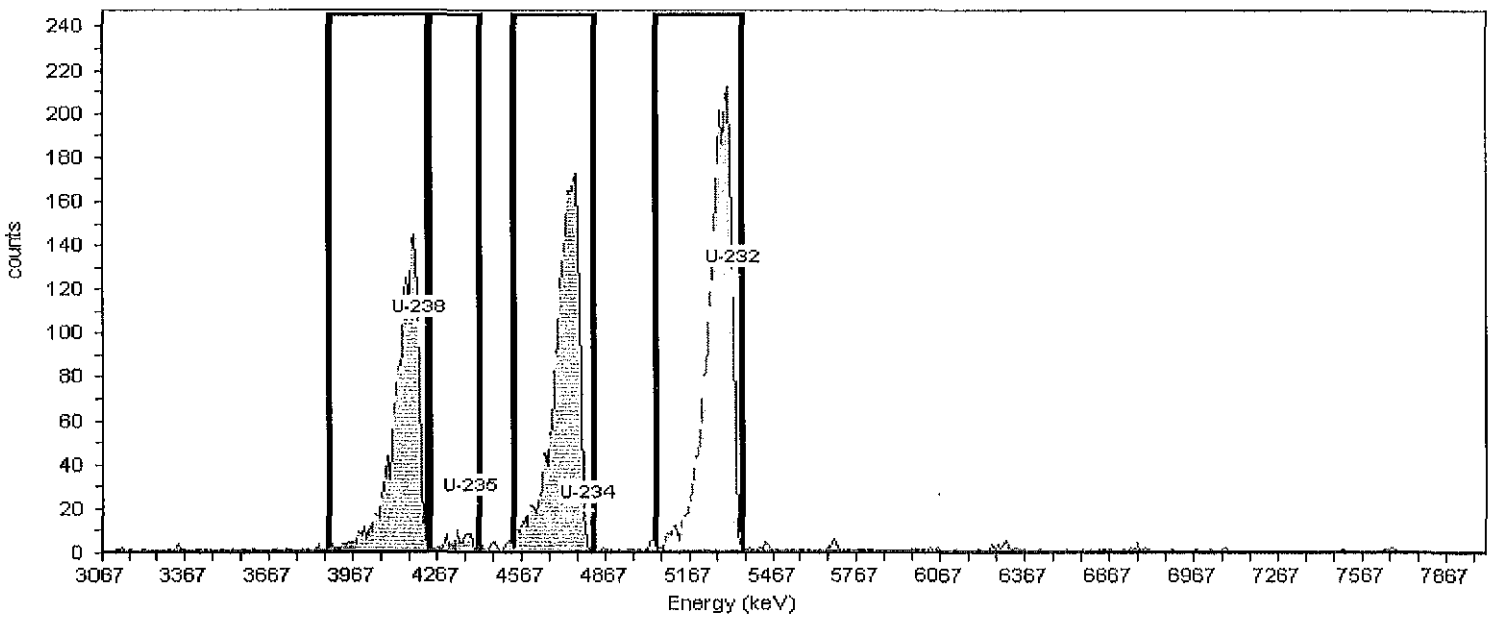
Energy Calibration: C10030360

Energy Cal: Gain = 9.6909 keV / Ch
Offset = 3,057.48 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 86.28%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/L	2.00Sigma TPU pCi/L	Critical Level pCi/L	MDA pCi/L
U-238	4201.0	3881.2	4230.1	32.1	100.2	1,445.00	4.00	1,441.00	6.2E+000	7.5E-001	1.9E-002	5.0E-002
U-235	4385.1	4239.8	4414.2	105.5	99.7	66.00	0.80	65.20	2.8E-001	7.7E-002	2.6E-002	2.9E-002
U-234	4801.8	4540.2	4821.2	90.0	100.0	1,840.00	6.40	1,833.60	7.9E+000	9.4E-001	2.4E-002	6.0E-002
U-232	5325.2	5044.1	5354.2	47.1	100.1	2,183.00	17.60	2,165.40	8.3E+000	3.6E-001	4.1E-002	9.4E-002

Reviewed By: EMF JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001250

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-12
Spectrum #1 Analysis #1

Sample Size : 1.00

Acquisition

Detector: 25
Batch Name: UAS100305-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute Interactive ROI Analysis
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:33:49PM
Live Time: 800.00 min.
Real Time: 800.02 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030325; Det: 25; Spectrum #1; Mar-03-2010 14:43

Calibration Date: 3/3/2010 1:34:37PM

Efficiency Calibration: C10030325

Efficiency: 29.36% +/- 0.20% TPU(2 sigma)

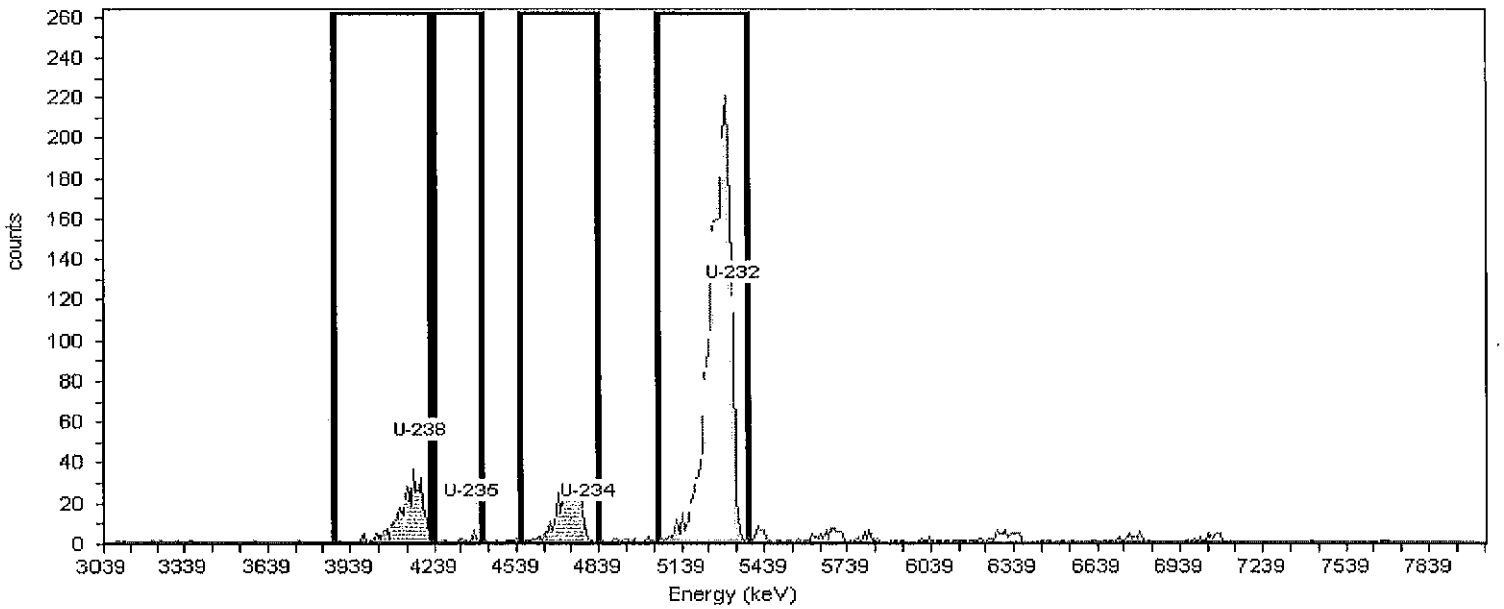
Energy Calibration: C10030325

Energy Cal: Gain = 9.8224 keV / Ch
Offset = 3,029.39 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 83.62%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4188.4	3874.1	4227.7	35.0	100.2	313.00	8.80	304.20	7.0E-001	1.1E-001	1.5E-002	3.6E-002
U-235	4375.1	4237.6	4414.4	24.9	99.7	16.00	3.20	12.80	2.9E-002	2.0E-002	200001251	2.4E-002
U-234	4797.4	4551.9	4836.7	102.6	100.0	298.00	4.80	293.20	6.7E-001	1.1E-001	1.1E-002	2.8E-002
U-232	5327.8	5052.8	5377.0	99.5	100.1	2,055.00	22.40	2,032.60	4.0E+000	1.8E-001	2.5E-002	5.6E-002

Reviewed By: JMF JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001251

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-13
Spectrum #1 Analysis #1

Sample Size : 1.00

Acquisition

Detector: 26
Batch Name: UAS100305-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute Interactive ROI Analysis
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:33:50PM
Live Time: 800.00 min.
Real Time: 800.02 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030326; Det: 26; Spectrum #1; Mar-03-2010 14:43

Calibration Date: 3/3/2010 1:35:06PM

Efficiency Calibration: C10030326

Efficiency: 31.01% +/- 0.15% TPU(2 sigma)

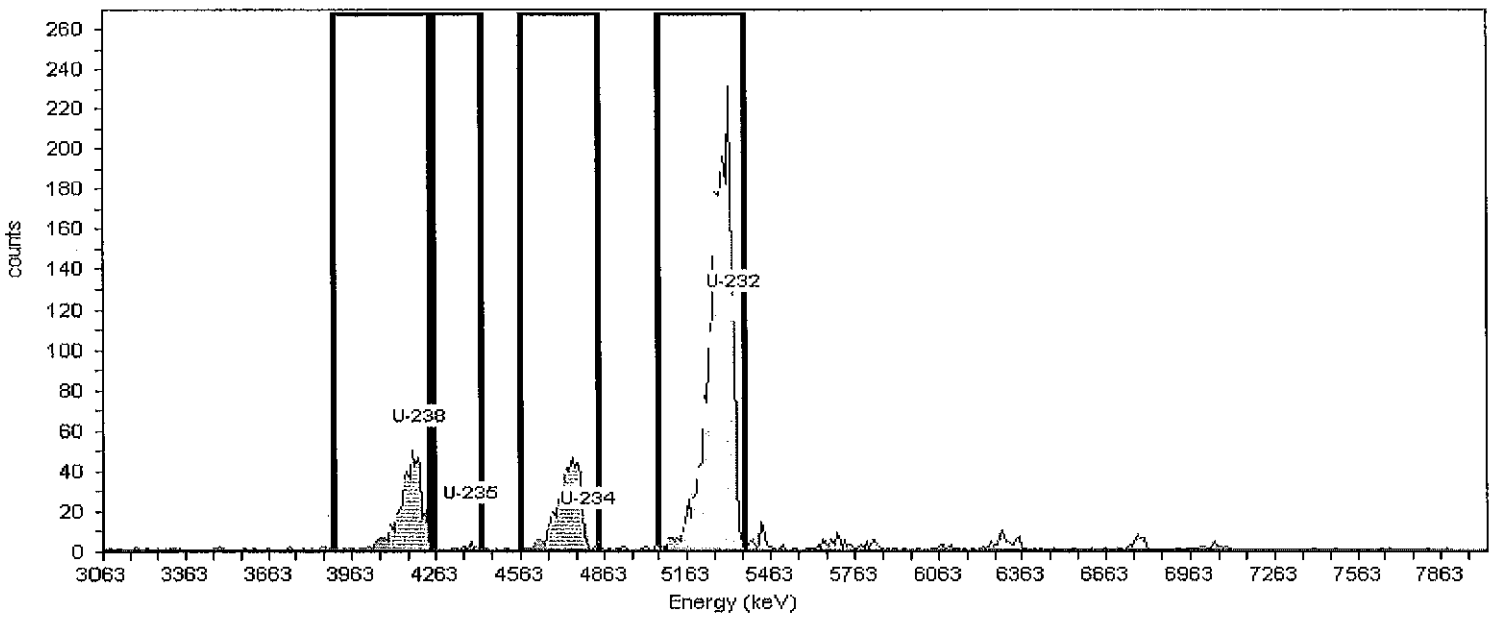
Energy Calibration: C10030326

Energy Cal: Gain = 9.7289 keV / Ch
Offset = 3,053.57 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 80.95%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4201.6	3890.2	4240.5	43.6	100.2	456.00	6.40	449.60	1.0E+000	1.5E-001	1.2E-002	3.1E-002
U-235	4386.4	4250.2	4425.3	60.2	99.7	15.00	4.00	11.00	2.5E-002	2.0E-002	2.0E-003	2.6E-002
U-234	4804.8	4561.5	4843.7	83.4	100.0	452.00	20.00	432.00	9.7E-001	1.4E-001	2.2E-002	5.0E-002
U-232	5330.1	5057.7	5369.0	66.7	100.1	2,102.00	23.20	2,078.80	3.9E+000	1.7E-001	2.5E-002	5.5E-002

200001252

Reviewed By: JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001252

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-14
Spectrum #1 Analysis #1

Sample Size : 1.00

Acquisition

Detector: 11
Batch Name: UAS100305-1_B
Nuclide Library: Uranium Default
Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default
ROI Set: Uranium Default

Acquisition Start Date: 3/7/2010 8:52:16PM
Live Time: 800.00 min.
Real Time: 800.03 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030211; Det: 11; Spectrum #1; Mar-02-2010 15:02

Calibration Date: 3/2/2010 11:31:10AM

Efficiency Calibration: C10030211

Efficiency: 31.76% +/- 0.17% TPU(2 sigma)

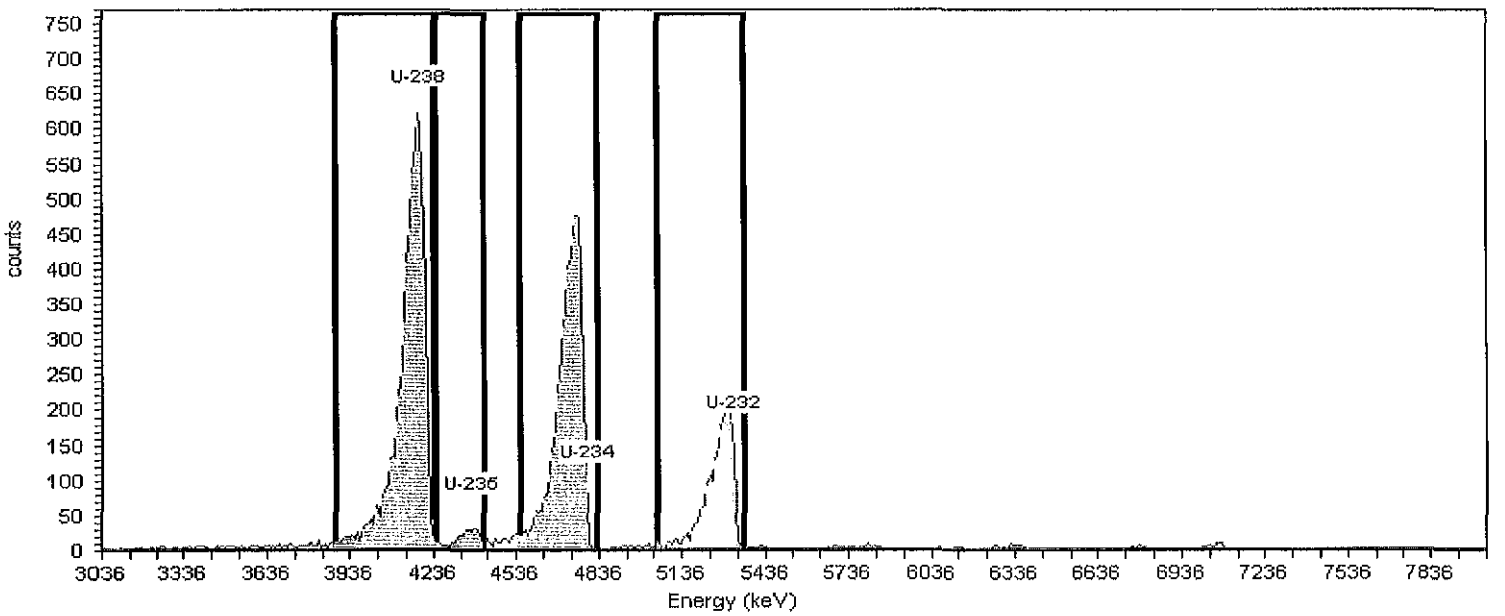
Energy Calibration: C10030211

Energy Cal: Gain = 9.8047 keV / Ch
Offset = 3,026.20 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 79.71%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4163.6	3879.2	4232.2	83.8	100.2	6,258.00	2.40	6,255.60	1.4E+001	1.6E+000	7.6E-003	2.1E-002
U-235	4349.8	4242.0	4418.5	89.6	99.7	292.00	4.80	287.20	6.4E-001	1.0E-001	2.0E-003	2.8E-002
U-234	4771.4	4545.9	4830.3	91.4	100.0	4,940.00	4.00	4,936.00	1.1E+001	1.2E+000	9.8E-003	2.6E-002
U-232	5300.9	5046.0	5359.7	99.6	100.1	2,106.00	9.60	2,096.40	3.8E+000	1.7E-001	1.6E-002	3.7E-002

Reviewed By: QWC JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001253

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-15
Spectrum #1 Analysis #1

Sample Size : 0.50

Acquisition

Detector: 62
Batch Name: UAS100305-2_A
Nuclide Library: Uranium Default
Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:36:08PM
Live Time: 800.00 min.
Real Time: 800.06 min.
Dead Time: 0.01 %

Calibration

Bkgd Info: Sample: B10030362; Det: 62; Spectrum #1; Mar-03-2010 14:44

Calibration Date: 3/3/2010 1:45:29PM

Efficiency Calibration: C10030362

Efficiency: 29.98% +/- 0.15% TPU(2 sigma)

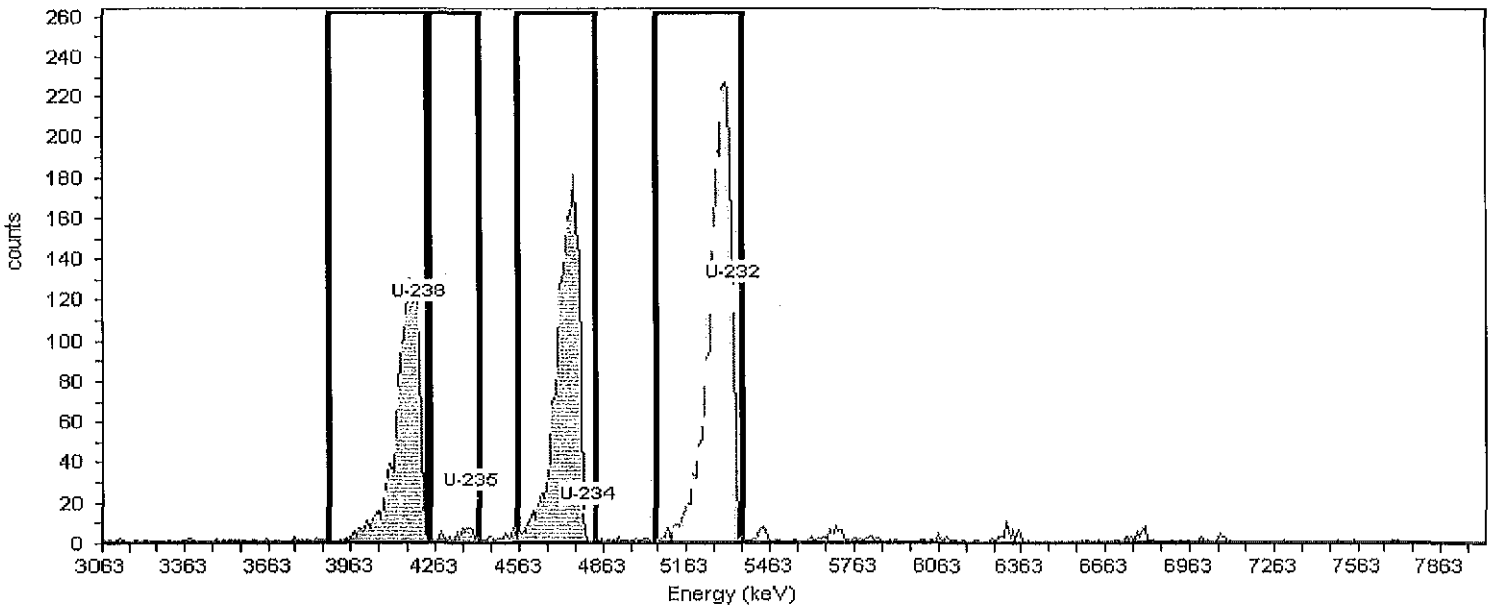
Energy Calibration: C10030362

Energy Cal: Gain = 9.7289 keV / Ch
Offset = 3,053.57 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 88.38%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/L	2.00Sigma TPU pCi/L	Critical Level pCi/L	MDA pCi/L
U-238	4172.6	3880.8	4231.0	98.9	100.2	1,325.97	5.58	1,320.39	5.6E+000	6.8E-001	2.2E-002	5.6E-002
U-235	4357.5	4240.7	4415.9	130.2	99.7	58.95	1.62	57.33	2.4E-001	7.1E-002	2.5E-002	3.5E-002
U-234	4775.8	4552.1	4834.2	89.0	100.0	1,723.05	4.80	1,718.25	7.3E+000	8.7E-001	2.1E-002	5.3E-002
U-232	5301.2	5048.2	5359.6	93.4	100.1	2,207.00	12.80	2,194.20	8.5E+000	3.7E-001	3.5E-002	8.1E-002

200001254

Reviewed By: EMF JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001254

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-16
Spectrum #1 Analysis #1

Sample Size : 1.00

Acquisition

Detector: 28
Batch Name: UAS100305-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute Interactive ROI Analysis
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:33:52PM
Live Time: 800.00 min.
Real Time: 800.02 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030328; Det: 28; Spectrum #1; Mar-03-2010 14:43

Calibration Date: 3/3/2010 1:36:02PM

Efficiency Calibration: C10030328

Efficiency: 28.81% +/- 0.20% TPU(2 sigma)

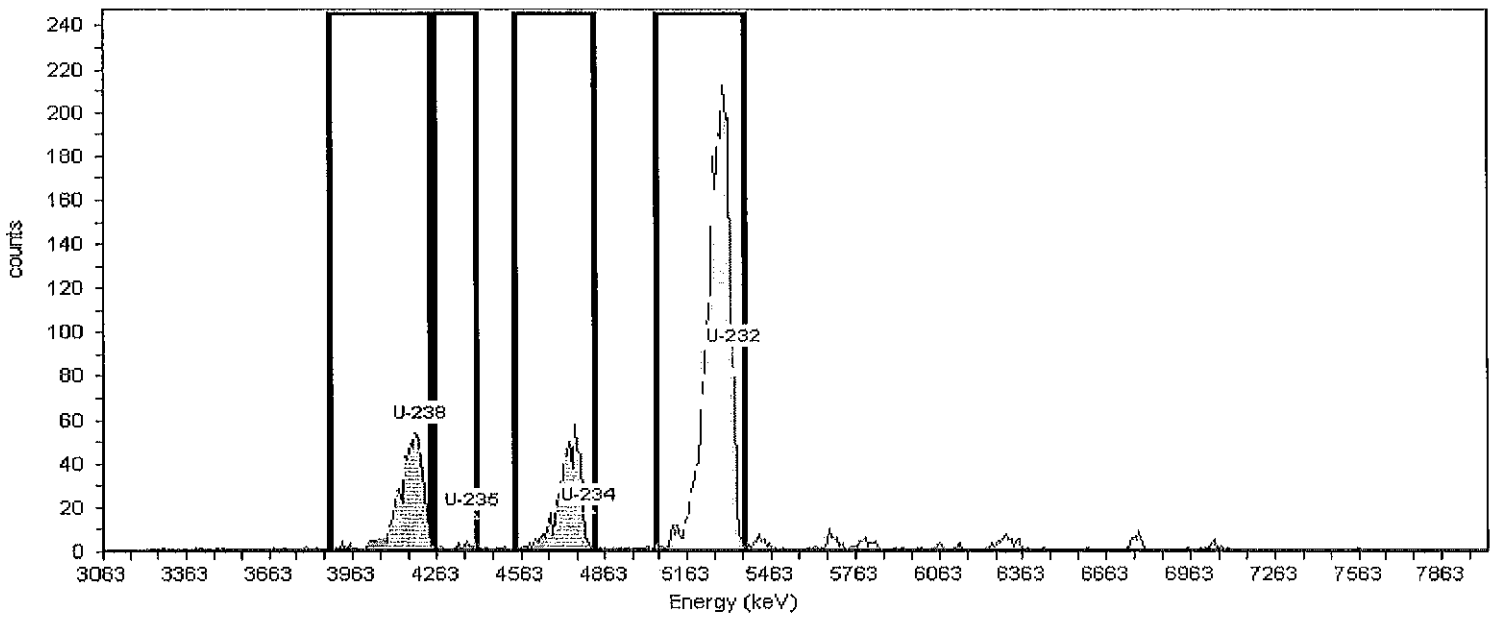
Energy Calibration: C10030328

Energy Cal: Gain = 9.7289 keV / Ch
Offset = 3,053.57 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 88.93%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4201.6	3880.5	4240.5	50.8	100.2	549.00	2.40	546.60	1.2E+000	1.7E-001	7.5E-003	2.1E-002
U-235	4386.4	4250.2	4405.9	.0	99.7	22.00	0.80	21.20	4.7E-002	2.2E-002	1.5E-003	1.5E-002
U-234	4804.8	4542.1	4824.2	82.8	100.0	498.00	4.00	494.00	1.1E+000	1.5E-001	9.7E-003	2.5E-002
U-232	5330.1	5048.0	5369.0	98.3	100.1	2,136.00	14.40	2,121.60	4.3E+000	1.9E-001	1.9E-002	4.4E-002

200001255

Reviewed By: GMC JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001255

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-16D
Spectrum #1 Analysis #1

Sample Size : 1.00

Acquisition

Detector: 29
Batch Name: UAS100305-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute Interactive ROI Analysis
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:33:52PM
Live Time: 800.00 min.
Real Time: 800.02 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030329; Det: 29; Spectrum #1; Mar-03-2010 14:43

Calibration Date: 3/3/2010 1:36:36PM

Efficiency Calibration: C10030329

Efficiency: 28.34% +/- 0.12% TPU(2 sigma)

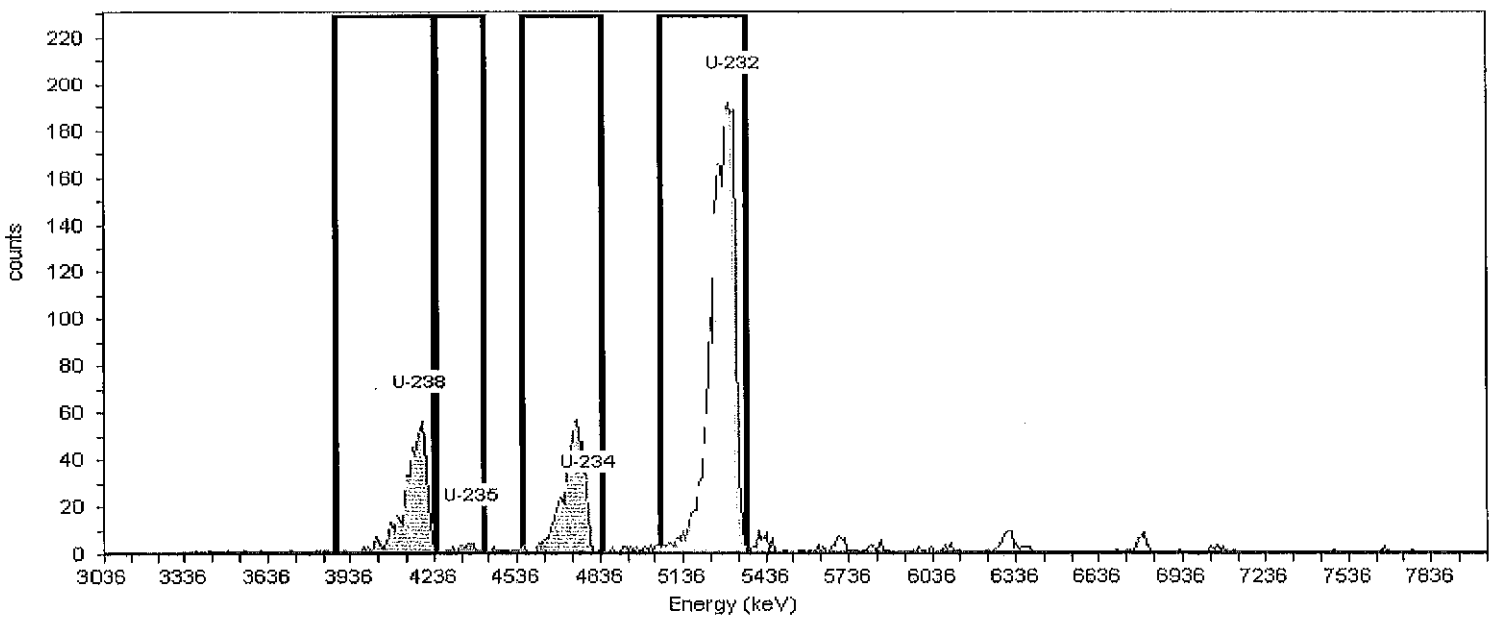
Energy Calibration: C10030329

Energy Cal: Gain = 9.8047 keV / Ch
Offset = 3,026.20 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 85.59%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4183.2	3879.2	4232.2	35.7	100.2	496.00	3.20	492.80	1.1E+000	1.6E-001	9.1E-003	2.5E-002
U-235	4369.5	4242.0	4418.5	51.7	99.7	26.00	0.00	26.00	6.1E-002	2.5E-002	2.0E-003	6.3E-003
U-234	4791.1	4555.7	4840.1	76.3	100.0	513.00	1.60	511.40	1.2E+000	1.7E-001	6.5E-003	1.9E-002
U-232	5320.5	5055.8	5369.5	61.5	100.1	2,020.00	11.20	2,008.80	4.1E+000	1.9E-001	1.8E-002	4.2E-002

Reviewed By: JMC JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001256

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-17
Spectrum #1 Analysis #1

Sample Size : 0.50

Acquisition

Detector: 63
Batch Name: UAS100305-2_A
Nuclide Library: Uranium Default
Analysis Method: Absolute Interactive ROI Analysis
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:36:08PM
Live Time: 800.00 min.
Real Time: 800.06 min.
Dead Time: 0.01 %

Calibration

Bkgd Info: Sample: B10030363; Det: 63; Spectrum #1; Mar-03-2010 14:44

Calibration Date: 3/3/2010 1:46:24PM

Efficiency Calibration: C10030363

Efficiency: 31.04% +/- 0.18% TPU(2 sigma)

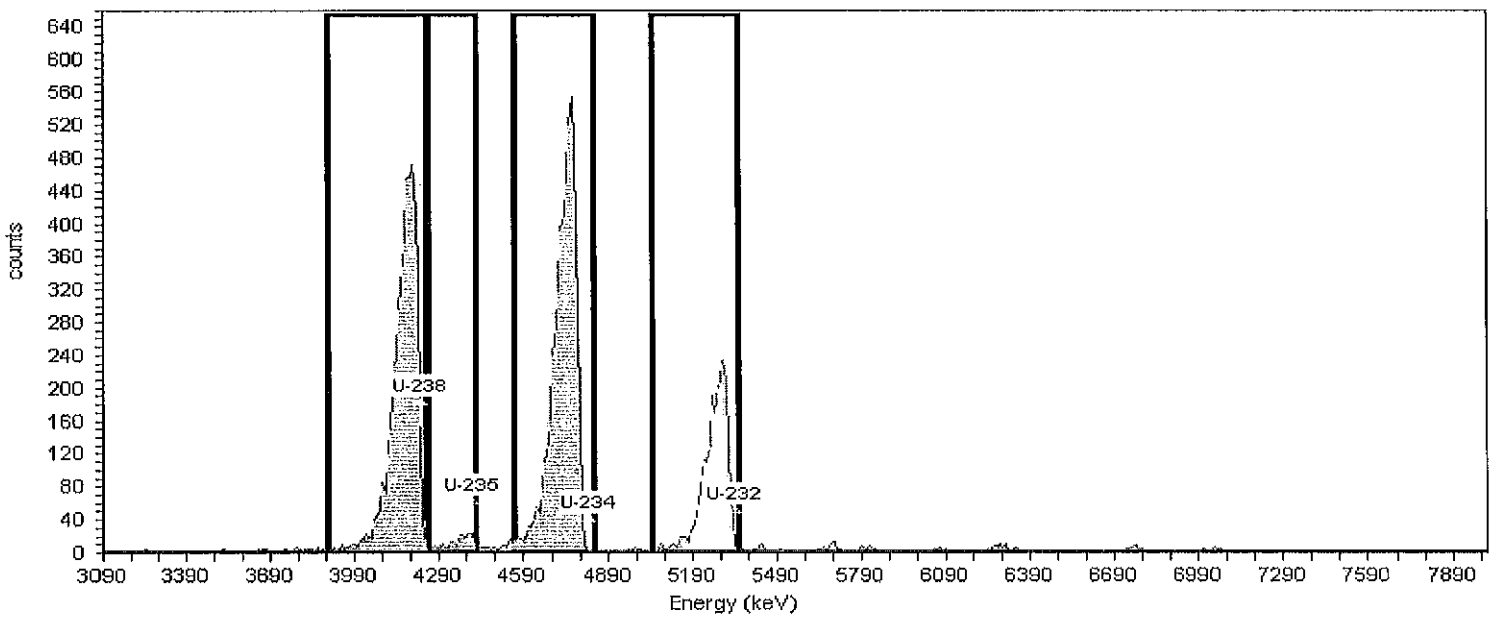
Energy Calibration: C10030363

Energy Cal: Gain = 9.6533 keV / Ch
Offset = 3,080.66 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 81.82%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/L	2.00Sigma TPU pCi/L	Critical Level pCi/L	MDA pCi/L
U-238	4219.8	3891.5	4239.1	34.2	100.2	4,546.00	4.00	4,542.00	2.0E+001	2.3E+000	2.0E-002	5.1E-002
U-235	4403.2	4248.7	4422.5	22.4	99.7	196.00	1.60	194.40	8.6E-001	1.6E-001	2.0E-002	3.7E-002
U-234	4818.3	4557.6	4837.6	82.9	100.0	5,024.00	3.20	5,020.80	2.2E+001	2.5E+000	1.7E-002	4.7E-002
U-232	5339.5	5049.9	5358.8	53.6	100.1	2,116.00	12.80	2,103.20	7.8E+000	3.5E-001	3.6E-002	8.4E-002

Reviewed By: EMF JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001257

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: 1003063-18
Spectrum #1 Analysis #1

Sample Size : 0.50

Acquisition

Detector: 64
Batch Name: UAS100305-2_A
Nuclide Library: Uranium Default
Analysis Method: Absolute Interactive ROI Analysis
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:36:09PM
Live Time: 800.00 min.
Real Time: 800.06 min.
Dead Time: 0.01 %

Calibration

Bkgd Info: Sample: B10030364; Det: 64; Spectrum #1; Mar-03-2010 14:44

Calibration Date: 3/3/2010 1:46:48PM

Efficiency Calibration: C10030364

Efficiency: 30.31% +/- 0.12% TPU(2 sigma)

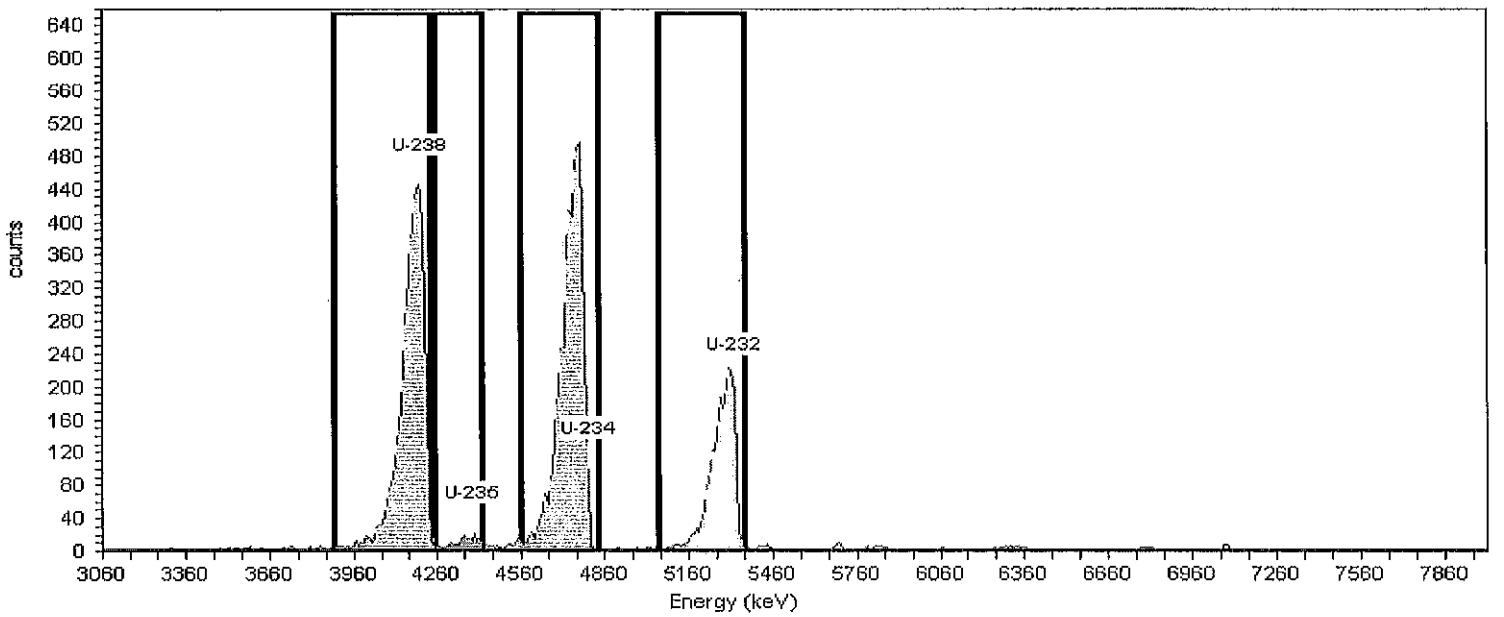
Energy Calibration: C10030364

Energy Cal: Gain = 9.7108 keV / Ch
Offset = 3,050.49 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 83.71%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/L	2.00Sigma TPU pCi/L	Critical Level pCi/L	MDA pCi/L
U-238	4196.4	3885.6	4235.2	37.2	100.2	4,304.00	5.60	4,298.40	1.9E+001	2.2E+000	2.3E-002	5.8E-002
U-235	4380.9	4244.9	4419.7	66.6	99.7	165.00	3.20	161.80	7.2E-001	1.4E-001	1.8E-002	4.7E-002
U-234	4798.4	4555.7	4837.3	80.5	100.0	4,718.00	3.20	4,714.80	2.1E+001	2.4E+000	1.8E-002	4.7E-002
U-232	5322.8	5050.9	5361.7	44.6	100.1	2,114.00	12.80	2,101.20	8.0E+000	3.5E-001	3.6E-002	8.4E-002

200001258

Reviewed By: EMF JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001258

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: AS100305-1MB
Spectrum #1 Analysis #1

Sample Size : 1.00

Acquisition

Detector: 30
Batch Name: UAS100305-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute Interactive ROI Analysis
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:33:53PM
Live Time: 800.00 min.
Real Time: 800.02 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030330; Det: 30; Spectrum #1; Mar-03-2010 14:43

Calibration Date: 3/3/2010 1:36:59PM

Efficiency Calibration: C10030330

Efficiency: 28.28% +/- 0.15% TPU(2 sigma)

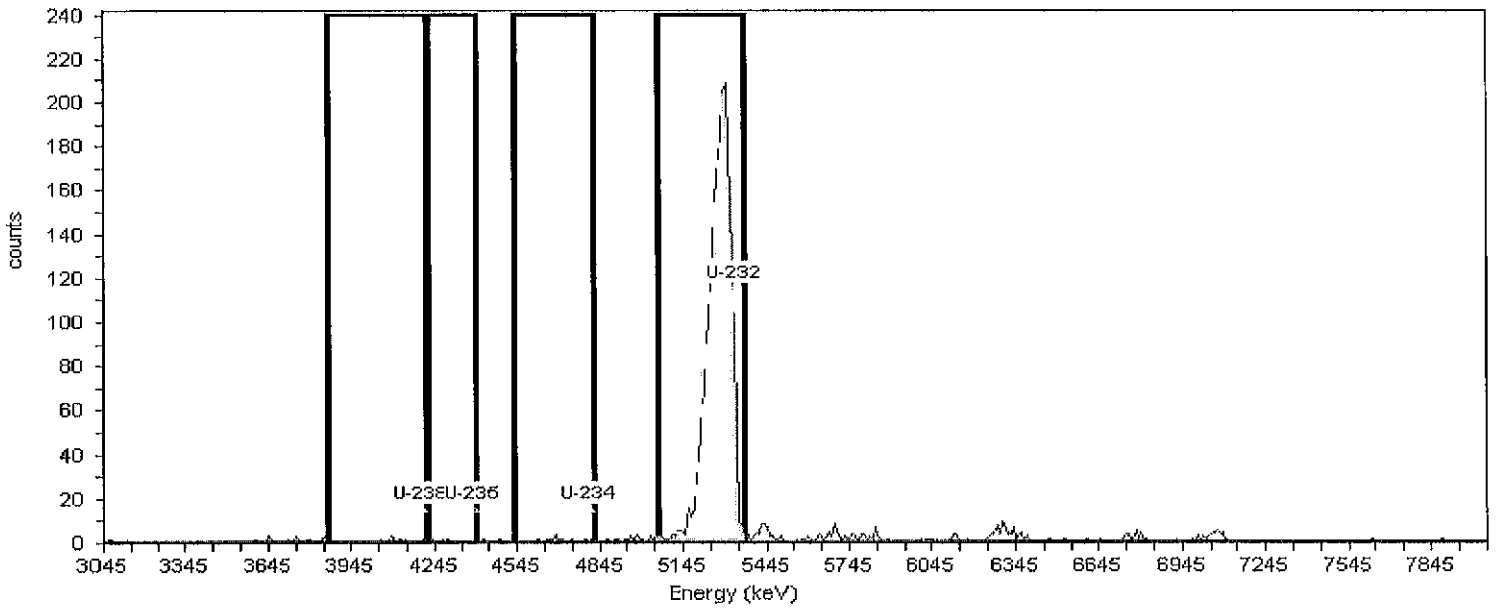
Energy Calibration: C10030330

Energy Cal: Gain = 9.8047 keV / Ch
Offset = 3,036.00 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 85.53%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4193.0	3859.6	4212.6	13.5	100.2	6.00	1.60	4.40	1.0E-002	1.3E-002	6.5E-003	1.9E-002
U-235	4379.3	4222.4	4398.9	73.4	99.7	3.00	0.80	2.20	5.1E-003	9.1E-003	4.6E-003	1.6E-002
U-234	4800.9	4536.1	4820.5	47.9	100.0	10.00	1.60	8.40	2.0E-002	1.6E-002	6.5E-003	1.9E-002
U-232	5330.3	5055.8	5369.5	77.0	100.1	2,018.00	15.20	2,002.80	4.1E+000	1.9E-001	2.1E-002	4.8E-002

200001259

Reviewed By: QMC JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001259

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: AS100305-1LCS
Spectrum #1 Analysis #1

Sample Size : 1.00

Acquisition

Detector: 31
Batch Name: UAS100305-1_A
Nuclide Library: Uranium Default
Analysis Method: Absolute Interactive ROI Analysis
ROI Set: Uranium Default

Acquisition Start Date: 3/6/2010 4:33:53PM
Live Time: 800.00 min.
Real Time: 800.02 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030331; Det: 31; Spectrum #1; Mar-03-2010 14:43

Calibration Date: 3/3/2010 1:37:24PM

Efficiency Calibration: C10030331

Efficiency: 29.66% +/- 0.18% TPU(2 sigma)

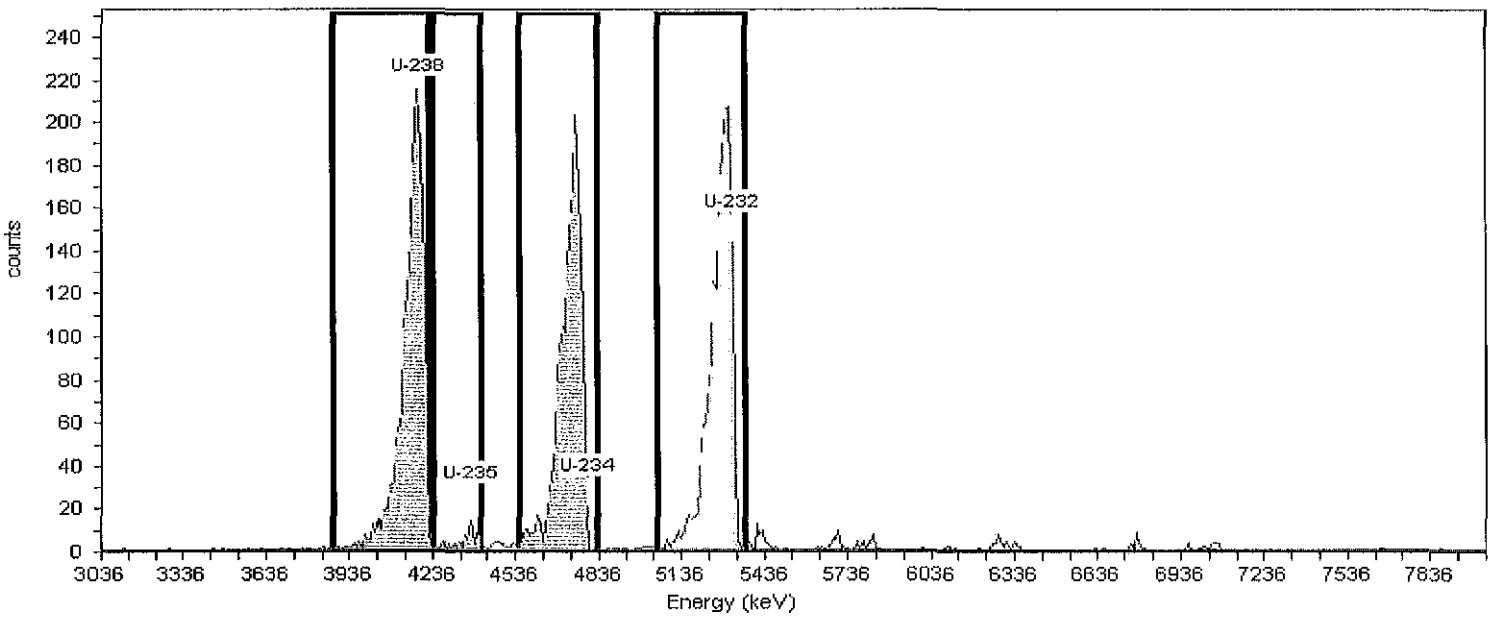
Energy Calibration: C10030331

Energy Cal: Gain = 9.8047 keV / Ch
Offset = 3,026.20 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 73.26%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/g	2.00Sigma TPU pCi/g	Critical Level pCi/g	MDA pCi/g
U-238	4183.2	3869.4	4222.4	40.4	100.2	1,816.00	8.00	1,808.00	4.7E+000	5.7E-001	1.6E-002	3.9E-002
U-235	4369.5	4232.2	4408.7	47.2	99.7	77.00	0.00	77.00	2.0E-001	5.1E-002	2.0E-002	7.0E-003
U-234	4791.1	4545.9	4830.3	88.2	100.0	1,691.00	4.00	1,687.00	4.4E+000	5.3E-001	1.1E-002	3.0E-002
U-232	5320.5	5046.0	5369.5	68.9	100.1	1,835.00	36.00	1,799.00	3.5E+000	1.7E-001	3.5E-002	7.8E-002

200001260

Reviewed By: GMC JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001260

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: AS100305-2MB
Spectrum #1 Analysis #1

Sample Size : 0.00

JP 3/8/10

Acquisition

Detector: 9
Batch Name: UAS100305-2_B
Nuclide Library: Uranium Default
Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default
ROI Set: Uranium Default

Acquisition Start Date: 3/7/2010 8:05:41PM
Live Time: 800.00 min.
Real Time: 800.03 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030209; Det: 9; Spectrum #1; Mar-02-2010 15:02

Calibration Date: 3/2/2010 11:30:06AM

Efficiency Calibration: C10030209

Efficiency: 30.99% +/- 0.20% TPU(2 sigma)

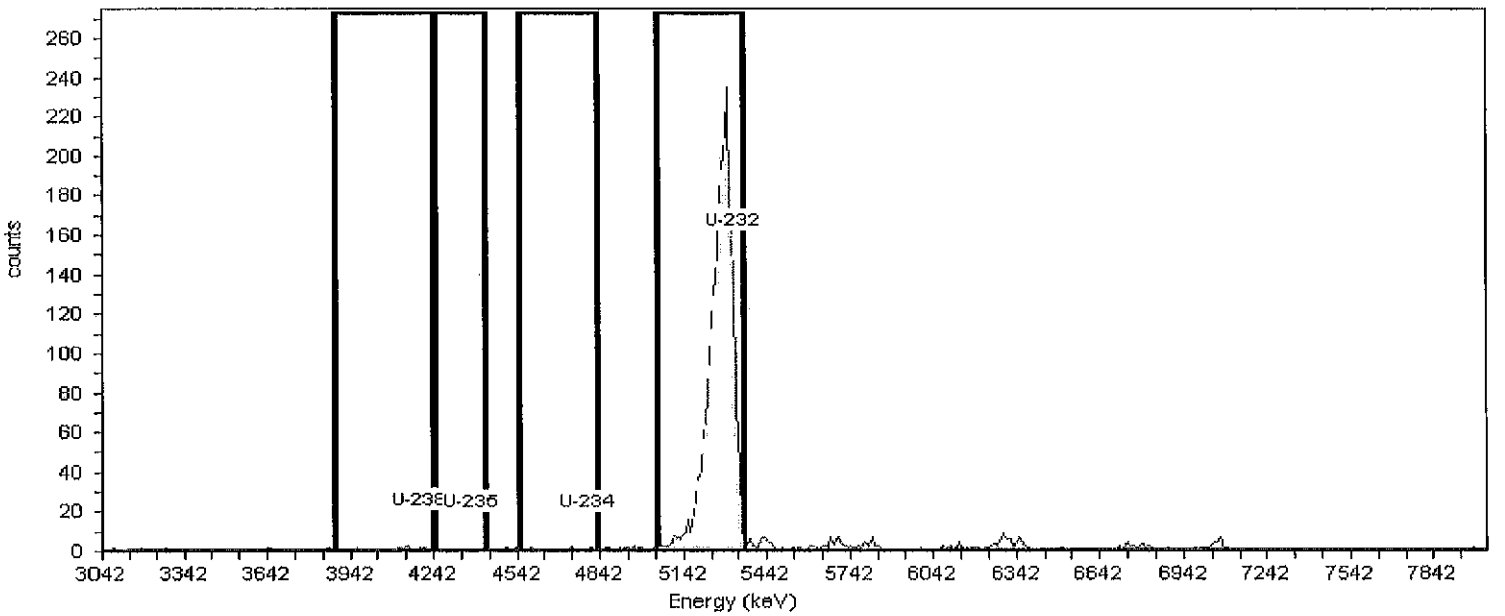
Energy Calibration: C10030209

Energy Cal: Gain = 9.7851 keV / Ch
Offset = 3,033.18 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 79.80%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/L	2.00Sigma TPU pCi/L	Critical Level pCi/L	MDA pCi/L
U-238	4168.3	3884.5	4236.8	102.3	100.2	8.00	0.80	7.20	1.6E+001	1.4E+001	4.5E+000	1.5E+001
U-235	4354.2	4246.5	4422.7	.0	99.7	0.00	0.80	-0.80	-1.8E+000	6.1E+000	4.5E+000	1.5E+001
U-234	4774.9	4549.9	4833.6	166.4	100.0	4.00	4.00	0.00	0.0E+000	1.3E+001	1.0E+001	2.6E+001
U-232	5303.3	5048.9	5362.0	100.0	100.1	2,058.00	10.40	2,047.60	3.8E+003	1.7E+002	1.7E+001	4.0E+001

200001261

Reviewed By: EMF JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001261

ALS Laboratory Group - Fort Collins

Alpha-Spectroscopy Analysis Report

Sample

Sample: AS100305-2LCS
Spectrum #1 Analysis #1

Sample Size : 0.00 l
JP 3/8/10

Acquisition

Detector: 10a
Batch Name: UAS100305-2_B
Nuclide Library: Uranium Default
Analysis Method: Absolute ROI Analysis, Set Name = Uranium Default
ROI Set: Uranium Default

Acquisition Start Date: 3/7/2010 8:05:40PM
Live Time: 800.00 min.
Real Time: 800.03 min.
Dead Time: 0.00 %

Calibration

Bkgd Info: Sample: B10030210; Det: 10a; Spectrum #1; Mar-02-2010 15:02

Calibration Date: 3/2/2010 11:30:45AM

Efficiency Calibration: C10030210

Efficiency: 31.56% +/- 0.15% TPU(2 sigma)

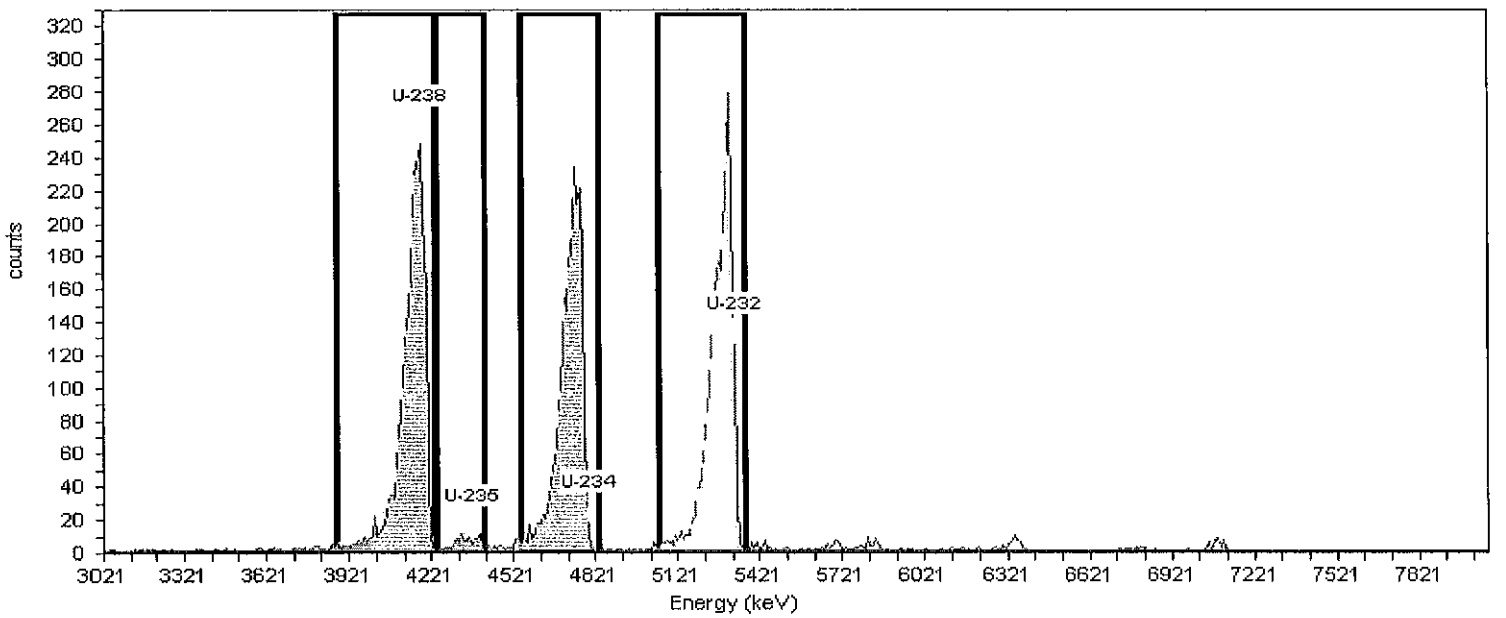
Energy Calibration: C10030210

Energy Cal: Gain = 9.9003 keV / Ch
Offset = 3,011.38 keV
Quadratic = 0.0000 keV / Ch^2

Tracer

Tracer Name: 837.3610.32 U-232
Tracer Activity: 21.29 DPM/mL x (Vol.)0.50 mL = 10.65 DPM

Tracer Nuclide: U-232
Tracer Recovery: 86.04%



Nuclide Summary (ROI)

Nuclide	Peak Energy keV	ROI Start keV	ROI End keV	FWHM keV	B.R. %.	Gross Counts	Bkgd Counts	Net Counts	Activity pCi/L	2.00Sigma TPU pCi/L	Critical Level pCi/L	MDA pCi/L
U-238	4159.8	3872.7	4229.1	78.1	100.2	2,234.00	1.60	2,232.40	4.6E+003	5.4E+002	5.8E+000	1.7E+001
U-235	4347.9	4239.0	4417.2	106.3	99.7	90.00	0.00	90.00	1.9E+002	4.5E+001	2.0E+000	5.6E+000
U-234	4773.6	4545.9	4833.0	84.5	100.0	2,101.00	2.40	2,098.60	4.3E+003	5.1E+002	7.1E+000	2.0E+001
U-232	5308.2	5050.8	5367.6	98.8	100.1	2,259.00	10.40	2,248.60	4.1E+003	1.8E+002	1.5E+001	3.6E+001

Reviewed By: SMF JP

All activity values and tracer recoveries are estimated values. The LIMS reporting system uses the count results to calculate all sample activity results. Thus, all activity values on this report may not be directly comparable to actual results on LIMS forms. The LIMS forms contain the actual true activity results for this sample.

200001262

ALS Laboratory Group - Fort Collins

FORM 746r8.xls (10/2/07)

Alpha Spectrometer Instrument Run Log

Date: 3/16

Detector	Batch ID	Sample ID	Iso/Matrix	Duration	Initial
32	VAS100305-2-A	1003063-4	V/W	800	EMF
57	↓	4D	↓	↓	↓
58		7R2			
59		10			
60		11			
62		15			
63		17			
64	↓	18	↓	↓	
46	PAS100217-2-C	AS100217-2LCS	P/F	800	
47	↓	↓ LCSD	↓	↓	
9	VAS100304-1-B	1003045-21	V/S	800	
10	↓	↓ 23	↓	↓	
11		AS100304-1MB			
12	↓	↓ LCS	↓	↓	
1	AAS100219-S-A	1002179-3	A/W/F	800	
2	↓	4	↓	↓	
3		7			
4		9			
5		10			
6		11			
7		13			
49		14			
50		19			
51	↓	21	↓	↓	↓

Detector	Batch ID	Sample ID	Iso/Matrix	Duration	Initial
52	AAS100219-S-A	1002179-22	A/W/F	800	EMF
54	↓	23	↓	↓	↓
55		26			
56		27			
33		34			
34		36			
35		37			
36		38			
37		47			
39	↓	↓ 48	↓	↓	
40		AS100219-SMMB			
42	↓	PMB	↓	↓	
43		LCS			
45	↓	↓ LCSD	↓	↓	
13	VAS100305-1-A	1003063-1	V/S	800	
14	↓	2R2	↓	↓	
16		3			
17		5			
18		5D			
22		6R2			
23		~~6R2~~ 8			
24		3/16/10 8/9			
25		9 12			
26	↓	↓ 12 13	↓	↓	↓

Notes:

Reviewed by: EMF
Date: 3/16/10

2000011263

385281

ALS Laboratory Group - Fort Collins

FORM 746r8.xls (10/2/07)

Alpha Spectrometer Instrument Run Log

Date: 3/16/10

Detector	Batch ID	Sample ID	Iso/Matrix	Duration	Initial
27	UAS100305-LA	10030163-14	U/S	800	SMF
28	↓	16	↓	↓	↓
29	↓	16D	↓	↓	↓
30	↓	AS100305-1MB	↓	↓	↓
31	↓	↓ LCS	↓	↓	↓
32	UAS100305-2-A	10030163-4	U/W	800	↓
57	↓	4D	↓	↓	↓
58	↓	~~FR2~~	↓	↓	↓
59	↓	10	↓	↓	↓
60	↓	11	↓	↓	↓
62	↓	15	↓	↓	↓
63	↓	17	↓	↓	↓
64	↓	18	↓	↓	↓

SMF 3/16/10

Detector	Batch ID	Sample ID	Iso/Matrix	Duration	Initial

SMF 3/16/10

Notes:

200001264

Reviewed by: SMF
Date: 3/16/10

385282

ALS Laboratory Group - Fort Collins

FORM 746r8.xls (10/2/07)

Alpha Spectrometer Instrument Run Log

Date: 8/7/10

Detector	Batch ID	Sample ID	Iso/Matrix	Duration	Initial
9	VAS100305-2_B	AS100305-2MB	U/W	800	EMF
10	↓	↓ LCS	↓	↓	↓
1	AAS100217-1_B	100Z100-2	AM/F	1000	↓
2	↓	AS100217-1MB	↓	↓	↓
11	VAS100305-1_B	100306E3-14	U/S	800	↓
18	VAS100219-5_B	100Z179-37	U/F	1000	↓
19	↓	↓ 38	↓	↓	↓
22	↓	↓ 67	↓	↓	↓
12	↓	↓ 68	↓	↓	↓
13	↓	AS100219-5MMB	↓	↓	↓
14	↓	↓ PMB	↓	↓	↓
16	↓	↓ LCS	↓	↓	↓
17	↓	↓ LCSD	↓	↓	↓
3	PAS100303-1_A	100301S-1	PU/W	1000	↓
4	↓	↓ ID	↓	↓	↓
5	↓	↓ 2	↓	↓	↓
6	↓	↓ 3	↓	↓	↓
7	↓	AS100303-1MB	↓	↓	↓
8	↓	↓ LCS	↓	↓	↓
25	TAS100303-2_A	100301S-1	Th/W	420	↓
26	↓	↓ ID	↓	↓	↓
31	↓	↓ 2	↓	↓	↓
28	↓	↓ 3	↓	↓	↓
29	↓	AS100303-2MB	↓	↓	↓
30	↓	↓ LCS	↓	↓	↓

Detector	Batch ID	Sample ID	Iso/Matrix	Duration	Initial
49	PAS100219-3_B	100Z179-30	PU/F	1000	EMF
50	↓	↓ 31	↓	↓	↓
51	↓	↓ 32	↓	↓	↓
52	↓	↓ 33	↓	↓	↓
54	↓	↓ 35	↓	↓	↓
55	↓	AS100219-3 MMB	↓	↓	↓
56	↓	↓ PMB	↓	↓	↓
33	↓	↓ LCS	↓	↓	↓
34	↓	↓ LCSD	↓	↓	↓
35	PAS100219-6_A	100Z179-39	PU/F	1000	↓
36	↓	↓ 40	↓	↓	↓
37	↓	↓ 44	↓	↓	↓
39	↓	↓ 46	↓	↓	↓
40	↓	↓ 47	↓	↓	↓
42	↓	↓ 48	↓	↓	↓
43	↓	↓ 49	↓	↓	↓
45	↓	↓ 58	↓	↓	↓
46	↓	AS100219-6MMB	↓	↓	↓
47	↓	↓ PMB	↓	↓	↓

EMF 8/7/10

Notes:

Reviewed by: EMF
Date: 8/7/10

200001265

385283

Section 6

QUALITY ASSURANCE SUMMARY REPORTS

200001266

No *NON-CONFORMANCE REPORTS* or *QUALITY ASSURANCE SUMMARY SHEETS* are included in this data package.

200001267

Section 7

LABORATORY BENCH SHEETS

7

200001268

Radiochemistry Instrument Worksheet

ALS Laboratory Group -- FC

Prep Batch: AS100305-1

Prep Procedure: UTOT

Analytical QASS / NCR? Y (N) NA

Prep Num	LabID	QC Type	Init Alq	Adj Alq %Moist	Units	Report Units	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes
1	1003063-1	SMP	1.0027	0.9678 3.4776	g	ug/g	_30631	13	EMF	_30631			_30631			A
* 1	1003063-2	SMP	1.0335	1.044 1.8821	g	ug/g	_30632			_30632	EMF 3/8/10		_30632			
1	1003063-2	REP	0.1034	0.1015 1.8821	g	ug/g	_3051R	14	EMF	_3051R			_3051R			A
1	1003063-3	SMP	1.0532	0.677 35.723	g	ug/g	_30633	EMF 3/5/10		_30633			_30633			
1	1003063-5	SMP	1.0337	0.5926 42.672	g	ug/g	_30635	17		_30635			_30635			
1	1003063-5	DUP	1.0355	0.5936 42.672	g	ug/g	_30635D	18		_30635D			_30635D			
* 1	1003063-6	SMP	1.0086	0.9659 4.2372	g	ug/g	_30636 EMF Fluo	19		_30636	EMF 3/8/10		_30636			
1	1003063-6	REP	0.3012	0.2884 4.2372	g	ug/g	_3051R	22	EMF	_3051R			_3051R			A
1	1003063-8	SMP	1.0183	0.6957 31.677	g	ug/g	_30638	23		_30638			_30638			
1	1003063-9	SMP	1.0497	0.7656 27.064	g	ug/g	_30639	24		_30639			_30639			
1	1003063-12	SMP	1.0565	0.7681 27.298	g	ug/g	_306312	25		_306312			_306312			
1	1003063-13	SMP	1.116	0.816 26.891	g	ug/g	_306313	26		_306313			_306313			
1	1003063-14	SMP	1.0378	1.0131 2.3771	g	ug/g	_306314	27		_306314	B 11	EMF	_306314			B peak Shift
1	1003063-16	SMP	1.1315	0.7634 32.534	g	ug/g	_306316	28		_306316			_306316			
1	1003063-16	DUP	1.0775	0.7269 32.534	g	ug/g	_306316D	29		_306316D			_306316D			
1	AS100305-1	MB	1	1	g	ug/g	_3051B	30		_3051B			_3051B			
1	AS100305-1	LCS	1	1	g	ug/g	_3051L	31		_3051L			_3051L			

Tracer/Carrier Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
T1	U-232	837.3610.32	20.660	DPM/ml	03/05/10	0.5	ml	AW013

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	U-234	644.3610.02	19.272	DPM/ml	03/05/10	0.5	ml	AW013
S1	U-235	644.3610.02	0.921	DPM/ml	03/05/10	0.5	ml	AW013
S1	U-238	644.3610.02	20.008	DPM/ml	03/05/10	0.5	ml	AW013

* Due to high activity in samples 1003063-2 and -6, The replicates will be reported in order to protect The integrity of The detectors. JP 3/8/10

200001269

Reporting Units

LabID:	TstGrpName:	RptUnits:
1003063-1	TotalU(Mass)	ug/g
1003063-2	TotalU(Mass)	ug/g
1003063-3	TotalU(Mass)	ug/g
1003063-5	TotalU(Mass)	ug/g
1003063-6	TotalU(Mass)	ug/g
1003063-8	TotalU(Mass)	ug/g
1003063-9	TotalU(Mass)	ug/g
1003063-12	TotalU(Mass)	ug/g
1003063-13	TotalU(Mass)	ug/g
1003063-14	TotalU(Mass)	ug/g
1003063-16	TotalU(Mass)	ug/g

Sample Barcodes

1003063-1
AS100305-1PS1

1003063-2
AS100305-1PS2

1003063-2REP
AS100305-1PS3

1003063-3
AS100305-1PS4

1003063-5
AS100305-1PS5

1003063-5DUP
AS100305-1PS6

1003063-6
AS100305-1PS7

1003063-6REP
AS100305-1PS8

1003063-8
AS100305-1PS9

1003063-9
AS100305-1PS10

1003063-12
AS100305-1PS11

1003063-13
AS100305-1PS12

1003063-14
AS100305-1PS13

1003063-16
AS100305-1PS14

1003063-16DUP
AS100305-1PS15

AS100305-1MB
AS100305-1PS16

AS100305-1LCS
AS100305-1PS17

200001270

Radiochemistry Prep Worksheet

ALS Laboratory Group -- FC

Prep Batch: AS100305-1

Prep Procedure: UTOT

Reviewed By: tde 1DE **Review Date:** 3/6/2010

Non-Routine Pre-Treatment? Y / (N) **Batch:** NA **Re-Prep?** Y / (N) **Batch:** NA **Prep QASS / NCR?** Y / (N) NA

Prep SOP: PAI 778 **Rev:** 13
Prep SOP: NONE
Matrix Class: solid

Prep Analyst: Tambrae Elhart TE
Prep Date: 3/5/2010
Prep Dept: AP

Balance: 27
Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Micro Init	Micro Date	Standards	Prep Notes
1	1	1003063-1	SMP		1.0027	1.0027	As Received	TE	3/6/10	T1	
2	1	1003063-2	SMP		1.0335	1.0335	As Received			T1	
3	1	1003063-2	REP		0.1034	0.1034	As Received			T1	
4	1	1003063-3	SMP		1.0532	1.0532	As Received			T1	
5	1	1003063-5	SMP		1.0337	1.0337	As Received			T1	
6	1	1003063-5	DUP		1.0355	1.0355	As Received			T1	
7	1	1003063-6	SMP		1.0086	1.0086	As Received			T1	
8	1	1003063-6	REP		0.3012	0.3012	As Received			T1	
9	1	1003063-8	SMP		1.0183	1.0183	As Received			T1	
10	1	1003063-9	SMP		1.0497	1.0497	As Received			T1	
11	1	1003063-12	SMP		1.0565	1.0565	As Received			T1	
12	1	1003063-13	SMP		1.116	1.116	As Received			T1	
13	1	1003063-14	SMP		1.0378	1.0378	As Received			T1	
14	1	1003063-16	SMP		1.1315	1.1315	As Received			T1	
15	1	1003063-16	DUP		1.0775	1.0775	As Received			T1	
16	1	AS100305-1	MB		1	1	As Received			T1	
17	1	AS100305-1	LCS		1	1	As Received			S1,T1	

TE 3/6/10

Comments

Due to potential matrix interference, a reduced aliquot of ~1g was taken for all samples. Due to elevated alpha activity seen in prescreen, replicates were taken for samples 2 and 6.

Spiked By: Tambrae Elhart **Date:** 3/5/2010

Witnessed By: Jeffrey T. Lee **Date:** 3/5/2010

Tracer/Carrier Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
T1	U-232	837.3610.32	20.660	DPM/ml	03/05/10	0.5	ml	AW013

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	U-234	644.3610.02	19.272	DPM/ml	03/05/10	0.5	ml	AW013
S1	U-235	644.3610.02	0.921	DPM/ml	03/05/10	0.5	ml	AW013
S1	U-238	644.3610.02	20.008	DPM/ml	03/05/10	0.5	ml	AW013

200001271

Radiochemistry Prep Worksheet

ALS Laboratory Group -- FC

Prep Batch: AS100305-1

Prep Procedure: UTOT

Prep Batch Not Validated!!!

Reviewed By: **Review Date:**

Non-Routine Pre-Treatment? Y / N **Batch:** _____ **Re-Prep? Y / N** **Batch:** _____ **Prep QASS / NCR? Y / N** _____

Prep SOP: PAI 778 **Rev:** 13
Prep SOP: NONE
Matrix Class: solid

Prep Analyst: Tambrae Elhart TE
Prep Date: 3/5/2010
Prep Dept: AP

Balance: 27
Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq g	Fin Alq g	Prep Basis	Micro Init	Micro Date	Standards	Prep Notes
1	1	1003063-1	SMP		1	1	As Received	1.0027		T1	
2	1	1003063-2	SMP		1	1	As Received	1.0335		T1	
3	1	1003063-2	REP		0.1	0.1	As Received	.1034		"	
4	1	1003063-3	SMP		1	1	As Received	1.0532		T1	
5	1	1003063-5	SMP		1	1	As Received	1.0337		T1	
6	1	1003063-5	DUP		1	1	As Received	1.0355		T1	
7	1	1003063-6	SMP		1	1	As Received	1.0086		T1	
8	1	1003063-6	REP		0.3	0.3	As Received	.3012		"	
9	1	1003063-8	SMP		1	1	As Received	1.0183		T1	
10	1	1003063-9	SMP		1	1	As Received	1.0497		T1	
11	1	1003063-12	SMP		1	1	As Received	1.0565		T1	
12	1	1003063-13	SMP		1	1	As Received	1.1160		T1	
13	1	1003063-14	SMP		1	1	As Received	1.0378		T1	
14	1	1003063-16	SMP		1	1	As Received	1.1315		T1	
15	1	1003063-16	DUP		1	1	As Received	1.0775		T1	
16	1	AS100305-1	MB		1	1	As Received			T1	
17	1	AS100305-1	LCS		1	1	As Received			S1,T1	

Comments

Due to potential matrix interference, a reduced aliquot of ~1g was taken for all samples. Due to elevated alpha activity seen in prescreen, replicates were taken for samples 2 and 6.

Spiked By: Tambrae Elhart TE **Date:** 3/5/2010 3/5/10

Witnessed By: CES **Date:** 3/5/10

Tracer/Carrier Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
T1	U-232	837.3610.32	20.660	DPM/ml	03/05/10	0.5	ml	AW013

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	U-234	644.3610.02	19.272	DPM/ml	03/05/10	0.5	ml	AW013
S1	U-235	644.3610.02	0.921	DPM/ml	03/05/10	0.5	ml	AW013
S1	U-238	644.3610.02	20.008	DPM/ml	03/05/10	0.5	ml	AW013

200001272

EXP 4/29/10 11/15/11

SAMPLE CONDITION FORM (SOLIDS)

ANALYST: TC

ANALYSIS DATE: 3/5/10 METHOD: Prep

WORK ORDER	SAMPLE ID	SAMPLE CONDITION		
		Dry/Wet	TEXTURE	Remarks
1003063	1	wet	solid	no standing water
	2			
	3			standing water
	5			
	6			no standing water
	8			standing water
	9			
	12			
	13			
	14			no standing water
	16			standing water

TC 3/5/10

200001273

Percent Moisture

Method SOP642 Revision 8

Lab Name: ALS Laboratory Group -- FC

Date Extracted: 03/06/2010
Date Analyzed: 03/06/2010
Analyst: Mike Lundgreen

Balance ID: 31
Oven ID: 17
In Oven: 3/5/2010 @ 3:15:00 PM
Out of Oven: 3/6/2010 @ 12:20:00 PM

Validated By: bch
Validation Date: 03/06/2010
Validation Time: 12:36:41 PM

Run ID	Prep Batch ID	QC Batch ID	Lab ID	QC Type	Dish Wt	Wet Wt	Dry Wt	Dry Wt-Dish Wt	Percent Moisture	Percent Solids	RPD
EX100305-1A	EX100305-1	EX100305-1-1	1003039-1	SMP	1.329	10.42	10.95	9.62	7.7	92.3	
EX100305-1A	EX100305-1	EX100305-1-1	1003055-3	SMP	1.324	10.24	8.436	7.11	30.6	69.4	
EX100305-1A	EX100305-1	EX100305-1-1	1003055-4	SMP	1.322	10.11	9.254	7.93	21.6	78.4	
EX100305-1A	EX100305-1	EX100305-1-1	1003055-5	SMP	1.317	10.11	8.776	7.46	26.2	73.8	
EX100305-1A	EX100305-1	EX100305-1-1	1003055-6	SMP	1.319	10.06	9.06	7.74	23.0	77.0	
EX100305-1A	EX100305-1	EX100305-1-1	1003055-7	DUP	1.325	10.12	9.188	7.86	22.3	77.7	8
EX100305-1A	EX100305-1	EX100305-1-1	1003055-7	SMP	1.324	10.24	9.085	7.76	24.2	75.8	
EX100305-1A	EX100305-1	EX100305-1-1	EX100305-1	MB	1.298	1.298	1.298	0.00	100.0	0.0	
EX100305-1A	EX100305-1	EX100305-1-1	1003063-1	SMP	1.33	10.12	11.1	9.77	3.5	96.5	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-12	SMP	1.323	11.18	9.454	8.13	27.3	72.7	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-13	SMP	1.328	11.26	9.563	8.23	26.9	73.1	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-14	DUP	1.319	10.51	11.59	10.27	2.3	97.7	3
EX100305-1A	EX100305-1	EX100305-1-2	1003063-14	SMP	1.32	10.48	11.55	10.23	2.4	97.6	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-16	SMP	1.315	11.81	9.28	7.97	32.5	67.5	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-2	SMP	1.323	10.52	11.65	10.32	1.9	98.1	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-3	SMP	1.321	12.58	9.409	8.09	35.7	64.3	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-5	SMP	1.32	13.17	8.869	7.55	42.7	57.3	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-6	SMP	1.328	10.57	11.45	10.13	4.2	95.8	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-8	SMP	1.326	10.53	8.517	7.19	31.7	68.3	
EX100305-1A	EX100305-1	EX100305-1-2	1003063-9	SMP	1.322	11.08	9.404	8.08	27.1	72.9	
EX100305-1A	EX100305-1	EX100305-1-2	EX100305-1	MB	1.298	1.298	1.298	0.00	100.0	0.0	

200001274

Percent Moisture

Method SOP642 Revision 8

Lab Name: ALS Laboratory Group -- FC

Date Extracted: 03/06/2010
Date Analyzed: 03/06/2010
Analyst: Mike Lundgreen

Balance ID: 31
Oven ID: 17
In Oven: 3/5/2010 @ 3:15:00 PM
Out of Oven: 3/6/2010 @ 12:20:00 PM

Validated By: bch
Validation Date: 03/06/2010
Validation Time: 12:36:41 PM

Run ID	Prep Batch ID	QC Batch ID	Lab ID	QC Type	Dish Wt	Wet Wt	Dry Wt	Dry Wt- Dish Wt	Percent Moisture	Percent Solids	RPD

QC Types

CAR	Carrier reference sample
LCS	Laboratory Control Sample
MB	Method Blank
MSD	Laboratory Matrix Spike Duplicate
RVS	Reporting Level Verification Standar
SYS	Sample Yield Spike

DUP	Laboratory Duplicate
LCSD	Laboratory Control Sample Duplicate
MS	Laboratory Matrix Spike
REP	Sample replicate
SMP	Field Sample

Comments:

DUP = Sample Duplicate
Wet Wt = Sample Wet Wt - Dish Wt
Dry Wt = Sample Dry Wt + Dish Wt
Dry Wt - Dish Wt = Sample Dry Wt - Dish Wt
All weight values shown above are expressed in grams.

$$RPD = \frac{(\text{Sample Value - Duplicate Value})}{2} \times 100$$

$$\% \text{ Solids} = \frac{\text{Dry Weight}}{\text{Wet Weight}} \times 100$$

$$\% \text{ Moisture} = \frac{(\text{Wet Weight - Dry Weight})}{\text{Wet Weight}} \times 100$$

200001275

Radiochemistry Instrument Worksheet

ALS Laboratory Group -- FC

Prep Batch: AS100305-2

Prep Procedure: UTOT

Analytical QASS / NCR? Y / (N) NA

Prep Num	LabID	QC Type	Init Alq	Fin Alq	Units	Report Units	Cnt 1 File	Cnt 1 Inst/Det	Cnt 1 Pos Chk By	Cnt 2 File	Cnt 2 Inst/Det	Cnt 2 Pos Chk By	Cnt 3 File	Cnt 3 Inst/Det	Cnt 3 Pos Chk By	Notes
1	1003063-4	SMP	500	500	ml	ug/l	_30634	32	EMF	_30634			_30634		A	
1	1003063-4	DUP	500	500	ml	ug/l	_30634D	37	↓	_30634D			_30634D		↓	
* 1	~~1003063-7~~	~~SMP~~	~~500~~	~~500~~	~~ml~~	~~ug/l~~	~~30637~~			_30637	EMF 3/8/10		_30637			~~DATA EMF 3/8/10~~
1	1003063-7	REP	15	15	ml	ug/l	_3052R	58	EMF	_3052R			_3052R		A	
1	1003063-10	SMP	500	500	ml	ug/l	_306310	59		_306310			_306310			
1	1003063-11	SMP	500	500	ml	ug/l	_306311	60		_306311			_306311			
1	1003063-15	SMP	500	500	ml	ug/l	_306315	62		_306315			_306315			
1	1003063-17	SMP	500	500	ml	ug/l	_306317	63		_306317			_306317			
1	1003063-18	SMP	500	500	ml	ug/l	_306318	64	↓	_306318			_306318			
1	AS100305-2	MB	1	1	ml	ug/l	_3052B	9	EMF	_3052B			_3052B		B	
1	AS100305-2	LCS	1	1	ml	ug/l	_3052L	10	↓	_3052L			_3052L	EMF 3/8/10	↓	EMF 3/8/10

Tracer/Carrier Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
T1	U-232	837.3610.32	20.660	DPM/ml	03/05/10	0.5	ml	AW013

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	U-234	644.3610.02	19.272	DPM/ml	03/05/10	0.5	ml	AW013
S1	U-235	644.3610.02	0.921	DPM/ml	03/05/10	0.5	ml	AW013
S1	U-238	644.3610.02	20.008	DPM/ml	03/05/10	0.5	ml	AW013

* Due to high activity in sample 1003063-7, The replicate (15ml) will be reported to protect the ~~integretity~~ ~~integretity~~ integrity of the detectors. JP 3/8/10 JP 3/8/10 JP 3/8/10

200001276

Reporting Units

LabID:	TstGrpName:	RptUnits:
1003063-4	TotalU(Mass)	ug/l
1003063-7	TotalU(Mass)	ug/l
1003063-10	TotalU(Mass)	ug/l
1003063-11	TotalU(Mass)	ug/l
1003063-15	TotalU(Mass)	ug/l
1003063-17	TotalU(Mass)	ug/l
1003063-18	TotalU(Mass)	ug/l

Sample Barcodes

1003063-4
AS100305-2PS1

1003063-4DUP
AS100305-2PS2

1003063-7
AS100305-2PS3

1003063-7REP
AS100305-2PS4

1003063-10
AS100305-2PS5

1003063-11
AS100305-2PS6

1003063-15
AS100305-2PS7

1003063-17
AS100305-2PS8

1003063-18
AS100305-2PS9

AS100305-2MB
AS100305-2PS10

AS100305-2LCS
AS100305-2PS11

200001277

Radiochemistry Prep Worksheet

ALS Laboratory Group -- FC

Prep Batch: AS100305-2

Prep Procedure: UTOT

Reviewed By: tde TE **Review Date:** 3/6/2010

Non-Routine Pre-Treatment? Y / (N) **Batch:** NA **Re-Prep?** Y / (N) **Batch:** NA **Prep QASS / NCR?** Y / (N) NA

Prep SOP: PAI 778 **Rev:** 13
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Tambrae Elhart TE
Prep Date: 3/5/2010
Prep Dept: AP

Balance:
Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Micro Init	Micro Date	Standards	Prep Notes
1	1	1003063-4	SMP		500	500	Unfiltered	TE	3/6/10	T1	
2	1	1003063-4	DUP		500	500	Unfiltered			T1	
3	1	1003063-7	SMP		500	500	Unfiltered			T1	
4	1	1003063-7	REP		15	15	Unfiltered			T1	
5	1	1003063-10	SMP		500	500	Unfiltered			T1	
6	1	1003063-11	SMP		500	500	Unfiltered			T1	
7	1	1003063-15	SMP		500	500	Unfiltered			T1	
8	1	1003063-17	SMP		500	500	Unfiltered			T1	
9	1	1003063-18	SMP		500	500	Unfiltered			T1	
10	1	AS100305-2	MB		1	1	Unfiltered			T1	
11	1	AS100305-2	LCS		1	1	Unfiltered			S1,T1	

TE 3/6/10

Comments

A reduced aliquot of 500mL was taken for all samples. Standard MDC's will be met with a standard count time. Due to elevated alpha activity in sample 7, a replicate was also taken. In order to avoid the large amount of sediment present in sample 7, it was decanted during aliquotting.

Spiked By: Tambrae Elhart **Date:** 3/5/2010

Witnessed By: Jeffrey T. Lee **Date:** 3/5/2010

Tracer/Carrier Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
T1	U-232	837.3610.32	20.660	DPM/ml	03/05/10	0.5	ml	AW013

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	U-234	644.3610.02	19.272	DPM/ml	03/05/10	0.5	ml	AW013
S1	U-235	644.3610.02	0.921	DPM/ml	03/05/10	0.5	ml	AW013
S1	U-238	644.3610.02	20.008	DPM/ml	03/05/10	0.5	ml	AW013

200001278

Radiochemistry Prep Worksheet

ALS Laboratory Group -- FC

Prep Batch: AS100305-2

Prep Procedure: UTOT

Prep Batch Not Validated!!!

Reviewed By: **Review Date:**

Non-Routine Pre-Treatment? Y / N **Batch:** _____ **Re-Prep? Y / N** **Batch:** _____ **Prep QASS / NCR? Y / N** _____

Prep SOP: PAI 778 **Rev:** 13
Prep SOP: NONE
Matrix Class: liquid

Prep Analyst: Tambrae Elhart TE
Prep Date: 3/5/2010
Prep Dept: AP

Balance:
Balance:

Samp Num	Prep Num	LabID	QC Type	Dish No.	Init Alq ml	Fin Alq ml	Prep Basis	Micro Init	Micro Date	Standards	Prep Notes
1	1	1003063-4	SMP		500	500	Unfiltered			T1	
2	1	1003063-4	DUP		500	500	Unfiltered			T1	
3	1	1003063-7	SMP		500	500	Unfiltered			T1	
4	1	1003063-10	SMP		500	500	Unfiltered			T1	
5	1	1003063-11	SMP		500	500	Unfiltered			T1	
6	1	1003063-15	SMP		500	500	Unfiltered			T1	
7	1	1003063-17	SMP		500	500	Unfiltered			T1	
8	1	1003063-18	SMP		500	500	Unfiltered			T1	
9	1	AS100305-2	MB		500	500	Unfiltered			T1	
10	1	AS100305-2	LCS		500	500	Unfiltered			S1,T1	
11		1003063 7Rep			15mL	↓				T1	

Comments

A reduced aliquot of 500mL was taken for all samples. Standard MDC's will be met with a standard count time.

Spiked By: TE **Date:** 3/5/10

Witnessed By: JR **Date:** 3/5/10

Tracer/Carrier Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
T1	U-232	837.3610.32	20.660	DPM/ml	03/05/10	0.5	ml	AW013

Spike Solution Information

Soln #	Nuclide	SolnID	Prep Conc	Units	Prep Date	Aliquot	Units	Pipet ID
S1	U-234	644.3610.02	19.272	DPM/ml	03/05/10	0.5	ml	AW013
S1	U-235	644.3610.02	0.921	DPM/ml	03/05/10	0.5	ml	AW013
S1	U-238	644.3610.02	20.008	DPM/ml	03/05/10	0.5	ml	AW013

4/29/10 Exp 11/15/11

200001279

SAMPLE CONDITION FORM (LIQUID)

ANALYST: TC

ANALYSIS DATE: 3/5/10 METHOD: Prep

WORK ORDER	SAMPLE ID	SAMPLE CONDITION pH	Color	Remarks
1003063	4	<2	clear	none
	7	~7	brown	Sediment decanted, maximum acid added, but buffered out, run per PM
	10	<2	clear	none
	11			
	15			
	17			
↓	18	↓	↓	↓

TC 3/5/10

200001280

Section 8

STANDARDS TRACEABILITY DOCUMENTS

8

200001281

PROJECT 644.3610.02 U-238/Nat Notebook No. 3610

Continued From Page

Prepare a working dilution of ~ 20.0 dpm/ml U-238 from 644.3020.53

1) Determine Density of 1M HNO_3 lot# 073371 Bal# 12 1

Mass of volumetric flask (100 ml) 68.7980 g

Mass of flask and 100 ml Acid 171.0125 g

Net Mass of Acid 102.7145 g

$\rho = 1.027145$ g/ml

2) Transfer 644.3020.53

Mass of Empty (No lid) 1000 ml Nalgene 74.7135 g 12 1

Mass of Nalgene and Std. Transferred 76.1629 g

Net Mass of Std. Transferred 1.4494 g

3) Dilute to final Vol.

Mass of Std, Nalgene, and diluent 1155.1 g 26

Mass of Nalgene 74.7135 g

Net Mass of New Std Dilution 1080.3865 g

Final Activity Calculation

$$\frac{\left(242.0 \frac{Bq}{g}\right)\left(\frac{60\ dpm}{1\ Bq}\right)\left(1.4494\ g\right)\left(1.027145 \frac{g}{ml}\right)}{\left(1080.3865\ g\right)} = 20.01\ dpm/ml$$

MC 7/13/08

Stnd ID: 644.3610.02

Description: U-234/238

Expiration: 4/8/2009

Activity: 20.01 dpm/mL MC 7/13/08

Density of 1.0 gram/mL assumed

2s Uncertainty: 0.12 dpm/mL

Ref. Date: 8/1/1997

Ref Time: N/A

Prep Date: 4/7/2008 Prep by: jdd

Matrix/Comp: 1 M HNO3

Half Life (y): 4.47E+09

Reverification Log		
Analysis Date	Initials	Expiration Date
2/23/09	RG	2/23/2010
1/15/2010	RG	1/15/2011 MC 7/13/08

200001282

MC 7/13/08

Continued on Page

Read and Understood By

4/7/08 Date

Signed

7/13/08 Date

PROJECT 644.3020.53

Notebook No. 3020

Continued From Page

Direct transfer of RSO 644 to 40 mL VOA vial

Mass of VOA vial w/o lid: 20.9455 g
Mass of vial + standard: 24.6612 g
Net mass of std transferred: 3.7157 g

Bal 12

RSO 644
U-238: 242.0 Bq/g
U-235: 11.14 Bq/g
U-234: 233.1 Bq/g

AB 11/28/06

Continued on Page

200001283

Read and Understood By

Signed	Date	Signed	Date
A Bailey	11/28/06	[signature]	7/13/08

200001283

National Institute of Standards & Technology

Certificate

PAF ED 0644
rec'd 10-18-02

Standard Reference Material 4321C
Natural Uranium Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive natural uranium nitrate and nitric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of alpha-particle counting instruments and for the monitoring of radiochemical procedures.

Radiological Hazard

The SRM ampoule contains uranium-238, uranium-235, and uranium-234 with a total activity of approximately 2600 Bq. Uranium decays by alpha-particle emission. The progeny of uranium-238, uranium-235, and uranium-234 have a total activity of approximately 2600 Bq and decay by alpha- and beta-particle emission. None of the alpha or beta particles escape from the SRM ampoule. During the decay process X-rays and gamma rays with energies from 11 keV to 2.0 MeV are also emitted. Most of these photons escape from the SRM ampoule but their intensities are so small that they do not represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]*. The SRM should be used only by persons qualified to handle radioactive material.

Chemical Hazard

The SRM ampoule contains nitric acid (HNO_3) with a concentration of 1 mole per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

Storage and Handling

The SRM should be stored and used at a temperature between 5 and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least August 2007.

The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) both because of the radioactivity and because of the strong acid.

Preparation

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, J.M.R. Hutchinson, Group Leader. The overall technical direction and physical measurements leading to certification were provided by L.L. Lucas of the Radioactivity Group.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by N.M. Trahey.

Gaithersburg, Maryland 20899
November 1997

Thomas E. Gills, Chief
Standard Reference Materials Program

200001284

*Notes and references are on pages 5 and 6.

200001284

Recommended Procedure for Opening the SRM Ampoule

1) If the SRM solution is to be diluted, it is recommended that the diluting solution have a composition comparable to that of the SRM solution.

2) Wear eye protection, gloves, and protective clothing and work over a tray with absorbent paper in it. Work in a fume hood. In addition to the radioactive material, the solution contains strong acid and is corrosive.

3) Shake the ampoule to wet all of the inside surface of the ampoule. Return the ampoule to the upright position.

4) Check that all of the liquid has drained out of the neck of the ampoule. If necessary, gently tap the neck to speed the process.

5) Holding the ampoule upright, score the narrowest part of the neck with a scribe or diamond pencil.

6) Lightly wet the scored line. This reduces the crack propagation velocity and makes for a cleaner break.

7) Hold the ampoule upright with a paper towel, a wiper, or a support jig. Position the scored line away from you. Using a paper towel or wiper to avoid contamination, snap off the top of the ampoule by pressing the narrowest part of the neck away from you while pulling the tip of the ampoule towards you.

8) Transfer the solution from the ampoule using a pycnometer or a pipet with dispenser handle. NEVER PIPETTE BY MOUTH.

9) Seal any unused SRM solution in a flame-sealed glass ampoule, if possible, to minimize the evaporation loss.

See also reference [4]*.

200001285

*Notes and references are on pages 5 and 6.

PROPERTIES OF SRM 4321C
(Certified values are shown in bold type)

Source identification number	NIST SRM 4321C		
Physical Properties:			
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule		
Ampoule specifications	Body outside diameter Wall Thickness Barium content Lead-oxide content Other heavy elements	(16.5 ± 0.5) mm (0.60 ± 0.04) mm Less than 2.5% Less than 0.02% Trace quantities	
Solution density	**(1.053 ± 0.001) g·mL^{-1} at 21.4 °C** [b]*		
Solution mass	**(5.258 ± 0.002) g** [b]		
Chemical Properties:			
Solution composition	Chemical Formula	Concentration (mol·L^{-1})	Mass Fraction (g·g^{-1})
	H_2O HNO_3 $UO_2(NO_3)_2$	53 1.0 0.09	0.91 0.06 0.03
Radiological Properties:			
Radionuclide	**Natural Uranium (Mixture of U-238, U-235, and U-234)**		
Reference time	**1200 EST, 1 August 1997**		
Massic activity of the solution [c]	**U-238: 242.0 Bq·g^{-1}** **U-235: 11.14 Bq·g^{-1}** **U-234: 233.1 Bq·g^{-1}**		
Relative expanded uncertainty (k=2)	**U-238: 0.60%** [d] [e] **U-235: 0.62%** [d] [e] **U-234: 0.98%** [d] [e]		
Mass fraction of uranium	**(0.01960 ± 0.00010) g·g^{-1}** [b]		
Photon-emitting impurities	None detected [f]		
Half lives used	Uranium-238: (4.468 ± 0.003) × 10^9 a [g] Uranium-235: (7.038 ± 0.005) × 10^8 a [g] Uranium-234: (2.455 ± 0.006) × 10^5 a [g]		
Measuring instruments	Mass spectrometer, silicon surface-barrier detector, and $4\pi(\alpha+\beta)$ liquid-scintillation counting systems.		

200001286

*Notes and references are on pages 5 and 6.

EVALUATION OF THE UNCERTAINTY OF THE MASSIC ACTIVITY [d]*

Input Quantity x_i, the source of uncertainty (and individual uncertainty components where appropriate)	Method Used To Evaluate $u(x_i)$, the standard uncertainty of x_i (A) denotes evaluation by statistical methods (B) denotes evaluation by other methods	Relative Uncertainty Of Input Quantity, $u(x_i)/x_i$, (%) [h]	Relative Sensitivity Factor, $\lvert \partial y/\partial x_i \rvert \cdot (x_i/y)$ [i]	Relative Uncertainty Of Output Quantity, $u_i(y)/y$, (%) [j]
Isotopic uranium atom fraction in SRM 960	Standard deviation of the mean for repeated mass-spectrometric measurements (A)	U-238: 0.001 U-235: 0.07 U-234: 0.31	1.0 1.0 1.0	0.001 0.07 0.31
Half life	Standard uncertainty of the half life (A)	U-238: 0.07 U-235: 0.07 U-234: 0.25	1.0 1.0 1.0	0.07 0.07 0.25
Uranium mass fraction in SRM 960	Certificate value (B)	0.003	1.0	0.003
Quantitative dissolution	Estimated (B)	0.25	1.0	0.25
Gravimetric measurements	Estimated (B)	0.10	1.0	0.10
Photon-emitting impurities	Limit of detection (B) [k]	100.	0.001	0.10
Relative Combined Standard Uncertainty of the Output Quantity, $u_c(y)/y$, (%)			U-238: U-235: U-234:	0.30 0.31 0.49
Coverage Factor, k				x 2
Relative Expanded Uncertainty of the Output Quantity, U/y, (%)			U-238: U-235: U-234:	0.60 0.62 0.98

200001287

*Notes and references are on pages 5 and 6.

NOTES

[a] The Sievert is the SI unit for dose equivalent. See reference [1]. One μSv is equal to 0.1 mrem.

Distance from Ampoule (cm):	1	30	100
Approximate Dose Rate (μSv/h):	<0.1	-	-

[b] The stated uncertainty is two times the standard uncertainty.

[c] **Massic activity** is the preferred name for the quantity activity divided by the total mass of the sample. See reference [1].

[d] The reported value, y, of massic activity (activity per unit mass) at the reference time was not measured directly but was derived from measurements and calculations of other quantities. This can be expressed as $y = f(x_1, x_2, x_3, \ldots x_n)$, where f is a mathematical function derived from the assumed model of the measurement process.

The value, x_i, used for each input quantity i has a **standard uncertainty**, $u(x_i)$, that generates a corresponding uncertainty in y, $u_i(y) = |\partial y/\partial x_i| \cdot u(x_i)$, called a **component of combined standard uncertainty** of y.

The **combined standard uncertainty** of y, $u_c(y)$, is the positive square root of the sum of the squares of the components of combined standard uncertainty.

The combined standard uncertainty is multiplied by a **coverage factor** of $k = 2$ to obtain U, the **expanded uncertainty** of y.

Since it can be assumed that the possible estimated values of the massic activity are approximately normally distributed with approximate standard deviation $u_c(y)$, the unknown value of the massic activity is believed to lie in the interval $y \pm U$ with a level of confidence of approximately 95 percent.

For further information on the expression of uncertainties, see references [2] and [3].

[e] The value of each standard uncertainty component, and hence the value of the expanded uncertainty itself, is a best estimate based upon all available information, but is only approximately known. That is to say, the "uncertainty of the uncertainty" is large and not well known. This is true for uncertainties evaluated by statistical methods (e.g., the relative standard deviation of the standard deviation of the mean for the massic count rate is approximately 50%) and for uncertainties evaluated by other methods (which could easily be over estimated or under estimated by substantial amounts). The unknown value of the expanded uncertainty is believed to lie in the interval $U/2$ to $2U$ (i.e., within a factor of 2 of the estimated value).

[f] Estimated limits of detection for photon-emitting impurities are:
1.4 $\gamma \cdot s^{-1} \cdot g^{-1}$ for energies between 8 and 59 keV,
1.1 $\gamma \cdot s^{-1} \cdot g^{-1}$ for energies between 67 and 88 keV,
0.5 $\gamma \cdot s^{-1} \cdot g^{-1}$ for energies between 102 and 197 keV,
0.3 $\gamma \cdot s^{-1} \cdot g^{-1}$ for energies between 205 and 762 keV,
0.2 $\gamma \cdot s^{-1} \cdot g^{-1}$ for energies between 770 and 996 keV, and
0.1 $\gamma \cdot s^{-1} \cdot g^{-1}$ for energies between 1006 and 1900 keV,
provided that the photons are separated in energy by 4 keV or more from photons emitted in the decay of uranium-238, uranium-235, uranium-234, or their progeny.

[g] The stated uncertainty is the standard uncertainty. See reference [5].

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[h] Relative standard uncertainty of the input quantity x_i.

[i] The relative change in the output quantity y divided by the relative change in the input quantity x_i. If $|\partial y/\partial x_i| \cdot (x_i/y) = 1.0$, then a 1% change in x_i results in a 1% change in y. If $|\partial y/\partial x_i| \cdot (x_i/y) = 0.05$, then a 1% change in x_i results in a 0.05% change in y.

[j] Relative component of combined standard uncertainty of output quantity y, rounded to two significant figures or less. The relative component of combined standard uncertainty of y is given by $u_i(y)/y \equiv |\partial y/\partial x_i| \cdot u(x_i)/y = |\partial y/\partial x_i| \cdot (x_i/y) \cdot u(x_i)/x_i$. The numerical values of $u(x_i)/x_i$, $|\partial y/\partial x_i| \cdot (x_i/y)$, and $u_i(y)/y$, all dimensionless quantities, are listed in columns 3, 4, and 5, respectively. Thus, the value in column 5 is equal to the value in column 4 multiplied by the value in column 3. The input quantities are independent, or very nearly so. Hence the covariances are zero or negligible.

[k] The standard uncertainty for each undetected impurity that might reasonably be expected to be present is estimated to be equal to the estimated limit of detection for that impurity, i.e. $u(x_i)/x_i = 100\%$. $|\partial y/\partial x_i| \cdot (x_i/y)$ = {(response per Bq of impurity)/(response per Bq of U-238)}·{(Bq of impurity)/(Bq of U-238)}. Thus $u_i(y)/y$ is the relative change in y if the impurity were present with a massic activity equal to the estimated limit of detection.

REFERENCES

[1] International Organization for Standardization (ISO), *ISO Standards Handbook - Quantities and Units*, 1993. Available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, U.S.A. 1-212-642-4900.

[2] International Organization for Standardization (ISO), *Guide to the Expression of Uncertainty in Measurement*, 1993. Available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, U.S.A. 1-212-642-4900. (Listed under ISO miscellaneous publications as "ISO Guide to the Expression 1993".)

[3] B. N. Taylor and C. E. Kuyatt, *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*, NIST Technical Note 1297, 1994. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20407, U.S.A.

[4] National Council on Radiation Protection and Measurements Report No. 58, *A Handbook of Radioactivity Measurements Procedures*, Second Edition, 1985. Available from the National Council on Radiation Protection and Measurements, 7910 Woodmont Avenue, Bethesda, MD 20814 U.S.A.

[5] Evaluated Nuclear Structure Data File (ENSDF), August 1997.

200001289

Prepare a Working Dilution of U-232 from 837.3020.72
- Use density of 1M HNO_3 Diluent from prior Range
lot# 083802, JDD 4/24/09 $\rho = 1.02669$ g/ml

bal #

1) Mass of Intermediate Used JDD 4/24/09
Mass of Open Empty 1000 ml Nalgene ~~74.96~~ 74.9942 g 12
Mass of Nalgene + Std. 77.8255 g 1
Net Mass of Std. Transferred. 2.8813 g

2) ~~Dilute~~ JDD 4/24/09 Dilute to Final Mass/Vol
Mass of Diluent, Std, + Nalgene 1012.0 g 26
Net Mass of New dilution 937.0558 g

Final Activity Calc:

JDD 4/24/09

$$\left(6745.123 \frac{dpm}{g}\right)\left(2.8813\ g\right)\left(\frac{1.02669\ g/ml}{937.0558\ g}\right) = \frac{21.29}{21.29\ dpm/ml}$$

RG 8/18/09

Stnd ID: **837.3610.32**

RG 8/18/09

Description: **U-232**
Expiration: **4/29/2010** RG 8/18/09
Activity: **21.29** **dpm/mL**

2s Uncertainty: **1.06** **dpm/mL**
Ref. Date: **3/7/2007**
Ref Time: **N/A**
Prep Date: **4/24/2009** *Prep by:* **JDD**
Matrix/Comp. **1.0M NO3**
Half Life (y): **6.89E+01**

RG 8/18/09

Reverification Log		
Analysis Date	Initials	Expiration Date

RG 8/18/09

RG 8/18/09

200001290

Continued on Page

Read and Understood By

Signed 4/24/09 Date — Signed 4/24/09 Date

PROJECT 837.3020.72 U-232 Notebook No. _____
Continued From Page _____

Prepare a primary dilution of U-232, RSO #837, by diluting Contents (#74682-307) to a final volume of approx. 40 ml.

1) Prepare a 1.0 M HNO_3 solution by diluting 63 ml conc HNO_3, Fischer lot # 065460, in 1 L DI water.

2) Determine density of ~~0.5~~ 1.0 KAG 3/27/07 M HNO_3 lot # 065460 (Bal 12)

Mass of 100 ml volumetric flask: 62.4704 g
Mass of flask + acid: 165.3413 g
Net mass of acid: 102.8709 g
% 100 ml = density of 1.0 M HNO_3: 1.029 g/ml

3) Transfer contents of vial to a 40 ml VOA vial (Bal 12)

Mass of VOA vial (w/ lid): 24.7623 g
Mass of VOA vial + std: 29.9487 g
Net mass of std transferred: 5.1864 g

4) Dilute with 1.0 M HNO_3 (Bal 12)

Mass of vial + std + acid: 63.2324 g
Mass of vial from above: 24.7623 g
Net mass of primary std: 38.4701 g

5) Final Activity Calculation:

$$\frac{4375\ dps\ (60\ s/min)(5.1864\ g)}{(5.24665\ g)(38.4701\ g)} = 6745.123\ dpm/g$$

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Continued on Page
200001291

Read and Understood By

Kryptal Brown 3/28/07 Renee Gallegos 4/11/07
Signed Date Signed Date

RSO # 837
Rcvd 3/14/07 MMP

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

74682-307

U-232 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by the Department Des Applications Et De La Metrologie Des Rayonnements Ionisants (DAMRI), Paris, France, as Number 23236.

Radionuclide purity and calibration were checked with a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	U-232
ACTIVITY (Bq):	4.375 E3
HALF-LIFE:	68.9 years
CALIBRATION DATE:	March 7, 2007 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	5.0%

Impurities: γ-impurities <0.1%
U-233 <0.3%
Am-241 <0.15%

5.24665 grams 1M HNO_3 solution.

PO NUMBER 72905, Item 1

SOURCE PREPARED BY: M Dimitrova
M. D. Dimitrova, Radiochemist

Q A APPROVED: M. Mc 3-8-07

200001292

Section 9

ADDITIONAL SUPPORTING DOCUMENTATION

200001293

9

Alpha Spectroscopy

Quality Control Data

Weekly Background, Energy, and Efficiency Calibrations

200001294

Calibration Data Summary

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:51:14 AM

Lab Sample ID Spectrum Analysis Date	QC Type	Batch ID Analysis Run	Test Name	Detector Id	Eff Spectrum Bkg Spectrum Egy Spectrum	Eff Date Bkg Date Egy Date	**RESULTS** %Efficiency Bkg CPM Energy keV	FLAGS Efficiency Background Energy	**LCL** %Efficiency Bkg CPM Energy keV	**LWL** %Efficiency Bkg CPM Energy keV	**UWL** %Efficiency Bkg CPM Energy keV	**UCL** %Efficiency Bkg CPM Energy keV
1003063-1	SMP	AS100305-1	UTOT	13	C10030213	3/2/2010	31.64	Pass	30.25	30.78	32.90	33.43
Spectrum #1		AS100305-1A			B10030213	3/2/2010	0.2700	Pass	0.0000	0.0498	0.4980	0.7500
3/6/2010					C10030213	3/2/2010	5545.9	Pass	5486.2	5496.2	5576.2	5586.2
1003063-2	REP	AS100305-1	UTOT	14	C10030214	3/2/2010	30.21	Pass	29.51	30.02	32.10	32.61
Spectrum #1		AS100305-1A			B10030214	3/2/2010	0.2520	Pass	0.0000	0.0498	0.4980	0.7500
3/6/2010					C10030214	3/2/2010	5536.2	Pass	5486.5	5496.5	5576.5	5586.5
1003063-3	SMP	AS100305-1	UTOT	16	C10030216	3/2/2010	30.65	Pass	29.39	29.91	31.97	32.49
Spectrum #1		AS100305-1A			B10030216	3/2/2010	0.2280	Pass	0.0000	0.0498	0.4980	0.7500
3/6/2010					C10030216	3/2/2010	5555.8	Pass	5494.4	5504.4	5584.4	5594.4
1003063-4	SMP	AS100305-2	UTOT	32	C1003032	3/3/2010	29.64	Pass	27.99	28.48	30.44	30.93
Spectrum #1		AS100305-2A			B10030332	3/3/2010	0.3360	Pass	0.0000	0.0500	0.5000	0.7500
3/6/2010					C1003032	3/3/2010	5546.0	Pass	5488.0	5498.0	5578.0	5588.0
1003063-4	DUP	AS100305-2	UTOT	57	C10030357	3/3/2010	30.63	Pass	29.30	29.81	31.87	32.38
Spectrum #1		AS100305-2A			B10030357	3/3/2010	0.1310	Pass	0.0000	0.0500	0.5000	0.7500
3/6/2010					C10030357	3/3/2010	5542.3	Pass	5494.0	5504.0	5584.0	5594.0
1003063-5	SMP	AS100305-1	UTOT	17a	C10030217	3/2/2010	30.63	Pass	28.99	29.50	31.54	32.05
Spectrum #1		AS100305-1A			B10030217	3/2/2010	0.3830	Pass	0.0000	0.0498	0.4980	0.7500
3/6/2010					C10030217	3/2/2010	5536.2	Pass	5486.5	5496.5	5576.5	5586.5
1003063-5	DUP	AS100305-1	UTOT	18	C10030218	3/2/2010	30.38	Pass	28.65	29.15	31.17	31.67
Spectrum #1		AS100305-1A			B10030218	3/2/2010	0.4000	Pass	0.0000	0.0498	0.4980	0.7500
3/6/2010					C10030218	3/2/2010	5547.9	Pass	5496.0	5506.0	5586.0	5596.0
1003063-6	REP	AS100305-1	UTOT	22	C10030222	3/2/2010	27.21	Pass	26.66	27.12	29.00	29.46
Spectrum #1		AS100305-1A			B10030222	3/2/2010	0.3560	Pass	0.0000	0.0498	0.4980	0.7500
3/6/2010					C10030222	3/2/2010	5532.6	Pass	5494.2	5504.2	5584.2	5594.2
1003063-7	REP	AS100305-2	UTOT	58	C10030358	3/3/2010	30.96	Pass	29.55	30.06	32.14	32.66
Spectrum #1		AS100305-2A			B10030358	3/3/2010	0.1610	Pass	0.0000	0.0500	0.5000	0.7500
3/6/2010					C10030358	3/3/2010	5544.3	Pass	5496.0	5506.0	5586.0	5596.0

Data Package ID: *UT1003063-1*

Abbreviations:
Eff - Efficiency; Bkg - Background; LCL - Lower Control Limit; UWL - Upper Warning Limit
Egy - Energy; CPM - Counts per Minute; LWL - Lower Warning Limit; UCL - Upper Control Limit; CI - The Analysis Date exceeds the Calibration Date by more than 7 days.

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Calibration Data Summary

Laboratory Name: ALS Laboratory Group -- FC
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010 10:51:14 AM

Lab Sample ID Spectrum Analysis Date	QC Type	Batch ID Analysis Run	Test Name	Detector Id	Eff Spectrum Bkg Spectrum Egy Spectrum	Eff Date Bkg Date Egy Date	**RESULTS** %Efficiency Bkg CPM Energy keV	FLAGS Efficiency Background Energy	**LCL** %Efficiency Bkg CPM Energy keV	**LWL** %Efficiency Bkg CPM Energy keV	**UWL** %Efficiency Bkg CPM Energy keV	**UCL** %Efficiency Bkg CPM Energy keV
1003063-8	SMP	AS100305-1	UTOT	23	C10030223	3/2/2010	28.56	Pass	27.37	27.85	29.77	30.25
Spectrum #1		AS100305-1A			B10030223	3/2/2010	0.4130	Pass	0.0000	0.0498	0.4980	0.7500
3/6/2010					C10030223	3/2/2010	5545.9	Pass	5503.7	5513.7	5593.7	5603.7
1003063-9	SMP	AS100305-1	UTOT	24	C10030224	3/2/2010	28.18	Warning	28.06	28.56	30.52	31.02
Spectrum #1		AS100305-1A			B10030224	3/2/2010	0.3100	Pass	0.0000	0.0498	0.4980	0.7500
3/6/2010					C10030224	3/2/2010	5544.2	Pass	5491.8	5501.8	5581.8	5591.8
1003063-10	SMP	AS100305-2	UTOT	59	C10030359	3/3/2010	31.43	Pass	30.14	30.67	32.79	33.32
Spectrum #1		AS100305-2A			B10030359	3/3/2010	0.2920	Pass	0.0000	0.0500	0.5000	0.7500
3/6/2010					C10030359	3/3/2010	5536.5	Pass	5494.3	5504.3	5584.3	5594.3
1003063-11	SMP	AS100305-2	UTOT	60	C10030360	3/3/2010	30.31	Pass	28.15	28.64	30.62	31.11
Spectrum #1		AS100305-2A			B10030360	3/3/2010	0.1820	Pass	0.0000	0.0500	0.5000	0.7500
3/6/2010					C10030360	3/3/2010	5538.4	Pass	5492.0	5502.0	5582.0	5592.0
1003063-12	SMP	AS100305-1	UTOT	25	C10030325	3/3/2010	29.36	Warning	26.95	27.42	29.32	29.79
Spectrum #1		AS100305-1A			B10030325	3/3/2010	0.4040	Pass	0.0000	0.0500	0.5000	0.7500
3/6/2010					C10030325	3/3/2010	5543.9	Pass	5496.0	5506.0	5586.0	5596.0
1003063-13	SMP	AS100305-1	UTOT	26	C10030326	3/3/2010	31.01	Pass	29.40	29.92	31.98	32.50
Spectrum #1		AS100305-1A			B10030326	3/3/2010	0.4110	Pass	0.0000	0.0498	0.4998	0.7500
3/6/2010					C10030326	3/3/2010	5544.2	Pass	5496.0	5506.0	5586.0	5596.0
1003063-14	SMP	AS100305-1	UTOT	11	C10030211	3/2/2010	31.76	Pass	29.69	30.21	32.29	32.81
Spectrum #1		AS100305-1A			B10030211	3/2/2010	0.3030	Pass	0.0000	0.0498	0.4980	0.7500
3/7/2010					C10030211	3/2/2010	5536.2	Pass	5497.0	5507.0	5587.0	5597.0
1003063-15	SMP	AS100305-2	UTOT	62	C10030362	3/3/2010	29.98	Warning	27.42	27.90	29.82	30.30
Spectrum #1		AS100305-2A			B10030362	3/3/2010	0.3490	Pass	0.0000	0.0500	0.5000	0.7500
3/6/2010					C10030362	3/3/2010	5544.2	Pass	5496.2	5506.2	5586.2	5596.2
1003063-16	SMP	AS100305-1	UTOT	28	C10030328	3/3/2010	28.81	Pass	27.32	27.80	29.72	30.20
Spectrum #1		AS100305-1A			B10030328	3/3/2010	0.2860	Pass	0.0000	0.0500	0.5000	0.7500
3/6/2010					C10030328	3/3/2010	5544.2	Pass	5513.0	5523.0	5603.0	5613.0

Data Package ID: *UT1003063-1*

Abbreviations:
Eff - Efficiency; Bkg - Background; LCL - Lower Control Limit; UWL - Upper Warning Limit
Egy - Energy; CPM - Counts per Minute; LWL - Lower Warning Limit; UCL - Upper Control Limit; CI - The Analysis Date exceeds the Calibration Date by more than 7 days.

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Calibration Data Summary

Laboratory Name: **ALS Laboratory Group -- FC**
PAI Work Order: 1003063

Prep SOP: PAI 778
Analytical SOP: PAI 714

Reported on: Monday, March 08, 2010
10:51:14 AM

Lab Sample ID Spectrum Analysis Date	QC Type	Batch ID Analysis Run	Test Name	Detector Id	Eff Spectrum Bkg Spectrum Egy Spectrum	Eff Date Bkg Date Egy Date	**RESULTS** %Efficiency Bkg CPM Energy keV	FLAGS Efficiency Background Energy	**LCL** %Efficiency Bkg CPM Energy keV	**LWL** %Efficiency Bkg CPM Energy keV	**UWL** %Efficiency Bkg CPM Energy keV	**UCL** %Efficiency Bkg CPM Energy keV
1003063-16	DUP	AS100305-1	UTOT	29	C10030329	3/3/2010	28.34	Pass	27.50	27.99	29.92	30.40
Spectrum #1		AS100305-1A			B10030329	3/3/2010	0.2800	Pass	0.0000	0.0500	0.5000	0.7500
3/6/2010					C10030329	3/3/2010	5536.2	Pass	5486.0	5496.0	5576.0	5586.0
1003063-17	SMP	AS100305-2	UTOT	63	C10030363	3/3/2010	31.04	Pass	29.41	29.93	31.99	32.51
Spectrum #1		AS100305-2A			B10030363	3/3/2010	0.2640	Pass	0.0000	0.0500	0.5000	0.7500
3/6/2010					C10030363	3/3/2010	5551.9	Pass	5486.5	5506.2	5586.2	5596.2
1003063-18	SMP	AS100305-2	UTOT	64	C10030364	3/3/2010	30.31	Pass	28.41	28.90	30.90	31.40
Spectrum #1		AS100305-2A			B10030364	3/3/2010	0.2440	Pass	0.0000	0.0500	0.5000	0.7500
3/6/2010					C10030364	3/3/2010	5536.5	Pass	5496.0	5506.0	5586.0	5596.0
AS100305-1	MB	AS100305-1	UTOT	30	C10030330	3/3/2010	28.28	Pass	26.99	27.46	29.36	29.83
Spectrum #1		AS100305-1A			B10030330	3/3/2010	0.3070	Pass	0.0000	0.0500	0.5000	0.7500
3/6/2010					C10030330	3/3/2010	5546.0	Pass	5514.0	5524.0	5604.0	5614.0
AS100305-1	LCS	AS100305-1	UTOT	31	C10030331	3/3/2010	29.66	Pass	28.09	28.58	30.56	31.05
Spectrum #1		AS100305-1A			B10030331	3/3/2010	0.3290	Pass	0.0000	0.0500	0.5000	0.7500
3/6/2010					C10030331	3/3/2010	5536.2	Pass	5496.0	5506.0	5586.0	5596.0
AS100305-2	MB	AS100305-2	UTOT	9	C10030209	3/2/2010	30.99	Pass	29.48	30.00	32.06	32.58
Spectrum #1		AS100305-2A			B10030209	3/2/2010	0.3170	Pass	0.0000	0.0498	0.4980	0.7500
3/7/2010					C10030209	3/2/2010	5538.2	Pass	5496.0	5506.0	5586.0	5596.0
AS100305-2	LCS	AS100305-2	UTOT	10a	C10030210	3/2/2010	31.56	Pass	29.79	30.31	32.41	32.93
Spectrum #1		AS100305-2A			B10030210	3/2/2010	0.2510	Pass	0.0000	0.0498	0.4980	0.7500
3/7/2010					C10030210	3/2/2010	5545.9	Pass	5486.2	5496.2	5576.2	5586.2

Data Package ID: *UT1003063-1*

Abbreviations:

Eff - Efficiency	Bkg - Background	LCL - Lower Control Limit	UWL - Upper Warning Limit	
Egy - Energy	CPM - Counts per Minute	LWL - Lower Warning Limit	UCL - Upper Control Limit	CI - The Analysis Date exceeds the Calibration Date by more than 7 days.

Alpha Spec Calibration Source Re-Certification

Recalibration performed by Isotope Products Laboratories
Primary Certified Source
Source ID: 190
Planchet Label: 9
Recalibrated on: 5/7/2009
Received by ALS on: 4/6/2009

Values from certificate		
Source ID:	92MIX223027	
Total Activity:	3765	dpm
Ref. Date:	4/1/09	

Nuclide	Act (Bq)	Act (dpm)	Half-Life (yrs)	Decay Corrected
U-234:	49.73	2983.8	2.48E+05	2983.80 dpm
U-235:	1.10	65.7	7.04E+08	65.70 dpm
Am-241:	11.92	715.2	432.17	715.07 dpm
			TOTAL	3764.57 dpm

Efficiency Determination for Detector: 29

Source Serial#	PA ID	Sequential #	Count Date	Am-241 net cts	U-234 net cts	U-235 net cts	count dur (s)	Total cpm	Known dpm	Detector efficiency
92MIX223027	190	97-19-103-09	5/13/09	6938	29944	795	2100	1076.49	3764.57	28.60%

Sources 1 through 8 activity determination

Source Serial#	PA ID	Sequential #	Count Date	Am-241 net cts	U-234 net cts	U-235 net cts	count dur (s)	Detector Efficiency	Am-241 dpm	U-234 dpm	U-235 dpm	Combined dpm
92MIX2203026	182	97-19-103-01	5/20/09	12768	75759	1778	2100	28.60%	1275.74	7569.60	177.65	9022.99
92MIX2203028	183	97-19-103-02	5/20/09	14905	145935	3075	2100	28.60%	1489.26	14581.37	307.24	16377.87
92MIX2203024	184	97-19-103-03	5/20/09	67603	69736	1495	2100	28.60%	6754.68	6967.80	149.38	13871.86
92MIX2203021	185	97-19-103-04	5/20/09	21411	59324	1535	2100	28.60%	2139.32	5927.47	153.37	8220.16
92MIX2203025	186	97-19-103-05	5/20/09	94397	116030	2465	2100	28.60%	9431.85	11593.35	246.30	21271.50
92MIX2203022	187	97-19-103-06	5/20/09	73174	78212	1662	2100	28.60%	7311.32	7814.70	166.06	15292.07
92MIX2203023	188	97-19-103-07	5/20/09	42437	66293	1447	2100	28.60%	4240.17	6623.79	144.58	11008.54
92MIX2203029	189	97-19-103-08	5/20/09	32012	204687	4583	2100	28.60%	3198.54	20451.68	457.92	24108.14

Efficiency Verification

Source Serial#	PA ID	Sequential #	Count Date	Am-241 net cts	U-234 net cts	U-235 net cts	Count dur (s)	Total cpm	Known dpm	Detector efficiency	RPD	FLAG
92MIX223027	190	97-19-103-09	5/20/09	7015	29860	740	2100	1074.71	3764.57	28.55%	0.16%	PASS

Sources 1 through 8 activity re-verification

Source Serial#	PA ID	Sequential #	Combined Obseved dpm	Combined Certified dpm*	Percent Difference %	Within 5% of Certified value?
92MIX2203026	182	97-19-103-01	9022.99	8864.99	1.78%	Yes
92MIX2203028	183	97-19-103-02	16377.87	16009.10	2.30%	Yes
92MIX2203024	184	97-19-103-03	13871.86	13577.99	2.16%	Yes
92MIX2203021	185	97-19-103-04	8220.16	8185.47	0.42%	Yes
92MIX2203025	186	97-19-103-05	21271.50	21082.49	0.90%	Yes
92MIX2203022	187	97-19-103-06	15292.07	15370.55	-0.51%	Yes
92MIX2203023	188	97-19-103-07	11008.54	10774.58	2.17%	Yes
92MIX2203029	189	97-19-103-08	24108.14	23631.30	2.02%	Yes

* Certificate values decay corrected to the count date

Data from certificates

Reference Date	U-234 (Bq)	U-234 (dpm)	U-235 (Bq)	U-235 (dpm)	Am-241 (Bq)	Am-241 (dpm)
5/1/2003	124.10	7446.00	2.43	145.74	21.43	1285.80
5/1/2003	239.30	14358.00	4.20	252.00	23.55	1413.00
5/1/2003	119.40	7164.00	1.93	115.56	106.00	6360.00
4/1/2003	101.00	6060.00	1.26	75.84	34.50	2070.00
4/1/2003	203.00	12180.00	3.41	204.72	146.40	8784.00
4/1/2003	132.90	7974.00	3.17	189.96	121.30	7278.00
4/1/2003	107.10	6426.00	0.93	55.54	72.26	4335.60
5/1/2003	334.80	20088.00	6.55	393.18	53.02	3181.20

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EXP 5/20/10

RG 5/29/09

AlphaVision v5.3

Alpha-Spectroscopy Calibration Report

ORTEC
801 S. Illinois Ave.
Oak Ridge, TN 37830

Analyst: ORTEC
Detector: 29
11:40:00AM 5/13/2009

Calibration

Energy Calibration: RSO 190 (#9)
Description:

Analysis Date: 5/13/2009 11:38:46AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: A9 RSO#190
Prepared by: IPL
Description:

Certification Date: 6/1/2007 12:00:00PM

Acquisition

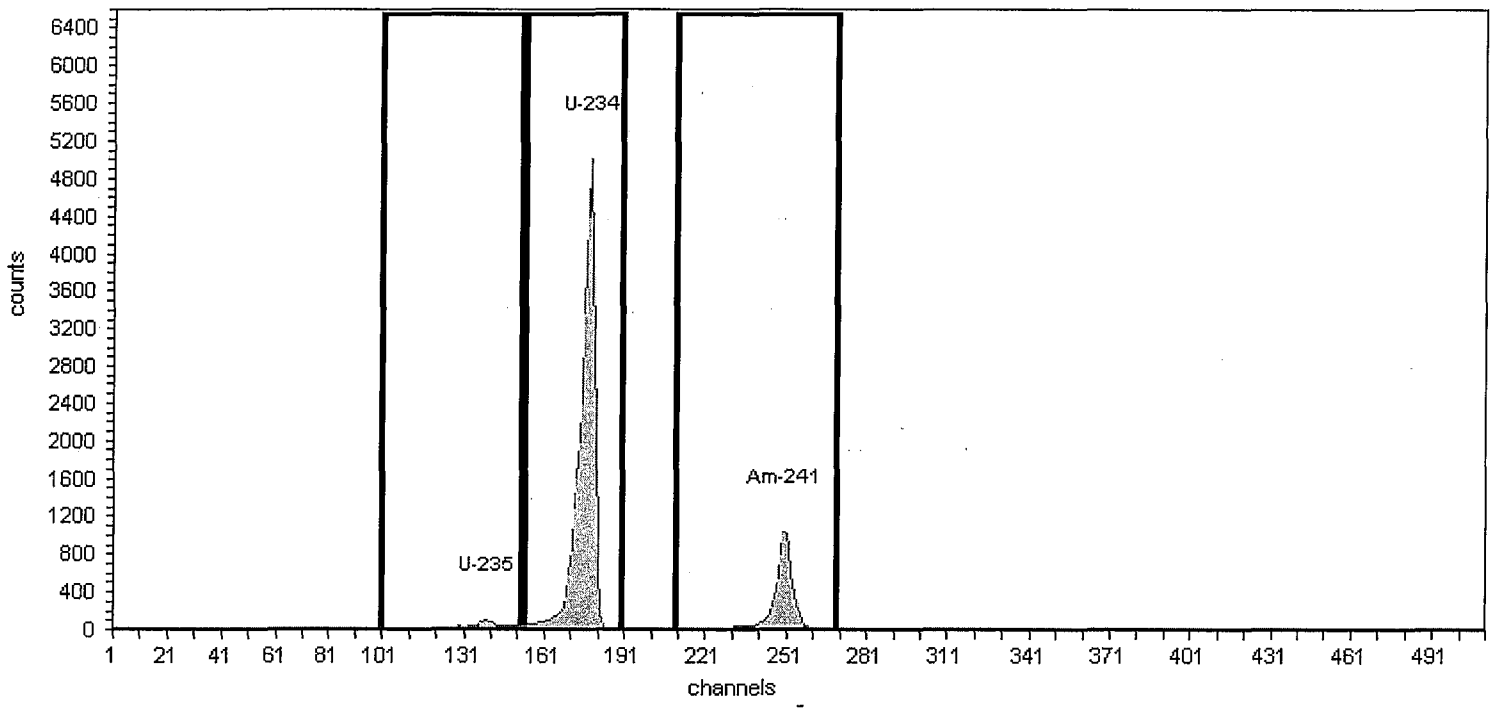
Detector: 29 , SN:
Acquisition Start Date: 5/7/2009 10:13:12AM

Live Time: 35.00 min.
Real Time: 35.01 min.

Efficiency Calibration Name: RSO 190 (#9)

Energy Calibration Equation:
Gain = 9.8224 keV / Ch
Offset = 3,029.39 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.43% +/- 0.30% TPU(2 sigma)



Method: Interactive ROI
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	139	4.40	100	152	795.00	22.71
U-234	178	4.78	153	190	29,944.00	855.54
Am-241	250	5.49	210	270	6,938.00	198.23

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AlphaVision v5.3 **Alpha-Spectroscopy Calibration Report**

ORTEC
801 S. Illinois Ave.
Oak Ridge, TN 37830
7:46:29AM 5/20/2009

Analyst: ORTEC
Detector: 29

Calibration

Energy Calibration: RSO 182 (#1)
Description:

Analysis Date: 5/20/2009 7:46:17AM
Calibration Type: Energy

Source Info

Certificate ID: A1 RSO#182
Prepared by: IPL
Description:

Certification Date: 5/1/2003 12:00:45PM

Acquisition

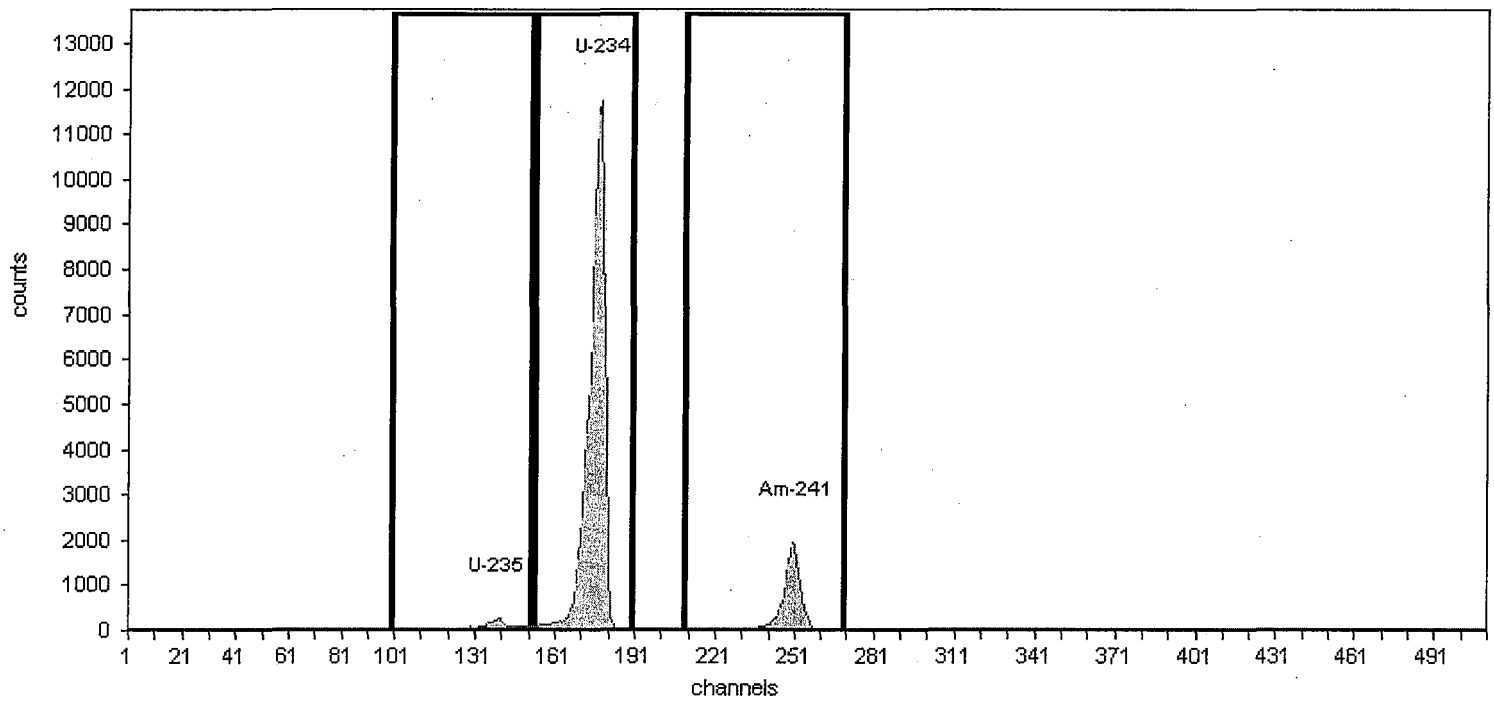
Detector: 29 , SN:
Acquisition Start Date: 5/7/2009 11:38:55AM

Live Time: 35.00 min.
Real Time: 35.03 min.

Efficiency Calibration Name: RSO 182 (#1)

Energy Calibration Equation:
Gain = 9.7289 keV / Ch
Offset = 3,043.84 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 29.06% +/- 0.20% TPU(2 sigma)



Method: Interactive ROI
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	139	4.40	100	152	1,778.00	50.80
U-234	178	4.78	153	190	75,759.00	2,164.54
Am-241	251	5.49	210	270	12,768.00	364.80

200001300

200001130

AlphaVision v5.3 **Alpha-Spectroscopy Calibration Report**

ORTEC
801 S. Illinois Ave.
Oak Ridge, TN 37830

Analyst: ORTEC
Detector: 29
7:47:07AM 5/20/2009

Calibration

Energy Calibration: RSO 183 (#2)
Description:

Analysis Date: 5/20/2009 7:46:53AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: A2 RSO#183
Prepared by: IPL
Description:

Certification Date: 5/1/2003 12:00:00PM

Acquisition

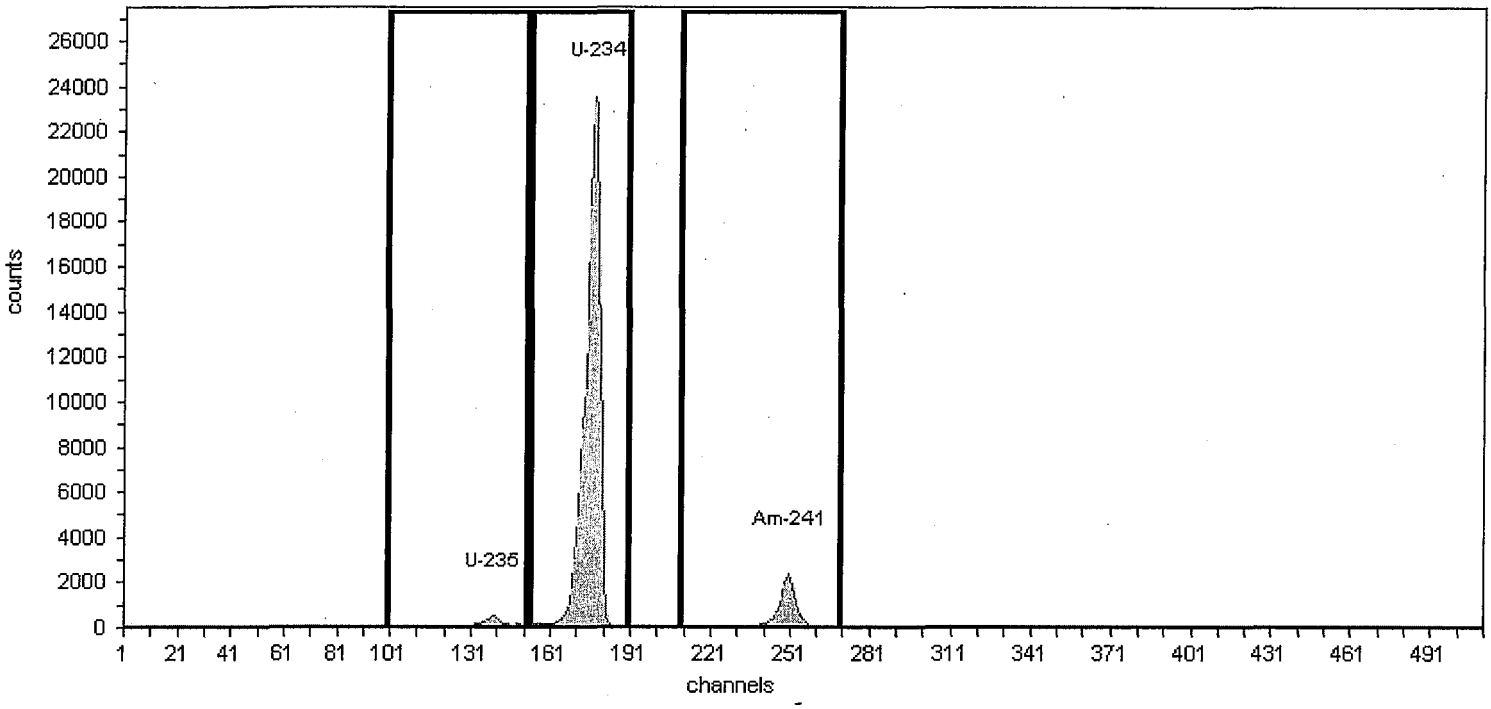
Detector: 29 , SN:
Acquisition Start Date: 5/7/2009 12:45:03PM

Live Time: 35.00 min.
Real Time: 35.05 min.

Efficiency Calibration Name: RSO 183 (#2)

Energy Calibration Equation:
Gain = 9.8224 keV / Ch
Offset = 3,029.39 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 29.21% +/- 0.15% TPU(2 sigma)



Method: Interactive ROI
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	139	4.40	100	152	3,075.00	87.86
U-234	178	4.78	153	190	145,935.00	4,169.57
Am-241	250	5.49	210	270	14,905.00	425.86

200001301

AlphaVision v5.3 — Alpha-Spectroscopy Calibration Report

ORTEC
801 S. Illinois Ave.
Oak Ridge, TN 37830

Analyst: ORTEC
Detector: 29
7:47:51AM 5/20/2009

Calibration

Energy Calibration: RSO 184 (#3)
Description:

Analysis Date: 5/20/2009 7:47:30AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: A3 RSO#184
Prepared by: IPL
Description:

Certification Date: 5/1/2003 12:00:00PM

Acquisition

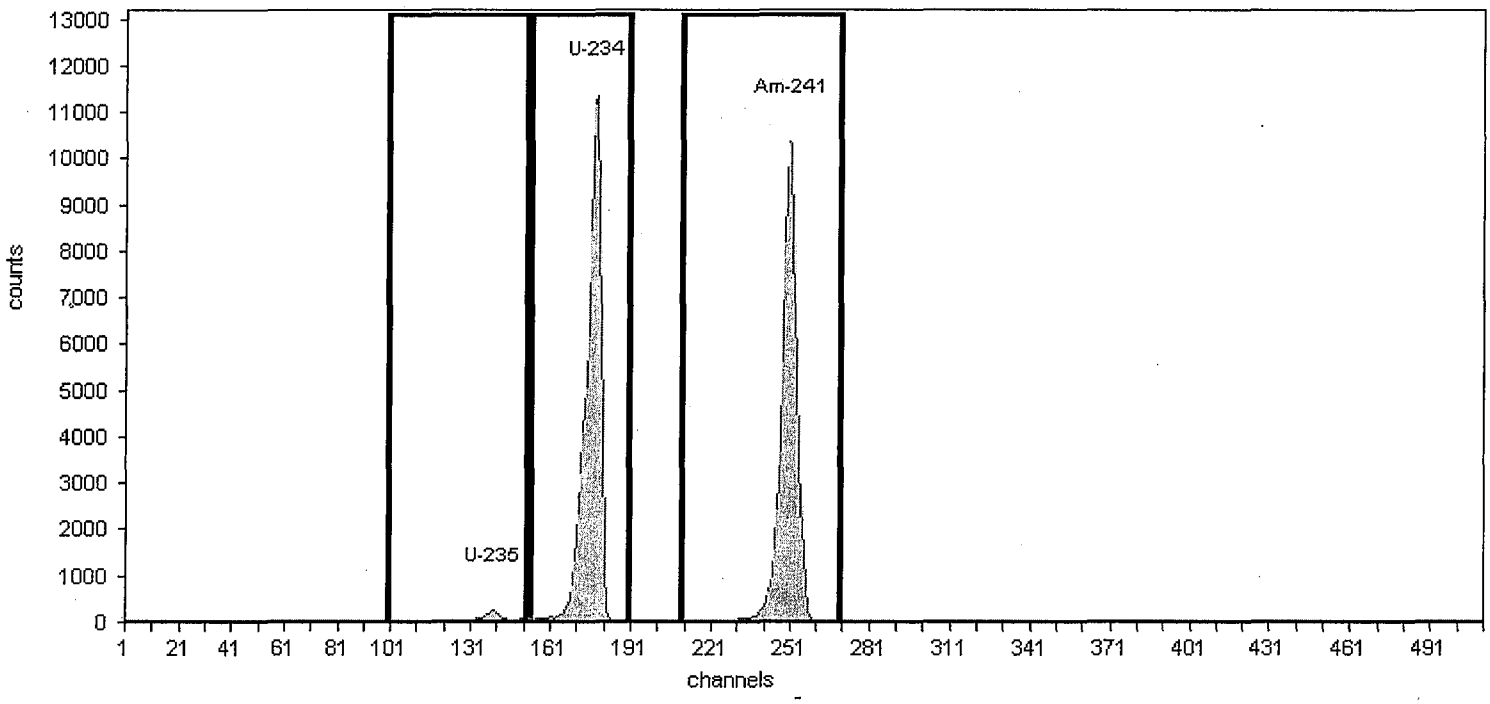
Detector: 29 , SN:
Acquisition Start Date: 5/7/2009 1:21:42PM

Live Time: 35.00 min.
Real Time: 35.04 min.

Efficiency Calibration Name: RSO 184 (#3)

Energy Calibration Equation:
Gain = 9.8047 keV / Ch
Offset = 3,036.00 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 29.11% +/- 0.16% TPU(2 sigma)



Method: Interactive ROI
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	139	4.40	100	152	1,495.00	42.71
U-234	177	4.78	153	190	69,763.00	1,993.23
Am-241	250	5.49	210	270	67,603.00	1,931.51

200001302

200001302

AlphaVision v5.3 **Alpha-Spectroscopy Calibration Report**

ORTEC
801 S. Illinois Ave.
Oak Ridge, TN 37830

Analyst: ORTEC
Detector: 29
7:48:18AM 5/20/2009

Calibration

Energy Calibration: RSO 185 (#4)
Description:

Analysis Date: 5/20/2009 7:48:08AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: A4 RSO#185
Prepared by: IPL
Description:

Certification Date: 4/1/2003 12:00:00PM

Acquisition

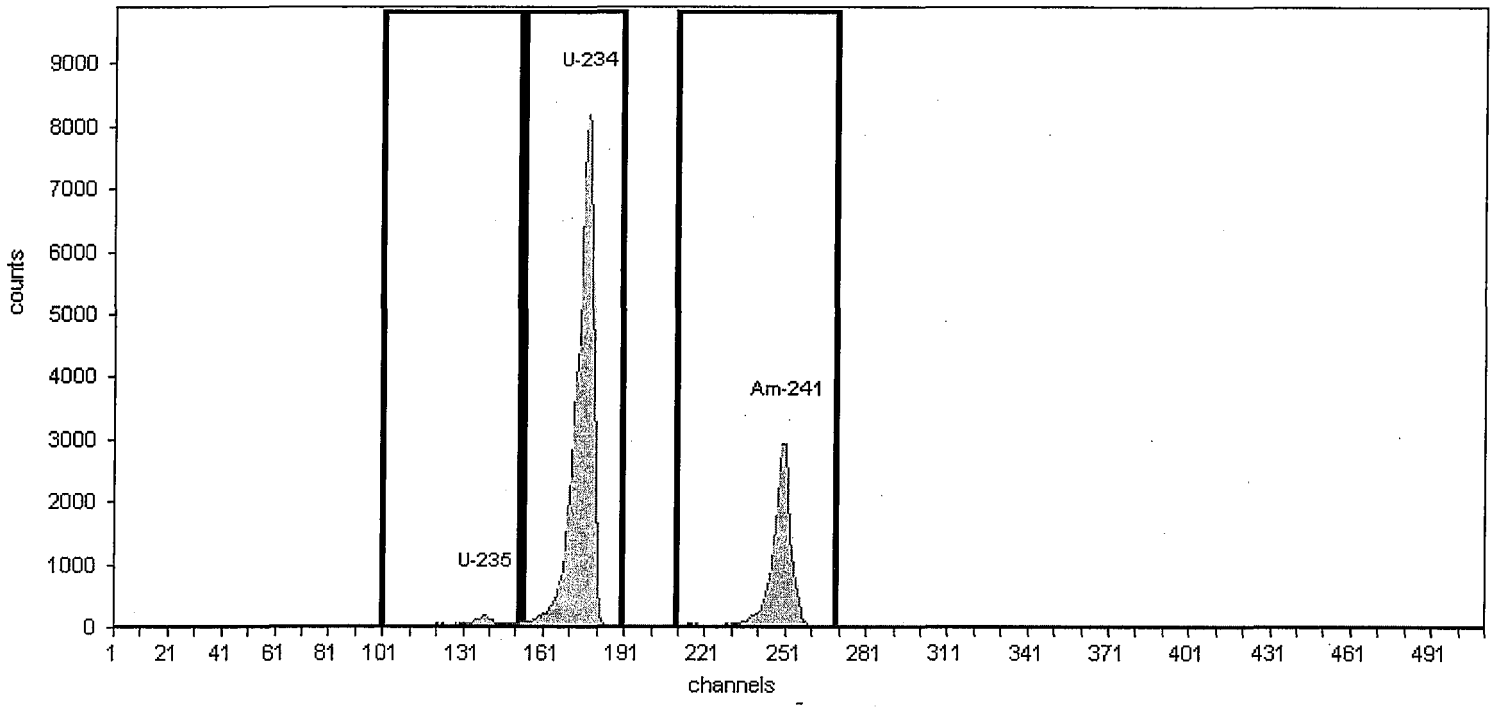
Detector: 29 , SN:
Acquisition Start Date: 5/7/2009 2:33:20PM

Live Time: 35.00 min.
Real Time: 35.03 min.

Efficiency Calibration Name: RSO 185 (#4)

Energy Calibration Equation:
Gain = 9.7108 keV / Ch
Offset = 3,050.49 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.43% +/- 0.20% TPU(2 sigma)



Method: Interactive ROI
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	139	4.40	100	152	1,535.00	43.86
U-234	177	4.78	153	190	59,324.00	1,694.97
Am-241	251	5.49	210	270	21,411.00	611.74

200001303

AlphaVision v5.3 — Alpha-Spectroscopy Calibration Report

ORTEC
801 S. Illinois Ave.
Oak Ridge, TN 37830

Analyst: ORTEC
Detector: 29
7:48:44AM 5/20/2009

Calibration

Energy Calibration: RSO 186 (#5)
Description:

Analysis Date: 5/20/2009 7:48:37AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: A5 RSO#186
Prepared by: IPL
Description:

Certification Date: 4/1/2003 12:00:00PM

Acquisition

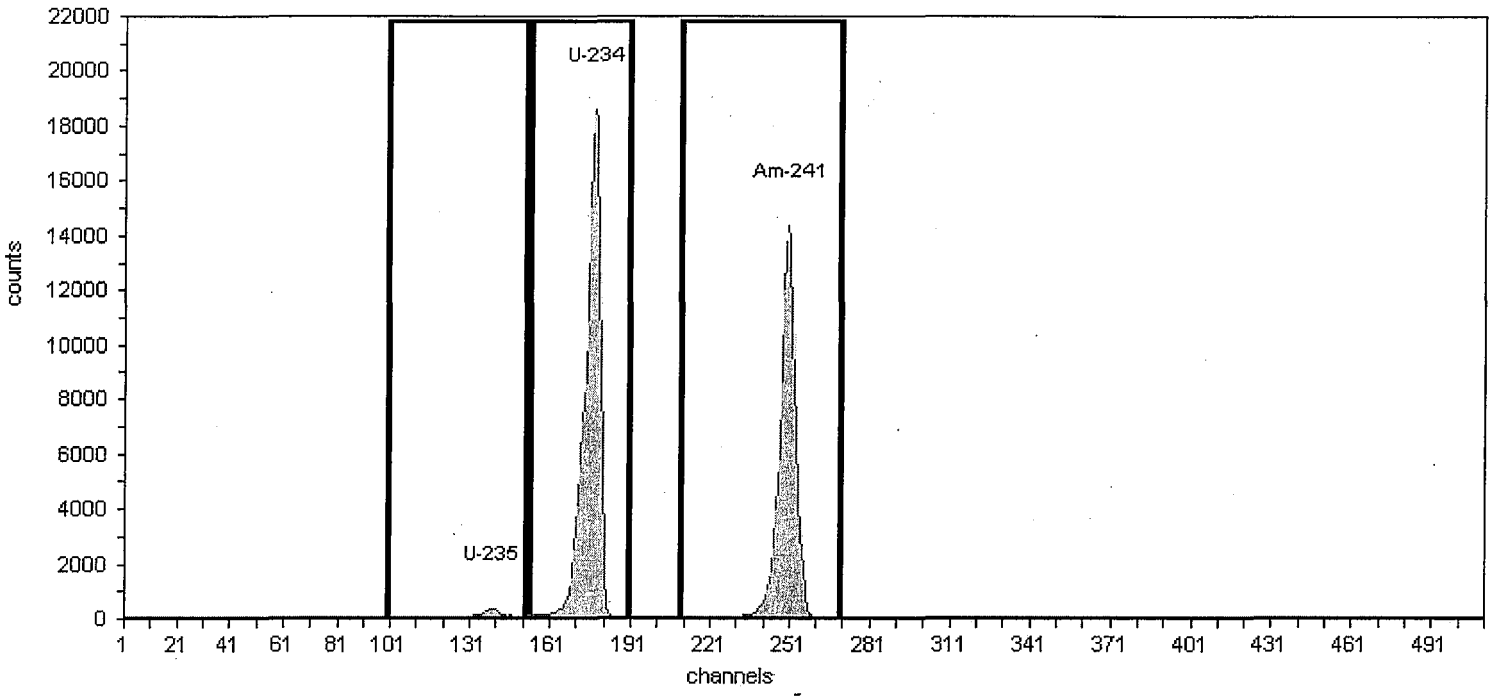
Detector: 29 , SN:
Acquisition Start Date: 5/7/2009 3:40:33PM

Live Time: 35.00 min.
Real Time: 35.06 min.

Efficiency Calibration Name: RSO 186 (#5)

Energy Calibration Equation:
Gain = 9.8047 keV / Ch
Offset = 3,036.00 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.71% +/- 0.13% TPU(2 sigma)



Method: Interactive ROI
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	139	4.40	100	152	2,465.00	70.43
U-234	177	4.78	153	190	116,030.00	3,315.14
Am-241	250	5.49	210	270	94,397.00	2,697.06

200001304

200001304

AlphaVision v5.3 **Alpha-Spectroscopy Calibration Report**

ORTEC
801 S. Illinois Ave.
Oak Ridge, TN 37830

Analyst: ORTEC
Detector: 29
7:49:23AM 5/20/2009

Calibration

Energy Calibration: RSO 187 (#6)
Description:

Analysis Date: 5/20/2009 7:49:17AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: A6 RSO#187
Prepared by: IPL
Description:

Certification Date: 4/1/2003 12:00:00PM

Acquisition

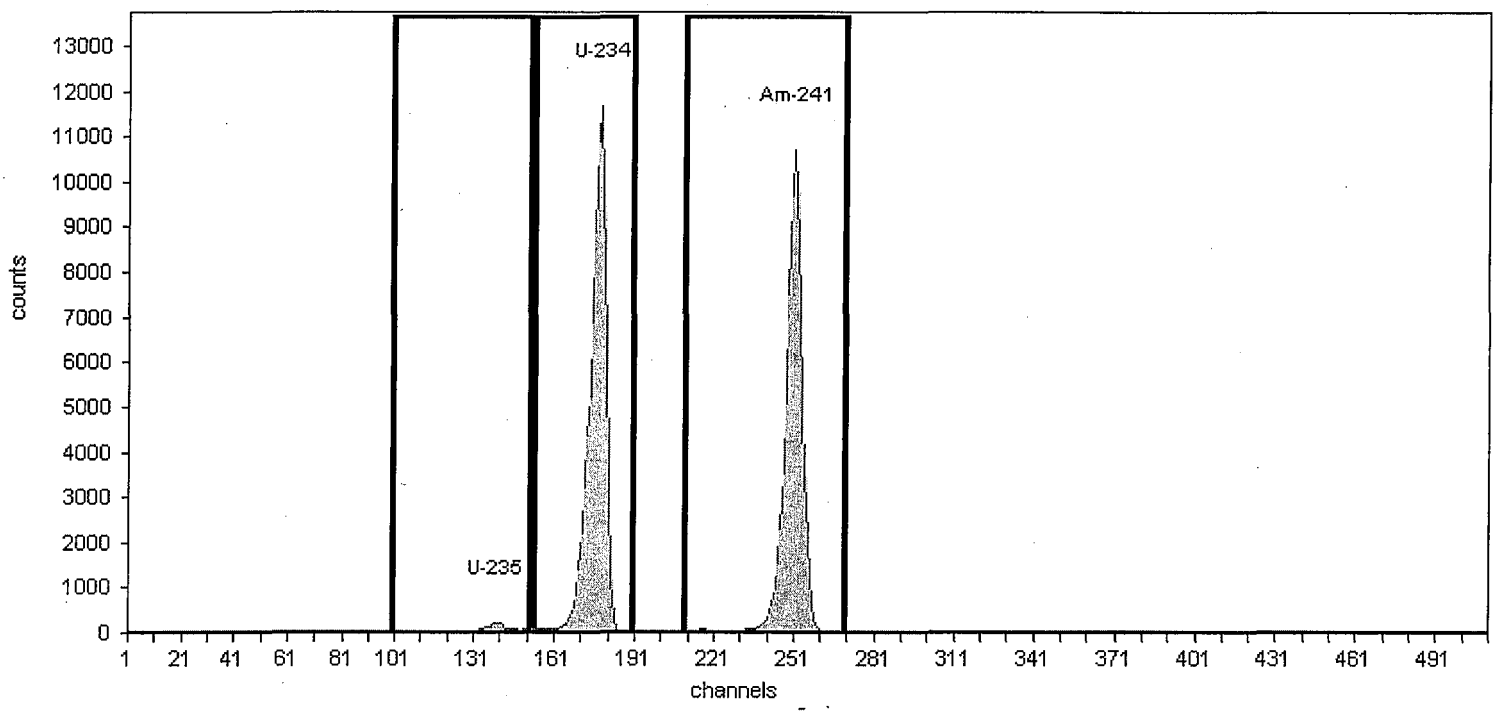
Detector: 29 , SN:
Acquisition Start Date: 5/8/2009 8:19:53AM

Live Time: 35.00 min.
Real Time: 35.05 min.

Efficiency Calibration Name: RSO 187 (#6)

Energy Calibration Equation:
Gain = 9.7289 keV / Ch
Offset = 3,043.84 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.47% +/- 0.15% TPU(2 sigma)



Method: Interactive ROI
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	139	4.40	100	152	1,662.00	47.49
U-234	178	4.78	153	190	78,212.00	2,234.63
Am-241	251	5.49	210	270	73,174.00	2090.69

200001305

AlphaVision v5.3 **Alpha-Spectroscopy Calibration Report**

ORTEC
801 S. Illinois Ave.
Oak Ridge, TN 37830

Analyst: ORTEC
Detector: 29

7:50:10AM 5/20/2009

Calibration

Energy Calibration: RSO 188 (#7)
Description:

Analysis Date: 5/20/2009 7:49:57AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: A7 RSO#188
Prepared by: IPL
Description:

Certification Date: 4/1/2003 12:00:00PM

Acquisition

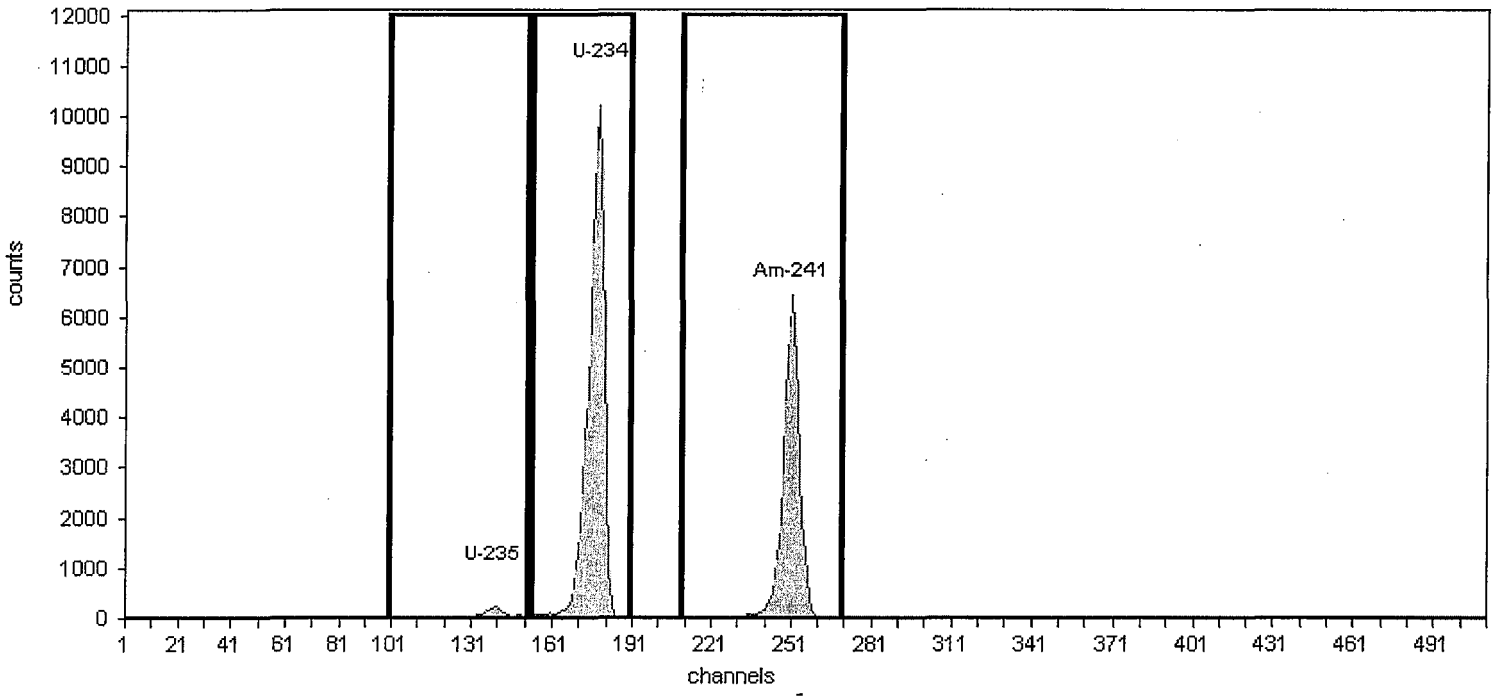
Detector: 29 , SN:
Acquisition Start Date: 5/8/2009 9:18:26AM

Live Time: 35.00 min.
Real Time: 35.03 min.

Efficiency Calibration Name: RSO 188 (#7)

Energy Calibration Equation:
Gain = 9.8224 keV / Ch
Offset = 3,029.39 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.98% +/- 0.18% TPU(2 sigma)



Method: Interactive ROI
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	139	4.40	100	152	1,447.00	41.34
U-234	178	4.78	153	190	66,293.00	1,894.09
Am-241	250	5.49	210	270	42,437.00	1212.49

200001306

AlphaVision v5.3 **Alpha-Spectroscopy Calibration Report**

ORTEC
801 S. Illinois Ave.
Oak Ridge, TN 37830

Analyst: ORTEC
Detector: 29
7:50:37AM 5/20/2009

Calibration

Energy Calibration: RSO 189 (#8)
Description:

Analysis Date: 5/20/2009 7:50:29AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: A8 RSO#189
Prepared by: IPL
Description:

Certification Date: 4/1/2003 12:00:00PM

Acquisition

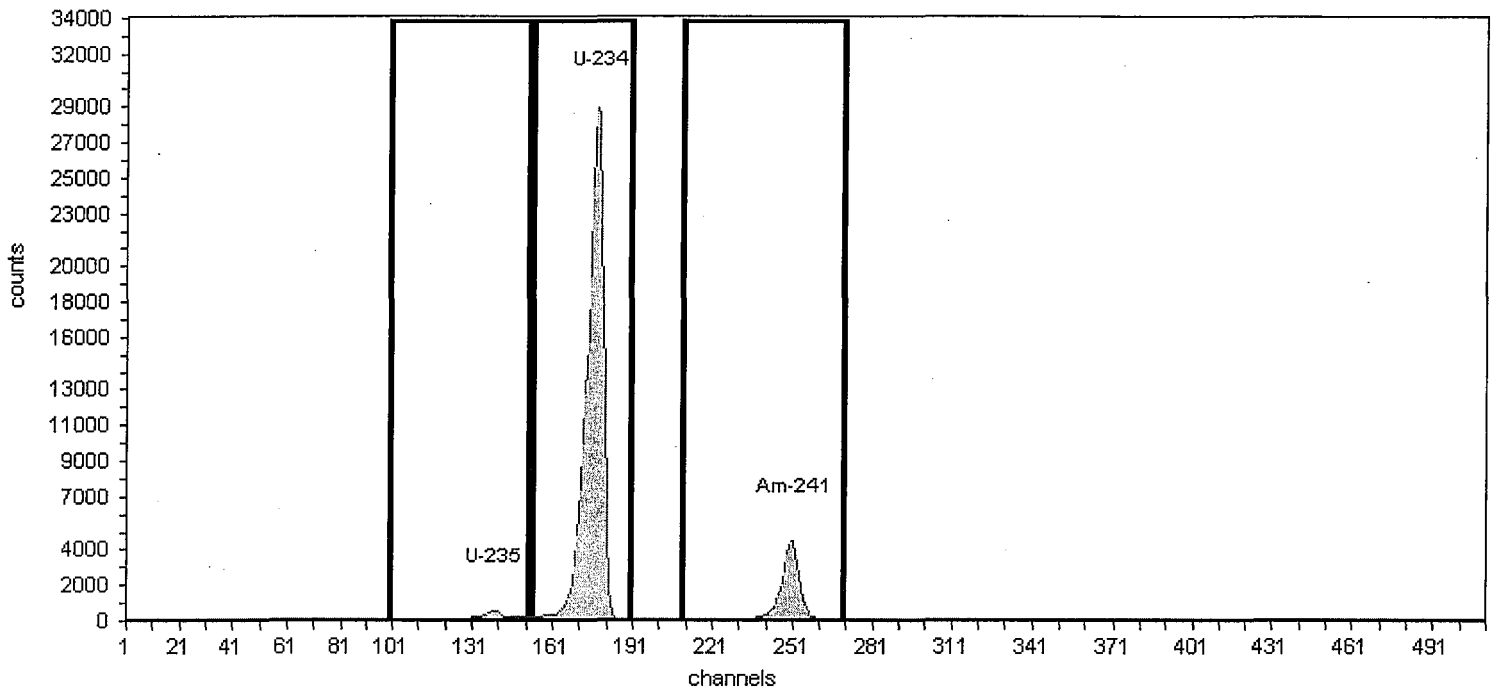
Detector: 29 , SN:
Acquisition Start Date: 5/8/2009 10:02:56AM

Live Time: 35.00 min.
Real Time: 35.07 min.

Efficiency Calibration Name: RSO 189 (#8)

Energy Calibration Equation:
Gain = 9.7289 keV / Ch
Offset = 3,043.84 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 29.17% +/- 0.12% TPU(2 sigma)



Method: Interactive ROI
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	139	4.40	100	152	4,583.00	130.94
U-234	178	4.78	153	190	204,687.00	5,848.20
Am-241	251	5.49	210	270	32,012.00	914.63

200001307

AlphaVision v5.3 **Alpha-Spectroscopy Calibration Report**

ORTEC
801 S. Illinois Ave.
Oak Ridge, TN 37830

Analyst: ORTEC
Detector: 29
7:51:33AM 5/20/2009

Calibration

Energy Calibration: RSO 190 (#9A)
Description:

Analysis Date: 5/20/2009 7:51:21AM
Calibration Type: Energy And Efficiency

Source Info

Certificate ID: A9 RSO#190
Prepared by: IPL
Description:

Certification Date: 6/1/2007 12:00:00PM

Acquisition

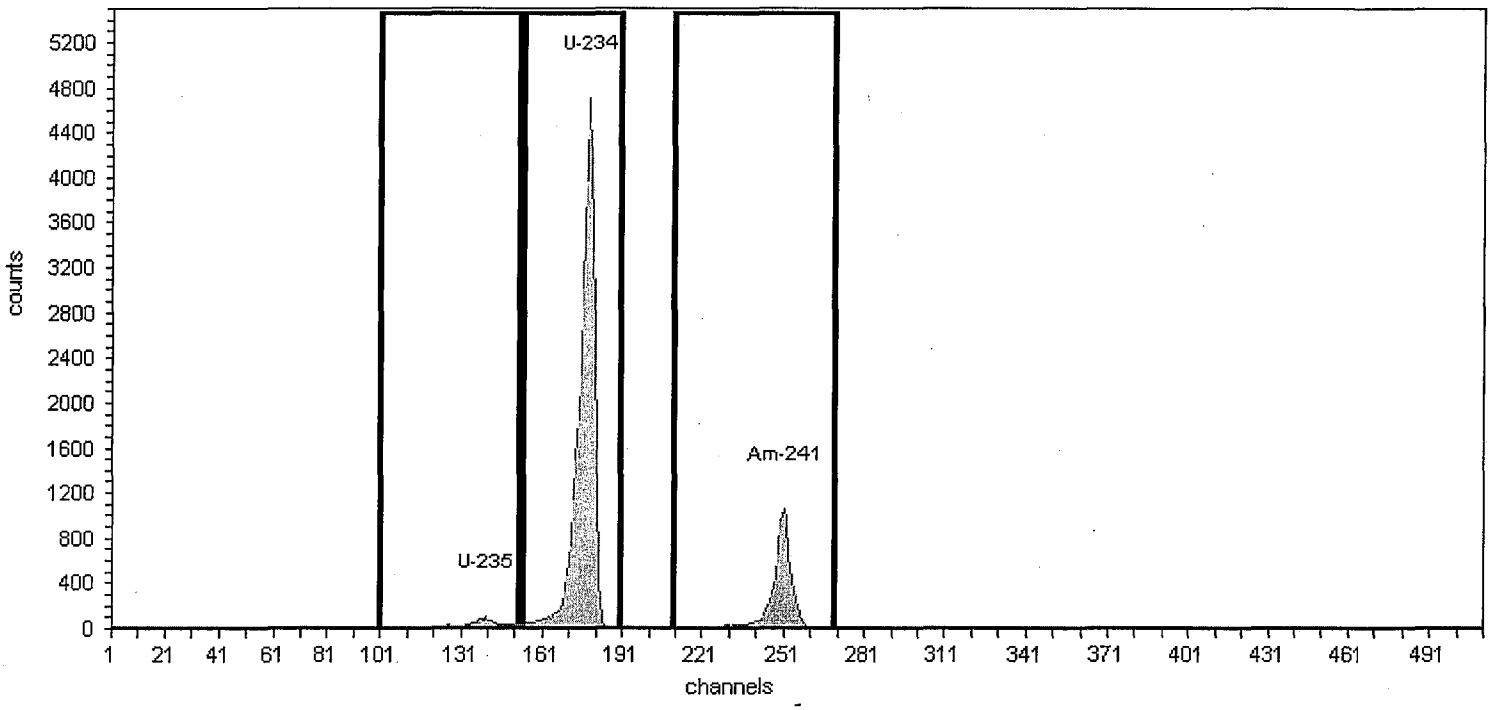
Detector: 29 , SN:
Acquisition Start Date: 5/8/2009 10:45:06AM

Live Time: 35.00 min.
Real Time: 35.01 min.

Efficiency Calibration Name: RSO 190 (#9A)

Energy Calibration Equation:
Gain = 9.8047 keV / Ch
Offset = 3,026.20 keV
Quadratic = 0.0000 keV / Ch^2

Efficiency: 28.41% +/- 0.30% TPU(2 sigma)



Method: Interactive ROI
Algorithm: Linear

Initial Calibration: No
Shelf: 1

Nuclide Activity Summary

Nuclide	Peak Channel	Peak Energy MeV	ROI Start Channel	ROI End Channel	Gross Counts	Net Count Rate (cpm)
U-235	140	4.40	100	152	740.00	21.14
U-234	178	4.78	153	190	29,860.00	853.14
Am-241	251	5.49	210	270	7,015.00	200.43

200001308

Isotope Products Laboratories
An Eckert & Ziegler Company

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010
Fax 661•257•8303

α1 reverified 5/7/09 expires 5/7/10

PAT 187 recalibrate 4-15-03

CERTIFICATE OF CALIBRATION
MIXED ALPHA STANDARD SOURCE

Radionuclide A:	U-234	**Customer:**	PARAGON ANALYTICS, INC.
Radionuclide B:	U-235	**P.O. No.:**	EW040203/R2193
Radionuclide C:	Am-241	**Catalog No.:**	MISC-STD
Half Life (U-234):	(2.454 ± 0.006)E+05 years	**Reference Date:**	1-May-03 12:00 PST
Half Life (U-235):	(7.037 ± 0.011)E+08 years	**Source No.:**	92MIX2203026
Half Life (Am-241):	432.17 ± 0.66 years		

Contained Radioactivity:

U-234:	3.354 nCi	(124.1 Bq)	Am-241:	0.5793 nCi	(21.43 Bq)
U-235:	0.06566 nCi	(2.429 Bq)	Total Activity:	3.999 nCi	(148.0 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Mar 1998.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 0.7%
B. Type B (systematic) uncertainty:	± 3.0%
C. Uncertainty in aliquot weighing:	± 0.0%
D. Total uncertainty at the 99% confidence level:	± 3.1%

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 4483 α/min in 2π on 11 Apr 03.

Daniel James Van Dalsem
Quality Control

15-Apr-03
Date Signed

IPL Ref. No.: 987-7
200001309

200001309

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Valencia, California 91355

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α2 reverified 5/7/09 expires 5/7/10

PAI 183 recalibrated 4-15-03

CERTIFICATE OF CALIBRATION
MIXED ALPHA STANDARD SOURCE

Radionuclide A:	U-234	**Customer:**	PARAGON ANALYTICS, INC.
Radionuclide B:	U-235	**P.O. No.:**	EW040203/R2193
Radionuclide C:	Am-241	**Catalog No.:**	MISC-STD
Half Life (U-234):	(2.454 ± 0.006)E+05 years	**Reference Date:**	1-May-03 12:00 PST
Half Life (U-235):	(7.037 ± 0.011)E+08 years	**Source No.:**	92MIX2203028
Half Life (Am-241):	432.17 ± 0.66 years		

Contained Radioactivity:

U-234:	6.467	nCi	(239.3 Bq)	Am-241:	0.6366	nCi	(23.55 Bq)
U-235:	0.1135	nCi	(4.200 Bq)	Total Activity:	7.217	nCi	(267.1 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Aug 1992.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 0.7%
B. Type B (systematic) uncertainty:	± 3.0%
C. Uncertainty in aliquot weighing:	± 0.0%
D. Total uncertainty at the 99% confidence level:	± 3.1%

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 8091 α/min in 2π on 11 Apr 03.

Daniel James Van Dalsem
Quality Control

15-Apr-03
Date Signed

IPL Ref. No.: 987-7
200001310

200001310

reverified 5/7/09
expires 5/7/10

α3

PAT I.D 184
recalibrated 4-1503

Isotope Products Laboratories
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Valencia, California 91355

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Fax 661•257•8303

CERTIFICATE OF CALIBRATION
MIXED ALPHA STANDARD SOURCE

Radionuclide A:	U-234	**Customer:**	PARAGON ANALYTICS, INC.
Radionuclide B:	U-235	**P.O. No.:**	EW040203/R2193
Radionuclide C:	Am-241	**Catalog No.:**	MISC-STD
Half Life (U-234):	(2.454 ± 0.006)E+05 years	**Reference Date:**	1-May-03 12:00 PST
Half Life (U-235):	(7.037 ± 0.011)E+08 years	**Source No.:**	92MIX2203024
Half Life (Am-241):	432.17 ± 0.66 years		

Contained Radioactivity:

U-234:	3.227	nCi	(119.4 Bq)	Am-241:	2.866	nCi	(106.0 Bq)
U-235:	0.05205	nCi	(1.926 Bq)	Total Activity:	6.145	nCi	(227.3 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Aug 1992.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 0.6%
B. Type B (systematic) uncertainty:	± 3.0%
C. Uncertainty in aliquot weighing:	± 0.0%
D. Total uncertainty at the 99% confidence level:	± 3.1%

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 6889 α/min in 2π on 11 Apr 03.

Daniel James Van Dalsem
Quality Control

15-Apr-03
Date Signed

IPL Ref. No.: 987-7
200001311

200001311

reverified 5/7/09
1 of 4
expires 5/7/10

Isotope Products Laboratories
An Eckert & Ziegler Company

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PAI ID 00185
recd from recalibrator
3-28-03

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOURCE

Radionuclide A:	U-234	**Customer:**	PARAGON ANALYTICS, INC.
Radionuclide B:	U-235	**P.O. No.:**	EW030603/R2155
Radionuclide C:	Am-241	**Catalog No.:**	MISC-STD
Half Life (U-234):	(2.454 ± 0.006)E+05 years	**Reference Date:**	1-Apr-03 12:00 PST
Half Life (U-235):	(7.037 ± 0.011)E+08 years	**Source No.:**	92MIX2203021
Half Life (Am-241):	432.17 ± 0.66 years		

Contained Radioactivity:

U-234:	2.731	nCi	(101.0 Bq)	Am-241:	0.9325	nCi	(34.50 Bq)
U-235:	0.03416	nCi	(1.264 Bq)	Total Activity:	3.698	nCi	(136.8 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Aug 1992.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 0.8%
B. Type B (systematic) uncertainty:	± 3.1%
C. Uncertainty in aliquot weighing:	± 0.0%
D. Total uncertainty at the 99% confidence level:	± 3.2%

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 4145 α/min in 2π on 18 Mar 03.

Daniel James Van Dalsem
Quality Control

19-Mar-03
Date Signed

IPL Ref. No.: 987-2
200001312

200001312

Isotope Products Laboratories
An Eckert & Ziegler Company

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Tel 661•309•1010
Fax 661•257•8303

αS reverified 5/7/09 expires 5/7/10

PAI ID 00186
recalibration received ~~186~~ 3-28-03

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOURCE

Radionuclide A:	U-234	**Customer:**	PARAGON ANALYTICS, INC.
Radionuclide B:	U-235	**P.O. No.:**	EW030603/R2155
Radionuclide C:	Am-241	**Catalog No.:**	MISC-STD
Half Life (U-234):	(2.454 ± 0.006)E+05 years	**Reference Date:**	1-Apr-03 12:00 PST
Half Life (U-235):	(7.037 ± 0.011)E+08 years	**Source No.:**	92MIX2203025
Half Life (Am-241):	432.17 ± 0.66 years		

Contained Radioactivity:

U-234:	5.486	nCi	(203.0 Bq)	Am-241:	3.958	nCi	(146.4 Bq)
U-235:	0.09221	nCi	(3.412 Bq)	Total Activity:	9.536	nCi	(352.8 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Aug 1992.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 0.8%
B. Type B (systematic) uncertainty:	± 3.1%
C. Uncertainty in aliquot weighing:	± 0.0%
D. Total uncertainty at the 99% confidence level:	± 3.2%

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 10690 α/min in 2π on 18 Mar 03.

Daniel James Van Dalsem
Quality Control

19-Mar-03
Date Signed

IPL Ref. No.: 987-2
200001313

200001313

Isotope Products Laboratories
An Eckert & Ziegler Company

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010
Fax 661•257•8303

α6 reverified 5/8/09 expires 5/7/10

PAID 00187 rec'd from recalibration 3-28-03

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOURCE

Radionuclide A:	U-234	**Customer:**	PARAGON ANALYTICS, INC.
Radionuclide B:	U-235	**P.O. No.:**	EW030603/R2155
Radionuclide C:	Am-241	**Catalog No.:**	MISC-STD
Half Life (U-234):	(2.454 ± 0.006)E+05 years	**Reference Date:**	1-Apr-03 12:00 PST
Half Life (U-235):	(7.037 ± 0.011)E+08 years	**Source No.:**	92MIX2203022
Half Life (Am-241):	432.17 ± 0.66 years		

Contained Radioactivity:

U-234:	3.592	nCi	(132.9 Bq)	Am-241:	3.279	nCi	(121.3 Bq)
U-235:	0.08556	nCi	(3.166 Bq)	Total Activity:	6.957	nCi	(257.4 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Aug 1992.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 0.8%
B. Type B (systematic) uncertainty:	± 3.1%
C. Uncertainty in aliquot weighing:	± 0.0%
D. Total uncertainty at the 99% confidence level:	± 3.2%

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 7799 α/min in 2π on 18 Mar 03.

Daniel James Van Dalsem
Quality Control

19-Mar-03
Date Signed

IPL Ref. No.: 987-2

200001314

200001314

reverified 5/8/09
α 7 expires ~~5/7/09~~ 5/7/10 RG

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PAID 188
rec'd for recalibration 3-28-03

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOURCE

Radionuclide A:	U-234	**Customer:**	PARAGON ANALYTICS, INC.
Radionuclide B:	U-235	**P.O. No.:**	EW030603/R2155
Radionuclide C:	Am-241	**Catalog No.:**	MISC-STD
Half Life (U-234):	(2.454 ± 0.006)E+05 years	**Reference Date:**	1-Apr-03 12:00 PST
Half Life (U-235):	(7.037 ± 0.011)E+08 years	**Source No.:**	92MIX2203023
Half Life (Am-241):	432.17 ± 0.66 years		

Contained Radioactivity:

U-234:	2.895	nCi	(107.1 Bq)	Am-241:	1.953	nCi	(72.26 Bq)
U-235:	0.02502	nCi	(0.9257 Bq)	Total Activity:	4.873	nCi	(180.3 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Aug 1992.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 0.8%
B. Type B (systematic) uncertainty:	± 3.1%
C. Uncertainty in aliquot weighing:	± 0.0%
D. Total uncertainty at the 99% confidence level:	± 3.2%

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 5463 α/min in 2π on 18 Mar 03.

Daniel James Van Dalsem
Quality Control

19-Mar-03
Date Signed

IPL Ref. No.: 987-2
200001315

200001315

reverified 5/8/09
α 8 expires ~~5/1/09~~ 5/1/10 2nd

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PAI ID 189
recd 4-2-03
recalibrated 4-15-03

CERTIFICATE OF CALIBRATION
MIXED ALPHA STANDARD SOURCE

Radionuclide A:	U-234	**Customer:**	PARAGON ANALYTICS, INC.
Radionuclide B:	U-235	**P.O. No.:**	EW040203/R2193
Radionuclide C:	Am-241	**Catalog No.:**	MISC-STD
Half Life (U-234):	(2.454 ± 0.006)E+05 years	**Reference Date:**	1-May-03 12:00 PST
Half Life (U-235):	(7.037 ± 0.011)E+08 years	**Source No.:**	92MIX2203029
Half Life (Am-241):	432.17 ± 0.66 years		

Contained Radioactivity:

U-234:	9.048	nCi	(334.8 Bq)	Am-241:	1.433	nCi	(53.02 Bq)
U-235:	0.1771	nCi	(6.553 Bq)	Total Activity:	10.66	nCi	(394.4 Bq)

Physical description:

A. Capsule type:	Disk (22 mm OD X 0.79 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxides
C. Active Diameter:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in Mar 1998.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 0.5%
B. Type B (systematic) uncertainty:	± 3.0%
C. Uncertainty in aliquot weighing:	± 0.0%
D. Total uncertainty at the 99% confidence level:	± 3.0%

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 11950 α/min in 2π on 11 Apr 03.

Daniel James Van Dalsem
Quality Control

15-Apr-03
Date Signed

IPL Ref. No.: 987-7
200001316

200001316

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α9
RSO #190
Rec'd 4/16/09 EMF

CERTIFICATE OF CALIBRATION
MIXED ALPHA STANDARD SOURCE

Radionuclide:	U-234	**Customer:**	PARAGON ANALYTICS, INC.
Radionuclide:	U-235	**P.O. No.:**	70359/R4367
Radionuclide:	Am-241	**Catalog No.:**	MISC-STD
Half-life (U-234):	(2.454 ± 0.006)E+05 years	**Reference Date:**	1-Apr-09 12:00 PST
Half-life (U-235):	(7.037 ± 0.011)E+08 years	**Source No.:**	92MIX223027
Half-life (Am-241):	432.17 ± 0.66 years		

Contained Radioactivity:

U-234:	1.344	**nCi,**	49.73	**Bq**	Am-241:	0.3221	**nCi,**	11.92	**Bq**
U-235:	0.02959	**nCi,**	1.095	**Bq**	Total Activity:	1.696	**nCi,**	62.75	**Bq**

Physical Description:

A. Capsule type:	Disk (47 mm OD x 0.76 mm THK)
B. Nature of active deposit:	Electrodeposited and diffusion bonded oxide
C. Active diameter/volume:	19 mm
D. Backing:	Stainless steel
E. Cover:	None

Radioimpurities: Not determined

Method of Calibration:

This source was assayed using a windowless internal gas flow proportional counter for total alpha activity. Individual nuclide ratios were taken from those determined in May 2001.

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 0.5 %
B. Type B (systematic) uncertainty:	± 3.0 %
C. Uncertainty in aliquot weighing:	± 0.0 %
D. Total uncertainty at the 99% confidence level:	± 3.0 %

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from "Table of Radioactive Isotopes", edited by Virginia Shirley, 1986.
- This source has a working life of 2 years.
- This source had a total alpha surface emission rate of 1901 α/min in 2π on 17-Mar-09.

200001317

Quality Control — 17 Mar 09 — Date — IPL Ref. No.: 1143-35

200001317

OA Systems Corporation
2201 Civic Circle, Suite 511 • Amarillo, Texas 79109 • (806) 354-8218 • FAX (806) 359-3718

JACKPILE-PAGUATE URANIUM MINE
RECORD OF DECISION
COMPLIANCE ASSESSMENT

September 2007

Prepared for:
Pueblo of Laguna

Prepared by:
OA Systems Corporation

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GROUNDWATER MW-1

	Analyte	Units	April 17,2007	June 5,2006	May 17, 2005	June 17, 2004	May 19, 2003	May 9, 2002	May 14, 2001	May 1, 2000	April 20, 1999	April 30, 1998	June 20, 1997
Field Measurements	sample temperature @	deg C		21.6	11.2	18.5	19						
	Conductivity	umhos/cm	2200	2130	2200	2040	2180	1060	1790	2120	1960	1910	1990
	pH	units	8.1	8.09	7.99	8.1	7.9	7.2	8	7.8	7.9	8	8.2
Major Cations and Anions	Total Dissolved Solids	mg/L	1300	1400	719	1380	1390	714	1379	1340	1240	1230	1260
	Alkalinity, Bicarbonate	mg/L	450	473	576	492	506	349	495	470	511	451	527
	Alkalinity, Carbonate	mg/L	11	6	< 2	6.2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
	Alkalinity, Total	mg/L	461	ND	576	498	506	349	495	470	511	451	527
	Chloride	mg/L	15	16	16.1	13.8	14.9	9.16	14.2	13.7	15.5	16.4	16.6
	Sulfate	mg/L	580	ND	540	590	602	239	470	487	506	514	469
	Calcium, dissolved	mg/L	7.6	12.1	6.49	7.3	6.87	144	6.8	6.31	5.9	5.2	61.3
	Magnesium, dissolved	mg/L	2.4	2.4	2.27	2.3	2.37	47.6	2.03	2.07	1.9	1.8	39.2
	Potassium, dissolved	mg/L	2.2	2.65	2.56	2.2	1.95	3.41	2.04	1.96	1.9	3.3	3
	Sodium, dissolved	mg/L	480	520	490	432	525	48.2	482	439	453	889	423
	Silica	mg/L	10	4.67								4.7	5.4
	Silica, as SiO2	mg/L	NA	ND	9.22	9	8.56	22.5	10.5	6.93	9		
Nutrients	Nitrate, as N	mg/L	0.3	< 0.05	0.329	0.05	1.06	< 0.05	0.44	0.7	0.9	0.3	0.9
	Nitrite, as N	mg/L	0.30B	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	0.9
	Orthophosphate, as P	mg/L	< 0.05	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5
Trace Metals	Arsenic, dissolved	mg/L	0.0015	< 0.001	< 0.001	0.0007	0.0012	0.0007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium, dissolved	mg/L	0.011	0.0111	0.0103	0.0095	0.0115	0.0214	0.0111	0.0095	< 0.01	< 0.01	0.01
	Cadmium, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Chromium, dissolved	mg/L	0.0027	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Cyanide, Total	mg/L	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
	Fluoride	mg/L	2	2.02	2.22	2.02	2.66	0.58	2.41	2.4	2.4	2.2	2.4
	Lead, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	0.0005	< 0.0005	ND	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06
	Lead-210	pCi/L	-0.66			-0.680+/-0.2700	0.17+/-0.18	0.49+/-0.28	1.18+/-0.24	-2.90+/-0.19	3.03+/-0.27	< 0.082	3.29
	Manganese, dissolved	mg/L	0.0049	0.0056	0.003	0.01	0.0014	0.0033	0.0034	< 0.0005	< 0.0005	< 0.0005	0.721
	Mercury	mg/L	< 0.0002	< 0.0002	< 0.0005	0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	Molybdenum, dissolved	mg/L	0.006	0.0085	0.0055	0.0063	0.0059	0.0016	0.0057	0.0055	0.006	< 0.005	< 0.005
	Selenium, dissolved	mg/L	< 0.005	< 0.005	< 0.005	0.005	< 0.0005	0.0084	< 0.0005	< 0.0005	0.008	< 0.0005	< 0.0005
	Silver, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Vanadium, dissolved	mg/L	0.0012B	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Zinc, dissolved	mg/L	0.0057	0.0091	< 0.005	0.011	0.011	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.1
Radiation	Gross Alpha	pCi/L	3.804			5.648+/-3.609	-3.34+/-1.63	13.22+/-1.51	-3.75+/-1.42	-4.84+/-1.73	ND	ND	17.33
	Gross Beta	pCi/L	2.917			0.577+/-3.829	-3.09+/-2.11	18.10+/-1.14	-0.99+/-1.70	-3.05+/-1.70	ND	ND	14.75
	Polonium 210	pCi/L	0.137			1.473+/-0.08	0.26+/-0.16	0.03+/-0.02	0.02+/-0.03	0.02+/-0.02	ND	ND	1.12
	Radium-226	pCi/L	0.456			0.500+/-0.6000	0.49+/-0.15	0.67+/-0.21	0.31+/-0.13	0.59+/-0.20	1.09+/-0.29	1.42	16.9
	Total Uranium	pCi/L	6.266			0.010+/-0.000	3.87+/-4.40	0.04+/-0.003	0.001+/-0.0007	0.0041+/-0.0011	0.16+/-0.02	0.36	0.58

GROUNDWATER MW-1

	Analyte	Units	Number	Mean	Maximum	Minimum	Median
Field Measurements	sample tempera	deg C					
	Conductivity	umhos/cm	11	1961.818	2200	1060	2040
	pH	units	11	7.934545	8.2	7.2	8
Major Cations and Anions	Total Dissolved	mg/L	11	1213.818	1400	714	1300
	Alkalinity, Bicarl	mg/L	11	481.8182	576	349	492
	Alkalinity, Carbo	mg/L	11	3.563636	11	2	2
	Alkalinity, Total	mg/L	10	484.4	576	349	496.5
	Chloride	mg/L	11	14.66909	16.6	9.16	15
	Sulfate	mg/L	10	499.7	602	239	510
	Calcium, dissolv	mg/L	11	24.53364	144	5.2	6.87
	Magnesium, dis	mg/L	11	9.667273	47.6	1.8	2.3
	Potassium, diss	mg/L	11	2.47	3.41	1.9	2.2
	Sodium, dissolv	mg/L	11	471.0182	889	48.2	480
	Silica	mg/L	4	6.1925	10	4.67	5.05
	Silica, as SiO2	mg/L	7	10.81571	22.5	6.93	9
Nutrients	Nitrate, as N	mg/L	11	0.461727	1.06	0.05	0.329
	Nitrite, as N	mg/L	10	0.15	0.9	0.05	0.05
	Orthophosphate	mg/L	11	0.213636	0.5	0.05	0.05
Trace Metals	Arsenic, dissolv	mg/L	11	0.000782	0.0015	0.0005	0.0007
	Barium, dissolv	mg/L	11	0.0114	0.0214	0.0095	0.0103
	Cadmium, disso	mg/L	11	0.000545	0.001	0.0005	0.0005
	Chromium, diss	mg/L	11	0.001155	0.0027	0.001	0.001
	Cyanide, Total	mg/L	11	0.01	0.01	0.01	0.01
	Fluoride	mg/L	11	2.119091	2.66	0.58	2.22
	Lead, dissolved	mg/L	10	0.0065	0.06	0.0005	0.0005
	Lead-210	pCi/L	3	0.904	3.29	-0.66	0.082
	Manganese, dis	mg/L	11	0.068555	0.721	0.0005	0.0033
	Mercury	mg/L	11	0.000227	0.0005	0.0002	0.0002
	Molybdenum, di	mg/L	11	0.005545	0.0085	0.0016	0.0057
	Selenium, disso	mg/L	11	0.003536	0.0084	0.0005	0.005
	Silver, dissolved	mg/L	11	0.000545	0.001	0.0005	0.0005
	VaNDdium, diss	mg/L	10	0.001	0.001	0.001	0.001
	Zinc, dissolved	mg/L	11	0.015164	0.1	0.005	0.005
Radiation	Gross Alpha	pCi/L					
	Gross Beta	pCi/L					
	Polonium 210	pCi/L					
	Radium-226	pCi/L					
	Total Uranium	pCi/L					

1997 Data: "E" - Analyte concentration (result) is an estimated value or exceeds analysis calibration range
1997 Comments: Samples analyzed for ortho-phosphate were received outside of EPA recommended holding time & the results were estimated.
Total Phosphorus was performed on the samples. The ortho-phosphate content will not be greater than the total phosphorus result.

Light blue = Exceedances of MCL concentrations
Light gray = Exceedances of Secondary Standards

National Maximum Contaminate Levels (USEPA 2002)

Inorganic Chemical	Standard
Arsenic	0.01 mg/L
Barium	2 mg/L
Cadmium	0.005 mg/L
Chromium (total)	0.1 mg/L
Copper	Action Level = 1.3
Cyanide (as free cyanide)	0.2 mg/L
Fluoride	4 mg/L
Lead	0.015 mg/L
Mercury (inorganic)	0.002 mg/L
Nitrate (measured as Nitrogen)	10 mg/L
Nitrite (measured as Nitrogen)	1 mg/L
Selenium	0.05 mg/L
Alpha particles	15 (pCi/L)
Beta particles and photon emitters	4 millirems/yr
Radium 226 & 228 (combined)	5 pCi/L
Uranium	30 ug/L

National Secondary Drinking Water Standards (USEPA 2002)

Contaminant	Standard
Aluminum	0.02 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor #
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids (TDS)	500 mg/L
Zinc	5 mg/L

Salinity Hazard (USDA)

Salinity	Conductivity (umhos/cm)	Dissolved solids (mg/L)
Low salinity, no detrimental effects expected	< 250	< 200
Medium salinity, detrimental effects to sensitive crops	250-750	200-500
High Salinity, adverse effects on many crops	750-2250	500-1500
Very high salinity, suitable only for salt tolerant plants	2250-5000	1500-3000

GROUNDWATER MW-2													
	Analyte	Units	April 17, 2007	June 5, 2006	May 16, 2005	June 17, 2004	May 19, 2003	May 9, 2002	May 14, 2001	May 1, 2000	April 20, 1999	April 30, 1998	June 19, 1997
Field Measurements	sample temperature @	deg C		21.4	11.1	18.5	19.4						
	Conductivity	umhos/cm	3500	3560	3510	3070	3300	3450	2940	3160	3020	3500	3240
	pH	units	7.9	7.52	7.43	7.6	7.5	7.5	7.6	< 7.6	7.5	7.6	7.8
Major Cations and Anions	Total Dissolved Solids	mg/L	3100	3110	3100	3000	2800	2880	2810	2570	2620	1930	2640
	Alkalinity, Bicarbonate	mg/L	340	399	447	374	376	342	342	336	363	336	138
	Alkalinity, Carbonate	mg/L	< 5	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
	Alkalinity, Total	mg/L	340	ND	447	374	376	342	342	336	363	336	138
	Chloride	mg/L	36	40.3	38.8	40.4	39.1	38.3	36.8	35.5	31	27.3	30.5
	Sulfate	mg/L	1700	ND	1740	1590	1660	1670	1540	1460	1570	1580	1520
	Calcium, dissolved	mg/L	200	203	178	166	194	205	250	178	160	146	152
	Magnesium, dissolved	mg/L	250	241	214	201	213	246	206	205	199	181	195
	Potassium, dissolved	mg/L	10	8.54	8.12	7.6	6.82	7.93	7.48	6.64	7.2	12.6	7.6
	Sodium, dissolved	mg/L	370	410	375	306	370	403	364	< 377	334	684	350
	Silica	mg/L	30	12.3	27.6							9.8	11.3
	Silica, as SiO2	mg/L	NA	26.3		27.8	59.9	26.7	35.3	30.5	46.1		
Nutrients	Nitrate, as N	mg/L	0.42	< 0.05	< 0.05	< 0.05	0.91	< 0.05	< 0.05	< 0.1	0.3	< 0.1	< 0.1
	Nitrite, as N	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1
	Orthophosphate, as P	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5
Trace Metals	Arsenic, dissolved	mg/L	0.0011	< 0.001	0.0012	0.0016	0.0012	0.0011	0.0018	0.0014	< 0.0005	< 0.0005	< 0.0005
	Barium, dissolved	mg/L	0.022	0.0161	0.012	0.0134	0.0162	0.0153	0.0254	0.014	< 0.01	0.01	0.02
	Cadmium, dissolved	mg/L	0.00006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Chromium, dissolved	mg/L	0.0021	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Cyanide, Total	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	Fluoride	mg/L	0.91	0.74	0.95	1.04	1.67	1.16	1.1	1.3	1.1	1.2	1.2
	Lead, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0006	< ND	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Lead-210	pCi/L	1.1			-0.730+/-0.2700	0.50+/-0.20	0.65+/-0.28	1.45+/-0.24	-0.27+/-0.25	4.09+/-0.28	3.08	0.48
	Manganese, dissolved	mg/L	0.042	0.243	0.246	0.22	0.233	0.21	0.248	0.212	0.2	0.176	0.184
	Mercury	mg/L	< 0.0002	< 0.0002	< 0.0005	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	Molybdenum, dissolved	mg/L	0.0056	0.0069	0.0058	0.0104	0.0063	0.0063	0.0061	0.0058	0.006	< 0.005	< 0.005
	Selenium, dissolved	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	0.0016	0.0015	0.0017	0.002	0.007	< 0.0005	< 0.0005
	Silver, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005
	Vanadium, dissolved	mg/L	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001
	Zinc, dissolved	mg/L	0.0079	0.0154	0.0085	0.007	0.007	0.089	0.01	< 0.006	< 0.005	< 0.005	< 0.005
Radiation	Gross Alpha	pCi/L	97.669		12.51+/-6.62	63.130+/-9.685	35.49+/-5.31	49.76+/-5.23	88.53+/-6.79	32.08+/-4.03	63.70+/-5.85	52.89	56.75
	Gross Beta	pCi/L	34.341		16.68+/-7.03	9.007+/-8.533	41.57+/-4.79	35.57+/-3.86	54.20+/-4.15	22.47+/-3.37	33.71+/-4.16	56.43	30.87
	Polonium 210	pCi/L	0.855		0.114+/-0.0617	0.683+/-0.05	0.09+/-0.09	0.07+/-0.04	0.15+/-0.09	-0.03+/-0.03	1.03+/-0.28	ND	0.15
	Radium-226	pCi/L	2.017			0.500+/-0.6900	0.67+/-0.17	0.36+/-0.13	-0.74+/-0.10	0.09+/-0.12	1.70+/-0.47	ND	3.66
	Total Uranium	pCi/L	88.391		0.832+/-0.0064	7.342+/-0.230	299.32+/-27.62	0.07+/-0.004	0.13+/-0.005	0.11+/-0.005	16.19+/-8.79	35.83	14.8

GROUNDWATER MW-2							
	Analyte	Units	Number	Mean	Maximum	Minimum	Median
Field Measurements	sample tempera	deg C					
	Conductivity	umhos/cm	11	3295.455	3560	2940	3300
	pH	units	11	7.595455	7.9	7.43	7.6
Major Cations and Anions	Total Dissolved	mg/L	11	2778.182	3110	1930	2810
	Alkalinity, Bicarl	mg/L	11	344.8182	447	138	342
	Alkalinity, Carbo	mg/L	11	2.272727	5	2	2
	Alkalinity, Total	mg/L	10	339.4	447	138	342
	Chloride	mg/L	11	35.81818	40.4	27.3	36.8
	Sulfate	mg/L	10	1603	1740	1460	1585
	Calcium, dissolv	mg/L	11	184.7273	250	146	178
	Magnesium, dis	mg/L	11	213.7273	250	181	206
	Potassium, diss	mg/L	11	8.23	12.6	6.64	7.6
	Sodium, dissolv	mg/L	11	394.8182	684	306	370
	Silica	mg/L	5	18.2	30	9.8	12.3
	Silica, as SiO2	mg/L	7	36.08571	59.9	26.3	30.5
Nutrients	Nitrate, as N	mg/L	11	0.198182	0.91	0.05	0.1
	Nitrite, as N	mg/L	11	0.068182	0.1	0.05	0.05
	Orthophosphate	mg/L	11	0.213636	0.5	0.05	0.05
Trace Metals	Arsenic, dissolv	mg/L	11	0.001082	0.0018	0.0005	0.0011
	Barium, dissolv	mg/L	11	0.015855	0.0254	0.01	0.0153
	Cadmium, disso	mg/L	11	0.00046	0.0005	0.00006	0.0005
	Chromium, diss	mg/L	11	0.0011	0.0021	0.001	0.001
	Cyanide, Total	mg/L	11	0.01	0.01	0.01	0.01
	Fluoride	mg/L	11	1.124545	1.67	0.74	1.1
	Lead, dissolved	mg/L	10	0.00056	0.001	0.0005	0.0005
	Lead-210	pCi/L	3	1.553333	3.08	0.48	1.1
	Manganese, dis	mg/L	11	0.201273	0.248	0.042	0.212
	Mercury	mg/L	11	0.000227	0.0005	0.0002	0.0002
	Molybdenum, di	mg/L	11	0.006291	0.0104	0.005	0.006
	Selenium, disso	mg/L	11	0.003164	0.007	0.0005	0.002
	Silver, dissolved	mg/L	11	0.000545	0.001	0.0005	0.0005
	Vanadium, diss	mg/L	11	0.001364	0.005	0.001	0.001
	Zinc, dissolved	mg/L	11	0.015073	0.089	0.005	0.007
Radiation	Gross Alpha	pCi/L					
	Gross Beta	pCi/L					
	Polonium 210	pCi/L					
	Radium-226	pCi/L					
	Total Uranium	pCi/L					

1997 Data: "E" - Analyte concentration (result) is an estimated value or exceeds analysis calibration range
1997 Comments: Samples analyzed for ortho-phosphate were received outside of EPA recommended holding time & the results were estimated.
Total Phosphorus was performed on the samples. The ortho-phosphate content will not be greater than the total phosphorus result.

Light blue = Exceedances of MCL concentrations
Light gray = Exceedances of Secondary Standards

National Maximum Contaminate Levels (USEPA 2002)

Inorganic Chemical	Standard
Arsenic	0.01 mg/L
Barium	2 mg/L
Cadmium	0.005 mg/L
Chromium (total)	0.1 mg/L
Copper	Action Level = 1.3
Cyanide (as free cyanide)	0.2 mg/L
Fluoride	4 mg/L
Lead	0.015 mg/L
Mercury (inorganic)	0.002 mg/L
Nitrate (measured as Nitrogen)	10 mg/L
Nitrite (measured as Nitrogen)	1 mg/L
Selenium	0.05 mg/L
Alpha particles	15 (pCi/L)
Beta particles and photon emitters	4 millirems/yr
Radium 226 & 228 (combined)	5 pCi/L
Uranium	30 ug/L

National Secondary Drinking Water Standards (USEPA 2002)

Contaminant	Standard
Aluminum	0.02 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor #
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids (TDS)	500 mg/L
Zinc	5 mg/L

Salinity Hazard (USDA)

Salinity	Conductivity (umhos/cm)	Dissolved solids (mg/L)
Low salinity, no detrimental effects expected	< 250	< 200
Medium salinity, detrimental effects to sensitive crops	250-750	200-500
High Salinity, adverse effects on many crops	750-2250	500-1500
Very high salinity, suitable only for salt tolerant plants	2250-5000	1500-3000

GROUNDWATER MW-3													
	Analyte	Units	April 17, 2007	June 5, 2006	May 16, 2005	June 18, 2004	May 19, 2003	May 10, 2002	May 15, 2001	May 2, 2000	April 21, 1999	May 1, 1998	June 19, 1997
Field Measurements	sample temperature @	deg C		22	12.7	17.8	19.5						
	Conductivity	umhos/cm	1200	1000	987	1170	1420	1060	773	1010	888	1466	1550
	pH	units	7.3	7.32	7.2	7.2	7.1	7.2	7.1	7.2	7.5	7.5	7.6
Major Cations and Anions	Total Dissolved Solids	mg/L	920	689	671	952	1110	714	591	672	606	1070	1130
	Alkalinity, Bicarbonate	mg/L	310	309	378	350	328	349	305	283	333	338	368
	Alkalinity, Carbonate	mg/L	< 5	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
	Alkalinity, Total	mg/L	310	ND	378	350	328	349	305	283	333	338	368
	Chloride	mg/L	7.7	6.32	6.33	7.89	8.47	9.16	8.61	7.6	9.2	17.7	19
	Sulfate	mg/L	370	ND	240	401	524	239	168	239	241	502	524
	Calcium, dissolved	mg/L	140	115	99.8	133	187	144	104	110	104	130	126
	Magnesium, dissolved	mg/L	53	43.1	36.1	50.6	70.4	47.6	40.7	48.7	39.5	84.6	79.4
	Potassium, dissolved	mg/L	3.5	2.61	2.97	3.3	3.63	3.41	3.1	2.84	2.8	6	7
	Sodium, dissolved	mg/L	56	48.9	44.9	70.1	82.9	48.2	42.8	63.3	48.4	196	92.5
	Silica	mg/L	20	9.46	20							14.2	29.9
	Silica, as SiO2	mg/L	NA	20.2		19.5	38.1	22.5	21.8	27	22.3		
Nutrients	Nitrate, as N	mg/L	< 0.5	< 0.05	< 0.05	< 0.05	0.64	< 0.05	< 0.05	< 0.1	0.2	< 0.1	< 0.1
	Nitrite, as N	mg/L	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1
	Orthophosphate, as P	mg/L	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5
Trace Metals	Arsenic, dissolved	mg/L	< 0.005	< 0.001	< 0.001	0.0006	0.0012	0.0007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium, dissolved	mg/L	0.025	0.0197	0.016	0.0251	0.0299	0.0214	0.0201	0.0178	0.01	0.02	0.02
	Cadmium, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Chromium, dissolved	mg/L	0.0019	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Cyanide, Total	mg/L	< 0.001	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	Fluoride	mg/L	0.38	0.395	< 0.05	< 0.05	0.99	0.58	< 0.05	0.7	0.6	0.8	0.7
	Lead, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Lead-210	pCi/L	1.3			-8.250+/-.3600	0.28+/-0.18	0.49+/-0.28	1.52+/-0.23	-0.43+/-0.19	1.28+/-0.25	1.5	0.6
	Manganese, dissolved	mg/L	< 0.001	< 0.0005	0.0006	< 0.01	0.0591	0.0033	0.0012	0.0124	0.01	0.354	0.216
	Mercury	mg/L	< 0.0002	< 0.0002	< 0.0005	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	Molybdenum, dissolved	mg/L	0.0011	< 0.005	< 0.005	< 0.005	0.0017	0.0016	0.0019	0.0019	0.002	< 0.005	< 0.005
	Selenium, dissolved	mg/L	0.0066	< 0.005	0.0053	< 0.005	0.0194	0.0084	0.007	0.0125	0.011	< 0.0005	< 0.0005
	Silver, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.01	< 0.0005	< 0.0005
	Vanadium, dissolved	mg/L	< 0.005	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Zinc, dissolved	mg/L	< 0.001	0.021	0.0056	0.007	0.02	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005
Radiation	Gross Alpha	pCi/L	44.948			45.680+/-5.271	31.92+/-2.84	13.22+/-1.51	4.97+/-1.05	6.07+/-0.62	21.59+/-1.58	70.65	104.85
	Gross Beta	pCi/L	12.6			17.110+/-2.906	22.87+/-2.11	18.10+/-1.14	7.87+/-1.20	4.01+/-0.56	17.17+/-1.25	43.91	66.89
	Polonium 210	pCi/L	0.222			0.904+/-0.06	0.09+/-0.09	0.03+/-0.02	0.05+/-0.04	0.036+/-0.025	1.20+/-0.44	1.1	0.58
	Radium-226	pCi/L	0.229			-0.680+/-0.4300	1.106+/-0.205	0.67+/-0.21	3.32+/-0.30	0.80+/-0.19	2.06+/-0.52	1.23	4.85
	Total Uranium	pCi/L	35.717			0.279+/-0.008	419.369+/-37.74	0.04+/-0.003	0.04+/-0.003	0.052+/-0.003	8.59+/-0.16	46.72	31.12

GROUNDWATER MW-3							
	Analyte	Units	Number	Mean	Maximum	Minimum	Median
Field Measurements	sample tempera	deg C					
	Conductivity	umhos/cm	11	1138.545	1550	773	1060
	pH	units	11	7.292727	7.6	7.1	7.2
Major Cations and Anions	Total Dissolved	mg/L	11	829.5455	1130	591	714
	Alkalinity, Bicarl	mg/L	11	331.9091	378	283	333
	Alkalinity, Carbo	mg/L	11	2.272727	5	2	2
	Alkalinity, Total	mg/L	10	334.2	378	283	335.5
	Chloride	mg/L	11	9.816364	19	6.32	8.47
	Sulfate	mg/L	10	344.8	524	168	305.5
	Calcium, dissolv	mg/L	11	126.6182	187	99.8	126
	Magnesium, dis	mg/L	11	53.97273	84.6	36.1	48.7
	Potassium, diss	mg/L	11	3.741818	7	2.61	3.3
	Sodium, dissolv	mg/L	11	72.18182	196	42.8	56
	Silica	mg/L	5	18.712	29.9	9.46	20
	Silica, as SiO2	mg/L	7	24.48571	38.1	19.5	22.3
Nutrients	Nitrate, as N	mg/L	11	0.171818	0.64	0.05	0.1
	Nitrite, as N	mg/L	11	0.109091	0.5	0.05	0.05
	Orthophosphate	mg/L	11	0.254545	0.5	0.05	0.05
Trace Metals	Arsenic, dissolv	mg/L	11	0.001091	0.005	0.0005	0.0006
	Barium, dissolv	mg/L	11	0.020455	0.0299	0.01	0.02
	Cadmium, disso	mg/L	11	0.000545	0.001	0.0005	0.0005
	Chromium, diss	mg/L	11	0.001082	0.0019	0.001	0.001
	Cyanide, Total	mg/L	11	0.009182	0.01	0.001	0.01
	Fluoride	mg/L	11	0.481364	0.99	0.05	0.58
	Lead, dissolved	mg/L	11	0.000545	0.001	0.0005	0.0005
	Lead-210	pCi/L	3	1.133333	1.5	0.6	1.3
	Manganese, dis	mg/L	11	0.060736	0.354	0.0005	0.01
	Mercury	mg/L	11	0.000227	0.0005	0.0002	0.0002
	Molybdenum, di	mg/L	11	0.0032	0.005	0.0011	0.002
	Selenium, disso	mg/L	11	0.007382	0.0194	0.0005	0.0066
	Silver, dissolved	mg/L	11	0.001409	0.01	0.0005	0.0005
	Vanadium, disso	mg/L	11	0.001455	0.005	0.001	0.001
	Zinc, dissolved	mg/L	11	0.007691	0.021	0.001	0.005
Radiation	Gross Alpha	pCi/L					
	Gross Beta	pCi/L					
	Polonium 210	pCi/L					
	Radium-226	pCi/L					
	Total Uranium	pCi/L					

1997 Data: "E" - Analyte concentration (result) is an estimated value or exceeds analysis calibration range
1997 Comments: Samples analyzed for ortho-phosphate were received outside of EPA recommended holding time & the results were estimated.
Total Phosphorus was performed on the samples. The ortho-phosphate content will not be greater than the total phosphorus result.

Light blue = Exceedances of MCL concentrations
Light gray = Exceedances of Secondary Standards

National Maximum Contaminate Levels (USEPA 2002)

Inorganic Chemical	Standard
Arsenic	0.01 mg/L
Barium	2 mg/L
Cadmium	0.005 mg/L
Chromium (total)	0.1 mg/L
Copper	Action Level = 1.3
Cyanide (as free cyanide)	0.2 mg/L
Fluoride	4 mg/L
Lead	0.015 mg/L
Mercury (inorganic)	0.002 mg/L
Nitrate (measured as Nitrogen)	10 mg/L
Nitrite (measured as Nitrogen)	1 mg/L
Selenium	0.05 mg/L
Alpha particles	15 (pCi/L)
Beta particles and photon emitters	4 millirems/yr
Radium 226 & 228 (combined)	5 pCi/L
Uranium	30 ug/L

National Secondary Drinking Water Standards (USEPA 2002)

Contaminant	Standard
Aluminum	0.02 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor #
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids (TDS)	500 mg/L
Zinc	5 mg/L

Salinity Hazard (USDA)

Salinity	Conductivity (umhos/cm)	Dissolved solids (mg/L)
Low salinity, no detrimental effects expected	< 250	< 200
Medium salinity, detrimental effects to sensitive crops	250-750	200-500
High Salinity, adverse effects on many crops	750-2250	500-1500
Very high salinity, suitable only for salt tolerant plants	2250-5000	1500-3000

GROUNDWATER MW-4													
	Analyte	Units	April 17, 2007	June 5, 2006	May 16, 2005	June 18, 2004	May 20, 2003	May 9, 2002	May 15, 2001	May 1, 2000	April 20, 1999	May 1, 1998	June 19, 1997
Field Measurements	sample temperature @	deg C		21.7	11.7	17.4	16.6						
	Conductivity	umhos/cm	1600	1410	1470	1400	1650	1190	1280	1420	1590	920	1060
	pH	units	7.2	7.21	7.04	7.2	7.1	7.1	7	7.2	7.2	7.4	7.7
Major Cations and Anions	Total Dissolved Solids	mg/L	1200	1060	1070	1190	1200	836	1019	1020	1220	424	740
	Alkalinity, Bicarbonate	mg/L	400	387	469	393	382	294	362	340	387	228	258
	Alkalinity, Carbonate	mg/L	< 5	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
	Alkalinity, Total	mg/L	400	NA	469	393	382	294	362	340	387	228	258
	Chloride	mg/L	14	13.4	13.8	15.8	17.2	16.2	15.7	18.4	21.2	7	7.6
	Sulfate	mg/L	630	NA	479	525	533	331	411	403	568	310	324
	Calcium, dissolved	mg/L	140	124	124	125	143	59.8	135	121	161	103	107
	Magnesium, dissolved	mg/L	94	77.3	72	80	80.4	32.1	79.8	67.1	99.8	49.7	44.4
	Potassium, dissolved	mg/L	7.4	6.32	6.01	6.2	6.28	4.65	6.7	6.08	7.1	2.4	2.7
	Sodium, dissolved	mg/L	92	90.4	83.6	96.8	134	95.8	91.6	95.3	99.4	109	50.4
	Silica	mg/L	37	13.5	21.2							8.3	9
	Silica, as SiO2	mg/L	NA	28.9		20.5	38.9	45.6	43.2	35.5	41.8		
Nutrients	Nitrate, as N	mg/L	0.1	< 0.05	< 0.05	< 0.05	0.59	< 0.05	< 0.05	< 0.1	< 0.1	0.3	< 0.1
	Nitrite, as N	mg/L	0.08	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1
	Orthophosphate, as P	mg/L	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5
Trace Metals	Arsenic, dissolved	mg/L	0.00053	< 0.001	< 0.001	0.0007	0.0017	0.0118	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium, dissolved	mg/L	0.023	0.0237	0.017	0.0218	0.0268	0.0268	0.0425	0.0185	0.02	0.01	0.02
	Cadmium, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Chromium, dissolved	mg/L	0.0026	< 0.001	< 0.001	< 0.001	< 0.001	0.006	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Cyanide, Total	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	Fluoride	mg/L	0.49	0.58	0.61	0.58	1.01	0.76	0.71	0.8	0.6	0.6	0.6
	Lead, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0005	< 0.0005	< 0.0005	ND	ND	ND
	Lead-210	pCi/L	5.5			2.300+/-0.4200	-0.06+/-0.17	0.22+/-0.28	6.60+/-0.33	40.95+/-0.34	9.97+/-0.34	1.51	2.24
	Manganese, dissolved	mg/L	0.045	0.0244	0.0138	< 0.01	0.0022	0.0011	0.0296	0.0011	0.08	0.03	ND
	Mercury	mg/L	< 0.0002	< 0.0002	< 0.0005	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0009	< 0.0002	< 0.0002	< 0.0002
	Molybdenum, dissolved	mg/L	0.0027	< 0.005	< 0.005	0.0061	0.0021	0.0044	0.0033	0.003	0.004	< 0.005	< 0.005
	Selenium, dissolved	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	0.0056	0.0021	0.0046	0.0044	0.006	0.01	< 0.0005
	Silver, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0005	< 0.0005	< 0.0005	0.01	< 0.0005	< 0.0005
	Vanadium, dissolved	mg/L	0.0015	< 0.002	< 0.001	< 0.001	0.001	0.027	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Zinc, dissolved	mg/L	0.0078	0.0072	0.011	0.02	0.031	0.046	0.012	0.009	< 0.005	< 0.005	< 0.005
Radiation	Gross Alpha	pCi/L	153.702			202.3+/-22.781	126.96+/-5.68	84.94+/-4.28	96.43+/-4.96	113.67+/-4.30	129.13+/-6.22	20.99	35.79
	Gross Beta	pCi/L	61.282			142.2+/-14.572	33.8+/-2.79	87.89+/-3.11	85.45+/-3.41	59.56+/-2.25	70.24+/-3.90	12.96	18.97
	Polonium 210	pCi/L	0.216			1.870+/-0.09	0.04+/-0.047	0.005+/-0.01	0.10+/-0.07	0.31+/-0.09	0.58+/-0.15	0.31	0.31
	Radium-226	pCi/L	1.44			0.250+/-1.0500	0.71+/-0.15	0.58+/-0.14	-0.18+/-0.16	1.15+/-0.18	2.76+/-0.99	1.34	1.85
	Total Uranium	pCi/L	141.188			0.569+/-0.017	624.51+/-39.75	0.11+/-0.005	0.09+/-0.004	0.25+/-0.007	63.17+/-0.47	10.89	7.27

GROUNDWATER MW-4							
	Analyte	Units	Number	Mean	Maximum	Minimum	Median
Field Measurements	sample tempera	deg C					
	Conductivity	umhos/cm	11	1362.727	1650	920	1410
	pH	units	11	7.213636	7.7	7	7.2
Major Cations and Anions	Total Dissolved	mg/L	11	998.0909	1220	424	1060
	Alkalinity, Bicarl	mg/L	11	354.5455	469	228	382
	Alkalinity, Carbo	mg/L	11	2.272727	5	2	2
	Alkalinity, Total	mg/L	10	351.3	469	228	372
	Chloride	mg/L	11	14.57273	21.2	7	15.7
	Sulfate	mg/L	10	451.4	630	310	445
	Calcium, dissolv	mg/L	11	122.0727	161	59.8	124
	Magnesium, dis	mg/L	11	70.6	99.8	32.1	77.3
	Potassium, diss	mg/L	11	5.621818	7.4	2.4	6.2
	Sodium, dissolv	mg/L	11	94.39091	134	50.4	95.3
	Silica	mg/L	5	17.8	37	8.3	13.5
	Silica, as SiO2	mg/L	7	36.34286	45.6	20.5	38.9
Nutrients	Nitrate, as N	mg/L	11	0.14	0.59	0.05	0.1
	Nitrite, as N	mg/L	11	0.070909	0.1	0.05	0.05
	Orthophosphate	mg/L	11	0.254545	0.5	0.05	0.05
Trace Metals	Arsenic, dissolv	mg/L	11	0.001748	0.0118	0.0005	0.00053
	Barium, dissolv	mg/L	11	0.022736	0.0425	0.01	0.0218
	Cadmium, disso	mg/L	11	0.000545	0.001	0.0005	0.0005
	Chromium, diss	mg/L	11	0.0016	0.006	0.001	0.001
	Cyanide, Total	mg/L	11	0.01	0.01	0.01	0.01
	Fluoride	mg/L	11	0.667273	1.01	0.49	0.6
	Lead, dissolved	mg/L	8	0.000563	0.001	0.0005	0.0005
	Lead-210	pCi/L	3	3.083333	5.5	1.51	2.24
	Manganese, dis	mg/L	10	0.02372	0.08	0.0011	0.0191
	Mercury	mg/L	11	0.000291	0.0009	0.0002	0.0002
	Molybdenum, di	mg/L	11	0.004145	0.0061	0.0021	0.0044
	Selenium, disso	mg/L	11	0.004836	0.01	0.0005	0.005
	Silver, dissolved	mg/L	11	0.001409	0.01	0.0005	0.0005
	Vanadium, disso	mg/L	11	0.0035	0.027	0.001	0.001
	Zinc, dissolved	mg/L	11	0.014455	0.046	0.005	0.009
Radiation	Gross Alpha	pCi/L					
	Gross Beta	pCi/L					
	Polonium 210	pCi/L					
	Radium-226	pCi/L					
	Total Uranium	pCi/L					

1997 Data: "E" - Analyte concentration (result) is an estimated value or exceeds analysis calibration range
1997 Comments: Samples analyzed for ortho-phosphate were received outside of EPA recommended holding time & the results were estimated.
Total Phosphorus was performed on the samples. The ortho-phosphate content will not be greater than the total phosphorus result.

Light blue = Exceedances of MCL concentrations
Light gray = Exceedances of Secondary Standards

National Maximum Contaminate Levels (USEPA 2002)

Inorganic Chemical	Standard
Arsenic	0.01 mg/L
Barium	2 mg/L
Cadmium	0.005 mg/L
Chromium (total)	0.1 mg/L
Copper	Action Level = 1.3
Cyanide (as free cyanide)	0.2 mg/L
Fluoride	4 mg/L
Lead	0.015 mg/L
Mercury (inorganic)	0.002 mg/L
Nitrate (measured as Nitrogen)	10 mg/L
Nitrite (measured as Nitrogen)	1 mg/L
Selenium	0.05 mg/L
Alpha particles	15 (pCi/L)
Beta particles and photon emitters	4 millirems/yr
Radium 226 & 228 (combined)	5 pCi/L
Uranium	30 ug/L

National Secondary Drinking Water Standards (USEPA 2002)

Contaminant	Standard
Aluminum	0.02 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor #
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids (TDS)	500 mg/L
Zinc	5 mg/L

Salinity Hazard (USDA)

Salinity	Conductivity (umhos/cm)	Dissolved solids (mg/L)
Low salinity, no detrimental effects expected	< 250	< 200
Medium salinity, detrimental effects to sensitive crops	250-750	200-500
High Salinity, adverse effects on many crops	750-2250	500-1500
Very high salinity, suitable only for salt tolerant plants	2250-5000	1500-3000

GROUNDWATER MW-5

	Analyte	Units	April 17, 2007	June 5, 2006	May 16, 2005	June 17, 2004	May 19, 2003	May 9, 2002	May 14, 2001	May 1, 2000	April 20, 1999	April 30, 1998	June 19, 1997
Field Measurements	sample temperature @	deg C		21.4	11.4	18.8	19.5						
	Conductivity	umhos/cm	2100	2090	2120	1910	2130	2160	1780	2090	2100	2400	2260
	pH	units	8.3	8.27	8.2	8.3	8.1	8.2	8.2	8.1	8.2	8.3	8.3
Major Cations and Anions	Total Dissolved Solids	mg/L	1300	1370	1360	1380	1350	1390	1330	1390	1420	1420	1390
	Alkalinity, Bicarbonate	mg/L	310	322	371	320	330	309	317	303	534	330	321
	Alkalinity, Carbonate	mg/L	12	8	10.2	6.21	6.3	< 2	< 2	< 2	ND	ND	2.1
	Alkalinity, Total	mg/L	324	330	381	326	336	309	317	303	534	330	323.1
	Chloride	mg/L	19	20.7	20.4	22.2	19.9	20.1	20.6	21.6	22.4	20.7	22
	Sulfate	mg/L	640	ND	618	587	619	602	577	650	707	697	689
	Calcium, dissolved	mg/L	11	16.3	11.1	12.2	12.6	12.9	12.4	12.4	12.7	12.4	12.8
	Magnesium, dissolved	mg/L	1.9	2.01	1.96	1.8	1.78	1.78	1.72	1.91	2	2	2.3
	Potassium, dissolved	mg/L	2.4	2.82	2.68	2.4	2.08	2.29	2.17	2.26	2.1	4.2	2.4
	Sodium, dissolved	mg/L	470	472	462	384	478	499	460	464	461	910	447
	Silica	mg/L	11	5.02	10.7							65.2	9.3
	Silica, as SiO2	mg/L	NA	10.7		10	23.7	11.7	15.9	17	25.9		
Nutrients	Nitrate, as N	mg/L	0.31	< 0.05	< 0.05	0.68	0.79	< 0.05	< 0.05	0.2	< 0.05	< 0.05	< 0.05
	Nitrite, as N	mg/L	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05
	Orthophosphate, as P	mg/L	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.5	< 0.05	< 0.05	3
Trace Metals	Arsenic, dissolved	mg/L	0.00077B	< 0.001	< 0.001	< 0.0005	0.0009	0.0006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium, dissolved	mg/L	0.0082	0.0077	0.006	0.0076	0.0073	0.0092	0.0071	0.0089	ND	ND	0.01
	Cadmium, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Chromium, dissolved	mg/L	0.002	< 0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Cyanide, Total	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	Fluoride	mg/L	1	1.21	1.15	1.26	1.68	1.46	1.4	1.4	1.4	1.5	1.3
	Lead, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	ND	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Lead-210	pCi/L	3.9			-3.240+/-0.3000	0.48+/-0.18	0.24+/-0.27	2.41+/-0.26	0.39+/-0.24	2.59+/-0.27	ND	0.74
	Manganese, dissolved	mg/L	< 0.001	< 0.0005	0.0008	< 0.01	0.0062	0.0058	0.0075	0.0014	ND	ND	ND
	Mercury	mg/L	< 0.0002	< 0.0002	< 0.0005	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	Molybdenum, dissolved	mg/L	0.0053	0.0062	< 0.005	< 0.005	0.0051	0.005	0.0054	0.0052	0.006	< 0.005	< 0.005
	Selenium, dissolved	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.0005	0.0007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Silver, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Vanadium, dissolved	mg/L	< 0.005	< 0.002	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Zinc, dissolved	mg/L	0.023	0.0203	0.0299	0.031	0.012	0.104	< 0.005	0.088	< 0.005	< 0.005	< 0.005
Radiation	Gross Alpha	pCi/L	3.166			-0.488+/--3.090	-4.94+/-1.55	4.46+/-1.75	1.33+/-1.74	-2.30+/-1.58	15.30+/-2.81	23.94	19.79
	Gross Beta	pCi/L	3.432			1.001+/-2.787	0.38+/-1.93	6.32+/-1.69	4.19+/-1.68	4.31+/-1.76	9.10+/-2.84	29.91	2.13
	Polonium 210	pCi/L	0.117			0.057+/-0.04	0.13+/-0.11	0.06+/-0.04	0.16+/-0.07	0.13+/-0.07	0.80+/-0.17	1.29	0.3
	Radium-226	pCi/L	0.514			0.120+/-0.3300	0.26+/-0.11	1.75+/-0.21	0.39+/-0.15	-0.15+/-0.12	1.34+/-0.48	4.67	2.78
	Total Uranium	pCi/L	0.577			0.011+/-0.000	9.35+/-5.71	0.005+/-0.001	0.0002+/-0.0006	0.0146+/-0.0020	3.80+/-0.16	11.76	0.3

GROUNDWATER MW-5

	Analyte	Units	Number	Mean	Maximum	Minimum	Median
Field Measurements	sample tempera	deg C					
	Conductivity	umhos/cm	11	2103.636	2400	1780	2100
	pH	units	11	8.224545	8.3	8.1	8.2
Major Cations and Anions	Total Dissolved	mg/L	11	1372.727	1420	1300	1380
	Alkalinity, Bicarl	mg/L	11	342.4545	534	303	321
	Alkalinity, Carbo	mg/L	9	5.645556	12	2	6.21
	Alkalinity, Total	mg/L	11	346.6455	534	303	326
	Chloride	mg/L	11	20.87273	22.4	19	20.7
	Sulfate	mg/L	10	638.6	707	577	629.5
	Calcium, dissolv	mg/L	11	12.61818	16.3	11	12.4
	Magnesium, dis	mg/L	11	1.923636	2.3	1.72	1.91
	Potassium, diss	mg/L	11	2.527273	4.2	2.08	2.4
	Sodium, dissolv	mg/L	11	500.6364	910	384	464
	Silica	mg/L	5	20.244	65.2	5.02	10.7
	Silica, as SiO2	mg/L	7	16.41429	25.9	10	15.9
Nutrients	Nitrate, as N	mg/L	11	0.211818	0.79	0.05	0.05
	Nitrite, as N	mg/L	11	0.095455	0.5	0.05	0.05
	Orthophosphate	mg/L	11	0.4	3	0.05	0.05
Trace Metals	Arsenic, dissolv	mg/L	10	0.00065	0.001	0.0005	0.0005
	Barium, dissolv	mg/L	9	0.008	0.01	0.006	0.0077
	Cadmium, disso	mg/L	11	0.000545	0.001	0.0005	0.0005
	Chromium, diss	mg/L	11	0.001091	0.002	0.001	0.001
	Cyanide, Total	mg/L	11	0.01	0.01	0.01	0.01
	Fluoride	mg/L	11	1.341818	1.68	1	1.4
	Lead, dissolved	mg/L	10	0.00055	0.001	0.0005	0.0005
	Lead-210	pCi/L	2	2.32	3.9	0.74	2.32
	Manganese, dis	mg/L	8	0.00415	0.01	0.0005	0.0036
	Mercury	mg/L	11	0.000227	0.0005	0.0002	0.0002
	Molybdenum, di	mg/L	11	0.005291	0.0062	0.005	0.0051
	Selenium, disso	mg/L	11	0.002155	0.005	0.0005	0.0005
	Silver, dissolved	mg/L	11	0.000545	0.001	0.0005	0.0005
	Vanadium, diss	mg/L	11	0.001455	0.005	0.001	0.001
	Zinc, dissolved	mg/L	11	0.029836	0.104	0.005	0.0203
Radiation	Gross Alpha	pCi/L					
	Gross Beta	pCi/L					
	Polonium 210	pCi/L					
	Radium-226	pCi/L					
	Total Uranium	pCi/L					

1997 Data: "E" - Analyte concentration (result) is an estimated value or exceeds analysis calibration range
1997 Comments: Samples analyzed for ortho-phosphate were received outside of EPA recommended holding time & the results were estimated.
Total Phosphorus was performed on the samples. The ortho-phosphate content will not be greater than the total phosphorus result.

Light blue = Exceedances of MCL concentrations
Light gray = Exceedances of Secondary Standards

National Maximum Contaminate Levels (USEPA 2002)

Inorganic Chemical	Standard
Arsenic	0.01 mg/L
Barium	2 mg/L
Cadmium	0.005 mg/L
Chromium (total)	0.1 mg/L
Copper	Action Level = 1.3
Cyanide (as free cyanide)	0.2 mg/L
Fluoride	4 mg/L
Lead	0.015 mg/L
Mercury (inorganic)	0.002 mg/L
Nitrate (measured as Nitrogen)	10 mg/L
Nitrite (measured as Nitrogen)	1 mg/L
Selenium	0.05 mg/L
Alpha particles	15 (pCi/L)
Beta particles and photon emitters	4 millirems/yr
Radium 226 & 228 (combined)	5 pCi/L
Uranium	30 ug/L

National Secondary Drinking Water Standards (USEPA 2002)

Contaminant	Standard
Aluminum	0.02 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor #
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids (TDS)	500 mg/L
Zinc	5 mg/L

Salinity Hazard (USDA)

Salinity	Conductivity (umhos/cm)	Dissolved solids (mg/L)
Low salinity, no detrimental effects expected	< 250	< 200
Medium salinity, detrimental effects to sensitive crops	250-750	200-500
High Salinity, adverse effects on many crops	750-2250	500-1500
Very high salinity, suitable only for salt tolerant plants	2250-5000	1500-3000

GROUNDWATER MW-6													
	Analyte	Units	April 17, 2007	June 5, 2006	May 16, 2005	June 17, 2004	May 19, 2003	May 9, 2002	May 14, 2001	May 1, 2000	April 20, 1999	April 30, 1998	June 19, 1997
Field Measurements	sample temperature @	deg C		21.4	11.3	18.4	19.3						
	Conductivity	umhos/cm	2900	2900	2870	2550	2860	2840	2390	2800	2790	3400	3180
	pH	units	7.5	7.37	7.35	7.5	7.4	7.4	7.4	7.6	7.4	7.5	7.7
Major Cations and Anions	Total Dissolved Solids	mg/L	2600	2470	2460	2450	2280	2510	2340	2240	2400	2460	2560
	Alkalinity, Bicarbonate	mg/L	320	327	384	305	348	304	297	293	382	284	300
	Alkalinity, Carbonate	mg/L	< 5	< 2	< 2	< 2	< 2	< 2	< 2	< 2	ND	ND	ND
	Alkalinity, Total	mg/L	320	ND	384	305	348	304	297	293	382	284	300
	Chloride	mg/L	30	30.4	29.6	29.5	28.3	28.2	27.2	28.7	30	28.9	31.7
	Sulfate	mg/L	1400	ND	1400	1350	1330	1300	1270	1280	1420	2230	1500
	Calcium, dissolved	mg/L	210	42.3	200	179	224	218	213	209	215	213	219
	Magnesium, dissolved	mg/L	170	32.7	153	136	150	158	153	128	163	161	170
	Potassium, dissolved	mg/L	9.8	1.96	8.89	8.1	7.98	8.7	8.06	7.85	8.6	14.9	9
	Sodium, dissolved	mg/L	280	59.5	277	196	278	298	281	248	279	576	282
	Silica	mg/L	41	17.7	37.9							9	17.7
	Silica, as SiO2	mg/L	NA	37.9		26.5	97.6	36.2	26	55.6	41.6		
Nutrients	Nitrate, as N	mg/L	0.098	< 0.05	< 0.05	< 0.05	0.61	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1
	Nitrite, as N	mg/L	0.077	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1
	Orthophosphate, as P	mg/L	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5
Trace Metals	Arsenic, dissolved	mg/L	0.00091	< 0.001	0.0011	0.0008	0.0015	0.0011	0.0012	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Barium, dissolved	mg/L	0.014	0.0133	0.011	0.012	0.0142	0.0139	0.012	0.0113	< 0.01	0.01	0.01
	Cadmium, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Chromium, dissolved	mg/L	0.002	< 0.001	0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Cyanide, Total	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
	Fluoride	mg/L	0.54	0.51	0.75	0.75	1.25	0.84	0.81	0.9	0.8	0.8	0.8
	Lead, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Lead-210	pCi/L	0.4			-0.340+/-0.2600	0.13+/-0.17	0.41+/-0.28	3.46+/-0.28	0.88+/-0.19	2.80+/-0.25	<.82 ND	1.46
	Manganese, dissolved	mg/L	0.035	0.016	0.0215	0.01	0.0797	0.0755	0.0763	0.0617	0.1	0.098	0.177
	Mercury	mg/L	< 0.0002	< 0.0002	< 0.0005	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.001	< 0.0002	< 0.0002	< 0.0002
	Molybdenum, dissolved	mg/L	0.0059	0.0056	0.0055	0.0057	0.005	0.0049	0.0049	0.0048	0.005	< 0.005	< 0.005
	Selenium, dissolved	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	0.0016	0.0013	0.0015	0.0019	0.007	< 0.0005	< 0.0005
	Silver, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Vanadium, dissolved	mg/L	0.0016	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Zinc, dissolved	mg/L	< 0.001	0.0064	0.0065	0.006	0.012	0.077	0.006	0.006	< 0.005	< 0.005	0.5
Radiation	Gross Alpha	pCi/L	82.796			77.210+/-8.924	-9.56+/-3.00	118.72+/-8.97	43.94+/-4.71	66.89+/-5.14	94.17+/-7.31	64.68	60.33
	Gross Beta	pCi/L	23.151			29.940+/-5.536	0.76+/-3.90	149.37+/-7.68	59.75+/-4.33	47.38+/-3.79	61.37+/-4.94	55.26	46.9
	Polonium 210	pCi/L	0.642			0.350+/-0.04	0.32+/-0.17	0.02+/-0.02	0.29+/-0.17	0.05+/-0.03	0.30+/-0.89	ND	0.04
	Radium-226	pCi/L	1.125			0.200+/-0.4300	0.61+/-0.13	0.61+/-0.18	0.63+/-0.19	0.20+/-0.13	5.05+/-0.94	1.14	4.19
	Total Uranium	pCi/L	69.762			0.391+/-0.012		0.12+/-0.005	0.07+/-0.004	0.13+/-0.005	28.53+/-0.30	45.88	17.52

GROUNDWATER MW-6							
	Analyte	Units	Number	Mean	Maximum	Minimum	Median
Field Measurements	sample tempera	deg C					
	Conductivity	umhos/cm	11	2623.333	3400	2390	2860
	pH	units	11	6.843333	7.7	7.35	7.4
Major Cations and Anions	Total Dissolved	mg/L	11	2230.833	2600	2240	2460
	Alkalinity, Bicarl	mg/L	11	295.3333	384	284	305
	Alkalinity, Carbo	mg/L	8	2.111111	5	2	2
	Alkalinity, Total	mg/L	10	292.4545	384	284	304.5
	Chloride	mg/L	11	26.875	31.7	27.2	29.5
	Sulfate	mg/L	10	1316.364	2230	1270	1375
	Calcium, dissolv	mg/L	11	178.525	224	42.3	213
	Magnesium, dis	mg/L	11	131.225	170	32.7	153
	Potassium, diss	mg/L	11	7.82	14.9	1.96	8.6
	Sodium, dissolv	mg/L	11	254.5417	576	59.5	279
	Silica	mg/L	5	20.55	41	9	17.7
	Silica, as SiO2	mg/L	7	40.175	97.6	26	37.9
Nutrients	Nitrate, as N	mg/L	11	0.113167	0.61	0.05	0.098
	Nitrite, as N	mg/L	11	0.06475	0.1	0.05	0.05
	Orthophosphate	mg/L	11	0.233333	0.5	0.05	0.05
Trace Metals	Arsenic, dissolv	mg/L	11	0.000801	0.0015	0.0005	0.00091
	Barium, dissolv	mg/L	11	0.010975	0.0142	0.01	0.012
	Cadmium, disso	mg/L	11	0.0005	0.001	0.0005	0.0005
	Chromium, diss	mg/L	11	0.001	0.002	0.001	0.001
	Cyanide, Total	mg/L	11	0.009167	0.01	0.01	0.01
	Fluoride	mg/L	11	0.729167	1.25	0.51	0.8
	Lead, dissolved	mg/L	11	0.0005	0.001	0.0005	0.0005
	Lead-210	pCi/L	2	0.62	1.46	0.4	0.93
	Manganese, dis	mg/L	11	0.062558	0.177	0.01	0.0755
	Mercury	mg/L	11	0.000275	0.001	0.0002	0.0002
	Molybdenum, di	mg/L	11	0.004775	0.0059	0.0048	0.005
	Selenium, disso	mg/L	11	0.002858	0.007	0.0005	0.0019
	Silver, dissolved	mg/L	11	0.0005	0.001	0.0005	0.0005
	Vanadium, diss	mg/L	11	0.00105	0.002	0.001	0.001
	Zinc, dissolved	mg/L	11	0.052575	0.5	0.001	0.006
Radiation	Gross Alpha	pCi/L					
	Gross Beta	pCi/L					
	Polonium 210	pCi/L					
	Radium-226	pCi/L					
	Total Uranium	pCi/L					

1997 Data: "E" - Analyte concentration (result) is an estimated value or exceeds analysis calibration range
1997 Comments: Samples analyzed for ortho-phosphate were received outside of EPA recommended holding time & the results were estimated.
Total Phosphorus was performed on the samples. The ortho-phosphate content will not be greater than the total phosphorus result.

Light blue = Exceedances of MCL concentrations
Light gray = Exceedances of Secondary Standards

National Maximum Contaminate Levels (USEPA 2002)

Inorganic Chemical	Standard
Arsenic	0.01 mg/L
Barium	2 mg/L
Cadmium	0.005 mg/L
Chromium (total)	0.1 mg/L
Copper	Action Level = 1.3
Cyanide (as free cyanide)	0.2 mg/L
Fluoride	4 mg/L
Lead	0.015 mg/L
Mercury (inorganic)	0.002 mg/L
Nitrate (measured as Nitrogen)	10 mg/L
Nitrite (measured as Nitrogen)	1 mg/L
Selenium	0.05 mg/L
Alpha particles	15 (pCi/L)
Beta particles and photon emitters	4 millirems/yr
Radium 226 & 228 (combined)	5 pCi/L
Uranium	30 ug/L

National Secondary Drinking Water Standards (USEPA 2002)

Contaminant	Standard
Aluminum	0.02 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor #
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids (TDS)	500 mg/L
Zinc	5 mg/L

Salinity Hazard (USDA)

Salinity	Conductivity (umhos/cm)	Dissolved solids (mg/L)
Low salinity, no detrimental effects expected	< 250	< 200
Medium salinity, detrimental effects to sensitive crops	250-750	200-500
High Salinity, adverse effects on many crops	750-2250	500-1500
Very high salinity, suitable only for salt tolerant plants	2250-5000	1500-3000

GROUNDWATER MW-7													
	Analyte	Units	April 17, 2007	June 5, 2006	May 16, 2005	June 17, 2004	May 19, 2003	May 9, 2002	May 14, 2001	May 1, 2000	April 20, 1999	April 30, 1998	June 19, 1997
Field Measurements	sample temperature @	deg C		21.4	10.7	19.8	20.3						
	Conductivity	umhos/cm	900	981	1100	1120	1330	1450	1450	1620	1540	1280	1310
	pH	units	8.5	8.46	8.29	8.5	8.2	8.2	8.2	8.2	8.1	8.4	8.5
Major Cations and Anions	Total Dissolved Solids	mg/L	590	598	666	754	829	924	1071	981	988	784	814
	Alkalinity, Bicarbonate	mg/L	340	353	480	354	473	469	767	486	544	459	452
	Alkalinity, Carbonate	mg/L	22	20	< 2	145	6.3	7.7	< 2	< 2	17.1	5.8	12.4
	Alkalinity, Total	mg/L	362	ND	480	499	479	477	767	486	561	465	464
	Chloride	mg/L	3.9	4.97	5.54	10.7	8.52	10.1	11.2	10.2	12.4	8.7	9.3
	Sulfate	mg/L	97	ND	159	154	216	261	265	268	276	177	195
	Calcium, dissolved	mg/L	3.3	5.95	5	6.2	8.5	9.47	13.1	10.5	11.2	7.2	8.2
	Magnesium, dissolved	mg/L	2	2.3	2.93	3.5	6.51	6.11	8.97	7.16	7.6	5.8	6.8
	Potassium, dissolved	mg/L	1.1	1.4	1.8	1.4	1.57	1.9	1.96	1.78	1.8	2.6	1.6
	Sodium, dissolved	mg/L	210	233	243	231	318	371	388	386	348	566	279
	Silica	mg/L	10	4.66	9.18							9.3	7.1
	Silica, as SiO2	mg/L	NA	ND		9.4	8.56	10.3	12.1	7.06	11.4		
Nutrients	Nitrate, as N	mg/L	0.16	< 0.05	< 0.05	1.07	0.71	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1
	Nitrite, as N	mg/L	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1	< 0.1
	Orthophosphate, as P	mg/L	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.18	< 0.5	< 0.5	< 0.5	< 0.5
Trace Metals	Arsenic, dissolved	mg/L	0.0055	0.005	0.0058	0.0047	0.0043	0.0029	0.0025	0.002	< 0.0005	< 0.0005	< 0.0005
	Barium, dissolved	mg/L	< 0.001	0.0211	0.018	0.0182	0.0198	0.0186	0.0176	0.02	0.02	0.03	0.03
	Cadmium, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Chromium, dissolved	mg/L	0.0012	< 0.001	0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Cyanide, Total	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	Fluoride	mg/L	1.3	1.39	1.41	1.74	2.61	2.54	2.59	2.4	2.5	2.2	1.6
	Lead, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Lead-210	pCi/L	3.2			0.100+/-0.2600	-0.51+/-0.17	1.09+/-0.33	5.91+/-0.35	7.70+/-0.23	8.11+/-0.33	3.63	2.22
	Manganese, dissolved	mg/L	0.0016	0.0028	0.0094	< 0.01	0.0155	0.0191	0.0335	0.0247	0.02	0.01	0.02
	Mercury	mg/L	< 0.0002	< 0.0002	< 0.0005	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0008	< 0.0002	< 0.0002	< 0.0002
	Molybdenum, dissolved	mg/L	0.0031	< 0.005	< 0.005	< 0.005	0.0046	0.0057	0.0061	0.006	0.007	< 0.005	< 0.005
	Selenium, dissolved	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Silver, dissolved	mg/L	< 0.001	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	Vanadium, dissolved	mg/L	< 0.005	< 0.002	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Zinc, dissolved	mg/L	0.0028	< 0.005	0.0059	0.017	< 0.005	0.067	< 0.005	0.01	< 0.005	< 0.005	< 0.005
Radiation	Gross Alpha	pCi/L	9.108			11.100+/-2.785	14.55+/-1.84	12.05+/-1.64	9.87+/-1.94	22.14+/-2.34	40.63+/-2.92	34.03	40.06
	Gross Beta	pCi/L	3.893			-15.540+/-3.888	7.30+/-2.41	11.03+/-1.22	11.98+/-2.02	19.80+/-1.94	27.42+/-2.26	15.42	12.38
	Polonium 210	pCi/L	0.777			0.353+/-0.04	0.08+/-0.08	0.08+/-0.04	0.26+/-0.09	0.08+/-0.05	4.85+/-0.57	5.02	0.67
	Radium-226	pCi/L	4.208			4.550+/-1.5800	2.15+/-0.27	2.49+/-0.24	4.07+/-0.33	5.71+/-0.44	10.91+/-1.01	8.27	5.35
	Total Uranium	pCi/L	1.515			0.140+/-0.000	30.68+/-10.73	0.01+/-0.001	0.002+/-0.0008	0.0147+/-0.0017	1.63+/-0.09	12.02	0.74

GROUNDWATER MW-7							
	Analyte	Units	Number	Mean	Maximum	Minimum	Median
Field Measurements	sample tempera	deg C					
	Conductivity	umhos/cm	11	1280.091	1620	900	1310
	pH	units	11	8.322727	8.5	8.1	8.29
Major Cations and Anions	Total Dissolved	mg/L	11	818.0909	1071	590	814
	Alkalinity, Bicarl	mg/L	11	470.6364	767	340	469
	Alkalinity, Carbo	mg/L	11	22.02727	145	2	7.7
	Alkalinity, Total	mg/L	10	504	767	362	479.5
	Chloride	mg/L	11	8.684545	12.4	3.9	9.3
	Sulfate	mg/L	10	206.8	276	97	205.5
	Calcium, dissolv	mg/L	11	8.056364	13.1	3.3	8.2
	Magnesium, dis	mg/L	11	5.425455	8.97	2	6.11
	Potassium, diss	mg/L	11	1.719091	2.6	1.1	1.78
	Sodium, dissolv	mg/L	11	324.8182	566	210	318
	Silica	mg/L	5	8.048	10	4.66	9.18
	Silica, as SiO2	mg/L	6	9.803333	12.1	7.06	9.85
Nutrients	Nitrate, as N	mg/L	11	0.230909	1.07	0.05	0.1
	Nitrite, as N	mg/L	11	0.109091	0.5	0.05	0.05
	Orthophosphate	mg/L	11	0.266364	0.5	0.05	0.18
Trace Metals	Arsenic, dissolv	mg/L	11	0.003109	0.0058	0.0005	0.0029
	Barium, dissolv	mg/L	11	0.019482	0.03	0.001	0.0198
	Cadmium, disso	mg/L	11	0.000545	0.001	0.0005	0.0005
	Chromium, diss	mg/L	11	0.001109	0.002	0.001	0.001
	Cyanide, Total	mg/L	11	0.01	0.01	0.01	0.01
	Fluoride	mg/L	11	2.025455	2.61	1.3	2.2
	Lead, dissolved	mg/L	11	0.000545	0.001	0.0005	0.0005
	Lead-210	pCi/L	3	3.016667	3.63	2.22	3.2
	Manganese, dis	mg/L	11	0.015145	0.0335	0.0016	0.0155
	Mercury	mg/L	11	0.000282	0.0008	0.0002	0.0002
	Molybdenum, di	mg/L	11	0.005227	0.007	0.0031	0.005
	Selenium, disso	mg/L	11	0.002136	0.005	0.0005	0.0005
	Silver, dissolved	mg/L	11	0.000545	0.001	0.0005	0.0005
	Vanadium, disso	mg/L	11	0.001455	0.005	0.001	0.001
	Zinc, dissolved	mg/L	11	0.012064	0.067	0.0028	0.005
Radiation	Gross Alpha	pCi/L					
	Gross Beta	pCi/L					
	Polonium 210	pCi/L					
	Radium-226	pCi/L					
	Total Uranium	pCi/L					

1997 Data: "E" - Analyte concentration (result) is an estimated value or exceeds analysis calibration range
1997 Comments: Samples analyzed for ortho-phosphate were received outside of EPA recommended holding time & the results were estimated.
Total Phosphrus was performed on samples. The ortho-phosphate content will not be greater than the total phosphorus result.

Light blue = Exceedances of MCL concentrations
Light gray = Exceedances of Secondary Standards

National Maximum Contaminate Levels (USEPA 2002)

Inorganic Chemical	Standard
Arsenic	0.01 mg/L
Barium	2 mg/L
Cadmium	0.005 mg/L
Chromium (total)	0.1 mg/L
Copper	Action Level = 1.3
Cyanide (as free cyanide)	0.2 mg/L
Fluoride	4 mg/L
Lead	0.015 mg/L
Mercury (inorganic)	0.002 mg/L
Nitrate (measured as Nitrogen)	10 mg/L
Nitrite (measured as Nitrogen)	1 mg/L
Selenium	0.05 mg/L
Alpha particles	15 (pCi/L)
Beta particles and photon emitters	4 millirems/yr
Radium 226 & 228 (combined)	5 pCi/L
Uranium	30 ug/L

National Secondary Drinking Water Standards (USEPA 2002)

Contaminant	Standard
Aluminum	0.02 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor #
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids (TDS)	500 mg/L
Zinc	5 mg/L

Salinity Hazard (USDA)

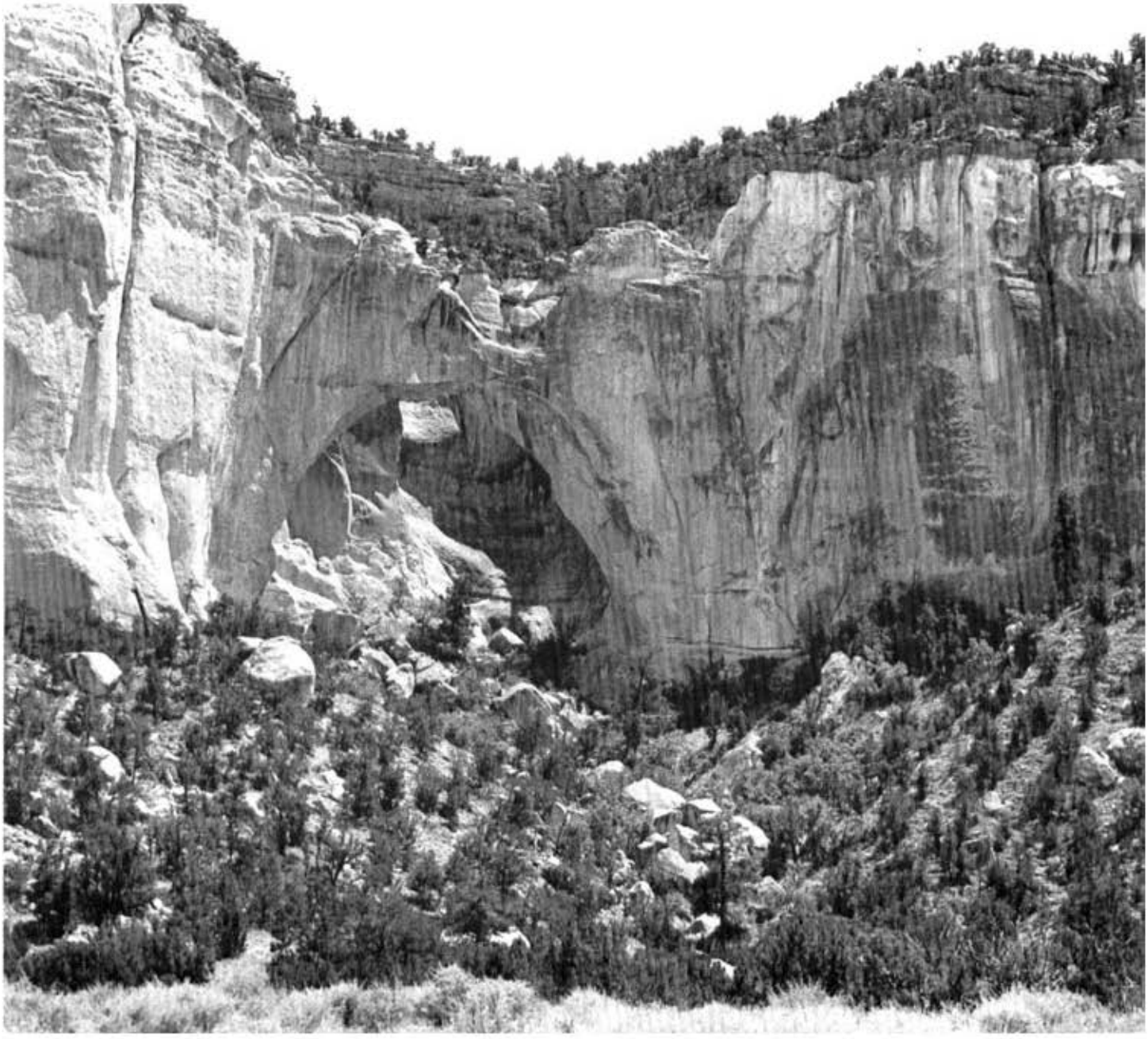
Salinity	Conductivity (umhos/cm)	Dissolved solids (mg/L)
Low salinity, no detrimental effects expected	< 250	< 200
Medium salinity, detrimental effects to sensitive crops	250-750	200-500
High Salinity, adverse effects on many crops	750-2250	500-1500
Very high salinity, suitable only for salt tolerant plants	2250-5000	1500-3000

United States Department of Agriculture

Soil Conservation Service

In cooperation with United States Department of the Interior, Bureau of Indian Affairs and Bureau of Land Management, and New Mexico Agricultural Experiment Station

Soil Survey of Cibola Area, New Mexico, Parts of Cibola, McKinley, and Valencia Counties



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How To Use This Soil Survey

General Soil Map

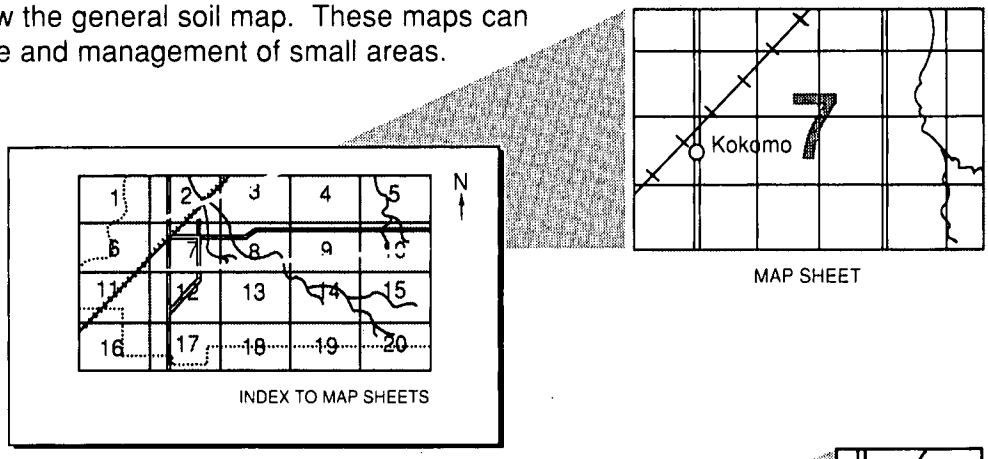
The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

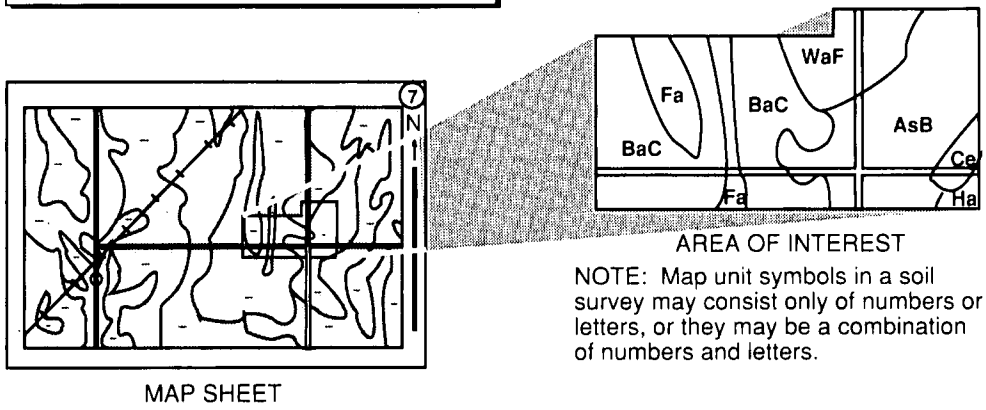
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1984. Soil names and descriptions were approved in 1985. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1984. This survey was made cooperatively by the Soil Conservation Service; United States Department of the Interior, Bureau of Indian Affairs and Bureau of Land Management; and the New Mexico Agricultural Experiment Station. It is part of the technical assistance furnished to the Lava, McKinley, Quemado, and Valencia Soil and Water Conservation Districts.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

All programs and services of the Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, sex, religion, marital status, handicap, or age.

Cover: La Ventana, a sandstone landmark east of The Narrows, in an area of Rock outcrop-Vessilla-Mion complex, 3 to 55 percent slopes.

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Foreword

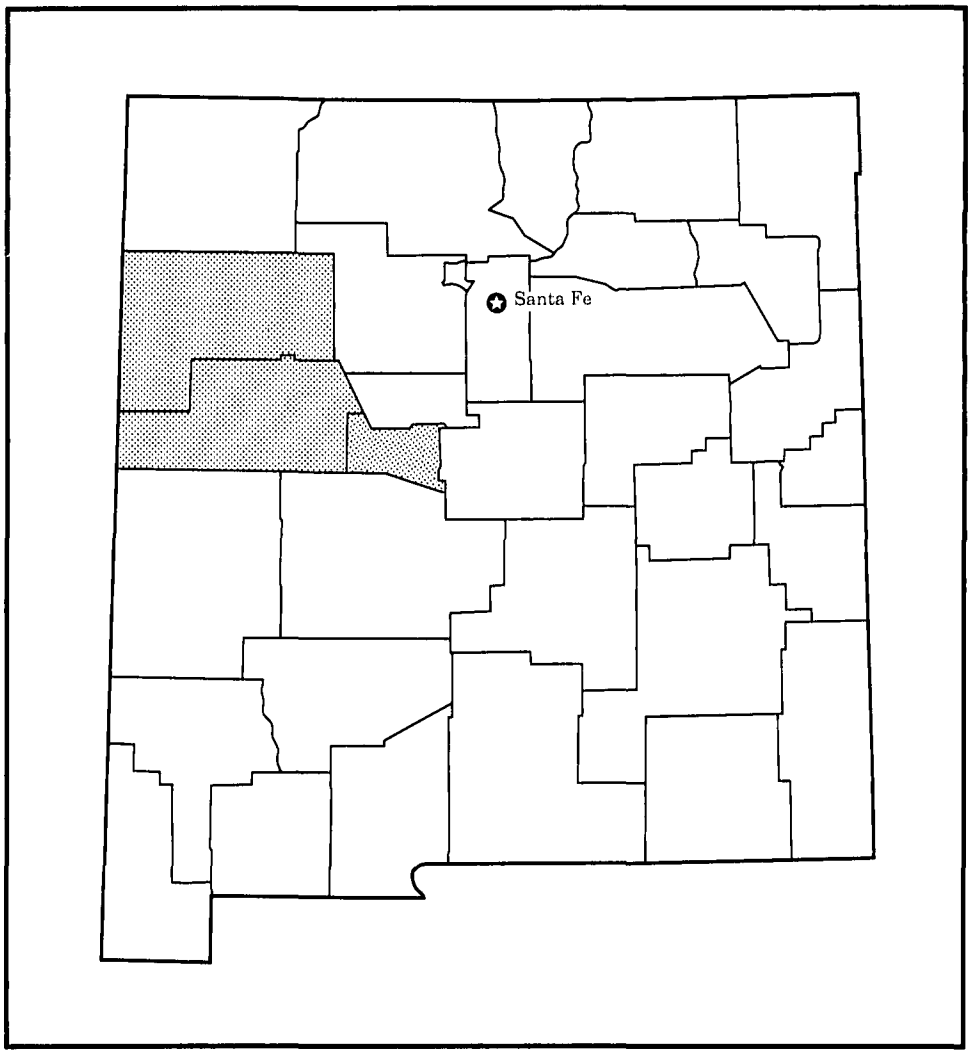
This soil survey contains information that can be used in land-planning programs in the survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

Ray T. Margo, Jr.
State Conservationist
Soil Conservation Service



Location of Cibola Area in New Mexico.

Soil Survey of Cibola Area, New Mexico,
Parts of Cibola, McKinley, and Valencia Counties

By Tommie Lee Parham, Soil Conservation Service

Fieldwork by Tommie Lee Parham, Clarence L. Chavez, Clarence E. Montoya, Michael W. Roybal, and Jon K. Melhus, Soil Conservation Service, and William M. Rigdon, Bureau of Indian Affairs

Vegetative work by Michael J. Delancey and Richard J. Reioux, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service,
in cooperation with
United States Department of the Interior, Bureau of Indian Affairs and Bureau of Land Management, and New Mexico Agricultural Experiment Station

This survey area is in the west-central part of New Mexico. It has a total area of 2,696,480 acres, or about 4,213 square miles. In 1980, Cibola County had a population of 30,109 and Grants, the largest city in the survey area, had a population of about 11,635. Grants became the county seat when Cibola County was established in 1981. The county was originally part of Valencia County.

Elevation in the survey area ranges from about 5,250 feet in an area near the Rio Puerco to 10,300 feet in an area north of Water Canyon, near Mount Taylor. Most areas are at elevations of 6,000 to 8,000 feet.

The eastern one-fifth of the survey area is mainly rangeland and does not support trees. It is characterized by limestone and gypsum hills and a few basalt-capped mesas.

The western part of the survey area, which is within the Colorado Plateau physiographic province, generally is characterized by rough, broken terrain, including small, steep mountainous areas, plateaus, and mesas intermingled with steep canyon walls, escarpments, and valleys.

The part of the survey area that has been subject to the most volcanic activity extends from Mount Taylor to the southwestern corner of the survey area. This part includes numerous volcanic plugs, such as Bandera Crater and Cerro Alto.

The survey area has very little surface water. The major bodies of water are Bluewater and Ramah Lakes (fig. 1). The Rio San Jose, in the central part of the area, and the Rio Puerco, in the eastern part, are the major tributaries.

Precipitation in the survey area varies with elevation. It ranges from about 7 inches in one of the lowest areas near the Rio Puerco to 25 inches east of Mount Taylor, the highest mountain in the area.

Coal mining, commercial woodcutting, and ranching are the most important enterprises in the survey area. Uranium mining formerly was important, but a decrease in demand has resulted in the closing of most uranium mines in the area. The ranches are mainly cow-calf enterprises, but some are yearling enterprises. Parts of the Bluewater Valley, the San Mateo area, the Grants-Milan area, the Seboyeta-Bibo area, and the Ramah Valley are used for farming. The survey area has about 4,500 acres of irrigated cropland and 1,500 acres of nonirrigated cropland. The main crops are alfalfa hay, corn, and wheat. Other crops include vegetables, orchard crops, and Irish potatoes. Some areas are used as irrigated pasture.

Parts of this survey area were included in the soil surveys of the Bluewater Area, New Mexico, published in 1958, and the Zuni Mountain Area, New Mexico, published in 1967. This survey updates the earlier surveys. It provides additional information and has larger maps, which show the soils in greater detail.

Figure 1.—Bluewater Lake, in the northwestern part of the survey area, is a popular recreation area in New Mexico.

Climate

Prepared by the State Climatologist, Las Cruces, New Mexico.

The average annual precipitation in this survey area generally ranges from about 9 inches at elevations of less than 6,000 feet to more than 12 inches at elevations of about 7,000 feet. The higher mountain peaks receive as much as 25 inches or more. The amounts can vary greatly from year to year. For example, San Fidel received a total of 22.41 inches in 1941, but Laguna received only 1.96 inches in 1956. The highest monthly total, recorded at the El Morro National Monument in August 1947, was 8.93 inches.

The average number of days with 0.1 inch or more of precipitation ranges from 25 at the lower elevations to 40 or more at the higher elevations. Generally, 3 to 6 days a year receive at least 0.5 inch of precipitation.

The rainy season is in summer. About half of the average annual precipitation falls during the period July through September, mostly during brief thunderstorms that are sometimes heavy. The thunderstorms are occasionally accompanied by hail and strong, gusty winds. Nearly three-fourths of the annual precipitation falls during the period May through October.

The main source of moisture in summer is the Gulf of Mexico. Moisture is carried into New Mexico by southeasterly winds from the Bermuda high pressure area. Occasionally, some moisture also is received from the eastern subtropical Pacific. In winter most of the precipitation is from storms that originate in the Pacific Ocean and move inland. Because much of the moisture from these storms is removed by the mountains to the west of New Mexico, precipitation generally is light in winter.

The average annual snowfall ranges from about 1 foot at the lower elevations to 4 feet or more at the higher elevations. In the winter of 1974-75, a total of 102.8 inches of snow fell at the El Morro National Monument. Most of the snow falls during the period November through March, but it can fall as late as May at the higher elevations.

The average annual temperature ranges from about 54 degrees F at the lower elevations to about 47 degrees at the higher elevations. It may be even lower, however, in the highest mountainous areas. The diurnal temperature range is quite wide. It averages about 33 degrees. The highest recorded temperature is 104 degrees, which occurred at San Fidel on July 7, 1966, and the lowest is -38 degrees, which occurred at the El Morro National Monument on January 13 and 15, 1963. The average number of days when temperatures of 90 degrees or higher occur ranges from about 50 per year at the lower elevations to 15 or less at the higher elevations. The average number of days with freezing temperatures ranges from 150 at the lower elevations to 200 or more at the higher elevations. The average number of days when temperatures of zero or below occur ranges from 2 at the lower elevations to 11 or more at the higher elevations.

The freeze-free period ranges from about 110 days at the El Morro National Monument, which has an elevation of 7,225 feet, to 156 days at Laguna, which has an elevation of 5,800 feet. The sun shines an average of 3,100 hours annually, or 70 percent of the time possible. The range is 65 percent of the time possible in January to 75 percent in July. At the El Morro National Monument, the relative humidity averages 77 percent early in the morning. It averages 39 percent in the afternoon during all months of the year, except for June, when it averages only about 25 percent. Estimated evaporation ranges from about 50 inches per year at the higher elevations to 60 inches per year at the lower elevations. The average annual windspeed is 10 miles per hour at Acomita. The windiest period is in March. The winds are most frequently from the west.

Table 1 gives temperature and precipitation data as recorded at Grants and Laguna.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils

systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by two or three kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The general map units in this survey have been grouped for broad interpretive purposes. Each of the broad groups and the map units in each group are described on the following pages.

Soil Descriptions

Lava Flows, Dry Soils, and Rock Outcrop in Areas of Hills, Mesas, Ridges, Valleys Between Lava Ridges, Cuestas, Fan Terraces, and Swales

This group consists of six map units. It makes up about 23 percent of the survey area. The native vegetation is grasses, shrubs, and scattered trees. Elevation is 5,800 to 7,100 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 115 to 145 days.

The soils in this group formed in alluvial and eolian material. They are used mainly for livestock grazing and wildlife habitat.

1. Lava Flows-Viuda

Lava flows and shallow soils, mainly on hills and ridges

This map unit is mainly on hills and ridges in the central part of the survey area. Slope is 1 to 15 percent. The vegetation is mainly grasses, shrubs, and scattered trees. Elevation is 6,200 to 7,100 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 115 to 145 days.

This unit makes up about 3.3 percent of the survey area. It is about 85 percent Lava flows and similar miscellaneous areas, 10 percent Viuda and similar soils, and 5 percent soils of minor extent.

Lava flows occur as barren or nearly barren areas of exposed lava. They have very sharp, jagged surfaces. Vegetation generally is limited to cracks and crevasses and included soils.

Viuda soils are on hills and ridges. These soils are shallow and well drained. They formed in alluvium and windblown sediments over basalt. Typically, the surface layer is brown very cobbly sandy loam about 3 inches thick. The subsoil is about 16 inches of brown and light brown clay and cobbly clay loam. Basalt is at a depth of about 19 inches.

Of minor extent in this unit are the deep Penistaja and moderately deep Hagerman soils in valleys between lava ridges.

This unit is used for livestock grazing and wildlife habitat. The main limitations are the rough, broken terrain, the depth to bedrock, rock outcrops, a restricted rooting depth, and stones on the surface. The vegetation is sparse.

This unit of limited grassland supports a diverse plant community of shrubs and junipers, which enhance the habitat for wildlife. Local areas receive surface runoff and support a more dense shrub or woodland habitat. Characteristic wildlife include coyote, bobcat, gray fox, cottontail, wood rat, rock wren, brown towhee, chipping sparrow, short-horned lizard, and black-tailed rattlesnake.

2. Poley-Rock Outcrop-Flaco

Moderately deep and deep soils and Rock outcrop, mainly on hills, ridges, and mesas

This map unit is mainly on hills, ridges, and mesas in the southeastern and south-central parts of the survey area. Slope is 1 to 25 percent. The vegetation is mainly

grasses, shrubs, and scattered juniper. Elevation is 5,900 to 7,100 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 145 days.

This unit makes up about 6.9 percent of the survey area. It is about 40 percent Poley and similar soils, 25 percent Rock outcrop, 20 percent Flaco and similar soils, and 15 percent soils of minor extent. Areas near the Socorro County line may have a higher percentage of minor soils.

Poley soils are on hills and ridges. These soils are deep and well drained. They formed in alluvium and colluvium derived dominantly from shale. Typically, the surface layer is reddish brown very cobbly loam about 3 inches thick. The upper part of the subsoil is reddish brown and yellowish red clay about 19 inches thick, and the lower part to a depth of 60 inches or more is light reddish brown and pink clay and clay loam.

Rock outcrop consists of barren or nearly barren areas of exposed basalt and sandstone.

Flaco soils are on basalt-capped mesas. These soils are moderately deep and well drained. They formed in mixed alluvium and windblown sediments. Typically, the surface layer is yellowish brown loam about 2 inches thick. The subsoil is about 27 inches thick. The upper 9 inches is yellowish brown loam and clay loam, and the lower 18 inches is yellowish brown and light yellowish brown clay loam and loam. Unweathered basalt is at a depth of about 29 inches.

Of minor extent in this unit are the shallow Berto soils on mesa tops, the moderately deep Hagerman and deep Harvey and Penistaja soils on mesas, the deep Pojoaque and Rana soils on mesa breaks, and the shallow Mion soils on hills.

This unit is used for livestock grazing and wildlife habitat. The main limitations are the Rock outcrop, the depth to bedrock in the Flaco soils, and the clayey texture of the Poley soils.

The ledges and rocky areas in this unit provide habitat for some kinds of wildlife. The unit supports a plant community of grasses, shrubs, and scattered juniper. Characteristic wildlife include coyote, cottontail, bobcat, wood rat, rock squirrel, flycatcher, wren, and crow. Most areas support only a few mule deer, but larger populations are on Sierra Lucero.

3. Viuda-Penistaja

Shallow and deep soils, mainly on hills and ridges and in valleys between lava ridges

This map unit is mainly on hills and ridges and in valleys between lava ridges in the south-central part of the survey area. Slope is 1 to 12 percent. The vegetation is mainly grasses and shrubs. Elevation is 6,000 to 7,000 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit makes up about 2.9 percent of the survey area. It is about 40 percent Viuda and similar soils, 35 percent Penistaja and similar soils, and 25 percent components of minor extent. Areas near the Catron County line may have a higher percentage of some minor components.

Viuda soils are on hills and ridges. These soils are shallow and well drained. They formed in alluvium and windblown sediments. Typically, the surface layer is brown very cobbly sandy loam about 3 inches thick. The subsoil is about 16 inches of brown clay and light brown cobbly clay loam. Unweathered basalt is at a depth of about 19 inches.

Penistaja soils are on ridges and in valleys between lava ridges. These soils are deep and well drained. They formed in wind-modified, mixed alluvium. Typically, the surface layer is brown sandy loam about 2 inches thick. The upper part of the subsoil is strong brown sandy clay loam about 20 inches thick. The lower part of the subsoil and the substratum to a depth of 60 inches are light brown and reddish brown sandy loam.

Of minor extent in this unit are Rock outcrop on lava ridges, the deep Aparejo and Venadito soils in valleys, and the deep Ildefonso soils on ridges.

This unit is used for livestock grazing and wildlife habitat. The main limitations are the depth to bedrock and rock fragments on the surface in areas of the Viuda soils.

This unit, which is referred to as the North Plains, is a large, open area of grassland that supports extensive stands of snakeweed and rubber rabbitbrush. Small, shallow playas retain surface water during wet periods.

This unit provides good habitat for pronghorn antelope. Other characteristic wildlife include black-tailed jackrabbit, coyote, ground squirrel, horned lark, golden eagle, and loggerhead shrike. During wet periods migrating waterfowl and shore birds frequent the shallow playas.

4. Hagerman-Rock Outcrop-Mion

Shallow and moderately deep soils and Rock outcrop, mainly on mesas, cuestas, hills, and ridges

This map unit is mainly on mesas, cuestas, hills, and ridges in the northeastern part of the survey area. Slope is 1 to 65 percent. The vegetation is mainly grasses, shrubs, and scattered oneseed juniper. Elevation is

6,000 to 7,000 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit makes up about 6.1 percent of the survey area. It is about 40 percent Hagerman and similar soils, 25 percent Rock outcrop, 15 percent Mion and similar soils, and 20 percent components of minor extent. Areas near the Bernalillo County line may have a higher percentage of some minor components.

Hagerman soils are on mesas and cuestas. These soils are moderately deep and well drained. They formed in eolian and alluvial material derived dominantly from sandstone. Typically, the surface layer is brown fine sandy loam about 3 inches thick. The subsurface layer is dark brown fine sandy loam about 3 inches thick. The upper part of the subsoil is brown sandy clay loam about 17 inches thick, and the lower part is strong brown and light brown sandy loam about 11 inches thick. Sandstone is at a depth of about 34 inches.

Rock outcrop consists of barren or nearly barren areas of exposed sandstone and shale on hills and ridges.

Mion soils are on hills and ridges. These soils are shallow and well drained. They formed in alluvium and colluvium derived dominantly from shale. Typically, the surface layer is light olive brown stony loam about 3 inches thick. The underlying material is about 10 inches of grayish brown silty clay and silty clay loam. Shale is at a depth of about 13 inches.

Of minor extent in this unit are the shallow Bond and Skyvillage soils on cuestas and mesas, Badland on hills and ridges, and the deep Penistaja soils on cuestas.

This unit is used for livestock grazing and wildlife habitat. The main limitations are the depth to bedrock, the slope, and the Rock outcrop.

This unit provides grassland habitat that supports only scattered oneseed juniper. Characteristic wildlife include coyote, black-tailed jackrabbit, prairie dog, mourning dove, toad, and prairie rattlesnake.

5. Winona-Rock Outcrop-Tanbark

Shallow and very shallow soils and Rock outcrop, mainly on mesas, hills, and ridges

This map unit is on mesas, hills, and ridges in the southeastern part of the survey area. Slope is 1 to 60 percent. The vegetation is mainly grasses and shrubs. Elevation is 5,800 to 6,500 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit makes up about 1.9 percent of the survey area. It is about 40 percent Winona and similar soils, 25 percent Rock outcrop, 20 percent Tanbark and similar soils, and 15 percent soils of minor extent. Areas near the Socorro County line may have a higher percentage of minor soils.

Winona soils are on mesas, hills, and ridges. These soils are shallow or very shallow and are well drained. They formed in windblown sediments derived dominantly from limestone. Typically, the surface layer is brown very gravelly loam about 3 inches thick. The subsoil is pale brown and very pale brown very cobbly loam about 7 inches thick. Unweathered limestone is at a depth of about 10 inches.

Rock outcrop consists of barren or nearly barren areas of exposed limestone on hills and ridges.

Tanbark soils are on ridges and hills. These soils are shallow and well drained. They formed in eolian material derived dominantly from gypsum. Typically, the surface layer is very pale brown loam about 2 inches thick. The underlying material is about 15 inches of very pale brown and white, gypsiferous silt loam and sandy loam. Unweathered gypsum is at a depth of about 17 inches.

Of minor extent in this unit are the deep Harvey soils on mesa tops, the shallow Rizozo and Mion soils on hills, and the deep Oelop soils in swales.

This unit is used for livestock grazing and wildlife habitat. The main limitations are the slope, the depth to bedrock, and the content of gypsum in the Tanbark soils.

This unit consists of desert grassland that includes areas of sparse shrubs along drainageways and areas that are barren and eroded. The unit provides fair habitat for pronghorn antelope, but the habitat for mule deer is very poor. Characteristic wildlife include coyote, badger, kangaroo rat, black-tailed jackrabbit, prairie lark, scaled quail, and prairie rattlesnake.

6. Harvey-Netoma-Oelop

Deep soils, mainly on mesas, fan terraces, and hills and in swales

This map unit is on mesas, fan terraces, and hills and in swales in the southeastern part of the survey area. Slope is 0 to 12 percent. The vegetation is mainly grasses and shrubs. Elevation is 5,800 to 6,500 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit makes up about 1.7 percent of the survey area. It is about 35 percent Harvey and similar soils, 25

percent Netoma and similar soils, 20 percent Oelop and similar soils, and 20 percent soils of minor extent. Areas near the Socorro County line and the Valencia County line may have a higher percentage of minor soils.

Harvey soils are on mesas. These soils are deep and well drained. They formed in mixed alluvium and windblown sediments. Typically, the surface layer is brown loam about 2 inches thick. The upper part of the subsoil is reddish yellow and light brown clay loam about 16 inches thick, and the lower part to a depth of 60 inches is pink loam.

Netoma soils are on fan terraces and hills. These soils are deep and well drained. They formed in alluvium derived dominantly from gypsiferous material. Typically, the surface layer is strong brown sandy loam about 4 inches thick. The upper part of the subsoil is strong brown sandy loam about 8 inches thick, and the lower part to a depth of 60 inches is light brown and reddish yellow, gypsiferous sandy loam.

Oelop soils are in swales. These soils are deep and well drained. They formed in mixed alluvium. Typically, the surface layer is dark yellowish brown loam about 3 inches thick. The upper part of the subsoil is dark yellowish brown clay loam about 13 inches thick, and the lower part to a depth of 60 inches is dark yellowish brown clay loam and loam.

Of minor extent in this unit are the deep Penistaja soils on cuestas, the shallow Bond and Rizozo soils on hills and ridges, and the gypsiferous Tanbark and Saido soils on hills and plains.

This unit is used for livestock grazing and wildlife habitat. The main limitations are the high content of calcium carbonate in the Harvey soils and the high content of gypsum in the Netoma soils.

This unit consists of desert grassland that includes areas of sparse shrubs along drainageways and areas that are barren and eroded. The unit provides fair habitat for pronghorn antelope, but the habitat for mule deer is very poor. Characteristic wildlife include coyote, badger, kangaroo rat, meadowlark, prairie lark, scaled quail, and prairie rattlesnake.

Moist Soils and Rock Outcrop in Areas of Hills, Ridges, Mesas, Fan Terraces, Alluvial Fans, Valleys Between Lava Ridges, Other Valleys, and Plateaus

This group consists of six map units. It makes up about 51 percent of the survey area. The native vegetation is pinyon, juniper, shrubs, and grasses. Elevation is 6,400 to 7,500 feet. The average annual precipitation is about 12 to 16 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 100 to 135 days.

The soils in this group formed in alluvial and eolian material. They are used mainly for livestock grazing, fuel wood production, and wildlife habitat.

7. Laporte-Rock Outcrop

Shallow soils and Rock outcrop, mainly on hills and ridges

This map unit is on hills and ridges in the central part of the survey area. Slope is 1 to 60 percent. The vegetation is mainly trees, shrubs, and an understory of grasses. Elevation is 6,500 to 7,200 feet. The average annual precipitation is about 12 to 15 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 110 to 135 days.

This unit makes up about 2.3 percent of the survey area. It is about 50 percent Laporte and similar soils, 35 percent Rock outcrop, and 15 percent soils of minor extent.

Laporte soils are on hills and ridges. These soils are shallow and well drained. They formed in mixed colluvium and windblown sediments. Typically, the surface layer is dark brown gravelly loam about 3 inches thick. The underlying material is dark grayish brown gravelly loam about 8 inches thick. Limestone is at a depth of about 11 inches.

Rock outcrop consists of barren or nearly barren areas of exposed limestone on hills and ridges.

Of minor extent in this unit are the moderately deep Celacy soils on hills; the shallow Atarque, Mion, and Vessilla soils on hills and ridges; and the deep Flugle and Goesling soils on hills.

This unit is used for livestock grazing, limited wood products, and wildlife habitat (fig. 2). The main limitations are the slope, the depth to bedrock, and the windthrow hazard.

This unit of rocky hillsides and ledges provides brushy habitat for mule deer, cottontail, bobcat, ring-tailed cat, scrub jay, great horned owl, chickadee, and raven. Areas in and around Bluewater Lake and Bluewater Creek provide aquatic and riparian habitat for coot, herons, mallard, teal, muskrat, raccoon, toads, and frogs.

8. Flugle-Catman-Rock Outcrop

Deep soils and Rock outcrop, mainly on mesas, fan terraces, and alluvial fans and in valleys

This map unit is on mesas, fan terraces, and alluvial fans and in valleys in the western and south-central parts of the survey area (fig. 3). Slope is 1 to 8 percent. The vegetation is mainly grasses, shrubs, and trees. Elevation is 6,400 to 7,300 feet. The average annual

Figure 2.—Typical area of the Laporte-Rock outcrop general soil map unit, near Bluewater Lake. This unit provides brushy habitat for a variety of wildlife.

precipitation is about 11 to 14 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 115 to 135 days.

This unit makes up about 19.2 percent of the survey area. It is about 40 percent Flugle and similar soils, 25 percent Catman and similar soils, 15 percent Rock outcrop, and 20 percent soils of minor extent. Areas near the Catron County line may have a higher percentage of some minor soils.

Flugle soils are on mesas and fan terraces. These soils are deep and well drained. They formed in wind-modified alluvium. Typically, the surface layer is brown loamy fine sand about 5 inches thick. The upper part of the subsoil is strong brown and brown sandy clay loam about 22 inches thick, and the lower part to a depth of 60 inches is light brown and pink sandy clay loam and sandy loam.

Catman soils are on alluvial fans and in valleys.

These soils are deep and well drained. They formed in alluvium derived dominantly from shale. Typically, the surface layer is light olive brown clay loam about 3 inches. The underlying material to a depth of 60 inches is light olive brown clay.

Rock outcrop consists of barren or nearly barren areas of exposed sandstone and shale on the edges of mesas.

Of minor extent in this unit are the deep Moncha, Goesling, and Teco soils on mesas and fan terraces; the deep Venadito, Hickman, and Catman Variant soils in valleys and on flood plains; the shallow Mion and Vessilla soils on hills; the shallow Atarque and moderately deep Celacy soils on mesas; and the deep Silkie soils on valley sides.

This unit is used for livestock grazing, fuel wood production, and wildlife habitat.

This unit is mainly grassland that supports only scattered shrubs and juniper. Sagebrush and greasewood are the dominant plants on the eroded bottom of some drainageways. Areas of wetland and riparian habitat are along Cebolla Creek. Areas of Catman Variant soils, which have a high water table, provide riparian habitat. Areas of nonirrigated and irrigated cropland contribute to the diverse habitat in this unit.

Characteristic wildlife include pronghorn antelope, black-tailed jackrabbit, coyote, prairie dog, ground squirrel, meadowlark, prairie lark, and prairie rattlesnake. The wildlife in the aquatic areas include

Figure 3.—Typical area of the Flugle-Catman-Rock outcrop general soil map unit.

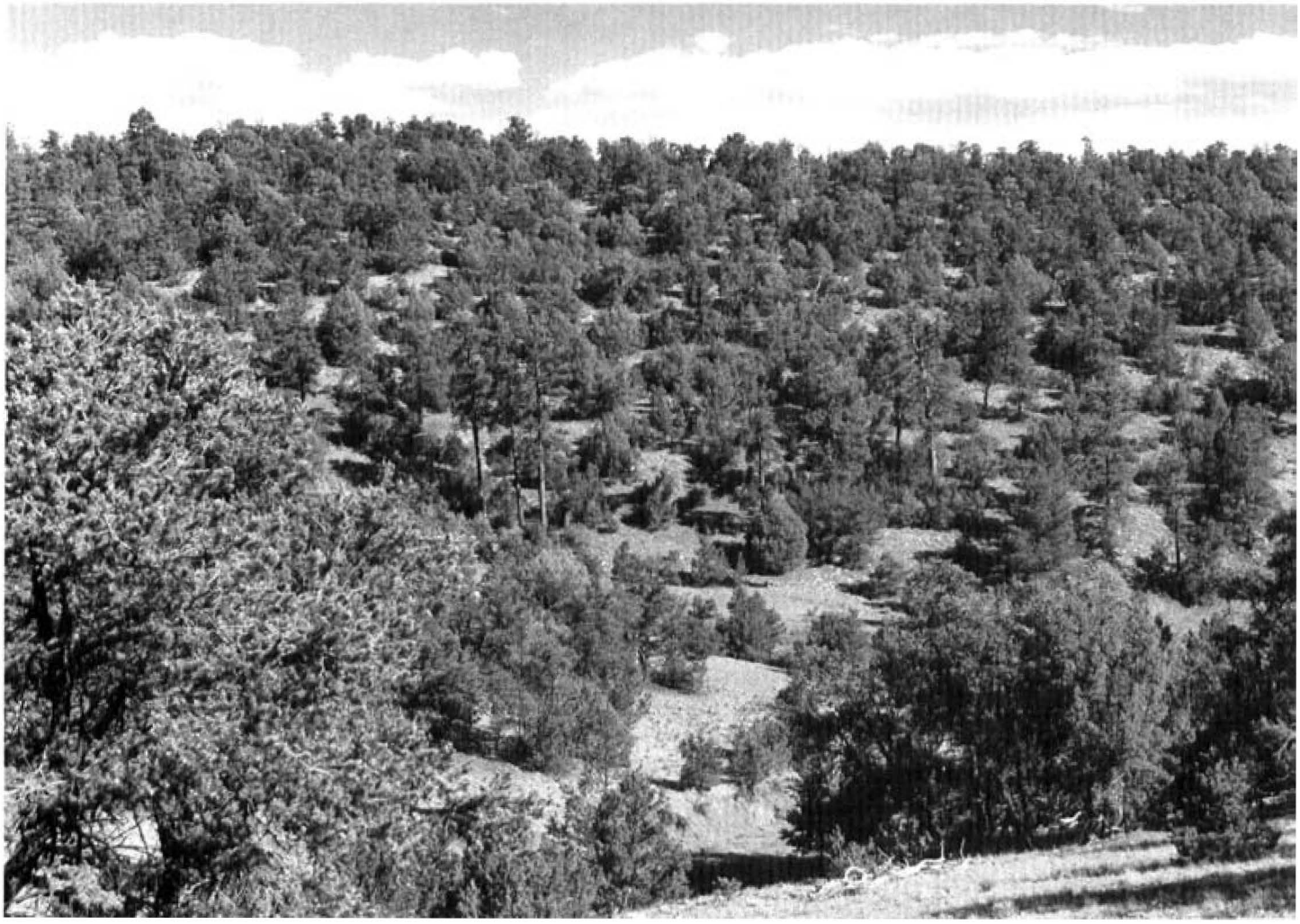


Figure 4.—Typical area of the Pinitos-Galestina-Mion general soil map unit.

muskrat, raccoon, rail, blackbird, coot, leopard frog, and garter snake.

9. Pinitos-Galestina-Mion

Shallow and deep soils, mainly on mesas, hills, and ridges

This map unit is on mesas, hills, and ridges in the western and south-central parts of the survey area (fig. 4). Slope is 1 to 55 percent. The vegetation is mainly trees, grasses, and shrubs. Elevation is 6,800 to 7,500 feet. The average annual precipitation is about 13 to 16 inches, the average annual air temperature is 47 to 51 degrees F, and the average frost-free period is 100 to 120 days.

This unit makes up about 12.7 percent of the survey area. It is about 35 percent Pinitos and similar soils, 25 percent Galestina and similar soils, 20 percent Mion and similar soils, and 20 percent components of minor extent. Areas near the Catron County line and the Socorro County line may have a higher percentage of some minor components.

Pinitos soils are on mesas and hills. These soils are deep and well drained. They formed in wind-modified alluvium. Typically, the surface layer is light brown sandy loam about 2 inches thick. The upper part of the subsoil is brown and light brown sandy clay loam about 22 inches thick, and the lower part to a depth of 60 inches is light yellowish brown sandy loam.

Galestina soils are on hills and mesas. These soils are deep and well drained. They formed in alluvium derived dominantly from shale. Typically, the surface layer is yellowish brown sandy loam about 2 inches thick. The subsurface layer is yellowish brown loam

about 5 inches thick. The upper 24 inches of the subsoil is yellowish brown clay, and the lower 15 inches is yellowish brown and light yellowish brown clay and clay loam. Shale is at a depth of 46 inches.

Mion soils are on ridges. These soils are shallow and well drained. They formed in colluvium and alluvium derived dominantly from shale. Typically, the surface layer is light olive brown stony loam about 3 inches thick. The underlying material is about 8 inches of grayish brown silty clay and silty clay loam. Shale is at a depth of about 13 inches.

Of minor extent in this unit are the deep Catman and Hickman soils on valley bottoms; the deep Montecito, Loarc, Millpaw, and Teco soils on mesas; the moderately deep Ribera and Nogal soils on mesas; the shallow Vessilla soils on hills; and Rock outcrop on hills and ridges.

This unit is used for fuel wood production, livestock grazing, and wildlife habitat. The main limitations are the clayey texture of the Galestina and Mion soils and the shallow depth of the Mion soils.

This unit provides large areas of brushy habitat on breaks and mesas and scattered areas of oak, ponderosa pine, and large pinyon. Characteristic wildlife include mule deer, fox, bobcat, wood rat, chipmunk, scrub jay, kestrel, turkey, great horned owl, flycatcher, nuthatch, and junco. Areas along the Arizona border provide habitat for a fair number of pronghorn antelope. The habitat for mule deer in this unit is fair in the western part of the survey area but is poor in the areas south and east of Ramah. The area west of Cebollita Mesa provides good winter range for mule deer.

10. Teco-Cabezon

Shallow and deep soils, mainly on mesas and ridges

This map unit is mainly on mesas and ridges in the northwestern part of the survey area. Slope is 1 to 12 percent. The vegetation is grasses, shrubs, and trees. Elevation is 6,600 to 7,100 feet. The average annual precipitation is about 11 to 15 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 110 to 135 days.

This unit makes up about 9.3 percent of the survey area. It is about 40 percent Teco and similar soils, 40 percent Cabezon and similar soils, and 20 percent soils of minor extent.

Teco soils are on mesas. These soils are deep and well drained. They formed in mixed alluvium. Typically, the surface layer is light brown fine sandy loam about 6 inches thick. The upper part of the subsoil is reddish brown and brown clay loam about 18 inches thick, and the lower part to a depth of 60 inches is light brown, pink, and reddish yellow clay loam, sandy clay loam, and gravelly sandy loam.

Cabezon soils are on ridges. These soils are shallow and well drained. They formed in windblown sediments and alluvium over basalt. Typically, the surface layer is brown very cobbly loam about 2 inches thick. The subsoil is brown clay about 16 inches thick. Basalt is at a depth of about 18 inches.

Of minor extent in this unit are the shallow Atarque and deep Montecito, Torreon, and Flugle soils on mesas.

This unit is used for livestock grazing, fuel wood production, and wildlife habitat. The main limitations are the stones on the surface and depth to bedrock in areas of the Cabezon soils.

This unit is dominantly grassland. The eroded bottom of some drainageways dominantly supports sagebrush. The area near Ramah provides fair habitat for pronghorn antelope. Characteristic wildlife include black-tailed jackrabbit, prairie dog, ground squirrel, meadowlark, horned lark, marsh hawk, and sage sparrow.

11. Cabezon-Cantina-Millpaw

Shallow and deep soils, mainly on hills and ridges, in valleys between lava ridges, and in other valleys

This map unit is on hills and ridges, in valleys between lava ridges, and in other valleys in the southwestern part of the survey area. Slope is 1 to 10 percent. The vegetation is mainly grasses and trees. Elevation is 6,800 to 7,300 feet. The average annual precipitation is about 13 to 16 inches, the average annual air temperature is 47 to 51 degrees F, and the average frost-free period is 100 to 120 days.

This unit makes up about 5.6 percent of the survey area. It is about 35 percent Cabezon and similar soils, 25 percent Cantina and similar soils, 20 percent Millpaw and similar soils, and 20 percent components of minor extent.

Cabezon soils are on hills and ridges. These soils are shallow and well drained. They formed in windblown sediments and alluvium over basalt. Typically, the surface layer is brown very cobbly loam about 2 inches thick. The subsoil is brown clay about 16 inches thick. Basalt is at a depth of about 18 inches.

Cantina soils are on hills and in valleys between lava ridges. These soils are deep and well drained. They formed in mixed alluvium. Typically, the surface layer is brown sandy loam about 2 inches thick. The upper 29 inches of the subsoil is brown sandy clay and sandy clay loam, and the lower 23 inches is brown sandy clay loam. Basalt is at a depth of about 54 inches.

Millpaw soils are in valleys. These soils are deep and well drained. They formed in mixed alluvium. Typically, the surface layer is brown loam about 3 inches thick. The upper 26 inches of the subsoil is dark brown clay loam and clay, the next 12 inches is brown sandy clay loam, and the lower part to a depth of 60 inches is brownish yellow sandy clay loam.

Of minor extent in this unit are the deep, cindery Bandera and Timhus soils on cinder cones, the deep Loarc and Montecito soils on mesas, and Rock outcrop on lava ridges.

This unit is used for livestock grazing, fuel wood production, nonirrigated crops, and wildlife habitat. The main limitations are the depth to bedrock, the rock fragments on and in the Cabezon soils, and the Rock outcrop.

This unit is dominantly grassland that has sizable areas of pinyon and juniper. Some areas are used as nonirrigated cropland. Characteristic wildlife include pronghorn antelope, mule deer, coyote, black-tailed jackrabbit, ground squirrel, marsh hawk, bluebird, crow, and horned lark. The unit provides poor or fair habitat for mule deer.

12. Paguate-Hackroy

Moderately deep and shallow soils, mainly on mesas and plateaus

This map unit is mainly on mesas and plateaus in the northeastern, central, and south-central parts of the survey area. Slope is 1 to 5 percent. The vegetation is mainly grasses, shrubs, and trees. Elevation is 6,400 to 7,000 feet. The average annual precipitation is about 14 to 16 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 100 to 120 days.

This unit makes up about 2.3 percent of the survey area. It is about 70 percent Paguate and similar soils, 15 percent Hackroy and similar soils, and 15 percent soils of minor extent.

Paguate soils are on mesas and plateaus. These soils are moderately deep and well drained. They formed in alluvium and windblown sediments. Typically, the surface layer is dark brown loam about 3 inches thick. The upper 16 inches of the subsoil is reddish brown clay and clay loam, and the lower 14 inches is pink gravelly clay loam. Unweathered basalt is at a depth of about 33 inches.

Hackroy soils are on mesas and plateaus. These soils are shallow and well drained. They formed in alluvium and windblown sediments. Typically, the surface layer is brown cobbly loam about 3 inches thick. The subsoil is about 11 inches of reddish brown clay loam and clay. Basalt is at a depth of about 14 inches.

Of minor extent in this unit are the deep Catman, Millpaw, and Silkie soils in valleys, the deep Loarc soils on mesas, and the shallow Cabezon soils on ridges.

This unit is used for livestock grazing, fuel wood production, and wildlife habitat. The main limitations are the depth to bedrock, the clayey texture, and the rock fragments on the surface.

This unit generally supports a plant community of pinyon and juniper. Numerous small, seasonal ponds on Cebollita Mesa provide habitat for aquatic wildlife. The La Mesa del Canon Seco, south of Marquez, is an important winter range area for elk. Characteristic wildlife include mule deer, coyote, wood rat, pinyon mouse, porcupine, scrub jay, plain titmouse, shore birds, waterfowl, tiger salamander, toads, and leopard frog.

Dry Soils in Areas of Cuestas, Fan Terraces, Flood Plains, Alluvial Fans, Drainageways, Hills, and Ridges

This group consists of two map units. It makes up about 18 percent of the survey area. The native vegetation is grasses and shrubs. Elevation is 5,400 to 7,000 feet. The annual precipitation is about 7 to 12 inches, the average annual air temperature is 49 to 55 degrees F, and average frost-free period is 115 to 160 days.

The soils in this group formed in alluvial and eolian material. They are used mainly for livestock grazing and wildlife habitat.

13. Penistaja-San Mateo-Sparank

Deep soils, mainly on cuestas, fan terraces, flood plains, and alluvial fans

This map unit is on cuestas, fan terraces, flood plains, and alluvial fans in the north-central and northeastern parts of the survey area. Slope is 1 to 10 percent. The vegetation is mainly grasses and shrubs. Elevation is 6,000 to 7,000 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 115 to 150 days.

This unit makes up about 11.3 percent of the survey area. It is about 40 percent Penistaja and similar soils, 20 percent San Mateo and similar soils, 20 percent Sparank and similar soils, and 20 percent components of minor extent. Areas near the Socorro County line may have a higher percentage of minor components.

Penistaja soils are on cuestas and fan terraces. These soils are deep and well drained. They formed in wind-modified alluvium derived dominantly from sandstone. Typically, the surface layer is brown fine sandy loam about 2 inches thick. The upper part of the

subsoil is brown and strong brown sandy clay loam about 20 inches thick. The lower part of the subsoil and the substratum to a depth of 60 inches are light brown and reddish brown sandy loam.

San Mateo soils are on flood plains and alluvial fans. These soils are deep and well drained. They formed in mixed alluvium. Typically, the surface layer is light yellowish brown loam about 2 inches thick. The underlying material to a depth of 60 inches is light olive brown loam and sandy clay loam.

Sparank soils are on flood plains and alluvial fans. These soils are deep and well drained. They formed in mixed alluvium. Typically, the surface layer is light yellowish brown clay loam about 2 inches thick. The underlying material to a depth of 60 inches is light yellowish brown and light olive brown silty clay.

Of minor extent in this unit are the moderately deep Hagerman soils on cuestas; the deep Clovis soils on fan terraces; the deep Aparejo and Venadito soils on flood plains; the deep, somewhat poorly drained Warm Springs soils in old lakebeds; the deep Mespun soils on dunes; and Pits and Dumps on hills and flats.

This unit is used for livestock grazing, irrigated crops, urban development, and wildlife habitat. The main limitations are the hazard of flooding on the San Mateo and Sparank soils and the clayey texture and content of salts in the Sparank soils.

This unit is dominantly grassland that is in poor condition. Shrubs are in drainageways and eroded areas. The downstream reaches of Bluewater Creek and the Rio San Jose traverse the unit and provide degraded aquatic, wetland, and riparian habitat. Springs are in the San Rafael area, which supports emergent wetland vegetation. Areas of nonirrigated and irrigated cropland contribute to the diversity of the habitat in this unit. Characteristic wildlife include black-tailed jackrabbit, pocket gopher, striped skunk, raccoon, prairie dog, meadowlark, swallow, mourning dove, tiger salamander, toads, and garter snake.

14. Navajo-Grieta

Deep soils, mainly on flood plains and alluvial fans, in drainageways, and on fan terraces, hills, and ridges

This map unit is mainly on flood plains and alluvial fans, in drainageways, and on fan terraces, hills, and ridges in the eastern part of the survey area. Slope is 1 to 10 percent. The vegetation is mainly grasses and shrubs. Elevation is 5,400 to 6,000 feet. The average annual precipitation is about 7 to 10 inches, the average annual air temperature is 51 to 55 degrees F, and the average frost-free period is 140 to 165 days.

This unit makes up about 6.5 percent of the survey area. It is about 40 percent Navajo and similar soils, 30 percent Grieta and similar soils, and 30 percent components of minor extent. Areas near the Socorro County line may have a higher percentage of minor components.

Navajo soils are on flood plains and alluvial fans and in drainageways. These soils are deep and well drained. They formed in mixed alluvium. Typically, the surface layer is reddish brown silty clay loam about 3 inches thick. The underlying material to a depth of 60 inches is reddish brown silty clay and clay.

Grieta soils are on fan terraces, hills, and ridges. These soils are deep and well drained. They formed in wind-modified, mixed alluvium. Typically, the surface layer is strong brown sandy loam about 3 inches thick. The upper 25 inches of the subsoil is strong brown sandy loam and sandy clay loam, and the lower part to a depth of 60 inches is pink and pinkish white sandy loam.

Of minor extent in this unit are the shallow Mion soils on hills, the gypsiferous Saido soils on fans and knolls, the deep Sheppard soils on dunes, and Rock outcrop on ridges and hills.

This unit is used for livestock grazing and wildlife habitat. The main limitations are the clayey texture of the Navajo soils and the low precipitation.

This unit is dominantly desert grassland that has scattered shrubs along the drainageways. Characteristic wildlife include coyote, black-tailed jackrabbit, scaled quail, mockingbird, curve-billed thrasher, and bullsnake.

Moist Soils, Lava Flows, and Rock Outcrop in Areas of Basalt Plains, Swales, Ridges, Hills, Mesas, Plateaus, and Mountains

This group consists of three map units. It makes up about 8 percent of the survey area. The native vegetation is mainly ponderosa pine, shrubs, and grasses. Elevation is 7,200 to 10,300 feet. The average annual precipitation is about 16 to 24 inches, the average annual air temperature is 42 to 47 degrees F, and the average frost-free period is 80 to 110 days.

The soils in this group formed in alluvial and eolian sediments. They are used mainly for commercial wood products, livestock grazing, and wildlife habitat.

15. Raton-Lava Flows-Charo

Very shallow, shallow, and moderately deep soils and Lava flows, mainly on basalt plains, in swales, and on ridges

This map unit is mainly on basalt plains, in swales, and on ridges in the central part of the survey area. Slope is 1 to 45 percent. The vegetation is mainly trees. Elevation is 7,200 to 8,300 feet. The average annual precipitation is about 16 to 20 inches, the average

annual air temperature is 40 to 46 degrees F, and the average frost-free period is 90 to 110 days.

This unit makes up about 2.8 percent of the survey area. It is about 30 percent Raton and similar soils, 30 percent Lava flows, 25 percent Charo and similar soils, and 15 percent soils of minor extent.

Raton soils are on basalt plains, in swales, and on ridges. These soils are very shallow or shallow and are well drained. They formed in alluvium and eolian sediments derived dominantly from basalt. Typically, the surface layer is dark reddish brown very cobbly loam about 5 inches thick. The subsoil is reddish brown very cobbly clay about 8 inches thick. Unweathered basalt is at a depth of about 13 inches.

Lava flows occur as barren or nearly barren areas of exposed lava. They have very sharp, jagged surfaces. Vegetation generally is limited to cracks and crevasses and included soils.

Charo soils are in swales. These soils are moderately deep and well drained. They formed in mixed alluvium and windblown sediments. Typically, the surface layer is dark brown loam about 5 inches thick. The subsoil is about 23 inches of reddish brown clay loam and clay. Basalt is at a depth of about 28 inches.

Of minor extent in this unit are the deep Bandera soils on cinder hills and the shallow Borrego soils on basalt-capped mesas.

This unit is used for livestock grazing and wood products. The main limitations are the depth to bedrock, the Lava flows, and the windthrow hazard.

This unit generally is forested with ponderosa pine and some oak brush. Characteristic wildlife include mule deer, coyote, porcupine, Steller's jay, Cooper's hawk, screech owl, hairy woodpecker, and chipmunk.

16. Cinnadale-Valnor-Techado

Shallow and moderately deep soils, mainly on ridges, hills, mesas, plateaus, and mountains

This map unit is mainly on ridges, hills, mesas, plateaus, and mountains in the northwestern and south-central parts of the survey area. It is in the foothills of the Zuni Mountains. Slope is 1 to 25 percent. The vegetation is mainly trees, shrubs, and an understory of grasses. Elevation is 7,500 to 8,900 feet. The average annual precipitation is about 18 to 24 inches, the average annual air temperature is 40 to 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit makes up about 2.1 percent of the survey area. It is about 30 percent Cinnadale and similar soils, 25 percent Valnor and similar soils, 20 percent Techado and similar soils, and 25 percent soils of minor extent. Areas near the Catron County line may have a higher percentage of some minor soils.

Cinnadale soils are on ridges and hills. These soils are shallow and well drained. They formed in alluvium and windblown sediments derived dominantly from siltstone and sandstone. Typically, the surface layer is light reddish brown gravelly very fine sandy loam about 4 inches thick. The subsoil is light reddish brown very channery loam about 8 inches thick. Sandstone is at a depth of about 12 inches.

Valnor soils are on hills, mesas, and plateaus. These soils are moderately deep and well drained. They formed in alluvium derived dominantly from interbedded shale and sandstone. Typically, the surface layer is yellowish brown clay loam about 2 inches thick. The upper part of the subsoil is dark yellowish brown and yellowish brown clay about 16 inches thick, and the lower part is light yellowish brown clay about 20 inches thick. Shale is at a depth of about 38 inches.

Techado soils are on hills, ridges, and mountains. These soils are shallow and well drained. They formed in alluvium and colluvium derived dominantly from shale and sandstone. Typically, the surface layer is light olive brown channery clay loam about 3 inches thick. The underlying material is light olive brown clay about 13 inches thick. Soft shale is at a depth of about 16 inches.

Of minor extent in this unit are the moderately deep Abersito soils on hills; the deep Moreno, Moreno Variant, Saladon, and Yankee soils on fan terraces and in valleys; the deep Kenray soils on dunes; the shallow Stout soils on mountains; and the moderately deep Mirabal soils on hills.

This unit is used for livestock grazing, wildlife habitat, and wood products. The main limitations are the depth to bedrock and the slope.

This unit consists mainly of forests and wet meadows. The area east of Oso Ridge is an important winter range area for mule deer. The northern part of the unit provides range for elk. Characteristic wildlife include coyote, porcupine, chipmunk, tree swallow, raven, chickadee, toads, and frogs. The areas of dense forest provide habitat for black bear.

17. Cebolleta-Charo-Rock Outcrop

Moderately deep soils and Rock outcrop, mainly on hills, mountains, and mesas

This map unit is mainly on hills, mountains, and mesas in the northeastern and central parts of the survey area. Slope is 1 to 15 percent. The vegetation is mainly grasses and trees. Elevation is 7,500 to 10,300 feet. The average annual precipitation is about 18 to 24 inches, the average annual air temperature is 40 to 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit makes up about 3.1 percent of the survey

area. It is about 40 percent Cebolleta and similar soils, 25 percent Charo and similar soils, 15 percent Rock outcrop, and 20 percent soils of minor extent.

Cebolleta soils are on hills, mountains, and mesas. These soils are moderately deep and well drained. They formed in windblown sediments and alluvium. Typically, the surface layer is very dark grayish brown very cobbly loam about 10 inches thick. The subsoil is reddish brown and brown very cobbly clay about 15 inches thick. Basalt is at a depth of about 25 inches.

Charo soils are on mesas and hills. These soils are moderately deep and well drained. They formed in windblown sediments and mixed alluvium. Typically, the surface layer is dark brown loam about 5 inches thick. The subsoil is about 23 inches of reddish brown clay loam and clay. Basalt is at a depth of about 28 inches.

Rock outcrop consists of barren or nearly barren areas of exposed igneous rocks on hills and mountains.

Of minor extent in this unit are the shallow Borrego, Raton, and Techado soils on ridges; the moderately deep Microy soils on hills; and the deep Parkay and Trag soils on mountains.

This unit is used for wood products, livestock grazing, and wildlife habitat. The main limitations are the depth to bedrock, the content of rock fragments, and the Rock outcrop.

This unit is dominantly forested. Several small streams provide aquatic and riparian habitat. Parts of the eastern slopes of Mount Taylor and the Negra and Cebolleta Mesas provide important range for mule deer and winter range for elk. Other characteristic wildlife species include wild turkey, blue grouse, rosy finch, black bear, mountain lion, Aberti's squirrel, chipmunk, Clark nutcracker, and Cooper's hawk.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Penistaja fine sandy loam, 1 to 3 percent slopes, is a phase of the Penistaja series.

Some map units are made up of two or more major soils. These map units are called soil complexes or associations.

A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Bond-Penistaja-Rock outcrop complex, 2 to 15 percent slopes, is an example.

A *soil association* is made up of two or more geographically associated soils that are shown as one unit on the maps. Because of present or anticipated soil uses in the survey area, it was not considered practical or necessary to map the soils separately. The pattern and relative proportion of the soils are somewhat similar. Catman-Silkie association, 1 to 10 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Lava flows is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

This survey area was mapped at two levels of detail. At the most detailed level, map units are narrowly defined. Map unit boundaries were plotted and verified at closely spaced intervals. At the less detailed level, map units are broadly defined. Boundaries were plotted and verified at wider intervals. The detail of mapping was selected to meet the anticipated long-term use of the survey, and the map units were designed to meet the needs for that use.

Table 2 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The "Glossary" defines many of the terms used in describing the soils.

Soil Descriptions

10—Lava flows. This map unit is on old lava plains. Areas are irregular in shape and are 100 to 4,000 acres in size. The vegetation, which is anchored in cracks and

crevices, is mainly grasses, shrubs, and trees. Elevation is 6,000 to 7,600 feet. The average annual precipitation is about 10 to 16 inches, the average annual air temperature is 46 to 54 degrees F, and the average frost-free period is 100 to 150 days.

Lava flows consist of areas of exposed basalt. They have sharp, jagged surfaces, crevices, and angular blocks. They support essentially no vegetation, but the amount and kind of vegetation change with elevation and precipitation.

Included in this unit are small areas of sandy soils that are shallow to basalt, Viuda and Bond soils on lava ridges, Penistaja and Hagerman soils in depressions, and Mespun soils on dunes. Included areas make up about 15 percent of the total acreage.

This unit is used mainly for wildlife habitat and recreation. It is not suitable for grazing by livestock because of the extremely rough, broken terrain and the sparse vegetation. The vegetation on the included soils and anchored in the cracks and crevices is dominantly Apacheplume, skunkbush sumac, sideoats grama, little bluestem, and muttongrass. Scattered oneseed juniper and pinyon are at the lower elevations. Areas at the higher elevations support stands of ponderosa pine and scattered Douglas fir and aspen. The understory is dominantly currant, pine dropseed, Arizona fescue, and mountain muhly. The suitability for wood products is extremely limited because of the rough, broken terrain.

20—Penistaja fine sandy loam, 1 to 3 percent slopes. This deep, well drained soil is on fan terraces. It formed in mixed alluvium and eolian material. Areas are irregular in shape and are 20 to 400 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is 5,700 to 6,600 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature 48 to 53 degrees F, and the average frost-free period is 115 to 140 days.

Typically, the surface layer is strong brown and brown fine sandy loam about 6 inches thick. The upper part of the subsoil is strong brown sandy clay loam about 13 inches thick, and the lower part to a depth of 60 inches is brown and strong brown sandy clay loam. The surface layer is sandy clay loam in some areas.

Included in this unit are small areas of Clovis and Mikim soils on fan terraces. Included areas make up about 15 percent of the total acreage.

Permeability is moderate in the Penistaja soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main hazard is soil blowing. Stubble and other crop residue can provide protection against soil blowing in spring. Border, furrow, sprinkler, and corrugation irrigation systems are suitable. The unit is suited to all climatically adapted crops.

This unit is well suited to urban development. It has few limitations. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees.

A wide variety of trees and shrubs can be grown as windbreaks and environmental plantings on this unit. Cultivation or applications of herbicide can help to remove competing vegetation. Properly designed and managed windbreaks can reduce the risk of soil blowing.

21—Clovis sandy clay loam, 1 to 3 percent slopes. This deep, well drained soil is on fan terraces. It formed in mixed alluvium and eolian material. Areas are irregular in shape and are 30 to 550 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 5,750 to 5,900 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 125 to 140 days.

Typically, the surface layer is dark yellowish brown sandy clay loam about 8 inches thick. The subsoil to a depth of 60 inches or more is sandy clay loam. The upper part is strong brown, and the lower part is pink. A strongly calcareous layer is at a depth of about 21 inches. The surface layer is sandy loam in some areas.

Included in this unit are small areas of Penistaja and Hagerman soils on fan terraces and Mikim soils on fans. Included areas make up about 15 percent of the total acreage.

Permeability is moderate in the Clovis soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main management concerns are soil blowing and a high content of calcium carbonate. Stubble and other crop residue can provide protection against soil blowing in spring. Crops that are sensitive to calcium carbonate should not be grown on this unit. Furrow, border, sprinkler, and corrugation irrigation systems are suitable.

If this unit is used for urban development, the main management concerns are soil blowing and a high content of calcium carbonate. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines,

shade trees, or ornamental trees.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of alkalinity and the high content of calcium carbonate, which ties up minerals and limits their availability. Cultivation or applications of herbicide can help to remove competing vegetation. Properly designed and managed windbreaks can reduce the risk of soil blowing. Species that are sensitive to large amounts of calcium carbonate should not be selected for planting.

25—Hickman-Catman complex, 1 to 6 percent slopes. This map unit is in valleys and swales and on alluvial fans. Areas are irregular in shape and are 50 to 1,000 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is 6,500 to 7,500 feet. The average annual precipitation is about 12 to 16 inches, the average annual air temperature is 47 to 51 degrees F, and the average frost-free period is 115 to 135 days.

This unit is 45 percent Hickman loam, 2 to 6 percent slopes, and 40 percent Catman silty clay loam, 1 to 3 percent slopes. The Hickman soil is in valleys and on alluvial fans, and the Catman soil is on valley bottoms and in swales. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used. The soils in some areas near the boundary of Apache County, Arizona, have a higher content of silt.

Included in this unit are small areas of Silkie and Flugle soils on valley sides, Vessilla and Mion soils on hills, and Goesling soils on fan terraces. Included areas make up about 15 percent of the total acreage.

The Hickman soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is pale brown loam about 4 inches thick. The underlying material to a depth of 60 inches is brown and light yellowish brown clay loam, sandy clay loam, loam, and sandy loam.

Permeability is moderately slow in the Hickman soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight. This soil is occasionally flooded for very brief periods in summer.

The Catman soil is deep and well drained. It formed in alluvium derived dominantly from shale. Typically, the surface layer is dark grayish brown silty clay loam about 4 inches thick. The subsurface layer is grayish brown silty clay loam about 4 inches thick. The underlying material to a depth of 60 inches is brown clay.

Permeability is very slow in the Catman soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight. This soil is slightly saline. It often has cracks in the upper 25 inches. It is occasionally flooded for long periods in summer.

This unit is used for livestock grazing. The potential natural plant community on the Hickman soil is mainly western wheatgrass, alkali sacaton, blue grama, and winterfat. This soil receives runoff from the adjacent areas. As a result, it is potentially more productive. The average annual production of air-dry vegetation ranges from 3,000 pounds per acre in favorable years to 1,200 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, alkali sacaton, spike muhly, and winterfat decrease in abundance and blue grama, galleta, broom snakeweed, and rabbitbrush increase. The increasers generally occur in small amounts in the potential natural plant community.

Good grazing management can increase the productivity and reproduction potential of western wheatgrass, alkali sacaton, Indian ricegrass, and winterfat. The Hickman soil is suited to such management practices as fencing, livestock pipelines, and range seeding. It is not suitable as a site for livestock ponds because of seepage.

The potential natural plant community on the Catman soil is mainly western wheatgrass, spike muhly, alkali sacaton, and fourwing saltbush. The average annual production of air-dry vegetation ranges from 3,200 pounds per acre in favorable years to 1,250 pounds in unfavorable years. This soil receives runoff from the adjacent areas. As a result, it is potentially more productive. If the plant community deteriorates, western wheatgrass, alkali sacaton, and spike muhly decrease in abundance and blue grama, galleta, ring muhly, rabbitbrush, and broom snakeweed increase. The increasers generally occur in small amounts in the potential natural plant community.

Properly managing livestock grazing can protect the Catman soil against water erosion. Deterioration of the plant community on this soil often results in the formation of very deep gullies that drain the site and hinder the production of vegetation. After very deep gullies have artificially drained the site, a combination of grazing management and engineering practices may be required to return the site to its productive potential.

Good grazing management can increase the productivity and reproduction potential of western wheatgrass, spike muhly, and alkali sacaton. The Catman soil is suited to such management practices as fencing, livestock pipelines, livestock ponds, and range seeding.

Good management is needed to protect the soils in this unit against excessive water erosion. If the plant

cover is disturbed, treatment is needed to control sheet erosion and gullying.

30—Warm Springs loam, 0 to 2 percent slopes. This deep, somewhat poorly drained soil is in old lakebeds and on flood plains. It formed in mixed alluvium and lacustrine material. Areas are irregular in shape and are 75 to 200 acres in size. The native vegetation is mainly scattered grasses and forbs. Elevation is 6,300 to 6,600 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 115 to 135 days.

Typically, the surface layer is brown and dark gray loam about 8 inches thick. The subsoil extends to a depth of 60 inches or more. The upper part is light brownish gray gravelly sandy loam, the next part is very pale brown and light brownish gray loam, and the lower part is light brownish gray sandy loam. In some areas the soil is clay loam throughout.

Included in this unit are small areas of Aparejo, Sparank, and Venadito soils on flood plains. Included areas make up about 15 percent of the total acreage.

Permeability is moderate in the Warm Springs soil. Available water capacity also is moderate. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate. A seasonal high water table fluctuates between depths of 12 and 30 inches during the year. It reaches its highest level during the period April through July. This soil is slightly saline. The sodium absorption ratio is more than 13. The soil is frequently flooded for brief periods late in summer.

This unit generally is used for livestock grazing. In areas near San Rafael, it is used for urban development.

The potential natural plant community on this unit is mainly inland saltgrass, alkali sacaton, fourwing saltbush, and iodinebush. The average annual production of air-dry vegetation ranges from 2,000 pounds per acre in favorable years to 1,200 pounds in unfavorable years. If the plant community deteriorates, alkali sacaton and fourwing saltbush decrease in abundance and inland saltgrass and iodinebush increase. The increasers generally occur in small amounts in the potential natural plant community.

This unit is suited to such management practices as fencing and range seeding. Good grazing management can increase the productivity and reproduction potential of alkali sacaton. Loss of the surface layer results in a severe decrease in productivity and in the potential of the soil to produce plants suitable for grazing. The main management concerns are the content of salts, depth to the water table, and the hazards of flooding and soil blowing.

If this unit is used for urban development, the main management concerns are the content of salts, depth to the water table, and the hazards of soil blowing and flooding. Plants that can tolerate the seasonal high water table, the salts, and droughtiness should be selected unless drainage and irrigation systems are installed. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

The selection of suitable trees and shrubs for windbreaks and environmental plantings is limited. The high water table, a high pH, and the content of salts affect the selection and growth of species. Seedling mortality may be severe because of the wetness. Cultivation or applications of herbicide can help to remove competing vegetation. Spring planting may be delayed because of the excessive moisture.

40—Aparejo clay loam, 0 to 1 percent slopes. This deep, well drained soil is on flood plains and alluvial fans. It formed in mixed alluvium. Areas are irregular in shape and are 5 to 200 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 6,200 to 6,600 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 110 to 140 days.

Typically, the surface layer is reddish brown clay loam about 6 inches thick. The upper part of the underlying material is reddish brown and light reddish brown clay loam about 41 inches thick, and the lower part to a depth of 60 inches or more is light reddish brown clay loam. In some areas the soil is sandy below a depth of 40 inches.

Included in this unit are small areas of Glenberg and San Mateo soils on flood plains and alluvial fans and the saline Aparejo soils on flood plains. Included areas make up about 15 percent of the total acreage.

Permeability is moderately slow in the Aparejo soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe. Thin strata of coarser textured material are throughout the profile. This soil is occasionally flooded for very brief periods in summer unless it is protected.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main hazards are flooding and soil blowing. Furrow, border, sprinkler, and corrugation irrigation systems are suitable. The unit is suited to all climatically adapted

crops. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

If this unit is used for urban development, the main hazards are soil blowing and flooding. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of alkalinity and a high content of calcium carbonate, which ties up minerals and limits their availability. Cultivation or applications of herbicide can help to remove competing vegetation.

41—Aparejo clay loam, sandy substratum, 0 to 1 percent slopes. This deep, well drained soil is on alluvial fans and flood plains. It formed in mixed alluvium. Areas are irregular in shape and are 5 to 150 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 6,200 to 6,600 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 110 to 140 days.

Typically, the surface layer is reddish brown clay loam about 6 inches thick. The upper 18 inches of the underlying material is reddish brown clay loam, the next 8 inches is light reddish brown sandy clay loam, and the lower part to a depth of 60 inches is light yellowish brown fine sand that has some thin strata of clay loam. In some areas the lower part of the underlying material is not sandy.

Included in this unit are small areas of Venadito and Glenberg soils on alluvial fans and flood plains and the saline Aparejo soils on flood plains. Included areas make up about 15 percent of the total acreage.

Permeability is moderately slow in the Aparejo soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe. This soil is occasionally flooded for very brief periods in summer unless it is protected.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main hazards are soil blowing and flooding. Furrow, border, sprinkler, and corrugation irrigation systems are suitable. The unit is suited to all climatically adapted crops. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

If this unit is used for urban development, the main hazards are soil blowing and flooding. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of alkalinity and a high content of calcium carbonate, which ties up minerals and limits their availability. Cultivation or applications of herbicide can help to remove competing vegetation.

45—Aparejo clay, 0 to 1 percent slopes. This deep, well drained soil is on flood plains and alluvial fans. It formed in mixed alluvium. Areas are irregular in shape and are 5 to 50 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 6,200 to 6,600 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 110 to 140 days.

Typically, the surface layer is reddish brown clay about 3 inches thick. The subsurface layer also is reddish brown clay. It is about 12 inches thick. The underlying material is yellowish brown. The upper 23 inches is sandy clay loam, and the lower part to a depth of 60 inches is dominantly sandy clay loam but includes some fine sandy loam. In some areas the surface layer is clay loam.

Included in this unit are small areas of Venadito and Glenberg soils on flood plains and alluvial fans and the saline Aparejo soils on flood plains. Included areas make up about 15 percent of the total acreage.

Permeability is moderately slow in the Aparejo soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe. This soil is occasionally flooded for very brief periods in summer unless it is protected.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main management concerns are the hazards of soil blowing and flooding and the clayey surface layer. Furrow, border, and corrugation irrigation systems are suitable. The unit is suited to all climatically adapted crops (fig. 5), but it generally is best suited to small grain and pasture. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

If this unit is used for urban development, the main management concerns are the hazards of soil blowing and flooding, the clayey surface layer, and a high

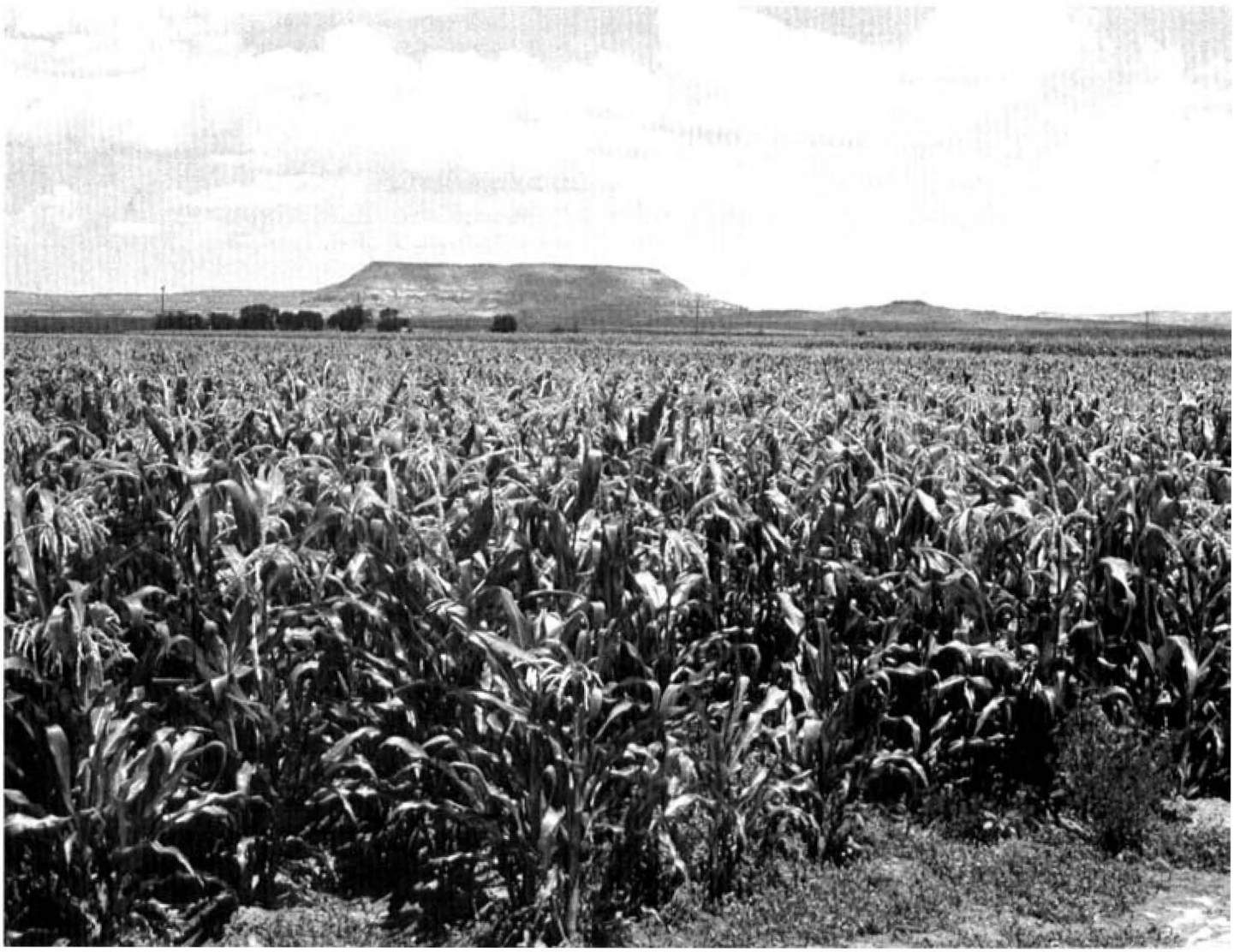


Figure 5.—Irrigated corn in an area of Aparejo clay, 0 to 1 percent slopes. Haystack Mountain, in the background, is the site of the first uranium mine in the Grants-Milan area.

shrink-swell potential. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks. Properly designing buildings and roads can reduce the damaging effects of the shrinking and swelling caused by the clayey texture.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of alkalinity and a high content of calcium carbonate, which ties up minerals and limits their availability. Cultivation or applications of herbicide can help to remove competing vegetation.

50—Venadito clay loam, 0 to 1 percent slopes. This deep, well drained soil is on alluvial fans and flood plains and in valleys. It formed in alluvium derived dominantly from shale. Areas are irregular in shape and are 5 to 150 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is 6,200 to 6,800 feet. The average annual precipitation is about 10 to 13 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 110 to 140 days.

Typically, the surface layer is reddish brown clay loam about 3 inches thick. The upper part of the underlying material is reddish brown clay loam about 11 inches thick, and the lower part to a depth of 60 inches

is reddish brown and dark reddish brown clay. In some areas the surface layer is sandy clay loam.

Included in this unit are small areas of Aparejo soils on alluvial fans, in valleys, and on flood plains; Glenberg soils on flood plains; and the saline Venadito soils on flood plains. Included areas make up about 15 percent of the total acreage.

Permeability is very slow in the Venadito soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe. This soil has a high shrink-swell potential. Unless protected, it is occasionally flooded for very brief periods in summer.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main management concerns are the hazards of soil blowing and flooding, the clayey texture, and the high shrink-swell potential. Furrow, border, and corrugation irrigation systems are suitable. The unit generally is best suited to small grain and pasture. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

If this unit is used for urban development, the main management concerns are the hazards of soil blowing and flooding, the clayey texture, and the high shrink-swell potential. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks. Properly designing buildings and roads can reduce the damaging effects of the shrinking and swelling caused by the clayey texture.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of droughtiness. The seedling mortality rate is high because of the high content of clay, which causes moisture stress in the seedlings. Extra care is needed during planting to ensure that the soil is firmly packed around the roots. Cultivation or applications of herbicide can help to remove competing vegetation.

51—Venadito sandy clay loam, 0 to 1 percent slopes. This deep, well drained soil is on alluvial fans, in valleys, and on flood plains. It formed in alluvium derived dominantly from shale. Areas are irregular in shape and are 5 to 80 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is 6,200 to 6,800 feet. The average annual precipitation is about 10 to 13 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 110 to 140 days.

Typically, the surface layer is pale brown sandy clay loam about 6 inches thick. The upper part of the underlying material is pale brown clay loam about 13 inches thick, and the lower part to a depth of 60 inches is reddish brown clay. In some areas the surface layer is clay loam.

Included in this unit are small areas of Aparejo soils on flood plains, in valleys, and on alluvial fans and Glenberg soils on flood plains. Included areas make up about 15 percent of the total acreage.

Permeability is very slow in the Venadito soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe. This soil is occasionally flooded for very brief periods in summer unless it is protected.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main management concerns are the hazards of flooding and soil blowing, the clayey texture, and a high shrink-swell potential. Furrow, border, sprinkler, and corrugation irrigation systems are suitable. The unit is suited to all climatically adapted crops, but it generally is best suited to small grain and pasture. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

If this unit is used for urban development, the main management concerns are the hazards of flooding and soil blowing, the clayey texture, and a high shrink-swell potential. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks. Properly designing buildings and roads can reduce the damaging effects of the shrinking and swelling caused by the clayey texture.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of droughtiness. The seedling mortality rate is high because of the high content of clay, which causes moisture stress in the seedlings. Extra care is needed during planting to ensure that the soil is firmly packed around the roots. Cultivation or applications of herbicide can help to remove competing vegetation.

52—Venadito Variant clay loam, 0 to 1 percent slopes. This moderately deep, well drained soil is in valleys and on flood plains and alluvial fans. It formed in mixed alluvium. Areas are irregular in shape and are 5 to 50 acres in size. The native vegetation is mainly

grasses and forbs. Elevation is 6,200 to 6,600 feet. The average annual precipitation is about 10 to 13 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 110 to 140 days.

Typically, the surface layer is reddish brown clay loam about 3 inches thick. The upper part of the underlying material is reddish brown clay about 15 inches thick, and the lower part is dark brown clay about 17 inches thick. Basalt is at a depth of about 35 inches.

Included in this unit are small areas of soils that are similar to the Venadito Variant soil but have bedrock within a depth of 20 inches, soils that are similar to Aparejo soils but are moderately deep, and Aparejo soils on flood plains and alluvial fans and in valleys. Included areas make up about 20 percent of the total acreage.

Permeability is very slow in the Venadito Variant soil. Available water capacity is moderate. The effective rooting depth is 20 to 40 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe. This soil has a high shrink-swell potential. Unless protected, it is occasionally flooded for very brief periods in summer.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main management concerns are the hazards of flooding and soil blowing, the clayey texture, the high shrink-swell potential, and the depth to bedrock. Furrow, border, and corrugation irrigation systems are suitable. The unit is suited to all climatically adapted crops, but it is best suited to small grain and pasture. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

If this unit is used for urban development, the main management concerns are the hazards of flooding and soil blowing, the clayey texture, the high shrink-swell potential, and the depth to bedrock. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks. Properly designing buildings and roads can reduce the damaging effects of the shrinking and swelling caused by the clayey texture.

55—Glenberg-San Mateo complex, 0 to 2 percent slopes. This map unit is on alluvial fans and flood plains. Areas are irregular in shape and are 3 to 200 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 6,200 to 7,000 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 110 to 140 days.

This unit is 45 percent Glenberg sandy loam, 0 to 2 percent slopes, and 35 percent San Mateo sandy clay loam, 0 to 2 percent slopes. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Aparejo soils on alluvial fans and flood plains, Venadito soils on flood plains, and Mespun soils on small dunes. Also included, on alluvial fans, are soils that are similar to the Glenberg and San Mateo soils but are saline. Included areas make up about 20 percent of the total acreage.

The Glenberg soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is light yellowish brown sandy loam about 11 inches thick. The upper part of the underlying material is light yellowish brown sandy loam about 10 inches thick, and the lower part to a depth of 60 inches is dominantly sandy loam but has strata of loam to loamy sand. In some areas clay is at a depth of about 48 to 60 inches.

Permeability is moderately rapid in the Glenberg soil. Available water capacity is moderate. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe. This soil is occasionally flooded for very brief periods in summer.

The San Mateo soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is brown sandy clay loam about 4 inches thick. The upper 12 inches of the underlying material is brown sandy clay loam. The next 17 inches is pale brown silty clay loam. The lower part to a depth of 60 inches is dominantly pale brown silty clay loam, but it has strata ranging from loam to silty clay loam.

Permeability is moderate in the San Mateo soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe. This soil is occasionally flooded for very brief periods in summer.

Most areas of this unit are used for irrigated crops. A few areas are used for urban development.

If this unit is used for irrigated crops, the main management concerns are the hazards of soil blowing and flooding. Furrow, border, sprinkler, and corrugation irrigation systems are suitable. The unit is suited to all climatically adapted crops. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

If this unit is used for urban development, the main management concerns are the hazards of flooding and

soil blowing and the sandy texture. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of alkalinity and a high content of calcium carbonate, which ties up minerals and limits their availability. Cultivation or applications of herbicide can help to remove competing vegetation.

56—Mespun loamy sand, 1 to 5 percent slopes. This deep, excessively drained soil is on dunes. It formed in eolian material derived dominantly from sandstone. Areas are irregular in shape and are 15 to 150 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is 6,500 to 7,000 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 135 days.

Typically, the surface layer is yellowish brown loamy sand about 2 inches thick. The underlying material to a depth of 60 inches is strong brown loamy fine sand and fine sand. In some areas the soil has thin strata of sandy loam at a depth of more than 40 inches.

Included in this unit are small areas of Palma soils between dunes, Aparejo and Glenberg soils in swales, and Penistaja soils on fan terraces. Included areas make up about 20 percent of the total acreage.

Permeability is rapid in the Mespun soil. Available water capacity is low. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe.

This unit is used for urban development. It is suited to urban uses. The main management concerns are the sandy texture and the hazard of soil blowing. Excavation for houses and access roads can expose material that is highly susceptible to soil blowing. Properly designed and managed windbreaks can reduce the risk of soil blowing. Cutbanks are not stable and therefore are subject to slumping. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of droughtiness. The seedling mortality rate is moderate because of the low available water capacity, which causes moisture stress in the seedlings. Soil blowing is the main hazard on this unit. Unless the young seedlings are protected during high winds, they can be damaged by sand blasting or covered by drifting sand. Soil blowing can be controlled by maintaining strips of native vegetation between the rows of trees and shrubs. Undesirable grasses and weeds can be controlled by applying herbicides or by rototilling or hoeing.

57—San Mateo clay loam, 1 to 3 percent slopes. This deep, well drained soil is on flood plains and alluvial fans. It formed in mixed alluvium. Areas are irregular in shape and are 5 to 100 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 5,800 to 6,500 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 110 to 140 days.

Typically, the surface layer is light brownish gray clay loam about 6 inches thick. The upper part of the underlying material is light brownish gray clay loam about 16 inches thick, and the lower part to a depth of 60 inches is brown sandy clay loam. In some areas the surface layer is sandy clay loam, and in other areas the slope is less than 1 percent.

Included in this unit are small areas of Sparank soils on flood plains, Glenberg soils on flood plains and alluvial fans, and the saline San Mateo soils on alluvial fans. Included areas make up about 15 percent of the total acreage.

Permeability is moderate in the San Mateo soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe. This soil is occasionally flooded for very brief periods in summer.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main hazards are soil blowing and flooding. Furrow, border, sprinkler, and corrugation irrigation systems are suitable. The unit is suited to all climatically adapted crops. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

If this unit is used for urban development, the main hazards are flooding and soil blowing. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of alkalinity and a high content of calcium

carbonate, which ties up minerals and limits their availability. Cultivation or applications of herbicide can help to remove competing vegetation.

58—San Mateo sandy clay loam, 1 to 3 percent slopes. This deep, well drained soil is on flood plains and alluvial fans. It formed in mixed alluvium. Areas are irregular in shape and are 5 to 150 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 5,800 to 6,500 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 110 to 140 days.

Typically, the surface layer is light olive brown sandy clay loam about 4 inches thick. The upper part of the underlying material is light yellowish brown sandy clay loam about 43 inches thick, and the lower part to a depth of 60 inches is light yellowish brown clay loam. In some areas the surface layer is clay loam, and in other areas the slope is less than 1 percent.

Included in this unit are small areas of Sparank soils on flood plains. Also included, on alluvial fans, are small areas of the saline San Mateo soils and small areas of Glenberg soils. Included areas make up about 15 percent of the total acreage.

Permeability is moderate in the San Mateo soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate. This soil is occasionally flooded for very brief periods in summer.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main hazards are soil blowing and flooding. Furrow, border, sprinkler, and corrugation irrigation systems are suitable. The unit is suited to all climatically adapted crops. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

If this unit is used for urban development, the main hazards are flooding and soil blowing. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of alkalinity and a high content of calcium carbonate, which ties up minerals and limits their availability. Cultivation or applications of herbicide can help to remove competing vegetation.

60—Sparank clay loam, 1 to 3 percent slopes. This deep, well drained soil is on flood plains and alluvial fans. It formed in mixed alluvium. Areas are irregular in shape and are 10 to 100 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 5,800 to 6,800 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 120 to 150 days.

Typically, the surface layer is light brownish gray clay loam about 10 inches thick. The upper part of the underlying material is light brownish gray silty clay about 22 inches thick, and the lower part to a depth of 60 inches is pale brown silty clay. In some areas the surface layer is sandy clay.

Included in this unit are small areas of San Mateo soils on flood plains and alluvial fans and the saline, wet, and sodic Sparank and San Mateo soils on flood plains. Included areas make up about 15 percent of the total acreage.

Permeability is very slow in the Sparank soil. Available water capacity is very high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe. This soil is occasionally flooded for brief periods in summer.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main management concerns are the clayey texture and the hazards of flooding and soil blowing. Furrow, border, sprinkler, and corrugation irrigation systems are suitable. Generally, the unit is best suited to small grain and pasture. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

If this unit is used for urban development, the main management concerns are the hazards of flooding and soil blowing, the clayey texture, and a high shrink-swell potential. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks. Properly designing buildings and roads can reduce the damaging effects of the shrinking and swelling caused by the clayey texture.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of droughtiness. The seedling mortality rate is high because of the high content of clay, which causes moisture stress in the seedlings. Extra care is needed during planting to ensure that the soil is firmly packed

around the roots. Cultivation or applications of herbicide can help to remove competing vegetation.

61—Sparham clay loam, 0 to 2 percent slopes. This deep, somewhat poorly drained soil is on flood plains. It formed in mixed alluvium. Areas are irregular in shape and are 10 to 90 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 6,200 to 6,600 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 120 to 140 days.

Typically, the surface layer is grayish brown clay loam about 10 inches thick. The upper part of the underlying material is pale brown silty clay about 34 inches thick, and the lower part to a depth of 60 inches is light olive brown clay.

Included in this unit are small areas of San Mateo and Sparank soils on flood plains and soils that are similar to the Sparham soil but have a water table at a depth of less than 36 inches. Included areas make up about 15 percent of the total acreage.

Permeability is very slow in the Sparham soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe. A seasonal high water table fluctuates between depths of 36 and 48 inches during the period April through September. The soil is moderately saline. It is occasionally flooded for brief periods in summer.

This unit is used for irrigated pasture and urban development.

If this unit is used for irrigated pasture, the main management concerns are the clayey texture, the fluctuating water table, and the hazards of flooding and soil blowing. Furrow, border, sprinkler, and corrugation irrigation systems are suitable.

If this unit is used for irrigated crops, salinity limits the choice of crops. The unit generally is suited to small grain. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

If this unit is used for urban development, the main management concerns are the clayey texture, the fluctuating water table, a high shrink-swell potential, a high content of salts, and the hazards of flooding and soil blowing. In summer, irrigation is needed in areas used for lawn grasses. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks. Properly designing buildings and roads can reduce the damaging effects of wetness and of the shrinking and swelling caused by the clayey texture.

This unit generally is unsuitable for windbreaks and environmental plantings. In some areas trees and shrubs can be grown if special treatment is applied.

62—Sparank sandy clay loam, saline, sodic, 1 to 3 percent slopes. This deep, well drained soil is on flood plains and alluvial fans. It formed in mixed alluvium. Areas are irregular in shape and are 10 to 100 acres in size. The native vegetation is mainly grasses. Elevation is 6,200 to 6,800 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 120 to 150 days.

Typically, the surface layer is light brownish gray sandy clay loam about 5 inches thick. The underlying material to a depth of 60 inches is light yellowish brown and grayish brown clay. In some areas the surface layer is clay loam or silty clay.

Included in this unit are small areas of San Mateo soils on flood plains and fans and Mikim soils on fans. Included areas make up about 15 percent of the total acreage.

Permeability is very slow in the Sparank soil. Available water capacity is very low. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is severe. The hazard of soil blowing is moderate. The soil is strongly saline. The sodium absorption ratio is more than 13. The soil commonly is eroded and gullied. Where it is not gullied, it is occasionally flooded for brief periods in summer.

This unit is used for livestock grazing. The potential natural plant community is mainly alkali sacaton, fourwing saltbush, blue grama, black greasewood, inland saltgrass, and western wheatgrass. The average annual production of air-dry vegetation ranges from 1,500 pounds per acre in favorable years to 550 pounds in unfavorable years. If the plant community deteriorates, alkali sacaton, western wheatgrass, and blue grama decrease in abundance and black greasewood and inland saltgrass increase. The increasers generally occur in small amounts in the potential natural plant community. The unit is suitable as a site for livestock ponds. Good grazing management can increase the productivity and reproduction potential of alkali sacaton.

This unit generally is unsuitable for windbreaks and environmental plantings. In some areas trees and shrubs can be grown if special treatment is applied.

66—Zia fine sandy loam, 3 to 5 percent slopes. This deep, well drained soil is fan terraces and valley sides. It formed in wind-modified alluvium derived dominantly from sandstone. Areas are irregular in shape and are 10 to 50 acres in size. The native vegetation is mainly grasses. Elevation is 6,000 to

6,500 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 120 to 140 days.

Typically, the surface layer is dark yellowish brown fine sandy loam about 8 inches thick. The upper part of the underlying material is brown fine sandy loam about 39 inches thick, and the lower part to a depth of 60 inches is yellow fine sandy loam.

Included in this unit are small areas of San Mateo soils on flood plains and alluvial fans; Mikim soils on fan terraces; Sparank soils on flood plains, in valleys, and on alluvial fans; and Penistaja soils on fan terraces. Included areas make up about 15 percent of the total acreage.

Permeability is moderately rapid in the Zia soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe.

This unit is used for urban development and irrigated crops.

If this unit is used for irrigated crops, the main hazard is soil blowing. Furrow and sprinkler irrigation systems are suitable. The unit is suited to all climatically adapted crops. Stubble and other crop residue can provide protection against soil blowing in spring.

This unit is suited to urban development. The main management concerns are the hazard of soil blowing and the sandy texture. Excavation for houses and access roads can expose material that is highly susceptible to soil blowing. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Properly designed and managed windbreaks can reduce the risk of soil blowing.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of droughtiness. Soil blowing is the main hazard. During periods of high winds, young seedlings can damaged by sand blasting and covered with drifting sand unless they are protected. Soil blowing can be controlled by maintaining strips of native vegetation between the plantings. Undesirable grasses and weeds can be controlled by applying herbicides or by rototilling or hoeing.

70—Catman clay loam, 1 to 3 percent slopes. This deep, well drained soil is on alluvial fans and flood plains and in valleys. It formed in mixed alluvium. Areas are irregular in shape and are 25 to 200 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 6,800 to 7,000 feet. The average annual precipitation is about 13 to 16 inches, the average annual air temperature is 47 to 51 degrees F, and the average frost-free period is 100 to 120 days.

Typically, the surface layer is dark brown clay loam about 6 inches thick. The upper part of the underlying material is dark brown clay about 35 inches thick, and the lower part to a depth of 60 inches is dark yellowish brown clay. In some areas the surface layer is sandy clay loam.

Included in this unit are small areas of Hickman soils on alluvial fans and flood plains, Catman Variant soils on valley bottoms and flood plains, and the saline Catman soils on alluvial fans and valley sides. Included areas make up about 15 percent of the total acreage.

Permeability is very slow in the Catman soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight. The soil has very pronounced vertical cracks as a result of shrinking and swelling. It is slightly saline. It is occasionally flooded for long periods in summer unless it is protected.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main management concerns are the clayey texture, a high shrink-swell potential, and the hazard of flooding. Graded or level border irrigation systems are suitable. The unit generally is best suited to small grain and pasture. Major flood-control structures are needed.

If this unit is used for urban development, the main management concerns are a high shrink-swell potential, the clayey texture, and the hazard of flooding. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed. Properly designing buildings and roads can reduce the damaging effects of the shrinking and swelling caused by the clayey texture.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of droughtiness. The seedling mortality rate is high because of the content of clay, which causes moisture stress in the seedlings. Extra care is needed during planting to ensure that the soil is firmly packed around the roots. Cultivation or applications of herbicide can help to remove competing vegetation. Drip irrigation can help to establish windbreaks.

72—Catman Variant clay loam, 1 to 3 percent slopes. This deep, somewhat poorly drained soil is on alluvial fans and flood plains and in valleys. It formed in mixed alluvium. Areas are irregular in shape and are 25 to 200 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 6,800 to 6,900 feet. The

average annual precipitation is about 13 to 16 inches, the average annual air temperature is 47 to 51 degrees F, and the average frost-free period is 100 to 120 days.

Typically, the surface layer is dark brown clay loam about 10 inches thick. The upper part of the underlying material is brown clay about 23 inches thick, and the lower part to a depth of 60 inches is yellowish brown clay.

Included in this unit are small areas of Catman soils on alluvial fans, in valleys, and on flood plains and Hickman soils on alluvial fans and flood plains. Included areas make up about 15 percent of the total acreage.

Permeability is very slow in the Catman Variant soil. Available water capacity is moderate. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight. A seasonal high water table generally fluctuates between depths of 24 and 40 inches. It occasionally rises to as high as 15 inches sometime during the period April through September. The soil is occasionally flooded for brief periods in summer. It is moderately saline.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main management concerns are the hazard of flooding, a high shrink-swell potential, a high content of salts, and the fluctuating water table. Graded or level border irrigation systems are suitable. Salinity, the fluctuating water table, and the clayey texture limit the choice of crops. The unit generally is best suited to small grain and pasture. Major flood-control structures are needed.

If this unit is used for urban development, the main management concerns are the hazard of flooding, a high shrink-swell potential, the fluctuating water table, a high content of salts, and the clayey texture. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed. Properly designing buildings and roads can reduce the damaging effects of wetness, salinity, and shrinking and swelling.

This unit generally is unsuitable as a site for windbreaks and environmental plantings. In some areas trees and shrubs can be grown if special treatment is applied.

73—Catman sandy clay loam, 1 to 3 percent slopes. This deep, well drained soil is on alluvial fans, in valleys, and on flood plains. It formed in mixed alluvium. Areas are irregular in shape and are 20 to 100 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is 6,800 to 7,000 feet. The average annual precipitation is about 13 to 16 inches, the average annual air temperature is 47 to 51 degrees F, and the average frost-free period is 100 to 120 days.

Typically, the surface layer is light olive brown sandy clay loam about 6 inches thick. The upper part of the underlying material is light olive brown sandy clay loam about 4 inches thick, and the lower part to a depth of 60 inches is light olive brown clay. In some areas the surface layer is clay loam.

Included in this unit are small areas of Hickman soils on flood plains and alluvial fans and the saline Catman soils on alluvial fans and valley sides. Included areas make up about 15 percent of the total acreage.

Permeability is very slow in the Catman soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight. The soil is slightly saline. It is occasionally flooded for long periods in summer unless it is protected.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main management concerns are the hazard of flooding, a high shrink-swell potential, and the clayey texture. Graded border and sprinkler irrigation systems are suitable. The unit is suited to all climatically adapted crops, but it generally is best suited to small grain and pasture. Major flood-control structures are needed. Stubble and other crop residue can improve tilth.

If this unit is used for urban development, the main management concerns are a high shrink-swell potential, the clayey texture, and the hazard of flooding. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed. Properly designing buildings and roads can reduce the damaging effects of the shrinking and swelling caused by the clayey texture.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of droughtiness. The seedling mortality rate is high because of the high content of clay, which causes moisture stress in the seedlings. Extra care is needed during planting to ensure that the soil is firmly packed around the roots. Cultivation or applications of herbicide can help to remove competing vegetation. Drip irrigation can help to establish windbreaks.

75—Hickman sandy clay loam, 1 to 3 percent slopes. This deep, well drained soil is on flood plains and alluvial fans. It formed in mixed alluvium. Areas are irregular in shape and are 5 to 150 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 6,800 to 7,000 feet. The average annual precipitation

is about 13 to 16 inches, the average annual air temperature is 47 to 51 degrees F, and the average frost-free period is 100 to 120 days.

Typically, the surface layer is light olive brown sandy clay loam about 6 inches thick. The underlying material to a depth of 60 inches is stratified, light olive brown and light yellowish brown sandy clay loam, clay loam, sandy loam, and silty clay loam. In some areas the surface layer is clay loam.

Included in this unit are small areas of Catman and Catman Variant soils. Included areas make up about 15 percent of the total acreage.

Permeability is moderately slow in the Hickman soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight. The soil is occasionally flooded for very brief periods in summer.

This unit is used for irrigated crops and urban development.

If this unit is used for irrigated crops, the main hazard is flooding. Graded border and sprinkler irrigation systems are suitable. The unit is suited to all climatically adapted crops, but it generally is best suited to small grain and pasture. Major flood-control structures are needed.

If this unit is used for urban development, the main hazard is flooding. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of alkalinity and a high content of calcium carbonate, which ties up minerals and limits their availability. Cultivation or applications of herbicide can help to remove competing vegetation.

100—Manzano loam, 1 to 5 percent slopes. This deep, well drained soil is on alluvial fans. It formed in mixed alluvium. Areas are irregular in shape and are 10 to 100 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 6,500 to 7,300 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 115 to 135 days.

Typically, the surface layer is brown loam about 4 inches thick. The upper part of the subsoil is brown silt loam about 18 inches thick, and the lower part to a depth of 60 inches is brown and dark yellowish brown loam and clay loam.

Included in this unit are small areas of Aparejo and Venadito soils along drainageways, Millpaw soils in swales, and Teco, Flugle, and Goesling soils on fan terraces. Included areas make up about 15 percent of the total acreage.

Permeability is moderately slow in the Manzano soil. Available water capacity is very high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe. The soil is occasionally flooded for very brief periods late in spring and in summer.

This unit is used for livestock grazing and urban development.

The potential natural plant community on this unit is mainly blue grama, western wheatgrass, New Mexico feathergrass, and spike muhly. The average annual production of air-dry vegetation ranges from 950 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass and spike muhly decrease in abundance and blue grama increases. The increasers generally occur in small amounts in the potential natural plant community.

This unit is suited to such management practices as livestock pipelines, range seeding, and brush control. Good grazing management can increase the productivity and reproduction potential of western wheatgrass and New Mexico feathergrass.

If this unit is used for urban development, the main hazards are soil blowing and flooding. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Major flood-control structures are needed. Soil blowing can be controlled by maintaining a good plant cover and establishing windbreaks.

A wide variety of trees and shrubs can be grown as windbreaks and environmental plantings on this unit. Cultivation or applications of herbicide can help to remove competing vegetation.

120—Rock outcrop-Laporte complex, 30 to 60 percent slopes. This map unit is on hills, ridges, and ledges. Areas are irregular in shape and are 100 to 1,500 acres in size. The native vegetation is mainly trees, shrubs, and grasses. Elevation is 6,650 to 7,500 feet. The average annual precipitation is about 12 to 15 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 110 to 135 days.

This unit is 50 percent Rock outcrop and 35 percent Laporte very cobbly loam, 30 to 60 percent slopes. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of soils that are similar to the Laporte soil but are very cobbly in the subsoil or are moderately deep and small areas of

Atarque, Mion, and Celacy soils on hills. Included areas make up about 15 percent of the total acreage.

The Rock outcrop consists of barren or nearly barren areas of limestone on the upper part of hills and ridges.

The Laporte soil is shallow and well drained. It formed in mixed colluvium and windblown sediments over limestone. Typically, the surface layer is dark yellowish brown very cobbly loam about 2 inches thick. The underlying material is yellowish brown cobbly loam about 9 inches thick. Limestone is at a depth of about 11 inches. In some areas the slope is less than 30 percent.

Permeability is moderate in the Laporte soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is rapid, and the hazard of water erosion is severe. The hazard of soil blowing also is severe.

This unit is used for livestock grazing and fuel wood production.

The site index for trees on the Laporte soil ranges from 32 to 42. Based on a site index of 36, the soil can produce 4 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot. The understory vegetation is blue grama, pine dropseed, and four o'clock.

Good management is needed to protect the Laporte soil against excessive water erosion. The soil is not suitable as a site for livestock pipelines and ponds because of the depth to bedrock and the slope.

130—Laporte-Rock outcrop complex, 3 to 20 percent slopes. This map unit is on ridges and hills. Areas are irregular in shape and are 100 to 2,000 acres in size. The native vegetation is mainly pinyon, juniper, and shrubs. Elevation is 6,800 to 7,500 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 110 to 135 days.

This unit is 55 percent Laporte gravelly loam, 3 to 20 percent slopes, and 30 percent Rock outcrop. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of soils that are similar to the Laporte soil but are very cobbly in the subsoil or are moderately deep over limestone, Celacy and Flugle soils on hills, and Winona and Mion soils. Included areas make up about 15 percent of the total acreage.

The Laporte soil is shallow and well drained. It formed in mixed colluvium and windblown sediments over limestone. Typically, the surface layer is dark brown gravelly loam about 3 inches thick. The underlying material is dark grayish brown gravelly loam about 8 inches thick. Limestone is at a depth of about 11 inches.

Permeability is moderate in the Laporte soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

The Rock outcrop consists of barren or nearly barren areas of exposed limestone on hills and ridges.

This unit is used for livestock grazing and fuel wood production.

The site index for trees on the Laporte soil ranges from 35 to 45. Based on a site index of 40, the soil can produce 5 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot. The understory vegetation is blue grama, pine dropseed, and four o'clock. As the density of the canopy increases, the abundance of the understory decreases.

Good management is needed to protect the Laporte soil against excessive water erosion. The soil is not suitable as a site for livestock pipelines and ponds because of the depth to bedrock.

200—Penistaja fine sandy loam, 2 to 10 percent slopes. This deep, well drained soil is on the dip slopes of cuestas and on fan terraces and valley sides. It formed in wind-modified alluvium derived dominantly from sandstone. Areas are irregular in shape and are 60 to 1,200 acres in size. The native vegetation is mainly grasses and scattered trees. Elevation is 6,000 to 7,000 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 115 to 140 days.

Typically, the surface layer is brown fine sandy loam about 2 inches thick. The upper part of the subsoil is brown and strong brown sandy clay loam about 20 inches thick. The lower part of the subsoil and the substratum to a depth of 60 inches are light brown and reddish yellow sandy loam. In some areas near the boundary of Catron County, the subsoil has a higher content of clay. In some areas near the boundary of Socorro County, the soil has a higher content of calcium carbonate and coarse fragments. In some areas near the boundary of Bernalillo County, it is shallow over sandstone.

Included in this unit are small areas of Hagerman and Bond soils on the upper dip slopes of cuestas and on ridgetops, Poley soils on benches, Palma and Mespun soils on hillsides, and Mikim soils on fan terraces. Included areas make up about 15 percent of the total acreage.

Permeability is moderate in the Penistaja soil.

Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

This unit is used for livestock grazing. The potential natural plant community is mainly blue grama, western wheatgrass, fourwing saltbush, and winterfat. The average annual production of air-dry vegetation ranges from 950 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass and Indian ricegrass decrease in abundance and blue grama, ring muhly, and broom snakeweed increase. The increasers generally occur in small amounts in the potential natural plant community. Pinyon and oneseed juniper may invade.

Good grazing management can increase the productivity and reproduction potential of western wheatgrass, spike muhly, and sideoats grama. Properly managing livestock grazing and maintaining enough plant residue on the surface can help to protect the soil against soil blowing.

This unit is suited to such management practices as livestock pipelines, fencing, and range seeding. It is not suitable as a site for livestock ponds because of seepage.

205—Ildefonso very gravelly sandy loam, 3 to 15 percent slopes. This deep, well drained soil is on ridges and fan terraces. It formed in mixed alluvium. Areas are elongated and are 20 to 100 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is 5,900 to 6,800 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 150 days.

Typically, the surface layer is brown very gravelly sandy loam about 3 inches thick. The upper part of the subsoil is light brown very gravelly loam about 5 inches thick, and the lower part to a depth of 60 inches is light brown and pink very gravelly loam. A strongly calcareous layer is at a depth of 20 inches or less.

Included in this unit are small areas of Harvey soils on ridges, Penistaja soils on fan terraces, and Manzano soils on fans. Included areas make up about 20 percent of the total acreage.

Permeability is moderate in the Ildefonso soil. Available water capacity also is moderate. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

This unit is used for livestock grazing. The potential natural plant community is mainly blue grama, little bluestem, black grama, and winterfat. The average annual production of air-dry vegetation ranges from 900 pounds per acre in favorable years to 350 pounds in unfavorable years. If the plant community deteriorates, black grama and winterfat decrease in abundance and blue grama and threeawn increase. The increasers generally occur in small amounts in the potential natural plant community.

This unit is limited as a site for livestock ponds because of seepage. Good grazing management can increase the productivity and reproduction potential of winterfat and black grama.

210—Bond-Penistaja-Rock outcrop complex, 2 to 15 percent slopes. This map unit is on valley sides, hills, ridges, and cuestas. Areas are irregular in shape and are 50 to 450 acres in size. The native vegetation is mainly grasses and scattered trees. Elevation is 6,000 to 7,000 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 115 to 140 days.

This unit is about 45 percent Bond sandy loam, 2 to 15 percent slopes; 25 percent Penistaja sandy loam, 2 to 10 percent slopes; and 20 percent Rock outcrop. The Bond soil is on hills and ridgetops and on cuestas near areas of Rock outcrop. The Penistaja soil is on valley sides, ridges, and cuestas. The Rock outcrop is on escarpments and hills. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Poley soils on benches, Skyvillage soils on hills and ridgetops, Mikim and Mion soils on fan terraces, and Hagerman soils on hills. Included areas make up about 10 percent of the total acreage.

The Bond soil is shallow and well drained. It formed in eolian material derived dominantly from sandstone. Typically, the surface layer is brown sandy loam about 3 inches thick. The next layer is brown sandy loam about 4 inches thick. The subsoil is reddish brown sandy clay loam about 6 inches thick. The substratum is light brown sandy clay loam about 3 inches thick. Sandstone is at a depth of about 16 inches.

Permeability is moderate in the Bond soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Penistaja soil formed in wind-modified alluvium derived dominantly from sandstone. Typically, the surface layer is reddish brown sandy loam about 3 inches thick. The upper part of the subsoil is reddish brown sandy clay loam about 27 inches thick. The lower part of the subsoil and the substratum to a depth of 60

inches are light reddish brown and reddish brown sandy loam.

Permeability is moderate in the Penistaja soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Rock outcrop consists of barren or nearly barren areas of exposed sandstone on hills, ridges, and escarpments.

This unit is used for livestock grazing. The potential natural plant community on the Bond soil is mainly sideoats grama, New Mexico feathergrass, Indian ricegrass, blue grama, and scattered oneseed juniper. The average annual production of air-dry vegetation ranges from 700 pounds per acre in favorable years to 275 pounds in unfavorable years. If the plant community deteriorates, sideoats grama, New Mexico feathergrass, and Indian ricegrass decrease in abundance and blue grama, broom snakeweed, and oneseed juniper increase. The increasers generally occur in small amounts in the potential natural plant community.

The suitability of the Bond soil for such management practices as livestock pipelines, range seeding, and fencing is limited because of the depth to bedrock and the available water capacity. The soil is suited to such practices as deferred grazing and rotation grazing. Good grazing management can increase the productivity and reproduction potential of sideoats grama and New Mexico feathergrass.

The potential natural plant community on the Penistaja soil is mainly blue grama, western wheatgrass, fourwing saltbush, and winterfat. The average annual production of air-dry vegetation ranges from 950 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass and Indian ricegrass decrease in abundance and blue grama, ring muhly, sand dropseed, pinyon, and oneseed juniper increase. The increasers generally occur in small amounts in the potential natural plant community.

The Penistaja soil is suited to such management practices as livestock pipelines, fencing, and range seeding. It is not suitable as a site for livestock ponds because of seepage. Good grazing management can increase the productivity and reproduction potential of western wheatgrass and Indian ricegrass.

Properly managing livestock grazing and maintaining enough plant residue on the surface can help to protect the soils against soil blowing.

218—Viuda-Penistaja-Rock outcrop complex, 1 to 10 percent slopes. This map unit is on hills and ridges and in valleys between lava ridges. Areas are irregular in shape and are 2,000 to 5,000 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 6,500 to 7,000 feet. The average annual precipitation is 10 to 12 inches, the average annual air temperature is 49 to 52 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 40 percent Viuda very cobbly sandy loam, 2 to 10 percent slopes, very stony; 35 percent Penistaja sandy loam, 1 to 5 percent slopes; and 15 percent Rock outcrop. The Viuda soil and Rock outcrop are on hills and ridges, and the Penistaja soil is in valleys between lava ridges. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Sparank and San Mateo soils on the bottom of valleys between lava ridges; deep, fine textured soils in valleys between lava ridges; and Hagerman and Bond soils on ridges. Included areas make up about 10 percent of the total acreage.

The Viuda soil is shallow and well drained. It formed in alluvium and windblown sediments over basalt. Typically, the surface layer is brown very cobbly sandy loam about 3 inches thick. The upper part of the subsoil is brown clay about 13 inches thick, and the lower part is light brown cobbly clay loam about 3 inches thick. Basalt is at a depth of about 19 inches.

Permeability is slow in the Viuda soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Penistaja soil is deep and well drained. It formed in wind-modified, mixed alluvium. Typically, the surface layer is brown sandy loam about 2 inches thick. The upper part of the subsoil is dark yellowish brown sandy clay loam about 22 inches thick. The lower part of the subsoil and the substratum to a depth of 60 inches are yellowish brown sandy loam.

Permeability is moderate in the Penistaja soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Rock outcrop consists of barren or nearly barren areas of exposed volcanic rock on ridges and hills.

This unit generally is used for livestock grazing. In areas near Grants, it is used for urban development.

The potential natural plant community on the Viuda soil is mainly blue grama, sideoats grama, black grama, little bluestem, and wolftail. The average annual production of air-dry vegetation ranges from 1,100 pounds per acre in favorable years to 425 pounds in unfavorable years. If the plant community deteriorates,

sideoats grama, black grama, and little bluestem decrease in abundance and blue grama increases. Blue grama generally occurs in small amounts in the potential natural plant community.

The suitability of the Viuda soil for such management practices as livestock pipelines is limited because of the rock fragments and the depth to bedrock.

The potential natural plant community on the Penistaja soil is mainly blue grama, western wheatgrass, fourwing saltbush, and winterfat. The average annual production of air-dry vegetation ranges from 950 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass and Indian ricegrass decrease in abundance and blue grama, ring muhly, sand dropseed, pinyon, and oneseed juniper increase. The increasers generally occur in small amounts in the potential natural plant community.

The Penistaja soil is suited to such management practices as livestock pipelines, fencing, and range seeding. It is not suitable as a site for livestock ponds because of seepage. Good grazing management can increase the productivity and reproduction potential of western wheatgrass.

Properly managing livestock grazing and maintaining enough plant residue on the surface can help to protect the soils in this unit against soil blowing.

The Viuda soil is poorly suited to urban development. The main management concerns are the depth to bedrock, the stones on the surface, and the hazard of soil blowing. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees.

The Penistaja soil is well suited to urban development. The main hazard is soil blowing. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Properly designed and managed windbreaks can reduce the risk of soil blowing.

The Viuda soil generally is unsuitable for windbreaks and environmental plantings. In some areas trees and shrubs can be grown if special treatment is applied.

A wide variety of trees and shrubs can be grown as windbreaks and environmental plantings on the Penistaja soil. Cultivation or applications of herbicide can help to remove competing vegetation.

230—Dumps-Pits complex. This map unit is on hills and flats. Slope is 5 to 90 percent. Areas are irregular in shape and are 200 to 1,000 acres in size. The unit is essentially barren of vegetation. Elevation is 6,000 to 7,500 feet. The average annual precipitation is about 8 to 15 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 100 to 160 days.

This unit is 50 percent Dumps and 35 percent Pits.

Included in this unit are small areas of Atarque, Bond, Hagerman, Penistaja, and Poley soils on mesas, hills, and flats; Mikim soils on fans; and San Mateo and Sparank soils in valleys. Included areas make up about 15 percent of the total acreage.

Dumps occur as areas of waste rock, mine spoil (mainly uranium tailings), and other refuse. Reaction ranges from medium acid to very strongly alkaline.

Pits consist of open excavations from which soil material and some rocks have been removed.

This unit has very limited value as a site for agricultural uses. The main limitations are a shallow depth, poor tilth, low fertility, and extremes in reaction. The unit has some value as a source of construction material.

251—Skyvillage-Rock outcrop-Bond complex, 3 to 40 percent slopes. This map unit is on benches, escarpments, and mesas. Areas are irregular in shape and are 100 to 600 acres in size. The native vegetation is mainly grasses, shrubs, and scattered pinyon and oneseed juniper. Elevation is 6,000 to 6,800 feet. The average annual precipitation is 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 150 days.

This unit is 40 percent Skyvillage sandy loam, 3 to 40 percent slopes; 30 percent Rock outcrop; and 20 percent Bond sandy loam, 3 to 8 percent slopes. The Skyvillage soil is on benches, the lee side of mesas, and the edges of mesa tops; the Rock outcrop is on escarpments; and the Bond soil is on benches and the edges of mesas. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of San Mateo and Sparank soils in valleys, Mikim and Mion soils on toe slopes, and Hagerman and Penistaja soils on mesas. Included areas make up about 10 percent of the total acreage.

The Skyvillage soil is shallow and well drained. It formed in eolian material derived dominantly from sandstone. Typically, the surface layer is light yellowish brown sandy loam about 4 inches thick. The underlying material is dark yellowish brown sandy loam about 8 inches thick. Sandstone is at a depth of about 12 inches.

Permeability is moderately rapid in the Skyvillage soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and

the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Rock outcrop consists of barren or nearly barren areas of exposed sandstone on benches and escarpments.

The Bond soil is shallow and well drained. It formed in eolian material derived dominantly from sandstone. Typically, the surface layer is brown sandy loam about 4 inches thick. The subsoil is reddish brown sandy clay loam about 6 inches thick. Sandstone is at a depth of about 10 inches.

Permeability is moderate in the Bond soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

This unit is used for livestock grazing. The potential natural plant community is mainly Indian ricegrass, New Mexico feathergrass, blue grama, Mormon tea, and scattered pinyon and oneseed juniper. The average annual production of air-dry vegetation ranges from 700 pounds per acre in favorable years to 275 pounds in unfavorable years. If the plant community deteriorates, New Mexico feathergrass and Indian ricegrass decrease in abundance and blue grama, threeawn, sandhill muhly, shrubs, and trees increase. The increasers generally occur in small amounts in the potential natural plant community.

In some areas dense stands of pinyon and oneseed juniper may become established. If properly managed, a limited wood crop can be produced in these areas.

This unit is suited to such management practices as deferred grazing and rotation grazing. Because of droughtiness, the shallow depth, and the slope, the unit is not suitable for such management practices as livestock pipelines, livestock ponds, and range seeding.

257—Sparank-San Mateo complex, 0 to 5 percent slopes. This map unit is on flood plains, in broad drainageways, in valleys, and on alluvial fans. Areas are elongated and are 100 to 1,500 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is 5,800 to 6,600 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 145 days.

This unit is 50 percent Sparank clay loam, 0 to 3 percent slopes, and 40 percent San Mateo loam, 1 to 5 percent slopes. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used. The soils in some areas near the boundary of Catron County are more moist in the underlying material, and those in some areas near the boundary of Bernalillo County are more highly developed.

Included in this unit are small areas of Aparejo, Glenberg, and Venadito soils on flood plains, in valleys, and on alluvial fans and Penistaja soils on fan terraces. Included areas make up about 10 percent of the total acreage.

The Sparank soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is light yellowish brown clay loam about 2 inches thick. The underlying material to a depth of 60 inches is light yellowish brown and light olive brown silty clay.

Permeability is very slow in the Sparank soil. Available water capacity is very high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is moderate. The hazard of soil blowing is severe. This soil is occasionally flooded for brief periods in summer unless it is protected or gullied.

The San Mateo soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is light yellowish brown loam about 2 inches thick. The upper 27 inches of the underlying material is light olive brown loam and sandy clay loam, and the lower part to a depth of 60 inches is dominantly light olive brown sandy clay loam but has thin strata of sandy loam to silty clay loam.

Permeability is moderate in the San Mateo soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe. This soil is occasionally flooded for very brief periods in summer unless it is protected or gullied.

This unit is used for livestock grazing and wildlife habitat.

The potential natural plant community on this unit is mainly western wheatgrass, vine mesquite, alkali sacaton, and fourwing saltbush. The average annual production of air-dry vegetation ranges from 3,200 pounds per acre in favorable years to 1,250 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, vine mesquite, alkali sacaton, and winterfat decrease in abundance and blue grama, galleta, broom snakeweed, and rabbitbrush increase. The increasers generally occur in small amounts in the potential natural plant community.

Deterioration of the plant community on this unit often results in the formation of gullies that drain the site and hinder the production of vegetation. Where deep gullies have artificially drained the site, a combination of grazing management and engineering practices may be needed to return the site to its productive potential.

The San Mateo soil is limited as a site for livestock

ponds because of seepage, but the Sparank soil is suitable as a site for these ponds. The soils are suited to such management practices as deferred grazing, rotation grazing, livestock pipelines, and fencing. Good grazing management can increase the productivity and reproduction potential of western wheatgrass, alkali sacaton, and winterfat.

259—Mikim loam, 1 to 5 percent slopes. This deep, well drained soil is on fan terraces and valley sides. It formed in mixed alluvium. Areas are irregular in shape and are 100 to 800 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is 5,800 to 6,800 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 51 to 53 degrees F, and the average frost-free period is 120 to 150 days.

Typically, the surface layer is pale brown loam about 4 inches thick. The underlying material to a depth of 60 inches is pale brown and light yellowish brown sandy clay loam and clay loam.

Included in this unit are small areas of San Mateo and Sparank soils in drainageways and depressions; Penistaja, Zia, and Palma soils on fan terraces; and Suwanee soils along drainageways. Included areas make up about 15 percent of the total acreage.

Permeability is moderate in the Mikim soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

This unit is used for livestock grazing. The potential natural plant community is mainly western wheatgrass, blue grama, New Mexico feathergrass, and galleta. The average annual production of air-dry vegetation ranges from 950 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass decreases in abundance and blue grama increases. Blue grama generally occurs in small amounts in the potential natural plant community.

This unit is suited to such management practices as livestock pipelines, range seeding, and brush control. It is not suitable as a site for livestock ponds because of seepage in the underlying material. Good grazing management can increase the productivity and reproduction potential of western wheatgrass.

262—Poley-Pojoaque very cobbly loams, 5 to 30 percent slopes. This map unit is on mesa breaks. Areas are irregular in shape and are 300 to 4,000 acres in size. The native vegetation is mainly grasses, shrubs, and trees. Elevation is 6,200 to 6,900 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 50 percent Poley very cobbly loam and 30 percent Pojoaque very cobbly loam. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Mion soils on hills, Penistaja and Hagerman soils on fan terraces, and Rock outcrop on hills and ridges. Included areas make up about 20 percent of the total acreage.

The Poley soil is deep and well drained. It formed in alluvium and colluvium derived dominantly from sandstone and shale. Typically, the surface layer is dark brown very cobbly loam about 2 inches thick. The upper part of the subsoil is dark brown gravelly clay loam about 16 inches thick, and the lower part to a depth of 60 inches is yellowish brown loam. In some areas the subsoil has more than 35 percent rock fragments.

Permeability is slow in the Poley soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Pojoaque soil is deep and well drained. It formed in alluvium and colluvium derived dominantly from shale and sandstone. Typically, the surface layer is brown very cobbly loam about 3 inches thick. The subsurface layer is brown gravelly clay loam about 4 inches thick. The underlying material to a depth of 60 inches is light yellowish brown and very pale brown cobbly clay loam and gravelly sandy clay loam. In some areas it has more than 35 percent rock fragments.

Permeability is moderate in the Pojoaque soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

This unit is used for livestock grazing and wildlife habitat.

The potential natural plant community on this unit is mainly blue grama, sideoats grama, black grama, New Mexico feathergrass, and sacahuista. The average annual production of air-dry vegetation ranges from 750 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, sideoats grama and black grama decrease in abundance and blue grama, threeawn, and sacahuista increase. The increasers generally occur in small amounts in the potential natural plant community.

This unit is limited as a site for such management practices as livestock pipelines and ponds because of the slope. Good grazing management can increase the

productivity and reproduction potential of black grama and sideoats grama.

264—Tapia sandy loam, 1 to 5 percent slopes. This deep, well drained soil is on fan terraces. It formed in mixed alluvium. Areas are irregular in shape and are 500 to 1,200 acres in size. The native vegetation is mainly grasses and scattered trees. Elevation is 6,200 to 6,900 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 120 to 150 days.

Typically, the surface layer is brown sandy loam about 4 inches thick. The upper 19 inches of the subsoil is brown clay loam and sandy clay loam, the next 17 inches is very pale brown cobbly sandy loam, and the lower part to a depth of 60 inches is very pale brown cobbly sand.

Included in this unit are small areas of Penistaja, Mikim, Hagerman, and Poley soils on fan terraces; San Mateo and Sparank soils on alluvial fans and in drainageways; and, on fan terraces, soils that are similar to the Tapia soil but have more than 35 percent rock fragments. Included areas make up about 20 percent of the total acreage.

Permeability is moderate in the Tapia soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

This unit is used for livestock grazing. The potential natural plant community is mainly western wheatgrass, blue grama, New Mexico feathergrass, and galleta. The average annual production of air-dry vegetation ranges from 950 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass decreases in abundance and blue grama increases. Blue grama generally occurs in small amounts in the potential natural plant community.

This unit is suited to such management practices as livestock pipelines, range seeding, and brush control. It is not suitable as a site for livestock ponds because of seepage. Good grazing management can increase the productivity and reproduction potential of western wheatgrass.

270—Charo loam, 0 to 5 percent slopes. This moderately deep, well drained soil is on hills and mesa tops. It formed in mixed alluvium and windblown sediments over basalt. Areas are irregular in shape and are 150 to 500 acres in size. The native vegetation is mainly grasses and scattered trees. Elevation is 7,800 to 8,200 feet. The average annual precipitation is about 16 to 20 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 90 to 110 days.

Typically, the surface layer is dark brown loam about 5 inches thick. The upper 6 inches of the subsoil is reddish brown clay loam, and the lower 17 inches is reddish brown clay and clay loam. Basalt is at a depth of about 28 inches. In some areas the surface layer is clay loam. In other areas the soil has as much as 15 percent rock fragments.

Included in this unit are small areas of Cebolleta and Borrego soils on hills and mesa tops, Rock outcrop on hillsides, and Trag soils in swales. Included areas make up about 20 percent of the total acreage.

Permeability is slow in the Charo soil. Available water capacity is low. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for livestock grazing and wildlife habitat.

The potential natural plant community on this unit is mainly mountain muhly, Arizona fescue, muttongrass, and prairie junegrass. The average annual production of air-dry vegetation ranges from 1,050 pounds per acre in favorable years to 650 pounds in unfavorable years. If the plant community deteriorates, mountain muhly and prairie junegrass decrease in abundance and needleandthread and blue grama increase. The increasers generally occur in small amounts in the potential natural plant community.

This unit is suited to such management practices as range seeding and livestock pipelines. It is not suitable as a site for livestock ponds because of the depth to bedrock.

272—Cebolleta-Borrego-Rock outcrop complex, 1 to 15 percent slopes. This map unit is on hills and mesas. Areas are irregular in shape and are 500 to 1,000 acres in size. The native vegetation is mainly grasses and trees. Elevation is 7,500 to 8,200 feet. The average annual precipitation is about 18 to 22 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 90 to 110 days.

This unit is 35 percent Cebolleta cobbly loam, 1 to 15 percent slopes, very stony; 30 percent Borrego gravelly loam, 1 to 15 percent slopes; and 20 percent Rock outcrop. The Cebolleta soil is on mesa tops and hills, the Borrego soil is on mesas and hilltops, and the Rock outcrop is on hills. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Charo soils on hillsides and mesa tops and Trag soils in swales. Also

included, on hilltops, are soils that are similar to the Borrego soil but have more rock fragments in the subsoil. Included areas make up about 15 percent of the total acreage.

The Cebolleta soil is moderately deep and well drained. It formed in alluvium and windblown sediments derived dominantly from basalt and andesite. Typically, the surface layer is brown cobbly loam about 2 inches thick. The next layer is brown very cobbly clay loam about 6 inches thick. The subsoil is strong brown and brown very cobbly clay about 17 inches thick. Basalt is at a depth of about 25 inches.

Permeability is slow in the Cebolleta soil. Available water capacity is very low. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Borrego soil is shallow and well drained. It formed in alluvium and windblown sediments derived dominantly from basalt and andesite. Typically, the surface layer is brown gravelly loam about 4 inches thick. Below this is brown gravelly clay about 14 inches thick. Basalt is at a depth of about 18 inches.

Permeability is very slow in the Borrego soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

The Rock outcrop consists of barren or nearly barren areas of exposed basalt on hills and mesa tops.

This unit is used for livestock grazing and wood products.

In some areas pinyon, juniper, and scattered ponderosa pine are at the lower elevations. The site index for ponderosa pine ranges from 54 to 64. Based on a site index of 60, the potential production of merchantable timber is 3,570 cubic feet, or 14,600 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 46 cubic feet, or 177 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting timber on this unit are seedling mortality, the hazard of windthrow, equipment limitations, and the stones on the surface. The stones can interfere with felling, yarding, and other activities involving the use of equipment. The seedling mortality rate is moderate because of the depth to bedrock, the clayey texture, and the available water capacity. Trees are subject to windthrow because of the limited rooting depth.

The understory vegetation on this unit is mainly Arizona fescue, Gambel oak, blue grama, muttongrass, western wheatgrass, and bottlebrush squirreltail.

276—Trag loam, 1 to 8 percent slopes. This deep, well drained soil is on valley sides. It formed in mixed alluvium. Areas are irregular in shape and are 50 to 100 acres in size. The native vegetation is mainly grasses and scattered trees. Elevation is 7,800 to 8,900 feet. The average annual precipitation is about 16 to 20 inches, the average annual air temperature is 40 to 46 degrees F, and the average frost-free period is 90 to 110 days.

Typically, the surface layer is brown loam about 3 inches thick. The subsoil is about 21 inches of reddish brown sandy clay loam and clay loam. The substratum to a depth of 60 inches is brown and light brown sandy clay loam.

Included in this unit are small areas of McGaffey soils in swales and Charo and Cebolleta soils on hills. Included areas make up about 15 percent of the total acreage.

Permeability is moderate in the Trag soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for livestock grazing. The potential natural plant community is mainly mountain muhly, Arizona fescue, muttongrass, and prairie junegrass. The average annual production of air-dry vegetation ranges from 1,050 pounds per acre in favorable years to 650 pounds in unfavorable years. If the plant community deteriorates, mountain muhly and prairie junegrass decrease in abundance and Poa and blue grama increase. The increasers generally occur in small amounts in the potential natural plant community.

This unit is suited to such management practices as range seeding, ponds, and livestock pipelines.

278—Microy-Rock outcrop complex, 5 to 30 percent slopes. This map unit is on hills. Areas are circular or irregular in shape and are 100 to 300 acres in size. The native vegetation is mainly grasses and trees. Elevation is 8,000 to 8,900 feet. The average annual precipitation is about 18 to 22 inches, the average annual air temperature is 40 to 44 degrees F, and the average frost-free period is 90 to 100 days.

This unit is 55 percent Microy cobbly loam, 5 to 30 percent slopes, and 25 percent Rock outcrop. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Borrego, Cebolleta, and Raton soils on hills. Included areas make up about 20 percent of the total acreage.

The Microy soil is moderately deep and well drained. It formed in mixed alluvium. Typically, the surface layer

is brown cobbly loam about 3 inches thick. The subsoil is dark reddish gray and reddish brown cobbly clay about 25 inches thick. The substratum is reddish brown very cobbly clay about 8 inches thick. Basalt is at a depth of about 36 inches. In some areas the surface layer is loam.

Permeability is slow in the Microy soil. Available water capacity is low. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Rock outcrop consists of barren or nearly barren areas of exposed basalt on hills.

This unit is used for wood products and livestock grazing.

The Microy soil is suited to the production of ponderosa pine. The site index for ponderosa pine averages 50. Based on a site index of 50, the potential production of merchantable timber is 2,500 cubic feet, or 9,200 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 46 cubic feet, or 177 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting timber are the hazard of erosion, equipment limitations, plant competition, and a slow growth rate. When timber is harvested, minimizing the risk of erosion is essential. Proper design of road drainage systems and care in the placement of culverts help to control erosion. Spoil from excavations is subject to rill and gully erosion and to sloughing. Constructing water bars and seeding cut and filled areas can protect logging roads and landings against erosion. Conventional methods of harvesting timber generally can be used, but their use may be limited when the soil is wet. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Brushy plants, such as Gambel oak, limit the natural regeneration of ponderosa pine. Thinning the stand can help to accelerate the growth of desirable trees.

The understory vegetation on this unit is Arizona fescue, mountain muhly, western wheatgrass, and Gambel oak.

282—Cebolleta cobbly loam, 2 to 10 percent slopes, very stony. This moderately deep, well drained soil is on hills. It formed in alluvium and windblown sediments derived dominantly from basalt and andesite. Areas are irregular in shape and are 100 to 1,500 acres in size. The native vegetation is mainly trees, grasses, and shrubs. Elevation is 7,900 to 9,100 feet. The average annual precipitation is about 20 to 24 inches, the average annual air temperature is 40 to 44 degrees F, and the average frost-free period is 80 to 100 days.

Typically, the surface layer is dark grayish brown cobbly loam about 4 inches thick. The next layer is dark grayish brown very cobbly loam about 6 inches thick. The subsoil is reddish brown very cobbly clay about 15 inches thick. Basalt is at a depth of about 25 inches.

Included in this unit are small areas of soils that are similar to the Cebolleta soil but have a light colored surface layer. These soils are on hills. Also included are Borrego soils on hilltops, Charo soils on hills, and Rock outcrop on ridges and hills. Included areas make up about 20 percent of the total acreage.

Permeability is slow in the Cebolleta soil. Available water capacity is very low. The effective rooting depth is 20 to 40 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight.

This unit is used for livestock grazing and commercial wood products.

This unit is moderately suited to the production of ponderosa pine at elevations above 8,000 feet and poorly suited at elevations below 8,000 feet. The site index for ponderosa pine ranges from 53 to 62 above 8,000 feet and from 43 to 47 below 8,000 feet. Based on a site index of 50, the potential production of merchantable timber is 2,500 cubic feet, or 9,200 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 38 cubic feet, or 130 board feet (International rule ⅛-inch kerf), per acre.

The main concerns in producing and harvesting ponderosa pine are the stones on the surface, plant competition, and a slow growth rate. The stones can interfere with felling, yarding, and other activities involving the use of equipment. Unless the site is adequately prepared, competition from undesirable plants can prevent or delay the natural or artificial regeneration of trees. Understory grasses and brushy plants limit the natural regeneration of ponderosa pine at elevations below 8,000 feet. Thinning the stand can help to accelerate the growth of desirable trees. When timber is harvested, minimizing the risk of erosion is essential. Leaving an undisturbed buffer or filter strip along watercourses minimizes sedimentation and thus helps to maintain water quality.

The understory vegetation on this unit is mainly Arizona fescue, mountain muhly, and prairie junegrass at elevations above 8,000 feet and blue grama, little bluestem, and mountainmahogany at elevations below 8,000 feet.

284—Cebolleta-Rock outcrop complex, 15 to 50 percent slopes. This map unit is on mountains. Areas are irregular in shape and are 100 to 1,000 acres in size. The native vegetation is mainly trees, shrubs, and grasses. Elevation is 7,700 to 9,400 feet. The average annual precipitation is about 20 to 24 inches, the average annual air temperature is 40 to 44 degrees F, and the average frost-free period is 80 to 100 days.

This unit is 65 percent Cebolleta very cobbly loam, 15 to 50 percent slopes, very stony, and 20 percent Rock outcrop. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of soils that are similar to the Cebolleta soil but have a light colored surface layer. These soils are on mountainsides. Also included are small areas of Borrego soils on mountainsides and benches. Included areas make up about 15 percent of the total acreage.

The Cebolleta soil is moderately deep and well drained. It formed in alluvium and colluvium derived dominantly from basalt and andesite. Typically, the surface layer is dark grayish brown very cobbly loam about 5 inches thick. The subsurface layer is grayish brown very cobbly loam about 5 inches thick. The subsoil is brown very cobbly clay about 14 inches thick. Basalt is at a depth of about 24 inches. In some areas the slope is less than 15 percent.

Permeability is slow in the Cebolleta soil. Available water capacity is very low. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Rock outcrop consists of barren or nearly barren areas of exposed basalt and andesite on mountainsides and benches.

This unit is used for livestock grazing and commercial wood products.

The Cebolleta soil is suited to the production of ponderosa pine and Douglas fir. The site index for ponderosa pine ranges from 52 to 64. Based on a site index of 60, the potential production of merchantable timber is 3,570 cubic feet, or 14,600 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 46 cubic feet, or 177 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting ponderosa pine and Douglas fir are the slope and the stones on the surface. Conventional methods of harvesting timber can be used in the less sloping areas, but their use is limited in the steeper areas. Properly designing logging roads, skid trails, and landings helps to overcome the slope. Erosion-control structures and seeding are needed to protect the roads against erosion. The stones can interfere with felling, yarding, and other activities involving the use of equipment. Such plants as Gambel oak, alligator juniper, and pinyon delay natural regeneration but do not prevent the eventual development of a fully stocked, normal stand of trees.

The understory vegetation on this unit is mainly Arizona fescue, mountain muhly, yarrow, and mountainmahogany.

286—Cebolleta-Raton complex, 1 to 5 percent slopes. This map unit is on hills and mesa tops. Areas are irregular in shape and are 500 to 1,000 acres in size. The native vegetation is mainly trees, shrubs, and grasses. Elevation is 8,400 to 8,800 feet. The average annual precipitation is about 20 to 24 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 80 to 100 days.

This unit is 60 percent Cebolleta very cobbly loam, 1 to 5 percent slopes, very stony, and 25 percent Raton cobbly loam, 1 to 5 percent slopes, very stony. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Charo soils and Rock outcrop on hills and mesa tops, Microy soils on hills, and Trag soils along drainageways. Included areas make up about 15 percent of the total acreage.

The Cebolleta soil is moderately deep and well drained. It formed in alluvium and windblown sediments derived dominantly from basalt. Typically, the surface layer is dark brown very cobbly loam about 3 inches thick. The subsurface layer is dark brown very cobbly clay loam about 6 inches thick. The subsoil is brown and reddish brown very cobbly clay about 19 inches thick. Basalt is at a depth of about 28 inches.

Permeability is slow in the Cebolleta soil. Available water capacity is very low. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Raton soil is shallow and well drained. It formed in alluvium and windblown sediments derived dominantly from igneous rock. Typically, the surface layer is dark yellowish brown cobbly loam about 3 inches thick. The subsurface layer is brown very cobbly clay loam about 3 inches thick. The subsoil is brown very cobbly clay about 4 inches thick. Basalt is at a depth of about 10 inches.

Permeability is slow in the Raton soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water

erosion is moderate. The hazard of soil blowing also is moderate.

This unit is used for livestock grazing and commercial wood products.

This unit is suited to the production of ponderosa pine. The site index for ponderosa pine ranges from 59 to 61. Based on a site index of 60, the potential production of merchantable timber is 3,570 cubic feet, or 14,600 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 46 cubic feet, or 177 board feet (International rule, ⅛-inch kerf), per acre.

Conventional methods of harvesting timber can be used. Carefully managing reforestation can minimize competition from undesirable understory plants. Brushy plants, such as Gambel oak, limit the natural regeneration of ponderosa pine.

The main concerns in producing and harvesting timber on the Cebolleta soil are seedling mortality and the hazard of windthrow. The seedling mortality rate is moderate because of the very low available water capacity. Trees commonly are subject to windthrow during periods when the soil is excessively wet and winds are strong.

The main concerns in producing and harvesting of timber on the Raton soil are equipment limitations, seedling mortality, and the hazard of windthrow. Rock outcrop restricts the movement of equipment, and sharp, angular cobbles and stones cause abnormal wear of rubber-tired equipment. The seedling mortality rate is moderate because of the very low available water capacity and the restricted rooting depth. Trees are subject to windthrow because of the restricted rooting depth.

The understory vegetation on this unit is Arizona fescue, blue grama, western wheatgrass, and Gambel oak.

290—Paguate-Hackroy complex, 1 to 5 percent slopes. This map unit is on basalt-capped mesa tops and plateaus. Areas are irregular in shape and are 100 to 1,300 acres in size. The native vegetation is mainly grasses, forbs, and trees. Elevation is 7,000 to 8,000 feet. The average annual precipitation is about 14 to 16 inches, the average annual air temperature is 47 to 52 degrees F, and the average frost-free period is 110 to 130 days.

This unit is 50 percent Paguate loam, 1 to 5 percent slopes, and 35 percent Hackroy cobbly loam, 1 to 5 percent slopes. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Cabezon soils on mesas and ridges; on mesas and plateaus, soils that are similar to the Hackroy and Paguate soils but have more rock fragments in the subsoil; Millpaw soils in upland drainageways and depressions; and Rock outcrop on the edges of mesas and on ridges. Included areas make up about 15 percent of the total acreage.

The Paguate soil is moderately deep and well drained. It formed in mixed alluvium and windblown sediments over basalt. Typically, the surface layer is dark brown loam about 3 inches thick. The upper 16 inches of the subsoil is reddish brown clay loam and clay, and the lower 14 inches is pink gravelly clay loam. Basalt is at a depth of about 33 inches.

Permeability is slow in the Paguate soil. Available water capacity is moderate. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

The Hackroy soil is shallow and well drained. It formed in mixed alluvium and windblown sediments over basalt. Typically, the surface layer is brown cobbly loam about 3 inches thick. The upper part of the subsoil is reddish brown clay loam about 8 inches thick, and the lower part is reddish brown clay about 3 inches thick. Basalt is at a depth of about 14 inches.

Permeability is slow in the Hackroy soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used for livestock grazing, wildlife habitat, and limited wood products.

The potential natural plant community on the Paguate soil is mainly blue grama, spike muhly, western wheatgrass, fourwing saltbush, and winterfat. The average annual production of air-dry vegetation ranges from 950 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass and spike muhly decrease in abundance and blue grama, ring muhly, sand dropseed, pinyon, and oneseed juniper increase. The increasers generally occur in small amounts in the potential natural plant community.

The Paguate soil is suited to such management practices as livestock pipelines, fencing, and range seeding. It is not suitable as a site for livestock ponds because of the depth to bedrock. Good grazing management can increase the productivity and reproduction potential of western wheatgrass and spike muhly.

The potential natural plant community on the Hackroy soil is mainly blue grama, sideoats grama, black grama, little bluestem, and western wheatgrass. The average annual production of air-dry vegetation ranges from

1,100 pounds per acre in favorable years to 425 pounds in unfavorable years. If the plant community deteriorates, sideoats grama, black grama, and western wheatgrass decrease in abundance and blue grama, threeawn, and pinyon increase. The increasers generally occur in small amounts in the potential natural plant community.

The suitability of the Hackroy soil for such management practices as livestock pipelines and range seeding is limited because of the depth to bedrock and the available water capacity. Good grazing management can increase the productivity and reproduction potential of western wheatgrass, spike muhly, sideoats grama, and black grama.

291—Paguate cobbly clay loam, 1 to 5 percent slopes. This moderately deep, well drained soil is on basalt-capped mesa tops and plateaus. It formed in mixed alluvium and windblown sediments. Areas are irregular in shape and are 100 to 2,500 acres in size. The native vegetation is mainly trees, grasses, and forbs. Elevation is 7,000 to 8,000 feet. The average annual precipitation is about 14 to 16 inches, the average annual air temperature is 47 to 51 degrees F, and the average frost-free period is 100 to 130 days.

Typically, the surface layer is dark yellowish brown cobbly clay loam about 5 inches thick. The upper part of the subsoil is strong brown and brown clay about 21 inches thick, and the lower part is reddish yellow clay loam about 12 inches thick. Basalt is at a depth of about 38 inches. In some areas the surface layer is clay loam.

Included in this unit are small areas of Cabezon soils on mesa tops, hills, and ridges; Millpaw soils in swales; and Rock outcrop on ridges, hills, and the edges of mesas. Also included are some areas near the boundary of Catron County where temperatures are slightly cooler and some areas near the boundary of Socorro County where the surface layer is darker. Included areas make up about 20 percent of the total acreage.

Permeability is slow in the Paguate soil. Available water capacity is low. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for livestock grazing and wood products.

The site index for pinyon and juniper on this unit ranges from 30 to 50. Based on a site index of 40, the soil can produce 6 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot.

Grasses, forbs, and shrubs limit the natural regeneration of woody species. Properly preparing the site can control the competing vegetation.

The understory vegetation on this unit is western wheatgrass, bluegrass, bottlebrush squirreltail, oak, and pinyon ricegrass. The production of understory plants can be increased by reducing the density of the canopy.

294—Parkay-Rock outcrop complex, 15 to 45 percent slopes. This map unit is on mountains, ridges, hills, and escarpments. Areas are irregular in shape and are 200 to 1,100 acres in size. The native vegetation is mainly trees, shrubs, and grasses. Elevation is 8,200 to 10,300 feet. The average annual precipitation is about 22 to 26 inches, the average annual air temperature is 36 to 42 degrees F, and the average frost-free period is 60 to 80 days.

This unit is 60 percent Parkay stony loam, 15 to 45 percent slopes, extremely stony, and 25 percent Rock outcrop. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Trag soils on ridges, mountains, and hills. Also included, on side slopes and ridges, are soils that are similar to the Parkay soil but are moderately deep over shale. Included areas make up about 15 percent of the total acreage.

The Parkay soil is deep and well drained. It formed in colluvium and alluvium derived dominantly from basalt and andesite. Typically, the surface layer is dark grayish brown stony loam about 2 inches thick. The subsurface layer is dark grayish brown very gravelly sandy clay loam about 6 inches thick. The subsoil is brown very cobbly sandy clay loam about 15 inches thick. The substratum to a depth of 60 inches is brown and light brown very cobbly sandy clay loam. In some areas the slope is less than 15 percent.

Permeability is moderate in the Parkay soil. Available water capacity also is moderate. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Rock outcrop consists of barren or nearly barren areas of exposed basalt and andesite on escarpments, mountains, hills, and ridges.

This unit is used for wood products and livestock grazing.

The Parkay soil is suited to the production of Douglas fir and Engelmann spruce. At the lower elevations, it is suited to the production of ponderosa pine. The site index for Douglas fir ranges from 70 to 85. The site index for Engelmann spruce ranges from 69 to 85 where slopes are 15 to 35 percent and from 76 to 96 where slopes are 35 to 45 percent. The site index

for ponderosa pine ranges from 56 to 76 in less sloping areas. Douglas fir and Engelmann spruce can be grown as Christmas trees.

Based on a site index of 75 for Douglas fir, the potential production of merchantable timber is 4,945 cubic feet, or 26,600 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 62 cubic feet, or 271 board feet (International rule, ⅛-inch kerf), per acre.

Based on a site index of 80 for Engelmann spruce, the potential production of merchantable timber is 4,360 cubic feet, or 21,800 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 76 cubic feet per acre.

The main concerns in producing and harvesting Engelmann spruce and Douglas fir are the hazard of erosion in the steeper areas, equipment limitations, and plant competition. When timber is harvested, minimizing the risk of erosion is essential. Conventional methods of harvesting can be used in the less sloping areas, but their use is restricted in the steeper areas. Areas that have slopes of more than 35 percent are not suited to conventional methods of harvesting. Stones on the surface can interfere with felling, yarding, and other activities involving the use of equipment, and Rock outcrop can restrict the movement of equipment. Special design of logging roads, skid trails, and landings is needed in the steeper areas. Erosion-control structures and seeding can protect the roads against erosion. Spoil from excavations is subject to rill and gully erosion and to sloughing. Leaving an undisturbed buffer or filter strip along watercourses minimizes sedimentation and thus helps to maintain water quality. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Aspen may limit the natural regeneration of Engelmann spruce and Douglas fir.

The understory vegetation on this unit is Arizona fescue, pyrola, violet, Fendler meadowrue, currant, and gooseberry. It is very sparse because of the dense canopy.

300—Saladon clay loam, 0 to 5 percent slopes. This deep, poorly drained soil is in valleys and drainageways. It formed in mixed alluvium. Areas are long and narrow and are 20 to 100 acres in size. The native vegetation is mainly grasses and sedges. Elevation is 7,900 to 8,300 feet. The average annual precipitation is about 20 to 24 inches, the average annual air temperature is 40 to 44 degrees F, and the average frost-free period is 90 to 110 days.

Typically, the surface layer is dark brown clay loam about 4 inches thick. The underlying material to a depth of 60 inches is black, yellowish brown, grayish brown, and very dark gray sandy clay and clay.

Included in this unit are small areas of McGaffey soils in valleys, soils that are similar to the Saladon soil but are well drained and are on valley sides, Moreno soils on valley sides, and soils that are similar to the Saladon soil but are less clayey. Included areas make up about 15 percent of the total acreage.

Permeability is very slow in the Saladon soil. Available water capacity is high. A high water table limits the effective rooting depth to 15 to 35 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight. A seasonal high water table fluctuates between depths of 18 to 36 inches. This soil is subject to rare flooding.

This unit is used for livestock grazing. The potential natural plant community is mainly tufted hairgrass, western wheatgrass, sedges, rushes, and bluegrass. The average annual production of air-dry vegetation ranges from 3,000 pounds per acre in favorable years to 2,500 pounds in unfavorable years. If the plant community deteriorates, tufted hairgrass and wheatgrass decrease in abundance and bluegrass and sedges increase. The increasers generally occur in small amounts in the potential natural plant community. Deterioration of the vegetation on this unit often results in the formation of gullies that drain the site and hinder production. After gullies have drained the site, a combination of grazing management and engineering practices may be required to return the site to its productive potential.

This unit is suited to such management practices as range seeding and livestock ponds.

310—Mirabal very gravelly loam, 2 to 15 percent slopes. This moderately deep, well drained soil is on hills. It formed in mixed alluvium and windblown sediments. Areas are irregular in shape and are 100 to 1,200 acres in size. The native vegetation is mainly trees and a sparse understory of grasses. Elevation is 8,100 to 8,800 feet. The average annual precipitation is about 20 to 24 inches, the average annual air temperature is 40 to 44 degrees F, and the average frost-free period is 85 to 105 days.

Typically, the surface layer is brown very gravelly loam about 3 inches thick. The upper part of the underlying material is light brown very gravelly loam about 11 inches thick, and the lower part is pink very cobbly sandy clay loam about 7 inches thick. Granite is at a depth of about 21 inches.

Included in this unit are small areas of soils that are similar to the Mirabal soil but are shallow over bedrock. These soils are on hills. Also included are small areas

of Moreno soils on fan terraces and in valleys and Rock outcrop on hilltops. Included areas make up about 15 percent of the total acreage.

Permeability is moderate in the Mirabal soil. Available water capacity is very low. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for wood products and livestock grazing.

This unit is suited to the production of ponderosa pine. The steeper, north-facing slopes also are suited to the production of Douglas fir for timber. The Douglas fir also can be grown as a Christmas tree species. The site index for ponderosa pine ranges from 50 to 67. The site index for Douglas fir is 62. Based on a site index of 60 for both species, the potential production of merchantable timber is 3,570 cubic feet, or 14,600 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 46 cubic feet, or 177 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting timber are the hazard of water erosion, seedling mortality, and the hazard of windthrow. When timber is harvested, minimizing the risk of erosion is essential. Erosion-control structures and seeding can protect logging roads against erosion. Leaving an undisturbed buffer or filter strip along watercourses minimizes sedimentation and thus helps to maintain water quality. Because of the very low available water capacity, the restricted rooting depth, and a high evaporation rate, the seedling mortality rate is low on the north-and east-facing slopes and moderate on the south- and west-facing slopes. During some periods of heavy rainfall or snowmelt, the soil is saturated and thus trees are subject to windthrow.

The understory vegetation on this unit is scattered Arizona fescue, mountain muhly, and bottlebrush squirreltail.

315—Abersito, cobbly-Abersito-Rock outcrop association, 5 to 30 percent slopes. This map unit is on hills and mesas. Areas are irregular in shape and are 50 to 450 acres in size. The native vegetation is mainly trees and a sparse understory of grasses. Elevation is 8,300 to 8,800 feet. The average annual precipitation is about 20 to 24 inches, the average annual air temperature is 40 to 44 degrees F, and the average frost-free period is 85 to 105 days.

This unit is 35 percent Abersito very cobbly sandy clay loam, 15 to 30 percent slopes, very stony; 30 percent Abersito gravelly loam, 5 to 10 percent slopes; and 20 percent Rock outcrop. The cobbly Abersito soil is on hills and the sides of mesas, the other Abersito soil is on hills and mesa tops, and the Rock outcrop is on escarpments, ridges, and ledges.

Included in this unit are small areas of shallow soils on hills and mesas, deep soils on hillsides, and Cinnadale soils on mesa tops. Also included, on mesas and hills, are soils that are similar to the Abersito soil but are less clayey in the subsoil. Included areas make up about 15 percent of the total acreage.

The cobbly Abersito soil is moderately deep and well drained. It formed in mixed alluvial and colluvial material. Typically, a thin mat of partially decomposed pine needles and oak leaves is on the surface. The surface layer is dark brown very cobbly sandy clay loam about 3 inches thick. The subsurface layer is light brown very cobbly fine sandy loam about 6 inches thick. The subsoil is yellowish red very cobbly clay about 15 inches thick. Sandstone bedrock is at a depth of about 24 inches.

The other Abersito soil is moderately deep and well drained. It formed in mixed alluvial and colluvial material. Typically, a thin mat of partially decomposed pine needles and oak leaves is on the surface. The surface layer is brown gravelly loam about 5 inches thick. The subsoil is brown and strong brown very cobbly clay about 19 inches thick. Sandstone is at a depth of about 24 inches.

Permeability is slow in the Abersito soils. Available water capacity is very low. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Rock outcrop consists of barren or nearly barren areas of sandstone on escarpments and ridges.

This unit is used for wood products and livestock grazing.

The Abersito soils are suited to the production of ponderosa pine. The site index for ponderosa pine ranges from 64 to 68. Based on a site index of 65, the potential production of merchantable timber is 4,025 cubic feet, or 8,300 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 50 cubic feet, or 203 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting timber are the hazard of water erosion, the slope, seedling mortality, plant competition, and the hazard of windthrow. When timber is harvested, minimizing the risk of erosion is essential. Conventional methods of harvesting can be used in the less sloping areas, but their use is restricted in the steeper areas. Special design of logging roads, skid trails, and landings is

needed in the steeper areas. Erosion-control structures and seeding can protect the roads against erosion. Proper design of road drainage systems and care in the placement of culverts also help to control erosion. Spoil from excavations is subject to rill and gully erosion and to sloughing. Stones on the surface can interfere with felling, yarding, and other activities involving the use of equipment.

Overall, the seedling mortality rate is moderate. The rate, however, is slightly lower on the north- and east-facing slopes than on the south- and west-facing slopes. Carefully managing reforestation can minimize competition from undesirable understory plants. Unless the site is adequately prepared, plant competition can prevent or delay the natural or artificial regeneration of trees. Brushy plants, such as Gambel oak, limit the natural regeneration of ponderosa pine. During some periods of heavy rainfall or snowmelt, the soils are saturated and thus trees are subject to windthrow.

The understory vegetation on this unit is Arizona fescue, mountain muhly, little bluestem, and Gambel oak.

This unit is limited as a site for such management practices as livestock pipelines and fencing because of the large stones, the depth to bedrock, and the Rock outcrop.

320—Cinnadale gravelly very fine sandy loam, 1 to 15 percent slopes. This shallow, well drained soil is on ridges and hills. It formed in alluvium and windblown sediments derived dominantly from sandstone and siltstone. Areas are irregular in shape and are 200 to 1,500 acres in size. The native vegetation is mainly trees and an understory of grasses (fig. 6). Elevation is 7,800 to 8,400 feet. The average annual precipitation is about 20 to 24 inches, the average annual air temperature is 40 to 44 degrees F, and the average frost-free period is 90 to 110 days.

Typically, the surface layer is light reddish brown gravelly very fine sandy loam about 4 inches thick. The subsoil is light reddish brown very channery loam about 8 inches thick. Sandstone is at a depth of about 12 inches. In some areas the bedrock is weathered in the upper few inches.

Included in this unit are small areas of Rock outcrop, small areas of soils that are similar to the Cinnadale soil but are moderately deep, and small areas of Stout soils. All of these included areas are on hills and ridges. Also included are small areas of Moreno and Moreno Variant soils on hills. Included areas make up about 15 percent of the total acreage.

Permeability is moderately rapid in the Cinnadale soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe.

This unit is used for wood products and livestock grazing.

The Cinnadale soil is suited to the production of ponderosa pine. The site index for ponderosa pine ranges from 61 to 68. Based on a site index of 65, the potential production of merchantable timber is 4,025 cubic feet, or 8,300 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 50 cubic feet, or 203 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting timber are the hazard of water erosion, seedling mortality, and the hazard of windthrow. When timber is harvested, minimizing the risk of erosion is essential. Constructing water bars and seeding cut and filled areas can protect logging roads and landings against erosion. Leaving an undisturbed buffer or filter strip along watercourses minimizes sedimentation and thus helps to maintain water quality.

Because of the very low available water capacity, the shallow rooting depth, and a high evaporation rate, the seedling mortality rate is moderate. During some periods of heavy rainfall or snowmelt, the soil is saturated and thus trees are subject to windthrow.

The understory vegetation on this unit is Arizona fescue, mountain muhly, prairie junegrass, bottlebrush squirreltail, and Fendler ceanothus.

325—Moreno Variant loam, 2 to 10 percent slopes. This deep, well drained soil is on fan terraces and toe slopes. It formed in mixed alluvium. Areas are irregular in shape and are 25 to 150 acres in size. The native vegetation is mainly grasses and trees. Elevation is 8,000 to 8,300 feet. The average annual precipitation is about 20 to 24 inches, the average annual air temperature is 40 to 44 degrees F, and the average frost-free period is 85 to 105 days.

Typically, the surface layer is dark brown loam about 7 inches thick. The subsurface layer is brown and strong brown very fine sandy loam about 15 inches thick. The subsoil to a depth of 60 inches is red clay loam and sandy clay loam.

Included in this unit are small areas of Moreno soils on fan terraces, Saladon soils along narrow drainageways, Cinnadale soils on hills and ridges, and soils that are similar to the Moreno Variant soil but are moderately deep and are on fan terraces and ridges. Included areas make up about 15 percent of the total acreage.

Permeability is moderately slow in the Moreno Variant soil. Available water capacity is high. The

Figure 6.—Ponderosa pine in an area of Cinnadale gravelly very fine sandy loam, 1 to 15 percent slopes.

effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight.

This unit is used for livestock grazing and wood products.

This unit is suited to the production of ponderosa pine. The site index ranges from 85 to 90. Based on a site index of 85, the potential production of merchantable timber is 6,055 cubic feet, or 35,750 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 77 cubic feet, or 357 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting timber are the hazard of erosion and plant competition. When timber is harvested, minimizing the risk of erosion is essential. Constructing water bars and seeding cut and filled areas can protect logging roads and landings against erosion. Leaving an undisturbed buffer or filter strip along watercourses minimizes sedimentation and thus helps to maintain water quality. Carefully managing reforestation can minimize competition from undesirable understory plants. Grasses, forbs, and shrubs limit the natural regeneration of ponderosa pine. Properly preparing the site can control competing vegetation.

The understory vegetation on this unit is Arizona fescue, mountain muhly, and western wheatgrass.

330—Moreno loam, 1 to 10 percent slopes. This deep, well drained soil is on fan terraces. It formed in mixed alluvium. Areas are irregular in shape and are 150 to 800 acres in size. The native vegetation is mainly ponderosa pine and grasses. Elevation is 7,800 to 8,200 feet. The average annual precipitation is about 20 to 24 inches, the average annual air temperature is 40 to 44 degrees F, and the average frost-free period is 90 to 110 days.

Typically, a thin mat of pine needles is on the surface. The surface layer is reddish brown loam about 11 inches thick. The upper 3 inches of the subsoil is yellowish red loam, the next 21 inches is red clay loam and reddish brown clay, and the lower part to a depth of 60 inches is red very gravelly clay loam.

Included in this unit are small areas of Yankee soils on valley bottoms and Moreno Variant soils on fan terraces. Included areas make up about 15 percent of the total acreage.

Permeability is moderately slow in the Moreno soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for wood products and livestock grazing.

This unit is suited to the production of ponderosa pine. The site index ranges from 70 to 90. Based on a site index of 80, the potential production of merchantable timber is 5,410 cubic feet, or 31,200 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 69 cubic feet, or 313 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting timber are the hazard of erosion and plant competition. When timber is harvested, minimizing the risk of erosion is essential. Constructing water bars and seeding cut and filled areas can protect logging roads and landings against erosion. Leaving an undisturbed buffer or filter strip along watercourses minimizes sedimentation and thus helps to maintain water quality. Carefully managing reforestation can minimize competition from undesirable understory plants. Grasses, forbs, and shrubs limit the natural regeneration of ponderosa pine. Properly preparing the site can control competing vegetation.

The understory vegetation on this unit is Arizona fescue, mountain muhly, and western wheatgrass.

340—Yankee silty clay loam, 0 to 3 percent slopes. This deep, well drained soil is on the bottom of mountain valleys. It formed in mixed alluvium. Areas are irregular in shape and are 50 to 800 acres in size. The native vegetation is mainly grasses. Elevation is 7,700 to 8,300 feet. The average annual precipitation is about 20 to 24 inches, the average annual air temperature is 40 to 44 degrees F, and the average frost-free period is 90 to 110 days.

Typically, the surface layer is dark reddish brown silty clay loam about 3 inches thick. The subsoil to a depth of 60 inches is dark reddish brown, dark reddish gray, and reddish brown silty clay.

Included in this unit are small areas of McGaffey and Moreno soils on valley sides. Included areas make up about 15 percent of the total acreage.

Permeability is slow in the Yankee soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight. The soil has cracks that extend from the surface to a depth of about 20 inches.

This unit is used for livestock grazing. The potential natural plant community is mainly tufted hairgrass, western wheatgrass, and bluegrass. The average annual production of air-dry vegetation ranges from 3,000 pounds per acre in favorable years to 2,500 pounds in unfavorable years. If the plant community deteriorates, tufted hairgrass and wheatgrass decrease in abundance and bluegrass increases. The increasers generally occur in small amounts in the potential natural plant community.

Deterioration of the vegetation on this unit often results in the formation of gullies that drain the site and hinder the production of vegetation. After gullies have drained the site, a combination of grazing management and engineering practices may be needed to return the site to its productive potential. The unit is suited to such management practices as range seeding and livestock ponds.

350—Rock outcrop-Stout complex, 3 to 15 percent slopes. This map unit is on ridges and hills. Areas are irregular in shape. The native vegetation is mainly trees, shrubs, and grasses. Elevation is 7,800 to 8,500 feet. The average annual precipitation is about 20 to 24 inches, the average annual air temperature is 40 to 44 degrees F, and the average frost-free period is 90 to 110 days.

This unit is 60 percent Rock outcrop and 25 percent Stout sandy loam, 3 to 15 percent slopes. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Cinnadale soils on hills and ridges and Mirabal soils on ridges. Also included, on hills, are soils that are similar to the Stout soil but are moderately deep. Included areas make up about 15 percent of the total acreage.

The Rock outcrop consists of barren or nearly barren areas of exposed sandstone on hills and ridges.

The Stout soil is very shallow or shallow and is well drained. It formed in eolian material derived dominantly from sandstone. Typically, the surface is covered with partially decomposed pine needles. The surface layer is brown sandy loam about 3 inches thick. The underlying material is brown sandy loam about 11 inches thick. Sandstone is at a depth of about 14 inches.

Permeability is moderately rapid in the Stout soil. Available water capacity is very low. The effective rooting depth is 6 to 20 inches. Runoff is rapid, and the hazard of water erosion is severe. The hazard of soil blowing also is severe.

This unit is used for wood products and livestock grazing.

The Stout soil is suited to the production of ponderosa pine. The site index for ponderosa pine ranges from 45 to 54. Based on a site index of 50, the potential production of merchantable timber is 2,500 cubic feet, or 9,200 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 38 cubic feet, or 130 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting ponderosa pine are the hazard of erosion, seedling mortality, plant competition, and the hazard of windthrow. When timber is harvested, minimizing the risk of erosion is essential. Soil blowing can be controlled and damage to seedlings minimized by maintaining enough plant residue on the surface. The seedling mortality rate is high because of the very low available water capacity. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. During some periods of heavy rainfall or snowmelt, the soil is saturated and thus trees are subject to windthrow. Conventional methods of harvesting timber can be used, but the Rock outcrop can interfere with cross-slope movement.

The understory vegetation on this unit is mountain muhly, bottlebrush squirreltail, little bluestem, and Gambel oak.

406—Poley-Rock outcrop complex, 2 to 25 percent slopes. This map unit is on hills, ridges, benches, and the escarpments of basalt mesas. Areas are irregular in shape and are 100 to 8,000 acres in size. The native vegetation is mainly grasses and scattered trees. Elevation is 5,800 to 7,100 feet. The average annual precipitation is 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 45 percent Poley very cobbly loam, 2 to 25 percent slopes, very stony, and 40 percent Rock outcrop. The Poley soil is on benches, ridges, and hills, and the Rock outcrop is on ridges and escarpments. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used. The soils in areas near the boundary of Socorro County may have a less well developed subsoil.

Included in this unit are small areas of Rana soils on benches and hills, Penistaja soils on hills, and fine textured, shallow and moderately deep soils that are underlain by shale and are on benches and hills. Included areas make up about 15 percent of the total acreage.

The Poley soil is deep and well drained. It formed in colluvium and alluvium derived dominantly from shale. Typically, the surface layer is reddish brown very cobbly loam about 3 inches thick. The upper part of the subsoil is reddish brown and yellowish red clay about 19 inches thick, and the lower part to a depth of 60 inches is light reddish brown and pink clay and clay loam.

Permeability is slow in the Poley soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

The Rock outcrop consists of barren or nearly barren areas of exposed basalt on ridges, benches, and escarpments.

This unit is used mainly for livestock grazing. In areas near Grants, it is used for urban development.

The potential natural plant community on the Poley soil is mainly blue grama, sideoats grama, New Mexico feathergrass, black grama, alkali sacaton, and sacahuista. The average annual production of air-dry vegetation ranges from 750 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, black grama, alkali sacaton, and sideoats grama decrease in abundance and blue grama, threeawn, and sacahuista increase. The increasers generally occur in small amounts in the potential natural plant community.

This unit is limited as a site for such management practices as livestock pipelines and range seeding because of the Rock outcrop and the low precipitation. Good grazing management can increase the productivity and reproduction potential of black grama and sideoats grama.

This unit is suited to urban development. The main limitations are the slope, the clayey texture, the stones on the surface, and a high shrink-swell potential. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Properly designing buildings and roads can reduce the damaging effects of shrinking and swelling and help overcome the slope and the stones on the surface.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of droughtiness. Extra care is needed during planting to ensure that the soil is firmly packed around the roots. Cultivation or applications of herbicide can help to remove competing vegetation. Drip irrigation can help to establish windbreaks.

407—Viuda-Rock outcrop complex, 1 to 10 percent slopes. This map unit is on ridges, hillsides, and benches on Cerro Verde. Areas are oval and are 2,000 to 4,000 acres in size. The native vegetation is mainly grasses, shrubs, and scattered juniper. Elevation is 6,500 to 7,000 feet. The average annual precipitation is 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 65 percent Viuda very cobbly silty clay loam, 1 to 10 percent slopes, very stony, and 15 percent Rock outcrop. The Viuda soil is on ridges, hillsides, and benches, and the Rock outcrop is on ridges and breaks and along drainageways. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of soils that are similar to the Viuda soil but are less well developed or are moderately deep. These soils are on ridges and hills. Also included are the cobbly Flaco and Berto soils on ridges and hillsides. Included areas make up about 20 percent of the total acreage.

The Viuda soil is shallow and well drained. It formed in windblown sediments and colluvium derived dominantly from basalt. Typically, the surface layer is brown very cobbly silty clay loam about 3 inches thick. The subsoil is brown clay about 10 inches thick. Basalt is at a depth of about 13 inches.

Permeability is slow in the Viuda soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Rock outcrop consists of barren or nearly barren areas of exposed basalt on ridges, breaks, and benches.

This unit is used for livestock grazing. The potential natural plant community on the Viuda soil is mainly blue grama, sideoats grama, black grama, little bluestem, and wolftail. The average annual production of air-dry vegetation ranges from 1,100 pounds per acre in favorable years to 425 pounds in unfavorable years. If the plant community deteriorates, sideoats grama, black grama, and little bluestem decrease in abundance and blue grama and wolftail increase. The increasers generally occur in small amounts in the potential natural plant community.

The suitability of the Viuda soil for such management practices as livestock pipelines and range seeding is limited because of the depth to bedrock and the low precipitation. Good grazing management can increase the productivity and reproduction potential of sideoats grama, black grama, and little bluestem.

419—Navajo silty clay loam, 1 to 5 percent slopes. This deep, well drained soil is on alluvial fans, in large drainageways, and on flood plains. It formed in alluvium derived dominantly from shale. Areas are irregular in shape and are 30 to 2,000 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is 5,400 to 6,000 feet. The average annual precipitation is about 7 to 10 inches, the average annual air temperature is 51 to 55 degrees F, and the average frost-free period is 140 to 165 days.

Typically, the surface layer is reddish brown silty clay loam about 3 inches thick. The underlying material to a depth of 60 inches is reddish brown silty clay and clay. Areas near the boundary of Bernalillo County are warmer. In places the surface layer is clay or sandy clay loam.

Included in this unit are small areas of Suwanee soils on alluvial fans and flood plains and Grieta soils on fan terraces. Included areas make up about 15 percent of the total acreage.

Permeability is very slow in the Navajo soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe. This soil is occasionally flooded for very brief periods in summer. Cracks are common in the upper 30 inches. The soil is slightly saline.

This unit is used for livestock grazing. The potential natural plant community is mainly giant sacaton, alkali sacaton, vine mesquite, and shadscale. The average annual production of air-dry vegetation ranges from 4,000 pounds per acre in favorable years to 800 pounds in unfavorable years. If the plant community deteriorates, giant sacaton and vine mesquite decrease in abundance and galleta, burrograss, mat muhly, and annual grasses and forbs increase. The increasers generally occur in small amounts in the potential natural plant community.

Good grazing management can increase the productivity and reproduction potential of giant sacaton, alkali sacaton, and vine mesquite. Grazing should be delayed until the soil is firm and the more desirable forage plants have achieved enough growth to withstand grazing pressure.

This soil receives runoff from the adjacent areas. As a result, it is potentially more productive. Deterioration of the plant community often results in the formation of gullies that drain the site and hinder the production of vegetation.

This unit is not suitable for such management practices as range seeding because of the low precipitation.

420—Navajo-Suwanee complex, 1 to 5 percent slopes. This map unit is on flood plains and alluvial fans and in large drainageways. Areas are irregular in shape and are 75 to 2,000 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is 5,400 to 6,000 feet. The average annual precipitation is about 7 to 10 inches, the average annual air temperature is 51 to 55 degrees F, and the average frost-free period is 140 to 165 days.

This unit is 45 percent Navajo clay loam, 1 to 5 percent slopes, and 40 percent Suwanee silty clay loam, 1 to 5 percent slopes. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used. Areas near the boundary of Bernalillo County are warmer.

Included in this unit are small areas of soils that are similar to the Suwanee soil but are more silty. These soils are on flood plains, mainly near the boundary of Socorro County and the boundary of the soil survey of the eastern part of Valencia County. Also included are areas of riverwash at the mouth of drainageways and in arroyos; Grieta soils on fan terraces; and Sheppard and Shiprock soils in windblown areas, mainly near the boundary of the soil survey of the eastern part of Valencia County. Included areas make up about 15 percent of the total acreage.

The Navajo soil is deep and well drained. It formed in alluvium derived dominantly from shale. Typically, the surface layer is reddish brown clay loam about 4 inches thick. The underlying material to a depth of 60 inches is reddish brown clay. In some areas the soil has less clay below a depth of 40 inches.

Permeability is very slow in the Navajo soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe. This soil is occasionally flooded for very brief periods in summer. Cracks are common in the upper 30 inches. The soil is slightly saline.

The Suwanee soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is reddish brown silty clay loam about 3 inches thick. The underlying material to a depth of 60 inches is dominantly brown and reddish brown silt loam and silty clay loam ranging from 18 to 35 percent in content of clay, but it includes strata of silty clay to loamy fine sand.

Permeability is moderately slow in the Suwanee soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate. This soil is occasionally flooded for very brief periods in summer.

This unit is used for livestock grazing. The potential natural plant community is mainly giant sacaton, alkali sacaton, vine mesquite, and shadscale. The average annual production of air-dry vegetation ranges from 4,000 pounds per acre in favorable years to 800 pounds in unfavorable years. If the plant community deteriorates, giant sacaton and vine mesquite decrease in abundance and galleta, burrograss, mat muhly, and annual forbs and grasses increase. The increasers generally occur in small amounts in the potential natural plant community.

Good grazing management can increase the productivity and reproduction potential of giant sacaton, alkali sacaton, and vine mesquite. Grazing should be delayed until the soil is firm and the more desirable forage plants have achieved enough growth to withstand grazing pressure.

This unit receives runoff from the adjacent areas. As a result, it is potentially more productive. Deterioration of the plant community often results in the formation of gullies that drain the site and hinder the production of vegetation. After gullies have drained the site, a combination of grazing management and engineering practices may be needed to return the site to its productive potential.

This unit is not suitable for such management practices as range seeding because of the low precipitation. The Suwanee soil is limited as a site for livestock ponds because of seepage, but the Navajo soil is suitable as a site for these ponds. Both soils are suited to such management practices as livestock pipelines and fencing.

424—Mespun-Palma association, 1 to 12 percent slopes. This map unit is on stable sand dunes, in interdune areas, and on ridges. Areas are irregular in shape and are 300 to 1,100 acres in size. The native vegetation is mainly grasses and scattered trees and shrubs. Elevation is 5,900 to 7,100 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 45 percent Mespun fine sand, 3 to 12 percent slopes, and 40 percent Palma loamy fine sand, 1 to 7 percent slopes. The Mespun soil is on the upper part of sand dunes and on ridges, and the Palma soil is in interdune areas and on the lower part of stable sand dunes. In areas near the boundary of the soil survey of the eastern part of Valencia County, the soils have a higher content of calcium carbonate and rock fragments.

Included in this unit are small areas of Penistaja and Hagerman soils on fan terraces and between dunes, mainly near the boundary of Bernalillo County; Rock

outcrop on ridges; Zia and Mikim soils on fans; and Aparejo soils on alluvial fans. Included areas make up about 15 percent of the total acreage.

The Mespun soil is deep and excessively drained. It formed in eolian material derived dominantly from sandstone. Typically, the surface layer is yellowish brown fine sand about 2 inches thick. The underlying material to a depth of 60 inches is reddish yellow loamy fine sand and fine sand.

Permeability is rapid in the Mespun soil. Available water capacity is low. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe.

The Palma soil is deep and well drained. It formed in eolian material derived dominantly from sandstone. Typically, the surface layer is light brown loamy fine sand about 4 inches thick. The upper part of the subsoil is brown fine sandy loam about 17 inches thick, and the lower part to a depth of 60 inches is reddish yellow sandy loam.

Permeability is moderately rapid in the Palma soil. Available water capacity is moderate. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe.

This unit is used for livestock grazing and limited wood products.

The potential natural plant community on the Mespun soil is mainly blue grama, Indian ricegrass, sand dropseed, western wheatgrass, and sand sagebrush. The average annual production of air-dry vegetation ranges from 900 pounds per acre in favorable years to 275 pounds in unfavorable years. If the plant community deteriorates, Indian ricegrass and western wheatgrass decrease in abundance and blue grama and broom snakeweed increase. The increasers generally occur in small amounts in the potential natural plant community.

The potential natural plant community on the Palma soil is mainly blue grama, western wheatgrass, Indian ricegrass, and winterfat. The average annual production of air-dry vegetation ranges from 850 pounds per acre in favorable years to 325 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, Indian ricegrass, needleandthread, and winterfat decrease in abundance and threeawn, galleta, muhly, and broom snakeweed increase. The increasers generally occur in small amounts in the potential natural plant community.

Woody species, such as pinyon and oneseed juniper, may invade on both soils.

This unit is not suitable as a site for livestock ponds because of seepage. Good grazing management can increase the productivity and reproduction potential of Indian ricegrass, western wheatgrass, and winterfat.

Properly managing livestock grazing can protect the unit against excessive soil blowing. Maintaining enough plant residue on the surface can control soil blowing and minimize damage to seedlings.

426—Sheppard-Shiprock association, 1 to 12 percent slopes. This map unit is on old stable dunes, in interdune areas, and on fans. Areas are elongated and are 50 to 1,000 acres in size. The native vegetation is mainly shrubs and grasses. Elevation is 5,400 to 6,000 feet. The average annual precipitation is about 7 to 10 inches, the average annual air temperature is 51 to 55 degrees F, and the average frost-free period is 140 to 165 days.

This unit is 45 percent Sheppard loamy fine sand, 3 to 12 percent slopes, and 35 percent Shiprock sandy loam, 1 to 8 percent slopes. The Sheppard soil is on the upper parts of dunes and on fans, and the Shiprock soil is on the lower parts of dunes, in interdune areas, and on fans.

Included in this unit are small areas of Grieta soils between dunes and on fans, Suwanee and Navajo soils along drainageways, and riverwash in drainageways. Included areas make up about 20 percent of the total acreage.

The Sheppard soil is deep and somewhat excessively drained. It formed in eolian material derived dominantly from sandstone. Typically, the surface layer is reddish yellow loamy fine sand about 4 inches thick. The underlying material to a depth of 60 inches is reddish yellowish loamy fine sand and loamy sand.

Permeability is rapid in the Sheppard soil. Available water capacity is low. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe.

The Shiprock soil is deep and well drained. It formed in wind-modified, mixed alluvium. Typically, the surface layer is reddish yellow sandy loam about 3 inches thick. The upper part of the subsoil is reddish yellow and reddish brown fine sandy loam about 15 inches thick, and the lower part to a depth of 60 inches is reddish yellow fine sandy loam.

Permeability is moderately rapid in the Shiprock soil. Available water capacity is moderate. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe.

This unit is used for livestock grazing. The potential natural plant community on the Sheppard soil is mainly black grama, New Mexico feathergrass, Indian ricegrass, and bush muhly. The average annual production of air-dry vegetation ranges from 900 pounds per acre in favorable years to 300 pounds in unfavorable years. If the plant community deteriorates,

black grama and Indian ricegrass decrease in abundance and sandhill muhly, annuals, and cacti increase. The increasers generally occur in small amounts in the potential natural plant community.

The potential natural plant community on the Shiprock soil is mainly black grama, New Mexico feathergrass, Indian ricegrass, and dropseed. The average annual production of air-dry vegetation ranges from 900 pounds per acre in favorable years to 400 pounds in unfavorable years. If the plant community deteriorates, black grama and Indian ricegrass decrease in abundance and ring muhly, sandhill muhly, annuals, and cacti increase. The increasers generally occur in small amounts in the potential natural plant community.

Properly managing livestock grazing can protect the unit against soil blowing. Maintaining enough plant residue on the surface can control soil blowing and minimize damage to seedlings.

This unit is not suitable for livestock ponds or range seeding because of seepage and droughtiness. It is suited to such management practices as livestock pipelines and fencing.

432—Winona-Rock outcrop complex, 3 to 20 percent slopes. This map unit is on benches, hills, ridges, and escarpments. Areas are irregular in shape and are 100 to 2,500 acres in size. The native vegetation is mainly grasses, shrubs, and scattered juniper. Elevation is 6,000 to 6,800 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 55 percent Winona very gravelly loam, 3 to 20 percent slopes, and 30 percent Rock outcrop. The Winona soil is on ridges, hills, and benches, and the Rock outcrop is on escarpments, hills, and ridges. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Harvey soils on hilltops and in depressions, mainly near the boundary of Socorro County, and small areas of Penistaja soils on hills. Included areas make up about 15 percent of the total acreage.

The Winona soil is very shallow or shallow and is well drained. It formed in alluvium and windblown sediments derived dominantly from limestone. Typically, the surface layer is brown very gravelly loam about 3 inches thick. The subsoil is pale brown and very pale brown very cobbly loam about 7 inches thick. Limestone is at a depth of about 10 inches. In some areas the slope is more than 20 percent.

Permeability is moderate in the Winona soil. Available water capacity is very low. The effective rooting depth is 5 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Rock outcrop consists of barren or nearly barren areas of exposed limestone, some of which is very slightly weathered.

This unit is used for livestock grazing. The potential natural plant community on the Winona soil is mainly blue grama, New Mexico feathergrass, sideoats grama, western wheatgrass, little bluestem, and winterfat. The average annual production of air-dry vegetation ranges from 850 pounds per acre in favorable years to 300 pounds in unfavorable years. If the plant community deteriorates, New Mexico feathergrass, sideoats grama, western wheatgrass, and winterfat decrease in abundance and blue grama, bottlebrush squirreltail, and broom snakeweed increase. The increasers generally occur in small amounts in the potential natural plant community.

The Winona soil is not suitable for such management practices as livestock pipelines and range seedling because of the depth to bedrock and the very low available water capacity. Good grazing management can increase the productivity and reproduction potential of New Mexico feathergrass, sideoats grama, and little bluestem.

434—Rizozo-Rock outcrop association, 3 to 55 percent slopes. This map unit is on hills, mesas, escarpments, ridges, and ledges. Areas are irregular in shape and are 100 to 1,100 acres in size. The native vegetation is mainly grasses and scattered trees. Elevation is 6,000 to 6,700 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 45 percent Rizozo sandy loam, 3 to 55 percent slopes, and 40 percent Rock outcrop. The Rizozo soil is on hills, mesa tops, and ridges, and the Rock outcrop is on hills, ridges, ledges, and escarpments.

Included in this unit are small areas of Penistaja and Oelop soils in depressions and drainageways, Suwanee soils along drainageways, Bond soils on mesa tops and hills, and riverwash along drainageways. Included areas make up about 15 percent of the total acreage.

The Rizozo soil is very shallow or shallow and is well drained. It formed in eolian material derived dominantly from sandstone. Typically, the surface layer is reddish brown sandy loam about 2 inches thick. The underlying material is reddish brown sandy loam about 6 inches

thick. Below this is weathered sandstone about 2 inches thick. Unweathered sandstone is at a depth of about 10 inches.

Permeability is moderate in the Rizozo soil. Available water capacity is very low. The effective rooting depth is 4 to 20 inches. Runoff is rapid, and the hazard of water erosion is severe. The hazard of soil blowing also is severe.

The Rock outcrop consists of barren or nearly barren areas of exposed sandstone on hills, ridges, ledges, and escarpments.

This unit is used for livestock grazing. The potential natural plant community on the Rizozo soil is mainly sideoats grama, blue grama, little bluestem, and oneseed juniper. The average annual production of air-dry vegetation ranges from 700 pounds per acre in favorable years to 275 pounds in unfavorable years. If the plant community deteriorates, sideoats grama and little bluestem decrease in abundance and blue grama and threeawn increase. The increasers generally occur in small amounts in the potential natural plant community.

The Rizozo soil is not suitable for such management practices as livestock pipelines and range seeding because of the depth to bedrock and the low precipitation. Good grazing management can increase the productivity and reproduction potential of sideoats grama and little bluestem.

446—Harvey-Oelop association, 0 to 5 percent slopes. This map unit is on fan terraces and mesas. Areas are irregular in shape and are 100 to 1,900 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is 6,000 to 6,500 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 55 percent Harvey loam, 1 to 5 percent slopes, and 30 percent Oelop loam, 0 to 2 percent slopes. The Harvey soil is on mesa tops and fan terraces, and the Oelop soil is in valleys and in drainageways on mesas. In areas near the boundary of the soil survey of the eastern part of Valencia County, the soils have a less well developed subsoil.

Included in this unit are small areas of Penistaja and Hagerman soils on mesas, Winona soils on the tops and sides of mesas, and soils that are similar to the Harvey soil but are very gravelly in the subsoil, are moderately deep, and are on the sides of mesas, mainly near the boundary of Socorro County. Included areas make up about 15 percent of the total acreage.

The Harvey soil is deep and well drained. It formed in alluvium and windblown sediments derived dominantly from limestone. Typically, the surface layer is brown loam about 2 inches thick. The upper part of the subsoil is reddish yellow and light brown clay loam about 18 inches thick, and the lower part to a depth of 60 inches is pink loam.

Permeability is moderate in the Harvey soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Oelop soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is dark yellowish brown loam about 3 inches thick. The upper part of the subsoil is dark yellowish brown clay loam about 13 inches thick, and the lower part to a depth of 60 inches is dark yellowish brown clay loam and loam.

Permeability is moderately slow in the Oelop soil. Available water capacity is very high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used for livestock grazing. The potential natural plant community on the Harvey soil is mainly black grama, sideoats grama, western wheatgrass, and winterfat. The average annual production of air-dry vegetation ranges from 950 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, black grama, western wheatgrass, sideoats grama, and winterfat decrease in abundance and blue grama, broom snakeweed, and cacti increase. The increasers generally occur in small amounts in the potential natural plant community.

Properly managing livestock grazing can protect the Harvey soil against soil blowing and water erosion. Loss of the surface layer results in a severe decrease in productivity and in the potential of the soil to produce plants suitable for grazing. If the plant cover is disturbed, special treatment is needed to control gullying and sheet erosion. Good grazing management can increase the productivity and reproduction potential of western wheatgrass, black grama, and winterfat. This soil is suitable as a site for livestock ponds.

The potential natural plant community on the Oelop soil is mainly western wheatgrass, vine mesquite, alkali sacaton, and fourwing saltbush. The average annual production of air-dry vegetation ranges from 2,000 pounds per acre in favorable years to 900 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, vine mesquite, and fourwing saltbush decrease in abundance and blue grama, galleta, mat muhly, and walkingstick cholla increase. The increasers generally occur in small amounts in the potential natural plant community.

Properly managing livestock grazing can protect the Oelop soil against water erosion. Deterioration of the

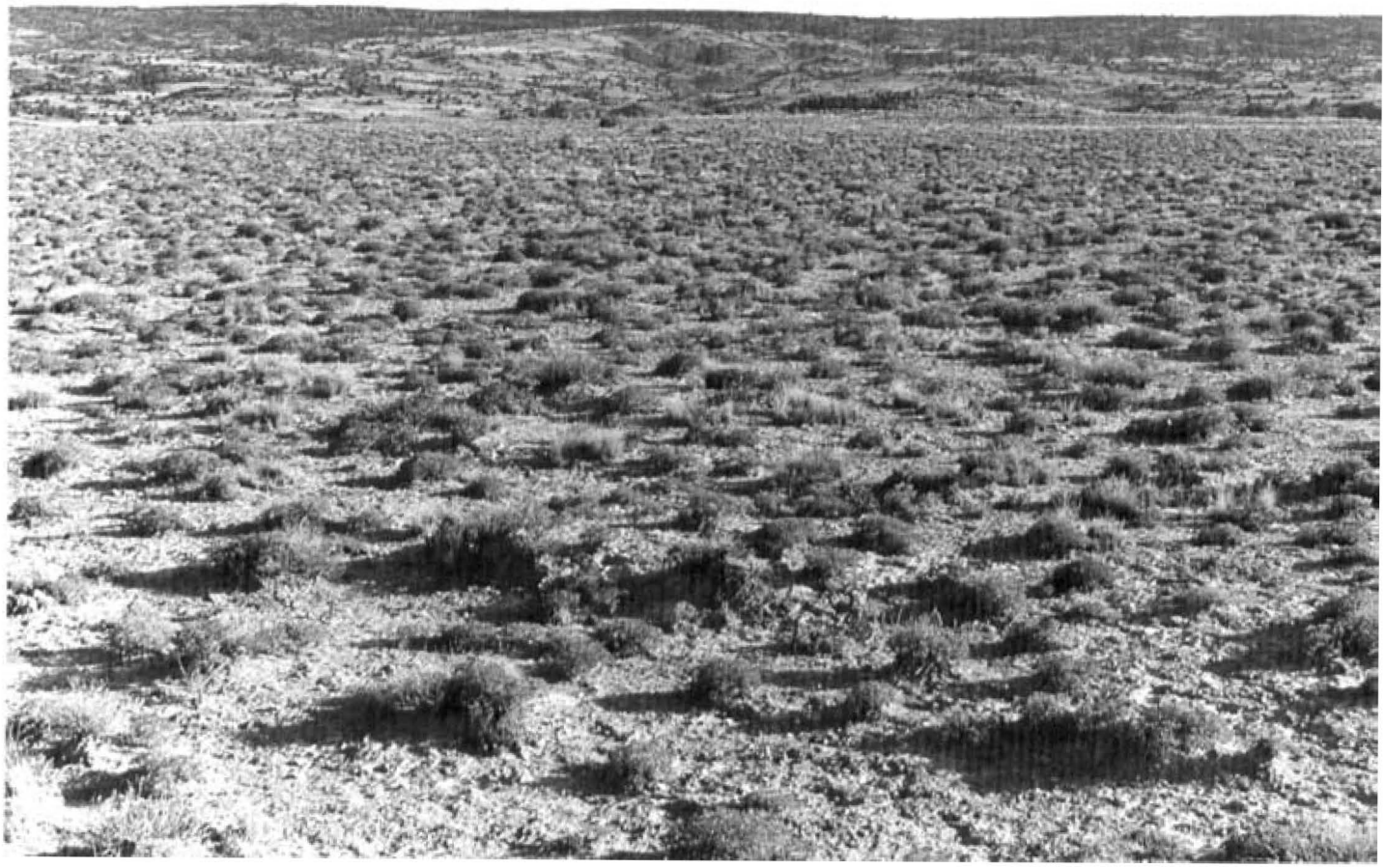


Figure 7.—Typical area of Saido loam, 1 to 12 percent slopes. This is a gypsiferous soil.

plant community often results in the formation of rills and gullies that drain the soil and hinder the production of vegetation. Because of seepage and piping, this soil is not suitable as a site for earthen structures and livestock ponds. Good grazing management can increase the productivity and reproduction potential of western wheatgrass, vine mesquite, and alkali sacaton.

476—Saido loam, 1 to 12 percent slopes. This deep, well drained soil is on fans and knolls. It formed in alluvium derived dominantly from gypsum (fig. 7). Areas are oval or elongated and are 50 to 800 acres in size. The native vegetation is mainly shrubs and forbs. Elevation is 5,500 to 6,400 feet. The average annual precipitation is about 8 to 12 inches, the average annual air temperature is 51 to 53 degrees F, and the average frost-free period is 130 to 150 days.

Typically, the surface layer is reddish brown loam about 2 inches thick. The upper part of the subsoil is white, gypsiferous loam about 9 inches thick, and the lower part to a depth of 60 inches is very pale brown and white loam. In some areas the surface layer is eroded. In areas near the boundary of Socorro County, the soils have a higher content of calcium carbonate and rock fragments.

Included in this unit are small areas of Navajo and Suwanee soils on alluvial fans and flood plains, Netoma soils on fan terraces and valley sides, Sheppard soils on dunes, and soils that are similar to the Netoma soil but are more silty, are shallow or moderately deep over gypsum, and are on plains. Included areas make up about 20 percent of the total acreage.

Permeability is moderate in the Saido soil. Available water capacity also is moderate. The effective rooting

depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe. The soil has more than 40 percent gypsum below a depth of 2 inches.

This unit is used for livestock grazing. The potential natural plant community is mainly alkali sacaton, black grama, blue grama, gyp grama, fourwing saltbush, and winterfat. The average annual production of air-dry vegetation ranges from 800 pounds per acre in favorable years to 350 pounds in unfavorable years. If the plant community deteriorates, black grama and alkali sacaton decrease in abundance and gyp muhly and gray coldenia increase. The increasers generally occur in small amounts in the potential natural plant community.

This unit is not suitable as a site for livestock ponds because of the content of gypsum and a potential for piping. Good grazing management can increase the productivity and reproduction potential of black grama and bush muhly.

485—Rock outcrop-Mion complex, 15 to 65 percent slopes. This map unit is on hills, escarpments, and benches. Areas are irregular in shape and are 75 to 2,000 acres in size. The native vegetation is mainly grasses, shrubs, and scattered trees. Elevation is 6,000 to 6,700 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 50 to 54 degrees F, and the average frost-free period is 120 to 160 days.

This unit is 60 percent Rock outcrop and 35 percent Mion stony loam, 15 to 65 percent slopes, extremely stony. The Rock outcrop is on escarpments and benches, and the Mion soil is on hills and benches. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Hagerman and Bond soils and Badland on hills, mainly near the boundary of Socorro County; Penistaja and Harvey soils on the lower hill slopes; Flaco and Berto soils on hills and in the lower areas underlain by basalt; on hills, soils that are similar to the Mion soil but are moderately deep over shale; and Skyvillage soils on ridges, mainly near the boundary of Bernalillo County. Included areas make up about 5 percent of the total acreage.

The Rock outcrop consists barren or nearly barren areas of exposed sandstone, basalt, limestone, or gypsum on steep escarpments and benches.

The Mion soil is shallow and well drained. It formed in alluvium and colluvium derived dominantly from shale and sandstone. Typically, the surface layer is light olive brown stony loam about 3 inches thick. The underlying material is about 10 inches of grayish brown silty clay and silty clay loam. Shale is at a depth of about 13 inches.

Permeability is very slow in the Mion soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is very rapid, and the hazard of water erosion is severe. The hazard of soil blowing also is severe.

This unit is used for livestock grazing. The potential natural plant community on the Mion soil is mainly blue grama, sideoats grama, New Mexico feathergrass, black grama, sacahuista, and oneseed juniper. The average annual production of air-dry vegetation ranges from 750 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, black grama and New Mexico feathergrass decrease in abundance and blue grama and threeawn increase. The increasers generally occur in small amounts in the potential natural plant community.

This unit is limited as a site for such management practices as livestock pipelines and mechanical brush control because of the depth to bedrock and the slope. Good grazing management can increase the productivity and reproduction potential of black grama and New Mexico feathergrass.

487—Mion-Badland complex, 20 to 65 percent slopes. This map unit is on hills, escarpments, benches, and ridges. Areas are elongated and are 100 to 2,500 acres in size. The native vegetation is mainly grasses, shrubs, and scattered trees. Elevation is 5,800 to 6,500 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 50 to 54 degrees F, and the average frost-free period is 120 to 160 days.

This unit is 50 percent Mion loam, 20 to 65 percent slopes, and 30 percent Badland. The Mion soil is on benches, hills, and ridges, and the Badland is on hills and escarpments. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of sandstone, limestone, and gypsum outcrops on benches and escarpments; Winona soils on hills; Skyvillage soils on benches and hills; and soils that are similar to the Mion soil but are moderately deep over shale. Included areas make up about 20 percent of the total acreage.

The Mion soil is shallow and well drained. It formed in alluvium and colluvium derived dominantly from shale. Typically, the surface layer is brown loam about 1 inch thick. The underlying material is about 15 inches of brown and grayish brown clay and silty clay. Shale is at a depth of about 16 inches. In areas near the boundary of Bernalillo County, the soil has less clay. In places it has more sand or gravel.

Permeability is very slow in the Mion soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is rapid, and the hazard of water erosion is severe. The hazard of soil blowing also is severe.

The Badland occurs as areas of exposed shale. It supports essentially no vegetation. It commonly is dissected.

This unit is used on a limited basis for livestock grazing. The potential natural plant community is mainly blue grama, sideoats grama, New Mexico feathergrass, black grama, sacahuista, and oneseed juniper. The average annual production of air-dry vegetation ranges from 750 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, black grama and New Mexico feathergrass decrease in abundance and blue grama and threeawn increase. The increasers generally occur in small amounts in the potential natural plant community.

This unit is limited as a site for such management practices as livestock pipelines and mechanical brush control because of the depth to rock and the slope. Good grazing management can increase the productivity and reproduction potential of black grama and New Mexico feathergrass.

500—Timhus-Bandera association, 20 to 50 percent slopes. This map unit is on the sides of cinder cones. Areas are oval and are 150 to 400 acres in size. The native vegetation is mainly pinyon, juniper, and ponderosa pine. Elevation is 7,400 to 8,100 feet. The average annual precipitation is about 14 to 20 inches, the average annual air temperature is 40 to 49 degrees F, and the average frost-free period is 90 to 110 days.

This unit is 45 percent Timhus extremely gravelly loam, 20 to 50 percent slopes, and 40 percent Bandera very gravelly loam, 20 to 45 percent slopes. The Timhus soil is on the south-facing side slopes of the cinder cones, and the Bandera soil is on the north-facing side slopes of the cinder cones.

Included in this unit are small areas of Microy soils on the north-facing side slopes of the cinder cones and Cantina and Cabezon soils on the lower parts of hills. Included areas make up about 15 percent of the total acreage.

The Timhus soil is deep and somewhat excessively drained. It formed in colluvial material and windblown volcanic sediments. Typically, the surface layer is yellowish brown extremely gravelly loam about 5 inches thick. The upper part of the subsoil is yellowish brown and light yellowish brown very gravelly loam about 15 inches thick, and the lower part is light yellowish brown extremely gravelly loam about 9 inches thick. Cinders are at a depth of about 29 inches. The depth to cinders ranges from 29 to 60 inches. In some areas the slope is less than 20 percent.

Permeability is moderate in the Timhus soil. Available water capacity is very low. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight.

The Bandera soil is deep and somewhat excessively drained. It formed in colluvial material and windblown volcanic sediments. Typically, the surface layer is dark brown very gravelly loam about 3 inches thick. The subsurface layer is dark brown gravelly loam about 5 inches thick. The underlying material is dark yellowish brown very gravelly loam about 8 inches thick. Cinders are at a depth of about 16 inches. The depth to cinders ranges from 16 to 60 inches.

Permeability is moderate in the Bandera soil. Available water capacity is very low. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight.

This unit is used for wood products and livestock grazing.

The site index for pinyon and juniper on the Timhus soil ranges from 25 to 40. Based on a site index of 33, this soil can produce 4 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot.

The understory vegetation on this unit is mainly blue grama, bottlebrush squirreltail, mountain muhly, and fourwing saltbush. The production of understory can be increased by reducing the density of the canopy. The slope limits access by livestock.

The Bandera soil is suited to the production of ponderosa pine. The site index averages 63 in areas that have slopes of 20 to 35 percent and is 54 to 58 in areas that have slopes of more than 35 percent. Based on a site index of 60, the potential production of merchantable timber is 3,570 cubic feet, or 14,600 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 46 cubic feet, or 177 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting ponderosa pine are the hazard of erosion and equipment limitations in the steeper areas, seedling mortality, and plant competition. When timber is harvested, minimizing the risk of erosion is essential. Conventional methods of harvesting can be used in the less sloping areas, but their use is restricted in the steeper areas. Areas that have slopes of more than 35 percent are not suited to conventional harvesting methods. Special design of logging roads, skid trails,

and landings is needed in the steeper areas. Erosion-control structures and seeding can protect the roads against erosion. The seedling mortality rate is moderate because of the low available water capacity.

The understory vegetation on this unit is Arizona fescue, mountain muhly, prairie junegrass, and Gambel oak.

505—Flugle-Goesling loamy fine sands, 1 to 8 percent slopes. This map unit is on fan terraces, hills, mesas, and ridges. Areas are irregular in shape and are 75 to 1,500 acres in size. The native vegetation is mainly grasses, shrubs, and a few scattered trees. Elevation is 6,000 to 6,800 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 48 to 53 degrees F, and the average frost-free period is 115 to 135 days.

This unit is 55 percent Flugle loamy fine sand, 1 to 8 percent slopes, and 25 percent Goesling loamy fine sand, 1 to 8 percent slopes. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used. In areas near the boundary of Catron County, the soils are moderately deep and slightly drier.

Included in this unit are small areas of Catman and Silkie soils in swales and valleys and Celacy, Atarque, and Quintana soils and Rock outcrop on hills and ridges. Included areas make up about 20 percent of the total acreage.

The Flugle soil is deep and well drained. It formed in wind-modified, mixed alluvium. Typically, the surface layer is brown loamy fine sand about 5 inches thick. The upper part of the subsoil is strong brown and brown sandy clay loam about 22 inches thick, the next part is light brown sandy clay loam about 14 inches thick, and the lower part to a depth of 60 inches is pink sandy loam.

Permeability is moderate in the Flugle soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

The Goesling soil is deep and well drained. It formed in wind-modified alluvium derived dominantly from sandstone. Typically, the surface layer is light brown loamy fine sand about 5 inches thick. The upper part of the subsoil is brown and light brown sandy clay loam about 13 inches thick. The lower part to a depth of 60 inches is light yellowish brown, very pale brown, and white sandy loam and loam. It has a high content of calcium carbonate in some part.

Permeability is moderately slow in the Goesling soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

This unit is used for livestock grazing. The potential natural plant community is mainly western wheatgrass, New Mexico feathergrass, galleta, blue grama, and winterfat. The average annual production of air-dry vegetation ranges from 1,100 pounds per acre in favorable years to 600 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass and New Mexico feathergrass decrease in abundance and blue grama and rabbitbrush increase. The increasers generally occur in small amounts in the potential natural plant community.

This unit is suited to such management practices as range seeding, fencing, and livestock pipelines. Good grazing management can increase the productivity and reproduction potential of western wheatgrass.

514—Raton-Rock outcrop complex, 1 to 10 percent slopes. This map unit is in swales on old lava flows, in depressions, and on ridges. Areas are irregular in shape and are 200 to 800 acres in size. The native vegetation is mainly ponderosa pine and an understory of grasses. Elevation is 7,200 to 8,000 feet. The average annual precipitation is about 16 to 20 inches, the average annual air temperature is 42 to 45 degrees F, and the average frost-free period is 90 to 110 days.

This unit is 55 percent Raton very cobbly loam, 1 to 10 percent slopes, extremely stony, and 25 percent Rock outcrop. The Raton soil is in swales on old lava flows, in depressions, and on ridgetops, and the Rock outcrop is on ridges. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Charo soils in swales; on ridgetops, soils are that are similar to the Raton soil but are loamy; and, in depressions and swales, soils that are similar to the Raton soil but have a lighter colored surface layer. Included areas make up about 20 percent of the total acreage.

The Raton soil is very shallow or shallow and is well drained. It formed in windblown sediments and alluvium over basalt. Typically, the surface layer is dark reddish brown very cobbly loam about 5 inches thick. The subsoil is reddish brown very cobbly clay about 8 inches thick. Basalt is at a depth of about 13 inches. In most places the soil is covered by layer of pine needles and litter about 1 inch thick.

Permeability is slow in the Raton soil. Available water capacity is very low. The effective rooting depth is 6 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Rock outcrop consists of barren or nearly barren

areas of exposed basalt on the sides of ridges.

This unit is used for wood products and livestock grazing.

The Raton soil is poorly suited to the production of ponderosa pine. The site index for ponderosa pine ranges from 41 to 44. Based on a site index of 40, the potential production of merchantable timber is 1,480 cubic feet, or 3,200 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 30 cubic feet, or 84 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting timber are equipment limitations, seedling mortality, the hazard of windthrow, a slow growth rate, and a low stocking rate. The Rock outcrop restricts the movement of equipment, and sharp, angular cobbles and stones cause abnormal wear of rubber-tired equipment. The seedling mortality rate is high because of the very low available water capacity, the restricted rooting depth, and a high evaporation rate. Trees are subject to windthrow because of the limited rooting depth. A below-normal stocking rate limits yields.

The understory vegetation on this unit is blue grama, little bluestem, sideoats grama, mountain muhly, skunkbush sumac, and Apacheplume. The canopy cover, which ranges from 12 to 22 percent, allows for good production of grasses and forbs.

The average annual production of air-dry understory vegetation ranges from 1,300 pounds per acre in favorable years to 800 pounds in unfavorable years. If the plant community deteriorates, Arizona fescue, little bluestem, and sideoats grama decrease in abundance and threeawn, ring muhly, and broom snakeweed increase. The increasers generally occur in small amounts in the plant community.

This unit is not suitable for such management practices as fencing, livestock ponds, and livestock pipelines because of the depth to bedrock and the Rock outcrop. Constructing trails or walkways can allow livestock to graze in areas where access is limited.

515—Rock outcrop-Vessilla-Mion complex, 3 to 55 percent slopes. This map unit is on escarpments, ridges, and hills. Areas are irregularly shaped and are 120 to 2,000 acres in size. The native vegetation is mainly trees and shrubs. Elevation is 6,500 to 7,400 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 47 to 53 degrees F, and the average frost-free period is 115 to 130 days.

This unit is 45 percent Rock outcrop, 20 percent Vessilla sandy loam, 3 to 55 percent slopes, and 20 percent Mion loam, 3 to 55 percent slopes. The Rock outcrop is on steep escarpments and ridges, the Vessilla soil is on the north-facing slopes of hills and ridges, and the Mion soil is on the south-facing slopes of hills and ridges. In areas near the boundary of Catron County, the soils are more highly developed and have a darker surface layer.

Included in this unit are small areas of Nogal, Celacy, and Galestina soils on hills; soils that are similar to the Mion and Vessilla soils but are moderately deep and are on hills and side slopes; Catman and Silkie soils in valleys; Hickman soils in valleys and on alluvial fans; and Flugle soils on hillsides. Included areas make up about 15 percent of the total acreage.

The Rock outcrop consists of barren or nearly barren areas of sandstone or shale.

The Vessilla soil is shallow or very shallow and is well drained. It formed in eolian and colluvial material derived dominantly from sandstone. Typically, the surface layer is reddish yellow sandy loam about 3 inches thick. The underlying material is light brown sandy loam about 12 inches thick. Sandstone is at a depth of about 15 inches. In some areas the soil is underlain by shale.

Permeability is moderately rapid in the Vessilla soil. Available water capacity is very low. The effective rooting depth is 6 to 20 inches. Runoff is rapid, and the hazard of water erosion is severe. The hazard of soil blowing also is severe.

The Mion soil is shallow and well drained. It formed in alluvium and colluvium derived dominantly from shale. Typically, the surface layer is brown loam about 2 inches thick. The underlying material is about 9 inches of yellowish brown silty clay and clay. Shale is at a depth of about 11 inches.

Permeability is very slow in the Mion soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is rapid, and the hazard of water erosion is severe. The hazard of soil blowing also is severe.

This unit is used for livestock grazing and limited wood products.

The site index for pinyon and juniper is 20 in areas of the Mion soil and 58 in areas of the Vessilla soil. The Mion soil can produce about 2 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot, and the Vessilla soil can produce about 8 cords.

The suitability of this unit for the production of pinyon and juniper is limited because of the slope, the hazard of windthrow, plant competition, and the hazard of erosion. The use of equipment is limited by the Rock outcrop and the slope. Trees are subject to windthrow because of the limited rooting depth. Carefully managing reforestation can minimize competition from

undesirable understory plants. Brushy plants, such as oak, limit the natural regeneration of pinyon and juniper.

Good management is needed to protect the soils against excessive water erosion. Constructing water bars and seeding cut and filled areas can protect logging roads and landings against erosion. Leaving an undisturbed buffer or filter strip along watercourses minimizes sedimentation and thus helps to maintain water quality.

The understory vegetation on this unit is blue grama, Indian ricegrass, western wheatgrass, hairy grama, and forbs. Reducing the density of the canopy can increase the production of understory plants.

518—Borrego-Charo-Rock outcrop complex, 1 to 10 percent slopes. This map unit is on basalt ridges and lava flows and in swales. Areas are irregular in shape and are 200 to 1,000 acres in size. The native vegetation is mainly trees, shrubs, and grasses. Elevation is 7,200 to 7,500 feet. The average annual precipitation is about 16 to 20 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 90 to 110 days.

This unit is 40 percent Borrego loam, 2 to 10 percent slopes, very stony; 30 percent Charo loam, 1 to 5 percent slopes; and 15 percent Rock outcrop. The Borrego soil is on basalt ridges, the Charo soil is in swales, and the Rock outcrop is on basalt ridges and lava flows.

Included in this unit are small areas of Hackroy soils on lava flows and ridges and in swales, Cebolleta soils on lava flows and in swales, and Trag soils in swales. Included areas make up about 15 percent of the total acreage.

The Borrego soil is shallow and well drained. It formed in mixed alluvium and windblown sediments over basalt. Typically, the surface layer is brown loam about 3 inches thick. The subsoil is strong brown clay about 8 inches thick. Basalt is at a depth of about 11 inches. In some areas a layer in which calcium carbonate has accumulated is directly above the basalt.

Permeability is very slow in the Borrego soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

The Charo soil is moderately deep and well drained. It formed in mixed alluvium and windblown sediments over basalt. Typically, the upper part of the surface layer is brown loam about 2 inches thick. The lower part is brown clay loam about 4 inches thick. The subsoil is brown clay about 21 inches thick. Basalt is at a depth of about 27 inches. In some areas a layer in which calcium carbonate has accumulated is directly above the basalt.

Permeability is slow in the Charo soil. Available water capacity is low. The effective rooting depth is 20 to 40 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight.

The Rock outcrop consists of barren or nearly barren areas of exposed basalt on lava flows and ridges.

This unit is used for livestock grazing and wood products.

The site index for ponderosa pine on the Borrego soil ranges from 52 to 58. Based on a site index of 55, the potential production of merchantable timber is 3,570 cubic feet, or 14,600 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 46 cubic feet, or 177 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting timber on the Borrego soil are equipment limitations, seeding mortality, and the hazard of windthrow. Stones on the surface can interfere with felling, yarding, and other activities involving the use of equipment. The seedling mortality rate is high because of the very low available water capacity and the clayey texture. The understory vegetation is gray horsebrush, Arizona fescue, blue grama, and mountain muhly.

The potential natural plant community on the Charo soil is mainly mountain muhly, Arizona fescue, muttongrass, western wheatgrass, and prairie junegrass. The average annual production of air-dry vegetation ranges from 1,050 pounds per acre in favorable years to 650 pounds in unfavorable years. If the plant community deteriorates, mountain muhly, western wheatgrass, and prairie junegrass decrease in abundance and Stipa and blue grama increase. The increasers generally occur in small amounts in the potential natural plant community.

The Charo soil is suited to such management practices as range seeding and livestock pipelines. It is not suitable as a site for livestock ponds because of the depth to bedrock.

520—Celacy-Atarque complex, 1 to 10 percent slopes. This map unit is on mesa tops, cuestas, and hilltops. Areas are irregular in shape and are 50 to 2,500 acres in size. The native vegetation is mainly grasses and some scattered trees. Elevation is 6,600 to 7,300 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 115 to 130 days.

This unit is 55 percent Celacy sandy loam, 1 to 5

percent slopes, and 30 percent Atarque fine sandy loam, 2 to 10 percent slopes. The Celacy soil is on mesa tops and the lower dip slopes of cuestas, and the Atarque soil is on mesa tops, the upper dip slopes of cuestas, and hilltops. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Flugle and Goesling soils in valleys between hills and on mesa tops, Catman soils in depressions and drainageways, and Rock outcrop on ledges, escarpments, and hilltops. Included areas make up about 15 percent of the total acreage.

The Celacy soil is moderately deep and well drained. It formed in alluvium and eolian material derived dominantly from sandstone. Typically, the surface layer is strong brown sandy loam about 2 inches thick. The upper part of the subsoil is strong brown sandy clay loam about 10 inches thick, and the lower part is reddish yellow sandy clay loam about 12 inches thick. Sandstone is at a depth of about 24 inches.

Permeability is moderate in the Celacy soil. Available water capacity is low. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

The Atarque soil is shallow or very shallow and is well drained. It formed in eolian material derived dominantly from sandstone. Typically, the surface layer is brown fine sandy loam about 2 inches thick. The subsoil is brown sandy clay loam about 14 inches thick. Sandstone is at a depth of about 16 inches.

Permeability is moderate in the Atarque soil. Available water capacity is very low. The effective rooting depth is 8 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

This unit is used for livestock grazing and fuel wood production.

The potential natural plant community on the Celacy soil is mainly blue grama, western wheatgrass, pinyon, and oneseed juniper. The average annual production of air-dry vegetation ranges from 875 pounds per acre in favorable years to 300 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, Indian ricegrass, pinyon ricegrass, and prairie junegrass decrease in abundance and blue grama, threeawn, pinyon, and oneseed juniper increase. The increasers generally occur in small amounts in the potential natural plant community.

The potential natural plant community on the Atarque soil is mainly sideoats grama, New Mexico feathergrass, Indian ricegrass, blue grama, and scattered oneseed juniper. The average annual production of air-dry vegetation ranges from 700 pounds per acre in favorable years to 275 pounds in unfavorable years. If the plant community deteriorates, sideoats grama, New Mexico feathergrass, and Indian ricegrass decrease in abundance and blue grama, sand sagebrush, broom snakeweed, and oneseed juniper increase. The increasers generally occur in small amounts in the potential natural plant community.

The site index for pinyon and juniper on the Celacy and Atarque soils ranges from 13 to 16. Based on a site index of 15, the soils can produce about 2 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot.

The soils are suited to such management practices as range seeding. In some areas dense stands of pinyon and juniper may become established. If properly managed, a limited wood crop can be produced in these areas. Reducing the density of the canopy can increase the production of understory grasses.

522—Bandera association, 15 to 45 percent slopes. This map unit is on cinder cones and hills. Areas are irregular in shape and are 50 to 600 acres in size. The native vegetation is mainly ponderosa pine and a sparse understory of grasses. Elevation is 7,800 to 8,300 feet. The average annual precipitation is about 16 to 20 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 90 to 110 days.

This unit is 50 percent Bandera gravelly loam, 30 to 45 percent slopes, and 30 percent Bandera gravelly loam, 15 to 30 percent slopes. The steeper Bandera soil is on cinder cones and the upper hillsides, and the less sloping Bandera soil is on the lower hills.

Included in this unit are small areas of Raton soils on ridges, Charo soils on hills and ridges, and Rock outcrop on hilltops and ridges. Included areas make up about 20 percent of the total acreage.

The steeper Bandera soil is deep and somewhat excessively drained. It formed in colluvium and windblown sediments derived dominantly from cinders. Typically, the surface layer is brown gravelly loam about 3 inches thick. The subsurface layer is dark brown gravelly loam about 5 inches thick. The underlying material is dark yellowish brown very gravelly loam about 10 inches thick. Cinders are at a depth of about 18 inches. A thin layer of undecomposed pine needles covers the surface in some areas.

Permeability is moderate in the steeper Bandera soil. Available water capacity is very low. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The less sloping Bandera soil is deep and somewhat

excessively drained. It formed in colluvium and windblown sediments derived dominantly from cinders. Typically, the surface layer is brown gravelly loam about 4 inches thick. The subsurface layer is brown gravelly loam about 5 inches thick. The underlying material is yellowish brown very gravelly loam about 7 inches thick. Unconsolidated cinders are at a depth of about 16 inches.

Permeability is moderate in the less sloping Bandera soil. Available water capacity is very low. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

This unit is used for livestock grazing and wood products.

This unit is suited to the production of ponderosa pine. The site index for ponderosa pine averages 63 in the less sloping areas and is 54 to 58 in the steeper areas. Based on a site index of 60, the potential production of merchantable timber is 3,570 cubic feet, or 14,600 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 46 cubic feet, or 177 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting ponderosa pine are the hazard of erosion and equipment limitations in the steeper areas, seedling mortality, and plant competition. Conventional methods of harvesting can be used in the less sloping areas, but their use is limited in the steeper areas. Areas that have slopes of more than 30 percent are not suited to conventional methods of harvesting. Special design of logging roads, skid trails, and landings is needed in the steeper areas. Erosion-control structures and seeding can protect the roads against erosion. The seedling mortality rate is moderate because of the large number of pebbles. Brushy plants, such as Gambel oak, and grasses, such as Arizona fescue and mountain muhly, limit the natural regeneration of ponderosa pine, but they do not prevent the eventual development of a fully stocked, normal stand of trees.

The understory vegetation on this unit is Arizona fescue, mountain muhly, prairie junegrass, Fendler ceanothus, and Gambel oak.

523—Charo-Raton complex, 1 to 10 percent slopes. This map unit is on basalt plains and basalt ridges and in depressions. Areas are irregular in shape and are 200 to 1,200 acres in size. The native vegetation is mainly ponderosa pine, grasses, and shrubs. Elevation is 7,500 to 8,000 feet. The average annual precipitation is about 16 to 20 inches, the average annual air temperature is 42 to 45 degrees F, and the average frost-free period is 90 to 110 days.

This unit is 45 percent Charo cobbly loam, 1 to 5 percent slopes, and 40 percent Raton very cobbly loam, 2 to 10 percent slopes, very stony. The Charo soil is in swales on basalt plains, and the Raton soil is on basalt ridges. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Rock outcrop on lava ridges, soils that are similar to the Raton soil but have less than 35 percent rock fragments in the subsoil and are on lava ridges, and soils that are similar to the Charo soil but are deep to basalt and are in pockets. Included areas make up about 15 percent of the total acreage.

The Charo soil is moderately deep and well drained. It formed in mixed alluvium and windblown sediments over basalt. Typically, the surface layer is brown cobbly loam about 2 inches thick. The next layer is brown clay loam about 6 inches thick. The subsoil is brown and strong brown clay about 20 inches thick. Basalt is at a depth of about 28 inches.

Permeability is slow in the Charo soil. Available water capacity is low. The effective rooting depth is 20 to 40 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight.

The Raton soil is shallow and well drained. It formed in alluvium and windblown sediments over basalt. Typically, the surface layer is dark grayish brown very cobbly loam about 2 inches thick. The subsurface layer also is dark grayish brown very cobbly loam. It is about 5 inches thick. The subsoil is brown and strong brown very cobbly clay about 11 inches thick. Basalt is at a depth of about 18 inches. In some areas a layer of pine needle litter about 1 inch thick is on the surface.

Permeability is slow in the Raton soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for wood products and livestock grazing.

This unit is suited to the production of ponderosa pine. The site index for ponderosa pine is 54 to 59 on the Raton soil and averages 66 on the Charo soil. Based on a site index of 60, the potential production of merchantable timber is 3,570 cubic feet, or 14,600 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 46 cubic feet, or 177 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting timber on the Raton soil are equipment limitations,

seedling mortality, and the hazard of windthrow. Stones on the surface can interfere with felling, yarding, and other activities involving the use of equipment. The seedling mortality rate is moderate because of the very low available water capacity and the high content of clay. Trees are subject to windthrow because of the limited rooting depth.

The main concerns in producing and harvesting timber on the Charo soil are equipment limitations and plant competition. Conventional methods of harvesting timber generally can be used, but their use may be limited when the soil is wet. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Brushy plants, such as Gambel oak and Fendler ceanothus, limit the natural regeneration of ponderosa pine. Trees commonly are subject to windthrow during periods when the soil is excessively wet and winds are strong.

The understory vegetation on this unit is Gambel oak, Fendler ceanothus, gray horsebrush, Arizona fescue, mountain muhly, and blue grama.

525—Catman-Silkie association, 1 to 10 percent slopes. This map unit is in valleys and on fans. Areas are irregular in shape and are 100 to 2,000 acres in size. The native vegetation is mainly grasses, forbs, and shrubs. Elevation is 6,600 to 7,500 feet. The average annual precipitation is about 13 to 16 inches, the average annual air temperature is 47 to 51 degrees F, and the average frost-free period is 100 to 120 days.

This unit is 45 percent Catman clay loam, 1 to 5 percent slopes, and 40 percent Silkie clay loam, 3 to 10 percent slopes. The Catman soil is on valley bottoms, alluvial fans, and the lower valley sides, and the Silkie soil is on the upper valley sides.

Included in this unit are small areas of Hickman soils on valley sides and fans, Flugle and Goesling soils on valley sides, and sandstone and shale outcrops on the upper valley sides. Included areas make up about 15 percent of the total acreage.

The Catman soil is deep and well drained. It formed in alluvium derived dominantly from shale. Typically, the surface layer is light olive brown clay loam about 3 inches thick. The underlying material to a depth of 60 inches is light olive brown clay. In some areas cracks are in the upper 20 inches when the soil is dry.

Permeability is very slow in the Catman soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight. This soil is slightly saline. It is occasionally flooded for long periods in summer.

The Silkie soil is deep and well drained. It formed in alluvium derived dominantly from shale. Typically, the surface layer is light yellowish brown clay loam about 4 inches thick. The subsoil to a depth of 60 inches is light olive brown clay.

Permeability is very slow in the Silkie soil. Available water capacity is very high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for livestock grazing. The potential natural plant community on the Catman soil is mainly western wheatgrass, vine mesquite, spike muhly, and fourwing saltbush. The average annual production of air-dry vegetation ranges from 3,200 pounds per acre in favorable years to 1,250 pounds in unfavorable years. This soil receives runoff from the adjacent areas. As a result, it is potentially more productive. If the plant community deteriorates, western wheatgrass, spike muhly, and winterfat decrease in abundance and blue grama, annual grasses and forbs, rabbitbrush, and broom snakeweed increase. The increasers generally occur in small amounts in the potential natural plant community.

The potential natural plant community on the Silkie soil is mainly alkali sacaton, spike muhly, western wheatgrass, bottlebrush squirreltail, and fourwing saltbush. The average annual production of air-dry vegetation ranges from 800 pounds per acre in favorable years to 300 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, spike muhly, and alkali sacaton decrease in abundance and blue grama, cacti, broom snakeweed, and rabbitbrush increase. The increasers generally occur in small amounts in the potential natural plant community.

Deterioration of the plant community on this unit often results in the formation of very deep, vertical-walled gullies that drain the site and hinder the production of vegetation. After the gullies have drained the site, a combination of grazing management and engineering practices may be needed to return the site to its productive potential.

This unit is suited to such management practices as livestock ponds, fencing, and livestock pipelines.

535—Millpaw loam, 0 to 5 percent slopes. This deep, well drained soil is in swales and valleys. It formed in mixed alluvium. Areas are irregular in shape and are 100 to 1,500 acres in size. The native vegetation is mainly grasses. Elevation is 7,000 to 7,800 feet. The average annual precipitation is about 14 to 16 inches, the average annual air temperature is 47 to 51 degrees F, and the average frost-free period is 100 to 120 days.

Typically, the surface layer is brown loam about 3

inches thick. The upper 26 inches of the subsoil is dark brown clay loam and clay, and the lower part to a depth of 60 inches is brown and brownish yellow sandy clay loam. In areas near the boundary of Catron County, temperatures are slightly cooler and the soil has a thinner surface layer and a higher content of calcium carbonate.

Included in this unit are small areas of Catman soils on valley bottoms and in depressions, Montecito soils on valley sides and bottoms, and Flugle, Galestina, and Pinitos soils on valley sides. Included areas make up about 15 percent of the total acreage.

Permeability is slow in the Millpaw soil. Available water capacity is very high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for livestock grazing and some dryland farming.

The potential natural plant community on this unit is mainly western wheatgrass, New Mexico feathergrass, galleta, blue grama, and winterfat. The average annual production of air-dry vegetation ranges from 1,100 pounds per acre in favorable years to 600 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass and New Mexico feathergrass decrease in abundance and blue grama and rabbitbrush increase. The increasers generally occur in small amounts in the potential natural plant community.

This unit is suited to such management practices as range seeding, fencing, livestock ponds, and livestock pipelines. Good grazing management can increase the productivity and reproduction potential of western wheatgrass.

If this unit is used for nonirrigated crops, the main limitation is the low precipitation.

536—McGaffey loam, 1 to 5 percent slopes. This deep, well drained soil is on fan terraces and valley floors. It formed in mixed alluvium. Areas are irregular in shape and are 100 to 600 acres in size. The native vegetation is mainly grasses and trees. Elevation is 7,500 to 8,500 feet. The average annual precipitation is about 18 to 22 inches, the average annual air temperature is 40 to 44 degrees F, and the average frost-free period is 90 to 105 days.

Typically, the surface layer is reddish brown loam about 3 inches thick. The subsoil is about 30 inches of reddish brown loam and clay loam. The substratum to a depth of 60 inches is reddish brown and reddish yellow loam and clay loam.

Included in this unit are small areas of Charo soils on mesas, Moreno soils on fan terraces, and Raton soils on lava ridges. Included areas make up about 20 percent of the total acreage.

Permeability is moderate in the McGaffey soil. Available water capacity is very high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight.

This unit is used for livestock grazing (fig. 8) and wood products.

This unit is well suited to the production of ponderosa pine. The site index ranges from 83 to 93. Based on a site index of 90, the potential production of merchantable timber is 6,700 cubic feet, or 40,300 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 85 cubic feet, or 403 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting timber are the hazard of erosion and plant competition. When timber is harvested, minimizing the risk of water erosion is essential. Constructing water bars and seeding cut and filled areas can protect logging roads and landings against erosion. Leaving an undisturbed buffer or filter strip along watercourses minimizes sedimentation and thus helps to maintain water quality. Grasses, forbs, and shrubs limit the natural regeneration of ponderosa pine. Properly preparing the site can control competing vegetation.

The understory vegetation on this unit is Arizona fescue, mountain muhly, and western wheatgrass.

537—Millpaw-Loarc complex, 0 to 10 percent slopes. This map unit is on fan terraces, in swales, and on mesa tops and hills. Areas are irregular in shape and are 100 to 1,500 acres in size. The native vegetation is mainly pinyon and oneseed juniper and an understory of grasses. Elevation is 7,200 to 7,800 feet. The average annual precipitation is about 14 to 16 inches, the average annual air temperature is 47 to 51 degrees F, and the average frost-free period is 100 to 120 days.

This unit is 50 percent Millpaw loam, 0 to 5 percent slopes, and 35 percent Loarc fine sandy loam, 0 to 10 percent slopes. The Millpaw soil is in swales and on mesa tops, and the Loarc soil is on mesa tops, fan terraces, and hills. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used. In areas near the boundary of Catron County, temperatures are slightly cooler and the soils have a thinner surface layer and a higher content of calcium carbonate.

Included in this unit are small areas of Pinitos and

Figure 8.—An area of McGaffey loam, 1 to 5 percent slopes, used for livestock grazing.

Ribera soils on fan terraces and mesa tops, Galestina soils on fan terraces and hills, Catman soils in depressions, and Cabezon soils on hills. Included areas make up about 15 percent of the total acreage.

The Millpaw soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is brown loam about 2 inches thick. The upper part of the subsoil is brown and strong brown sandy clay about 35 inches thick, and the lower part to a depth of 60 inches is strong brown sandy clay and sandy clay loam.

Permeability is slow in the Millpaw soil. Available water capacity is very high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Loarc soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is brown fine sandy loam about 4 inches thick. The upper part of the subsoil is brown and dark yellowish brown sandy clay loam about 27 inches thick, and the lower part to a depth of 60 inches is yellowish brown sandy clay loam.

Permeability is moderate in the Loarc soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for livestock grazing and wood products.

The site index for pinyon and juniper on this unit ranges from 40 to 52. Based on a site index of 46, the

unit can produce about 7 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot.

The understory vegetation on this unit is blue grama, bottlebrush squirreltail, pinyon ricegrass, and rabbitbrush.

540—Montecito fine sandy loam, 1 to 15 percent slopes. This deep, well drained soil is on mesas and ridges. It formed in mixed alluvium and windblown sediments. Areas are irregular in shape and are 200 to 2,000 acres in size. The native vegetation is mainly pinyon, juniper, and grasses. Elevation is 6,800 to 7,300 feet. The average annual precipitation is about 14 to 16 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 100 to 120 days.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The upper part of the subsoil is brown and strong brown clay about 25 inches thick, and the lower part to a depth of 60 inches is pink gravelly clay loam. In some areas on Santa Rita Mesa, near Fence Lake, the soil has indurated caliche at a depth of less than 40 inches.

Included in this unit are small areas of Millpaw soils in depressions, Pinitos and Ribera soils on mesas and ridges, and Loarc soils on mesas. Included areas make up about 25 percent of the total acreage.

Permeability is moderately slow in the Montecito soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for wood products and livestock grazing.

The site index for pinyon and juniper on this unit ranges from 25 to 35. Based on a site index of 30, the unit can produce about 3 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot.

The understory vegetation on this unit is blue grama, muttongrass, western wheatgrass, spineless horsebrush, and fringed sagebrush.

550—Nogal-Galestina sandy loams, 1 to 10 percent slopes. This map unit is on mesa tops and hills. Areas are irregular in shape and are 100 to 2,500 acres in size. The native vegetation is mainly grasses, pinyon, and scattered juniper. Elevation is 6,800 to 7,500 feet. The average annual precipitation is about 14 to 16 inches, the average annual air temperature is 47 to 51 degrees F, and the average frost-free period is 100 to 120 days.

This unit is 45 percent Nogal sandy loam, 1 to 10 percent slopes, and 35 percent Galestina sandy loam, 1 to 8 percent slopes. Both soils are on mesa tops and hills. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used. The soils in areas near the boundary of Catron County have a higher content of calcium carbonate and are drier in the subsoil. Those in areas near the boundary of Socorro County have a less well developed subsoil.

Included in this unit are small areas of Rock outcrop on hills, ridges, and escarpments; Silkie soils on valley sides; shallow, fine textured soils on hills; and Pinitos and Ribera soils on mesa tops. Included areas make up about 20 percent of the total acreage.

The Nogal soil is moderately deep and well drained. It formed in alluvium derived dominantly from interbedded sandstone and shale. Typically, the surface layer is brown sandy loam about 1 inch thick. The upper 18 inches of the subsoil is brown clay loam and clay, and the lower 12 inches is strong brown clay. Hard, interbedded sandstone and shale are at a depth of about 31 inches.

Permeability is slow in the Nogal soil. Available water capacity is low. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

The Galestina soil is deep and well drained. It formed in alluvium derived dominantly from sandstone and shale. Typically, the surface layer is yellowish brown sandy loam about 2 inches thick. The subsurface layer is yellowish brown loam about 5 inches thick. The upper part of the subsoil is yellowish brown clay about 24 inches thick, and the lower part is yellowish brown and light yellowish brown clay about 15 inches thick. Shale is at a depth of about 46 inches.

Permeability is slow in the Galestina soil. Available water capacity is moderate. The effective rooting depth is 40 to 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for livestock grazing and wood products.

The site index for pinyon and juniper on the Nogal soil ranges from 21 to 50. Based on a site index of 35, the soil can produce about 6 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot. The suitability for the production of pinyon and juniper is limited because of the medium runoff and the low available water capacity.

The understory vegetation on the Nogal soil is western wheatgrass, blue grama, prairie junegrass,

Gambel oak, and forbs. Reducing the density of the canopy can increase the production of understory plants.

The potential natural plant community on the Galestina soil is mainly western wheatgrass, New Mexico feathergrass, sideoats grama, and winterfat. The average annual production of air-dry vegetation ranges from 950 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, New Mexico feathergrass, sideoats grama, and winterfat decrease in abundance and blue grama, galleta, and cactus increase. The increasers generally occur in small amounts in the potential natural plant community.

Good grazing management can increase the productivity and reproduction potential of cool-season grasses. If the plant cover is disturbed, special treatment is needed to control gullying and sheet erosion.

555—Pinitos-Ribera sandy loams, 1 to 10 percent slopes. This map unit is on mesa tops and gently rolling hills. Areas are irregular in shape and are 150 to 2,000 acres in size. The native vegetation is mainly grasses, pinyon, and scattered juniper and ponderosa pine. Elevation is 6,800 to 7,500 feet. The average annual precipitation is about 14 to 16 inches, the average annual air temperature is 47 to 51 degrees F, and the average frost-free period is 100 to 120 days.

This unit is 50 percent Pinitos sandy loam and 30 percent Ribera sandy loam. Both soils are on mesa tops and hills. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used. The soils in areas near the boundary of Catron County have a higher content of clay in the subsoil. Those in areas near the boundary of Socorro County are less well developed and are shallower.

Included in this unit are small areas of Galestina and Nogal soils between hills and in depressions; Rock outcrop on hilltops, ridges, ledges, and escarpments; soils that are similar to the Ribera soil but are shallow and are on hilltops and ridgetops; and Catman soils along drainageways. Included areas make up about 20 percent of the total acreage.

The Pinitos soil is deep and well drained. It formed in wind-modified alluvium derived dominantly from sandstone. Typically, the surface layer is light brown sandy loam about 2 inches thick. The upper part of the subsoil is brown and light brown sandy clay loam about 22 inches thick, and the lower part to a depth of 60 inches is light brown sandy loam.

Permeability is moderate in the Pinitos soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Ribera soil is moderately deep and well drained. It formed in wind-modified alluvium derived dominantly from sandstone. Typically, the surface layer is brown sandy loam about 3 inches thick. The upper 13 inches of the subsoil is brown and yellowish brown sandy clay loam, and the lower 23 inches is yellowish brown and brown sandy clay loam and clay loam. Sandstone is at a depth of about 39 inches.

Permeability is moderate in the Ribera soil. Available water capacity also is moderate. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

This unit is used for livestock grazing and wood products.

The site index for pinyon and juniper on this unit ranges from 40 to 50. Based on a site index of 45, the unit can produce about 7 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot.

The understory vegetation on this unit is western wheatgrass, blue grama, big sagebrush, bottlebrush squirreltail, and pinyon ricegrass. Reducing the density of the canopy can increase the production of understory plants.

560—Flugle-Teco association, 1 to 8 percent slopes. This map unit is on mesas and ridges and in swales. Areas are irregular in shape and are 500 to 6,000 acres in size. The native vegetation is mainly grasses and trees. Elevation is 6,600 to 7,000 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 115 to 135 days.

This unit is 50 percent Flugle loamy fine sand, 3 to 8 percent slopes, and 30 percent Teco sandy loam, 1 to 4 percent slopes. The Flugle soil is on ridges and mesas, and the Teco soil is on ridges and mesas and in swales. The soils in areas near the boundary of Apache County, Arizona, have a lower content of clay in the subsoil. Those in areas near the boundary of Catron County are moderately deep over bedrock.

Included in this unit are small areas of Hickman and Catman soils along drainageways and in swales; on ridges and hills, soils that are similar to the Flugle soil but have less than 18 percent clay; and Goesling and Quintana soils on ridges. Included areas make up about 20 percent of the total acreage.

The Flugle soil is deep and well drained. It formed in wind-modified, mixed alluvium. Typically, the surface layer is brown loamy fine sand about 3 inches thick.

The subsurface layer is brown fine sandy loam about 2 inches thick. The upper 16 inches of the subsoil is reddish brown clay loam and sandy clay, the upper part of the subsoil is dark brown sandy clay loam about 14 inches thick, the next part is light brown and brown sandy clay loam about 18 inches thick, and the lower part to a depth of 60 inches is sandy loam.

Permeability is moderate in the Flugle soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

The Teco soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is brown sandy loam about 2 inches thick. The upper 16 inches of the subsoil is reddish brown clay loam and sandy clay, the next 25 inches is light reddish brown sandy clay loam, and the lower part to a depth of 60 inches is light reddish brown sandy loam.

Permeability is moderately slow in the Teco soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight.

This unit is used for livestock grazing and wood products.

The site index for pinyon and juniper on the Flugle soil ranges from 30 to 50. Based on a site index of 40, the soil can produce about 6 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot. Properly managing the soil helps to control soil blowing.

The understory vegetation on the Flugle soil is pinyon ricegrass, Indian ricegrass, blue grama, and bottlebrush squirreltail. Reducing the density of the canopy can increase the production of understory plants.

The potential natural plant community on the Teco soil is mainly western wheatgrass, alkali sacaton, galleta, and winterfat. The average annual production of air-dry vegetation ranges from 1,200 pounds per acre in favorable years to 600 pounds in unfavorable years. The soil is suited to such management practices as livestock pipelines, range seeding, and brush control. Good grazing management can increase the productivity and reproduction potential of western wheatgrass and alkali sacaton.

561—Flugle-Quintana complex, 2 to 15 percent slopes. This map unit is on ridges and hills and in dissected valleys. Areas are elongated and are 150 to 1,200 acres in size. The native vegetation is mainly grasses and trees. Elevation is 6,400 to 6,900 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 115 to 130 days.

This unit is 45 percent Flugle sandy loam, 2 to 8 percent slopes, and 35 percent Quintana fine sandy loam, 5 to 15 percent slopes. The Flugle soil is on hills and ridges, and the Quintana soil is on ridges and in dissected valleys. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used. The soils in areas near the boundary of Apache County, Arizona, have a higher content of calcium carbonate. Those in areas near the boundary of Catron County are moderately deep and fine textured and have a higher content of calcium carbonate.

Included in this unit are small areas of Goesling soils on mesas and Teco soils on mesa tops and in swales. Also included are Atarque soils on ridges and in gullied areas. Included areas make up about 20 percent of the total acreage.

The Flugle soil is deep and well drained. It formed in wind-modified, mixed alluvium. Typically, the surface layer is brown sandy loam about 2 inches thick. The upper 17 inches of the subsoil is brown and reddish brown sandy clay loam, the next 28 inches is light brown sandy clay loam and clay loam, and the lower part to a depth of 60 inches is light brown sandy loam.

Permeability is moderate in the Flugle soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Quintana soil is deep and well drained. It formed in mixed alluvium reworked by the wind. Typically, the surface layer is light brown fine sandy loam about 2 inches thick. The upper 9 inches of the subsoil is brown fine sandy loam, the next 35 inches is pink loam and sandy clay loam, and the lower part to a depth of 60 inches is pink sandy loam. In some areas the slope is more than 15 percent.

Permeability is moderate in the Quintana soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is severe. The hazard of soil blowing is slight.

This unit is used for livestock grazing and wood products.

The site index for pinyon and juniper on this unit ranges from 30 to 50. Based on a site index of 40, the unit can produce 6 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot. Good management is needed to protect the unit against excessive soil blowing and water erosion.

The understory vegetation on this unit is pinyon ricegrass, Indian ricegrass, blue grama, and bottlebrush

squirreltail. Reducing the density of the canopy can increase the production of understory plants.

565—Quintana sandy loam, 5 to 15 percent slopes, gullied. This deep, well drained soil is on dissected ridges and terrace escarpments. It formed in wind-modified, mixed alluvium. Areas are irregular in shape and are 200 to 1,500 acres in size. The native vegetation is mainly trees and grasses. Elevation is 6,400 to 6,900 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 115 to 130 days.

Typically, the surface layer is brown sandy loam about 4 inches thick. The upper part of the subsoil is strong brown and light brown sandy clay loam about 17 inches thick, and the lower part to a depth of 60 inches is pink and light brown sandy loam.

Included in this unit are small areas of Goesling and Flugle soils on mesas and side slopes, Teco soils in swales and valleys, and gullied land. Included areas make up about 20 percent of the total acreage.

Permeability is moderate in the Quintana soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is rapid, and the hazard of water erosion is severe. The hazard of soil blowing is slight.

This unit is used for limited livestock grazing and fuel wood production.

The site index for pinyon and juniper on this unit ranges from 32 to 38. Based on a site index of 35, the unit can produce 4 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot.

The understory vegetation on this unit is antelope bitterbrush and Indian ricegrass.

570—Torreon-Rock outcrop-Cabezon complex, 15 to 45 percent slopes. This map unit is on hills, ridges, and escarpments. Areas are irregular in shape and are 100 to 1,250 acres in size. The native vegetation is mainly grasses, shrubs, and trees. Elevation is 6,400 to 7,800 feet. The average annual precipitation is about 12 to 16 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 100 to 135 days.

This unit is 40 percent Torreon very cobbly loam, 15 to 35 percent slopes, extremely stony; 25 percent Rock outcrop; and 15 percent Cabezon very cobbly loam, 15 to 45 percent slopes. The Torreon and Cabezon soils are on hills and ridges, and the Rock outcrop is on escarpments, hills, and ridges. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used. Areas near the boundary of Catron County are cooler.

Included in this unit are small areas of Atarque soils on mesa breaks; Flugle, Celacy, Ribera, and Pinitos soils on hills and ridges; and Catman and Hickman soils along narrow drainageways. Included areas make up about 20 percent of the total acreage.

The Torreon soil is deep and well drained. It formed in mixed colluvium and alluvium. Typically, the surface layer is brown very cobbly loam about 2 inches thick. The upper 23 inches of the subsoil is brown and reddish brown clay loam and clay, and the lower 35 inches is pinkish white silty clay loam. In some areas the soil is moderately deep or has less clay or more gravel.

Permeability is slow in the Torreon soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Rock outcrop consists of barren or nearly barren areas of exposed basalt on escarpments, ledges, and ridges.

The Cabezon soil is shallow and well drained. It formed in windblown sediments and alluvium. Typically, the surface layer is brown very cobbly loam about 3 inches thick. The subsoil is brown and dark brown clay loam about 10 inches thick. Basalt is at a depth of about 13 inches.

Permeability is slow in the Cabezon soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for livestock grazing, wildlife habitat, and wood products.

The site index for pinyon and juniper on the Torreon and Cabezon soils ranges from 38 to 55. Based on a site index of 46, the soils can produce 6 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot.

The understory vegetation on this unit is blue grama, bottlebrush squirreltail, and pinyon ricegrass. Reducing the density of the canopy can increase the production of understory plants. The main limitations affecting the use of this unit for livestock grazing are stones on the surface and the slope.

575—Teco-Atarque association, 1 to 8 percent slopes. This map unit is on old basalt-capped mesas. The soils formed in mixed alluvium reworked by the wind. Areas are elongated and are 200 to 2,000 acres in size. The native vegetation is mainly grasses and scattered trees. Elevation is 6,600 to 7,000 feet. The

average annual precipitation is about 12 to 14 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 115 to 135 days.

This unit is 60 percent Teco fine sandy loam, 1 to 4 percent slopes, and 25 percent Atarque fine sandy loam, 1 to 8 percent slopes. The Teco soil is in swales and in low areas on basalt-capped mesas, and the Atarque soil is on knolls in high areas on basalt-capped mesas. The soils in areas near the boundary of Apache County, Arizona, have less clay in the subsoil.

Included in this unit are small areas of Flugle and Goesling soils on mesas, Rock outcrop on knolls, soils that are similar to the Atarque soil but are fine textured and are on knolls, and soils that are similar to the Teco soil but are moderately deep and are on mesas and the lower parts of knolls. Included areas make up about 15 percent of the total acreage.

The Teco soil is deep and well drained. It formed in alluvium and eolian material derived dominantly from sandstone and shale. Typically, the surface layer and subsurface layer are light brown fine sandy loam. The surface layer is about 4 inches thick, and the subsurface layer is about 2 inches thick. The upper 18 inches of the subsoil is reddish brown and brown clay loam, the next 17 inches is light brown and pink clay loam and sandy clay loam, and the lower part to a depth of 60 inches is reddish yellow gravelly sandy loam.

Permeability is moderately slow in the Teco soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing also is slight.

The Atarque soil is shallow or very shallow and is well drained. It formed in wind-modified, mixed alluvium. Typically, the surface layer is brown fine sandy loam about 3 inches thick. The subsoil is brown and light brown clay loam about 16 inches thick. Basalt is at a depth of about 19 inches.

Permeability is moderate in the Atarque soil. Available water capacity is very low. The effective rooting depth is 8 to 20 inches. Runoff is rapid, and the hazard of water erosion is severe. The hazard of soil blowing also is severe.

This unit is used for livestock grazing. The potential natural plant community on the Teco soil is mainly alkali sacaton, western wheatgrass, galleta, and winterfat. The average annual production of air-dry vegetation ranges from 1,200 pounds per acre in favorable years to 600 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, alkali sacaton, and winterfat decrease in abundance and muhly, dropseed, and rabbitbrush increase. The increasers normally occur in small amounts in the potential natural plant community.

The Teco soil is suited to such management practices as livestock pipelines and range seeding. Good grazing management can increase the productivity and reproduction potential of western wheatgrass and alkali sacaton. This soil receives runoff from the adjacent areas. As a result, it is potentially more productive.

The potential natural plant community on the Atarque soil is mainly blue grama, sideoats grama, black grama, little bluestem, and wolftail. The average annual production of air-dry vegetation ranges from 1,100 pounds per acre in favorable years to 425 pounds in unfavorable years. If the plant community deteriorates, sideoats grama, black grama, and little bluestem decrease in abundance and blue grama and wolftail increase. The increasers normally occur in small amounts in the potential natural plant community.

The Atarque soil is not suitable as a site for as livestock pipelines and livestock ponds because of the depth to bedrock. Good grazing management can increase the productivity and reproduction potential of sideoats grama, black grama, and little bluestem.

576—Teco sandy loam, 2 to 5 percent slopes. This deep, well drained soil is on valley sides and hills. It formed in mixed alluvium. Areas are irregular in shape and are 100 to 600 acres in size. The native vegetation is mainly grasses. Elevation is 6,800 to 7,500 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 115 to 135 days.

Typically, the surface layer is light brown sandy loam about 3 inches thick. The upper part of the subsoil is reddish brown sandy clay about 25 inches thick, and the lower part to a depth of 60 inches is reddish yellow sandy clay.

Included in this unit are small areas of Atarque soils on hilltops, Catman and Venadito soils on valley bottoms, Silkie soils on fans, and Flugle soils on hillsides. Included areas make up about 20 percent of the total acreage.

Permeability is moderately slow in the Teco soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for livestock grazing. The potential natural plant community is mainly alkali sacaton, western wheatgrass, galleta, and winterfat. The average annual production of air-dry vegetation ranges from 1,200 pounds per acre in favorable years to 600 pounds

in unfavorable years. If the plant community deteriorates, western wheatgrass, alkali sacaton, and winterfat decrease in abundance and muhly, dropseed, and rabbitbrush increase. The increasers normally occur in small amounts in the potential natural plant community.

This unit is suited to such management practices as livestock ponds, livestock pipelines, and range seeding. Good grazing management can increase the productivity and reproduction potential of western wheatgrass and alkali sacaton. This soil receives runoff from the adjacent areas. As a result, it is potentially more productive.

577—Cabezon-Montecito-Rock outcrop association, 1 to 10 percent slopes. This map unit is on hills, ridges, and valley bottoms. Areas are irregular in shape and are 1,000 to 6,000 acres in size. The native vegetation is mainly grasses, shrubs, juniper, and pinyon. Elevation is 7,100 to 7,500 feet. The average annual precipitation is about 14 to 16 inches, the average annual air temperature is 47 to 52 degrees F, and the average frost-free period is 100 to 120 days.

This unit is 35 percent Cabezon very cobbly loam, 2 to 10 percent slopes, very stony; 30 percent Montecito clay loam, 1 to 5 percent slopes; and 20 percent Rock outcrop. The Cabezon soil is on lava hills and ridges, the Montecito soil is on the lower hillsides and in valleys between lava ridges, and the Rock outcrop is on hills and ridges.

Included in this unit are small areas of Millpaw soils on bottoms, Cantina soils on the lower hillsides and in valleys between lava ridges, and soils that are similar to the Montecito soil but are moderately deep and are on hillsides. Included areas make up about 15 percent of the total acreage.

The Cabezon soil is shallow and well drained. It formed in alluvium and windblown sediments. Typically, the surface layer is brown very cobbly loam about 2 inches thick. The subsoil is brown clay about 16 inches thick. Basalt is at a depth of about 18 inches.

Permeability is slow in the Cabezon soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Montecito soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is dark brown clay loam about 3 inches thick. The upper part of the subsoil is yellowish brown clay about 21 inches thick, and the lower part to a depth of 60 inches is light yellowish brown sandy clay.

Permeability is moderately slow in the Montecito soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Rock outcrop consists of barren or nearly barren areas of exposed basalt on hills and ridges.

This unit is used for livestock grazing and wood products.

The site index for pinyon and juniper on the Cabezon soil ranges from 34 to 52. Based on a site index of 43, the soil can produce 5 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot. The main limitations are the depth to bedrock and the low available water capacity.

The understory vegetation on the Cabezon soil is blue grama, bottlebrush squirreltail, and muttongrass. Reducing the density of the canopy can increase the production of understory plants.

The potential natural plant community on the Montecito is mainly western wheatgrass, alkali sacaton, galleta, and winterfat. The average annual production of air-dry vegetation ranges from 1,200 pounds per acre in favorable years to 600 pounds in unfavorable years.

The Montecito soil is suited to such management practices as livestock ponds, livestock pipelines, range seeding, and brush control. This soil receives runoff from the adjacent areas. As a result, it is potentially more productive. Good grazing management can increase the productivity and reproduction potential of western wheatgrass and alkali sacaton.

The main limitations affecting the use of this unit for livestock grazing are the Rock outcrop and the depth to bedrock and stones on the surface in areas of the Cabezon soil.

579—Cabezon-Cantina complex, 1 to 7 percent slopes. This map unit is on hills and in valleys between basalt ridges. Areas are irregular in shape and are 1,000 to 3,000 acres in size. The native vegetation is mainly trees and an understory of grasses. Elevation is 7,100 to 7,500 feet. The average annual precipitation is about 14 to 16 inches, the average annual air temperature is 47 to 51 degrees F, and the average frost-free period is 100 to 120 days.

This unit is 45 percent Cabezon very cobbly sandy loam, 1 to 7 percent slopes, very stony, and 40 percent Cantina sandy loam, 1 to 3 percent slopes. The Cabezon soil is on hills, and the Cantina soil is on the lower hills and in valleys between basalt ridges. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of soils that are similar to the Cantina soil but are moderately deep, Millpaw and Montecito soils in valleys between lava

ridges, and Rock outcrop on basalt hills and ridges. Included areas make up about 15 percent of the total acreage.

The Cabezon soil is shallow and well drained. It formed in alluvium and windblown sediments. Typically, the surface layer is brown very cobbly sandy loam about 2 inches thick. The subsoil is dark yellowish brown sandy clay about 12 inches thick. Basalt is at a depth of about 14 inches.

Permeability is slow in the Cabezon soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Cantina soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is brown sandy loam about 2 inches thick. The upper part of the subsoil is brown sandy clay loam about 7 inches thick, the next part is brown sandy clay about 22 inches thick, and the lower part is strong brown sandy clay loam about 23 inches thick. Basalt is at a depth of about 54 inches.

Permeability is slow in the Cantina soil. Available water capacity is high. The effective rooting depth is 40 to 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used for livestock grazing and wood products.

The site index for pinyon and juniper on the Cabezon soil ranges from 34 to 52. Based on a site index of 43, the soil can produce 5 cords of wood per acre from trees that average 5 inches in diameter at a height of 1 foot. The main limitations affecting the use of this soil for wood products are the depth to bedrock and the low available water capacity.

The site index for pinyon and juniper on the Cantina soil ranges from 39 to 70. Based on a site index of 55, the soil can produce 7 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot.

The understory vegetation on this unit is blue grama, bottlebrush squirreltail, and muttongrass.

581—Laporte-Vessilla complex, 3 to 15 percent slopes. This map unit is on hilltops and ridges. Areas are irregular in shape and are 500 to 1,500 acres in size. The native vegetation is mainly trees and grasses. Elevation is 7,000 to 7,500 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 110 to 125 days.

This unit is 45 percent Laporte gravelly loam, 3 to 15 percent slopes, and 35 percent Vessilla sandy loam, 3 to 15 percent slopes. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Mion soils on hills, Rock outcrop on hills and ridges, and Ribera soils on ridges. Included areas make up about 20 percent of the total acreage.

The Laporte soil is shallow and well drained. It formed in alluvium and windblown sediments derived dominantly from limestone. Typically, the surface layer is very dark grayish brown gravelly loam about 1 inch thick. The upper part of the underlying material is dark grayish brown gravelly loam about 14 inches thick, and the lower part is brown gravelly loam about 3 inches thick. Limestone is at a depth of about 18 inches.

Permeability is moderate in the Laporte soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Vessilla soil is shallow and well drained. It formed in eolian material derived dominantly from sandstone. Typically, the surface layer is dark brown sandy loam about 6 inches thick. The underlying material is light brown sandy loam about 12 inches thick. Sandstone is at a depth of about 18 inches.

Permeability is moderately rapid in the Vessilla soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

This unit is used for fuel wood production and livestock grazing.

The site index for pinyon and juniper on this unit generally ranges from 40 to 50. Based on a site index of 45, the unit can produce 7 cords of wood per acre in a stand of trees that average 5 inches in diameter at a height of 1 foot. In the vicinity of Oso Ridge Lookout, the site index for pinyon and juniper is higher on the Laporte soil. The overstory in this area consists of scattered ponderosa pine, Rocky Mountain juniper, alligator juniper, oneseed juniper, pinyon, and Gambel oak.

The understory vegetation on this unit is little bluestem, New Mexico feathergrass, blue grama, and sideoats grama. Reducing the density of the canopy can increase the production of understory plants.

582—Kenray fine sand, 3 to 15 percent slopes. This deep, excessively drained soil is on dunes, hills, and mesas. It formed in eolian material derived dominantly from sandstone. Areas are irregular in shape and are 200 to 1,300 acres in size. The native vegetation is mainly ponderosa pine, shrubs, and

grasses. Elevation is 7,300 to 8,000 feet. The average annual precipitation is about 16 to 20 inches, the average annual air temperature is 43 to 45 degrees F, and the average frost-free period is 90 to 110 days.

Typically, the surface layer is brown fine sand about 15 inches thick. The underlying material to a depth of 60 inches is light yellowish brown and brownish yellow loamy sand.

Included in this unit are small areas of Pinitos and Ribera soils on hillsides at the lower elevations, soils that are similar to the Kenray soil but are moderately deep or shallow and are on hills, Techado soils on hills, and Valnor soils on mesas. Included areas make up about 20 percent of the total acreage.

Permeability is rapid in the Kenray soil. Available water capacity is low. The effective rooting depth is 60 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is severe.

This unit is used for limited wood products and livestock grazing.

This unit is suited to the production of ponderosa pine. The site index for ponderosa pine ranges from 50 to 65. Based on a site index of 60, the potential production of merchantable timber is 3,570 cubic feet, or 14,600 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 46 cubic feet, or 177 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting timber are the hazard of soil blowing, equipment limitations, seedling mortality, and plant competition. The sandy texture of the surface layer can interfere with felling, yarding, and other activities involving the use of equipment. When timber is harvested, minimizing the risk of erosion is essential. Special design of logging roads, skid trails, and landings is needed. Erosion-control structures and seeding can protect the roads, trails, and landings against erosion. Because of the low available water capacity, the seedling mortality rate is moderate on the north- and east-facing slopes and severe on the south- and west-facing slopes. Carefully managing reforestation can minimize competition from undesirable understory plants. Unless the site is adequately prepared, plant competition can prevent or delay the natural or artificial regeneration of trees. In the Zuni Mountains, Gambel oak and various grasses limit the natural regeneration of ponderosa pine. At the lower elevations, pinyon, oneseed juniper, skunkbush sumac, and oaks limit natural regeneration. Properly preparing the site can control competing vegetation. Leaving an undisturbed buffer or filter strip along watercourses minimizes sedimentation and thus helps to maintain water quality.

The understory vegetation on this unit is blue grama, Arizona fescue, mountain muhly, and Gambel oak.

585—Moncha silt loam, 2 to 10 percent slopes. This deep, well drained soil is in valleys, on fan terraces, and on mesa tops. It formed in alluvium derived from siltstone and shale. Areas are irregular in shape and are 100 to 1,000 acres in size. The native vegetation is mainly grasses and a few scattered trees. Elevation is 6,800 to 7,300 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 48 to 52 degrees F, and the average frost-free period is 115 to 130 days.

Typically, the surface layer is light red silt loam about 2 inches thick. The subsoil is red silty clay loam about 19 inches thick. The substratum to a depth of 60 inches also is red silty clay loam.

Included in this unit are small areas of Venadito soils in depressions and along drainageways, Teco soils in depressions, and Flugle and Goesling soils on fan terraces. Included areas make up about 15 percent of the total acreage.

Permeability is moderately slow in the Moncha soil. Available water capacity is very high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for livestock grazing. The potential natural plant community on the Moncha soil is mainly alkali sacaton, spike muhly, western wheatgrass, bottlebrush squirreltail, and fourwing saltbush. The average annual production of air-dry vegetation ranges from 800 pounds per acre in favorable years to 300 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, spike muhly, and alkali sacaton decrease in abundance and blue grama, cacti, broom snakeweed, and rabbitbrush increase. The increasers normally occur in small amounts in the potential natural plant community. This soil receives runoff from the adjacent areas. As a result, it is potentially more productive.

Deterioration of the plant community often results in the formation of deep, vertical-walled gullies that drain the site and hinder the production of vegetation. After the gullies have drained the site, a combination of grazing management and engineering practices may be needed to return the site to its productive potential.

This soil is suited to such management practices as fencing and livestock pipelines.

586—Venadito-Teco association, 0 to 10 percent slopes. This map unit is on valley bottoms and sides and on hills. Areas are irregular in shape and are 75 to 1,300 acres in size. The native vegetation is mainly

grasses and a few scattered trees. Elevation is 6,500 to 7,500 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 40 to 53 degrees F, and the average frost-free period is 115 to 135 days.

This unit is 60 percent Venadito clay loam, 0 to 5 percent slopes, and 25 percent Teco clay loam, 2 to 10 percent slopes. The Venadito soil is on valley bottoms and the lower valley sides, and the Teco soil is on valley sides and hills.

Included in this unit are small areas of Flugle soils on fan terraces, Quintana soils on hills, and Aparejo, Catman, and Hickman soils along drainageways. Included areas make up about 15 percent of the total acreage.

The Venadito soil is deep and well drained. It formed in alluvium derived dominantly from shale. Typically, the surface layer is reddish brown clay loam about 3 inches thick. The underlying material to a depth of 60 inches is reddish brown clay.

Permeability is very slow in the Venadito soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight. This soil has prominent slickensides and cracks that extend to a depth of about 35 inches. It is occasionally flooded for very brief periods in summer.

The Teco soil is deep and well drained. It formed in alluvium derived dominantly from shale and sandstone. Typically, the surface layer is reddish brown clay loam about 3 inches thick. The upper 25 inches of the subsoil is reddish brown clay and clay loam, and the lower part to a depth of 60 inches is light reddish brown clay loam.

Permeability is moderately slow in the Teco soil. Available water capacity is very high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for livestock grazing. The potential natural plant community on the Venadito soil is mainly western wheatgrass, vine mesquite, alkali sacaton, blue grama, and fourwing saltbush. The average annual production of air-dry vegetation ranges from 3,200 pounds per acre in favorable years to 900 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass and vine mesquite decrease in abundance and blue grama increases. Blue grama normally occurs in small amounts in the potential natural plant community.

The potential natural plant community on the Teco soil is mainly alkali sacaton, western wheatgrass, galleta, and winterfat. The average annual production of air-dry vegetation ranges from 1,200 pounds per acre in favorable years to 600 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, alkali sacaton, and winterfat decrease in abundance and muhly, dropseed, and rabbitbrush increase. The increasers normally occur in small amounts in the potential natural plant community.

The Venadito soil is suitable as a site for livestock ponds. The Teco soil is suited to such management practices as livestock ponds, livestock pipelines, and range seeding.

Good grazing management on this unit can increase the productivity and reproduction potential of western wheatgrass.

591—Valnor-Techado association, 2 to 25 percent slopes. This map unit is on hills, plateaus, and mesas. Areas are irregular in shape and are 100 to 4,500 acres in size. The native vegetation is mainly pine trees and an understory of grasses. Elevation is 7,500 to 8,200 feet. The average annual precipitation is about 16 to 20 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 90 to 110 days.

This unit is 45 percent Valnor clay loam, 2 to 7 percent slopes, and 40 percent Techado channery clay loam, 5 to 25 percent slopes. The Valnor soil is on mesa tops, hilltops, and plateaus, and the Techado soil is on hillsides and hilltops.

Included in this unit are small areas of soils that are similar to the Valnor soil but have shale below a depth of 40 inches and are on mesa tops, soils that are similar to the Valnor and Techado soils but have less clay in the subsoil and are on hills and mesas, Rock outcrop on hills and mesas, and Catman soils along narrow drainageways. Included areas make up about 15 percent of the total acreage.

The Valnor soil is moderately deep and well drained. It formed in alluvium derived dominantly from shale and sandstone. Typically, the surface layer is yellowish brown clay loam about 2 inches thick. The upper part of the subsoil is dark yellowish brown and yellowish brown clay about 16 inches thick, and the lower part is light yellowish brown clay about 20 inches thick. Soft shale is at a depth of about 38 inches.

Permeability is slow in the Valnor soil. Available water capacity is moderate. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Techado soil is shallow and well drained. It formed in alluvium derived from shale and sandstone. Typically, the surface layer is light olive brown channery clay loam about 3 inches thick. The underlying material is light olive brown clay about 13 inches thick. Soft shale is at a depth of about 16 inches. In areas near

the boundary of Catron County, the underlying material has less clay.

Permeability is slow in the Techado soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

This unit is used for livestock grazing and wood products.

This unit is suited to limited production of ponderosa pine. The site index for ponderosa pine ranges from 43 to 47. Based on a site index of 45, the potential production of merchantable timber is 1,990 cubic feet, or 6,200 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 34 cubic feet, or 107 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting wood products are the hazard of erosion, plant competition, a slow growth rate, seedling mortality, and equipment limitations. Also, the Techado soil is subject to windthrow during periods when the soil is excessively wet and winds are strong. When timber is harvested, minimizing the risk of erosion is essential. Proper design of road drainage systems and care in the placement of culverts help to control erosion. Spoil from excavations is subject to rill and gully erosion and to sloughing. Constructing water bars and seeding cut and filled areas can protect logging roads and landings against erosion. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Brushy plants, such as Gambel oak and juniper, limit the natural regeneration of ponderosa pine. Thinning the stand can accelerate the growth of desirable trees. The seedling mortality rate is moderate because of the clayey texture. Conventional methods of harvesting timber generally can be used, but their use may be limited when the soils are wet.

The understory vegetation on the Valnor soil is Arizona fescue, mountain muhly, western wheatgrass, and Gambel oak, and that on the Techado soil is blue grama, spike muhly, gray horsebrush, and Gambel oak.

610—Grieta-Shiprock association, 1 to 10 percent slopes. This map unit is on hills, ridges, fan terraces, and stable dunes. Areas are irregular in shape and are 50 to 1,250 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is 5,400 to 6,100 feet. The average annual precipitation is about 7 to 10 inches, the average annual air temperature is 51 to 55 degrees F, and the average frost-free period is 140 to 165 days.

This unit is 65 percent Grieta sandy loam, 1 to 7 percent slopes, and 20 percent Shiprock sandy loam, 3 to 10 percent slopes. The Grieta soil is on hilltops, on fan terraces, and in interdune areas, and the Shiprock soil is on stable dunes, ridges, and hills.

Included in this unit are small areas of Sheppard soils on stable dunes, Kiki soils on hills, and Suwanee and Navajo soils on flood plains. Included areas make up about 15 percent of the total acreage.

The Grieta soil is deep and well drained. It formed in wind-modified, mixed alluvium. Typically, the surface layer is strong brown sandy loam about 3 inches thick. The subsurface layer also is strong brown sandy loam. It is about 5 inches thick. The upper part of the subsoil is strong brown sandy clay loam about 20 inches thick. The lower part to a depth of 60 inches is pink and pinkish white sandy loam. It has a high content of calcium carbonate.

Permeability is moderate in the Grieta soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Shiprock soil is deep and well drained. It formed in wind-modified, mixed alluvium. Typically, the surface layer is reddish yellow sandy loam about 3 inches thick. The subsurface layer is brown sandy loam about 10 inches thick. The upper part of the subsoil is brown sandy loam about 12 inches thick, and the lower part to a depth of 60 inches is reddish yellow sandy loam.

Permeability is moderately rapid in the Shiprock soil. Available water capacity is moderate. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

This unit is used for livestock grazing. The potential natural plant community on the Grieta soil is mainly bush muhly, black grama, galleta, and winterfat. The average annual production of air-dry vegetation ranges from 800 pounds per acre in favorable years to 400 pounds in unfavorable years. If the plant community deteriorates, bush muhly, black grama, galleta, and winterfat decrease in abundance and blue grama, broom snakeweed, and annuals increase. The increasers normally occur in small amounts in the potential natural plant community.

The potential natural plant community on the Shiprock soil is mainly black grama, Indian ricegrass, and dropseed. The average annual production of air-dry vegetation ranges from 900 pounds per acre in favorable years to 400 pounds in unfavorable years. If the plant community deteriorates, black grama and Indian ricegrass decrease in abundance and ring muhly, threeawn, annuals, and cacti increase. The increasers

normally occur in small amounts in the potential natural plant community.

Good management is needed to protect the soils against excessive soil blowing. Soil blowing can be controlled and damage to seedlings minimized by maintaining enough plant residue on the surface.

This unit is not suitable as a site for livestock ponds and range seeding because of seepage and droughtiness. It is suited to such management practices as livestock pipelines, fencing, deferred grazing, and rotation grazing.

611—Grieta-Kiki sandy loams, 3 to 15 percent slopes. This map unit is on knolls, ridges, and hills. Areas are irregular in shape and are 50 to 700 acres in size. The native vegetation is mainly grasses and forbs. Elevation is 5,500 to 6,000 feet. The average annual precipitation is about 7 to 10 inches, the average annual air temperature is 51 to 55 degrees F, and the average frost-free period is 140 to 165 days.

This unit is 50 percent Grieta sandy loam, 3 to 10 percent slopes, and 35 percent Kiki sandy loam, 3 to 15 percent slopes. The Grieta soil is on the lower parts of hills, and the Kiki soil is on knolls and ridges. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of shallow, loamy soils on hilltops and hills, Rock outcrop on hilltops, Suwanee and Navajo soils on flood plains, and Shiprock soils on hills. Included areas make up about 15 percent of the total acreage.

The Grieta soil is deep and well drained. It formed in mixed alluvium reworked by the wind. Typically, the surface layer is yellowish red sandy loam about 3 inches thick. The upper part of the subsoil is yellowish red sandy clay loam about 10 inches thick, and the lower part to a depth of 60 inches is reddish yellow, yellowish red, and reddish brown sandy clay loam.

Permeability is moderate in the Grieta soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Kiki soil is moderately deep and well drained. It formed in eolian material and mixed alluvium. Typically, the surface layer and subsurface layer are strong brown sandy loam. They are each about 3 inches thick. The upper part of the subsoil is strong brown sandy clay loam about 8 inches thick, and the lower part is strong brown sandy clay loam about 10 inches thick. Basalt is at a depth of about 24 inches.

Permeability is moderate in the Kiki soil. Available water capacity is low. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

This unit is used for livestock grazing and urban development.

The potential natural plant community on the Grieta soil is mainly black grama, galleta, bush muhly, and winterfat. The average annual production of air-dry vegetation ranges from 800 pounds per acre in favorable years to 400 pounds in unfavorable years. If the plant community deteriorates, black grama and winterfat decrease in abundance and broom snakeweed, forbs, and cacti increase. The increasers normally occur in small amounts in the potential natural plant community.

The potential natural plant community on the Kiki soil is mainly black grama, Indian ricegrass, and dropseed. The average annual production of air-dry vegetation ranges from 900 pounds per acre in favorable years to 400 pounds in unfavorable years. If the plant community deteriorates, black grama and Indian ricegrass decrease in abundance and ring muhly, sandhill muhly, annuals, and cacti increase. The increasers normally occur in small amounts in the potential natural plant community.

Good management is needed to protect the soils against excessive soil blowing. Soil blowing can be controlled and damage to seedlings minimized by maintaining enough plant residue on the surface.

This unit is not suitable as a site for livestock ponds and range seeding because of seepage and droughtiness.

The trees and shrubs selected for windbreaks and environmental plantings should be those that are tolerant of droughtiness. Unless the seedlings on the Kiki soil are irrigated, the mortality rate is moderate because of the moisture stress caused by the low available water capacity. Unless the young seedlings are protected during high winds, they can be damaged by sand blasting or covered with drifting sand. Soil blowing can be controlled by maintaining strips of native vegetation between the rows of trees and shrubs. Undesirable grasses and weeds can be controlled by applying herbicides and by rototilling or hand hoeing.

The soils in this unit are suited to urban development. The main management concerns are the hazard of soil blowing, the high content of calcium carbonate in the Grieta soil, and the depth to bedrock in the Kiki soil. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees.

615—Trag-Techado-Rock outcrop complex, 3 to 55 percent slopes. This map unit is on mountainsides, ridges, benches, and escarpments. Areas are irregular in shape and are 200 to 3,000 acres in size. The native vegetation is mainly trees, shrubs, and grasses. Elevation is 7,200 to 8,900 feet. The average annual precipitation is about 16 to 22 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 90 to 110 days.

This unit is 35 percent Trag cobbly loam, 3 to 30 percent slopes; 30 percent Techado cobbly clay loam, 5 to 55 percent slopes; and 20 percent Rock outcrop. The Trag soil is on benches and mountainsides, the Techado soil is on mountainsides and ridges, and the Rock outcrop is on ridges and escarpments.

Included in this unit are small areas of Parkay soils on mountainsides and benches; on benches and mountainsides, soils that are similar to the Trag soil but have an accumulation of calcium carbonate; on benches and ridges, soils that are similar to the Techado soil but are underlain by basalt and have an accumulation of calcium carbonate; and, on benches, mountainsides, and ridges, soils that are similar to the Techado and Trag soils but are moderately deep. Included areas make up about 15 percent of the total acreage.

The Trag soil is deep and well drained. It formed in mixed alluvium and colluvium. Typically, the surface layer is dark grayish brown cobbly loam about 2 inches thick. The subsoil is yellowish brown and brown cobbly sandy clay loam about 33 inches thick. The substratum to a depth of 60 inches is light brown cobbly sandy loam. In some areas bedrock is at a depth of 40 to 60 inches.

Permeability is moderate in the Trag soil. Available water capacity also is moderate. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

The Techado soil is shallow and well drained. It formed in alluvium and colluvium derived dominantly from shale and sandstone. Typically, the surface layer is light yellowish brown cobbly clay loam about 2 inches thick. The underlying material is about 17 inches of dark yellowish brown clay loam and sandy clay. Soft shale is at a depth of about 19 inches.

Permeability is slow in the Techado soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is rapid, and the hazard of water erosion is severe. The hazard of soil blowing is moderate.

The Rock outcrop consists of barren or nearly barren areas of exposed sandstone, andesite, or basalt on escarpments, benches, and mountainsides.

This unit is used for wood products and livestock grazing.

This unit is suited to the production of ponderosa pine. The site index ranges from 61 to 66 on the Trag soil and averages 56 on the Techado soil. Based on a site index of 60, the potential production of merchantable timber is 3,570 cubic feet, or 14,600 board feet (International rule, ⅛-inch kerf), per acre in an even-aged, fully stocked stand of trees 100 years old. The culmination of mean annual increment is 46 cubic feet, or 177 board feet (International rule, ⅛-inch kerf), per acre.

The main concerns in producing and harvesting timber are the hazard of water erosion and plant competition. Equipment limitations and the hazard of windthrow also are concerns on the Techado soil. When timber is harvested, minimizing the risk of erosion is essential. Proper design of road drainage systems and care in the placement of culverts help to control erosion. Spoil from excavations is subject to rill and gully erosion and to sloughing. Constructing water bars and seeding cut and filled areas can protect logging roads and landings against erosion. Leaving an undisturbed buffer or filter strip along watercourses minimizes sedimentation and thus helps to maintain water quality.

Carefully managing reforestation can minimize competition from undesirable understory plants. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Grasses, forbs, and shrubs limit the natural regeneration of ponderosa pine. Properly preparing the site can control the competing vegetation.

Conventional methods of harvesting can be used in the areas that have slopes of less than 35 percent slopes, but their use is limited in the steeper areas. Harvesting activities are hindered when the soil is wet. Special design of logging roads, skid trails, and landings is needed in the steeper areas. Erosion-control structures and seeding can protect the roads against erosion. Trees on the Techado soil are subject to windthrow because of the limited rooting depth.

The understory vegetation on this unit is Arizona fescue, mountain muhly, and Gambel oak.

618—Netoma sandy loam, 2 to 12 percent slopes. This deep, well drained soil is on fan terraces and hills. It formed in alluvium derived dominantly from gypsiferous material. Areas are irregular in shape and are 50 to 800 acres in size. The native vegetation is mainly grasses and scattered trees. Elevation is 5,800 to 6,500 feet. The average annual precipitation is about

10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

Typically, the surface layer is strong brown sandy loam about 4 inches thick. The upper part of the subsoil is strong brown sandy loam about 8 inches thick, and the lower part to a depth of 60 inches is light brown and reddish yellow, gypsiferous sandy loam. In areas near the boundary of Bernalillo County, the soils have a higher content of clay and shale crops out.

Included in this unit are small areas of Grieta, Kiki, Shiprock, and Penistaja soils on fan terraces; soils that are similar to the Netoma soil but are gravelly or have more clay in the subsoil and are on fan terraces and hillsides; soils that are similar to the Netoma soil but soft bedrock at a depth of less than 40 inches and are on hills, mainly near the boundary of Socorro County; and Harvey soils on hills, mainly near the boundary of Socorro County. Included areas make up about 15 percent of the total acreage.

Permeability is moderately rapid in the Netoma soil. Available water capacity is moderate. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe. This soil is slightly saline.

This unit is used for livestock grazing. The potential natural plant community is mainly western wheatgrass, blue grama, Indian ricegrass, and spike dropseed. The average annual production of air-dry vegetation ranges from 850 pounds per acre in favorable years to 325 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass and Indian ricegrass decrease in abundance and blue grama and rabbitbrush increase. The increasers normally occur in small amounts in the potential natural plant community.

This unit is suited to such management practices as livestock pipelines, brush control, and seeding. It is not suitable as a site for livestock ponds because of seepage, piping, and the content of gypsum. Good grazing management can increase the productivity and reproduction potential of western wheatgrass.

619—Venadito clay loam, 1 to 5 percent slopes. This deep, well drained soil is on alluvial fans and flood plains and in valleys. It formed in alluvium derived dominantly from shale. Areas are irregular in shape and are 50 to 2,000 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is 6,200 to 7,500 feet. The average annual precipitation is about 10 to 13 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

Typically, the surface layer is reddish brown clay loam about 4 inches thick. The underlying material to a depth of 60 inches is reddish brown clay.

Included in this unit are small areas of Aparejo soils on alluvial fans and flood plains and in valleys and Penistaja soils on fan terraces and valley sides. Included areas make up about 10 percent of the total acreage.

Permeability is very slow in the Venadito soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate. Cracks that extend to a depth of about 30 inches are common. This soil is occasionally flooded for very brief periods in summer.

This unit is used for livestock grazing. The potential natural plant community is mainly western wheatgrass, vine mesquite, alkali sacaton, spike muhly, and fourwing saltbush. The average annual production of air-dry vegetation ranges from 3,200 pounds per acre in favorable years to 1,250 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, spike muhly, and winterfat decrease in abundance and blue grama, threeawn, annual grasses and forbs, and rabbitbrush increase. The increasers normally occur in small amounts in the potential natural plant community. This soil receives runoff from the adjacent areas. As a result, it is potentially more productive.

Good grazing management can increase the productivity and reproduction potential of western wheatgrass, vine mesquite, alkali sacaton, and spike muhly. Grazing should be delayed until the soil is firm and the more desirable forage plants have achieved enough growth to withstand grazing pressure. Deterioration of the vegetation on this unit often results in the formation of gullies that drain the site and hinder the production of vegetation. After deep gullies have artificially drained the site, a combination of grazing management and engineering practices may be needed to return the site to its productive potential.

620—Aparejo-Venadito complex, 1 to 5 percent slopes. This map unit is on flood plains and in large drainageways. Areas are irregular in shape and are 150 to 1,300 acres in size. The native vegetation is mainly grasses and scattered shrubs. Elevation is 6,200 to 7,500 feet. The average annual precipitation is about 12 to 14 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 50 percent Aparejo silt loam, 1 to 5 percent slopes, and 35 percent Venadito silty clay loam, 1 to 5 percent slopes. The Aparejo soil is on flood plains and the bottom of drainageways, and the Venadito soil is on flood plains and in drainageways. The components of this unit occur as areas so

intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Flugle and Penistaja soils on small hills and fan terraces, Catman and Hickman soils on flood plains, and riverwash in arroyos. Included areas make up about 15 percent of the total acreage.

The Aparejo soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is yellowish red silt loam about 2 inches thick. The upper part of the underlying material is yellowish red silty clay loam about 16 inches thick. The lower part to a depth of 60 inches is dominantly yellowish red silt loam, but it commonly has strata of sandy loam, clay loam, or clay less than 0.5 inch thick.

Permeability is moderately slow in the Aparejo soil. Available water capacity is very high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate. This soil is occasionally flooded for very brief periods in summer.

The Venadito soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is reddish brown silty clay loam about 3 inches thick. The upper part of the underlying material is reddish brown clay about 24 inches thick, and the lower part to a depth of 60 inches is yellowish red clay.

Permeability is very slow in the Venadito soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate. This soil is occasionally flooded for very brief periods in summer. Cracks extend to a depth of about 30 inches.

This unit is used for livestock grazing. The potential natural plant community is mainly western wheatgrass, vine mesquite, and fourwing saltbush. The average annual production of air-dry vegetation ranges from 3,200 pounds per acre in favorable years to 1,250 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, alkali sacaton, Indian ricegrass, and winterfat decrease in abundance and blue grama, galleta, rabbitbrush, and broom snakeweed increase. The unit receives runoff from the adjacent areas. As a result, it is potentially more productive.

Deterioration of the plant community on this unit often results in the formation of deep gullies that drain the site and hinder the production of vegetation. After deep gullies have artificially drained the site, a combination of grazing management and engineering practices may be needed to return the site to its productive potential.

The suitability of the Aparejo soil for livestock ponds is limited because of seepage. The Venadito soil is suitable as a site for these ponds. Good grazing management can increase the productivity and reproduction potential of western wheatgrass, alkali sacaton, and winterfat. The unit is suited to such management practices as deferred grazing, rotation grazing, livestock pipelines, and fencing.

625—Hagerman-Bond association, 1 to 10 percent slopes. This map unit is on mesa tops, cuestas, hills, and ridges. Areas are irregular in shape and are 50 to 1,500 acres in size. The native vegetation is mainly grasses and some scattered trees. Elevation is 6,000 to 7,000 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 55 percent Hagerman fine sandy loam, 1 to 5 percent slopes, and 30 percent Bond sandy loam, 2 to 10 percent slopes. The Hagerman soil is on mesa tops, on the lower dip slopes of cuestas, and on hills and ridges, and the Bond soil is on mesa tops, on the upper dip slopes of cuestas, and on hilltops and ridges. In areas near the boundary of Socorro County, the soils have a less well developed subsoil and there is more Rock outcrop.

Included in this unit are small areas of Skyvillage soils on hills and ridgetops, mainly near the boundary of Bernalillo County; Penistaja soils on the lower side slopes; Rock outcrop on hilltops, ledges, ridges, and escarpments; and Mikim and Mion soils at the base of escarpments. Included areas make up about 15 percent of the total acreage.

The Hagerman soil is moderately deep and well drained. It formed in eolian and alluvial material derived dominantly from sandstone. Typically, the surface layer is brown fine sandy loam about 3 inches thick. The subsurface layer is dark brown fine sandy loam about 3 inches thick. The upper part of the subsoil is brown sandy clay loam about 17 inches thick, and the lower part is strong brown and light brown sandy loam about 11 inches thick. Sandstone is at a depth of about 34 inches.

Permeability is moderate in the Hagerman soil. Available water capacity is low. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Bond soil is shallow and well drained. It formed in eolian material derived dominantly from sandstone. Typically, the surface layer is brown sandy loam about 5 inches thick. The subsoil is dark brown sandy clay loam about 10 inches thick. The substratum is strong

brown sandy clay loam about 3 inches thick. Hard sandstone is at a depth of about 18 inches.

Permeability is moderate in the Bond soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

This unit is used for livestock grazing and urban development.

The potential natural plant community on the Hagerman soil is mainly blue grama, western wheatgrass, sideoats grama, and fourwing saltbush. The average annual production of air-dry vegetation ranges from 950 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, sideoats grama, and New Mexico feathergrass decrease in abundance and blue grama, galleta, ring muhly, and broom snakeweed increase. Pinyon and oneseed juniper may invade.

Good grazing management can increase the productivity and reproduction potential of western wheatgrass, sideoats grama, and spike muhly. The Hagerman soil is suited to such management practices as livestock pipelines, fencing, and range seeding.

The potential natural plant community on the Bond soil is mainly sideoats grama, Indian ricegrass, blue grama, and scattered oneseed juniper. The average annual production of air-dry vegetation ranges from 700 pounds per acre in favorable years to 275 pounds in unfavorable years. If the plant community deteriorates, sideoats grama, Indian ricegrass, and little bluestem decrease in abundance and juniper, broom snakeweed, sand sagebrush, and blue grama increase. The increasers normally occur in small amounts in the potential natural plant community.

Good grazing management can increase the productivity and reproduction potential of sideoats grama, little bluestem, and Indian ricegrass. The Bond soil is suited to such management practices as deferred grazing and rotation grazing. It is limited as a site for such management practices as livestock pipelines, fencing, and range seeding because of the depth to bedrock and droughtiness.

Properly managing livestock grazing can protect this unit against soil blowing. Soil blowing can be controlled and damage to seedlings minimized by maintaining enough plant residue on the surface. In some areas dense stands of pinyon and oneseed juniper may become established. If the stand in these areas is properly managed, a limited wood crop can be produced. The unit is not suitable as a site for livestock ponds because of the texture of the soils and the depth to bedrock.

If the soils in this unit are used for urban development, the main management concerns are the hazard of soil blowing, the depth to bedrock, and the slope in some areas. In summer, irrigation is needed in areas used for lawn grasses, shrubs, vines, shade trees, or ornamental trees. Properly designing buildings and roads can help to control soil blowing and overcome the slope and the depth to bedrock.

630—Bond-Rizozo-Rock outcrop complex, 2 to 20 percent slopes. This map unit is on ridges, escarpments, and hills. Areas are irregular in shape and are 70 to 1,000 acres in size. The native vegetation is mainly grasses and some scattered trees. Elevation is 6,000 to 6,700 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 35 percent Bond sandy loam, 2 to 20 percent slopes; 25 percent Rizozo loam, 5 to 20 percent slopes; and 25 percent Rock outcrop. The Bond soil is on hills and ridgetops. The Rizozo soil is on hills and ridges. The Rock outcrop is on escarpments, hills, and ridges. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Hagerman soils on fan terraces and Rana soils at the base of escarpments. Included areas make up about 15 percent of the total acreage.

The Bond soil is shallow and well drained. It formed in eolian material derived dominantly from sandstone. Typically, the surface layer is yellowish red sandy loam about 2 inches thick. The subsoil is yellowish red clay loam about 5 inches thick. The substratum is red loam about 12 inches thick. Sandstone is at a depth of about 19 inches. In some areas the surface layer is channery or very channery.

Permeability is moderate in the Bond soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Rizozo soil is shallow or very shallow and is well drained. It formed in eolian material derived dominantly from fine grained sandstone. Typically, the surface layer is reddish brown loam about 2 inches thick. The underlying material also is reddish brown loam. It is about 12 inches thick. Sandstone is at a depth of about 14 inches. In some areas the surface layer is channery or very channery.

Permeability is moderate in the Rizozo soil. Available water capacity is very low. The effective rooting depth is

5 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Rock outcrop consists of barren or nearly barren areas of exposed sandstone on hills, ridges, and escarpments.

This unit is used for livestock grazing. The potential natural plant community is mainly New Mexico feathergrass, Indian ricegrass, blue grama, sideoats grama, and juniper. The average annual production of air-dry vegetation ranges from 700 pounds per acre in favorable years to 275 pounds in unfavorable years. If the plant community deteriorates, sideoats grama, New Mexico feathergrass, and Indian ricegrass decrease in abundance and blue grama, oneseed juniper, and broom snakeweed increase. The increasers normally occur in small amounts in the potential natural plant community.

This unit is limited as a site for such management practices as livestock pipelines and range seeding because of the depth to bedrock and the very low available water capacity. It is suited to such practices as deferred grazing and rotation grazing. Good grazing management can increase the productivity and reproduction potential of sideoats grama, New Mexico feathergrass, and winterfat.

640—Flaco-Berto loams, 0 to 5 percent slopes. This map unit is on basalt-capped mesa tops. Areas are irregular in shape and are 150 to 3,000 acres in size. The native vegetation is mainly grasses and a few trees and shrubs. Elevation is 6,000 to 7,000 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 55 percent Flaco loam, 0 to 5 percent slopes, and 30 percent Berto loam, 1 to 5 percent slopes. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used. In areas near the boundary of the soil survey of the eastern part of Valencia County, temperatures are higher and the soils are less well developed and have a higher content of rock fragments.

Included in this unit are small areas of Harvey soils on mesa tops, soils that are similar to the Flaco and Berto soils but have more than 35 percent clay in the subsoil, Oelop soils along drainageways, and Rock outcrop on knolls and hills. Included areas make up about 15 percent of the total acreage.

The Flaco soil is moderately deep and well drained. It formed in mixed alluvium and windblown sediments. Typically, the surface layer is yellowish brown loam about 2 inches thick. The upper 9 inches of the subsoil is yellowish brown loam and clay loam, and the lower 18 inches is yellowish brown and light yellowish brown clay loam and loam. Basalt is at a depth of about 29 inches. In some areas the surface layer is cobbly or stony.

Permeability is moderately slow in the Flaco soil. Available water capacity is low. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Berto soil is shallow and well drained. It formed in mixed alluvium and windblown sediments over basalt. Typically, the surface layer is brown loam about 2 inches thick. The upper 10 inches of the subsoil also is brown loam. The lower 6 inches is pink cobbly loam and loam. Basalt is at a depth of about 18 inches. In some areas the surface layer is cobbly or stony.

Permeability is moderate in the Berto soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

This unit is used for livestock grazing. The potential natural plant community on the Flaco soil is mainly western wheatgrass, New Mexico feathergrass, black grama, and winterfat. The average annual production of air-dry vegetation ranges from 950 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, black grama, and winterfat decrease in abundance and blue grama, threeawn, broom snakeweed, and cacti increase. The increasers normally occur in small amounts in the potential natural plant community.

The Flaco soil is suitable as a site for livestock pipelines. It is not suitable as a site for livestock ponds because of the depth to bedrock.

The potential natural plant community on the Berto soil is mainly western wheatgrass, sideoats grama, black grama, alkali sacaton, and winterfat. The average annual production of air-dry vegetation ranges from 800 pounds per acre in favorable years to 400 pounds in unfavorable years. If the plant community deteriorates, sideoats grama, black grama, winterfat, and western wheatgrass decrease in abundance and blue grama, broom snakeweed, and cacti increase. The increasers normally occur in small amounts in the potential natural plant community.

The Berto soil is not suitable for livestock pipelines, livestock ponds, or range seeding because of the depth to bedrock and the low available water capacity.

The included Oelop soils in this unit receive runoff from the adjacent areas. As a result, they are potentially more productive. Areas of these soils provide about 20 percent of the available forage on the unit.

641—Berto-Flaco cobbly loams, 1 to 10 percent slopes. This map unit is on basalt-capped mesa tops. Areas are irregular in shape and are 100 to 2,500 acres in size. The native vegetation is mainly grasses and some scattered trees and shrubs. Elevation is 6,000 to 7,000 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 55 percent Berto cobbly loam, 1 to 10 percent slopes, and 30 percent Flaco cobbly loam, 1 to 10 percent slopes. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Harvey soils on mesa tops, soils that are similar to the Flaco and Berto soils but have more than 35 percent clay in the subsoil, and Rock outcrop on hills and mesa tops. Included areas make up about 15 percent of the total acreage.

The Berto soil is shallow and well drained. It formed in mixed alluvium and windblown sediments. Typically, the surface layer is brown cobbly loam about 2 inches thick. The upper part of the subsoil is brown clay loam about 6 inches thick, and the lower part is brown cobbly clay loam about 8 inches thick. Basalt is at a depth of about 16 inches. In some areas the surface layer is not cobbly.

Permeability is moderate in the Berto soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Flaco soil is moderately deep and well drained. It formed in mixed alluvium and windblown sediments. Typically, the surface layer is brown cobbly loam about 2 inches thick. The upper 7 inches of the subsoil is brown clay loam, and the lower 17 inches is yellowish brown and very pale brown clay loam and cobbly loam. Basalt is at a depth of about 26 inches. In some areas the surface layer is not cobbly.

Permeability is moderately slow in the Flaco soil. Available water capacity is low. The effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight.

This unit is used for livestock grazing. The potential natural plant community on the Berto soil is mainly blue grama, black grama, winterfat, little bluestem, alkali sacaton, and fourwing saltbush. The average annual production of air-dry vegetation ranges from 800 pounds per acre in favorable years to 400 pounds in unfavorable years. If the plant community deteriorates, alkali sacaton and winterfat decrease in abundance and blue grama, broom snakeweed, and cacti increase. The increasers normally occur in small amounts in the potential natural plant community.

The potential natural plant community on the Flaco soil is mainly western wheatgrass, New Mexico feathergrass, black grama, and winterfat. The average annual production of air-dry vegetation ranges from 950 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass, black grama, and winterfat decrease in abundance and blue grama, threeawn, broom snakeweed, and cacti increase. The increasers normally occur in small amounts in the potential natural plant community.

The suitability of this unit for such management practices as livestock pipelines and fencing is limited because of the content of rock fragments and the depth to bedrock. The unit is not suitable for livestock ponds or range seeding because of the depth to bedrock and the low available water capacity.

645—Penistaja-Oelop association, 0 to 5 percent slopes. This map unit is on fan terraces and in swales. Areas are irregular in shape and are 450 to 2,000 acres in size. The native vegetation is mainly grasses. Elevation is 6,000 to 6,800 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 60 percent Penistaja sandy loam, 0 to 5 percent slopes, and 25 percent Oelop loam, 0 to 3 percent slopes. The Penistaja soil is on fan terraces, and the Oelop soil is in swales.

Included in this unit are small areas of Palma soils on hills, Aparejo and Venadito soils along drainageways and on alluvial fans, and Mikim and Zia soils on fan terraces. Included areas make up about 15 percent of the total acreage.

The Penistaja soil is deep and well drained. It formed in mixed alluvium reworked by the wind. Typically, the surface layer is brown sandy loam about 3 inches thick. The upper part of the subsoil is strong brown sandy clay loam about 15 inches thick, and the lower part to a depth of 60 inches is light brown and strong brown sandy loam.

Permeability is moderate in the Penistaja soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Oelop soil is deep and well drained. It formed in mixed alluvium. Typically, the surface layer is yellowish brown loam about 3 inches thick. The upper part of the subsoil is brown clay loam about 13 inches thick, and

the lower part to a depth of 60 inches is yellowish brown clay loam and loam.

Permeability is moderately slow in the Oelop soil. Available water capacity is very high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

This unit is used for livestock grazing. The potential natural plant community on the Penistaja soil is mainly blue grama, western wheatgrass, and fourwing saltbush. The average annual production of air-dry vegetation ranges from 950 pounds per acre in favorable years to 375 pounds in unfavorable years. If the plant community deteriorates, western wheatgrass decreases in abundance and blue grama, ring muhly, and sand dropseed increase. The increasers normally occur in small amounts in the potential natural plant community.

Good grazing management can increase the productivity and reproduction potential of western wheatgrass, spike muhly, and sideoats grama. Properly managing livestock grazing can protect the Penistaja soil against soil blowing. Soil blowing can be controlled and damage to seedlings minimized by maintaining enough plant residue on the surface. The soil is suited to such management practices as fencing, range seeding, and livestock pipelines. It is not suitable as a site for livestock ponds because of seepage.

The potential natural plant community on the Oelop soil is mainly western wheatgrass, vine mesquite, and alkali sacaton. This soil receives runoff from the adjacent areas. As a result, it is potentially more productive. The average annual production of air-dry vegetation ranges from 1,350 pounds per acre in favorable years to 600 pounds in unfavorable years. If the plant community deteriorates, alkali sacaton, vine mesquite, and western wheatgrass decrease in abundance and blue grama, galleta, tumble windmillgrass, and mat muhly increase. The increasers normally occur in small amounts in the potential natural plant community.

Properly managing livestock grazing can protect the Oelop soil against water erosion. The soil is suitable as a site for erosion-control structures and livestock ponds.

650—Winona-Tanbark-Rock outcrop association, 15 to 60 percent slopes. This map unit is on mesa breaks, hills, ridges, and escarpments. Areas are irregular in shape and are 50 to 2,500 acres in size. The native vegetation is mainly grasses, shrubs, and scattered trees. Elevation is 5,800 to 6,800 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 45 percent Winona very gravelly loam, 15 to 45 percent slopes; 30 percent Tanbark loam, 25 to 60 percent slopes; and 15 percent Rock outcrop. The Winona soil is on mesa breaks and hills, the Tanbark soil is on ridges and hills, and the Rock outcrop is on escarpments, mesa breaks, hills, and ridgetops.

Included in this unit are small areas of Harvey soils on mesa breaks, mainly near the boundary of Socorro County; on hills and mesa breaks, soils that are similar to the Winona soil but are moderately deep; Suwanee and Aparejo soils in drainageways; and Hagerman soils on hills. Included areas make up about 10 percent of the total acreage.

The Winona soil is shallow and well drained. It formed in alluvium and windblown sediments derived dominantly from limestone. Typically, the surface layer is yellowish brown very gravelly loam about 3 inches thick. The subsoil is brown very cobbly loam about 12 inches thick. Limestone is at a depth of about 15 inches.

Permeability is moderate in the Winona soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is severe.

The Tanbark soil is shallow and well drained. It formed in alluvial and eolian material derived dominantly from gypsum. Typically, the surface layer is very pale brown loam about 2 inches thick. The upper part of the underlying material is very pale brown, gypsiferous silt loam about 10 inches thick, and the lower part is white, gypsiferous sandy loam about 5 inches thick. Gypsum is at a depth of about 17 inches.

Permeability is moderate in the Tanbark soil. Available water capacity is very low. The effective rooting depth is 10 to 20 inches. Runoff is rapid, and the hazard of water erosion is severe. The hazard of soil blowing also is severe.

The Rock outcrop consists of barren or nearly barren areas of exposed limestone on escarpments, ridges, and mesa breaks.

This unit is used for livestock grazing. The potential natural plant community on the Winona soil is mainly New Mexico muhly, New Mexico feathergrass, black grama, blue grama, sideoats grama, winterfat, and scattered juniper. The average annual production of air-dry vegetation ranges from 1,200 pounds per acre in favorable years to 700 pounds in unfavorable years. If the plant community deteriorates, New Mexico feathergrass, sideoats grama, and black grama decrease in abundance and sacahuista, blue grama, and oneseed juniper increase. The increasers normally occur in small amounts in the potential natural plant community.

The potential natural plant community on the Tanbark soil is mainly gyp dropseed, alkali sacaton, galleta, hairy coldenia, and black grama. The average annual production of air-dry vegetation ranges from 475 pounds per acre in favorable years to 200 pounds in unfavorable years. If the plant community deteriorates, galleta, black grama, and sideoats grama decrease in abundance and gyp dropseed, threeawn, ring muhly, and hairy coldenia increase. The increasers normally occur in small amounts in the potential natural plant community.

The slope limits access by livestock. Constructing trails or walkways can allow the livestock to graze in areas where access is limited.

This unit is not suitable for livestock ponds, livestock pipelines, or range seeding because of the depth to bedrock, the slope, and the low available water capacity.

660—Rana-Rock outcrop complex, 2 to 25 percent slopes. This map unit is on mesa breaks, ridges, ledges, and escarpments. Areas are irregular in shape and are 900 to 7,000 acres in size. The native vegetation is mainly grasses and scattered trees and shrubs. Elevation is 5,800 to 7,000 feet. The average annual precipitation is about 10 to 12 inches, the average annual air temperature is 49 to 53 degrees F, and the average frost-free period is 120 to 140 days.

This unit is 45 percent Rana very cobbly clay, 2 to 25 percent slopes, very stony, and 40 percent Rock outcrop. The Rana soil is on benches and hills on mesa breaks, and the Rock outcrop is on ridges, ledges, and escarpments. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the scale used.

Included in this unit are small areas of Poley soils on ridges and mesa breaks; Torreon soils on hillsides on mesa breaks; on benches and hills on mesa breaks, soils that are similar to the Rana soil but are less than 40 inches deep over shale; and outcrops of sedimentary rock on ridges, ledges, and escarpments. Included areas make up about 15 percent of the total acreage.

The Rana soil is deep and well drained. It formed in alluvium and colluvium derived dominantly from red-bed shale. Typically, the surface layer is red very cobbly clay about 3 inches thick. The upper part of the underlying material is red clay about 31 inches thick, and the lower part to a depth of 60 inches is reddish brown clay.

Permeability is very slow in the Rana soil. Available water capacity is high. The effective rooting depth is 60 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing also is moderate.

The Rock outcrop consists of barren or nearly barren areas of exposed basalt on ridges and escarpments.

This unit is used for livestock grazing. The potential natural plant community on the Rana soil is mainly alkali sacaton, galleta, sideoats grama, black grama, and fourwing saltbush. The average annual production of air-dry vegetation ranges from 660 pounds per acre in favorable years to 250 pounds in unfavorable years. If the plant community deteriorates, alkali sacaton, sideoats grama, and black grama decrease in abundance and galleta, silver bluestem, and broom snakeweed increase. The increasers normally occur in small amounts in the potential natural plant community.

Good grazing management can increase the productivity and reproduction potential of alkali sacaton, sideoats grama, and black grama. The Rana soil is suited to such management practices as livestock ponds, livestock pipelines, and fencing.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban and built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal expenditure of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded

during the growing season. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Soil Conservation Service.

About 1,047 acres in the survey area would meet the soil requirements for prime farmland if an adequate and dependable supply of irrigation water were available. Most of the irrigated farmland in the area is subject to excessive soil blowing and therefore is not considered prime farmland.

The map units in the survey area that are considered prime farmland where irrigated are Clovis sandy clay loam, 1 to 3 percent slopes (unit 21) and Hickman sandy clay loam, 1 to 3 percent slopes (unit 75). The extent of the two map units is shown in table 2. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

By Kenneth R. Walker, district conservationist, Soil Conservation Service.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

About 4,500 acres in the survey area is irrigated cropland, most of which is in small tracts adjacent to dwellings. The supply of irrigation water is limited in most areas. Most of the small number of irrigation reservoirs in the survey area have a limited storage capacity. About 1,500 acres of nonirrigated cropland is in the Fence Lake area. The growing season in the survey area ranges from 100 to 160 days, depending on the elevation.

The primary crops in Bluewater Valley are alfalfa and small grain. A small acreage is used for potatoes, pinto beans, sweet corn, or millet. About 240 acres is used as irrigated pasture. The irrigation water in this area is provided by Bluewater Lake and by wells. Water from wells is used only when the allocation of water from the lake is less than 3 acre-feet per acre. The cropland in this valley is occasionally flooded for brief periods when snow melts in the spring.

Most of the nonirrigated cropland in the survey area is used for small grain that is grazed, but a small amount of dryland alfalfa is grown in the Fence Lake area. Enough acreage is excluded from grazing each year to allow for the harvest of seed for the next year's planting.

In the Bibo-Seboyeta, Laguna, and San Mateo communities, the main crops are truck crops, chiles, beans, and blue corn. Also, small orchards are in a few areas. The irrigation water in these areas is provided by small reservoirs constructed across two of the larger side arroyos and by the Rio San Jose.

All of the cropland in the Acoma area is used for garden crops, alfalfa, truck crops, or orchard crops,

mainly for home consumption. Some of the soils in this area have a high content of sodium and are highly saline.

In the Ramah Valley area, the main crop is small grain. A small acreage in this area is used as irrigated pasture. Irrigation water is provided by the Ramah Reservoir.

The main objectives in cropland management are proper irrigation, maintenance of good soil tilth and fertility, and control of water erosion and soil blowing. Measures that reduce salinity or sodicity and improve drainage also are needed in some areas. Salinity and sodicity can be reduced by leaching or by applying soil amendments.

Using a suitable cropping system helps to maintain good soil tilth, structure, aeration, and fertility. A single crop can be grown for many years on some soils with little adverse effect on yields. Other soils deteriorate rapidly if low-residue crops are grown unless large amounts of organic matter are added annually. Rotating crops helps to control insects, disease, and weeds.

Applying adequate amounts of irrigation water in a timely manner and avoiding overirrigation are essential for high yields. The irrigation system should be adapted to the soil and the crops grown. Overirrigation leaches nutrients from the root zone, results in excessive wetness of the lower part of the soil, and reduces aeration in the root zone.

Good management practices, such as planting improved varieties of crops, timely planting and harvesting, and applying fertilizer according to the needs of the crops, can increase yields of annual crops, hay crops, and pasture plants. Control of weeds, insects, and disease also helps to increase yields.

Good pasture management includes such practices as applying adequate fertilizer, clipping after grazing to remove excess forage and weeds, and rotation grazing.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 3. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 3 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops *(11)*. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The capability classification of each map unit that includes irrigated land is shown in table 3. The classification of the other map units in the survey area is available at the local office of the Soil Conservation Service.

Rangeland

Mike Delancy, range conservationist, Soil Conservation Service, helped prepare this section.

Rangeland consists of areas that support a potential natural plant community of dominantly grasses, grasslike plants, forbs, and shrubs suitable for grazing or browsing. In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

In the section "Detailed Soil Map Units," the relationship between soils and vegetation is expressed in terms of the potential natural plant community on the soils in the map units. In the following paragraphs, potential natural plant community and some of the other terms used in the map unit descriptions are defined.

The potential natural plant community is an association of plants that are best adapted to a unique combination of environmental factors. Even on similar soils, the proportion and production of these plants vary naturally from place to place and year to year. The dominant plant or plants are used to characterize a plant community because of their relative stability in areas that have not been disturbed or have not deteriorated. The grasses, forbs, and shrubs that characterize the potential natural plant community on each major soil are listed by common name in the map units.

Similar plant communities are grouped into range sites. A range site is a distinctive kind of rangeland that produces a characteristic natural plant community that differs from natural plant communities on other range sites in kind, amount, and proportion of range plants. The relationship between soils and vegetation was ascertained during this survey; thus, range sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table also are important. Information about the range sites in this survey area is available at the local offices of the Soil Conservation Service.

The average annual production is given in the map unit descriptions. It is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. The total amount of vegetation that can be used for forage in a given area depends on the kinds of grazing animals, the grazing season, and uses of the

area for purposes other than grazing.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range condition. Range condition is determined by comparing the present plant community with the potential natural plant community on a particular range site. The more closely the existing community resembles the potential community, the better the range condition. Range condition is an ecological rating only.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as those in the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, a range condition somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

About 60 percent of the survey area supports a plant community of dominantly grasses, forbs, and shrubs that are suitable for grazing or browsing. Nearly all of the wooded areas produce grazable understory. About 25 percent of the survey area receives enough snowfall to prevent winter grazing. Cow-calf enterprises are dominant, but some livestock producers maintain yearling enterprises.

Good grazing management includes practices that increase the extent of the ground cover, accumulate litter, and improve the vigor and reproduction potential of the more desirable grasses and shrubs. Continuous, year-round grazing or grazing every year during the growing season, usually from April through October, results in a deteriorated plant community that generally has a reduced value as forage.

Proper grazing use and deferred grazing, which varies the season of use during successive years, are needed to maintain a healthy, balanced plant community and to provide high-quality forage throughout the year. Resting pastures in summer encourages the growth and reproduction of warm-season grasses, such as sideoats grama, black grama, blue grama, and little bluestem. Resting pastures in spring encourages the growth of cool-season grasses, such as western wheatgrass and New Mexico feathergrass. Resting pastures in fall and winter encourages the growth of shrubs, such as mountainmahogany.

Flexibility in the number of grazing animals and in the frequency and intensity of grazing is essential if any grazing program is to be successful. Effective livestock distribution can be achieved through the use of fences, livestock water developments, salting facilities, and planned grazing systems.

Woodland Management and Productivity

Richard J. Reioux, forester, Soil Conservation Service, helped prepare this section.

A total of 1,078,592 acres in the survey area, or about 40 percent of the acreage, is woodland. Ponderosa pine, Douglas fir, and Engelmann spruce are the major commercial timber species in the area. They cover about 323,578 acres, or about 30 percent of the woodland in the area. The remaining 755,014 acres supports mainly pinyon and juniper *(9)*.

Logging in the Mount Taylor area and the Zuni Mountains began in the 1890's. These areas were logged extensively from the 1900's to the 1940's. In the Zuni Mountains, a narrow-gauge railroad was used to transport logs to the sawmills. From the late 1930's through World War II, areas that had appreciable amounts of ponderosa pine were cut over for the production of railroad ties.

The many periods of heavy cutting and the subsequent farming, overgrazing, and control of fires have resulted in the present forest conditions. Some wooded areas are understocked. The residual trees in these areas are of poor quality for timber. Many second-growth stands are overstocked and require thinning before optimum growth and yields can be achieved.

The dominant timber species in the survey area is ponderosa pine. Scattered Douglas fir and southwestern white pine are throughout the stands. The Zuni Mountains and the Mount Taylor area support no white fir (*Abies concolor*), which is common on most of the other woodland in the survey area. Ponderosa pine grows best at elevations above 8,000 feet, but it also grows at elevations as low as 7,300 feet. Douglas fir grows best on the north-facing slopes between elevations of 7,800 and 8,300 feet. Most of the Engelmann spruce and Douglas fir in the survey area is on Mount Taylor. Small areas of Douglas fir are on the cooler, north-facing slopes in the Zuni Mountains. The main species at elevations above 8,800 feet are Engelmann spruce and corkbar fir. Narrow bands of blue spruce are along some of the drainageways at the higher elevations.

Of the soils in the survey area, Moreno Variant, McGaffey, Moreno, Parkay, and Abersito soils have the highest potential for timber production. Timber can also be produced on Cebolleta, Cinnadale, and Charo soils.

Pinyon and oneseed juniper are common at elevations of 7,100 to 7,800 feet, but they also grow on

the south-facing slopes at elevations as high as 8,100 feet. Rocky Mountain juniper and alligator juniper are included in the overstory at the higher elevations. Although pinyon and juniper are not considered commercial species, they are used extensively for fuel wood, fenceposts, Christmas trees, and ornamental plantings. Pinyon also provides edible nuts.

Most of the understory in the areas of pinyon and juniper is used for livestock grazing. Thinning of trees and other practices are needed to obtain maximum forage production in many areas. The soils that support the best stands of pinyon and juniper are those of the Pintos, Ribera, Cantina, and Vessilla series. Other soils that support these trees are those of the Flugle, Nogal, and Cabezon series.

Good woodland management includes protection against fire, insects, and disease; thinning and pruning to improve tree growth and quality; reforestation; cutting to improve the stocking level; and proper watershed management.

Fire prevention or control is provided by the Forest Service, the New Mexico Division of Forestry, and private individuals. Proper silvicultural practices provide protection against insects, such as bark beetles, and diseases, such as dwarf mistletoe and red rot. Thinning and pruning of selected trees improves the quality of the timber and the growth potential of the site.

Reforestation can be achieved by natural regeneration and by planting. Proper site preparation may be needed to provide a good seedbed and minimize competition from shrubs and grasses.

Watershed management includes the proper location of skid trails, logging roads, and landings and the proper treatment of all areas disturbed by logging activities. Constructing water bars, cross ditching, and building out-sloping roads and then seeding grasses, forbs, and browse species help to control water erosion. Leaving a buffer strip of undisturbed soil and vegetation on both sides of watercourses also helps to control water erosion and minimizes the amount of sediment that can reach streams.

Table 4 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce. The number 1 indicates low potential productivity; 2 and 3, moderate; 4 and 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; and *F*, a high content of rock fragments in the soil. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, and F.

In table 4, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are

moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *productivity class*. The site index generally is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. For pinyon and juniper, however, the site index is determined by the basal area. The site index applies to fully stocked, even-aged, unmanaged stands. The site index curves for ponderosa pine were developed by Meyer *(7)*, those for Douglas fir by Edminster and Jump *(5)*, those for Engelmann spruce by Alexander *(1)*, and those for pinyon and juniper by Howell *(6)*. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *productivity class*, a number, is the yield expressed in cubic meters per hectare per year calculated at the age of culmination for a fully stocked, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It is the dominant species on the soil and the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

Woodland Understory Vegetation

Understory vegetation consists of grasses, forbs, shrubs, and other plants. If well managed, some woodland can produce enough understory vegetation to support grazing by livestock or wildlife, or both, without damage to the trees.

The quantity and quality of understory vegetation vary with the kind of soil, the age and kind of trees in the canopy, the density of the canopy, and the depth and condition of the litter. The density of the canopy determines the amount of light that understory plants receive; therefore, the production of understory plants can be increased by thinning the trees in the overstory. In the section "Detailed Soil Map Units," the common understory plants are specified for the soils in the survey area that are used as woodland.

Windbreaks and Environmental Plantings

Richard J. Reioux, forester, Soil Conservation Service, helped prepare this section.

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 5 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 5 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens.

The trees or shrubs selected for planting in windbreaks should be those that are suited to the soils on the site. Selecting suitable species helps to ensure the survival, rapid growth, and longevity of windbreaks. The soil characteristics that greatly affect the growth rate of trees and shrubs are permeability, available water capacity, and depth to bedrock.

Grazing can be detrimental to windbreaks and environmental plantings because livestock compact the soil and remove the lower branches of the trees and shrubs. Compaction retards growth, and removal of the lower branches reduces the effectiveness and esthetic value of the windbreaks. Weeds and insects prevent maximum growth rates. Clean cultivation and applications of herbicide help to control weeds. Fallowing a year before planting helps to ensure a sufficient soil moisture supply for the establishment of seedlings. Penistaja, Clovis, Glenberg, Mespun, Grieta,

and Kiki soils are subject to soil blowing. As a result, sites for windbreaks and environmental plantings on these soils should be prepared in spring.

Shallow soils and soils that have a high water table or a high content of salts or sodium are severely limited as sites for windbreaks and environmental plantings. Plantings can be successfully established in some areas of these soils if suitable species are selected and special management is applied.

An insufficient moisture supply hinders the survival of trees in urban areas and on cropland. Drip irrigation or other methods of irrigation are needed to reduce the seedling mortality rate and ensure continued growth.

Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local offices of the Soil Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Recreation

The soils of the survey area are rated in table 6 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 6, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 6 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 9 and interpretations for dwellings without basements and for local roads and streets in table 8.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Edwin A. Swenson, state biologist, Soil Conservation Service, helped prepare this section.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 7, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, wheatgrass, timothy, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are muhly, dropseed, buckwheat, wheatgrass, grama, tumbleweed, and mallow.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are ponderosa pine, spruce, Douglas fir, pinyon, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are mountainmahogany, Apacheplume, oak, skunkbush sumac, sand sagebrush, and fourwing saltbush.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, cattail, saltgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, playas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include coyote, striped skunk, cottontail, and pocket gopher.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, elk, mule deer, porcupine, chickadee, squirrels, and woodpeckers.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, tiger salamander, beaver, and leopard frog.

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include antelope, black-tailed jackrabbit, prairie dog, horned lark, and prairie rattlesnake.

Engineering

Bernice A. Dyer, area engineer, Soil Conservation Service, helped prepare this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the "Glossary."

Building Site Development

Table 8 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell

potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity *(2, 3)*.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 9 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 9 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 9 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 9 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 10 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and depth to the water table is less than 1 foot. These soils may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 10, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification

are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 11 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features generally are favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, and terraces and diversions.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even more than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

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Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 12 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area *(8)*. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture *(10)*. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the "Glossary."

Classification of the soils is determined according to the Unified soil classification system *(3)* and the system adopted by the American Association of State Highway and Transportation Officials *(2)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The

estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 13 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at ⅓ bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2

millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control soil blowing are used.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly erodible. Crops can be grown if measures to control soil blowing are used.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.
8. Soils that are not subject to soil blowing because of coarse fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 13, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 14 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet, receive precipitation from long-duration storms, and are not protected by a plant cover.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 14 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs, on the average, once or less in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 14 are the depth to the seasonal high water table, the kind of water table, and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 14. Only saturated zones within a depth of about 6 feet are indicated. An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(12)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 15 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Fluvent (*Fluv*, meaning flood plain, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Ustifluvents (*Ust*, meaning ustic moisture regime, plus *fluvent*, the suborder of the Entisols characterized by an irregular decrease in carbon content).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Ustifluvents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed (calcareous), mesic Typic Ustifluvents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(10)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(12)*. Unless otherwise stated, matrix colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Abersito Series

The soils in the Abersito series are classified as clayey-skeletal, mixed Mollic Eutroboralfs. These moderately deep, well drained soils formed in mixed

colluvial and alluvial sediments. They are on hills and mesas. Slope is 5 to 30 percent. Elevation is 8,300 to 8,800 feet. The average annual precipitation is 20 to 24 inches. The average annual air temperature is 40 to 44 degrees F, and the frost-free period is 85 to 105 days.

Typical pedon of Abersito very cobbly sandy clay loam, in an area of Abersito, cobbly-Abersito-Rock outcrop association, 5 to 30 percent slopes; about 0.5 mile southwest of Lookout Mountain; 1,100 feet east and 2,300 feet south of the northwest corner of sec. 2, T. 11 N., R. 14 W.

Oi—2 inches to 0; pine needles and oak leaves.
A—0 to 3 inches; brown (7.5YR 4/2) very cobbly sandy clay loam, dark brown (7.5YR 3/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common fine and very fine irregular pores; about 40 percent cobbles, 10 percent gravel, and 5 percent stones; slightly acid; clear smooth boundary.
E—3 to 9 inches; light brown (7.5YR 6/4) very cobbly fine sandy loam, dark brown (7.5YR 3/4) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common very fine and few fine irregular pores; about 30 percent cobbles and 10 percent gravel; slightly acid; abrupt smooth boundary.
Bt—9 to 24 inches; yellowish red(5YR 5/6) very cobbly clay, yellowish red (5YR 4/6) moist; strong medium angular blocky structure; hard, firm, sticky and plastic; few very fine, fine, and medium roots; few very fine tubular pores; many thick clay films on faces of peds and in pores; about 35 percent cobbles and 5 percent gravel; slightly acid; abrupt smooth boundary.
2R—24 inches; sandstone.

The depth to bedrock ranges from 20 to 40 inches. The content of rock fragments in the control section ranges from 35 to 60 percent.

The A horizon is very cobbly sandy clay loam or gravelly loam. It has value of 4 or 5 (3 or 4 moist) and chroma of 2 or 3. The E horizon has value of 5 or 6 (3 or 4 moist) and chroma of 4 to 6. The Bt horizon has hue of 7.5YR or 5YR, value of 5 or 6 (4 or 5 moist), and chroma of 4 to 6.

Aparejo Series

The soils in the Aparejo series are classified as fine-loamy, mixed (calcareous), mesic Typic Ustifluvents. These deep, well drained soils formed in mixed alluvium. They are on flood plains and alluvial fans. Slope is 0 to 5 percent. Elevation is 6,200 to 7,500 feet. The average annual precipitation is 12 to 14 inches. The average annual air temperature is 48 to 53 degrees F, and the frost-free period is 110 to 140 days.

Typical pedon of Aparejo silt loam, in an area of Aparejo-Venadito complex, 1 to 5 percent slopes; about 3 miles northwest of Mesa Aparejo; 400 feet north and 2,165 feet east of the southwest corner of sec. 28, T. 6 N., R. 3 W.

A—0 to 2 inches; yellowish red (5YR 4/6) silt loam, reddish brown (5YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common medium and fine and few very fine roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline; abrupt smooth boundary.
C1—2 to 18 inches; yellowish red (5YR 5/6) silty clay loam, yellowish red (5YR 4/6) moist; massive; soft, very friable, slightly sticky and nonplastic; few medium, fine, and very fine roots; common very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.
C2—18 to 60 inches; yellowish red (5YR 5/6) silt loam, reddish brown (5YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline.

The soils generally are stratified with lenses of sandy or silty material less than 1 inch thick.

The A horizon is silt loam, clay loam, or clay. It has hue of 5YR or 2.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 to 6.

The C horizon is stratified silt loam, silty clay loam, clay loam, fine sandy loam, or sandy clay loam. The content of clay ranges from 18 to 35 percent, and the content of fine sand or coarser sand is more than 15 percent. This horizon has hue of 5YR or 2.5YR and value of 4 or 5 (3 or 4 moist).

Atarque Series

The soils in the Atarque series are classified as loamy, mixed, mesic Lithic Haplustalfs. These shallow and very shallow, well drained soils formed in eolian material derived mainly from sandstone. They are on mesa tops, knolls, cuestas, and hilltops. Slope is 1 to 10 percent. Elevation is 6,600 to 7,300 feet. The average annual precipitation is 12 to 14 inches. The average annual air temperature is 48 to 52 degrees F,

and the frost-free period is 115 to 135 days.

Typical pedon of Atarque fine sandy loam, in an area of Celacy-Atarque complex, 1 to 10 percent slopes; about 3.75 miles southeast of Broom Mountain; 725 feet west and 600 feet south of the northeast corner of sec. 27, T. 5 N., R. 7 W.

A—0 to 2 inches; brown (7.5YR 5/4) fine sandy loam, brown (7.5YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few medium and fine roots; few very fine irregular pores; neutral; abrupt smooth boundary.

Bt1—2 to 9 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few medium and fine roots; common very fine and few fine irregular pores; few moderately thick clay films on faces of peds and in pores; neutral; clear smooth boundary.

Bt2—9 to 16 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; few fine and very fine roots; common fine and very fine irregular pores; common moderately thick clay films on faces of peds and in pores; neutral; abrupt smooth boundary.

2R—16 inches; sandstone.

The depth to bedrock is 8 to 20 inches. The soils are neutral or mildly alkaline throughout.

The A horizon has hue of 5YR or 7.5YR and value of 4 to 6 (3 to 5 moist). The Bt horizon is sandy clay loam or clay loam. It has hue of 5YR or 7.5YR and value of 4 or 5 (3 or 4 moist). The 2R horizon generally is sandstone, but in some areas it is basalt.

Bandera Series

The soils in the Bandera series are classified as loamy-skeletal over fragmental, mixed Entic Haploborolls. These deep, somewhat excessively drained soils formed in colluvium and windblown volcanic sediments. They are on cinder hills and cones. Slope is 15 to 45 percent. Elevation is 7,400 to 8,300 feet. The average annual precipitation is 16 to 20 inches. The average annual air temperature is 40 to 45 degrees F, and the frost-free period is 90 to 110 days.

Typical pedon of Bandera gravelly loam, in an area of Bandera association, 15 to 45 percent slopes; about 0.5 mile southeast of Bandera Crater; 2,200 feet east and 2,175 feet north of the southwest corner of sec. 23, T. 9 N., R. 12 W.

A1—0 to 4 inches; brown (10YR 4/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few coarse roots; common very fine and fine irregular pores; about 25 percent pebble-sized cinders; neutral; clear smooth boundary.

A2—4 to 9 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common very fine and fine irregular pores; about 30 percent pebble-sized cinders; neutral; clear smooth boundary.

C—9 to 16 inches; yellowish brown (10YR 5/6) very gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and few fine and coarse roots; common very fine and fine irregular pores; about 40 percent pebble-sized cinders; neutral; abrupt wavy boundary.

2C—16 to 60 inches; cinders.

The A horizon is very gravelly or gravelly loam. It has value of 2 or 3 moist and chroma of 2 or 3. The C horizon has value of 4 or 5 (3 or 4 moist) and chroma of 3 to 6. The 2C horizon has more than 80 percent cinders to a depth of 60 inches.

Berto Series

The soils in the Berto series are classified as loamy, mixed, mesic Lithic Ustollic Haplargids. These shallow, well drained soils formed in mixed alluvium and windblown sediments. They are on mesa tops. Slope is 1 to 10 percent. Elevation is 6,000 to 7,000 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Berto loam, in an area of Flaco-Berto loams, 0 to 5 percent slopes; about 2,110 feet west and 2,220 feet south of the northeast corner of sec. 28, T. 7 N., R. 3 W.

A—0 to 2 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 4/4) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; few very fine irregular pores; about 2 percent cobbles and 2 percent gravel; strongly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

Bt1—2 to 6 inches; brown (7.5YR 5/4) loam, dark brown

(7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine and fine irregular and few fine tubular pores; common moderately thick clay films on faces of peds and in pores; about 2 percent cobbles and 2 percent gravel; strongly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.

Bt2—6 to 11 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine and fine irregular and few fine tubular pores; common thin clay films on faces of peds and in pores; about 2 percent cobbles and 2 percent gravel; strongly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.

Bk1—11 to 17 inches; pink (7.5YR 8/4) cobbly loam, light brown (7.5YR 6/4) moist; massive; hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; few very fine irregular pores; about 10 percent cobbles and 10 percent gravel; violently effervescent; disseminated calcium carbonate, many coarse irregular soft masses of calcium carbonate, and coatings of calcium carbonate on rock fragments; moderately alkaline; abrupt smooth boundary.

Bk2—17 to 18 inches; pink (7.5YR 8/4) loam, pink (7.5YR 7/4) moist; massive; hard, friable, slightly sticky and nonplastic; about 5 percent cobbles and 5 percent gravel; violently effervescent; disseminated calcium carbonate, many coarse irregular soft masses of calcium carbonate, and coatings of calcium carbonate on rock fragments; moderately alkaline; abrupt wavy boundary.

2R—18 inches; basalt.

The depth to bedrock is 10 to 20 inches.

The A horizon is cobbly loam or loam. It has hue of 7.5YR or 10YR, value of 4 or 5 (3 or 4 moist), and chroma of 3 or 4. The content of rock fragments ranges from 0 to 20 percent.

The Bt horizon is loam or clay loam. It has hue of 7.5YR or 10YR and value of 4 or 5 (3 or 4 moist). The content of rock fragments ranges from 0 to 10 percent.

The Bk horizon has hue of 7.5YR or 10YR, value of 6 to 8 (6 or 7 moist), and chroma of 4 or 5. The content of rock fragments ranges from 10 to 20 percent. The calcium carbonate equivalent is more than 15 percent.

Bond Series

The soils in the Bond series are classified as loamy, mixed, mesic Lithic Ustollic Haplargids. These shallow, well drained soils formed in eolian material derived dominantly from sandstone. They are on the upper slopes of cuestas and on the tops of hills, cuestas, mesas, and ridges. Slope is 2 to 20 percent. Elevation is 6,000 to 7,000 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 48 to 53 degrees F, and the frost-free period is 115 to 150 days.

Typical pedon of Bond sandy loam, in an area of Bond-Penistaja-Rock outcrop complex, 2 to 15 percent slopes; about 300 feet south and 2,600 feet east of the northwest corner of sec. 8, T. 12 N., R. 10 W.

A—0 to 3 inches; brown (7.5YR 5/4) sandy loam, dark brown (7.5YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few medium and fine roots; few very fine irregular pores; neutral; clear smooth boundary.

BA—3 to 7 inches; brown (7.5YR 5/4) sandy loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine irregular pores; neutral; abrupt smooth boundary.

Bt—7 to 13 inches; reddish brown (5YR 4/4) sandy clay loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and slightly plastic; common moderately thick clay films on faces of peds and in pores; common very fine and few fine roots; common very fine and few fine tubular pores; neutral; abrupt smooth boundary.

C—13 to 16 inches; light brown (7.5YR 6/4) sandy clay loam, brown (7.5YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots; common very fine irregular pores; strongly effervescent; few fine irregular seams and filaments of calcium carbonate; moderately alkaline; abrupt smooth boundary.

2R—16 inches; sandstone.

The depth to bedrock ranges from 10 to 20 inches. Some pedons have a Cr horizon of weathered sandstone.

The A horizon has hue of 5YR or 7.5YR, value of 4 or 5 dry or moist, and chroma of 3 or 4. The Bt horizon is sandy clay loam or clay loam. It has hue of 5YR or 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 4 to 6. The C horizon is sandy loam, loam, clay loam, or

sandy clay loam. It has hue of 5YR or 7.5YR, value of 5 to 8 (5 or 6 moist), and chroma of 3 or 4 moist.

Borrego Series

The soils in the Borrego series are classified as clayey, mixed Lithic Eutroboralfs. These shallow, well drained soils formed in alluvium and windblown sediments. They are on basalt-capped mesas, ridges, and hills. Slope is 1 to 15 percent. Elevation is 7,200 to 8,200 feet. The average annual precipitation is 16 to 22 inches. The average annual air temperature is 40 to 45 degrees F, and the frost-free period is 90 to 110 days.

Typical pedon of Borrego gravelly loam, in an area of Cebolleta-Borrego-Rock outcrop complex, 1 to 15 percent slopes; about 138 feet northwest of Rancho Chupadero; long. 107 degrees 35 minutes 54 seconds W. and lat. 35 degrees 10 minutes 14 seconds N.

A—0 to 4 inches; brown (7.5YR 4/4) gravelly loam, dark brown (7.5YR 3/4) moist; moderate fine granular structure; soft, very friable, slightly sticky and nonplastic; common fine and very fine roots; about 10 percent cobbles and 20 percent gravel; slightly acid; abrupt smooth boundary.

BA—4 to 8 inches; brown (7.5YR 4/4) gravelly clay loam, dark brown (7.5YR 3/4) moist; moderate fine subangular blocky structure; hard, friable, sticky and plastic; common fine and very fine roots; few fine irregular and tubular pores; about 5 percent cobbles and 10 percent gravel; neutral; clear smooth boundary.

Bt1—8 to 13 inches; strong brown (7.5YR 4/6) gravelly clay, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; very hard, very firm, very sticky and very plastic; common fine and very fine roots; common very fine tubular pores; many moderately thick clay films on faces of peds and in pores; about 5 percent cobbles and 10 percent gravel; mildly alkaline; clear smooth boundary.

Bt2—13 to 18 inches; strong brown (7.5YR 4/6) gravelly clay, dark brown (7.5YR 4/4) moist; moderate medium angular blocky structure; very hard, very firm, very sticky and very plastic; common very fine roots; common very fine tubular pores; many moderately thick clay films on faces of peds and in pores; about 15 percent gravel; slightly effervescent; mildly alkaline; abrupt smooth boundary.

2R—18 inches; basalt.

The depth to bedrock is 10 to 20 inches.

The A horizon is gravelly loam or loam. The content of rock fragments ranges from 10 to 35 percent. This horizon has value of 4 or 5 (3 or 4 moist) and chroma of 2 or 4.

The content of rock fragments in the BA horizon ranges from 15 to 35 percent. This horizon has value of 4 or 5 (3 or 4 moist) and chroma of 2 or 4.

The Bt horizon is gravelly clay or clay. The content of rock fragments ranges from 5 to 35 percent. This horizon has value of 4 or 5 (3 or 4 moist) and chroma of 2 to 6.

The Borrego soils in this survey area are a taxadjunct to the series because they are underlain by basalt and are slightly effervescent and mildly alkaline in the lower part of the argillic horizon, directly above the basalt. These differences, however, do not significantly affect the use and management of the soils.

Cabezon Series

The soils in the Cabezon series are classified as clayey, montmorillonitic, mesic Lithic Argiustolls. These shallow, well drained soils formed in windblown sediments and alluvium over basalt. They are on hills and ridges. Slope is 1 to 45 percent. Elevation is 6,400 to 7,800 feet. The average annual precipitation is 12 to 16 inches. The average annual air temperature is 47 to 52 degrees F, and the frost-free period is 100 to 135 days.

Typical pedon of Cabezon very cobbly loam, in an area of Cabezon-Montecito-Rock outcrop association, 1 to 10 percent slopes; about 14 miles north of Techado; 2,100 feet west and 500 feet north of the southeast corner of sec. 2, T. 6 N., R. 15 W.

A—0 to 2 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; many very fine vesicular pores; about 2 percent stones, 25 percent cobbles, and 10 percent gravel; neutral; abrupt smooth boundary.

Bt1—2 to 10 inches; brown (7.5YR 5/2) clay, dark brown (7.5YR 3/2) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few coarse and common very fine roots; common very fine tubular and irregular pores; many moderately thick clay films on faces of peds and in pores; about 10 percent cobbles; mildly alkaline; clear smooth boundary.

Bt2—10 to 18 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few coarse and very fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds and in pores; about 5

percent cobbles and 5 percent gravel; mildly alkaline; abrupt smooth boundary.
2R—18 inches; basalt; thin coating of calcium carbonate at contact.

The depth to bedrock is 10 to 20 inches. Some pedons have a thin Bk horizon. The calcium carbonate equivalent in this horizon is less than 15 percent.

The A horizon is very cobbly loam or very cobbly sandy loam. It has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 or 3. The content of rock fragments ranges from 35 to 60 percent.

The Bt horizon is clay, sandy clay, or clay loam. It has value of 4 or 5. The content of rock fragments ranges from 10 to 25 percent.

Cantina Series

The soils in the Cantina series are classified as fine, mixed, mesic Aridic Argiustolls. These deep, well drained soils formed in mixed alluvium. They are in valleys between lava ridges and on hills. Slope is 1 to 3 percent. Elevation is 7,100 to 7,500 feet. The average annual precipitation is 14 to 16 inches. The average annual air temperature is 47 to 51 degrees F, and the frost-free period is 100 to 120 days.

Typical pedon of Cantina sandy loam, in an area of Cabezon-Cantina complex, 1 to 7 percent slopes; about 1.5 miles northwest of Mujeres Camp; 1,800 feet south and 2,100 feet east of the northwest corner of sec. 16, T. 5 N., R. 14 W.

A—0 to 2 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; moderate fine granular structure; slightly hard, friable, nonsticky and nonplastic; few coarse and common very fine roots; many fine vesicular pores; neutral; abrupt smooth boundary.
Bt1—2 to 9 inches; brown (10YR 4/3) sandy clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few coarse and common very fine roots; common very fine tubular and irregular pores; common moderately thick clay films on faces of peds and in pores; neutral; abrupt wavy boundary.
Bt2—9 to 16 inches; brown (10YR 4/3) sandy clay, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to strong medium subangular blocky; very hard, firm, sticky and plastic; few coarse and common very fine roots; common very fine tubular pores; many moderately thick clay films on faces of peds and in pores; mildly alkaline; clear smooth boundary.
Bt3—16 to 24 inches; brown (10YR 5/3) sandy clay, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to strong medium subangular blocky; very hard, firm, sticky and plastic; few coarse and common very fine roots; common very fine tubular pores; many moderately thick clay films on faces of peds and in pores; slightly effervescent; mildly alkaline; clear smooth boundary.
Btk—24 to 31 inches; brown (10YR 5/3) sandy clay, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; very hard, firm, sticky and plastic; common fine and very fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds and in pores; strongly effervescent; disseminated calcium carbonate and few medium irregular soft masses of calcium carbonate; moderately alkaline; abrupt smooth boundary.
Bk—31 to 54 inches; brown (7.5YR 5/4) sandy clay loam, strong brown (7.5YR 4/6) moist; massive; hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; common very fine irregular pores; strongly effervescent; disseminated calcium carbonate and few medium irregular soft masses of calcium carbonate; moderately alkaline; abrupt smooth boundary.
2R—54 inches; basalt.

The depth to bedrock ranges from 40 to 60 inches. The A horizon has value of 4 or 5 and chroma of 2 or 3. The Bk horizon is sandy clay loam or sandy clay. It has hue of 7.5YR or 10YR and value of 4 to 6 (4 or 5 moist). The calcium carbonate equivalent in this horizon is 2 to 10 percent.

Catman Series

The soils in the Catman series are classified as very fine, montmorillonitic, mesic Udorthentic Chromusterts. These deep, well drained soils formed in alluvium derived dominantly from shale. They are on flood plains, in swales, on alluvial fans, and in drainageways and valleys. Slope is 1 to 5 percent. Elevation is 6,500 to 7,500 feet. The average annual precipitation is 12 to 16 inches. The average annual air temperature is 47 to 51 degrees F, and the frost-free period is 100 to 135 days.

Typical pedon of Catman clay loam, in an area of Catman-Silkie association, 1 to 10 percent slopes; about 0.25 mile southeast of Crockett Peak; 560 feet north and 2,580 feet east of the southwest corner of sec. 28, T. 8 N., R. 17 W.

A—0 to 3 inches; light olive brown (2.5Y 5/4) clay loam, olive brown (2.5Y 4/4) moist; moderate medium granular structure; soft, friable, slightly sticky and slightly plastic; common very fine roots; common fine irregular pores; cracks 1 to 3 centimeters wide; slightly effervescent; neutral; clear smooth boundary.

C1—3 to 32 inches; light olive brown (2.5Y 5/4) clay, olive brown (2.5Y 4/4) moist; very hard, very firm, very sticky and very plastic; common very fine and few fine roots; common very fine irregular pores; cracks 0.5 inch wide; many intersecting slickensides; slightly effervescent; neutral; clear smooth boundary.

C2—32 to 60 inches; light olive brown (2.5Y 5/4) clay, olive brown (2.5Y 4/4) moist; massive; very hard, very firm, sticky and plastic; few very fine roots; common very fine irregular pores; strongly effervescent; few fine irregular seams and filaments of calcium carbonate; mildly alkaline.

Cracks more than 0.5 inch wide extend to a depth of 32 inches. The A horizon is clay loam, sandy clay loam, or silty clay loam. It has hue of 10YR or 2.5Y, value of 4 to 7 (4 to 6 moist), and chroma of 3 or 4. The C horizon has hue of 10YR or 2.5Y, value of 4 to 7 (4 to 6 moist), and chroma of 3 or 4.

Catman Variant

The soils in the Catman Variant are classified as very fine, montmorillonitic (calcareous), mesic Mollic Ustifluvents. These deep, somewhat poorly drained soils formed in mixed alluvium. They are on alluvial fans and flood plains and in valleys. Slope is 1 to 3 percent. Elevation is 6,800 to 6,900 feet. The average annual precipitation is 13 to 16 inches. The average annual air temperature is 47 to 51 degrees F, and the frost-free period is 100 to 120 days.

Typical pedon of Catman Variant clay loam, 1 to 3 percent slopes; 300 feet south and 800 feet west of the northeast corner of sec. 3, T. 10 N., R. 16 W.

Ap—0 to 10 inches; dark brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; massive; hard, firm, sticky and plastic; common very fine and fine and few coarse roots; many very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.

C1—10 to 25 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; massive; very hard, very firm, very sticky and plastic; common very fine and fine and few coarse roots; common very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.

C2—25 to 33 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; massive; very hard, very firm, very sticky and plastic; few very fine and fine roots; common very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.

C3—33 to 60 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; common medium distinct reddish yellow (7.5YR 6/8) mottles; massive; very hard, very firm, very sticky and plastic; few fine roots; common very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline.

The water table in these soils fluctuates between depths of 24 and 40 inches. Electrical conductivity ranges from 8 to 16 millimhos per centimeter.

Cebolleta Series

The soils in the Cebolleta series are classified as clayey-skeletal, mixed Typic Argiborolls. These moderately deep, well drained soils formed in windblown sediments and alluvium. They are on hills, mountainsides, and mesas. Slope is 1 to 50 percent. Elevation is 7,500 to 9,400 feet. The average annual precipitation is 18 to 24 inches. The average annual air temperature is 40 to 45 degrees F, and the frost-free period is 80 to 110 days.

Typical pedon of Cebolleta cobbly loam, 2 to 10 percent slopes, very stony; about 0.75 mile west of Big Lake; long. 107 degrees 31 minutes 17 seconds W. and lat. 35 degrees 15 minutes 36 seconds N.

Oi—1 inch to 0; pine needles and oak leaves.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) cobbly loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; few medium and common fine and very fine roots; few very fine pores; about 2 percent stones, 20 percent cobbles, and 5 percent gravel; slightly acid; abrupt smooth boundary.

BA—4 to 10 inches; dark grayish brown (10YR 4/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and slightly plastic; common coarse, fine, and very fine roots; common very fine tubular pores; about 30 percent cobbles and 5 percent gravel; neutral; abrupt smooth boundary.

Bt1—10 to 19 inches; reddish brown (5YR 5/4) very cobbly clay, reddish brown (5YR 4/4) moist;

moderate medium subangular blocky structure; hard, friable, sticky and plastic; few coarse and common fine and very fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds and in pores; about 30 percent cobbles and 10 percent gravel; slightly acid; clear smooth boundary.

Bt2—19 to 25 inches; brown (7.5YR 4/4) very cobbly clay, dark brown (7.5YR 3/4) moist; strong medium angular blocky structure; very hard, firm, sticky and plastic; few very fine roots; few very fine tubular pores; common moderately thick clay films on faces of peds and in pores; about 25 percent cobbles and 20 percent gravel; slightly acid; abrupt wavy boundary.

2R—25 inches; basalt.

The depth to bedrock, or to the base of the Bt horizon, is 20 to 40 inches. The thickness of the mollic epipedon is 8 to 15 inches.

The A horizon is cobbly or very cobbly loam. It has hue of 7.5YR or 10YR, value of 3 to 5 (2 or 3 moist), and chroma of 2 or 3. The content of rock fragments ranges from 25 to 45 percent, by volume, including 0 to 5 percent stones, 20 to 30 percent cobbles, and 5 to 10 percent gravel.

The BA horizon is very cobbly loam and very cobbly clay loam. It has hue of 5YR to 10YR, value of 4 or 5, and chroma of 2 or 3. The content of rock fragments ranges from 35 to 50 percent, by volume, including 0 to 5 percent stones, 30 to 35 percent cobbles, and 5 to 10 percent gravel.

The Bt horizon has hue of 5YR to 10YR, value of 4 or 5 (3 or 4 moist), and chroma of 2 to 4.

Celacy Series

The soils in the Celacy series are classified as fine-loamy, mixed, mesic Aridic Haplustalfs. These moderately deep, well drained soils formed in alluvium and eolian material derived dominantly from interbedded sandstone and shale. They are on mesa tops and cuestas. Slope is 1 to 5 percent. Elevation is 6,600 to 7,300 feet. The average annual precipitation is 12 to 14 inches. The average annual air temperature is 48 to 52 degrees F, and the frost-free period is 115 to 130 days.

Typical pedon of Celacy sandy loam, in an area of Celacy-Atarque complex, 1 to 10 percent slopes; about 3.75 miles east of Broom Mountain; 1,375 feet west and 500 feet north of the southeast corner of sec. 22, T. 5 N., R. 7 W.

A—0 to 2 inches; strong brown (7.5YR 5/6) sandy loam, strong brown (7.5YR 4/6) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few coarse, medium, and fine roots; few very fine irregular pores; mildly alkaline; abrupt smooth boundary.

Bt1—2 to 6 inches; strong brown (7.5YR 5/6) sandy clay loam, strong brown (7.5YR 4/6) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few coarse, medium, fine, and very fine roots; common fine and very fine tubular pores; few thin clay films on faces of peds and in pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

Bt2—6 to 12 inches; strong brown (7.5YR 5/6) sandy clay loam, strong brown (7.5YR 4/6) moist; moderate medium subangular blocky structure; soft, friable, slightly sticky and nonplastic; common fine and very fine roots; common fine and very fine tubular pores; common moderately thick clay films on faces of peds and in pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

Bk—12 to 24 inches; reddish yellow (7.5YR 6/8) sandy clay loam, strong brown (7.5YR 5/8) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few very fine irregular pores; violently effervescent; few fine irregular seams and filaments of calcium carbonate; mildly alkaline; abrupt smooth boundary.

2R—24 inches; sandstone.

The depth to bedrock is 20 to 40 inches, and depth to the base of the Bt horizon is 10 to 24 inches. The content of rock fragments ranges from 0 to 10 percent.

The Bt and Bk horizons are sandy clay loam or clay loam. The 2R horizon is sandstone or interbedded sandstone and shale.

Charo Series

The soils in the Charo series are classified as fine, mixed Typic Argiborolls. These moderately deep, well drained soils formed in windblown sediments and mixed alluvium. They are on ridges and hills, in swales, and on mesa tops. Slope is 0 to 5 percent. Elevation is 7,200 to 8,300 feet. The average annual precipitation is 16 to 20 inches. The average annual air temperature is 40 to 45 degrees F, and the frost-free period is 90 to 110 days.

Typical pedon of Charo loam, 0 to 5 percent slopes;

about 8 miles northeast of Bibo; long. 107 degrees 22 minutes 16 seconds W. and lat. 35 degrees 16 minutes 47 seconds N.

A—0 to 5 inches; dark brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; common fine and many very fine roots; few fine irregular pores; neutral; abrupt smooth boundary.

Bt1—5 to 11 inches; reddish brown (5YR 4/3) clay loam, dark reddish brown (5YR 3/3) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; common fine and many very fine roots; few fine and very fine tubular pores; few thin clay films on faces of peds and in pores; neutral; clear smooth boundary.

Bt2—11 to 18 inches; reddish brown (5YR 4/4) clay loam, dark reddish brown (5YR 3/4) moist; moderate fine angular blocky structure; very hard, firm, sticky and plastic; few fine and many very fine roots; few fine and very fine tubular pores; common moderately thick clay films on faces of peds and in pores; mildly alkaline; clear smooth boundary.

Bt3—18 to 28 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; moderate fine prismatic structure parting to strong medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine roots; few fine and very fine tubular pores; many moderately thick clay films on faces of peds and in pores; mildly alkaline; abrupt wavy boundary.

2R—28 inches; basalt.

The depth to bedrock, or to the base of the Bt horizon, ranges from 20 to 40 inches. The thickness of the mollic epipedon is 8 to 13 inches.

The A horizon is loam or cobbly loam. It has hue of 10YR or 7.5YR and chroma of 2 or 3. The content of rock fragments ranges from 0 to 25 percent, by volume, including 0 to 15 percent cobbles and 0 to 10 percent gravel.

The Bt horizon has value of 4 or 5 (3 or 4 moist) and chroma of 3 to 6. The content of rock fragments ranges from 0 to 15 percent, by volume, including 0 to 10 percent cobbles and 0 to 5 percent gravel.

Cinnadale Series

The soils in the Cinnadale series are classified as loamy-skeletal, mixed, frigid Lithic Ustochrepts. These shallow, well drained soils formed in alluvium and windblown sediments derived dominantly from siltstone and sandstone. They are on ridges and hills. Slope is 1 to 15 percent. Elevation is 7,800 to 8,400 feet. The average annual precipitation is 20 to 24 inches. The average annual air temperature is 40 to 44 degrees F, and the frost-free period is 90 to 110 days.

Typical pedon of Cinnadale gravelly very fine sandy loam, 1 to 15 percent slopes; about 3 miles southeast of Page; 1,500 feet west and 1,800 feet south of the northeast corner of sec. 10, T. 12 N., R. 15 W.

Oi—1 inch to 0; partially decomposed pine needles.

A—0 to 4 inches; light reddish brown (5YR 6/3) gravelly very fine sandy loam, dark reddish brown (5YR 3/3) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine roots; few very fine irregular pores; about 20 percent gravel; neutral; clear smooth boundary.

Bw—4 to 12 inches; light reddish brown (5YR 6/4) very channery loam, dark reddish brown (5YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; few very fine irregular pores; about 30 percent channers and 20 percent gravel; neutral; abrupt smooth boundary.

2R—12 inches; red sandstone.

The depth to bedrock is 10 to 20 inches. The content of clay ranges from 10 to 15 percent. In some pedons the upper few inches of the sandstone is weathered.

The A horizon has hue of 2.5YR or 5YR. It has 15 to 25 percent angular pebble-sized fragments. The B horizon has 20 to 30 percent angular pebble-sized fragments and 20 to 30 percent channers.

Clovis Series

The soils in the Clovis series are classified as fine-loamy, mixed, mesic Ustollic Haplargids. These deep, well drained soils formed in mixed alluvium and windblown sediments. They are on fan terraces. Slope is 1 to 3 percent. Elevation is 5,750 to 5,900 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 48 to 52 degrees F, and the frost-free period is 125 to 140 days.

Typical pedon of Clovis sandy clay loam, 1 to 3 percent slopes; about 0.5 mile southwest of Lady Lake, in New Laguna; 2,000 feet east and 1,200 feet south of the northwest corner of sec. 1, T. 9 N., R. 6 W.

Ap—0 to 8 inches; dark yellowish brown (10YR 4/6) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and nonplastic; common very fine and fine roots; many very fine and common fine irregular pores; slightly effervescent;

disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

Bt—8 to 21 inches; strong brown (7.5YR 4/6) sandy clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and slightly plastic; common very fine and few fine roots; few very fine and fine tubular pores; common moderately thick clay films on faces of peds and in pores; slightly effervescent; few fine irregular soft filaments of calcium carbonate; mildly alkaline; abrupt smooth boundary.

Bk1—21 to 37 inches; pink (7.5YR 8/4) sandy clay loam, pink (7.5YR 7/4) moist; massive; hard, friable, slightly sticky and nonplastic; few very fine roots; few very fine irregular pores; violently effervescent; many coarse irregular soft masses of calcium carbonate; strongly alkaline; clear smooth boundary.

Bk2—37 to 60 inches; pink (7.5YR 7/4) sandy clay loam, light brown (7.5YR 6/4) moist; massive; hard, friable, slightly sticky and nonplastic; few very fine roots; few very fine irregular pores; violently effervescent; many coarse irregular soft masses of calcium carbonate; strongly alkaline.

The Clovis soils in this survey area are a taxadjunct to the series because they are slightly effervescent in the upper part. This difference, however, does not significantly affect the use and management of the soils.

Flaco Series

The soils in the Flaco series are classified as fine-loamy, mixed, mesic Ustollic Haplargids. These moderately deep, well drained soils formed in mixed alluvium and windblown sediments. They are on basalt-capped mesas. Slope is 0 to 10 percent. Elevation is 6,000 to 7,000 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Flaco loam, in an area of Flaco-Berto loams, 0 to 5 percent slopes; on Mesa Lucero; 800 feet west and 1,060 feet north of the southeast corner of sec. 21, T. 6 N., R. 3 W.

A—0 to 2 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; few very fine irregular pores; slightly effervescent; moderately alkaline; abrupt smooth boundary.

Bt—2 to 7 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common very fine irregular pores; few thin clay films in pores; slightly effervescent; moderately alkaline; clear smooth boundary.

Btk—7 to 11 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; few fine and very fine roots; common fine and very fine irregular pores; common thin clay films on faces of peds and in pores; strongly effervescent; common medium irregular soft masses of calcium carbonate; moderately alkaline; abrupt smooth boundary.

Bk1—11 to 16 inches; yellowish brown (10YR 5/6) clay loam, dark yellowish brown (10YR 4/6) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few very fine roots; few fine irregular pores; violently effervescent; many coarse irregular soft masses of calcium carbonate; moderately alkaline; clear smooth boundary.

Bk2—16 to 29 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; violently effervescent; many coarse irregular soft masses of calcium carbonate; moderately alkaline; abrupt smooth boundary.

2R—29 inches; basalt that has a thin layer of partially cemented calcium carbonate.

The depth to bedrock is 20 to 40 inches. Depth to the base of the Bt horizon is 9 to 18 inches.

The A horizon is loam or cobbly loam. It has hue of 7.5YR or 10YR, value of 3 to 5 dry or moist, and chroma of 3 or 4. The content of rock fragments ranges from 0 to 20 percent.

The Bt horizon has hue of 7.5YR or 10YR and value of 4 or 5 (3 or 4 moist). The content of rock fragments ranges from 0 to 10 percent.

The Bk horizon is loam, clay loam, or gravelly loam. It has hue of 7.5YR or 10YR, value of 4 to 6 dry or moist, and chroma of 4 to 6. The content of rock fragments ranges from 0 to 20 percent. The calcium carbonate equivalent is more than 15 percent.

Flugle Series

The soils in the Flugle series are classified as fine-loamy, mixed, mesic Aridic Haplustalfs. These deep, well drained soils formed in wind-modified, mixed alluvium. They are on hills, ridges, fan terraces, and mesas. Slope is 1 to 8 percent. Elevation is 6,000 to 7,000 feet. The average annual precipitation is 12 to 14

inches. The average annual air temperature is 48 to 53 degrees F, and the frost-free period is 115 to 135 days.

Typical pedon of Flugle loamy fine sand, in an area of Flugle-Goesling loamy fine sands, 1 to 8 percent slopes; about 2.5 miles east of the intersection of the Cibola-Catron County line and the Arizona State line; 500 feet north and 120 feet west of the southeast corner of sec. 11, T. 4 N., R. 21 W.

A—0 to 5 inches; brown (7.5YR 5/4) loamy fine sand, brown (7.5YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few very fine, fine, and medium roots; few very fine irregular pores; neutral; clear smooth boundary.

Bt1—5 to 18 inches; strong brown (7.5YR 4/6) sandy clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; common thin clay films on faces of peds; neutral; gradual wavy boundary.

Bt2—18 to 27 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few medium and very fine roots; few fine tubular pores; few thin clay films on faces of peds and in pores; mildly alkaline; gradual wavy boundary.

Bk1—27 to 41 inches; light brown (7.5YR 6/4) sandy clay loam, brown (7.5YR 5/4) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine irregular pores; slightly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

Bk2—41 to 55 inches; pink (7.5YR 7/4) sandy loam, light brown (7.5YR 6/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; strongly effervescent; few thin irregular seams and filaments of calcium carbonate; mildly alkaline; gradual smooth boundary.

Bk3—55 to 61 inches; pink (7.5YR 7/4) sandy loam, light brown (7.5YR 6/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; strongly effervescent; few thin irregular seams and filaments of calcium carbonate; mildly alkaline.

The depth to calcium carbonate is 20 to 30 inches. The calcium carbonate equivalent is less than 10 percent. The content of rock fragments ranges from 0 to 15 percent throughout the profile.

The A horizon is loamy fine sand or sandy loam. It has hue of 7.5YR or 10YR, value of 4 or 5 (3 or 4 moist), and chroma of 3 or 4. The Bt horizon is sandy clay loam, clay loam, or loam. It has hue of 5YR, 7.5YR, or 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6. The Bk horizon is sandy clay loam, sandy loam, loam, fine sandy loam, or clay loam. It has hue of 7.5YR or 10YR, value of 5 to 7 (4 to 6 moist), and chroma of 3 to 6.

Galestina Series

The soils in the Galestina series are classified as fine, mixed, mesic Aridic Paleustalfs. These deep, well drained soils formed in alluvium derived from shale. They are on hillsides and mesa tops. Slope is 1 to 8 percent. Elevation is 6,800 to 7,500 feet. The average annual precipitation is 14 to 16 inches. The average annual air temperature is 47 to 51 degrees F, and the frost-free period is 100 to 120 days.

Typical pedon of Galestina sandy loam, in an area of Nogal-Galestina sandy loams, 1 to 10 percent slopes; about 0.5 mile north of Ojo Pueblo Ruins; 2,160 feet east and 600 feet north of the southwest corner of sec. 21, T. 8 N., R. 16 W.

A—0 to 2 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common fine vesicular pores; neutral; abrupt smooth boundary.

BA—2 to 7 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, friable, nonsticky and nonplastic; common very fine and fine roots; common fine tubular and few fine vesicular pores; mildly alkaline; clear smooth boundary.

Bt1—7 to 24 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure parting to strong medium angular blocky; very hard, very firm, very sticky and very plastic; common very fine and fine roots; common fine tubular pores; continuous thick clay films on faces of peds and in pores; mildly alkaline; clear smooth boundary.

Bt2—24 to 31 inches; yellowish brown (10YR 5/4) clay, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; very hard, very firm, very sticky and very plastic; common very fine and few fine roots; few fine tubular pores; many thick clay films on faces of peds and in pores; slightly effervescent; mildly alkaline; clear smooth boundary.

Bk1—31 to 42 inches; yellowish brown (10YR 5/8) clay,

yellowish brown (10YR 5/6) moist; massive; very hard, very firm, very sticky and very plastic; few very fine roots; common very fine irregular pores; strongly effervescent; few medium irregular soft masses of calcium carbonate; mildly alkaline; gradual smooth boundary.

Bk2—42 to 46 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; massive; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine irregular pores; strongly effervescent; common medium irregular soft masses of calcium carbonate; mildly alkaline; clear wavy boundary.

Cr—46 to 60 inches; shale.

Depth to the Cr horizon is 40 to 60 inches. Depth to the base of the Bt horizon is 12 to 35 inches.

The Bt horizon is clay or clay loam. The calcium carbonate equivalent in the Bk horizon is less than 5 percent. The Cr horizon is dominantly shale and some interbedded sandstone.

Glenberg Series

The soils in the Glenberg series are classified as coarse-loamy, mixed (calcareous), mesic Ustic Torrifluvents. These deep, well drained soils formed in alluvium derived dominantly from sandstone. They are on flood plains and alluvial fans. Slope is 0 to 2 percent. Elevation is 6,200 to 6,600 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 48 to 53 degrees F, and the frost-free period is 110 to 140 days.

Typical pedon of Glenberg sandy loam, in an area of Glenberg-San Mateo complex, 0 to 2 percent slopes; about 0.5 mile northwest of Milan; 600 feet east and 2,400 feet south of the northwest corner of sec. 4, T. 11 N., R. 10 W.

A—0 to 11 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; few very fine irregular pores; slightly effervescent; mildly alkaline; abrupt smooth boundary.

C1—11 to 21 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; few very fine irregular pores; slightly effervescent; moderately alkaline; abrupt smooth boundary.

C2—21 to 60 inches; pale brown (10YR 6/3) sandy loam stratified with thin lenses of loam and loamy sand; brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine and very fine roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline.

Goesling Series

The soils in the Goesling series are classified as fine-loamy, mixed, mesic Aridic Haplustalfs. These deep, well drained soils formed in wind-modified, mixed alluvium. They are on mesas, fan terraces, hills, and ridges. Slope is 1 to 8 percent. Elevation is 6,000 to 6,800 feet. The average annual precipitation is 12 to 14 inches. The average annual air temperature is 48 to 53 degrees F, and the frost-free period is 115 to 135 days.

Typical pedon of Goesling loamy fine sand, in an area of Flugle-Goesling loamy fine sands, 1 to 8 percent slopes; about 6 miles northeast of the intersection of the southern Cibola County line and the Arizona State line; 400 feet south and 1,580 feet east of the northwest corner of sec. 8, T. 4 N., R. 20 W.

A—0 to 5 inches; light yellowish brown (10YR 6/4) loamy fine sand, dark yellowish brown (10YR 3/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and common fine roots; few very fine irregular pores; about 10 percent gravel; neutral; abrupt smooth boundary.

Bt1—5 to 10 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and slightly plastic; common very fine, fine, and medium roots; common fine tubular pores; few thin clay films on faces of peds and in pores; about 5 percent gravel; neutral; clear wavy boundary.

Bt2—10 to 18 inches; light brown (7.5YR 6/4) sandy clay loam, brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; hard, friable, sticky and slightly plastic; common fine and very fine roots; few fine tubular pores; few thin clay films on faces of peds and in pores; about 5 percent gravel; mildly alkaline; clear wavy boundary.

Bk1—18 to 25 inches; light yellowish brown (10YR 6/4) sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few very fine roots; few very fine irregular pores; about 5 percent cobbles and 5 percent gravel; violently effervescent; many coarse irregular soft masses of calcium carbonate; mildly alkaline; clear wavy boundary.

Bk2—25 to 46 inches; white (10YR 8/2) loam, very pale brown (10YR 7/4) moist; massive; slightly hard,

friable, slightly sticky and slightly plastic; few very fine roots; few very fine irregular pores; about 5 percent gravel; violently effervescent; many coarse irregular soft masses of calcium carbonate; moderately alkaline; clear wavy boundary.

Bk3—46 to 60 inches; very pale brown (10YR 7/3) sandy loam, yellowish brown (10YR 5/4) moist; massive; loose, very friable, nonsticky and nonplastic; few very fine roots; violently effervescent; many coarse irregular soft masses of calcium carbonate; moderately alkaline.

Depth to the Bk horizon is 15 to 20 inches. The calcium carbonate equivalent is 15 to 30 percent.

The Bt horizon is sandy clay loam or clay loam. The Bk horizon is loam, sandy loam, or sandy clay loam.

Grieta Series

The soils in the Grieta series are classified as fine-loamy, mixed, mesic Typic Haplargids. These deep, well drained soils formed in wind-modified, mixed alluvium. They are on fan terraces, hills, and ridges and in interdune areas. Slope is 1 to 10 percent. Elevation is 5,400 to 6,100 feet. The average annual precipitation is 7 to 10 inches. The average annual air temperature is 51 to 55 degrees F, and the frost-free period is 140 to 165 days.

Typical pedon of Grieta sandy loam, in an area of Grieta-Shiprock association, 1 to 10 percent slopes; about 3.75 miles west of Suwanee; 420 feet east and 1,050 feet south of the northwest corner of sec. 7, T. 8 N., R. 3 W.

A—0 to 3 inches; strong brown (7.5YR 5/6) sandy loam, brown (7.5YR 4/4) moist; soft, very friable, nonsticky and nonplastic; many fine and few very fine roots; slightly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

AB—3 to 8 inches; strong brown (7.5YR 5/6) sandy loam, strong brown (7.5YR 4/6) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine irregular pores; slightly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

Bt1—8 to 16 inches; strong brown (7.5YR 5/6) sandy clay loam, strong brown (7.5YR 4/6) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common very fine roots; few very fine tubular pores; common thin clay films on faces of peds; mildly alkaline; clear smooth boundary.

Bt2—16 to 28 inches; strong brown (7.5YR 5/6) sandy clay loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; few very fine roots; few very fine tubular pores; few thin clay films on faces of peds and in pores; mildly alkaline; abrupt smooth boundary.

Bk1—28 to 42 inches; pink (7.5YR 8/4) sandy loam, light brown (7.5YR 6/4) moist; massive; hard, friable, slightly sticky and nonplastic; few fine roots; few fine irregular pores; violently effervescent; many coarse irregular soft masses of calcium carbonate; moderately alkaline; clear smooth boundary.

Bk2—42 to 60 inches; pinkish white (7.5YR 8/2) sandy loam, pink (7.5YR 7/4) moist; massive; hard, friable, slightly sticky and nonplastic; violently effervescent; many coarse irregular soft masses of calcium carbonate; moderately alkaline.

Depth to the base of the Bt horizon is 20 to 34 inches. The calcium carbonate equivalent in the Bk horizon is more than 15 percent.

The A horizon has hue of 5YR or 7.5YR, value of 5 or 6 (4 or 5 moist), and chroma of 4 to 6. The content of rock fragments ranges from 0 to 10 percent.

The Bt horizon is sandy clay loam or clay loam. It has hue of 5YR or 7.5YR, value of 5 or 6 (4 or 5 moist), and chroma of 4 to 6.

The Bk horizon is sandy clay loam or sandy loam. It has hue of 5YR or 7.5YR, value of 5 to 8 (5 to 7 moist), and chroma of 2 to 6. The content of rock fragments ranges from 0 to 10 percent.

Hackroy Series

The soils in the Hackroy series are classified as clayey, mixed, mesic Lithic Haplustalfs. These shallow, well drained soils formed in alluvium and windblown sediments. They are on the tops of basalt-capped mesas and on plateaus. Slope is 1 to 5 percent. Elevation is 7,000 to 8,000 feet. The average annual precipitation is 14 to 16 inches. The average annual air temperature is 47 to 52 degrees F, and the frost-free period is 110 to 130 days.

Typical pedon of Hackroy cobbly loam, in an area of Paguate-Hackroy complex, 1 to 5 percent slopes; at the top of Chicken Mountain; 900 feet north and 980 feet west of the southeast corner of sec. 19, T. 5 N., R. 4 W.

A—0 to 3 inches; brown (7.5YR 5/4) cobbly loam, dark brown (7.5YR 4/4) moist; weak fine granular structure; slightly hard, very friable, nonsticky and slightly plastic; many very fine roots; common fine

irregular pores; about 15 percent cobbles; mildly alkaline; abrupt smooth boundary.
Bt1—3 to 11 inches; reddish brown (5YR 5/4) clay loam, reddish brown (5YR 4/4) moist; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, firm, sticky and plastic; few fine and common very fine roots; common fine tubular pores; many thick clay films on faces of peds and in pores; about 10 percent cobbles; mildly alkaline; clear smooth boundary.
Bt2—11 to 14 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; very hard, firm, sticky and plastic; few very fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds and in pores; about 10 percent cobbles; mildly alkaline; abrupt smooth boundary.
2R—14 inches; basalt.

The depth to bedrock is 10 to 20 inches. The content of rock fragments in the A horizon ranges from 15 to 20 percent. The Bt horizon is clay loam or clay. It has 35 to 50 percent clay and 0 to 15 percent rock fragments.

Hagerman Series

The soils in the Hagerman series are classified as fine-loamy, mixed, mesic Ustollic Haplargids. These moderately deep, well drained soils formed in eolian material and alluvium derived dominantly from sandstone. They are on hills, ridges, mesas, and cuestas. Slope is 1 to 5 percent. Elevation is 6,000 to 7,000 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Hagerman fine sandy loam, in an area of Hagerman-Bond association, 1 to 10 percent slopes; about 3 miles east of Bibo; long. 107 degrees 16 minutes 11 seconds W. and lat. 35 degrees 11 minutes 10 seconds N.

A—0 to 3 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 3/4) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and medium roots; few very fine irregular pores; mildly alkaline; abrupt smooth boundary.
AB—3 to 6 inches; dark brown (7.5YR 4/4) fine sandy loam, dark brown (7.5YR 4/6) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; few fine and common very fine tubular pores; mildly alkaline; abrupt smooth boundary.
Bt—6 to 23 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; few fine and very fine tubular pores; common moderately thick clay films on faces of peds and in pores; mildly alkaline; abrupt smooth boundary.
Bk—23 to 34 inches; light brown (7.5YR 6/4) sandy loam, brown (7.5YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine and very fine roots; few very fine irregular pores; strongly effervescent; few medium irregular soft masses of calcium carbonate; moderately alkaline; abrupt smooth boundary.
2R—34 inches; sandstone.

The depth to sandstone is 20 to 40 inches. Depth to the base of the Bt horizon is 12 to 25 inches.

The Bt horizon is sandy clay loam or clay loam. The Bk horizon is sandy clay loam or sandy loam. It has a calcium carbonate equivalent of 3 to 10 percent.

Harvey Series

The soils in the Harvey series are classified as fine-loamy, mixed, mesic Ustollic Calciorthids. These deep, well drained soils formed in alluvium and windblown sediments derived dominantly from limestone. They are on fan terraces and mesa tops. Slope is 1 to 5 percent. Elevation is 6,000 to 6,500 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Harvey loam, in an area of Harvey-Oelop association, 0 to 5 percent slopes; about 2 miles northeast of Lucero Windmill; 1,700 feet east and 400 feet north of the southwest corner of sec. 34, T. 8 N., R. 3 W.

A—0 to 2 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and medium roots; few fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.
Bw1—2 to 10 inches; reddish yellow (7.5YR 6/6) clay loam, strong brown (7.5YR 5/6) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and common fine and medium roots; few very fine irregular pores; strongly effervescent; few medium irregular seams and filaments of calcium carbonate; moderately alkaline; clear smooth boundary.
Bw2—10 to 18 inches; light brown (7.5YR 6/4) clay

loam, brown (7.5YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; few very fine irregular pores; strongly effervescent; few medium irregular soft masses of calcium carbonate; moderately alkaline; clear wavy boundary.

Bk1—18 to 21 inches; pink (7.5YR 7/4) loam, light brown (7.5YR 6/4) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic: common fine and few medium roots; few very fine irregular pores; violently effervescent; many coarse irregular soft masses of calcium carbonate; moderately alkaline; clear wavy boundary.

Bk2—21 to 31 inches; pink (7.5YR 8/4) loam, pink (7.5YR 8/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; common fine and few medium roots; few very fine irregular pores; violently effervescent; many coarse irregular soft masses of calcium carbonate; moderately alkaline; clear wavy boundary.

Bk3—31 to 60 inches; pink (7.5YR 8/4) loam, pink (7.5YR 8/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine and medium roots; few very fine irregular pores; violently effervescent; many coarse irregular soft masses of calcium carbonate; moderately alkaline.

The content of rock fragments ranges from 0 to 15 percent throughout the profile. The Bw and Bk horizons are loam or clay loam.

Hickman Series

The soils in the Hickman series are classified as fine-loamy, mixed (calcareous), mesic Typic Ustifluvents. These deep, well drained soils formed in mixed alluvium. They are on flood plains and alluvial fans and in valleys. Slope is 1 to 6 percent. Elevation is 6,500 to 7,500 feet. The average annual precipitation is 12 to 16 inches. The average annual air temperature is 47 to 51 degrees F, and the frost-free period is 100 to 135 days.

Typical pedon of Hickman loam, in an area of Hickman-Catman complex, 1 to 6 percent slopes; about 1.5 miles north of the intersection of the Cibola-Catron County line and the Arizona State line; 1,056 feet west and 2,112 feet south of the northeast corner of sec. 4, T. 4 N., R. 21 W.

A—0 to 4 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; moderate thin platy structure parting to weak fine granular; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

C1—4 to 32 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and few very fine roots; common very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.

C2—32 to 52 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine irregular pores; about 10 percent gravel; strongly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.

C3—52 to 60 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few very fine roots; few very fine irregular pores; about 5 percent gravel; strongly effervescent; disseminated calcium carbonate; moderately alkaline.

The content of rock fragments ranges from 0 to 15 percent throughout the profile.

The A horizon is loam or sandy clay loam. It has hue of 10YR or 2.5Y, value of 5 or 6 (4 or 5 moist), and chroma of 3 or 4.

The C horizon is clay loam, loam, sandy clay loam, silty clay loam, or sandy loam. The content of clay ranges from 18 to 35 percent. This horizon has hue of 10YR or 2.5Y, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6.

Ildefonso Series

The soils in the Ildefonso series are classified as loamy-skeletal, mixed, mesic Ustollic Calciorthids. These deep, well drained soils formed in mixed alluvium. They are on ridges and fan terraces. Slope is 3 to 15 percent. Elevation is 5,900 to 6,800 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 150 days.

Typical pedon of Ildefonso very gravelly sandy loam, 3 to 15 percent slopes; about 1.5 miles north of Ponia Canyon; 2,600 feet east and 50 feet south of the northwest corner of sec. 5, T. 7 N., R. 4 W.

A—0 to 3 inches; brown (7.5YR 5/4) very gravelly sandy loam, dark brown (7.5YR 3/4) moist; weak fine granular structure; soft, very friable, nonsticky

and nonplastic; few very fine and fine roots; common fine irregular pores; about 5 percent cobbles and 35 percent gravel; slightly effervescent; mildly alkaline; clear smooth boundary.

Bw—3 to 8 inches; brown (7.5YR 5/4) very gravelly loam, dark brown (7.5YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few very fine and fine roots; common fine irregular pores; about 10 percent cobbles and 30 percent gravel; strongly effervescent; disseminated calcium carbonate; moderately alkaline; abrupt smooth boundary.

Bk1—8 to 16 inches; light brown (7.5YR 6/4) very gravelly loam, brown (7.5YR 4/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few very fine roots; common fine irregular pores; about 10 percent cobbles and 28 percent gravel; violently effervescent; common fine irregular soft masses and seams of calcium carbonate; moderately alkaline; gradual smooth boundary.

Bk2—16 to 60 inches; pink (7.5YR 7/4) very gravelly loam, brown (7.5YR 5/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few very fine roots; common fine irregular pores; about 10 percent cobbles and 28 percent gravel; violently effervescent; many medium irregular soft masses of calcium carbonate; strongly alkaline.

The content of rock fragments ranges from 35 to 60 percent throughout the profile. The calcium carbonate equivalent ranges from 15 to 30 percent.

The Ildefonso soils in this survey area have more clay in the particle-size control section than is defined as the range for the series. This difference, however, does not significantly affect the use and management of the soils.

Kenray Series

The soils in the Kenray series are classified as mixed, frigid Typic Ustipsamments. These deep, excessively drained soils formed in eolian material derived dominantly from sandstone. They are on dunes, hills, and mesas. Slope is 3 to 15 percent. Elevation is 7,300 to 8,000 feet. The average annual precipitation is 16 to 20 inches. The average annual air temperature is 43 to 45 degrees F, and the frost-free period is 90 to 110 days.

Typical pedon of Kenray fine sand, 3 to 15 percent slopes; about 20 miles south of Grants; 1,740 feet west and 360 feet north of the southeast corner of sec. 2, T. 7 N., R. 10 W.

A1—0 to 5 inches; brown (10YR 5/3) fine sand, dark brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; common fine and very fine roots; common fine irregular pores; neutral; clear smooth boundary.

A2—5 to 15 inches; brown (10YR 5/3) fine sand, dark brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; common very fine and few fine and medium roots; common fine irregular pores; neutral; clear smooth boundary.

C1—15 to 32 inches; light yellowish brown (10YR 6/4) loamy sand, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine, fine, and medium roots; common fine irregular pores; neutral; gradual wavy boundary.

C2—32 to 60 inches; brownish yellow (10YR 6/6) loamy sand, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; common fine irregular pores; neutral.

The C horizon is loamy sand, fine sand, or sand.

Kiki Series

The soils in the Kiki series are classified as fine-loamy, mixed, mesic Typic Haplargids. These moderately deep, well drained soils formed in eolian material and alluvium derived dominantly from sandstone. They are on knolls and ridges. Slope is 3 to 15 percent. Elevation is 5,500 to 6,000 feet. The average annual precipitation is 7 to 10 inches. The average annual air temperature is 51 to 55 degrees F, and the frost-free period is 140 to 165 days.

Typical pedon of Kiki sandy loam, in an area of Grieta-Kiki sandy loams, 3 to 15 percent slopes; about 2 miles west of Suwanee; 2,000 feet east and 2,100 feet north of the southwest corner of sec. 6, T. 8 N., R. 3 W.

A1—0 to 3 inches; strong brown (7.5YR 5/6) sandy loam, strong brown (7.5YR 4/6) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and few medium roots; few very fine irregular pores; mildly alkaline; clear smooth boundary.

A2—3 to 6 inches; strong brown (7.5YR 5/6) sandy loam, strong brown (7.5YR 4/6) moist; weak medium granular structure; soft, very friable, nonsticky and nonplastic; many very fine, common fine, and few medium roots; few fine irregular pores; mildly alkaline; abrupt smooth boundary.

Bt—6 to 14 inches; yellowish red (5YR 4/6) sandy clay loam, yellowish red (5YR 4/6) moist; strong medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; few very fine and fine tubular pores; common thin clay films on faces of

peds and in pores; mildly alkaline; clear smooth boundary.
Bw—14 to 19 inches; strong brown (7.5YR 5/6) sandy clay loam, strong brown (7.5YR 4/6) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few very fine irregular pores; mildly alkaline; abrupt smooth boundary.
Bk—19 to 24 inches; strong brown (7.5YR 5/6) sandy clay loam, strong brown (7.5YR 4/6) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; violently effervescent; common medium irregular soft masses of calcium carbonate; mildly alkaline; abrupt smooth boundary.
2R—24 inches; basalt.

The depth to bedrock is 20 to 40 inches. The depth to an accumulation of calcium carbonate is 15 to 25 inches.

The content of rock fragments in the A horizon ranges from 0 to 15 percent. The Bt horizon is sandy clay loam or clay loam. The Bk horizon is sandy clay loam, clay loam, or loam. The calcium carbonate equivalent in this horizon is less than 15 percent.

Laporte Series

The soils in the Laporte series are classified as loamy, carbonatic, mesic Lithic Haplustolls. These shallow, well drained soils formed in mixed colluvium and windblown sediments. They are on hills and ridges. Slope is 3 to 60 percent. Elevation is 6,650 to 7,500 feet. The average annual precipitation is 12 to 15 inches. The average annual air temperature is 48 to 52 degrees F, and the frost-free period is 110 to 135 days.

Typical pedon of Laporte gravelly loam, in an area of Laporte-Rock outcrop complex, 3 to 20 percent slopes; about 2 miles west of Bluewater Lake; 400 feet east and 750 feet south of the northwest corner of sec. 18, T. 12 N., R. 12 W.

A—0 to 3 inches; dark brown (10YR 4/3) gravelly loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; soft, friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common fine irregular pores; strongly effervescent; disseminated calcium carbonate and few fine irregular soft masses of calcium carbonate; about 25 percent gravel; mildly alkaline; abrupt smooth boundary.
C—3 to 11 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium and coarse roots; common fine irregular pores; strongly effervescent; disseminated calcium carbonate and few fine irregular soft masses of calcium carbonate; about 20 percent gravel; moderately alkaline; abrupt smooth boundary.
2R—11 inches; limestone.

The depth to bedrock ranges from 10 to 20 inches. The A horizon is gravelly or very cobbly loam. It has value of 4 or 5 and chroma of 2 or 3. The C horizon has value of 4 or 5 (3 or 4 moist) and chroma of 2 or 3. In some pedons the 2R horizon is fractured in the upper few inches.

Loarc Series

The soils in the Loarc series are classified as fine-loamy, mixed, mesic Aridic Argiustolls. These deep, well drained soils formed in mixed alluvium. They are on fan terraces, hills, and mesas. Slope is 0 to 10 percent. Elevation is 7,200 to 7,800 feet. The average annual precipitation is 14 to 16 inches. The average annual air temperature is 47 to 51 degrees F, and the frost-free period is 100 to 120 days.

Typical pedon of Loarc fine sandy loam, in an area of Millpaw-Loarc complex, 0 to 10 percent slopes; about 0.5 mile south of the Ponderosa Ranch House; 2,100 feet west and 300 feet north of the southeast corner of sec. 26, T. 5 N., R. 15 W.

A—0 to 4 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common very fine irregular pores; neutral; clear smooth boundary.
Bt1—4 to 10 inches; brown (10YR 4/3) sandy clay loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; few fine and very fine roots; common very fine irregular pores; few thin clay films on faces of peds and in pores; neutral; clear smooth boundary.
Bt2—10 to 17 inches; brown (10YR 4/3) sandy clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; few fine and very fine roots; few fine tubular pores; common moderately thick clay films on faces of peds and in pores; neutral; clear wavy boundary.
Bt3—17 to 31 inches; dark yellowish brown (10YR 4/4) sandy clay loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; hard,

friable, slightly sticky and slightly plastic; few very fine roots; common very fine irregular pores; few thin clay films on faces of peds and in pores; mildly alkaline; abrupt smooth boundary.

Bk—31 to 60 inches; yellowish brown (10YR 5/6) sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; common very fine irregular pores; strongly effervescent; few fine irregular seams and filaments of calcium carbonate; mildly alkaline.

The mollic epipedon ranges from 10 to 19 inches in thickness. Depth to the Bk horizon ranges from 25 to 50 inches. The calcium carbonate equivalent in this horizon is less than 15 percent.

Manzano Series

The soils in the Manzano series are classified as fine-loamy, mixed, mesic Cumulic Haplustolls. These deep, well drained soils formed in mixed alluvium. They are on alluvial fans. Slope is 1 to 5 percent. Elevation is 6,500 to 7,300 feet. The average annual precipitation is 12 to 14 inches. The average annual air temperature is 48 to 52 degrees F, and the frost-free period is 115 to 135 days.

Typical pedon of Manzano loam, 1 to 5 percent slopes; about 1 mile southwest of the Grants-Milan Airport; 800 feet west and 1,700 feet north of the southeast corner of sec. 29, T. 11 N., R. 10 W.

A—0 to 4 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; common fine irregular pores; slightly effervescent; mildly alkaline; abrupt smooth boundary.

Bw—4 to 22 inches; brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common very fine and fine roots; common fine tubular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline; abrupt smooth boundary.

Bk1—22 to 49 inches; brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine roots; common fine irregular pores; violently effervescent; common medium irregular soft masses of calcium carbonate; moderately alkaline; clear smooth boundary.

Bk2—49 to 60 inches; dark yellowish brown (10YR 4/4) clay loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine irregular pores; strongly effervescent; common medium irregular soft masses of calcium carbonate; moderately alkaline.

The thickness of the mollic epipedon ranges from 20 to 30 inches. The Bw horizon is silt loam, loam, or clay loam. The Bk horizon is loam or clay loam. The calcium carbonate equivalent in this horizon is less than 15 percent.

The Manzano soils in this survey area have more calcium carbonate in the upper 22 inches than is defined as the range for the series. This difference, however, does not significantly affect the use and management of the soils.

McGaffey Series

The soils in the McGaffey series are classified as fine-loamy, mixed Cumulic Haploborolls. These deep, well drained soils formed in mixed alluvium. They are on fan terraces and valley floors. Slope is 1 to 5 percent. Elevation is 7,500 to 8,500 feet. The average annual precipitation is 18 to 22 inches. The average annual air temperature is 40 to 44 degrees F, and the frost-free period is 90 to 105 days.

Typical pedon of McGaffey loam, 1 to 5 percent slopes; about 5 miles west of the Ice Caves; 2,300 feet south and 800 feet west of the northeast corner of sec. 12, T. 9 N., R. 13 W.

A—0 to 3 inches; reddish brown (5YR 5/3) loam, dark reddish brown (5YR 3/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common fine irregular pores; neutral; abrupt smooth boundary.

Bw1—3 to 14 inches; reddish brown (5YR 5/3) loam, dark reddish brown (5YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common very fine roots; few fine tubular pores; neutral; clear smooth boundary.

Bw2—14 to 23 inches; reddish brown (5YR 5/3) clay loam, dark reddish brown (5YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common very fine and few fine roots; common very fine irregular pores; mildly alkaline; abrupt smooth boundary.

Bk—23 to 33 inches; reddish brown (5YR 4/3) loam, dark reddish brown (5YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; few very fine and fine roots; common fine tubular pores; strongly

effervescent; common fine irregular filaments, threads, and soft masses of calcium carbonate; mildly alkaline; clear smooth boundary.
C1—33 to 45 inches; reddish brown (5YR 5/4) loam, reddish brown (5YR 4/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few very fine roots; common fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.
C2—45 to 60 inches; reddish yellow (5YR 6/6) loam, yellowish red (5YR 5/6) moist; massive; slightly hard, slightly sticky and nonplastic; few very fine roots; common fine irregular pores; slightly effervescent; disseminated calcium carbonate; mildly alkaline.

The mollic epipedon ranges from 18 to 35 inches in thickness. The calcium carbonate equivalent in the Bk horizon is less than 7 percent. The C horizon is loam or clay loam.

Mespun Series

The soils in the Mespun series are classified as mixed, mesic Ustic Torripsamments. These deep, excessively drained soils formed in eolian material derived dominantly from sandstone. They are on dunes and ridges. Slope is 1 to 12 percent. Elevation is 5,900 to 7,100 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 48 to 53 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Mespun fine sand, in an area of Mespun-Palma association, 1 to 12 percent slopes; about 1 mile south of the old Roundy Ranch House; 1,300 feet west and 1,100 feet north of the southeast corner of sec. 17, T. 12 N., R. 9 W.

A—0 to 2 inches; yellowish brown (10YR 5/6) fine sand, dark yellowish brown (10YR 4/6) moist; single grain; loose, nonsticky and nonplastic; common very fine and few fine roots; common very fine irregular pores; mildly alkaline; abrupt smooth boundary.
C1—2 to 15 inches; reddish yellow (7.5YR 7/6) loamy fine sand, strong brown (7.5YR 5/6) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine irregular pores; mildly alkaline; clear smooth boundary.
C2—15 to 29 inches; reddish yellow (7.5YR 7/6) loamy fine sand, strong brown (7.5YR 5/6) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine irregular pores; mildly alkaline; gradual smooth boundary.
C3—29 to 60 inches; reddish yellow (7.5YR 6/6) fine sand, strong brown (7.5YR 5/6) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; common very fine irregular pores; mildly alkaline.

The A horizon is loamy sand or fine sand. The C horizon is fine sand, loamy sand, or loamy fine sand. It has hue of 5YR or 7.5YR, value of 5 to 7 (4 to 6 moist), and chroma of 5 or 6.

Microy Series

The soils in the Microy series are classified as fine, mixed Typic Argiborolls. These moderately deep, well drained soils formed in mixed alluvium. They are on hills. Slope is 5 to 30 percent. Elevation is 8,000 to 8,900 feet. The average annual precipitation is 18 to 22 inches. The average annual air temperature is 40 to 44 degrees F, and the frost-free period is 90 to 100 days.

Typical pedon of Microy cobbly loam, in an area of Microy-Rock outcrop complex, 5 to 30 percent slopes; about 100 feet southwest of the summit of Cerro Redondo; long. 107 degrees 29 minutes 36 seconds W. and lat. 35 degrees 17 minutes 39 seconds N.

A—0 to 3 inches; brown (7.5YR 4/2) cobbly loam, dark brown (7.5YR 3/2) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; few medium and common fine roots; many very fine irregular pores; about 15 percent cobble-sized and 10 percent pebble-sized cinders; neutral; abrupt smooth boundary.
Bt1—3 to 12 inches; dark reddish gray (5YR 4/2) cobbly clay, dark reddish brown (5YR 3/2) moist; moderate medium subangular blocky structure; very hard, firm, very sticky and plastic; few coarse and common medium and fine roots; many very fine tubular pores; common moderately thick clay films on faces of peds and in pores; about 15 percent cobble-sized and 15 percent pebble-sized cinders; neutral; clear smooth boundary.
Bt2—12 to 28 inches; reddish brown (5YR 4/3) cobbly clay, dark reddish brown (5YR 4/3) moist; strong medium prismatic structure parting to strong medium angular blocky; very hard, firm, very sticky and plastic; few coarse and very fine roots; common very fine tubular pores; many thick clay films on faces of peds and in pores; about 15 percent cobble-sized and 15 percent pebble-sized cinders; mildly alkaline; clear wavy boundary.
C—28 to 36 inches; reddish brown (5YR 4/3) very cobbly clay, reddish brown (5YR 4/3) moist; massive; very hard, firm, very sticky and plastic; few medium and very fine roots; few very fine irregular

pores; about 20 percent cobble-sized and 20 percent pebble-sized cinders; mildly alkaline; abrupt wavy boundary.
2R—36 inches; basalt.

The depth to bedrock ranges from 20 to 40 inches. The mollic epipedon ranges from 9 to 15 inches in thickness. Depth to the base of the Bt horizon ranges from 14 to 31 inches.

The A horizon has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 2 or 3. The content of rock fragments ranges from 15 to 35 percent, by volume, including 10 to 20 percent cobble-sized and 5 to 15 percent pebble-sized cinders.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 2 to 4. The content of rock fragments ranges from 15 to 35 percent, by volume, including 10 to 20 percent cobble-sized and 5 to 15 percent pebble-sized cinders.

The C horizon has hue of 5YR or 2.5YR. The content of rock fragments ranges from 20 to 40 percent, by volume, including 20 percent cobble-sized and 0 to 20 percent pebble-sized cinders.

Mikim Series

The soils in the Mikim soils are classified as fine-loamy, mixed (calcareous), mesic Ustic Torriorthents. These deep, well drained soils formed in mixed alluvium. They are on fan terraces and valley sides. Slope is 1 to 5 percent. Elevation is 5,800 to 6,800 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 51 to 53 degrees F, and the frost-free period is 120 to 150 days.

Typical pedon of Mikim loam, 1 to 5 percent slopes; about 1 mile south of Casa Blanca; 1,900 feet east and 2,360 feet north of the southwest corner of sec. 9, T. 9 N., R. 6 W.

A—0 to 4 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common fine and very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline; abrupt smooth boundary.
C1—4 to 11 inches; pale brown (10YR 6/3) sandy clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; common very fine and fine roots; common fine and very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.
C2—11 to 25 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; common very fine and few medium roots; few fine and very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.
C3—25 to 42 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; massive; hard, friable, sticky and slightly plastic; few very fine roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.
C4—42 to 60 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, slightly sticky and nonplastic; few very fine roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline.

Millpaw Series

The soils in the Millpaw series are classified as fine, mixed, mesic Pachic Argiustolls. These deep, well drained soils formed in mixed alluvium. They are in valleys and swales and on mesas. Slope is 0 to 5 percent. Elevation is 7,000 to 7,800 feet. The average annual precipitation is 14 to 16 inches. The average annual air temperature is 47 to 51 degrees F, and the frost-free period is 100 to 120 days.

Typical pedon of Millpaw loam, 0 to 5 percent slopes; about 1.5 miles west of the Towner Ranch House; 500 feet east and 160 feet south of the northwest corner of sec. 31, T. 5 N., R. 15 W.

A—0 to 3 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common fine vesicular pores; mildly alkaline; abrupt smooth boundary.
BA—3 to 8 inches; dark brown (10YR 4/3) clay loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; few very fine irregular pores; mildly alkaline; abrupt smooth boundary.
Bt1—8 to 19 inches; dark brown (10YR 4/3) clay, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; hard, friable, sticky and plastic; few fine and common very fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds and in pores; mildly alkaline; clear smooth boundary.
Bt2—19 to 29 inches; dark brown (10YR 4/3) clay, very dark grayish brown (10YR 3/2) moist; weak medium

subangular blocky structure; hard, friable, sticky and slightly plastic; few fine and common very fine roots; common very fine tubular pores; common thin clay films on faces of peds and in pores; mildly alkaline; abrupt smooth boundary.

Bt3—29 to 41 inches; brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine and very fine roots; few very fine irregular pores; few thin clay films in pores; slightly effervescent; mildly alkaline; abrupt smooth boundary.

Bk—41 to 60 inches; brownish yellow (10YR 6/6) sandy clay loam, yellowish brown (10YR 5/6) moist; massive; hard, friable, sticky and slightly plastic; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate and few small irregular soft masses of calcium carbonate; moderately alkaline.

The mollic epipedon ranges from 20 to 35 inches in thickness. The Bt horizon is clay or sandy clay in the upper part and sandy clay loam in the lower part. It has value of 4 or 5 (3 or 4 moist) and chroma of 2 or 3. The Bk horizon has hue of 10YR or 7.5YR, value of 5 or 6 (4 or 5 moist), and chroma of 4 to 6.

Mion Series

The soils in the Mion series are classified as clayey, mixed (calcareous), mesic, shallow Ustic Torriorthents. These shallow, well drained soils formed in colluvium and alluvium derived dominantly from shale. They are on hills, benches, and ridges. Slope is 3 to 65 percent. Elevation is 5,800 to 7,400 feet. The average annual precipitation is 10 to 14 inches. The average annual air temperature is 49 to 54 degrees F, and the average frost-free period is 115 to 160 days.

Typical pedon of Mion stony loam, in an area of Rock outcrop-Mion complex, 15 to 65 percent slopes; about 1 mile south of Sky City; 400 feet east and 1,700 feet north of the southwest corner of sec. 31, T. 8 N., R. 7 W.

A—0 to 3 inches; light olive brown (2.5Y 5/4) stony loam, olive brown (2.5Y 4/4) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; few fine and very fine roots; common fine irregular pores; about 10 percent stones, 5 percent cobbles, and 10 percent gravel; strongly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

C1—3 to 8 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, sticky and plastic; few fine and very fine roots; few very fine irregular pores; about 5 percent gravel; slightly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

C2—8 to 13 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable, slightly sticky and plastic; few fine and very fine roots; few very fine irregular pores; about 5 percent gravel; slightly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

2Cr—13 to 60 inches; grayish brown (2.5YR 5/2) shale.

The depth to shale ranges from 10 to 20 inches. The soils are mildly alkaline or moderately alkaline throughout. The content of rock fragments ranges from 0 to 35 percent.

The A horizon is stony loam or loam. It has hue of 10YR or 2.5Y, value of 4 to 6 (3 or 4 moist), and chroma of 2 to 4. The C horizon is clay, silty clay loam, or silty clay. It has hue of 10YR or 2.5Y, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 6.

Mirabal Series

The soils in the Mirabal series are classified as loamy-skeletal, mixed, nonacid, frigid Typic Ustorthents. These moderately deep, well drained soils formed in mixed alluvium and windblown sediments. They are on hills. Slope is 2 to 15 percent. Elevation is 8,100 to 8,800 feet. The average annual precipitation is 20 to 24 inches. The average annual air temperature is 40 to 44 degrees F, and the frost-free period is 85 to 105 days.

Typical pedon of Mirabal very gravelly loam, 2 to 15 percent slopes; about 1.5 miles southwest of Lookout Mountain; 1,550 feet east and 2,350 feet south of the northwest corner of sec. 10, T. 11 N., R. 14 W.

A—0 to 3 inches; brown (7.5YR 5/4) very gravelly loam, dark brown (10YR 4/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and few very fine and medium roots; common fine and very fine tubular pores; about 5 percent cobbles and 40 percent gravel; slightly acid; abrupt smooth boundary.

C1—3 to 14 inches; light brown (7.5YR 6/4) very gravelly loam, brown (7.5YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common medium and fine and few very fine roots; common very fine and few fine irregular pores; about 20 percent cobbles and 35 percent gravel; slightly acid; clear smooth boundary.

C2—14 to 21 inches; pink (5YR 7/3) very cobbly sandy clay loam, strong brown (7.5YR 4/6) moist; massive;

soft, very friable, nonsticky and nonplastic; few medium, fine, and very fine roots; common very fine irregular pores; about 30 percent cobbles and 30 percent gravel; slightly acid; abrupt smooth boundary.
2R—21 inches; granite.

Moncha Series

The soils in the Moncha series are classified as fine-silty, mixed, mesic Aridic Haplustalfs. These deep, well drained soils formed in alluvium derived dominantly from siltstone and shale. They are on fan terraces, in valleys, and on mesas. Slope is 2 to 10 percent. Elevation is 6,800 to 7,300 feet. The average annual precipitation is 12 to 14 inches. The average annual air temperature is 48 to 52 degrees F, and the frost-free period is 115 to 130 days.

Typical pedon of Moncha silt loam, 2 to 10 percent slopes; about 7 miles north of Atarque Lake; 640 feet east and 600 feet north of the southwest corner of sec. 30, T. 8 N., R. 18 W.

A—0 to 2 inches; light red (2.5YR 6/6) silt loam, reddish brown (2.5YR 4/4) moist; moderate fine granular structure; soft, very friable, slightly sticky and nonplastic; common very fine roots; slightly effervescent; disseminated calcium carbonate; moderately alkaline; abrupt smooth boundary.
Bt1—2 to 12 inches; red (2.5YR 5/6) silty clay loam, dark reddish brown (2.5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many fine tubular pores; few thin clay films on faces of peds and in pores; slightly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.
Bt2—12 to 21 inches; red (2.5YR 5/6) silty clay loam, dark reddish brown (2.5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many fine tubular pores; few thin clay films on faces of peds and in pores; slightly effervescent; disseminated calcium carbonate; moderately alkaline; gradual smooth boundary.
C1—21 to 38 inches; red (2.5YR 5/6) silty clay loam, reddish brown (2.5YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; common very fine irregular pores; slightly effervescent; disseminated calcium carbonate; moderately alkaline; gradual smooth boundary.
C2—38 to 60 inches; red (2.5YR 5/8) silty clay loam, red (2.5YR 4/6) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few very fine irregular pores; slightly effervescent; disseminated calcium carbonate; mildly alkaline.

The depth to the base of the Bt horizon is 14 to 30 inches. The Bt and C horizons are silty clay loam or silt loam. The content of clay in the Bt horizon is 25 to 35 percent.

Montecito Series

The soils in the Montecito series are classified as fine, mixed, mesic Aridic Haplustalfs. These deep, well drained soils formed in mixed alluvium. They are on mesas and hills, in valleys between lava ridges, and on ridges. Slope is 1 to 15 percent. Elevation is 6,800 to 7,500 feet. The average annual precipitation is 14 to 16 inches. The average annual air temperature is 47 to 52 degrees F, and the frost-free period is 100 to 120 days.

Typical pedon of Montecito fine sandy loam, 1 to 15 percent slopes; about 3 miles southwest of Fence Lake, 0.5 mile west of a gravel pit; 1,300 feet west and 120 feet south of the northeast corner of sec. 9, T. 4 N., R. 18 W.

A—0 to 5 inches; dark brown (10YR 4/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, friable, slightly sticky and nonplastic; common very fine and fine roots; common fine irregular pores; neutral; abrupt smooth boundary.
Bt—5 to 20 inches; brown (7.5YR 4/4) clay, dark brown (7.5YR 3/4) moist; moderate medium angular blocky structure; hard, firm, sticky and plastic; common very fine and fine roots; common fine irregular pores; common moderately thick clay films on faces of peds and in pores; neutral; abrupt smooth boundary.
Btk—20 to 30 inches; strong brown (7.5YR 4/6) clay, strong brown (7.5YR 4/6) moist; moderate medium prismatic structure; very hard, firm, sticky and plastic; common very fine and fine roots; few very fine tubular pores; common thick clay films on faces of peds and in pores; about 5 percent cobbles and 5 percent gravel; slightly effervescent; common medium irregular seams and soft masses of calcium carbonate; mildly alkaline; abrupt smooth boundary.
Bk1—30 to 42 inches; pink (7.5YR 8/4) gravelly clay loam, reddish yellow (7.5YR 6/6) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common fine irregular pores; about 10 percent cobbles and 25 percent gravel; violently effervescent; many coarse irregular

soft masses of calcium carbonate; mildly alkaline; clear smooth boundary.

Bk2—42 to 60 inches; pink (7.5YR 8/4) gravelly clay loam, pink (7.5YR 7/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine irregular pores; about 10 percent cobbles and 25 percent gravel; violently effervescent; many coarse irregular soft masses of calcium carbonate; mildly alkaline.

Depth to the Bk horizon is 25 to 35 inches. The content of rock fragments is less than 15 percent in the Bt horizon, but it may increase to as much as 40 percent in the lower part of the Bk horizon.

The A horizon is fine sandy loam or clay loam. It has hue of 7.5YR or 10YR, value of 4 or 5 (3 or 4 moist), and chroma of 3 or 4. The Bt horizon is clay or clay loam. It has hue of 7.5YR or 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 to 6. The Bk horizon is clay loam, clay, or sandy clay. It has 10 to 35 percent rock fragments. It has hue of 7.5YR or 10YR, value of 7 or 8 (6 or 7 moist), and chroma of 2 to 4.

Moreno Series

The soils in the Moreno series are classified as fine, mixed Typic Argiborolls. These deep, well drained soils formed in mixed alluvium. They are on fan terraces. Slope is 1 to 10 percent. Elevation is 7,800 to 8,200 feet. The average annual precipitation is 20 to 24 inches. The average annual air temperature is 40 to 44 degrees F, and the frost-free period is 90 to 110 days.

Typical pedon of Moreno loam, 1 to 10 percent slopes; about 1.25 miles south of Page; 2,200 feet west and 1,800 feet south of the northeast corner of sec. 5, T. 12 N., R. 15 W.

A—0 to 11 inches; reddish brown (5YR 5/3) loam, dark reddish brown (5YR 3/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine irregular pores; neutral; clear smooth boundary.

Bw—11 to 14 inches; yellowish red (5YR 5/6) loam, reddish brown (5YR 4/4) moist; moderate fine subangular blocky structure; hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine irregular pores; about 10 percent gravel; neutral; clear smooth boundary.

Bt1—14 to 20 inches; red (2.5YR 4/6) clay loam, dark red (2.5YR 3/6) moist; moderate fine subangular blocky structure; hard, very friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; common moderately thick clay films on faces of peds and in pores; about 10 percent gravel; neutral; clear smooth boundary.

Bt2—20 to 35 inches; reddish brown (2.5YR 4/4) clay, dark red (2.5YR 3/6) moist; moderate fine subangular blocky structure; hard, friable, sticky and slightly plastic; few very fine tubular pores; many thick clay films on faces of peds and in pores; about 10 percent gravel; mildly alkaline; clear smooth boundary.

Bt3—35 to 60 inches; red (2.5YR 5/6) very gravelly clay loam, red (2.5YR 4/6) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and slightly plastic; few very fine tubular pores; common moderately thick clay films on faces of peds and in pores; about 35 percent gravel; mildly alkaline.

The content of rock fragments ranges from 0 to 10 percent in the A horizon, from 0 to 15 percent in the upper part of the Bt horizon, and from 25 to 45 percent in the lower part of the Bt horizon. The Bt horizon is clay loam, clay, gravelly clay, or very gravelly clay loam.

Moreno Variant

The soils in the Moreno Variant are classified as fine-loamy, mixed Mollic Eutroboralfs. These deep, well drained soils formed in mixed alluvium. They are on fan terraces and toe slopes. Slope is 2 to 10 percent. Elevation is 8,000 to 8,300 feet. The average annual precipitation is 20 to 24 inches. The average annual air temperature is 40 to 44 degrees F, and the frost-free period is 85 to 105 days.

Typical pedon of Moreno Variant loam, 2 to 10 percent slopes; about 0.5 mile north of Johnny Mack Canyon; 180 feet west and 200 feet north of the southeast corner of sec. 6, T. 11 N., R. 14 W.

A—0 to 7 inches; dark brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and few medium roots; common very fine irregular pores; slightly acid; clear smooth boundary.

E1—7 to 13 inches; brown (7.5YR 5/4) very fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine irregular pores; neutral; clear smooth boundary.

E2—13 to 22 inches; strong brown (7.5YR 5/6) very fine sandy loam, strong brown (7.5YR 4/6) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine irregular pores; neutral; abrupt smooth boundary.

Bt1—22 to 35 inches; red (2.5YR 4/6) clay loam, reddish brown (2.5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; common very fine irregular and few fine tubular pores; many moderately thick clay films on faces of peds and in pores; neutral; clear smooth boundary.

Bt2—35 to 49 inches; red (2.5YR 5/6) clay loam, dark red (2.5YR 3/6) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and nonplastic; few very fine and fine roots; few very fine irregular and tubular pores; common moderately thick clay films on faces of peds and in pores; neutral; clear smooth boundary.

Bt3—49 to 60 inches; red (2.5YR 5/6) sandy clay loam, dark red (2.5YR 3/6) moist; weak fine subangular blocky structure; hard, friable, slightly sticky and nonplastic; few very fine and fine roots; few very fine irregular and tubular pores; few thin clay films on faces of peds and in pores; neutral.

Navajo Series

The soils in the Navajo series are classified as fine, mixed (calcareous), mesic Vertic Torrifluvents. These deep, well drained soils formed in mixed alluvium. They are on alluvial fans, in drainageways, and on flood plains. Slope is 1 to 5 percent. Elevation is 5,400 to 6,000 feet. The average annual precipitation is 7 to 10 inches. The average annual air temperature is 51 to 55 degrees F, and the frost-free period is 140 to 165 days.

Typical pedon of Navajo silty clay loam, 1 to 5 percent slopes; about 3 miles west of Suwanee; 2,376 feet west and 2,904 feet south of the northeast corner of sec. 7, T. 8 N., R. 3 W.

A—0 to 3 inches; reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; moderate fine granular structure; slightly hard, friable, sticky and plastic; common medium and fine roots; common very fine irregular pores; violently effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

C1—3 to 8 inches; reddish brown (5YR 4/4) silty clay, dark reddish brown (5YR 3/4) moist; massive; slightly hard, friable, sticky and plastic; common medium and fine roots; common very fine irregular pores; cracks more than 0.5 inch wide common during dry periods; violently effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

C2—8 to 32 inches; reddish brown (5YR 4/4) silty clay, dark reddish brown (5YR 3/4) moist; massive; very hard, firm, very sticky and very plastic; common very fine and fine roots; common very fine irregular pores; cracks more than 0.5 inch wide common during dry periods; common moderately thick slickensides; violently effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

C3—32 to 60 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; massive; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine irregular pores; violently effervescent; disseminated calcium carbonate; mildly alkaline.

The A horizon is silty clay loam or clay loam. It has hue of 2.5YR or 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 3 or 4. The C horizon is silty clay, clay, silty clay loam, or clay loam. It has hue of 2.5YR or 5YR, value of 4 or 5 (3 or 4 moist), and chroma of 3 or 4. In some pedons it has gypsum crystals in the lower part.

Netoma Series

The soils in the Netoma series are classified as coarse-loamy, gypsic, mesic Typic Gypsiorthids. These deep, well drained soils formed in alluvium derived dominantly from gypsiferous material. They are on fan terraces and hills. Slope is 2 to 12 percent. Elevation is 5,800 to 6,500 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Netoma sandy loam, 2 to 12 percent slopes; about 1 mile southeast of Chicken Mountain; 2,112 feet west and 1,584 feet north of the southeast corner of sec. 36, T. 6 N., R. 4 W.

A—0 to 4 inches; strong brown (7.5YR 5/6) sandy loam, dark brown (7.5YR 3/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; common very fine irregular pores; slightly effervescent; about 5 percent gravel; mildly alkaline; abrupt smooth boundary.

Bw—4 to 12 inches; strong brown (7.5YR 5/6) sandy loam, strong brown (7.5YR 4/6) moist; weak fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few fine and very fine roots; common very fine irregular pores; slightly effervescent; about 5 percent gravel; moderately alkaline; clear smooth boundary.

By1—12 to 22 inches; light brown (7.5YR 6/4), gypsiferous sandy loam, strong brown (7.5YR 4/6) moist; massive; soft, friable, nonsticky and

nonplastic; few fine and very fine roots; few very fine irregular pores; common medium nests of gypsum crystals; strongly effervescent; disseminated calcium carbonate; about 5 percent gravel; mildly alkaline; abrupt smooth boundary.

By2—22 to 37 inches; reddish yellow (7.5YR 6/6), gypsiferous sandy loam, strong brown (7.5YR 4/6) moist; massive; soft, friable, nonsticky and nonplastic; few very fine roots; few very fine irregular pores; common medium nests of gypsum crystals; strongly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

By3—37 to 60 inches; reddish yellow (7.5YR 6/6), gypsiferous sandy loam, strong brown (7.5YR 4/6) moist; massive; soft, friable, nonsticky and nonplastic; few very fine roots; few very fine irregular pores; common medium nests of gypsum crystals; strongly effervescent; disseminated calcium carbonate; mildly alkaline.

Depth to the gypsiferous material ranges from 5 to 15 inches. The content of rock fragments ranges from 0 to 10 percent throughout the profile.

Nogal Series

The soils in the Nogal series are classified as fine, mixed, mesic Aridic Haplustalfs. These moderately deep, well drained soils formed in alluvium derived dominantly from shale and sandstone. They are on mesas and hills. Slope is 1 to 10 percent. Elevation is 6,800 to 7,500 feet. The average annual precipitation is 14 to 16 inches. The average annual air temperature is 47 to 51 degrees F, and the frost-free period is 100 to 120 days.

Typical pedon of Nogal sandy loam, in an area of Nogal-Galestina sandy loams, 1 to 10 percent slopes; about 1.5 miles west of New Mexico Highway 32 and 3.25 miles south of the McKinley County line; 1,000 feet east and 1,180 feet south of the northwest corner of sec. 24, T. 8 N., R. 18 W.

A—0 to 1 inch; brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; common fine and very fine irregular pores; neutral; abrupt smooth boundary.

Bt1—1 to 7 inches; brown (7.5YR 4/4) clay loam, dark brown (7.5YR 3/4) moist; weak medium subangular blocky structure; slightly hard, firm, sticky and slightly plastic; many fine and very fine roots; common fine and very fine irregular pores; few thin clay films on faces of peds and in pores; neutral; clear smooth boundary.

Bt2—7 to 15 inches; brown (7.5YR 4/4) clay, dark brown (7.5YR 3/4) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; common fine and very fine roots; common very fine tubular pores; common thick clay films on faces of peds and in pores; neutral; clear smooth boundary.

Bt3—15 to 19 inches; brown (7.5YR 4/4) clay, brown (7.5YR 4/4) moist; moderate medium prismatic structure parting to strong medium angular blocky; hard, firm, very sticky and plastic; few very fine roots; few very fine tubular pores; many thick clay films on faces of peds and in pores; slightly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

Bk—19 to 31 inches; strong brown (7.5YR 5/6) clay, strong brown (7.5YR 4/6) moist; massive; hard, firm, sticky and slightly plastic; few very fine roots; few very fine irregular pores; strongly effervescent; few medium irregular soft masses of calcium carbonate; moderately alkaline; abrupt smooth boundary.

Cr—31 inches; interbedded shale and sandstone.

The depth to paralithic contact is 20 to 40 inches. Depth to the base of the argillic horizon is 16 to 35 inches. The calcium carbonate equivalent in the Bk horizon is 1 to 14 percent.

Oelop Series

The soils in the Oelop series are classified as fine-loamy, mixed, mesic Ustollic Haplargids. These deep, well drained soils formed in mixed alluvium. They are in the lower areas on mesas and in swales and drainageways. Slope is 0 to 3 percent. Elevation is 6,000 to 6,800 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Oelop loam, in an area of Harvey-Oelop association, 0 to 5 percent slopes; about 4.5 miles southwest of South Garcia; 2,480 feet east and 100 feet north of the southwest corner of sec. 33, T. 8 N., R. 3 W.

A—0 to 3 inches; dark yellowish brown (10YR 4/4) loam, dark yellowish brown (10YR 3/4) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; few fine and medium roots; few fine irregular pores; mildly alkaline; abrupt smooth boundary.

Bt1—3 to 8 inches; dark yellowish brown (10YR 4/4) clay loam, dark yellowish brown (10YR 3/4) moist;

moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and medium roots; few fine tubular pores; common moderately thick clay films on faces of peds and in pores; mildly alkaline; clear smooth boundary.

Bt2—8 to 16 inches; dark yellowish brown (10YR 4/4) clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and medium and common fine roots; few fine tubular pores; common moderately thick clay films on faces of peds and in pores; mildly alkaline; clear smooth boundary.

Bk1—16 to 34 inches; dark yellowish brown (10YR 4/4) clay loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, friable, sticky and plastic; few very fine and fine roots; few fine irregular pores; slightly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.

Bk2—34 to 44 inches; dark yellowish brown (10YR 4/4) loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine irregular pores; strongly effervescent; few fine irregular filaments of calcium carbonate; moderately alkaline; clear smooth boundary.

Bk3—44 to 60 inches; dark yellowish brown (10YR 4/4) loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine irregular pores; strongly effervescent; few fine irregular seams and filaments of calcium carbonate; moderately alkaline.

Depth to the base of the Bt horizon is 15 to 30 inches. The content of rock fragments ranges from 0 to 5 percent throughout the profile.

The A horizon has hue of 7.5YR or 10YR and value of 4 to 6 (3 to 5 moist). The Bt horizon is loam or clay loam. It has hue of 7.5YR or 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 3 or 4. The Bk horizon has hue of 7.5YR or 10YR, value of 4 to 7 (4 or 5 moist), and chroma of 3 to 6. The calcium carbonate equivalent in this horizon is less than 10 percent.

Paguate Series

The soils in the Paguate series are classified as fine, mixed, mesic Aridic Haplustalfs. These moderately deep, well drained soils formed in alluvium and windblown sediments. They are on basalt-capped mesas and plateaus. Slope is 1 to 5 percent. Elevation is 7,000 to 8,000 feet. The average annual precipitation is 14 to 16 inches. The average annual air temperature is 47 to 52 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Paguate loam, in an area of Paguate-Hackroy complex, 1 to 5 percent slopes; about 4 miles west of Bibo; long. 107 degrees 25 minutes 08 seconds W. and lat. 35 degrees 11 minutes 53 seconds N.

A—0 to 3 inches; dark brown (7.5YR 4/4) loam, dark brown (7.5YR 3/4) moist; moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; few fine and common very fine roots; common fine irregular pores; about 10 percent gravel; neutral; abrupt smooth boundary.

BA—3 to 8 inches; reddish brown (5YR 4/4) clay loam, dark reddish brown (5YR 3/4) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; few medium and common very fine roots; few fine tubular pores; neutral; clear smooth boundary.

Bt1—8 to 16 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; weak medium prismatic structure parting to moderate fine subangular blocky; very hard, firm, sticky and plastic; few medium and common very fine roots; few fine tubular pores; common moderately thick clay films on faces of peds and in pores; mildly alkaline; clear smooth boundary.

Bt2—16 to 19 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; moderate medium prismatic structure parting to strong medium subangular blocky; very hard, firm, sticky and plastic; few fine and common very fine roots; few very fine tubular pores; mildly alkaline; abrupt smooth boundary.

Bk—19 to 33 inches; pink (5YR 7/3) gravelly clay loam, light reddish brown (5YR 6/3) moist; massive; soft, friable, slightly sticky and slightly plastic; about 20 percent gravel; violently effervescent; disseminated calcium carbonate and many medium irregular soft masses of calcium carbonate; moderately alkaline; abrupt smooth boundary.

2R—33 inches; basalt.

The depth to bedrock is 20 to 40 inches. Depth to the base of the Bt horizon, or the top of the Bk horizon, is 11 to 33 inches.

The A horizon is loam or cobbly clay loam. The content of rock fragments ranges from 0 to 20 percent. This horizon has value of 4 to 6 (3 to 5 moist) and chroma of 3 or 4.

The content of rock fragments in the BA horizon ranges from 0 to 15 percent. This horizon has hue of

5YR or 7.5YR, value of 4 to 6 (3 or 4 moist), and chroma of 3 or 4.

The Bt horizon is clay or gravelly clay. The content of rock fragments ranges from 0 to 20 percent. This horizon has hue of 5YR or 7.5YR, value of 4 to 6 (3 or 4 moist), and chroma of 3 to 6.

The Bk horizon is gravelly clay loam or clay loam. The content of rock fragments ranges from 10 to 30 percent. This horizon has hue of 5YR or 7.5YR, value of 6 to 8 (5 to 7 moist), and chroma of 3 to 6. The calcium carbonate equivalent is 25 to 40 percent.

Palma Series

The soils in the Palma series are classified as coarse-loamy, mixed, mesic Ustollic Haplargids. These deep, well drained soils formed in eolian material derived dominantly from sandstone. They are on stable sand dunes and in interdune areas. Slope is 1 to 7 percent. Elevation is 5,900 to 7,100 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 48 to 52 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Palma loamy fine sand, in an area of Mespun-Palma association, 1 to 12 percent slopes; about 1 mile east of the Roundy Ranch House; 1,800 feet west and 1,620 feet north of the southeast corner of sec. 9, T. 12 N., R. 9 W.

A—0 to 4 inches; light brown (7.5YR 6/4) loamy fine sand, brown (7.5YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common very fine irregular pores; mildly alkaline; abrupt smooth boundary.

Bt1—4 to 11 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; few very fine irregular pores; few thin clay films coating sand grains; mildly alkaline; clear smooth boundary.

Bt2—11 to 21 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine, fine, and medium roots; few very fine tubular pores; few thin clay films coating and bridging sand grains; mildly alkaline; abrupt smooth boundary.

Bk1—21 to 32 inches; reddish yellow (7.5YR 6/6) sandy loam, strong brown (7.5YR 5/6) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine irregular pores; slightly effervescent; few fine irregular seams and filaments of calcium carbonate; moderately alkaline; clear smooth boundary.

Bk2—32 to 60 inches; reddish yellow (7.5YR 6/6) sandy loam, strong brown (7.5YR 5/6) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine irregular pores; strongly effervescent; few fine irregular seams, filaments, and soft masses of calcium carbonate; moderately alkaline.

The Bk horizon is fine sandy loam or sandy loam.

Parkay Series

The soils in the Parkay series are classified as loamy-skeletal, mixed Argic Pachic Cryoborolls. These deep, well drained soils formed in colluvium and alluvium derived dominantly from basalt and andesite. They are on mountains, hills, and ridges. Slope is 15 to 45 percent. Elevation is 8,200 to 10,300 feet. The average annual precipitation is 22 to 26 inches. The average annual air temperature is 36 to 42 degrees F, and the frost-free period is 60 to 80 days.

Typical pedon of Parkay stony loam, in an area of Parkay-Rock outcrop complex, 15 to 45 percent slopes; about 1.5 miles southwest of Big Lake; long. 107 degrees 32 minutes 00 seconds W. and lat. 35 degrees 15 minutes 01 second N.

Oi—1 inch to 0; thin covering of partly decomposed fir and pine needles and aspen leaves.

A1—0 to 2 inches; dark grayish brown (10YR 4/2) stony loam, black (10YR 2/1) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; common very fine irregular pores; about 5 percent stones, 5 percent cobbles, and 15 percent gravel; mildly alkaline; abrupt smooth boundary.

A2—2 to 8 inches; dark grayish brown (10YR 4/2) very gravelly sandy clay loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; few medium and common very fine roots; common very fine irregular pores; about 10 percent cobbles and 25 percent gravel; neutral; clear smooth boundary.

Bt1—8 to 20 inches; brown (7.5YR 5/4) very cobbly sandy clay loam, dark brown (7.5YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; few medium and common very fine roots; common very fine tubular and irregular pores; few thin clay films on faces of peds and in pores; about 15 percent cobbles and 25 percent gravel; slightly acid; clear smooth boundary.

Bt2—20 to 23 inches; brown (7.5YR 5/4) very cobbly sandy clay loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; few coarse and common very fine roots; common very fine tubular pores; few thin clay films on faces of peds and in pores; about 15 percent cobbles and 25 percent gravel; slightly acid; clear smooth boundary.

C1—23 to 35 inches; brown (7.5YR 5/4) very cobbly sandy clay loam, dark brown (7.5YR 3/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few coarse and common very fine roots; common very fine irregular pores; about 25 percent cobbles and 20 percent gravel; neutral; abrupt smooth boundary.

C2—35 to 60 inches; light brown (7.5YR 6/4) very cobbly sandy clay loam, dark brown (7.5YR 4/4) moist; massive; hard, friable; slightly sticky and slightly plastic; few fine and very fine roots; common very fine irregular pores; about 30 percent cobbles and 20 percent gravel; neutral.

The content of rock fragments in the control section ranges from 35 to 60 percent. Depth to the base of the Bt horizon ranges from 20 to 30 inches. The thickness of the mollic epipedon ranges from 20 to 24 inches.

The Bt horizon is very gravelly sandy clay loam, very cobbly sandy clay loam, or very cobbly clay loam. The C horizon is very cobbly sandy clay loam or extremely cobbly sandy clay loam. The content of rock fragments in this horizon ranges from 40 to 70 percent, including 25 to 45 percent cobbles and 15 to 25 percent gravel.

Penistaja Series

The soils in the Penistaja series are classified as fine-loamy, mixed, mesic Ustollic Haplargids. These deep, well drained soils formed in alluvium and eolian material derived dominantly from sandstone. They are on cuestas and ridges, in valleys between lava ridges and in other valleys, and on fan terraces. Slope is 0 to 10 percent. Elevation is 5,700 to 7,000 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 48 to 53 degrees F, and the frost-free period is 115 to 140 days.

Typical pedon of Penistaja fine sandy loam, 2 to 10 percent slopes; about 2.25 miles north of Anaconda Mill; 400 feet west and 2,000 feet north of the southeast corner of sec. 6, T. 12 N., R. 10 W.

A—0 to 2 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 3/4) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine irregular pores; neutral; abrupt smooth boundary.

BA—2 to 6 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine tubular pores; few thin clay films in pores; neutral; abrupt smooth boundary.

Bt1—6 to 16 inches; strong brown (7.5YR 4/6) sandy clay loam, brown (7.5YR 4/4) moist; strong medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine tubular pores; many moderately thick clay films on faces of peds and in pores; mildly alkaline; clear smooth boundary.

Bt2—16 to 22 inches; strong brown (7.5YR 5/6) sandy clay loam, strong brown (7.5YR 4/6) moist; moderate medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common very fine and fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds and in pores; mildly alkaline; abrupt smooth boundary.

Bk—22 to 53 inches; light brown (7.5YR 6/4) sandy loam, strong brown (7.5YR 5/6) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine irregular pores; violently effervescent; disseminated calcium carbonate and common medium rounded soft masses of calcium carbonate; moderately alkaline; clear smooth boundary.

C—53 to 60 inches; reddish yellow (7.5YR 6/6) sandy loam, strong brown (7.5YR 5/6) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline.

Depth to the base of the Bt horizon is 13 to 35 inches. In some pedons this horizon is slightly calcareous. The calcium carbonate equivalent is less than 15 percent in the upper 40 inches. In some pedons the soils have as much as 15 percent gravel throughout. In other pedons buried horizons are below a depth of 40 inches.

The A horizon is fine sandy loam or sandy loam. It has hue of 5YR to 10YR, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 4. The Bt horizon is sandy clay loam or clay loam. It has hue of 5YR or 7.5YR, value of 4 to 6 (4 or 5 moist), and chroma of 4 to 6. The Bk and C horizons are sandy loam, fine sandy loam, sandy clay loam, or loam. They have hue of 5YR to 10YR, value of 5 to 8 (4 to 6 moist), and chroma of 3 to 6.

Pinitos Series

The soils in the Pinitos series are classified as fine-loamy, mixed, mesic Aridic Haplustalfs. These deep, well drained soils formed in wind-modified alluvium derived dominantly from sandstone. They are on hills and mesa tops. Slope is 1 to 10 percent. Elevation is 6,800 to 7,500 feet. The average annual precipitation is 14 to 16 inches. The average annual air temperature is 47 to 51 degrees F, and the frost-free period is 100 to 120 days.

Typical pedon of Pinitos sandy loam, in an area of Pinitos-Ribera sandy loams, 1 to 10 percent slopes; about 1 mile east of Balok Ranch; 1,080 feet west and 700 feet north of the southwest corner of sec. 3, T. 8 N., R. 16 W.

A—0 to 2 inches; light brown (7.5YR 6/4) sandy loam, brown (7.5YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine irregular pores; neutral; clear smooth boundary.

Bt1—2 to 6 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common very fine and fine and few medium roots; common very fine irregular and few very fine tubular pores; few thin clay films on faces of peds and in pores; neutral; clear smooth boundary.

Bt2—6 to 14 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and slightly plastic; common fine and very fine and few medium roots; common fine tubular pores; many moderately thick clay films on faces of peds and in pores; mildly alkaline; clear smooth boundary.

Bt3—14 to 24 inches; light brown (7.5YR 6/4) sandy clay loam, dark brown (7.5YR 4/4) moist; weak coarse subangular blocky structure; hard, friable, slightly sticky and nonplastic; common very fine and few fine roots; few fine tubular pores; few thin clay films in pores and on faces of peds; mildly alkaline; abrupt smooth boundary.

Bk1—24 to 38 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/6) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; few very fine irregular pores; slightly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

Bk2—38 to 60 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/6) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few very fine irregular pores; strongly effervescent; common medium irregular soft masses of calcium carbonate; mildly alkaline.

Depth to the base of the Bt horizon and to an accumulation of calcium carbonate is 18 to 31 inches. The Bt horizon is sandy clay loam or clay loam. The Bk horizon is sandy loam or sandy clay loam. The calcium carbonate equivalent in this horizon is 1 to 10 percent.

Pojoaque Series

The soils in the Pojoaque series are classified as fine-loamy, mixed (calcareous), mesic Ustic Torriorthents. These deep, well drained soils formed in alluvium and colluvium derived dominantly from sandstone and shale. They are on mesa breaks. Slope is 5 to 30 percent. Elevation is 6,200 to 6,900 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Pojoaque very cobbly loam, in an area of Poley-Pojoaque very cobbly loams, 5 to 30 percent slopes; about 3 miles southeast of Marquez on New Mexico State Road 279; long. 107 degrees 15 minutes 44.6 seconds W. and lat. 35 degrees 15 minutes 32 seconds N.

A1—0 to 3 inches; brown (10YR 4/3) very cobbly loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, nonsticky and slightly plastic; few coarse, common fine, and many very fine roots; few fine irregular pores; about 5 percent stones, 20 percent cobbles, and 20 percent gravel; strongly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

A2—3 to 7 inches; brown (10YR 5/3) gravelly clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few coarse and many very fine roots; few fine irregular pores; about 5 percent cobbles and 25 percent gravel; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

Ck1—7 to 30 inches; light yellowish brown (10YR 6/4) cobbly clay loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few coarse and common very fine roots; common very fine irregular pores; about 10 percent cobbles and 15 percent gravel; violently

effervescent; few fine irregular soft masses of calcium carbonate; moderately alkaline; clear smooth boundary.

Ck2—30 to 45 inches; very pale brown (10YR 7/3) gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common very fine irregular pores; about 5 percent cobbles and 25 percent gravel; violently effervescent; common fine irregular soft masses of calcium carbonate; moderately alkaline; clear smooth boundary.

Ck3—45 to 60 inches; very pale brown (10YR 7/3) gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and nonplastic; few fine and common very fine roots; about 5 percent cobbles and 20 percent gravel; violently effervescent; common medium irregular soft masses of calcium carbonate; mildly alkaline.

A few stones are on the surface. The content of rock fragments in the A horizon ranges from 30 to 60 percent. The C horizon is gravelly sandy clay loam, cobbly clay loam, or gravelly clay loam. The content of rock fragments in this horizon ranges from 15 to 35 percent. The calcium carbonate equivalent ranges from 5 to 15 percent.

Poley Series

The soils in the Poley series are classified as fine, mixed, mesic Ustollic Haplargids. These deep, well drained soils formed in alluvium and colluvium derived dominantly from shale. They are on benches, ridges, hills, and mesa breaks. Slope is 2 to 30 percent. Elevation is 5,800 to 7,100 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Poley very cobbly loam, in an area of Poley-Rock outcrop complex, 2 to 25 percent slopes; about 1 mile west of Chicken Mountain; 2,100 feet east and 100 feet north of the southwest corner of sec. 28, T. 6 N., R. 4 W.

A—0 to 3 inches; reddish brown (5YR 4/4) very cobbly loam, reddish brown (5YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common fine irregular pores; about 5 percent stones, 15 percent cobbles, and 15 percent gravel; slightly effervescent; disseminated calcium carbonate; neutral; abrupt smooth boundary.

Bt—3 to 12 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; strong medium subangular blocky structure; hard, firm, sticky and plastic; few coarse and fine and common very fine roots; common fine tubular pores; many thick clay films on faces of peds and in pores; about 1 percent cobbles; mildly alkaline; abrupt smooth boundary.

Btk—12 to 22 inches; yellowish red (5YR 5/6) clay, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; few coarse and very fine roots; common fine tubular pores; common moderately thick clay films on faces of peds and in pores; about 1 percent cobbles; violently effervescent; common coarse irregular soft masses of calcium carbonate; moderately alkaline; gradual smooth boundary.

Bk1—22 to 49 inches; light reddish brown (5YR 6/4) clay, reddish brown (5YR 5/4) moist; massive; hard, firm, sticky and plastic; few coarse and very fine roots; common fine tubular pores; about 10 percent cobbles and 5 percent gravel; violently effervescent; common coarse irregular soft masses of calcium carbonate; moderately alkaline; clear smooth boundary.

Bk2—49 to 60 inches; pink (5YR 7/3) clay loam, light reddish brown (5YR 6/4) moist; massive; soft, friable, slightly sticky and slightly plastic; few very fine roots; few very fine irregular pores; about 10 percent cobbles; violently effervescent; many coarse irregular soft masses of calcium carbonate; strongly alkaline.

The A horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 or 4. The content of rock fragments ranges from 35 to 50 percent.

The Bt horizon is clay or clay loam. It has hue of 5YR to 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 3 to 6. The content of rock fragments ranges from 0 to 15 percent.

The Bk horizon is loam, clay, or clay loam. It has hue of 5YR to 10YR. The content of rock fragments ranges from 0 to 15 percent. The calcium carbonate equivalent is 15 to 30 percent.

Quintana Series

The soils in the Quintana series are classified as fine-loamy, mixed, mesic Typic Ustochrepts. These deep, well drained soils formed in wind-modified, mixed alluvium. They are in valleys and on ridges and terraces. Slope is 5 to 15 percent. Elevation is 6,400 to 6,900 feet. The average annual precipitation is 12 to 14 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 115 to 130 days.

Typical pedon of Quintana fine sandy loam, in an area of Flugle-Quintana complex, 2 to 15 percent slopes; about 1.5 miles north of Thompson Draw; 1,750 feet south and 180 feet east of the northwest corner of sec. 6, T. 7 N., R. 19 W.

A—0 to 2 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 5/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

Bw—2 to 11 inches; brown (7.5YR 5/4) fine sandy loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; soft, friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

Bk1—11 to 33 inches; pink (7.5YR 7/4) loam, light brown (7.5YR 6/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; common very fine irregular pores; violently effervescent; common medium irregular seams and filaments of calcium carbonate; moderately alkaline; clear smooth boundary.

Bk2—33 to 46 inches; pink (7.5YR 7/4) sandy clay loam, light brown (7.5YR 6/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few very fine roots; few fine tubular pores; violently effervescent; common medium irregular seams and filaments of calcium carbonate; moderately alkaline; clear smooth boundary.

Bk3—46 to 60 inches; pink (7.5YR 7/4) sandy loam, light brown (7.5YR 6/4) moist; massive; soft, friable, nonsticky and nonplastic; few very fine roots; common very fine irregular pores; violently effervescent; few fine irregular seams and filaments of calcium carbonate; moderately alkaline.

The A horizon is sandy loam or fine sandy loam. It has value of 5 or 6 (4 or 5 moist) and chroma of 3 or 4. The Bw horizon is fine sandy loam or sandy clay loam. It has hue of 10YR or 7.5YR, value of 5 or 6 (4 or 5 moist), and chroma of 3 or 4. The Bk horizon is sandy clay loam, sandy loam, loam, clay loam, or fine sandy loam. It has value of 4 to 8 (4 to 7 moist) and chroma of 4 to 6.

The Quintana soils in this survey receive less annual precipitation and more precipitation in winter than is defined as the range for the series. These differences, however, do not significantly affect the use and management of the soils.

Rana Series

The soils in the Rana series are classified as very fine, montmorillonitic (calcareous), mesic Ustertic Torriorthents. These deep, well drained soils formed in alluvium and colluvium derived dominantly from red-bed shale. They are on mesa breaks. Slope is 2 to 25 percent. Elevation is 5,800 to 7,800 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Rana very cobbly clay, in an area of Rana-Rock outcrop complex, 2 to 25 percent slopes; about 8 miles southwest of the headquarters of Harrington Ranch; 1,600 feet east and 990 feet south of the northwest corner of sec. 3, T. 6 N., R. 5 W.

A—0 to 3 inches; red (2.5YR 4/6) very cobbly clay, yellowish red (5YR 4/6) moist; strong fine granular structure; soft, firm, sticky and plastic; few very fine and common fine and medium roots; common very fine irregular pores; about 30 percent cobbles and 10 percent gravel; strongly effervescent; disseminated calcium carbonate; moderately alkaline; abrupt smooth boundary.

C1—3 to 20 inches; red (2.5YR 4/6) clay, yellowish red (5YR 4/6) moist; massive; very hard, very firm, very sticky and very plastic; few very fine and common fine and medium roots; few very fine irregular and few fine tubular pores; few small slickensides; strongly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.

C2—20 to 34 inches; red (2.5YR 4/6) clay, yellowish red (5YR 4/6) moist; massive; very hard, very firm, very sticky and very plastic; few very fine and fine roots; few very fine irregular and few fine tubular pores; strongly effervescent; few fine irregular seams and filaments of calcium carbonate; moderately alkaline; clear smooth boundary.

C3—34 to 52 inches; red (2.5YR 4/6) clay, dark red (2.5YR 3/6) moist; massive; very hard, firm, sticky and plastic; few very fine roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; strongly alkaline; gradual wavy boundary.

C4—52 to 60 inches; reddish brown (2.5YR 4/4) clay, red (2.5YR 4/6) moist; massive; very hard, firm, sticky and plastic; few very fine irregular pores; about 5 percent pebble-sized shale fragments; strongly effervescent; disseminated calcium carbonate; strongly alkaline.

The content of rock fragments in the A horizon ranges from 35 to 55 percent. The content of rock

fragments, mainly shale, in the C horizon is less than 10 percent. Most of the fragments are in the lower part of the horizon.

Raton Series

The soils in the Raton series are classified as clayey-skeletal, mixed Lithic Argiborolls. These shallow and very shallow, well drained soils formed in windblown sediments and mixed alluvium. They are on mesas, in depressions and swales, and on basalt plains, ridges, and hills. Slope is 1 to 10 percent. Elevation is 7,200 to 8,800 feet. The average annual precipitation is 16 to 24 inches. The average annual air temperature is 40 to 45 degrees F, and the frost-free period is 80 to 110 days.

Typical pedon of Raton very cobbly loam, in an area of Raton-Rock outcrop complex, 1 to 10 percent slopes; about 1.5 miles southwest of "Hole in the Wall"; 400 feet west and 2,400 feet south of the northeast corner of sec. 26, T. 7 N., R. 12 W.

Oi—1 inch to 0; pine needles and leaves.
A—0 to 5 inches; dark reddish brown (5YR 3/3) very cobbly loam, dark reddish brown (5YR 2.5/2) moist; moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine and common fine roots; common very fine irregular pores; about 30 percent cobbles, 5 percent stones, and 10 percent gravel; neutral; clear smooth boundary.
Bt1—5 to 9 inches; reddish brown (5YR 4/3) very cobbly clay, dark reddish brown (5YR 3/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine and common coarse roots; common fine tubular pores; common moderately thick clay films on faces of peds and in pores; about 30 percent cobbles and 10 percent gravel; neutral; clear wavy boundary.
Bt2—9 to 13 inches; reddish brown (5YR 4/4) very cobbly clay, dark reddish brown (5YR 3/4) moist; moderate medium subangular blocky structure; very hard, very firm, sticky and plastic; few very fine and fine and common coarse roots; few fine tubular pores; common moderately thick clay films on faces of peds and in pores; about 45 percent cobbles and 10 percent gravel; neutral; abrupt smooth boundary.
2R—13 inches; basalt.

The depth to bedrock ranges from 6 to 20 inches. The mollic epipedon is 6 to 14 inches thick.

The A horizon is very cobbly or cobbly loam. The content of rock fragments ranges from 25 to 60 percent, by volume, including 0 to 15 percent stones, 20 to 35 percent cobbles, and 5 to 10 percent gravel. This horizon has hue of 5YR to 10YR, value of 3 to 5 (2 or 3 moist), and chroma of 2 or 3.

The Bt horizon is very cobbly clay or very cobbly clay loam. The content of rock fragments ranges from 40 to 60 percent, by volume, including 0 to 5 percent stones, 35 to 45 percent cobbles, and 5 to 10 percent gravel. This horizon has hue of 5YR or 7.5YR, value of 3 to 5 dry or moist, and chroma of 2 to 4.

Ribera Series

The soils in the Ribera series are classified as fine-loamy, mixed, mesic Aridic Haplustalfs. These moderately deep, well drained soils formed in wind-modified alluvium derived dominantly from sandstone. They are on hills and mesas. Slope is 1 to 10 percent. Elevation is 6,800 to 7,500 feet. The average annual precipitation is 14 to 16 inches. The average annual air temperature is 47 to 51 degrees F, and the frost-free period is 100 to 120 days.

Typical pedon of Ribera sandy loam, in an area of Pinitos-Ribera sandy loams, 1 to 10 percent slopes; about 7 miles north of Beggs Cattle Camp; 150 feet west and 890 feet south of the northeast corner of sec. 27, T. 8 N., R. 18 W.

A—0 to 3 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine irregular pores; neutral; abrupt smooth boundary.
BA—3 to 6 inches; brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; few very fine and fine irregular pores; neutral; clear smooth boundary.
Bt1—6 to 10 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine tubular pores; common thin clay films on faces of peds and in pores; mildly alkaline; clear smooth boundary.
Bt2—10 to 16 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; strong medium subangular blocky structure; hard, firm, sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; many moderately thick clay films on faces of peds and in pores; mildly alkaline; clear smooth boundary.

Bk1—16 to 27 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and slightly plastic; few very fine roots; few very fine irregular pores; strongly effervescent; few fine irregular seams and filaments of calcium carbonate; mildly alkaline; abrupt smooth boundary.
Bk2—27 to 39 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; massive; hard, firm, sticky and slightly plastic; few very fine roots; few very fine irregular pores; violently effervescent; common medium irregular seams and filaments of calcium carbonate; moderately alkaline; abrupt smooth boundary.
2R—39 inches; sandstone.

The depth to bedrock is 20 to 40 inches. Depth to the base of the Bt horizon is 11 to 25 inches. This horizon is sandy clay loam or clay loam. The calcium carbonate equivalent in the Bk horizon is less than 15 percent.

Rizozo Series

The soils in the Rizozo series are classified as loamy, mixed (calcareous), mesic Lithic Ustic Torriorthents. These shallow and very shallow, well drained soils formed in eolian material derived dominantly from sandstone. They are on hills, ridges, and mesas. Slope is 3 to 55 percent. Elevation is 6,000 to 6,700 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Rizozo loam, in an area of Bond-Rizozo-Rock outcrop complex, 2 to 20 percent slopes; about 2 miles southeast of Harrington Ranch House; 250 feet south and 1,600 feet west of the northeast corner of sec. 4, T. 5 N., R. 3 W.

A—0 to 2 inches; reddish brown (5YR 5/4) loam, reddish brown (5YR 4/4) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; common very fine irregular pores; slightly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.
C—2 to 14 inches; reddish brown (5YR 5/4) loam, reddish brown (5YR 4/4) moist; massive; soft, very friable, slightly sticky and nonplastic; few very fine roots; common very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline; abrupt smooth boundary.
2R—14 inches; sandstone.

The depth to bedrock is 4 to 20 inches. The content of rock fragments ranges from 0 to 15 percent in the A and C horizons. These horizons are sandy loam or loam. The A horizon has hue of 2.5YR or 5YR, value of 3 or 4 dry or moist, and chroma of 4 or 5. The C horizon has hue of 2.5YR or 5YR, value of 3 or 4 dry or moist, and chroma of 4 to 6.

The Rizozo soil in map unit 434 has less silt than is defined as the range for the series. This difference, however, does not significantly affect the use and management of the soil.

Saido Series

The soils in the Saido series are classified as coarse-silty, gypsic, mesic Typic Gypsiorthids. These deep, well drained soils formed in alluvium derived dominantly from gypsiferous material. They are on fans and knolls. Slope is 1 to 12 percent. Elevation is 5,500 to 6,400 feet. The average annual precipitation is 8 to 12 inches. The average annual air temperature is 51 to 53 degrees F, and the frost-free period is 130 to 150 days.

Typical pedon of Saido loam, 1 to 12 percent slopes; about 7 miles south of Interstate 40 from the New Mexico Highway 6 exit; 528 feet west and 515 feet north of the southeast corner of sec. 19, T. 8 N., R. 3 W.

A—0 to 2 inches; reddish brown (5YR 5/4) loam, reddish brown (5YR 4/4) moist; weak fine granular structure; soft, friable, slightly sticky and nonplastic; common very fine and few fine roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.
By1—2 to 11 inches; white (10YR 8/1), gypsiferous loam, very pale brown (10YR 7/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine, fine, and medium roots; few very fine irregular pores; common medium nests of gypsum; slightly effervescent; disseminated calcium carbonate; neutral; gradual wavy boundary.
By2—11 to 25 inches; white (10YR 8/1), gypsiferous loam, very pale brown (10YR 7/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few very fine irregular pores; common medium nests of gypsum; strongly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.
By3—25 to 32 inches; white (10YR 8/2), gypsiferous loam, very pale brown (10YR 7/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine irregular pores; common medium nests of

gypsum; violently effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

By4—32 to 44 inches; very pale brown (10YR 8/4), gypsiferous loam, very pale brown (10YR 7/4) moist; massive; hard, friable, nonsticky and nonplastic; common medium nests of gypsum; violently effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.

By5—44 to 60 inches; white (10YR 8/1), gypsiferous loam, light gray (10YR 7/2) moist; massive; hard, friable, nonsticky and nonplastic; common soft accumulations of gypsum; violently effervescent; disseminated calcium carbonate; mildly alkaline.

Saladon Series

The soils in the Saladon series are classified as fine, montmorillonitic Typic Cryaquolls. These deep, poorly drained soils formed in mixed alluvium. They are in valleys and drainageways. Slope is 0 to 5 percent. Elevation is 7,900 to 8,300 feet. The average annual precipitation is 20 to 24 inches. The average annual air temperature is 40 to 44 degrees F, and the frost-free period is 90 to 110 days.

Typical pedon of Saladon clay loam, 0 to 5 percent slopes; about 1.5 miles southwest of Lookout Mountain; 200 feet east and 1,600 feet north of the southwest corner of sec. 11, T. 11 N., R. 14 W.

A—0 to 4 inches; dark brown (10YR 4/3) clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; common very fine and few fine irregular pores; slightly acid; abrupt smooth boundary.

C1—4 to 19 inches; black (10YR 2/1) clay, black (10YR 2/1) moist; massive; very hard, firm, sticky and plastic; common very fine and fine roots; few very fine irregular pores; slightly acid; clear smooth boundary.

C2—19 to 25 inches; black (10YR 2/1) clay, black (10YR 2/1) moist; few medium prominent dark yellowish brown (10YR 4/4) mottles; massive; very hard, firm, sticky and plastic; common very fine and few fine roots; few very fine irregular pores; about 5 percent gravel; slightly acid; abrupt smooth boundary.

C3—25 to 35 inches; yellowish brown (10YR 5/4) sandy clay, dark yellowish brown (10YR 4/4) moist; few medium prominent dark yellowish brown (10YR 4/6) mottles; massive; very hard, very firm, sticky and plastic; few very fine roots; common very fine and fine irregular pores; about 15 percent gravel; slightly acid; abrupt smooth boundary.

C4—35 to 45 inches; grayish brown (10YR 5/2) clay, very dark gray (N 3/0) moist; common medium prominent dark yellowish brown (10YR 4/6) mottles; massive; very hard, very firm, sticky and plastic; common very fine and few fine irregular pores; about 15 percent gravel; slightly acid; clear smooth boundary.

C5—45 to 60 inches; very dark gray (10YR 3/1) clay, very dark gray (N 3/0) moist; common medium prominent dark yellowish brown (10YR 4/6, 4/4) mottles; massive; very hard, very firm, sticky and plastic; few very fine irregular pores; slightly acid.

The mollic epipedon ranges from 20 to 40 inches in thickness. A fluctuating water table is at a depth of 18 to 36 inches.

The Saladon soils in this survey area are a taxadjunct to the series because the average annual temperature is about 5 degrees warmer, the temperature in summer is warmer, and the mollic epipedon is thicker than is defined as the range for the series. These differences, however, do not significantly affect the use and management of the soils.

San Mateo Series

The soils in the San Mateo series are classified as fine-loamy, mixed (calcareous), mesic Ustic Torrifluvents. These deep, well drained soils formed in mixed alluvium. They are on flood plains and alluvial fans and in valleys and drainageways. Slope is 0 to 5 percent. Elevation is 5,800 to 6,600 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 48 to 53 degrees F, and the frost-free period is 110 to 145 days.

Typical pedon of San Mateo loam, in an area of Sparank-San Mateo complex, 0 to 5 percent slopes; about 1 mile northwest of Moquino; long. 107 degrees 18 minutes 21 seconds W. and lat. 35 degrees 11 minutes 10 seconds N.

A—0 to 2 inches; light yellowish brown (2.5Y 6/4) loam, olive brown (2.5Y 4/4) moist; moderate fine granular structure; soft, friable, nonsticky and nonplastic; common fine and very fine roots; strongly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

C1—2 to 12 inches; light olive brown (2.5Y 5/4) loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; common fine and very fine roots; common fine and very fine irregular

pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.
C2—12 to 29 inches; light olive brown (2.5Y 5/6) sandy clay loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; gradual smooth boundary.
C3—29 to 60 inches; light olive brown (2.5Y 5/6) sandy clay loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline.

The soils are mildly alkaline or moderately alkaline throughout.

The A horizon is loam, clay loam, or sandy clay loam. It has hue of 10YR or 2.5Y, value of 5 or 6 (3 to 5 moist), and chroma of 3 to 6. The calcium carbonate equivalent is less than 15 percent.

The C horizon is dominantly sandy clay loam, loam, clay loam, or silty clay loam. In some pedons it has thin strata of loam, silt loam, clay loam, silty clay loam, fine sandy loam, loamy sand, or sandy loam. It has hue of 10YR or 2.5Y, value of 5 or 6 (4 or 5 moist), and chroma of 3 to 6. The content of rock fragments ranges from 0 to 10 percent. The calcium carbonate equivalent is less than 15 percent.

Sheppard Series

The soils in the Sheppard series are classified as mixed, mesic Typic Torripsamments. These deep, somewhat excessively drained soils formed in eolian material derived dominantly from sandstone. They are on sand dunes and fans. Slope is 3 to 12 percent. Elevation is 5,400 to 6,000 feet. The average annual precipitation is 7 to 10 inches. The average annual air temperature is 51 to 55 degrees F, and the frost-free period is 140 to 165 days.

Typical pedon of Sheppard loamy fine sand, in an area of Sheppard-Shiprock association, 1 to 12 percent slopes; about 1 mile northeast of the headquarters of Marmon Ranch; 2,100 feet south and 2,380 feet east of the northwest corner of sec. 2, T. 7 N., R. 6 W.

A—0 to 4 inches; reddish yellow (5YR 6/6) loamy fine sand, yellowish red (5YR 5/6) moist; weak fine granular structure; loose, nonsticky and nonplastic; few very fine and fine roots; mildly alkaline; clear smooth boundary.
C1—4 to 22 inches; reddish yellow (5YR 6/6) loamy fine sand, yellowish red (5YR 5/6) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine irregular pores; mildly alkaline; clear smooth boundary.
C2—22 to 47 inches; reddish yellow (5YR 6/6) loamy sand, yellowish red (5YR 4/6) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine irregular pores; slightly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.
C3—47 to 60 inches; reddish yellow (5YR 6/6) loamy fine sand, yellowish red (5YR 5/6) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; slightly effervescent; disseminated calcium carbonate; mildly alkaline.

Shiprock Series

The soils in the Shiprock series are classified as coarse-loamy, mixed, mesic Typic Haplargids. These deep, well drained soils formed in wind-modified alluvium derived dominantly from sandstone. They are on stable dunes, in interdune areas, and on fan terraces, hills, and ridges. Slope is 1 to 10 percent. Elevation is 5,400 to 6,100 feet. The average annual precipitation is 7 to 10 inches. The average annual air temperature is 51 to 55 degrees F, and the frost-free period is 140 to 165 days.

Typical pedon of Shiprock sandy loam, in an area of Grieta-Shiprock association, 1 to 10 percent slopes; about 1.5 miles south of Suwanee; 217 feet south and 80 feet west of the northeast corner of sec. 15, T. 8 N., R. 3 W.

A1—0 to 3 inches; reddish yellow (7.5YR 6/6) sandy loam, strong brown (7.5YR 5/6) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common very fine irregular pores; mildly alkaline; abrupt smooth boundary.
A2—3 to 13 inches; brown (7.5YR 5/4) sandy loam, brown (7.5YR 4/4) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common very fine irregular pores; moderately alkaline; clear smooth boundary.
Bt—13 to 25 inches; brown (7.5YR 5/4) sandy loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; many very fine roots; common fine irregular pores; few thin clay films on faces of peds and bridging sand grains; moderately alkaline; abrupt smooth boundary.
Bk1—25 to 37 inches; reddish yellow (7.5YR 6/6) sandy

loam, strong brown (7.5YR 5/6) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine roots; common fine irregular pores; strongly effervescent; common medium irregular soft masses of calcium carbonate; moderately alkaline; gradual smooth boundary.

Bk2—37 to 60 inches; reddish yellow (7.5YR 7/6) sandy loam, reddish yellow (7.5YR 6/6) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; few fine irregular pores; strongly effervescent; common medium irregular soft masses of calcium carbonate; moderately alkaline.

The A horizon has hue of 5YR or 7.5YR, value of 5 to 7 (4 or 5 moist), and chroma of 4 to 6. The Bt horizon is sandy loam or fine sandy loam. It has hue of 5YR or 7.5YR, value of 4 to 6 dry or moist, and chroma of 3 to 6. The Bk horizon is sandy loam or fine sandy loam. It has hue of 5YR or 7.5YR, value of 6 to 8 (4 to 7 moist), and chroma of 4 to 6.

Silkie Series

The soils in the Silkie series are classified as fine, mixed, mesic Vertic Haplustalfs. These deep, well drained soils formed in alluvium derived dominantly from shale. They are on valley sides. Slope is 3 to 10 percent. Elevation is 6,600 to 7,500 feet. The average annual precipitation is 13 to 16 inches. The average annual air temperature is 47 to 51 degrees F, and the frost-free period is 100 to 120 days.

Typical pedon of Silkie clay loam, in an area of Catman-Silkie association, 1 to 10 percent slopes; about 0.25 mile east of Crockett Peak; 2,550 feet west and 780 feet north of the southeast corner of sec. 28, T. 8 N., R. 17 W.

A—0 to 4 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine irregular pores; mildly alkaline; clear smooth boundary.

Bt—4 to 16 inches; light olive brown (2.5Y 5/4) clay, olive brown (2.5Y 4/4) moist; moderate medium prismatic structure parting to strong medium subangular blocky; very hard, firm, very sticky and very plastic; common very fine and fine roots; common fine irregular pores; cracks 0.5 to 1.0 inch wide; many thick clay films on faces of peds and in pores; neutral; clear smooth boundary.

Bk1—16 to 35 inches; light olive brown (2.5Y 5/4) clay, olive brown (2.5Y 4/4) moist; massive; hard, firm, sticky and plastic; few very fine and fine roots; few fine irregular pores; few small slickensides; few cracks 0.5 to 1.0 inch wide; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

Bk2—35 to 60 inches; light olive brown (2.5Y 5/4) clay, olive brown (2.5Y 4/4) moist; massive; very hard, firm, very sticky and plastic; few very fine roots; few very fine irregular pores; violently effervescent; common medium irregular soft masses of calcium carbonate; mildly alkaline.

Depth to the base of the Bt horizon is 15 to 27 inches. Cracks 0.5 to 1.0 inch wide extend to a depth of 21 to 35 inches. The Bt and Bk horizons are clay or clay loam. The calcium carbonate equivalent in the Bk horizon is 1 to 10 percent.

Skyvillage Series

The soils in the Skyvillage series are classified as loamy, mixed (calcareous), mesic Lithic Ustic Torriorthents. These shallow, well drained soils formed in eolian material derived dominantly from fine grained sandstone. They are on benches and the edges of mesas. Slope is 3 to 40 percent. Elevation is 6,000 to 6,800 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 150 days.

Typical pedon of Skyvillage sandy loam, in an area of Skyvillage-Rock outcrop-Bond complex, 3 to 40 percent slopes; about 2 miles east of the Lobo Cow Camp; long. 107 degrees 14 minutes 02 seconds W. and lat. 35 degrees 12 minutes 00 seconds N.

A—0 to 4 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few fine and common very fine roots; few fine irregular pores; slightly effervescent; mildly alkaline; abrupt smooth boundary.

C—4 to 12 inches; yellowish brown (10YR 5/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common fine and few very fine roots; few fine irregular pores; slightly effervescent; moderately alkaline; abrupt smooth boundary.

2R—12 inches; sandstone.

The depth to bedrock ranges from 10 to 20 inches. The content of rock fragments ranges from 0 to 15 percent in the A and C horizons.

Sparank Series

The soils in the Sparank series are classified as fine, mixed (calcareous), mesic Ustic Torrifluvents. These deep, well drained soils formed in mixed alluvium. They are on valley floors, in drainageways, and on flood plains, valley bottoms, and alluvial fans. Slope is 0 to 3 percent. Elevation is 5,800 to 6,800 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 48 to 53 degrees F, and the frost-free period is 120 to 150 days.

Typical pedon of Sparank clay loam, in an area of Sparank-San Mateo complex, 0 to 5 percent slopes; about 1 mile east of Grants; 900 feet east and 200 feet north of the southwest corner of sec. 28, T. 11 N., R. 9 W.

A—0 to 2 inches; light yellowish brown (2.5Y 6/4) clay loam, olive brown (2.5Y 4/4) moist; strong fine granular structure; soft, friable, sticky and slightly plastic; few very fine roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

C1—2 to 21 inches; light yellowish brown (2.5Y 6/4) silty clay, olive brown (2.5Y 4/4) moist; massive; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine irregular pores; few small slickensides; slightly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

C2—21 to 42 inches; light olive brown (2.5Y 5/4) silty clay, olive brown (2.5Y 4/4) moist; massive; very hard, very firm, very sticky and very plastic; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

C3—42 to 46 inches; light olive brown (2.5Y 5/4) silty clay, olive brown (2.5Y 4/4) moist; massive; hard, firm, sticky and plastic; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

C4—46 to 60 inches; light olive brown (2.5Y 5/4) silty clay, olive brown (2.5Y 4/4) moist; massive; very hard, very firm, very sticky and very plastic; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline.

The soils are mildly alkaline to strongly alkaline throughout. Electrical conductivity ranges from 2 to 16 millimhos per centimeter, and the sodium adsorption ratio is 0 to 13 or more.

The A horizon is clay loam or sandy clay loam. It has hue of 10YR or 2.5YR, value of 5 or 6 (4 or 5 moist), and chroma of 3 or 4. The C horizon dominantly is clay, silty clay, or silty clay loam. In some pedons, however, it has thin strata of loamy sand or silt loam in the lower part. This horizon has hue of 10YR or 2.5Y, value of 5 or 6 (4 or 5 moist), and chroma of 3 or 4.

Sparham Series

The soils in the Sparham series are classified as fine, mixed (calcareous), mesic Typic Ustifluvents. These deep, somewhat poorly drained soils formed in mixed alluvium. They are on flood plains. Slope is 0 to 2 percent. Elevation is 6,200 to 6,600 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 48 to 52 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Sparham clay loam, 0 to 2 percent slopes; about 3 miles west of Santa Maria Mission; 200 feet east and 1,900 feet south of the northwest corner of sec. 30, T. 10 N., R. 8 W.

A—0 to 10 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; strong fine granular structure; soft, friable, sticky and slightly plastic; few very fine roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

C1—10 to 44 inches; pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; massive; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine irregular pores; slightly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

C2—44 to 60 inches; light olive brown (2.5Y 5/4) clay, olive brown (2.5Y 4/4) moist; massive; very hard, very firm, very sticky and very plastic; few very fine irregular pores; mildly alkaline.

The C horizon is silty clay or clay. Electrical conductivity ranges from 4 to 16 millimhos per centimeter.

Stout Series

The soils in the Stout series are classified as loamy, mixed, nonacid, frigid Lithic Ustorthents. These very shallow and shallow, well drained soils formed in eolian material derived dominantly from sandstone. They are on hills and ridges. Slope is 3 to 15 percent. Elevation is 7,800 to 8,500 feet. The average annual precipitation is 20 to 24 inches. The average annual air temperature is 40 to 44 degrees F, and the frost-free period is 90 to 110 days.

Typical pedon of Stout sandy loam, in an area of Rock outcrop-Stout complex, 3 to 15 percent slopes;

about 3 miles southwest of Page; 900 feet west and 1,000 feet north of the southeast corner of sec. 7, T. 12 N., R. 15 W.

Oi—1 inch to 0; partially decomposed pine needles and oak leaves.
A—0 to 3 inches; brown (7.5YR 5/4) sandy loam, brown (7.5YR 4/4) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; common fine roots; common very fine irregular pores; about 10 percent gravel; neutral; clear smooth boundary.
C—3 to 14 inches; brown (7.5YR 5/4) sandy loam, brown (7.5YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; few very fine irregular pores; about 10 percent gravel; neutral; abrupt wavy boundary.
2R—14 inches; sandstone.

The depth to bedrock is 6 to 20 inches. The content of rock fragments averages less than 15 percent in the A and C horizons.

Suwanee Series

The soils in the Suwanee series are classified as fine-loamy, mixed (calcareous), mesic Ustic Torrifluvents. These deep, well drained soils formed in mixed alluvium. They are on flood plains, in drainageways, and on alluvial fans. Slope is 1 to 5 percent. Elevation is 5,400 to 6,000 feet. The average annual precipitation is 7 to 10 inches. The average annual air temperature is 51 to 55 degrees F, and the frost-free period is 140 to 165 days.

Typical pedon of Suwanee silty clay loam, in an area of Navajo-Suwanee complex, 1 to 5 percent slopes; about 4 miles south of the intersection of New Mexico Highway 6 and Interstate 40; about 1,320 feet east and 1,056 feet north of the southwest corner of sec. 19, T. 8 N., R. 3 W.

A—0 to 3 inches; reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; few fine and medium roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.
C1—3 to 16 inches; yellowish red (5YR 5/6) silty clay loam, yellowish red (5YR 4/6) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine and medium roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.
C2—16 to 21 inches; reddish brown (5YR 5/4) silt loam, reddish brown (5YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine and medium roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.
C3—21 to 27 inches; reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; massive; slightly hard, friable, sticky and slightly plastic; few fine and medium roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.
C4—27 to 32 inches; brown (7.5YR 5/4) sandy loam, dark brown (7.5YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and medium roots; few fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.
C5—32 to 35 inches; reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few fine and medium roots; few very fine irregular pores; violently effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.
C6—35 to 38 inches; brown (7.5YR 5/4) loamy fine sand, dark brown (7.5YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and medium roots; few fine irregular pores; violently effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.
C7—38 to 46 inches; reddish brown (5YR 5/4) silt loam, reddish brown (5YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine, fine, and medium roots; few very fine irregular pores; violently effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.
C8—46 to 60 inches; reddish brown (5YR 4/4) silty clay, dark reddish brown (5YR 3/4) moist; massive; hard, firm, sticky and plastic; few very fine, fine, and medium roots; few very fine irregular pores; violently effervescent; disseminated calcium carbonate; mildly alkaline.

The C horizon is stratified silty clay loam, silt loam, sandy loam, silty clay, clay loam, sandy clay loam, or loamy fine sand. The content of clay in this horizon ranges from 18 to 35 percent.

Tanbark Series

The soils in the Tanbark series are classified as loamy, gypsic, mesic, shallow Ustic Torriorthents. These shallow, well drained soils formed in eolian material

derived dominantly from gypsum. They are on hills and ridges. Slope is 25 to 60 percent. Elevation is 5,800 to 6,800 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Tanbark loam, in an area of Winona-Tanbark-Rock outcrop association, 15 to 60 percent slopes; about 15 miles southeast of Chicken Mountain; 1,500 feet west and 2,380 feet south of the northeast corner of sec. 1, T. 4 N., R. 5 W.

A—0 to 2 inches; very pale brown (10YR 8/4) loam, very pale brown (10YR 7/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine irregular pores; about 10 percent gravel; strongly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

C1—2 to 12 inches; very pale brown (10YR 8/3), gypsiferous silt loam, very pale brown (10YR 7/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and few medium roots; common very fine irregular pores; strongly effervescent; disseminated calcium carbonate; mildly alkaline; clear smooth boundary.

C2—12 to 17 inches; white (10YR 8/2), gypsiferous sandy loam, very pale brown (10YR 7/4) moist; massive; soft, very friable, nonsticky and nonplastic; strongly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

2Cr—17 inches; white (10YR 8/2) gypsum.

The depth to gypsum is 10 to 20 inches. The C horizon is gypsiferous silt loam or loam in the upper part and gypsiferous sandy loam in the lower part.

Tapia Series

The soils in the Tapia series are classified as fine-loamy, mixed, mesic Ustollic Haplargids. These deep, well drained soils formed in mixed alluvium. They are on fan terraces. Slope is 1 to 5 percent. Elevation is 6,200 to 6,900 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 48 to 52 degrees F, and the frost-free period is 120 to 150 days.

Typical pedon of Tapia sandy loam, 1 to 5 percent slopes; about 3 miles northeast of Cubero; long. 107 degrees 30 minutes 05 seconds W. and lat. 35 degrees 07 minutes 59 seconds N.

A—0 to 4 inches; brown (7.5YR 4/4) sandy loam, dark brown (7.5YR 3/4) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine irregular pores; about 3 percent gravel; mildly alkaline; abrupt smooth boundary.

Bt1—4 to 9 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, firm, sticky and plastic; common very fine and fine roots; common very fine tubular pores; few thin clay films on faces of peds and in pores; about 5 percent gravel; mildly alkaline; clear smooth boundary.

Bt2—9 to 16 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, firm, sticky and plastic; common very fine and fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds and in pores; about 10 percent gravel; slightly effervescent; mildly alkaline; abrupt smooth boundary.

Btk—16 to 23 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist; weak fine subangular blocky structure; slightly hard, firm, sticky and slightly plastic; common very fine and few fine roots; common very fine irregular pores; few thin clay films on faces of peds and in pores; about 10 percent gravel; violently effervescent; many medium irregular soft masses of calcium carbonate; moderately alkaline; clear smooth boundary.

Bk1—23 to 40 inches; very pale brown (10YR 7/3) cobbly sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, nonsticky and nonplastic; few very fine and fine roots; common very fine irregular pores; about 15 percent cobbles and 20 percent gravel; violently effervescent; weakly cemented in the upper part; many medium irregular soft masses of calcium carbonate; moderately alkaline; clear smooth boundary.

Bk2—40 to 60 inches; very pale brown (10YR 7/4) cobbly sand, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, nonsticky and nonplastic; few very fine and fine roots; common very fine irregular pores; about 15 percent cobbles and 20 percent gravel; violently effervescent; many medium irregular soft masses of calcium carbonate; moderately alkaline.

Depth to the base of the Bt horizon is 19 to 30 inches. The content of rock fragments ranges from 0 to 15 percent in the upper 20 inches and from 25 to 50 percent below that depth. The upper part of the Bk horizon is cobbly sandy loam or very cobbly sandy clay loam.

Techado Series

The soils in the Techado series are classified as clayey, mixed, nonacid, frigid, shallow Typic Ustorthents. These shallow, well drained soils formed in alluvium and colluvium derived dominantly from shale and sandstone. They are on hills, ridges, and mountains. Slope is 5 to 55 percent. Elevation is 7,200 to 8,900 feet. The average annual precipitation is 16 to 22 inches. The average annual air temperature is 40 to 45 degrees F, and the frost-free period is 90 to 110 days.

Typical pedon of Techado channery clay loam, in an area of Valnor-Techado association, 2 to 25 percent slopes; about 5 miles south of Cebollita Peak; 2,375 feet east and 25 feet south of the northwest corner of sec. 19, T. 5 N., R. 9 W.

A—0 to 3 inches; light olive brown (2.5Y 5/4) channery clay loam, olive brown (2.5Y 4/4) moist; strong fine granular structure; soft, friable, sticky and plastic; few very fine and fine roots; common fine irregular pores; about 25 percent channers; neutral; abrupt smooth boundary.

C—3 to 16 inches; light olive brown (2.5Y 5/4) clay, olive brown (2.5Y 4/4) moist; massive; very hard, very firm, very sticky and very plastic; common very fine and few fine, medium, and coarse roots; common very fine irregular pores; about 10 percent channers; neutral; clear smooth boundary.

2Cr—16 inches; soft shale interbedded with sandstone.

The depth to soft shale ranges from 10 to 20 inches. The A horizon is channery or cobbly clay loam. It has hue of 2.5Y or 10YR and value of 4 or 5 (3 or 4 moist). The content of rock fragments in this horizon ranges from 15 to 35 percent, by volume. The C horizon is clay, clay loam, or sandy clay. It has hue of 2.5Y or 10YR, value of 4 or 5 (3 or 4 moist), and chroma of 2 to 4. The content of rock fragments in this horizon ranges from 0 to 15 percent, by volume.

Teco Series

The soils in the Teco series are classified as fine, mixed, mesic Aridic Haplustalfs. These deep, well drained soils formed in mixed alluvium and wind-modified alluvium. They are on mesas, ridges, and hills and in valleys and swales. Slope is 1 to 10 percent. Elevation is 6,500 to 7,500 feet. The average annual precipitation is 12 to 14 inches. The average annual air temperature is 48 to 53 degrees F, and the frost-free period is 115 to 135 days.

Typical pedon of Teco fine sandy loam, in an area of Teco-Atarque association, 1 to 8 percent slopes; about 7 miles west of Atarque Lake; 320 feet south and 2,300 feet east of the northwest corner of sec. 2, T. 6 N., R. 20 W.

A1—0 to 4 inches; light brown (7.5YR 6/4) fine sandy loam, dark brown (7.5YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine irregular pores; neutral; clear smooth boundary.

A2—4 to 6 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 5/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; few very fine irregular pores; neutral; abrupt smooth boundary.

Bt1—6 to 9 inches; reddish brown (5YR 4/4) clay loam, reddish brown (5YR 4/4) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; common very fine and fine roots; few fine tubular pores; few thin clay films on faces of peds and in pores; mildly alkaline; clear smooth boundary.

Bt2—9 to 15 inches; reddish brown (5YR 4/4) clay loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common very fine roots; common fine tubular pores; common moderately thick clay films on faces of peds and in pores; mildly alkaline; clear smooth boundary.

Btk—15 to 24 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; few fine tubular pores; slightly effervescent; few fine irregular seams and filaments of calcium carbonate; moderately alkaline; clear smooth boundary.

Bk1—24 to 29 inches; light brown (7.5YR 6/4) sandy clay loam, brown (7.5YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine irregular pores; strongly effervescent; disseminated calcium carbonate and many coarse irregular soft masses of calcium carbonate; moderately alkaline; clear smooth boundary.

Bk2—29 to 41 inches; pink (7.5YR 7/4) clay loam, light brown (7.5YR 6/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine irregular pores; about 10 percent gravel; violently effervescent; disseminated calcium carbonate and many coarse irregular soft masses of calcium carbonate; moderately alkaline; clear smooth boundary.

Bk3—41 to 60 inches; reddish yellow (7.5YR 6/6) gravelly sandy loam, strong brown (7.5YR 5/6)

moist; massive; slightly hard, friable, nonsticky and nonplastic; about 30 percent gravel; strongly effervescent; disseminated calcium carbonate and common coarse irregular soft masses of calcium carbonate; moderately alkaline.

Depth to the Bk horizon is 20 to 40 inches. The A horizon is fine sandy loam, clay loam, or sandy loam. It has hue of 7.5YR or 10YR, value of 5 to 7 (4 to 6 moist), and chroma of 3 or 4. The Bt horizon is clay loam, clay, or sandy clay. It has hue of 2.5YR to 7.5YR, value of 4 to 6 (3 to 5 moist), and chroma of 4 to 6. The Bk horizon is clay loam, sandy clay, or sandy clay loam in the fine-earth fraction. It has 5 to 25 percent gravel. It has hue of 2.5YR to 7.5YR, value of 5 to 7 (4 to 6 moist), and chroma of 4 to 6.

Timhus Series

The soils in the Timhus series are classified as loamy-skeletal over fragmental, mixed, mesic Aridic Ustochrepts. These deep, somewhat excessively drained soils formed in alluvial material and windblown volcanic sediments. They are on cinder cones. Slope is 20 to 50 percent. Elevation is 7,400 to 8,100 feet. The average annual precipitation is 14 to 16 inches. The average annual air temperature is 47 to 49 degrees F, and the frost-free period is 90 to 110 days.

Typical pedon of Timhus extremely gravelly loam, in an area of Timhus-Bandera association, 20 to 50 percent slopes; on the south side of Cerro American; 1,300 feet west and 100 feet north of the southeast corner of sec. 11, T. 8 N., R. 13 W.

A—0 to 5 inches; yellowish brown (10YR 5/4) extremely gravelly loam, dark yellowish brown (10YR 3/4) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and nonplastic; common fine roots; few fine tubular pores; about 70 percent pebble-sized cinders; neutral; abrupt smooth boundary.

Bk1—5 to 13 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; common fine and medium roots; common very fine irregular and few fine tubular pores; about 55 percent pebble-sized cinders; slightly effervescent; disseminated calcium carbonate and coatings of calcium carbonate on the underside of cinders; mildly alkaline; clear smooth boundary.

Bk2—13 to 20 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; common fine and medium and few coarse roots; common very fine irregular pores; about 50 percent pebble-sized cinders; strongly effervescent; common coarse irregular soft masses of calcium carbonate and coatings of calcium carbonate on cinders; moderately alkaline; abrupt smooth boundary.

Bk3—20 to 29 inches; light yellowish brown (10YR 6/4) extremely gravelly loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few fine, medium, and coarse roots; common very fine irregular pores; about 65 percent pebble-sized cinders; violently effervescent; many coarse irregular soft masses of calcium carbonate and coatings of calcium carbonate on cinders; moderately alkaline; abrupt smooth boundary.

2C—29 to 60 inches; pebble-sized cinders.

The depth to cinders ranges from 20 to 40 inches. The content of cinders in the 2C horizon is 80 percent or more.

Torreon Series

The soils in the Torreon series are classified as fine, montmorillonitic, mesic Aridic Argiustolls. These deep, well drained soils formed in mixed alluvium and colluvium. They are on hills and ridges. Slope is 15 to 35 percent. Elevation is 6,400 to 7,800 feet. The average annual precipitation is 12 to 16 inches. The average annual air temperature is 48 to 52 degrees F, and the frost-free period is 100 to 135 days.

Typical pedon of Torreon very cobbly loam, in an area of Torreon-Rock outcrop-Cabezon complex, 15 to 45 percent slopes; about 0.5 mile west of Chicken Mountain; 2,450 feet west and 1,500 feet south of the northeast corner of sec. 18, T. 5 N., R. 4 W.

A—0 to 2 inches; brown (7.5YR 4/2) very cobbly loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and many very fine roots; common very fine irregular pores; about 5 percent stones, 20 percent cobbles, and 20 percent gravel; neutral; abrupt smooth boundary.

Bt1—2 to 7 inches; brown (7.5YR 4/2) clay loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots; few fine and common very fine tubular pores; few moderately thick clay films on faces of peds and in pores; about 5 percent gravel; neutral; clear smooth boundary.

Bt2—7 to 11 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; strong medium subangular blocky structure; hard, firm, very sticky and very plastic; common fine and very fine roots; few fine and common very fine tubular pores; common moderately thick clay films on faces of peds and in pores; about 5 percent gravel; mildly alkaline; abrupt smooth boundary.

Btk—11 to 25 inches; reddish brown (5YR 5/4) clay, dark reddish brown (5YR 3/4) moist; moderate medium subangular blocky structure; hard, firm, very sticky and very plastic; few fine and very fine roots; few fine and very fine tubular pores; few thin clay films on faces of peds and in pores; about 5 percent gravel; strongly effervescent; few medium irregular soft masses of calcium carbonate; mildly alkaline; clear smooth boundary.

Bk—25 to 60 inches; pinkish white (5YR 8/2) silty clay loam, pinkish gray (5YR 7/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine irregular pores; violently effervescent; many coarse irregular soft masses of calcium carbonate; strongly alkaline.

Trag Series

The soils in the Trag series are classified as fine-loamy, mixed Typic Argiborolls. These deep, well drained soils formed in mixed alluvium and colluvium. They are in valleys and on mountains and benches. Slope is 1 to 30 percent. Elevation is 7,200 to 8,900 feet. The average annual precipitation is 16 to 22 inches. The average annual air temperature is 40 to 46 degrees F, and the frost-free period is 90 to 110 days.

Typical pedon of Trag loam, 1 to 8 percent slopes; on Mesa Chivato; long. 107 degrees 22 minutes 38 seconds W. and lat. 35 degrees 14 minutes 26 seconds N.

A—0 to 3 inches; brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; common very fine irregular pores; neutral; abrupt smooth boundary.

Bt1—3 to 7 inches; reddish brown (5YR 4/3) sandy clay loam, dark reddish brown (5YR 3/3) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and few fine and medium roots; few fine and very fine tubular pores; few thin clay films on faces of peds and in pores; neutral; clear smooth boundary.

Bt2—7 to 15 inches; reddish brown (5YR 4/3) sandy clay loam, dark reddish brown (5YR 3/3) moist; moderate medium subangular blocky structure; very hard, firm, sticky and plastic; few medium, fine, and very fine roots; few fine and common very fine tubular pores; common thin clay films on faces of peds and in pores; neutral; abrupt smooth boundary.

Bt3—15 to 24 inches; reddish brown (5YR 4/4) clay loam, dark reddish brown (5YR 3/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, firm, sticky and plastic; few medium, fine, and very fine roots; few fine and common very fine tubular pores; many moderate thick clay films on faces of peds and in pores; mildly alkaline; abrupt smooth boundary.

C1—24 to 36 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 4/4) moist; massive; hard, firm, slightly sticky and nonplastic; few fine roots; few very fine irregular pores; about 5 percent gravel; mildly alkaline; gradual smooth boundary.

C2—38 to 60 inches; light brown (7.5YR 6/4) sandy clay loam, brown (7.5YR 4/4) moist; massive; hard, firm, slightly sticky and nonplastic; few fine roots; few fine irregular pores; about 5 percent gravel; mildly alkaline.

The mollic epipedon ranges from 10 to 15 inches in thickness. The content of rock fragments ranges from 0 to 25 percent throughout the profile.

The A horizon is loam or cobbly loam. It has value of 4 or 5 and chroma of 2 or 3. The Bt horizon is clay loam, cobbly sandy clay loam, or sandy clay loam. It has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. The C horizon is cobbly sandy clay loam, sandy clay loam, clay loam, or sandy loam. It has hue of 5YR or 7.5YR, value of 4 to 6 (3 or 4 moist), and chroma of 4 or 5.

The Trag soil in map unit 276 is a taxadjunct to the series because it has hue of 5YR, and that in map unit 615 is a taxadjunct because it has more than 15 percent gravel in the particle-size control section. These differences, however, do not significantly affect the use and management of the soils.

Valnor Series

The soils in the Valnor series are classified as fine, mixed Mollic Eutroboralfs. These moderately deep, well drained soils formed in alluvium derived dominantly from interbedded shale and sandstone. They are on mesas, hills, and plateaus. Slope is 2 to 7 percent. Elevation is 7,500 to 8,200 feet. The average annual precipitation is 16 to 20 inches. The average annual air temperature is 40 to 45 degrees F, and the frost-free period is 90 to 110 days.

Typical pedon of Valnor clay loam, in an area of Valnor-Techado association, 2 to 25 percent slopes; 6.5 miles south of Cebollita Peak; 825 feet west and 1,375 feet north of the southeast corner of sec. 26, T. 5 N., R. 10 W.

A—0 to 2 inches; yellowish brown (10YR 5/4) clay loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, friable, sticky and plastic; common fine and very fine roots; common very fine irregular pores; neutral; abrupt smooth boundary.

Bt1—2 to 10 inches; dark yellowish brown (10YR 4/6) clay, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; common fine and very fine roots; few very fine tubular pores; few thin clay films on faces of peds and in pores; neutral; clear smooth boundary.

Bt2—10 to 18 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure; very hard, very firm, very sticky and very plastic; few fine and common very fine roots; few very fine tubular pores; common moderately thick clay films on faces of peds and in pores; mildly alkaline; abrupt smooth boundary.

Bk—18 to 38 inches; light yellowish brown (10YR 6/4) clay, olive brown (2.5Y 4/4) moist; massive; very hard, very firm, very sticky and very plastic; few fine and very fine roots; few very fine irregular pores; strongly effervescent; few fine irregular seams and filaments of calcium carbonate; moderately alkaline; gradual smooth boundary.

Cr—38 to 60 inches; shale interbedded with weathered sandstone.

Venadito Series

The soils in the Venadito series are classified as very fine, montmorillonitic, mesic Udorthentic Chromusterts. These deep, well drained soils formed in alluvium derived dominantly from shale. They are fans and in valleys. Slope is 0 to 5 percent. Elevation is 6,200 to 7,500 feet. The average annual precipitation is 10 to 14 inches. The average annual air temperature is 48 to 53 degrees F, and the frost-free period is 110 to 140 days.

Typical pedon of Venadito clay loam, in an area of Venadito-Teco association, 0 to 10 percent slopes; about 3 miles north of the headquarters of Atarque Ranch; 500 feet east and 175 feet north of the southwest corner of sec. 19, T. 7 N., R. 18 W.

A—0 to 3 inches; reddish brown (2.5YR 4/4) clay loam, reddish brown (5YR 4/4) moist; moderate fine granular structure; soft, friable, sticky and slightly plastic; few very fine, fine, and coarse roots; few very fine irregular pores; vertical cracks 1.5 inches wide; strongly effervescent; moderately alkaline; abrupt smooth boundary.

C1—3 to 35 inches; reddish brown (2.5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; massive; very hard, very firm, very sticky and very plastic; few very fine, fine, and coarse roots; few very fine irregular pores; common intersecting slickensides; vertical cracks 0.25 inch wide; strongly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.

C2—35 to 60 inches; reddish brown (2.5YR 5/4) clay, reddish brown (2.5YR 4/4) moist; massive; very hard, very firm, very sticky and very plastic; few very fine and fine roots; few very fine irregular pores; strongly effervescent; disseminated calcium carbonate; moderately alkaline.

The particle-size control section averages more than 60 percent clay. The A horizon is clay loam, sandy clay loam, or silty clay loam. It has hue of 2.5YR or 5YR, value of 3 or 4 dry or moist, and chroma of 4 to 6. The C horizon has hue of 2.5YR or 5YR, value of 3 to 5 dry or moist, and chroma of 3 to 6.

Venadito Variant

The soils in the Venadito Variant are classified as very fine, montmorillonitic, mesic Udic Chromusterts. These moderately deep, well drained soils formed in mixed alluvium. They are on flood plains and alluvial fans and in valleys. Slope is 0 to 1 percent. Elevation is 6,200 to 6,600 feet. The average annual precipitation is 10 to 13 inches. The average annual air temperature is 48 to 53 degrees F, and the frost-free period is 110 to 140 days.

Typical pedon of Venadito Variant clay loam, 0 to 1 percent slopes; about 0.5 mile north of the village of Bluewater; 2,600 feet west and 2,100 feet north of the southeast corner of sec. 15, T. 12 N., R. 11 W.

Ap—0 to 3 inches; reddish brown (5YR 4/4) clay loam, dark reddish brown (5YR 3/4) moist; moderate fine granular structure; slightly hard, firm, sticky and slightly plastic; few very fine and fine roots; common very fine irregular pores; vertical cracks 1 inch wide; strongly effervescent; disseminated calcium carbonate; neutral; abrupt smooth boundary.

C1—3 to 18 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; massive; very hard, very firm, very sticky and very plastic; few very fine and fine roots; few fine irregular pores; vertical

cracks 0.5 inch wide; common intersecting slickensides; strongly effervescent; disseminated calcium carbonate; neutral; clear smooth boundary.
C2—18 to 35 inches; brown (7.5YR 4/4) clay, dark brown (7.5YR 3/4) moist; massive; very hard, very firm, very sticky and very plastic; few very fine and fine roots; few fine irregular pores; vertical cracks 0.5 inch wide; strongly effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.
2R—35 inches; basalt.

Vessilla Series

The soils in the Vessilla series are classified as loamy, mixed (calcareous), mesic Lithic Ustorthents. These very shallow and shallow, well drained soils formed in eolian material and colluvium derived dominantly from sandstone. They are on hills, ridges, and benches. Slope is 3 to 55 percent. Elevation is 6,500 to 7,500 feet. The average annual precipitation is 12 to 14 inches. The average annual air temperature is 48 to 52 degrees F, and the frost-free period is 110 to 130 days.

Typical pedon of Vessilla sandy loam, in an area of Laporte-Vessilla complex, 3 to 15 percent slopes; about 2.25 miles east of Pueblitos Ruins; 1,600 feet north and 2,260 feet east of the southwest corner of sec. 28, T. 10 N., R. 13 W.

A—0 to 6 inches; brown (7.5YR 4/4) sandy loam, dark brown (7.5YR 3/4) moist; moderate fine granular structure; nonsticky and nonplastic; common fine and very fine roots; common very fine irregular pores; about 5 percent gravel; slightly effervescent; mildly alkaline; clear smooth boundary.
C1—6 to 12 inches; light brown (7.5YR 6/4) sandy loam, brown (7.5YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and common very fine roots; common very fine irregular pores; about 5 percent gravel; slightly effervescent; mildly alkaline; clear smooth boundary.
C2—12 to 18 inches; light brown (7.5YR 6/4) sandy loam, brown (7.5YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; common very fine irregular pores; about 10 percent cobbles; slightly effervescent; mildly alkaline; clear smooth boundary.
2R—18 inches; sandstone.

The depth to bedrock ranges from 6 to 20 inches. The content of rock fragments ranges from 5 to 35 percent in the A and C horizons. The A horizon has value of 4 or 5 (3 or 4 moist) and chroma of 4.

Viuda Series

The soils in the Viuda series are classified as clayey, mixed, mesic Lithic Ustollic Haplargids. These shallow, well drained soils formed in alluvium and windblown sediments. They are on benches, hills, and ridges. Slope is 1 to 10 percent. Elevation is 6,500 to 7,000 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Viuda very cobbly sandy loam, in an area of Viuda-Penistaja-Rock outcrop complex, 1 to 10 percent slopes; about 3.25 miles southwest of Four Corners Windmill; 1,040 feet east and 1,200 feet north of the southwest corner of sec. 10, T. 5 N., R. 12 W.

A—0 to 3 inches; brown (7.5YR 5/4) very cobbly sandy loam, dark brown (7.5YR 3/4) moist; moderate fine granular structure; soft, friable, nonsticky and nonplastic; few medium and fine roots; common very fine irregular pores; about 5 percent stones, 20 percent cobbles, and 15 percent gravel; mildly alkaline; abrupt smooth boundary.
Bt—3 to 10 inches; brown (7.5YR 4/4) clay, dark brown (7.5YR 3/4) moist; moderate medium prismatic structure parting to strong medium subangular blocky; very hard, firm, sticky and plastic; few medium and common fine roots; common very fine tubular pores; many moderately thick clay films on faces of peds and in pores; about 5 percent cobbles and 5 percent gravel; slightly effervescent; disseminated calcium carbonate; moderately alkaline; clear smooth boundary.
Btk—10 to 16 inches; brown (7.5YR 5/4) clay, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; very hard, firm, sticky and plastic; few fine and very fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds and in pores; about 5 percent cobbles and 5 percent gravel; strongly effervescent; disseminated calcium carbonate and few fine irregular soft masses of calcium carbonate; moderately alkaline; abrupt smooth boundary.
Bk—16 to 19 inches; light brown (7.5YR 6/4) cobbly clay loam, brown (7.5YR 5/4) moist; massive; hard, friable, sticky and plastic; few very fine roots; few very fine irregular pores; about 15 percent cobbles; violently effervescent; common medium irregular soft masses of calcium carbonate; moderately alkaline; abrupt smooth boundary.
2R—19 inches; basalt.

The depth to bedrock is 10 to 20 inches.
The A horizon is very cobbly sandy loam or very

cobbly silty clay loam. It has hue of 10YR or 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 3 or 4. The content of rock fragments ranges from 35 to 60 percent.

The Bt horizon is clay or sandy clay. It has hue of 10YR or 7.5YR, value of 4 or 5 (3 or 4 moist), and chroma of 3 or 4. The content of rock fragments ranges from 5 to 15 percent.

The Bk horizon is clay loam, cobbly clay loam, or sandy clay loam. It has hue of 10YR or 7.5YR. The content of rock fragments ranges from 5 to 20 percent.

Warm Springs Series

The soils in the Warm Springs series are classified as fine-loamy, mixed, mesic Aquic Calciustolls. These deep, somewhat poorly drained soils formed in mixed alluvium and lacustrine material. They are in old lakebeds and on flood plains. Slope is 0 to 2 percent. Elevation is 6,300 to 6,600 feet. The average annual precipitation is 12 to 14 inches. The average annual air temperature is 48 to 52 degrees F, and the frost-free period is 115 to 135 days.

Typical pedon of Warm Springs loam, 0 to 2 percent slopes; about 0.5 mile northeast of San Rafael; 760 feet west and 430 feet south of the northeast corner of sec. 10, T. 10 N., R. 10 W.

Ap1—0 to 1 inch; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, friable, nonsticky and nonplastic; common very fine and fine roots; common fine irregular pores; violently effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

Ap2—1 to 8 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine granular structure; soft, friable, nonsticky and nonplastic; common very fine and fine roots; common fine irregular pores; violently effervescent; disseminated calcium carbonate; mildly alkaline; abrupt wavy boundary.

Bk1—8 to 12 inches; light brownish gray (10YR 6/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine and few fine roots; common fine irregular pores; about 20 percent gravel; violently effervescent; disseminated calcium carbonate; moderately alkaline; abrupt smooth boundary.

Bk2—12 to 36 inches; very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine and fine roots; common fine and few very fine irregular pores; violently effervescent; disseminated calcium carbonate and many coarse irregular soft masses and seams of calcium carbonate; strongly alkaline; abrupt smooth boundary.

Bk3—36 to 44 inches; light brownish gray (2.5Y 6/2) loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few very fine irregular pores; violently effervescent; disseminated calcium carbonate; strongly alkaline; abrupt smooth boundary.

Bk4—44 to 60 inches; light brownish gray (2.5Y 6/2) sandy loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few fine irregular pores; about 10 percent gravel; violently effervescent; disseminated calcium carbonate; strongly alkaline.

Depth to the water table generally is 12 to 30 inches, but it ranges from 10 to 60 inches. The sodium adsorption ratio in the Bk horizon is more than 13, and the calcium carbonate equivalent is more than 25 percent.

Winona Series

The soils in the Winona series are classified as loamy-skeletal, carbonatic, mesic Lithic Ustollic Calciorthids. These shallow and very shallow, well drained soils formed in windblown sediments derived dominantly from limestone. They are on ridges, hills, benches, and mesa breaks. Slope is 3 to 45 percent. Elevation is 5,800 to 6,800 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 49 to 53 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Winona very gravelly loam, in an area of Winona-Rock outcrop complex, 3 to 20 percent slopes; about 5 miles southeast of the headquarters of Harrington Ranch; 630 feet east and 200 feet south of the northwest corner of sec. 6, T. 6 N., R. 3 W.

A—0 to 3 inches; brown (7.5YR 5/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; few very fine irregular pores; about 40 percent gravel and 10 percent cobbles; violently effervescent; disseminated calcium carbonate; mildly alkaline; abrupt smooth boundary.

Bk1—3 to 7 inches; pale brown (10YR 6/3) very cobbly

loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; few very fine irregular and few fine tubular pores; about 20 percent cobbles and 20 percent gravel; violently effervescent; many coarse irregular soft masses of calcium carbonate; mildly alkaline; clear smooth boundary.

Bk2—7 to 10 inches; very pale brown (10YR 7/3) very cobbly loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine and very fine roots; few very fine irregular and few fine tubular pores; about 20 percent cobbles and 20 percent gravel; violently effervescent; many coarse irregular soft masses of calcium carbonate; mildly alkaline; abrupt smooth boundary.

2R—10 inches; limestone.

The depth to bedrock ranges from 5 to 20 inches. The content of limestone gravel and cobbles ranges from 35 to 55 percent in the A and Bk horizons.

The A horizon has hue of 7.5YR or 10YR and value of 4 to 6 (3 or 4 moist). The Bk horizon has value of 5 to 7 (4 to 6 moist) and chroma of 3 or 4.

Yankee Series

The soils in the Yankee series are classified as fine, mixed Vertic Argiborolls. These deep, well drained soils formed in mixed alluvium. They are in valleys. Slope is 0 to 3 percent. Elevation is 7,700 to 8,300 feet. The average annual precipitation is 20 to 24 inches. The average annual air temperature is 40 to 44 degrees F, and the frost-free period is 90 to 110 days.

Typical pedon of Yankee silty clay loam, 0 to 3 percent slopes; about 4.25 miles southwest of Page; 200 feet east and 550 feet north of the southwest corner of sec. 18, T. 12 N., R. 15 W.

A—0 to 3 inches; dark reddish brown (5YR 3/2) silty clay loam, dark reddish brown (5YR 2/2) moist; strong very fine granular structure; soft, very friable, sticky and slightly plastic; many very fine roots; common very fine irregular pores; neutral; clear smooth boundary.

Bt1—3 to 11 inches; dark reddish brown (5YR 3/2) silty clay, dark reddish brown (5YR 2/2) moist; strong very fine angular blocky structure; hard, firm, very sticky and plastic; few very fine roots; few very fine tubular pores; vertical cracks 0.5 to 1.0 inch wide; many thick clay films on faces of peds and in pores; mildly alkaline; clear smooth boundary.

Bt2—11 to 28 inches; dark reddish gray (5YR 4/2) silty clay, dark reddish brown (5YR 3/2) moist; strong coarse prismatic structure; hard, firm, very sticky and plastic; few very fine roots; few very fine tubular pores; vertical cracks 0.5 to 1.0 inch wide; many thick clay films on faces of peds and in pores; slightly effervescent; moderately alkaline; gradual smooth boundary.

Bt3—28 to 60 inches; reddish brown (5YR 4/3) silty clay, dark reddish brown (5YR 2/2) moist; strong coarse prismatic structure; hard, firm, very sticky and plastic; few very fine roots; few very fine tubular pores; many thick clay films on faces of peds and in pores; slightly effervescent; moderately alkaline.

The mollic epipedon ranges from 30 to 57 inches in thickness. Vertical cracks 0.5 to 1.0 inch wide extend to a depth of 20 to 30 inches.

The Yankee soils in this survey area receive more precipitation than is defined as the range for the series. This difference, however, does not significantly affect the use and management of the soils.

Zia Series

The soils in the Zia series are classified as coarse-loamy, mixed (calcareous), mesic Ustic Torriorthents. These deep, well drained soils formed in wind-modified alluvium derived dominantly from sandstone. They are on fan terraces and valley sides. Slope is 3 to 5 percent. Elevation is 6,000 to 6,500 feet. The average annual precipitation is 10 to 12 inches. The average annual air temperature is 48 to 52 degrees F, and the frost-free period is 120 to 140 days.

Typical pedon of Zia fine sandy loam, 3 to 5 percent slopes; about 0.75 mile southwest of Santa Maria Mission; 500 feet north and 2,200 feet east of the southwest corner of sec. 28, T. 10 N., R. 8 W.

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) fine sandy loam, dark brown (10YR 4/3) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine irregular pores; slightly effervescent; disseminated calcium carbonate; moderately alkaline; gradual wavy boundary.

C1—8 to 47 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine irregular pores; slightly effervescent; few fine irregular seams and soft masses of calcium carbonate; moderately alkaline; clear smooth boundary.

C2—47 to 60 inches; yellow (10YR 7/6) fine sandy loam, very pale brown (10YR 7/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; few very fine irregular pores; violently effervescent; few fine irregular seams and soft masses of calcium carbonate; moderately alkaline.

The C horizon is fine sandy loam or sandy loam.

Formation of the Soils

Soil is unconsolidated mineral or organic material that supports plants *(12)*. An individual soil is three-dimensional. The shape and size of individual bodies of soil commonly are related to the shape and characteristics of the landforms.

Soil is the natural result of the interaction of five soil-forming factors—parent material, living organisms, climate, topography, and time. The effect of any one factor is dependent on the other four factors. Changes in climate, vegetation, and land use all affect soil formation.

Parent Material

Few soils, if any, are static. Soils are a product of the addition and removal of material as influenced by the other soil-forming factors.

Dust blown onto the surface or deposited by rainfall adds mineral material that affects soil formation. Some of these deposits contain calcium carbonate that is added to the soils. Some soils also receive annual or more frequent deposits of sediment carried by overland flow.

Soil blowing and water erosion can remove soil material as fast or faster than it is deposited. Soil blowing removes only the smaller sized particles from the surface, leaving a gravelly desert pavement that is resistant to further wind action.

Water erosion can occur in the form of sheet, rill, or gully erosion. The material can be transported only a few inches or many miles. It may be sorted or mixed with other material and redeposited. It may be deposited in large enough quantities to be considered parent material or such small quantities that it only offsets a slight loss of material on a relatively stable soil.

The soils in the survey area formed in material weathered from rocks that range in age from late Precambrian to Quaternary. The material includes intrusive and volcanic igneous rock, sedimentary rock, and metamorphic rock. The numerous kinds of rock and their varying ages have resulted in the formation of many different kinds of soil.

Soils that formed in material weathered from rocks of the Quaternary include those of the Aparejo, Navajo, and Venadito series, which are on flood plains and in valleys that receive sediment during periods of flooding, and those of the Pojoaque and Rana series, which are on mesa breaks.

Soils that formed in material weathered from rocks of the Tertiary, including basalt flows and rhyolite, are those of the Berto, Flaco, Kiki, and Viuda series. Scattered areas of these soils are throughout the survey area.

Soils that formed in material weathered from rocks of the Cretaceous, Jurassic, and Triassic are those of the Atarque, Bond, Galestina, Hagerman, Montecito, Penistaja, Pinitos, and Teco series. These rocks are Dakota Sandstone, Gallup Sandstone, Mancos Shale, the Morrison Formation, and Zuni Sandstone *(4)*.

Soils that formed in material weathered from rocks of the Precambrian include those of the Mirabal series. These rocks are mainly granitic and are in the Zuni Mountains.

The method of deposition and the type of rock influence the texture of the parent material. The material deposited by slowly moving water passing through an area of shale may be fine textured clay, but that deposited by rapidly moving streams near areas of granite may be very gravelly and cobbly. Wind- and water-deposited material derived from sandstone commonly is sandy. The texture of the parent material considerably affects the permeability, available water capacity, rooting depth, and chemical characteristics of a soil.

Living Organisms

Plant and animal life on and in the soil affects soil formation. Organic material, such as leaves, branches, logs, stems, and decaying roots, is added to the soil, and a multitude of micro-organisms in the soil act on the material. Insects and burrowing animals mix the soil. The larger animals trample the soil. The trampling breaks up the surface crust and allows more moisture to enter the soil. Animals also add organic matter and

other nutrients. Human beings apply fertilizer, soil amendments, and other material to the soil and extract products from it. All of these activities alter the nature of the soil.

The influence of human activities on the formation of the soils in the survey area generally has been minimal. It has been significant, however, in areas of irrigated cropland, in urban areas, and in areas that have been mined for uranium. These activities have depleted some plant nutrients and added others, such as waste products from livestock enterprises, commercial fertilizer, garbage, and green manure crops. In some areas erosion has occurred as a result of overgrazing.

The soils in the survey area support several types of vegetation. Each type has a specific influence on soil formation. In the southeastern part of the area, the vegetation is mainly desert shrubs and warm-season grasses. Precipitation is low in this area, and plant growth is not so vigorous as it is in the cooler, north-central part of the survey area. Grieta, Kiki, Suwanee, and Navajo are examples of soils that support this type of vegetation. These soils have a low content of organic matter.

In the north-central part of the survey area, the vegetation is mainly pinyon, juniper, ponderosa pine, cool-season grasses, and shrubs. Precipitation is higher in this area than in other parts of the survey area, and the rate of evaporation is lower. The plants grow more vigorously and produce more litter. Manzano, McGaffey, Millpaw, Moreno, and Saladon are examples of soils that support these plants. These soils have a higher content of organic matter than the soils in other parts of the survey area.

Topography

Topography affects soil formation through its influence on drainage, erosion, canopy cover, and soil temperature. Generally, the shallower soils that have less distinct horizons are in steep areas on ridges. Runoff is rapid in these areas. These soils exhibit little profile development because soil material is eroded away faster than the soils can form. The deeper soils that have distinct horizons are in gently sloping areas. Runoff is slow in these areas. These soils lose only small amounts of soil material through water erosion. Alluvial material is deposited on the nearly level soils on flood plains so frequently that distinct horizons cannot form.

Relief and surface drainage are closely related. Relief varies in the survey area. The main drainageways are the Rio Pescado, the Rio Puerco, and the Rio San Jose and numerous arroyos and washes. The Rio Pescado drains the west-central part of the survey area, the Rio San Jose drains the area north of Interstate 40, and the Rio Puerco drains the northeastern part of the survey area.

Soils on south and west aspects are warmer than soils on north and east aspects and have a higher evaporation rate. As a result, they support less vegetation, are more susceptible to erosion, and exhibit less profile development.

Climate

Climate is a major factor of soil formation in this survey area. Temperature, precipitation, humidity, and wind affect vegetation, parent material, and soil drainage. Generally, precipitation and humidity increase and temperature decreases as elevation increases.

The climate in the survey area is highly varied because of the wide range in elevation and the uneven topography. Elevation ranges from 5,250 feet near the Rio Puerco to 10,300 feet north of Water Canyon, near Mount Taylor. The average annual temperature ranges from about 38 to 55 degrees F, and the average annual precipitation ranges from 7 to 25 inches. About 50 percent of the precipitation falls during brief, generally heavy thunderstorms in the period July through September. Much of the precipitation runs off the more sloping soils because of the intensity of the storms. All of the soils in the survey area can receive and absorb the moisture from gentle rains, but heavy rainfall is concentrated in the nearly level areas. The soils in these areas are leached of soluble salts to a greater depth than the soils in other areas. Also, they support more lush vegetation.

Time

Soils form over a long period of time. The length of time that the other soil-forming factors have been acting on the parent material generally is evidenced by the soil profile. As the length of time increases, the development of the profile becomes more apparent. Calcium carbonate and very fine clay may be leached downward and may accumulate in the underlying layers.

In this survey area, most of the irrigated soils are on flood plains and alluvial fans. These soils generally are deep, are slowly permeable, and have ample plant nutrients. They have few apparent horizons other than those having accumulations of organic matter.

Sparank, Venadito, Aparejo, and San Mateo are examples of soils that exhibit little or no profile development. The parent material has been altered very little. Manzano, McGaffey, and Winona soils show

evidence of some profile development. Soluble salts have been leached from the upper part of these soils, and distinct horizons are recognizable. Flugle, Goesling, Montecito, and Teco soils are highly developed. The soluble salts have been leached from the upper part of the profile, and clay has formed and accumulated in the lower part.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Arroyo. The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in alluvium.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3.5
Low	3.5 to 5.0
Moderate	5.0 to 7.5
High	7.5 to 10.0
Very high	more than 10.0

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Badland. Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable

for reseeding or to reduce or eliminate competition from woody vegetation and thus to allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte. An isolated small mountain or hill with steep or precipitous sides and a top variously flat, rounded, or pointed that may be a residual mass isolated by erosion or an exposed volcanic neck.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche. A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds just beneath the solum, or it is exposed at the surface by erosion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Canyon. A long, deep, narrow, very steep sided valley with high, precipitous walls in an area of high local relief.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Climax plant community. The plant community on a given site that will be established if present environmental conditions continue to prevail and the site is properly managed.

Coarse fragments. Mineral or rock particles larger than 2 millimeters in diameter.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material is 35 to 60 percent of these rock fragments, and extremely cobbly soil material is more than 60 percent.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use

of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—Readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—Adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Cuesta. An asymmetric, homoclinal ridge capped by resistant rock layers of slight or moderate dip.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth, soil. The thickness of weathered soil material overlying bedrock. The depth classes recognized in this survey area are:

Very shallow	less than 10 inches
Shallow	10 to 20 inches
Moderately deep	20 to 40 inches
Deep	more than 40 inches

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Desert pavement. A layer of gravel or coarser fragments on a desert surface that was emplaced by upward movement of fragments from underlying sediment or remains after finer particles have been removed by running water or the wind.

Dip slope. A slope of the land surface, roughly determined by and approximately conforming with the dip of underlying bedded rock.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—These soils have very high and high hydraulic conductivity and a low water-holding capacity. They are not suited to crop production unless irrigated.

Somewhat excessively drained.—These soils have high hydraulic conductivity and a low water-holding capacity. Without irrigation, only a narrow range of crops can be grown and yields are low.

Well drained.—These soils have an intermediate water-holding capacity. They retain optimum amounts of moisture, but they are not wet close enough to the surface or long enough during the growing season to adversely affect yields.

Moderately well drained.—These soils are wet

close enough to the surface or long enough that planting or harvesting operations or yields of some field crops are adversely affected unless a drainage system is installed. Moderately well drained soils commonly have a layer with low hydraulic conductivity, a wet layer relatively high in the profile, additions of water by seepage, or some combination of these.

Somewhat poorly drained.—These soils are wet close enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless a drainage system is installed. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, a wet layer high in the profile, additions of water through seepage, or a combination of these.

Poorly drained.—These soils commonly are so wet at or near the surface during a considerable part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these.

Very poorly drained.—These soils are wet to the surface most of the time. The wetness prevents the growth of important crops (except for rice) unless a drainage system is installed.

Drainage, surface. Runoff, or surface flow of water, from an area.

Draw. A small stream valley, generally more open and with broader bottom land than a ravine or gulch.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sodium (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, or clay.

Flaggy soil material. Material that is, by volume, 15 to

35 percent flagstones. Very flaggy soil material is 35 to 60 percent flagstones, and extremely flaggy soil material is more than 60 percent flagstones.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gullied land. Areas where erosion has resulted in a network of V- or U-shaped channels. Gullied land resembles small areas of badland.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Gypsum land. Exposures of nearly pure, soft gypsum. The surface generally is very unstable and erodes easily. Trafficability is very poor.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the

material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Light textured soil. Sand or loamy sand.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by the wind.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until

the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mesa. A broad, nearly flat topped and commonly isolated upland mass characterized by summit widths that are more than the heights of bounding erosional scarps.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides and considerable bare-rock surface. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of

moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability or an impermeable layer near the surface, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Red beds. Sedimentary strata mainly red in color and composed largely of sandstone and shale.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Ridge. A long and narrow, generally sharp-crested land surface that has steep sides and forms on uplands between valleys. Ridges are in areas of hills and mountains.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Riverwash. Unstabilized sandy, silty, clayey, or gravelly sediments in areas that are flooded, washed, and reworked by rivers so frequently that they support little or no vegetation.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Salty water (in tables). Water that is too salty for consumption by livestock.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site class. A grouping of site indexes into five to seven production capability levels. Each level can be represented by a site curve.

Site curve (100-year). A set of related curves on a graph that shows the average height of dominant and codominant trees for a range of ages on soils that differ in productivity. Each level is represented by a curve. The basis of the curves is the height of dominant and codominant trees that are 100 years old or are 100 years old at breast height.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodic soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 6 to 15 inches (15 to 38 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Tailwater. The water just downstream of a structure.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Too arid (in tables). The soil is dry most of the time, and vegetation is difficult to establish.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The action of uprooting and tipping over trees by the wind.

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Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1953-90 at Grants, New Mexico, and 1949-90 at Laguna, New Mexico)

Month	Temperature		Precipitation	
	Average daily maximum	Average daily minimum	Average monthly total	Average number of days with 0.10 inch or more
	°F	°F	In	
GRANTS:				
January	44.6	13.7	0.47	1
February	50.0	18.0	.46	1
March	56.6	23.2	.46	1
April	66.4	29.6	.41	1
May	74.9	38.2	.48	1
June	85.3	47.2	.57	1
July	87.0	55.0	1.83	4
August	83.8	52.6	2.02	5
September	78.5	44.2	1.35	3
October	68.1	32.7	1.14	2
November	55.3	22.0	.51	1
December	46.3	14.4	.60	2
Year	66.4	32.6	10.30	23
LAGUNA:				
January	47.5	18.8	0.40	1
February	52.8	22.3	.44	1
March	59.6	27.3	.41	1
April	69.0	34.2	.39	1
May	77.8	42.9	.59	1
June	88.3	52.3	.44	1
July	90.5	58.8	1.66	4
August	87.4	57.1	1.80	5
September	81.5	48.9	1.17	3
October	71.2	37.6	1.15	2
November	58.2	26.6	.33	1
December	49.0	19.4	.49	1
Year	69.4	37.2	9.27	22

TABLE 2.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Cibola	Mckinley	Valencia	Total-- Area	Extent
		Acres	Acres	Acres	Acres	Pct
10	Lava flows	98,488	0	0	98,488	3.8
20	Penistaja fine sandy loam, 1 to 3 percent slopes	7,496	0	0	7,496	0.3
21	Clovis sandy clay loam, 1 to 3 percent slopes	817	0	0	817	*
25	Hickman-Catman complex, 1 to 6 percent slopes	53,388	65	0	53,453	2.0
30	Warm Springs loam, 0 to 2 percent slopes	2,163	0	0	2,163	0.1
40	Aparejo clay loam, 0 to 1 percent slopes	1,493	0	0	1,493	0.1
41	Aparejo clay loam, sandy substratum, 0 to 1 percent slopes	1,993	0	0	1,993	0.1
45	Aparejo clay, 0 to 1 percent slopes	1,250	0	0	1,250	*
50	Venadito clay loam, 0 to 1 percent slopes	4,385	0	0	4,385	0.2
51	Venadito sandy clay loam, 0 to 1 percent slopes	625	0	0	625	*
52	Venadito Variant clay loam, 0 to 1 percent slopes	780	0	0	780	*
55	Glenberg-San Mateo complex, 0 to 2 percent slopes	1,250	0	0	1,250	*
56	Mespun loamy sand, 1 to 5 percent slopes	650	0	0	650	*
57	San Mateo clay loam, 1 to 3 percent slopes	3,189	0	0	3,189	0.1
58	San Mateo sandy clay loam, 1 to 3 percent slopes	1,885	0	0	1,885	0.1
60	Sparank clay loam, 1 to 3 percent slopes	4,038	0	0	4,038	0.1
61	Sparham clay loam, 0 to 2 percent slopes	906	0	0	906	*
62	Sparank sandy clay loam, saline, sodic, 1 to 3 percent slopes	4,531	0	0	4,531	0.2
66	Zia fine sandy loam, 3 to 5 percent slopes	355	0	0	355	*
70	Catman clay loam, 1 to 3 percent slopes	0	677	0	677	*
72	Catman Variant clay loam, 1 to 3 percent slopes	0	305	0	305	*
73	Catman sandy clay loam, 1 to 3 percent slopes	0	319	0	319	*
75	Hickman sandy clay loam, 1 to 3 percent slopes	0	233	0	233	*
100	Manzano loam, 1 to 5 percent slopes	1,987	0	0	1,987	0.1
120	Rock outcrop-Laporte complex, 30 to 60 percent slopes	12,132	0	0	12,132	0.4
130	Laporte-Rock outcrop complex, 3 to 20 percent slopes	36,375	0	0	36,375	1.3
200	Penistaja fine sandy loam, 2 to 10 percent slopes	71,754	0	1,202	72,956	2.8
205	Ildefonso very gravelly sandy loam, 3 to 15 percent slopes	850	0	0	850	*
210	Bond-Penistaja-Rock outcrop complex, 2 to 15 percent slopes	6,283	0	276	6,559	0.2
218	Viuda-Penistaja-Rock outcrop complex, 1 to 10 percent slopes	66,325	0	0	66,325	2.5
230	Dumps-Pits complex	6,609	0	0	6,609	0.2
251	Skyvillage-Rock outcrop-Bond complex, 3 to 40 percent slopes	34,603	0	1,205	35,808	1.3
257	Sparank-San Mateo complex, 0 to 5 percent slopes	78,559	0	2,389	80,948	3.0
259	Mikim loam, 1 to 5 percent slopes	17,155	0	367	17,522	0.6
262	Poley-Pojoaque very cobbly loams, 5 to 30 percent slopes	42,119	0	0	42,119	1.6
264	Tapia sandy loam, 1 to 5 percent slopes	2,793	0	0	2,793	0.1
270	Charo loam, 0 to 5 percent slopes	14,388	0	0	14,388	0.5
272	Cebolleta-Borrego-Rock outcrop complex, 1 to 15 percent slopes	11,601	0	0	11,601	0.4
276	Trag loam, 1 to 8 percent slopes	2,494	0	0	2,494	0.1
278	Microy-Rock outcrop complex, 5 to 30 percent slopes	4,320	0	0	4,320	0.2
282	Cebolleta cobbly loam, 2 to 10 percent slopes, very stony	9,151	0	0	9,151	0.3
284	Cebolleta-Rock outcrop complex, 15 to 50 percent slopes	15,655	0	0	15,655	0.6
286	Cebolleta-Raton complex, 1 to 5 percent slopes	3,197	0	0	3,197	0.1
290	Paguate-Hackroy complex, 1 to 5 percent slopes	20,624	0	0	20,624	0.8
291	Paguate cobbly clay loam, 1 to 5 percent slopes	41,679	0	0	41,679	1.5
294	Parkay-Rock outcrop complex, 15 to 45 percent slopes	7,413	0	0	7,413	0.3
300	Saladon clay loam, 0 to 5 percent slopes	651	0	0	651	*
310	Mirabal very gravelly loam, 2 to 15 percent slopes	5,925	0	0	5,925	0.2

See footnote at end of table.

TABLE 2.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Cibola	Mckinley	Valencia	Total-- Area	Extent
		Acres	Acres	Acres	Acres	Pct
315	Abersito, cobbly-Abersito-Rock outcrop association, 5 to 30 percent slopes	5,664	0	0	5,664	0.2
320	Cinnadale gravelly very fine sandy loam, 1 to 15 percent slopes	10,037	0	0	10,037	0.4
325	Moreno Variant loam, 2 to 10 percent slopes	542	0	0	542	*
330	Moreno loam, 1 to 10 percent slopes	1,895	0	0	1,895	0.1
340	Yankee silty clay loam, 0 to 3 percent slopes	551	0	0	551	*
350	Rock outcrop-Stout complex, 3 to 15 percent slopes	6,634	0	0	6,634	0.2
406	Poley-Rock outcrop complex, 2 to 25 percent slopes	48,908	0	7,469	56,377	2.1
407	Viuda-Rock outcrop complex, 1 to 10 percent slopes	6,357	0	0	6,357	0.2
419	Navajo silty clay loam, 1 to 5 percent slopes	14,969	0	3,298	18,267	0.7
420	Navajo-Suwanee complex, 1 to 5 percent slopes	52,584	0	7,344	59,928	2.2
424	Mespun-Palma association, 1 to 12 percent slopes	49,936	0	3,342	53,278	2.0
426	Sheppard-Shiprock association, 1 to 12 percent slopes	20,993	0	1,542	22,535	0.8
432	Winona-Rock outcrop complex, 3 to 20 percent slopes	14,550	0	7,545	22,095	0.8
434	Rizozo-Rock outcrop association, 3 to 55 percent slopes	10,160	0	1,257	11,417	0.4
446	Harvey-Oelop association, 0 to 5 percent slopes	9,825	0	14,973	24,798	0.9
476	Saido loam, 1 to 12 percent slopes	12,728	0	1,409	14,137	0.5
485	Rock outcrop-Mion complex, 15 to 65 percent slopes	88,604	0	8,415	97,019	3.6
487	Mion-Badland complex, 20 to 65 percent slopes	7,401	0	7,719	15,120	0.6
500	Timhus-Bandera association, 20 to 50 percent slopes	8,024	0	0	8,024	0.3
505	Flugle-Goesling loamy fine sands, 1 to 8 percent slopes	65,498	245	0	65,743	2.4
514	Raton-Rock outcrop complex, 1 to 10 percent slopes	10,715	0	0	10,715	0.4
515	Rock outcrop-Vessilla-Mion complex, 3 to 55 percent slopes	242,043	8,762	0	250,805	9.3
518	Borrego-Charo-Rock outcrop complex, 1 to 10 percent slopes	7,768	0	0	7,768	0.3
520	Celacy-Atarque complex, 1 to 10 percent slopes	49,290	1,082	0	50,372	1.9
522	Bandera association, 15 to 45 percent slopes	4,287	0	0	4,287	0.2
523	Charo-Raton complex, 1 to 10 percent slopes	33,107	0	0	33,107	1.2
525	Catman-Silkie association, 1 to 10 percent slopes	66,091	6,043	0	72,134	2.7
535	Millpaw loam, 0 to 5 percent slopes	21,581	0	0	21,581	0.8
536	McGaffey loam, 1 to 5 percent slopes	1,883	0	0	1,883	0.1
537	Millpaw-Loarc complex, 0 to 10 percent slopes	11,870	0	0	11,870	0.4
540	Montecito fine sandy loam, 1 to 15 percent slopes	19,278	0	0	19,278	0.7
550	Nogal-Galestina sandy loams, 1 to 10 percent slopes	68,155	1,007	0	69,162	2.6
555	Pinitos-Ribera sandy loams, 1 to 10 percent slopes	55,481	1,618	0	57,099	2.1
560	Flugle-Teco association, 1 to 8 percent slopes	107,826	3,404	0	111,230	4.2
561	Flugle-Quintana complex, 2 to 15 percent slopes	51,253	0	0	51,253	1.9
565	Quintana sandy loam, 5 to 15 percent slopes, gullied	10,783	0	0	10,783	0.4
570	Torreon-Rock outcrop-Cabezon complex, 15 to 45 percent slopes	20,537	0	0	20,537	0.8
575	Teco-Atarque association, 1 to 8 percent slopes	132,254	4,738	0	136,992	5.1
576	Teco sandy loam, 2 to 5 percent slopes	5,141	3,296	0	8,437	0.3
577	Cabezon-Montecito-Rock outcrop association, 1 to 10 percent slopes	135,037	211	0	135,248	5.0
579	Cabezon-Cantina complex, 1 to 7 percent slopes	73,127	298	0	73,425	2.7
581	Laporte-Vessilla complex, 3 to 15 percent slopes	4,476	0	0	4,476	0.2
582	Kenray fine sand, 3 to 15 percent slopes	6,772	0	0	6,772	0.3
585	Moncha silt loam, 2 to 10 percent slopes	4,227	0	0	4,227	0.2
586	Venadito-Teco association, 0 to 10 percent slopes	14,985	0	0	14,985	0.6
591	Valnor-Techado association, 2 to 25 percent slopes	23,544	0	0	23,544	0.9
610	Grieta-Shiprock association, 1 to 10 percent slopes	33,528	0	4,429	37,957	1.4
611	Grieta-Kiki sandy loams, 3 to 15 percent slopes	9,863	0	5,128	14,991	0.6
615	Trag-Techado-Rock outcrop complex, 3 to 55 percent slopes	9,415	0	0	9,415	0.3
618	Netoma sandy loam, 2 to 12 percent slopes	7,266	0	1,968	9,234	0.3
619	Venadito clay loam, 1 to 5 percent slopes	6,796	0	101	6,897	0.3

See footnote at end of table.

TABLE 2.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Cibola	Mckinley	Valencia	Total-- Area	Total-- Extent
		Acres	Acres	Acres	Acres	Pct
620	Aparejo-Venadito complex, 1 to 5 percent slopes	17,277	0	2,626	19,903	0.7
625	Hagerman-Bond association, 1 to 10 percent slopes	59,606	0	2,016	61,622	2.3
630	Bond-Rizozo-Rock outcrop complex, 2 to 20 percent slopes	1,528	0	2,323	3,851	0.1
640	Flaco-Berto loams, 0 to 5 percent slopes	13,031	0	5,825	18,856	0.7
641	Berto-Flaco cobbly loams, 1 to 10 percent slopes	23,122	0	1,131	24,253	0.9
645	Penistaja-Oelop association, 0 to 5 percent slopes	9,580	0	2,721	12,301	0.5
650	Winona-Tanbark-Rock outcrop association, 15 to 60 percent slopes	12,436	0	8,860	21,296	0.8
660	Rana-Rock outcrop complex, 2 to 25 percent slopes	30,695	0	0	30,695	1.1
	Water	962	497	0	1,459	0.1
	Total	2,556,800	32,800	106,880	2,696,480	100.0

* Less than 0.1 percent.

TABLE 3.--CAPABILITY SUBCLASSES FOR IRRIGATED LAND AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil. Only the soils suited to crops and pasture are listed)

Soil name and map symbol	Land capability	Corn	Alfalfa hay	Wheat	Pasture	Irish potatoes
		Bu	Tons	Bu	AUM*	Cwt
20---------- Penistaja	IIIe	---	5.0	---	---	---
21---------- Clovis	IIIe	---	5.0	---	---	---
40---------- Aparejo	IIIe	130	5.0	80	12	250
41---------- Aparejo	IIIe	120	5.0	80	13	300
45---------- Aparejo	IIIe	135	4.0	80	12	---
50---------- Venadito	IIIs	110	4.5	50	12	---
51---------- Venadito	IIIs	110	4.5	50	12	---
52---------- Venadito Variant	IVe	135	3.0	50	7	---
55---------- Glenberg-San Mateo	IIIe	---	5.0	---	---	---
57, 58---------- San Mateo	IIIe	---	5.0	---	13	---
60---------- Sparank	IIIs	---	5.0	---	12	---
61---------- Sparham	IIIs	---	1.5	---	9	---
66---------- Zia	IIIe	---	5.0	---	8	---
70---------- Catman	IIIs	---	3.0	50	8	---
72---------- Catman Variant	IIIs	---	1.5	40	5	---
73---------- Catman	IIIs	---	3.0	50	8	---
75---------- Hickman	IIIe	---	5.0	50	10	---

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 4.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
120**:									
Rock outcrop.									
Laporte	1R	Severe	Severe	Severe	Slight	Oneseed juniper	36	1	
						Pinyon	---	---	
130**:									
Laporte	1D	Slight	Severe	Severe	Slight	Pinyon	40	1	
						Oneseed juniper	---	---	
Rock outcrop.									
272**:									
Cebolleta	3F	Slight	Moderate	Moderate	Moderate	Ponderosa pine	51	3	Ponderosa pine.
Borrego	3D	Moderate	Moderate	Severe	Moderate	Ponderosa pine	55	3	
Rock outcrop.									
278**:									
Microy	3C	Slight	Slight	Slight	Moderate	Ponderosa pine	51	3	Ponderosa pine.
Rock outcrop.									
282--- Cebolleta	3F	Slight	Moderate	Moderate	Moderate	Ponderosa pine	51	3	Ponderosa pine.
284**:									
Cebolleta	3X	Moderate	Moderate	Moderate	Moderate	Ponderosa pine	57	3	Ponderosa pine.
						Douglas fir	---	---	
Rock outcrop.									
286**:									
Cebolleta	3F	Slight	Moderate	Moderate	Moderate	Ponderosa pine	51	3	Ponderosa pine.
Raton	4X	Moderate	Moderate	Severe	Slight	Ponderosa pine	65	4	Ponderosa pine.
						Douglas fir	---	---	
291--- Paguate	1C	Moderate	Moderate	Slight	Severe	Oneseed juniper	40	1	Pinyon.
						Pinyon	---	---	
294**:									
Parkay	5F	Moderate	Slight	Slight	Moderate	Engelmann spruce	75	5	Engelmann spruce, Douglas fir.
						Corkbark fir	---	---	
						Douglas fir	77	---	
Rock outcrop.									
310--- Mirabal	3D	Slight	Moderate	Moderate	Slight	Ponderosa pine	60	3	Ponderosa pine.
						Douglas fir	62	---	
315**:									
Abersito, cobbly	4X	Slight	Moderate	Moderate	Slight	Ponderosa pine	66	4	Ponderosa pine.

See footnotes at end of table.

TABLE 4.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
315**:									
Abersito	4X	Moderate	Moderate	Moderate	Slight	Ponderosa pine	67	4	Ponderosa pine.
Rock outcrop.									
320 Cinnadale	4D	Slight	Moderate	Moderate	Slight	Ponderosa pine	65	4	Ponderosa pine.
325 Moreno Variant	6A	Slight	Slight	Slight	Severe	Ponderosa pine	87	6	Ponderosa pine.
330 Moreno	5A	Slight	Slight	Slight	Severe	Ponderosa pine	79	5	Ponderosa pine.
350**:									
Rock outcrop.									
Stout	3D	Slight	Slight	Severe	Slight	Ponderosa pine	50	3	
500**:									
Timhus	1R	Severe	Moderate	Slight	Slight	Pinyon	26	1	
						Oneseed juniper	---	---	
Bandera	3R	Slight	Moderate	Slight	Moderate	Ponderosa pine	56	3	Ponderosa pine.
514**:									
Raton	2X	Slight	Moderate	Severe	Slight	Ponderosa pine	42	2	
						Pinyon	---	---	
						Rocky Mountain juniper	---	---	
Rock outcrop.									
515**:									
Rock outcrop.									
Vessilla	1R	Severe	Moderate	Severe	Slight	Pinyon	50	1	
						Oneseed juniper	---	---	
Mion	1R	Severe	Moderate	Severe	Moderate	Pinyon	20	1	
						Oneseed juniper	---	---	
518**:									
Borrego	3D	Moderate	Moderate	Severe	Moderate	Ponderosa pine	55	3	
Charo.									
Rock outcrop.									
520**:									
Celacy	1A	Slight	Moderate	Slight	Moderate	Oneseed juniper	15	1	
						Pinyon	---	---	
						Utah juniper	---	---	
Atarque.									

See footnotes at end of table.

TABLE 4.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
522**:									
Bandera, 30 to 45 percent slopes	3R	Slight	Moderate	Slight	Moderate	Ponderosa pine	56	3	Ponderosa pine.
Bandera, 15 to 30 percent slopes	3F	Slight	Moderate	Slight	Moderate	Ponderosa pine	64	3	Ponderosa pine.
523**:									
Charo	4C	Slight	Slight	Moderate	Moderate	Ponderosa pine	66	4	Ponderosa pine.
						Pinyon	---	---	
						Rocky Mountain juniper	---	---	
Raton	3X	Moderate	Moderate	Severe	Slight	Ponderosa pine	55	3	Ponderosa pine.
						Douglas fir	---	---	
536--McGaffey	6A	Moderate	Slight	Slight	Severe	Ponderosa pine	87	6	Ponderosa pine.
537**:									
Millpaw	1C	Slight	Moderate	Slight	Severe	Pinyon	43	1	Pinyon, oneseed juniper.
						Oneseed juniper	---	---	
Loarc	1A	Slight	Moderate	Slight	Moderate	Pinyon	45	1	Pinyon.
						Oneseed juniper	---	---	
540--Montecito	1C	Slight	Slight	Slight	Severe	Oneseed juniper	34	1	
						Pinyon	---	---	
550**:									
Nogal	1C	Slight	Moderate	Moderate	Moderate	Pinyon	36	1	Pinyon, oneseed juniper.
						Oneseed juniper	---	---	
Galestina.									
555**:									
Pinitos	1A	Slight	Moderate	Slight	Moderate	Pinyon	45	1	Pinyon.
						Oneseed juniper	---	---	
Ribera	1A	Slight	Slight	Slight	Moderate	Pinyon	45	1	Pinyon.
						Oneseed juniper	---	---	
560**:									
Flugle	1A	Slight	Slight	Slight	Severe	Pinyon	40	1	
						Oneseed juniper	---	---	
Teco.									
561**:									
Flugle	1A	Slight	Slight	Slight	Severe	Pinyon	40	1	
						Oneseed juniper	---	---	
Quintana	1A	Moderate	Slight	Slight	Severe	Pinyon	44	1	
						Oneseed juniper	---	---	

See footnotes at end of table.

TABLE 4.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
565---------- Quintana	1A	Moderate	Slight	Slight	Severe	Pinyon---------- Oneseed juniper-----	35 ---	1 ---	
570**: Torreon--------	1F	Slight	Slight	Slight	Severe	Pinyon---------- Juniper----------	45 ---	1 ---	
Rock outcrop.									
Cabezon--------	1D	Moderate	Severe	Severe	Slight	Pinyon---------- Oneseed juniper-----	47 ---	1 ---	
577**: Cabezon--------	1D	Slight	Severe	Severe	Slight	Pinyon---------- Oneseed juniper-----	45 ---	1 ---	
Montecito.									
Rock outcrop.									
579**: Cabezon--------	1D	Slight	Severe	Severe	Slight	Pinyon---------- Oneseed juniper-----	43 ---	1 ---	
Cantina--------	1C	Slight	Slight	Slight	Moderate	Pinyon---------- Oneseed juniper-----	55 ---	1 ---	Pinyon.
581**: Laporte--------	1D	Slight	Severe	Severe	Slight	Pinyon---------- Oneseed juniper-----	45 ---	1 ---	
Vessilla-------	1D	Moderate	Moderate	Severe	Slight	Pinyon---------- Oneseed juniper-----	35 ---	1 ---	
582---------- Kenray	3S	Severe	Severe	Slight	Moderate	Ponderosa pine------ Pinyon---------- Oneseed juniper-----	60 --- ---	3 --- ---	Ponderosa pine.
591**: Valnor---------	2A	Slight	Slight	Slight	Moderate	Ponderosa pine------	45	2	Ponderosa pine.
Techado--------	2D	Moderate	Moderate	Severe	Moderate	Ponderosa pine------ Rocky Mountain juniper----------	45 ---	2 ---	Ponderosa pine.
615**: Trag----------	3A	Slight	Slight	Slight	Severe	Ponderosa pine------	63	3	Ponderosa pine.
Techado--------	3R	Severe	Moderate	Moderate	Moderate	Ponderosa pine------ Rocky Mountain juniper----------	56 ---	3 ---	
Rock outcrop.									

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 5.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

(The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil. Only the soils suited to windbreaks and environmental plantings are listed)

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
20---- Penistaja	---	Pinyon, fourwing saltbush, lilac.	Austrian pine, eastern redcedar, Rocky Mountain juniper, ponderosa pine, white fir.	Russian olive, green ash.	Siberian elm, Lombardy poplar.
21---- Clovis	Fourwing saltbush	Skunkbush sumac, Amur honeysuckle, lilac.	Green ash, honeylocust, golden willow.	Russian olive-----	Siberian elm.
30---- Warm Springs	---	Lilac, Siberian peashrub, tatarian honeysuckle.	---	Golden willow, Russian olive, plains cottonwood.	Siberian elm.
40---- Aparejo	Fourwing saltbush	Pinyon, skunkbush sumac, Amur honeysuckle, lilac.	Eastern redcedar, green ash, honeylocust, golden willow.	Russian olive-----	Siberian elm.
41---- Aparejo	Fourwing saltbush	Pinyon, skunkbush sumac, Amur honeysuckle, lilac.	Eastern redcedar, Rocky Mountain juniper, green ash, honeylocust, golden willow.	Russian olive-----	Siberian elm.
45---- Aparejo	Fourwing saltbush	Pinyon, skunkbush sumac, Amur honeysuckle, lilac.	Eastern redcedar, green ash, honeylocust, golden willow.	Russian olive-----	Siberian elm.
50, 51---- Venadito	Fourwing saltbush, lilac.	Green ash, skunkbush sumac, American plum.	Siberian elm, Russian mulberry, Osageorange.	---	---
52---- Venadito Variant	Lilac----------	Austrian pine, eastern redcedar, Rocky Mountain juniper, green ash.	Siberian elm, Russian mulberry, Osageorange.	---	---
55*:					
Glenberg---------	Lilac----------	Eastern redcedar, Rocky Mountain juniper, pinyon, American plum, Amur honeysuckle.	Green ash, honeylocust, Osageorange.	Russian olive, Siberian elm.	---
San Mateo--------	Lilac----------	Eastern redcedar, Rocky Mountain juniper, pinyon, American plum, Amur honeysuckle.	Green ash, honeylocust, Osageorange.	Russian olive, Siberian elm.	---

See footnote at end of table.

TABLE 5.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
56---------- Mespun	Lilac, fourwing saltbush, western sandcherry.	Austrian pine, redcedar, Rocky Mountain juniper, ponderosa pine, Siberian elm, green ash.	---	---	---
57, 58---------- San Mateo	Lilac----------	Pinyon, Amur honeysuckle, American plum, eastern redcedar, Rocky Mountain juniper, fourwing saltbush.	Osageorange, honeylocust, green ash.	Russian olive, Siberian elm.	---
60---------- Sparank	Lilac----------	Austrian pine, eastern redcedar, Rocky Mountain juniper, Russian olive, green ash, skunkbush sumac, American plum.	Siberian elm, Russian mulberry, Osageorange.	---	---
61. Sparham**					
62. Sparank**					
66---------- Zia	Fourwing saltbush, lilac, western sandcherry.	Austrian pine, eastern redcedar, Rocky Mountain juniper, ponderosa pine, pinyon, Siberian elm, green ash.	Russian olive, honeylocust.	---	---
70---------- Catman	Lilac----------	Austrian pine, eastern redcedar, Rocky Mountain juniper, Russian olive, green ash, skunkbush sumac, American plum, fourwing saltbush.	Siberian elm, Russian mulberry, Osageorange.	---	---
72. Catman Variant**					
73---------- Catman	Lilac----------	Austrian pine, eastern redcedar, Rocky Mountain juniper, Russian olive, green ash, skunkbush sumac, American plum, fourwing saltbush.	Siberian elm, Russian mulberry, Osageorange.	---	---

See footnote at end of table.

TABLE 5.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
75---------- Hickman	Fourwing saltbush	Skunkbush sumac, lilac.	Eastern redcedar, Rocky Mountain juniper, blue spruce.	Russian olive, green ash, honeylocust, golden willow.	Siberian elm, Lombardy poplar.
100---------- Manzano	---	Fourwing saltbush, skunkbush sumac, lilac, American plum.	Austrian pine, eastern redcedar, Rocky Mountain juniper, ponderosa pine.	Russian olive, green ash.	Siberian elm, Lombardy poplar.
218*: Viuda**					
Penistaja---------	---	Pinyon, fourwing saltbush, lilac.	Austrian pine, eastern redcedar, Rocky Mountain juniper, ponderosa pine, white fir.	Russian olive, green ash.	Siberian elm, Lombardy poplar.
Rock outcrop.					

* See description of the map unit for composition and behavior characteristics of the map unit.
** Planting trees and shrubs may be suitable if special treatment is used.

TABLE 6.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
10*. Lava flows					
20---------- Penistaja	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
21---------- Clovis	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
25*:					
Hickman----------	Severe: flooding.	Slight----------	Moderate: slope, small stones, flooding.	Slight----------	Moderate: flooding.
Catman----------	Severe: flooding.	Moderate: excess salt.	Moderate: slope, flooding, percs slowly.	Slight----------	Moderate: excess salt, flooding.
30---------- Warm Springs	Severe: flooding.	Moderate: flooding, wetness, excess salt.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
40, 41---------- Aparejo	Severe: flooding.	Slight----------	Moderate: flooding.	Slight----------	Moderate: flooding.
45---------- Aparejo	Severe: flooding.	Moderate: too clayey.	Moderate: too clayey, flooding.	Moderate: too clayey.	Severe: too clayey.
50, 51---------- Venadito	Severe: flooding.	Moderate: percs slowly.	Moderate: flooding, percs slowly.	Slight----------	Moderate: flooding.
52---------- Venadito Variant	Severe: flooding.	Moderate: percs slowly.	Moderate: flooding, percs slowly.	Slight----------	Moderate: flooding, depth to rock.
55*:					
Glenberg----------	Severe: flooding.	Slight----------	Moderate: small stones, flooding.	Slight----------	Moderate: droughty, flooding.
San Mateo----------	Severe: flooding.	Slight----------	Moderate: flooding.	Slight----------	Moderate: flooding.
56---------- Mespun	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
57, 58---------- San Mateo	Severe: flooding.	Slight----------	Moderate: slope, flooding.	Slight----------	Moderate: flooding.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
60 Sparank	Severe: flooding.	Moderate: percs slowly.	Moderate: slope, flooding, percs slowly.	Slight	Moderate: flooding.
61 Sparham	Severe: flooding.	Moderate: excess salt, percs slowly.	Moderate: flooding, percs slowly, excess salt.	Slight	Moderate: excess salt, flooding.
62 Sparank	Severe: flooding, excess sodium, excess salt.	Severe: excess sodium, excess salt.	Severe: excess sodium, excess salt.	Slight	Severe: excess salt, excess sodium, droughty.
66 Zia	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
70 Catman	Severe: flooding.	Moderate: excess salt.	Moderate: slope, flooding, percs slowly.	Slight	Moderate: excess salt, flooding.
72 Catman Variant	Severe: flooding.	Moderate: wetness, excess salt, percs slowly.	Moderate: slope, wetness, flooding.	Slight	Moderate: excess salt, droughty, flooding.
73 Catman	Severe: flooding.	Moderate: excess salt.	Moderate: slope, flooding, percs slowly.	Slight	Moderate: excess salt, flooding.
75 Hickman	Severe: flooding.	Slight	Moderate: slope, small stones, flooding.	Slight	Moderate: flooding.
100 Manzano	Severe: flooding.	Slight	Moderate: slope, flooding.	Slight	Moderate: flooding.
120*: Rock outcrop.					
Laporte	Severe: slope, large stones, depth to rock.	Severe: slope, large stones, depth to rock.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: large stones, slope, depth to rock.
130*: Laporte	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones.	Slight	Severe: depth to rock.
Rock outcrop.					
200 Penistaja	Slight	Slight	Severe: slope.	Slight	Slight.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
205--Ildefonso	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight	Severe: small stones, droughty.
210*:					
Bond	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight	Severe: depth to rock.
Penistaja	Slight	Slight	Severe: slope.	Slight	Slight.
Rock outcrop.					
218*:					
Viuda	Severe: large stones, small stones, depth to rock.	Severe: large stones, small stones, depth to rock.	Severe: large stones, slope, small stones.	Moderate: large stones.	Severe: small stones, large stones, depth to rock.
Penistaja	Slight	Slight	Moderate: slope.	Slight	Slight.
Rock outcrop.					
230*:					
Dumps.					
Pits.					
251*:					
Skyvillage	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: slope, depth to rock.
Rock outcrop.					
Bond	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.
257*:					
Sparank	Severe: flooding.	Moderate: percs slowly.	Moderate: flooding, percs slowly.	Slight	Moderate: flooding.
San Mateo	Severe: flooding.	Moderate: dusty.	Moderate: slope, flooding, dusty.	Moderate: dusty.	Moderate: flooding.
259--Mikim	Moderate: dusty.	Moderate: dusty.	Moderate: slope, small stones, dusty.	Moderate: dusty.	Slight.
262*:					
Poley	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Moderate: large stones, slope, dusty.	Severe: small stones, large stones, slope.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
262*:					
Pojoaque	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Moderate: large stones, slope, dusty.	Severe: small stones, large stones, slope.
264 Tapia	Slight	Slight	Moderate: slope.	Slight	Moderate: large stones.
270 Charo	Slight	Slight	Moderate: slope.	Slight	Moderate: large stones, depth to rock.
272*:					
Cebolleta	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: large stones, slope.	Moderate: large stones.	Severe: large stones.
Borrego	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight	Severe: depth to rock.
Rock outcrop.					
276 Trag	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.
278*:					
Microy	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: large stones, slope.	Severe: slope.
Rock outcrop.					
282 Cebolleta	Moderate: large stones.	Moderate: large stones.	Severe: large stones, slope.	Moderate: large stones.	Severe: large stones.
284*:					
Cebolleta	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: large stones, slope.
Rock outcrop.					
286*:					
Cebolleta	Severe: large stones.	Severe: large stones.	Severe: large stones, small stones.	Moderate: large stones.	Severe: large stones.
Raton	Severe: depth to rock.	Severe: depth to rock.	Severe: large stones, depth to rock.	Slight	Severe: depth to rock.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
290*:					
Paguate	Moderate: dusty.	Moderate: dusty.	Moderate: slope, small stones, depth to rock.	Moderate: dusty.	Moderate: large stones, depth to rock.
Hackroy	Severe: depth to rock.	Severe: depth to rock.	Severe: large stones, depth to rock.	Moderate: large stones.	Severe: large stones, depth to rock.
291 Paguate	Moderate: large stones, small stones.	Moderate: large stones, small stones.	Severe: large stones, small stones.	Moderate: large stones.	Moderate: small stones, large stones, depth to rock.
294*:					
Parkay	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Rock outcrop.					
300 Saladon	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
310 Mirabal	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight	Severe: small stones.
315*:					
Abersito, cobbly	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Severe: large stones.	Severe: large stones, slope.
Abersito	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, large stones.
Rock outcrop.					
320 Cinnadale	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight	Severe: depth to rock.
325 Moreno Variant	Slight	Slight	Severe: slope.	Slight	Slight.
330 Moreno	Slight	Slight	Moderate: slope.	Slight	Moderate: large stones.
340 Yankee	Slight	Slight	Slight	Slight	Slight.
350*:					
Rock outcrop.					

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
350*:					
Stout	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight	Severe: depth to rock.
406*:					
Poley	Severe: large stones.	Severe: large stones.	Severe: large stones, slope, small stones.	Moderate: large stones, dusty.	Severe: large stones.
Rock outcrop.					
407*:					
Viuda	Severe: large stones, small stones, depth to rock.	Severe: large stones, small stones, depth to rock.	Severe: large stones, small stones.	Moderate: large stones.	Severe: small stones, large stones, depth to rock.
Rock outcrop.					
419 Navajo	Severe: flooding, excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight	Severe: excess sodium.
420*:					
Navajo	Severe: flooding, excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight	Severe: excess sodium.
Suwanee	Severe: flooding.	Slight	Moderate: slope, flooding.	Slight	Moderate: flooding.
424*:					
Mespun	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty.
Palma	Slight	Slight	Moderate: slope.	Slight	Slight.
426*:					
Sheppard	Slight	Slight	Severe: slope.	Slight	Moderate: droughty.
Shiprock	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
432*:					
Winona	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Moderate: dusty.	Severe: small stones.
Rock outcrop.					
434*:					
Rizozo	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
434*:					
Rock outcrop.					
446*:					
Harvey	Slight	Slight	Moderate: slope.	Slight	Slight.
Oelop	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.	Slight.
476	Moderate:	Moderate:	Severe:	Slight	Moderate:
Saido	excess salt.	excess salt.	slope.		excess salt.
485*:					
Rock outcrop.					
Mion	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: large stones, slope, depth to rock.
487*:					
Mion	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.	Severe: slope, depth to rock.
Badland.					
500*:					
Timhus	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope.
Bandera	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, droughty, slope.
505*:					
Flugle	Slight	Slight	Moderate: slope.	Slight	Slight.
Goesling	Slight	Slight	Moderate: slope.	Slight	Slight.
514*:					
Raton	Severe: large stones, depth to rock.	Severe: large stones, depth to rock.	Severe: large stones, depth to rock.	Severe: large stones.	Severe: large stones, depth to rock.
Rock outcrop.					
515*:					
Rock outcrop.					
Vessilla	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
515*:					
Mion	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.	Severe: slope, depth to rock.
518*:					
Borrego	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight	Severe: depth to rock.
Charo	Slight	Slight	Moderate: slope.	Slight	Moderate: large stones, depth to rock.
Rock outcrop.					
520*:					
Celacy	Slight	Slight	Moderate: slope, depth to rock.	Slight	Moderate: depth to rock.
Atarque	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight	Severe: depth to rock.
522*:					
Bandera, 30 to 45 percent slopes	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: droughty, slope.
Bandera, 15 to 30 percent slopes	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: droughty, slope.
523*:					
Charo	Moderate: large stones.	Moderate: large stones.	Moderate: slope, small stones.	Slight	Moderate: large stones, depth to rock.
Raton	Severe: depth to rock.	Severe: depth to rock.	Severe: large stones, slope.	Severe: large stones.	Severe: large stones, depth to rock.
525*:					
Catman	Severe: flooding.	Moderate: excess salt.	Moderate: slope, flooding, percs slowly.	Slight	Moderate: excess salt, flooding.
Silkie	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
535 Millpaw	Slight	Slight	Moderate: slope.	Slight	Slight.
536 McGaffey	Slight	Slight	Moderate: slope.	Slight	Slight.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
537*:					
Millpaw	Slight	Slight	Moderate: slope.	Slight	Slight.
Loarc	Slight	Slight	Moderate: slope.	Slight	Slight.
540 Montecito	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
550*:					
Nogal	Slight	Slight	Moderate: slope, depth to rock.	Slight	Moderate: depth to rock.
Galestina	Slight	Slight	Moderate: slope.	Slight	Slight.
555*:					
Pinitos	Slight	Slight	Moderate: slope.	Slight	Slight.
Ribera	Slight	Slight	Moderate: slope, depth to rock.	Slight	Moderate: depth to rock.
560*:					
Flugle	Slight	Slight	Moderate: slope.	Slight	Slight.
Teco	Slight	Slight	Moderate: slope.	Slight	Slight.
561*:					
Flugle	Slight	Slight	Moderate: slope.	Slight	Slight.
Quintana	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
565 Quintana	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
570*:					
Torreon	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: small stones, large stones, slope.
Rock outcrop.					
Cabezon	Severe: slope, large stones, depth to rock.	Severe: slope, large stones, depth to rock.	Severe: large stones, slope, small stones.	Severe: large stones, slope.	Severe: large stones, slope, depth to rock.
575*:					
Teco	Slight	Slight	Moderate: slope.	Slight	Slight.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
575*:					
Atarque	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.
576 Teco	Slight	Slight	Moderate: slope.	Slight	Slight.
577*:					
Cabezon	Severe: large stones, depth to rock.	Severe: large stones, depth to rock.	Severe: large stones, slope, small stones.	Severe: large stones.	Severe: large stones, depth to rock.
Montecito	Slight	Slight	Moderate: slope.	Slight	Moderate: large stones.
Rock outcrop.					
579*:					
Cabezon	Severe: large stones, depth to rock.	Severe: large stones, depth to rock.	Severe: large stones, small stones.	Severe: large stones.	Severe: large stones, depth to rock.
Cantina	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
581*:					
Laporte	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones.	Slight	Severe: depth to rock.
Vessilla	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight	Severe: depth to rock.
582 Kenray	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty, slope.
585 Moncha	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
586*:					
Venadito	Severe: flooding.	Moderate: percs slowly.	Moderate: slope, flooding, percs slowly.	Slight	Moderate: flooding.
Teco	Slight	Slight	Severe: slope.	Slight	Slight.
591*:					
Valnor	Slight	Slight	Moderate: slope, small stones, depth to rock.	Slight	Moderate: depth to rock.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
591*:					
Techado	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: slope, depth to rock.
610*:					
Grieta	Slight	Slight	Moderate: slope.	Slight	Slight.
Shiprock	Slight	Slight	Severe: slope.	Slight	Moderate: droughty.
611*:					
Grieta	Slight	Slight	Severe: slope.	Slight	Slight.
Kiki	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, depth to rock.
615*:					
Trag	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Moderate: slope.	Severe: slope.
Techado	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope, depth to rock.
Rock outcrop.					
618 Netoma	Moderate: dusty, excess salt.	Moderate: excess salt, dusty.	Severe: slope.	Moderate: dusty.	Moderate: excess salt.
619 Venadito	Severe: flooding.	Moderate: percs slowly.	Moderate: slope, flooding, percs slowly.	Slight	Moderate: flooding.
620*:					
Aparejo	Severe: flooding.	Slight	Moderate: slope, flooding.	Slight	Moderate: flooding.
Venadito	Severe: flooding.	Moderate: percs slowly.	Moderate: slope, flooding, percs slowly.	Slight	Moderate: flooding.
625*:					
Hagerman	Slight	Slight	Moderate: slope, depth to rock.	Slight	Moderate: depth to rock.
Bond	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight	Severe: depth to rock.

See footnote at end of table.

TABLE 6.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
630*:					
Bond	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight	Severe: depth to rock.
Rizozo	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.	Severe: depth to rock.
Rock outcrop.					
640*:					
Flaco	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: depth to rock.
Berto	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Severe: depth to rock.
641*:					
Berto	Severe: depth to rock.	Severe: depth to rock.	Severe: large stones, depth to rock.	Moderate: dusty.	Severe: depth to rock.
Flaco	Moderate: large stones, small stones.	Moderate: large stones, small stones.	Severe: large stones, small stones.	Moderate: dusty.	Moderate: small stones, large stones.
645*:					
Penistaja	Slight	Slight	Moderate: slope.	Slight	Slight.
Oelop	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.	Slight.
650*:					
Winona	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, slope.
Tanbark	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, erodes easily.	Severe: slope, depth to rock.
Rock outcrop.					
660*:					
Rana	Severe: large stones.	Severe: large stones.	Severe: large stones, slope, small stones.	Severe: large stones.	Severe: large stones, too clayey.
Rock outcrop.					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
10*. Lava flows											
20---------- Penistaja	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
21---------- Clovis	Fair	Good	Good	---	Poor	Good	Fair	Fair	---	Fair	Fair.
25*:											
Hickman----------	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
Catman----------	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
30---------- Warm Springs	Very poor.	Very poor.	Poor	---	Poor	Fair	Fair	Poor	---	Fair	Poor.
40---------- Aparejo	Good	Good	Fair	---	Fair	Good	Fair	Good	---	Fair	Fair.
41---------- Aparejo	Fair	Good	Good	---	Good	Poor	Very poor.	Good	---	Very poor.	Good.
45---------- Aparejo	Good	Good	Fair	---	Fair	Good	Fair	Good	---	Fair	Fair.
50, 51---------- Venadito	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
52---------- Venadito Variant	Fair	Fair	Fair	---	Poor	Poor	Fair	Fair	Good	Poor	Poor.
55*:											
Glenberg----------	Poor	Poor	Fair	---	Fair	Poor	Poor	Poor	---	Poor	Fair.
San Mateo----------	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
56---------- Mespun	Poor	Poor	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
57, 58---------- San Mateo	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
60---------- Sparank	Fair	Fair	Fair	---	Fair	Good	Good	Fair	---	Good	Fair.
61---------- Sparham	Fair	Fair	Poor	---	Poor	Fair	Fair	Fair	---	Fair	Poor.
62---------- Sparank	Very poor.	Very poor.	Very poor.	---	Poor	Poor	Very poor.	Very poor.	---	Very poor.	Very poor.

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
66---------- Zia	Good	Good	Good	Fair	Fair	Fair	Poor	Good	Good	Poor	Fair.
70---------- Catman	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
72---------- Catman Variant	Fair	Fair	Poor	---	Poor	Fair	Poor	Fair	---	Poor	Poor.
73---------- Catman	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
75---------- Hickman	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
100---------- Manzano	Fair	Good	Fair	---	Fair	Fair	Fair	Fair	---	Fair	---
120*: Rock outcrop.											
Laporte----------	Poor	Fair	Poor	Very poor.	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.	Poor.
130*: Laporte----------	Poor	Fair	Poor	Very poor.	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.	Poor.
Rock outcrop.											
200---------- Penistaja	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
205---------- Ildefonso	Poor	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	Very poor.
210*: Bond----------	Poor	Poor	Fair	---	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
Penistaja---------	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
Rock outcrop.											
218*: Viuda----------	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
Penistaja---------	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
Rock outcrop.											
230*: Dumps.											
Pits.											

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
251*:											
Skyvillage	Very poor.	Very poor.	Poor	---	Poor	Poor	Very poor.	Very poor.	---	Very poor.	Poor.
Rock outcrop.											
Bond	Poor	Poor	Fair	---	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
257*:											
Sparank	Very poor.	Very poor.	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
San Mateo	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
259--Mikim	Poor	Fair	Fair	---	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	Fair.
262*:											
Poley	Poor	Fair	Fair	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
Pojoaque	Poor	Fair	Fair	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
264--Tapia	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
270--Charo	Poor	Poor	Fair	Good	Fair	Poor	Very poor.	Poor	Good	Very poor.	Fair.
272*:											
Cebolleta	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Good	Very poor.	Fair.
Borrego	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
Rock outcrop.											
276--Trag	Fair	Good	Fair	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
278*:											
Microy	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
Rock outcrop.											
282--Cebolleta	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Good	Very poor.	Fair.
284*:											
Cebolleta	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Good	Very poor.	Fair.
Rock outcrop.											

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
286*:											
Cebolleta	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Good	Very poor.	Fair.
Raton	Very poor.	Very poor.	Fair	Very poor.	Fair	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Fair.
290*:											
Paguate	Poor	Fair	Good	---	Good	Poor	Poor	Fair	---	Poor	Good.
Hackroy	Very poor.	Very poor.	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Very poor.	Poor.
291---------- Paguate	Poor	Fair	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor	Fair.
294*:											
Parkay	Poor	Poor	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.	Good.
Rock outcrop.											
300---------- Saladon	Poor	Poor	Good	---	Poor	Good	Good	Poor	---	Good	Fair.
310---------- Mirabal	Poor	Fair	Poor	Very poor.	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	Poor.
315*:											
Abersito, cobbly--	Poor	Poor	Good	Good	Fair	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.
Abersito	Poor	Poor	Good	Good	Fair	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.
Rock outcrop.											
320---------- Cinnadale	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.	Fair.
325---------- Moreno Variant	Fair	Good	Good	Good	Fair	Poor	Very poor.	Fair	Good	Very poor.	Fair.
330---------- Moreno	Poor	Fair	Good	Good	Fair	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.
340---------- Yankee	Fair	Good	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
350*:											
Rock outcrop.											
Stout	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
406*:											
Poley	Poor	Fair	Fair	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
Rock outcrop.											

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
407*:											
Viuda	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
Rock outcrop.											
419 Navajo	Very poor.	Very poor.	Poor	---	Poor	Poor	Very poor.	Very poor.	---	Very poor.	Poor.
420*:											
Navajo	Very poor.	Very poor.	Poor	---	Poor	Poor	Very poor.	Very poor.	---	Very poor.	Poor.
Suwanee	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
424*:											
Mespun	Poor	Poor	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
Palma	Poor	Poor	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
426*:											
Sheppard	Very poor.	Very poor.	Poor	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
Shiprock	Very poor.	Very poor.	Poor	---	Poor	Poor	Very poor.	Very poor.	---	Very poor.	Poor.
432*:											
Winona	Very poor.	Very poor.	Poor	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
Rock outcrop.											
434*:											
Rizozo	Very poor.	Very poor.	Poor	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
Rock outcrop.											
446*:											
Harvey	Poor	Fair	Fair	---	Poor	Poor	Very poor.	Fair	---	Very poor.	Fair.
Oelop	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
476 Saido	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Poor	---	Very poor.	Fair.
485*:											
Rock outcrop.											
Mion	Very poor.	Poor	Poor	---	Poor	Very poor.	Very poor.	Poor	---	Very poor.	Poor.

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Conif-erous plants	Shrubs	Wetland plants	Shallow water areas	Open-land wild-life	Wood-land wild-life	Wetland wild-life	Range-land wild-life
487*:											
Mion	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Very poor.	---	Very poor.	Fair.
Badland.											
500*:											
Timhus	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Good	Very poor.	Fair.
Bandera	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
505*:											
Flugle	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
Goesling	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
514*:											
Raton.											
Rock outcrop.											
515*:											
Rock outcrop.											
Vessilla	Very poor.	Very poor.	Poor	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor.
Mion	Very poor.	Very poor.	Fair	---	Fair	Very poor.	Very poor.	Very poor.	---	Very poor.	Fair.
518*:											
Borrego	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
Charo	Poor	Poor	Fair	Good	Fair	Poor	Very poor.	Poor	Good	Very poor.	Fair.
Rock outcrop.											
520*:											
Celacy	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
Atarque	Poor	Poor	Fair	Poor	Fair	Poor	Very poor.	Poor	Poor	Very poor.	Fair.
522*:											
Bandera, 30 to 45 percent slopes	Very poor.	Very poor.	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
Bandera, 15 to 30 percent slopes	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
523*:											
Charo	Poor	Poor	Fair	Good	Fair	Poor	Very poor.	Poor	Good	Very poor.	Fair.
Raton	Very poor.	Very poor.	Fair	Very poor.	Fair	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Fair.
525*:											
Catman	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
Silkie	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
535--Millpaw	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
536--McGaffey	Poor	Fair	Good	Good	Fair	Poor	Poor	Fair	Fair	Poor	Fair.
537*:											
Millpaw	Poor	Fair	Fair	Good	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
Loarc	Poor	Fair	Fair	Good	Fair	Poor	Very poor.	Fair	Good	Very poor.	Fair.
540--Montecito	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.	Fair.
550*:											
Nogal	Poor	Fair	Fair	Good	Poor	Very poor.	Very poor.	Fair	Good	Very poor.	---
Galestina	Poor	Fair	Good	---	Good	Poor	Very poor.	Fair	---	Very poor.	Good.
555*:											
Pinitos	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.	Good.
Ribera	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.	Good.
560*:											
Flugle	Poor	Fair	Fair	Good	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
Teco	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.
561*:											
Flugle	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
Quintana	Poor	Fair	Fair	Good	Fair	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
565---------- Quintana	Poor	Fair	Fair	Good	Fair	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.
570*: Torreon----------	Poor	Fair	Fair	Good	Fair	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.
Rock outcrop.											
Cabezon----------	Poor	Poor	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	Fair.
575*: Teco----------	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.
Atarque----------	Poor	Poor	Fair	Poor	Fair	Poor	Very poor.	Poor	Poor	Very poor.	Fair.
576---------- Teco	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.
577*: Cabezon----------	Poor	Poor	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	Fair.
Montecito---------	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
Rock outcrop.											
579*: Cabezon----------	Poor	Poor	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	Fair.
Cantina----------	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.	Good.
581*: Laporte----------	Poor	Fair	Poor	Very poor.	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.	Poor.
Vessilla----------	Very poor.	Very poor.	Poor	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor.
582---------- Kenray	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.	Fair.
585---------- Moncha	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
586*: Venadito----------	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
Teco----------	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
591*:											
Valnor	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
Techado	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.	Fair.
610*:											
Grieta	Very poor.	Very poor.	Good	---	Good	Poor	Very poor.	Poor	---	Very poor.	Good.
Shiprock	Very poor.	Very poor.	Poor	---	Poor	Poor	Very poor.	Very poor.	---	Very poor.	Poor.
611*:											
Grieta	Very poor.	Very poor.	Good	---	Good	Poor	Very poor.	Poor	---	Very poor.	Good.
Kiki	Very poor.	Very poor.	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
615*:											
Trag	Poor	Fair	Good	Good	Fair	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.
Techado	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
Rock outcrop.											
618--- Netoma	Very poor.	Very poor.	Very poor.	---	Very poor.	Very poor.	Very poor.	Very poor.	---	Very poor.	Very poor.
619--- Venadito	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
620*:											
Aparejo	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
Venadito	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
625*:											
Hagerman	Poor	Fair	Fair	---	Poor	Poor	Very poor.	Poor	---	Very poor.	Fair.
Bond	Poor	Poor	Fair	---	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
630*:											
Bond	Poor	Poor	Fair	---	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
Rizozo	Very poor.	Very poor.	Poor	---	Fair	Very poor.	Very poor.	Very poor.	---	Very poor.	Fair.
Rock outcrop.											

See footnote at end of table.

TABLE 7.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
640*:											
Flaco	Very poor.	Very poor.	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
Berto	Very poor.	Very poor.	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
641*:											
Berto	Very poor.	Very poor.	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
Flaco	Very poor.	Very poor.	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
645*:											
Penistaja	Poor	Fair	Fair	---	Fair	Poor	Very poor.	Fair	---	Very poor.	Fair.
Oelop	Poor	Poor	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
650*:											
Winona	Very poor.	Very poor.	Poor	---	Poor	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
Tanbark	Very poor.	Very poor.	Fair	---	Fair	Poor	Very poor.	Poor	---	Very poor.	Fair.
Rock outcrop.											
660*:											
Rana	Very poor.	Very poor.	Very poor.	---	Fair	Very poor.	Very poor.	Very poor.	---	Very poor.	Poor.
Rock outcrop.											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
10*. Lava flows						
20---- Penistaja	Slight	Slight	Slight	Slight	Moderate: low strength.	Slight.
21---- Clovis	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Severe: low strength.	Slight.
25*:						
Hickman	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Catman	Moderate: too clayey, flooding.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Moderate: excess salt, flooding.
30---- Warm Springs	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.	Severe: flooding.
40---- Aparejo	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
41---- Aparejo	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
45---- Aparejo	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: too clayey.
50, 51---- Venadito	Moderate: too clayey, flooding.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Moderate: flooding.
52---- Venadito Variant	Severe: depth to rock.	Severe: flooding, shrink-swell.	Severe: flooding, depth to rock, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Moderate: flooding, depth to rock.
55*:						
Glenberg	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: droughty, flooding.
San Mateo	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
56---- Mespun	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
57, 58---- San Mateo	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
60--Sparank	Moderate: too clayey, flooding.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Moderate: flooding.
61--Sparham	Moderate: too clayey, wetness, flooding.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Moderate: excess salt, flooding.
62--Sparank	Moderate: too clayey, flooding.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Severe: excess salt, excess sodium, droughty.
66--Zia	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
70--Catman	Moderate: too clayey, flooding.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Moderate: excess salt, flooding.
72--Catman Variant	Severe: wetness.	Severe: flooding, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Moderate: excess salt, droughty, flooding.
73--Catman	Moderate: too clayey, flooding.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Moderate: excess salt, flooding.
75--Hickman	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
100--Manzano	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
120*:						
Rock outcrop.						
Laporte	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: large stones, slope, depth to rock.
130*:						
Laporte	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Rock outcrop.						
200--Penistaja	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
205--Ildefonso	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: small stones, droughty.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
210*:						
Bond	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Penistaja	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
Rock outcrop.						
218*:						
Viuda	Severe: depth to rock.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: small stones, large stones, depth to rock.
Penistaja	Slight	Slight	Slight	Slight	Moderate: low strength.	Slight.
Rock outcrop.						
230*:						
Dumps.						
Pits.						
251*:						
Skyvillage	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						
Bond	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
257*:						
Sparank	Moderate: too clayey, flooding.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Moderate: flooding.
San Mateo	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
259 Mikim	Slight	Slight	Slight	Slight	Slight	Slight.
262*:						
Poley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, large stones, slope.
Pojoaque	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, large stones, slope.
264 Tapia	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: large stones.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
270--- Charo	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: low strength.	Moderate: large stones, depth to rock.
272*:						
Cebolleta	Severe: depth to rock, large stones.	Severe: large stones.	Severe: depth to rock, large stones.	Severe: slope, large stones.	Severe: low strength, large stones.	Severe: large stones.
Borrego	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Rock outcrop.						
276--- Trag	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Moderate: large stones.
278*:						
Microy	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Rock outcrop.						
282--- Cebolleta	Severe: depth to rock, large stones.	Severe: large stones.	Severe: depth to rock, large stones.	Severe: large stones.	Severe: low strength, large stones.	Severe: large stones.
284*:						
Cebolleta	Severe: depth to rock, large stones, slope.	Severe: slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: slope, large stones.	Severe: low strength, slope, large stones.	Severe: large stones, slope.
Rock outcrop.						
286*:						
Cebolleta	Severe: depth to rock, large stones.	Severe: large stones.	Severe: depth to rock, large stones.	Severe: large stones.	Severe: low strength, large stones.	Severe: large stones.
Raton	Severe: depth to rock.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: depth to rock.
290*:						
Paguate	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: low strength.	Moderate: large stones, depth to rock.
Hackroy	Severe: depth to rock.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: large stones, depth to rock.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
291---------- Paguate	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Moderate: depth to rock, low strength.	Moderate: small stones, large stones, depth to rock.
294*:						
Parkay----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
300---------- Saladon	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
310---------- Mirabal	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, large stones.	Severe: small stones.
315*:						
Abersito, cobbly-	Severe: depth to rock, large stones, slope.	Severe: shrink-swell, slope, large stones.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope, large stones.	Severe: shrink-swell, low strength, slope.	Severe: large stones, slope.
Abersito---------	Severe: depth to rock, large stones.	Severe: shrink-swell, large stones.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, large stones.	Severe: shrink-swell, low strength.	Moderate: small stones, large stones.
Rock outcrop.						
320---------- Cinnadale	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
325---------- Moreno Variant	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Slight.
330---------- Moreno	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: large stones.
340---------- Yankee	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
350*: Rock outcrop.						
Stout----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
406*:						
Poley----------	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Severe: large stones.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
406*:						
Rock outcrop.						
407*:						
Viuda	Severe: depth to rock.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: small stones, large stones, depth to rock.
Rock outcrop.						
419	Moderate:	Severe:	Severe:	Severe:	Severe:	Severe:
Navajo	too clayey, flooding.	flooding, shrink-swell.	flooding, shrink-swell.	flooding, shrink-swell.	shrink-swell, low strength, flooding.	excess sodium.
420*:						
Navajo	Moderate: too clayey, flooding.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Severe: excess sodium.
Suwanee	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
424*:						
Mespun	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Palma	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
426*:						
Sheppard	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Shiprock	Slight	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
432*:						
Winona	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: small stones.
Rock outcrop.						
434*:						
Rizozo	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						
446*:						
Harvey	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Slight.
Oelop	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
476--- Saido	Slight	Slight	Slight	Moderate: slope.	Slight	Moderate: excess salt.
485*: Rock outcrop.						
Mion	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: large stones, slope, depth to rock.
487*:						
Mion	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope, depth to rock.
Badland.						
500*:						
Timhus	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Bandera	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, droughty, slope.
505*:						
Flugle	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Slight.
Goesling	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Moderate: shrink-swell.	Slight.
514*:						
Raton	Severe: depth to rock, large stones.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: large stones, depth to rock.
Rock outcrop.						
515*: Rock outcrop.						
Vessilla	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.
Mion	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope, depth to rock.
518*:						
Borrego	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
518*:						
Charo	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: low strength.	Moderate: large stones, depth to rock.
Rock outcrop.						
520*:						
Celacy	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Moderate: depth to rock, shrink-swell.	Moderate: depth to rock.
Atarque	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
522*:						
Bandera, 30 to 45 percent slopes	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
Bandera, 15 to 30 percent slopes	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
523*:						
Charo	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: low strength.	Moderate: large stones, depth to rock.
Raton	Severe: depth to rock, large stones.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: large stones, depth to rock.
525*:						
Catman	Moderate: too clayey, flooding.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Moderate: excess salt, flooding.
Silkie	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
535--Millpaw	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
536--McGaffey	Slight	Slight	Slight	Slight	Moderate: low strength, frost action.	Slight.
537*:						
Millpaw	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
Loarc	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Slight.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
540--- Montecito	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: large stones, slope.
550*:						
Nogal---	Moderate: depth to rock, too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: depth to rock.
Galestina---	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
555*:						
Pinitos---	Slight---	Slight---	Slight---	Moderate: slope.	Moderate: frost action.	Slight.
Ribera---	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock, low strength.	Moderate: depth to rock.
560*:						
Flugle---	Slight---	Moderate: shrink-swell.	Slight---	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Slight.
Teco---	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
561*:						
Flugle---	Slight---	Moderate: shrink-swell.	Slight---	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Slight.
Quintana---	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, low strength, slope.	Moderate: slope.
565--- Quintana	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, low strength, slope.	Moderate: slope.
570*:						
Torreon---	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: small stones, large stones, slope.
Rock outcrop.						
Cabezon---	Severe: depth to rock, slope.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: large stones, slope, depth to rock.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
575*:						
Teco	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
Atarque	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
576						
Teco	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
577*:						
Cabezon	Severe: depth to rock.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: large stones, depth to rock.
Montecito	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: large stones.
Rock outcrop.						
579*:						
Cabezon	Severe: depth to rock.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: large stones, depth to rock.
Cantina	Moderate: depth to rock, too clayey.	Severe: shrink-swell.	Moderate: depth to rock, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
581*:						
Laporte	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Vessilla	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.	Severe: depth to rock.
582						
Kenray	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
585						
Moncha	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, frost action.	Slight.
586*:						
Venadito	Moderate: too clayey, flooding.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Moderate: flooding.
Teco	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
591*:						
Valnor	Moderate: depth to rock, too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: depth to rock.
Techado	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope, depth to rock.
610*:						
Grieta	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
Shiprock	Slight	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
611*:						
Grieta	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
Kiki	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, shrink-swell, slope.	Moderate: slope, depth to rock.
615*:						
Trag	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Techado	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope, depth to rock.
Rock outcrop.						
618 Netoma	Slight	Slight	Slight	Moderate: slope.	Slight	Moderate: excess salt.
619 Venadito	Moderate: too clayey, flooding.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Moderate: flooding.
620*:						
Aparejo	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Venadito	Moderate: too clayey, flooding.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength, flooding.	Moderate: flooding.
625*:						
Hagerman	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Moderate: depth to rock, shrink-swell.	Moderate: depth to rock.
Bond	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
630*:						
Bond	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Rizozo	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Rock outcrop.						
640*:						
Flaco	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Moderate: depth to rock, frost action.	Moderate: depth to rock.
Berto	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
641*:						
Berto	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Flaco	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock, low strength.	Moderate: small stones, large stones.
645*:						
Penistaja	Slight	Slight	Slight	Slight	Moderate: low strength.	Slight.
Oelop	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
650*:						
Winona	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: small stones, slope.
Tanbark	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						
660*:						
Rana	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Severe: large stones, too clayey.
Rock outcrop.						

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
10*. Lava flows					
20--Penistaja	Moderate: percs slowly.	Severe: seepage.	Slight	Slight	Good.
21--Clovis	Moderate: percs slowly.	Severe: seepage.	Slight	Slight	Good.
25*:					
Hickman	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
Catman	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding, too clayey.	Severe: flooding.	Poor: too clayey, hard to pack.
30--Warm Springs	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: small stones, wetness.
40--Aparejo	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
41--Aparejo	Severe: flooding, percs slowly.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Poor: thin layer.
45--Aparejo	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
50, 51--Venadito	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding, too clayey.	Severe: flooding.	Poor: too clayey, hard to pack.
52--Venadito Variant	Severe: flooding, depth to rock, percs slowly.	Severe: depth to rock, flooding.	Severe: flooding, depth to rock, too clayey.	Severe: flooding, depth to rock.	Poor: depth to rock, too clayey, hard to pack.
55*:					
Glenberg	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding.	Severe: flooding.	Fair: too sandy.
San Mateo	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
56--Mespun	Severe: poor filter.	Severe: seepage.	Severe: too sandy.	Slight	Poor: too sandy.
57, 58--San Mateo	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
60--Sparank	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Poor: hard to pack.
61--Sparham	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack.
62--Sparank	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding, excess salt.	Severe: flooding.	Poor: hard to pack.
66--Zia	Slight	Severe: seepage.	Slight	Slight	Good.
70--Catman	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding, too clayey.	Severe: flooding.	Poor: too clayey, hard to pack.
72--Catman Variant	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack.
73--Catman	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding, too clayey.	Severe: flooding.	Poor: too clayey, hard to pack.
75--Hickman	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
100--Manzano	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding, seepage.	Severe: flooding.	Fair: too clayey.
120*:					
Rock outcrop.					
Laporte	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
130*:					
Laporte	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
Rock outcrop.					
200--Penistaja	Moderate: percs slowly.	Severe: seepage.	Slight	Slight	Good.
205--Ildefonso	Moderate: slope.	Severe: seepage, slope.	Moderate: slope, large stones.	Moderate: slope.	Poor: small stones.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
210*:					
Bond	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Moderate: slope.	Poor: depth to rock.
Penistaja	Moderate: percs slowly.	Severe: seepage.	Slight	Slight	Good.
Rock outcrop.					
218*:					
Viuda	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Poor: depth to rock, hard to pack.
Penistaja	Moderate: percs slowly.	Severe: seepage.	Slight	Slight	Good.
Rock outcrop.					
230*:					
Dumps.					
Pits.					
251*:					
Skyvillage	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: depth to rock, slope.
Rock outcrop.					
Bond	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Poor: depth to rock.
257*:					
Sparank	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Poor: hard to pack.
San Mateo	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
259 Mikim	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Fair: small stones.
262*:					
Poley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Pojoaque	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
264 Tapia	Slight	Severe: seepage.	Severe: too sandy.	Slight	Poor: too sandy, small stones.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
270--Charo	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
272*:					
Cebolleta	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Borrego	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
Rock outcrop.					
276--Trag	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, small stones.
278*:					
Microy	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Rock outcrop.					
282--Cebolleta	Severe: depth to rock, percs slowly.	Severe: depth to rock, large stones.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
284*:					
Cebolleta	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Rock outcrop.					
286*:					
Cebolleta	Severe: depth to rock, percs slowly.	Severe: depth to rock, large stones.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Raton	Severe: depth to rock.	Severe: depth to rock, large stones.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
290*:					
Paguate	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock.	Slight	Poor: depth to rock, small stones.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
290*:					
Hackroy	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
291	Severe:	Severe:	Severe:	Slight	Poor:
Paguate	depth to rock, percs slowly.	depth to rock.	depth to rock.		depth to rock, small stones.
294*:					
Parkay	Severe: slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Poor: large stones, slope.
Rock outcrop.					
300	Severe:	Moderate:	Severe:	Severe:	Poor:
Saladon	wetness, percs slowly.	slope.	wetness, too clayey.	wetness.	too clayey, hard to pack, wetness.
310	Severe:	Severe:	Severe:	Severe:	Poor:
Mirabal	depth to rock.	depth to rock, slope.	depth to rock.	depth to rock.	depth to rock, small stones.
315*:					
Abersito, cobbly	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, large stones.
Abersito	Severe: depth to rock, large stones.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, large stones.
Rock outcrop.					
320	Severe:	Severe:	Severe:	Severe:	Poor:
Cinnadale	depth to rock.	depth to rock, slope.	depth to rock, seepage.	depth to rock.	depth to rock, small stones.
325	Severe:	Moderate:	Moderate:	Slight	Fair:
Moreno Variant	percs slowly.	seepage, slope.	too clayey.		too clayey.
330	Severe:	Moderate:	Severe:	Slight	Poor:
Moreno	percs slowly.	slope.	too clayey.		too clayey, hard to pack.
340	Severe:	Slight	Severe:	Slight	Poor:
Yankee	percs slowly.		too clayey.		too clayey, hard to pack.
350*:					
Rock outcrop.					

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
350*:					
Stout	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock.	Poor: depth to rock.
406*:					
Poley	Severe: percs slowly.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Poor: hard to pack.
Rock outcrop.					
407*:					
Viuda	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Poor: depth to rock, hard to pack.
Rock outcrop.					
419 Navajo	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
420*:					
Navajo	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
Suwanee	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: too sandy.
424*:					
Mespun	Severe: poor filter.	Severe: seepage, slope.	Severe: too sandy.	Slight	Poor: too sandy.
Palma	Slight	Severe: seepage.	Slight	Slight	Good.
426*:					
Sheppard	Severe: poor filter.	Severe: seepage, slope.	Moderate: too sandy.	Slight	Fair: too sandy.
Shiprock	Slight	Severe: seepage.	Slight	Slight	Good.
432*:					
Winona	Severe: depth to rock.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, large stones.	Moderate: slope.	Poor: depth to rock.
Rock outcrop.					
434*:					
Rizozo	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: depth to rock, slope.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
434*:					
Rock outcrop.					
446*:					
Harvey	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
Oelop	Severe: percs slowly.	Severe: seepage.	Slight	Slight	Good.
476	Severe:	Severe:	Slight	Slight	Poor:
Saido	excess gypsum.	excess gypsum.			thin layer.
485*:					
Rock outcrop.					
Mion	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: depth to rock, slope.
487*:					
Mion	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: depth to rock, hard to pack, slope.
Badland.					
500*:					
Timhus	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, small stones, slope.
Bandera	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, small stones, slope.
505*:					
Flugle	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
Goesling	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Good.
514*:					
Raton	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Rock outcrop.					
515*:					
Rock outcrop.					

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
515*:					
Vessilla	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Mion	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: depth to rock, hard to pack, slope.
518*:					
Borrego	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
Charo	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Rock outcrop.					
520*:					
Celacy	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Poor: depth to rock.
Atarque	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
522*:					
Bandera, 30 to 45 percent slopes	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, small stones, slope.
Bandera, 15 to 30 percent slopes	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, small stones, slope.
523*:					
Charo	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Raton	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
525*:					
Catman	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding, too clayey.	Severe: flooding.	Poor: too clayey, hard to pack.
Silkie	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
535---------- Millpaw	Severe: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack.
536---------- McGaffey	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
537*:					
Millpaw----------	Severe: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack.
Loarc----------	Slight----------	Severe: seepage.	Moderate: too sandy.	Slight----------	Fair: too sandy, small stones.
540---------- Montecito	Severe: percs slowly.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
550*:					
Nogal----------	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Galestina----------	Severe: percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
555*:					
Pinitos----------	Slight----------	Severe: seepage.	Slight----------	Slight----------	Good.
Ribera----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
560*:					
Flugle----------	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----------	Slight----------	Good.
Teco----------	Severe: percs slowly.	Severe: seepage.	Slight----------	Slight----------	Good.
561*:					
Flugle----------	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----------	Slight----------	Good.
Quintana----------	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Fair: too clayey, slope.
565---------- Quintana	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Fair: too clayey, slope.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
570*:					
Torreon	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Rock outcrop.					
Cabezon	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
575*:					
Teco	Severe: percs slowly.	Severe: seepage.	Slight	Slight	Good.
Atarque	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
576 Teco	Severe: percs slowly.	Severe: seepage.	Slight	Slight	Good.
577*:					
Cabezon	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Montecito	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Rock outcrop.					
579*:					
Cabezon	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Cantina	Severe: percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock.	Moderate: depth to rock.	Poor: thin layer.
581*:					
Laporte	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, small stones.
Vessilla	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock.	Poor: depth to rock.
582 Kenray	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy.
585 Moncha	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
586*:					
Venadito	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding, too clayey.	Severe: flooding.	Poor: too clayey, hard to pack.
Teco	Severe: percs slowly.	Severe: seepage.	Slight	Slight	Good.
591*:					
Valnor	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: depth to rock, too clayey, hard to pack.
Techado	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
610*:					
Grieta	Slight	Severe: seepage.	Slight	Slight	Good.
Shiprock	Slight	Severe: seepage.	Slight	Slight	Good.
611*:					
Grieta	Slight	Severe: seepage.	Slight	Slight	Good.
Kiki	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Moderate: slope.	Poor: depth to rock.
615*:					
Trag	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: slope.
Techado	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Rock outcrop.					
618 Netoma	Severe: excess gypsum.	Severe: excess gypsum, slope.	Slight	Slight	Good.
619 Venadito	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding, too clayey.	Severe: flooding.	Poor: too clayey, hard to pack.
620*:					
Aparejo	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Fair: too clayey.
Venadito	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding, too clayey.	Severe: flooding.	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
625*:					
Hagerman	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Poor: depth to rock.
Bond	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Poor: depth to rock.
630*:					
Bond	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Moderate: slope.	Poor: depth to rock.
Rizozo	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Moderate: slope.	Poor: depth to rock.
Rock outcrop.					
640*:					
Flaco	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Poor: depth to rock.
Berto	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Poor: depth to rock.
641*:					
Berto	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Poor: depth to rock.
Flaco	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Poor: depth to rock.
645*:					
Penistaja	Moderate: percs slowly.	Severe: seepage.	Slight	Slight	Good.
Oelop	Severe: percs slowly.	Severe: seepage.	Slight	Slight	Good.
650*:					
Winona	Severe: depth to rock, slope.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: slope.	Poor: depth to rock, slope.
Tanbark	Severe: depth to rock, slope, excess gypsum.	Severe: depth to rock, slope, excess gypsum.	Severe: depth to rock, slope.	Severe: slope.	Poor: depth to rock, slope.
Rock outcrop.					
660*:					
Rana	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: hard to pack.
Rock outcrop.					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
10*. Lava flows				
20---------- Penistaja	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
21---------- Clovis	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
25*:				
Hickman----------	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Catman----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
30---------- Warm Springs	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, excess salt.
40---------- Aparejo	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
41---------- Aparejo	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer.
45---------- Aparejo	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
50, 51---------- Venadito	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
52---------- Venadito Variant	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
55*:				
Glenberg----------	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
San Mateo----------	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
56---------- Mespun	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
57, 58---------- San Mateo	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
60---------- Sparank	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
61---------- Sparham	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess salt.
62---------- Sparank	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess salt, excess sodium.
66---------- Zia	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
70---------- Catman	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
72---------- Catman Variant	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess salt.
73---------- Catman	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
75---------- Hickman	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
100---------- Manzano	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
120*: Rock outcrop.				
Laporte----------	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
130*: Laporte----------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Rock outcrop.				
200---------- Penistaja	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
205---------- Ildefonso	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
210*:				
Bond	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Penistaja	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Rock outcrop.				
218*:				
Viuda	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, large stones.
Penistaja	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Rock outcrop.				
230*:				
Dumps.				
Pits.				
251*:				
Skyvillage	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
Rock outcrop.				
Bond	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
257*:				
Sparank	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
San Mateo	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
259 Mikim	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
262*:				
Poley	Fair: shrink-swell, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Pojoaque	Fair: large stones, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
264---------- Tapia	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
270---------- Charo	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
272*:				
Cebolleta----------	Poor: depth to rock, low strength, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: too clayey, large stones.
Borrego----------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
Rock outcrop.				
276---------- Trag	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
278*:				
Microy----------	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Rock outcrop.				
282---------- Cebolleta	Poor: depth to rock, low strength, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: too clayey, large stones.
284*:				
Cebolleta----------	Poor: depth to rock, low strength, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: too clayey, large stones, slope.
Rock outcrop.				
286*:				
Cebolleta----------	Poor: depth to rock, low strength, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: too clayey, large stones.
Raton----------	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: depth to rock, large stones.
290*:				
Paguate----------	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
290*:				
Hackroy	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey.
291 Paguate	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
294*:				
Parkay	Poor: slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, small stones, slope.
Rock outcrop.				
300 Saladon	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
310 Mirabal	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
315*:				
Abersito, cobbly	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: too clayey, large stones, slope.
Abersito	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: too clayey, large stones.
Rock outcrop.				
320 Cinnadale	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
325 Moreno Variant	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
330 Moreno	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
340 Yankee	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
350*:				
Rock outcrop.				
Stout	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
406*:				
Poley	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, area reclaim.
Rock outcrop.				
407*:				
Viuda	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, large stones.
Rock outcrop.				
419 Navajo	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
420*:				
Navajo	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
Suwanee	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
424*:				
Mespun	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
Palma	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
426*:				
Sheppard	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
Shiprock	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
432*:				
Winona	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, large stones.
Rock outcrop.				
434*:				
Rizozo	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
Rock outcrop.				
446*:				
Harvey	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, area reclaim.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
446*:				
Oelop	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
476	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Saido				
485*:				
Rock outcrop.				
Mion	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, slope.
487*:				
Mion	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, slope.
Badland.				
500*:				
Timhus	Poor: slope.	Improbable: small stones.	Probable	Poor: small stones, area reclaim, slope.
Bandera	Poor: slope.	Improbable: small stones.	Probable	Poor: small stones, area reclaim, slope.
505*:				
Flugle	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Goesling	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
514*:				
Raton	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: depth to rock, too clayey, large stones.
Rock outcrop.				
515*:				
Rock outcrop.				
Vessilla	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
Mion	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, slope.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
518*:				
Borrego	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey.
Charo	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Rock outcrop.				
520*:				
Celacy	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, small stones.
Atarque	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
522*:				
Bandera, 30 to 45 percent slopes	Poor: slope.	Improbable: small stones.	Probable	Poor: small stones, area reclaim, slope.
Bandera, 15 to 30 percent slopes	Fair: slope.	Improbable: small stones.	Probable	Poor: small stones, area reclaim, slope.
523*:				
Charo	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, large stones.
Raton	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: depth to rock, large stones.
525*:				
Catman	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Silkie	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
535 Millpaw	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
536 McGaffey	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
537*:				
Millpaw	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Loarc	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
540--Montecito	Good	Improbable: small stones.	Probable	Poor: too clayey, small stones, area reclaim.
550*:				
Nogal	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
Galestina	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
555*:				
Pinitos	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Ribera	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, thin layer.
560*:				
Flugle	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Teco	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
561*:				
Flugle	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Quintana	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
565--Quintana	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
570*:				
Torreon	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Rock outcrop.				

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
570*:				
Cabezon	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, large stones.
575*:				
Teco	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Atarque	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
576 Teco	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
577*:				
Cabezon	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, large stones.
Montecito	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, thin layer.
Rock outcrop.				
579*:				
Cabezon	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, large stones.
Cantina	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
581*:				
Laporte	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Vessilla	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
582 Kenray	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
585 Moncha	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
586*:				
Venadito	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Teco	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
591*:				
Valnor	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Techado	Poor: depth to rock, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
610*:				
Grieta	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Shiprock	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
611*:				
Grieta	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Kiki	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, small stones.
615*:				
Trag	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim, slope.
Techado	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
Rock outcrop.				
618 Netoma	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
619 Venadito	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
620*:				
Aparejo	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Venadito	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
625*:				
Hagerman	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, small stones.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
625*:				
Bond	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
630*:				
Bond	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Rizozo	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Rock outcrop.				
640*:				
Flaco	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Berto	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
641*:				
Berto	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Flaco	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
645*:				
Penistaja	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Oelop	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
650*:				
Winona	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, large stones, slope.
Tanbark	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
Rock outcrop.				
660*:				
Rana	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Rock outcrop.				

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions
10*. Lava flows					
20---------- Penistaja	Severe: seepage.	Severe: piping.	Deep to water----	Favorable--------	Favorable.
21---------- Clovis	Severe: seepage.	Severe: piping.	Deep to water----	Favorable--------	Erodes easily.
25*:					
Hickman----------	Moderate: slope.	Moderate: piping.	Deep to water----	Slope, flooding.	Erodes easily.
Catman----------	Slight----------	Severe: hard to pack.	Deep to water----	Percs slowly-----	Percs slowly.
30---------- Warm Springs	Moderate: seepage.	Severe: piping.	Flooding, frost action.	Wetness, droughty, erodes easily.	Erodes easily, wetness.
40---------- Aparejo	Moderate: seepage.	Severe: piping.	Deep to water----	Flooding---------	Erodes easily.
41---------- Aparejo	Severe: seepage.	Moderate: thin layer, piping.	Deep to water----	Flooding---------	Favorable.
45---------- Aparejo	Moderate: seepage.	Severe: piping.	Deep to water----	Slow intake, flooding.	Erodes easily.
50, 51---------- Venadito	Slight----------	Moderate: hard to pack.	Deep to water----	Percs slowly-----	Percs slowly.
52---------- Venadito Variant	Moderate: depth to rock.	Moderate: thin layer, hard to pack.	Deep to water----	Percs slowly, depth to rock, flooding.	Depth to rock, percs slowly.
55*:					
Glenberg---------	Severe: seepage.	Severe: piping.	Deep to water----	Droughty, soil blowing, flooding.	Too sandy, soil blowing.
San Mateo--------	Moderate: seepage.	Moderate: piping.	Deep to water----	Flooding---------	Favorable.
56---------- Mespun	Severe: seepage.	Severe: seepage, piping.	Deep to water----	Slope, droughty, fast intake.	Too sandy, soil blowing.
57, 58---------- San Mateo	Moderate: seepage.	Moderate: piping.	Deep to water----	Flooding---------	Favorable.
60---------- Sparank	Slight----------	Moderate: hard to pack.	Deep to water----	Percs slowly-----	Erodes easily, percs slowly.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions
61---------- Sparham	Slight----------	Moderate: hard to pack, wetness, excess salt.	Deep to water----	Percs slowly, flooding, excess salt.	Percs slowly.
62---------- Sparank	Slight----------	Severe: excess sodium, excess salt.	Deep to water----	Droughty---------	Erodes easily, percs slowly.
66---------- Zia	Severe: seepage.	Slight----------	Deep to water----	Slope, soil blowing.	Favorable.
70---------- Catman	Slight----------	Severe: hard to pack.	Deep to water----	Percs slowly-----	Percs slowly.
72---------- Catman Variant	Slight----------	Severe: hard to pack.	Percs slowly, flooding, frost action.	Wetness, droughty, percs slowly.	Wetness, percs slowly.
73---------- Catman	Slight----------	Severe: hard to pack.	Deep to water----	Percs slowly-----	Percs slowly.
75---------- Hickman	Slight----------	Moderate: piping.	Deep to water----	Flooding---------	Favorable.
100---------- Manzano	Moderate: slope.	Moderate: thin layer, piping.	Deep to water----	Slope, flooding.	Erodes easily.
120*: Rock outcrop.					
Laporte----------	Severe: depth to rock, slope.	Severe: piping.	Deep to water----	Slope, large stones, depth to rock.	Slope, large stones, depth to rock.
130*: Laporte----------	Severe: depth to rock, slope.	Severe: piping.	Deep to water----	Slope, depth to rock.	Slope, large stones, depth to rock.
Rock outcrop.					
200---------- Penistaja	Severe: seepage.	Severe: piping.	Deep to water----	Slope----------	Favorable.
205---------- Ildefonso	Severe: seepage, slope.	Moderate: large stones.	Deep to water----	Slope, droughty.	Slope, large stones.
210*: Bond----------	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water----	Slope, depth to rock.	Slope, depth to rock, soil blowing.
Penistaja--------	Severe: seepage.	Severe: piping.	Deep to water----	Slope----------	Favorable.
Rock outcrop.					

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions
218*:					
Viuda	Severe: depth to rock.	Severe: thin layer.	Deep to water	Slope, percs slowly, depth to rock.	Large stones, depth to rock.
Penistaja	Severe: seepage.	Severe: piping.	Deep to water	Slope	Favorable.
Rock outcrop.					
230*:					
Dumps.					
Pits.					
251*:					
Skyvillage	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Slope, soil blowing, depth to rock.	Slope, depth to rock.
Rock outcrop.					
Bond	Severe: depth to rock.	Severe: thin layer.	Deep to water	Slope, depth to rock.	Depth to rock, soil blowing.
257*:					
Sparank	Slight	Moderate: hard to pack.	Deep to water	Percs slowly	Erodes easily, percs slowly.
San Mateo	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope, erodes easily, flooding.	Erodes easily.
259--- Mikim	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	Favorable.
262*:					
Poley	Severe: slope.	Severe: piping.	Deep to water	Slope, percs slowly.	Slope, erodes easily.
Pojoaque	Severe: slope.	Moderate: large stones.	Deep to water	Slope, large stones.	Slope, large stones.
264--- Tapia	Severe: seepage.	Severe: seepage.	Deep to water	Slope, soil blowing.	Large stones, too sandy, soil blowing.
270--- Charo	Moderate: depth to rock.	Severe: thin layer.	Deep to water	Percs slowly, depth to rock.	Depth to rock, percs slowly.
272*:					
Cebolleta	Severe: slope.	Severe: large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, depth to rock.
Borrego	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, percs slowly, depth to rock.	Slope, depth to rock.
Rock outcrop.					

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions
276---------- Trag	Moderate: seepage, slope.	Severe: piping.	Deep to water----	Slope----------	Favorable.
278*:					
Microy----------	Severe: slope.	Moderate: thin layer, hard to pack, large stones.	Deep to water----	Slope, large stones, droughty.	Slope, large stones, depth to rock.
Rock outcrop.					
282---------- Cebolleta	Moderate: depth to rock, slope.	Severe: large stones.	Deep to water----	Slope, large stones, droughty.	Large stones, depth to rock.
284*:					
Cebolleta--------	Severe: slope.	Severe: large stones.	Deep to water----	Slope, large stones, droughty.	Slope, large stones, depth to rock.
Rock outcrop.					
286*:					
Cebolleta--------	Moderate: depth to rock, slope.	Severe: large stones.	Deep to water----	Slope, large stones, droughty.	Large stones, depth to rock.
Raton----------	Severe: depth to rock.	Severe: large stones.	Deep to water----	Slope, large stones, droughty.	Large stones, depth to rock.
290*:					
Paguate----------	Moderate: depth to rock, slope.	Moderate: thin layer, piping, large stones.	Deep to water----	Slope, percs slowly, depth to rock.	Large stones, depth to rock, erodes easily.
Hackroy----------	Severe: depth to rock.	Severe: thin layer.	Deep to water----	Slope, percs slowly.	Depth to rock, percs slowly.
291---------- Paguate	Moderate: depth to rock, slope.	Moderate: thin layer, piping, large stones.	Deep to water----	Slope, percs slowly, depth to rock.	Large stones, depth to rock.
294*:					
Parkay----------	Severe: slope.	Severe: large stones.	Deep to water----	Slope, large stones, droughty.	Slope, large stones.
Rock outcrop.					
300---------- Saladon	Slight----------	Severe: wetness.	Percs slowly-----	Wetness----------	Wetness, percs slowly.
310---------- Mirabal	Severe: slope.	Severe: thin layer.	Deep to water----	Slope, large stones, droughty.	Slope, large stones, depth to rock.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions
315*:					
Abersito, cobbly-	Severe: slope.	Severe: large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, depth to rock.
Abersito	Moderate: depth to rock, slope.	Severe: large stones.	Deep to water	Slope, large stones, droughty.	Large stones, depth to rock.
Rock outcrop.					
320--- Cinnadale	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.
325--- Moreno Variant	Moderate: seepage, slope.	Slight	Deep to water	Slope, erodes easily.	Erodes easily.
330--- Moreno	Moderate: slope.	Moderate: hard to pack.	Deep to water	Slope, percs slowly.	Erodes easily, percs slowly.
340--- Yankee	Slight	Moderate: hard to pack.	Deep to water	Percs slowly, erodes easily.	Erodes easily, percs slowly.
350*:					
Rock outcrop.					
Stout	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Slope, soil blowing, depth to rock.	Slope, depth to rock, soil blowing.
406*:					
Poley	Severe: seepage, slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, percs slowly.	Slope, percs slowly.
Rock outcrop.					
407*:					
Viuda	Severe: depth to rock.	Severe: thin layer.	Deep to water	Slope, percs slowly, depth to rock.	Large stones, depth to rock.
Rock outcrop.					
419--- Navajo	Moderate: slope.	Severe: excess sodium.	Deep to water	Slope, percs slowly, erodes easily.	Erodes easily, percs slowly.
420*:					
Navajo	Moderate: slope.	Severe: excess sodium.	Deep to water	Slope, percs slowly.	Percs slowly.
Suwanee	Moderate: slope.	Moderate: piping.	Deep to water	Slope, erodes easily, flooding.	Erodes easily.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions
424*:					
Mespun	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.
Palma	Severe: seepage.	Severe: piping.	Deep to water	Slope, fast intake, soil blowing.	Soil blowing.
426*:					
Sheppard	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
Shiprock	Severe: seepage.	Slight	Deep to water	Slope, droughty.	Soil blowing.
432*:					
Winona	Severe: depth to rock, slope.	Severe: large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, depth to rock.
Rock outcrop.					
434*:					
Rizozo	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, soil blowing, depth to rock.	Slope, depth to rock, soil blowing.
Rock outcrop.					
446*:					
Harvey	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope	Erodes easily.
Oelop	Severe: seepage.	Moderate: piping.	Deep to water	Favorable	Erodes easily.
476- Saido	Severe: excess gypsum, seepage.	Severe: excess gypsum, thin layer.	Deep to water	Excess gypsum, slope, erodes easily.	Excess gypsum, erodes easily.
485*: Rock outcrop.					
Mion	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.
487*:					
Mion	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, percs slowly, depth to rock.	Slope, depth to rock, erodes easily.
Badland.					
500*:					
Timhus	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, droughty.	Slope.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions
500*:					
Bandera	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, droughty.	Slope.
505*:					
Flugle	Moderate: seepage, slope.	Slight	Deep to water	Slope, fast intake.	Erodes easily, soil blowing.
Goesling	Moderate: slope.	Slight	Deep to water	Slope, fast intake, soil blowing.	Soil blowing.
514*:					
Raton	Severe: depth to rock.	Severe: large stones.	Deep to water	Slope, large stones, droughty.	Large stones, depth to rock.
Rock outcrop.					
515*:					
Rock outcrop.					
Vessilla	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, soil blowing, depth to rock.	Slope, depth to rock, soil blowing.
Mion	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, percs slowly, depth to rock.	Slope, depth to rock, erodes easily.
518*:					
Borrego	Severe: depth to rock.	Severe: thin layer.	Deep to water	Slope, percs slowly, depth to rock.	Depth to rock, erodes easily.
Charo	Moderate: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, percs slowly, depth to rock.	Depth to rock, percs slowly.
Rock outcrop.					
520*:					
Celacy	Moderate: seepage, depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock.	Depth to rock, erodes easily.
Atarque	Severe: depth to rock.	Severe: thin layer.	Deep to water	Slope, soil blowing, depth to rock.	Depth to rock, soil blowing.
522*:					
Bandera, 30 to 45 percent slopes	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, droughty.	Slope.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions
522*:					
Bandera, 15 to 30 percent slopes	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, droughty.	Slope.
523*:					
Charo	Moderate: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, percs slowly, depth to rock.	Large stones, depth to rock, percs slowly.
Raton	Severe: depth to rock.	Severe: large stones.	Deep to water	Slope, large stones, droughty.	Large stones, depth to rock.
525*:					
Catman	Moderate: slope.	Severe: hard to pack.	Deep to water	Slope, percs slowly.	Percs slowly.
Silkie	Moderate: slope.	Moderate: hard to pack.	Deep to water	Slope, percs slowly.	Percs slowly.
535--- Millpaw	Moderate: seepage.	Moderate: hard to pack.	Deep to water	Percs slowly, erodes easily.	Erodes easily, percs slowly.
536--- McGaffey	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily.
537*:					
Millpaw	Moderate: seepage.	Moderate: hard to pack.	Deep to water	Percs slowly, erodes easily.	Erodes easily, percs slowly.
Loarc	Severe: seepage.	Slight	Deep to water	Slope, soil blowing.	Too sandy, soil blowing.
540--- Montecito	Severe: seepage, slope.	Moderate: thin layer, large stones.	Deep to water	Slope, soil blowing.	Slope, large stones.
550*:					
Nogal	Moderate: depth to rock, slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, soil blowing, percs slowly.	Depth to rock, soil blowing.
Galestina	Moderate: depth to rock, slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, soil blowing, percs slowly.	Erodes easily, soil blowing, percs slowly.
555*:					
Pinitos	Severe: seepage.	Slight	Deep to water	Slope, soil blowing.	Favorable.
Ribera	Moderate: seepage, depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, soil blowing, depth to rock.	Depth to rock.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions
560*:					
Flugle	Moderate: seepage, slope.	Slight	Deep to water	Slope, fast intake.	Erodes easily, soil blowing.
Teco	Severe: seepage.	Slight	Deep to water	Soil blowing	Erodes easily, soil blowing.
561*:					
Flugle	Moderate: seepage, slope.	Slight	Deep to water	Slope	Erodes easily, soil blowing.
Quintana	Severe: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Slope, soil blowing.	Slope, soil blowing.
565--- Quintana	Severe: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Slope, soil blowing.	Slope, soil blowing.
570*:					
Torreon	Severe: slope.	Moderate: piping.	Deep to water	Slope, percs slowly.	Slope, erodes easily.
Rock outcrop.					
Cabezon	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, large stones, percs slowly.	Slope, large stones, depth to rock.
575*:					
Teco	Severe: seepage.	Slight	Deep to water	Soil blowing	Erodes easily, soil blowing.
Atarque	Severe: depth to rock.	Severe: thin layer.	Deep to water	Slope, soil blowing, depth to rock.	Depth to rock, soil blowing.
576--- Teco	Severe: seepage.	Slight	Deep to water	Slope, soil blowing.	Erodes easily, soil blowing.
577*:					
Cabezon	Severe: depth to rock.	Severe: thin layer.	Deep to water	Slope, large stones, percs slowly.	Large stones, depth to rock.
Montecito	Moderate: slope.	Slight	Deep to water	Slope	Favorable.
Rock outcrop.					
579*:					
Cabezon	Severe: depth to rock.	Severe: thin layer.	Deep to water	Slope, large stones, percs slowly.	Large stones, depth to rock.
Cantina	Moderate: seepage, depth to rock.	Moderate: thin layer, piping.	Deep to water	Soil blowing, percs slowly.	Soil blowing.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions
581*:					
Laporte	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Slope, depth to rock.	Slope, large stones, depth to rock.
Vessilla	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, soil blowing, depth to rock.	Slope, depth to rock, soil blowing.
582 Kenray	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.
585 Moncha	Moderate: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily.
586*:					
Venadito	Slight	Moderate: hard to pack.	Deep to water	Percs slowly	Percs slowly.
Teco	Severe: seepage.	Slight	Deep to water	Slope	Erodes easily.
591*:					
Valnor	Moderate: depth to rock, slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, percs slowly.	Depth to rock, erodes easily.
Techado	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, percs slowly.
610*:					
Grieta	Severe: seepage.	Severe: piping.	Deep to water	Slope, soil blowing.	Soil blowing.
Shiprock	Severe: seepage.	Slight	Deep to water	Slope, droughty.	Soil blowing.
611*:					
Grieta	Severe: seepage.	Severe: piping.	Deep to water	Slope, soil blowing.	Soil blowing.
Kiki	Severe: slope.	Severe: piping.	Deep to water	Slope, soil blowing, depth to rock.	Slope, depth to rock, soil blowing.
615*:					
Trag	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope, large stones.
Techado	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.
Rock outcrop.					
618 Netoma	Severe: excess gypsum, seepage.	Severe: excess gypsum, piping.	Deep to water	Excess gypsum, slope, erodes easily.	Excess gypsum, erodes easily.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions
619---------- Venadito	Moderate: slope.	Moderate: hard to pack.	Deep to water----	Slope, percs slowly.	Percs slowly.
620*:					
Aparejo----------	Moderate: seepage, slope.	Severe: piping.	Deep to water----	Slope, flooding.	Erodes easily.
Venadito---------	Moderate: slope.	Moderate: hard to pack.	Deep to water----	Slope, percs slowly, erodes easily.	Erodes easily, percs slowly.
625*:					
Hagerman---------	Moderate: seepage, depth to rock, slope.	Moderate: thin layer, piping.	Deep to water----	Slope, soil blowing, depth to rock.	Depth to rock.
Bond----------	Severe: depth to rock.	Severe: thin layer.	Deep to water----	Slope, depth to rock.	Depth to rock, soil blowing.
630*:					
Bond----------	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water----	Slope, depth to rock.	Slope, depth to rock, soil blowing.
Rizozo----------	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water----	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.
Rock outcrop.					
640*:					
Flaco----------	Moderate: seepage, depth to rock.	Severe: piping.	Deep to water----	Depth to rock----	Depth to rock, erodes easily.
Berto----------	Severe: depth to rock.	Severe: thin layer.	Deep to water----	Slope, depth to rock, erodes easily.	Depth to rock, erodes easily.
641*:					
Berto----------	Severe: depth to rock.	Severe: thin layer.	Deep to water----	Slope, depth to rock.	Depth to rock, erodes easily.
Flaco----------	Moderate: seepage, depth to rock, slope.	Severe: thin layer.	Deep to water----	Slope, depth to rock.	Large stones, depth to rock.
645*:					
Penistaja--------	Severe: seepage.	Severe: piping.	Deep to water----	Favorable--------	Favorable.
Oelop----------	Severe: seepage.	Moderate: piping.	Deep to water----	Favorable--------	Erodes easily.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions
650*:					
Winona	Severe: depth to rock, slope.	Severe: large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, depth to rock.
Tanbark	Severe: depth to rock, slope, seepage.	Severe: thin layer, excess gypsum.	Deep to water	Depth to rock, slope, excess gypsum.	Slope, depth to rock, erodes easily.
Rock outcrop.					
660*:					
Rana	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, slow intake, percs slowly.	Slope, percs slowly.
Rock outcrop.					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
10*. Lava flows											
20---------- Penistaja	0-6	Fine sandy loam	SC-SM, CL-ML	A-4	0	100	100	90-100	40-60	20-30	5-10
	6-60	Sandy clay loam, clay loam.	CL, SC	A-6	0	100	100	95-100	45-75	30-35	10-15
21---------- Clovis	0-8	Sandy clay loam	CL-ML	A-4	0	100	100	90-100	65-85	25-30	5-10
	8-60	Sandy clay loam, clay loam, loam.	CL	A-6	0	100	100	90-100	50-85	30-40	10-20
25*:											
Hickman---------	0-4	Loam----------	CL-ML, CL	A-4, A-6	0	80-100	75-100	60-75	50-65	25-35	5-15
	4-60	Stratified sandy loam to silty clay loam.	CL	A-6	0	80-100	75-100	60-75	50-65	25-40	10-20
Catman----------	0-12	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	80-90	35-45	15-20
	12-60	Clay----------	CH	A-7	0	100	100	90-100	80-90	60-70	30-40
30---------- Warm Springs	0-8	Loam----------	ML	A-4	0	100	100	60-80	50-65	15-25	NP-5
	8-36	Gravelly sandy loam, loam.	SC-SM, CL-ML	A-4	0	80-100	70-100	60-80	45-60	25-30	5-10
	36-60	Sandy loam, loam	SC-SM, CL-ML	A-4	0	90-100	85-100	60-80	45-60	25-30	5-10
40---------- Aparejo	0-6	Clay loam--------	CL	A-6, A-7	0	100	100	90-100	80-90	35-45	15-20
	6-47	Silty clay loam, silt loam, clay loam.	CL	A-6	0	100	100	90-100	80-90	25-40	10-20
	47-60	Silt loam, sandy clay loam, clay loam.	CL	A-6	0	100	100	85-100	65-85	25-35	10-15
41---------- Aparejo	0-6	Clay loam--------	CL	A-6	0	100	100	80-95	75-85	35-40	15-20
	6-42	Clay loam, sandy clay loam.	CL	A-6	0	100	100	70-85	65-75	30-40	15-20
	42-60	Stratified fine sand to clay loam.	SM, SC-SM, SC	A-2, A-4, A-6	0	100	100	60-80	30-50	15-40	NP-15
45---------- Aparejo	0-15	Clay----------	CL, CH	A-7	0	100	100	85-100	80-95	45-55	20-30
	15-38	Sandy clay loam, clay loam.	CL	A-6	0	100	100	90-100	80-90	25-40	10-20
	38-60	Sandy clay loam, fine sandy loam.	CL	A-6	0	100	100	85-100	65-85	25-35	10-15
50---------- Venadito	0-14	Clay loam--------	CL	A-6, A-7	0	100	100	85-95	75-85	35-45	15-20
	14-60	Clay----------	CH	A-7	0	100	100	95-100	85-95	55-65	30-40
51---------- Venadito	0-19	Sandy clay loam, clay loam.	SC, CL	A-6	0	100	100	60-75	45-60	30-40	10-15
	19-60	Clay----------	CH	A-7	0	100	100	95-100	85-95	55-65	30-40

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
52----------	0-3	Clay loam--------	CL	A-6	0	100	100	85-95	75-85	30-35	10-15
Venadito Variant	3-35	Clay----------	CH	A-7	0	100	100	95-100	85-95	50-60	30-40
	35-39	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
55*:											
Glenberg--------	0-11	Sandy loam-------	SM	A-4	0	95-100	85-100	60-70	35-45	15-20	NP-5
	11-21	Sandy loam-------	SM	A-4	0	95-100	85-100	60-70	35-45	15-20	NP-5
	21-60	Stratified loamy sand to loam.	SM	A-2, A-4	0	90-100	75-90	50-80	25-40	15-20	NP-5
San Mateo-------	0-4	Sandy clay loam	SC, CL	A-6	0	100	100	55-75	35-55	30-35	10-15
	4-60	Stratified sandy loam to silty clay loam.	CL	A-6	0	85-100	75-90	60-75	50-65	30-40	10-20
56----------	0-2	Loamy sand-------	SM	A-2	0	100	100	60-80	20-35	---	NP
Mespun	2-60	Fine sand, loamy fine sand, loamy sand.	SM	A-2	0	100	100	70-90	15-35	---	NP
57----------	0-6	Clay loam--------	CL	A-6	0	100	100	80-90	60-70	35-40	15-20
San Mateo	6-60	Stratified sandy loam to silty clay loam.	CL	A-6	0	85-100	75-90	60-75	50-65	30-40	10-20
58----------	0-4	Sandy clay loam	SC, CL	A-6	0	100	100	55-75	35-55	30-35	10-15
San Mateo	4-47	Loam, sandy clay loam.	SC, CL	A-6	0	85-100	75-90	60-75	45-65	30-40	10-20
	47-60	Stratified sandy loam to silty clay loam.	CL	A-6	0	85-100	75-90	60-75	50-65	30-40	10-20
60----------	0-10	Clay loam--------	CL	A-6, A-7	0	95-100	90-100	80-95	70-90	35-45	15-20
Sparank	10-60	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	95-100	90-100	80-95	70-90	40-55	15-30
61----------	0-10	Clay loam--------	CL	A-6, A-7	0	100	100	80-100	75-90	35-45	15-20
Sparham	10-60	Silty clay, clay	CL, CH	A-7	0	100	100	90-100	80-95	45-60	20-30
62----------	0-5	Sandy clay loam	SC	A-2, A-6	0	95-100	90-100	50-70	30-40	30-40	15-20
Sparank	5-60	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	95-100	90-100	80-95	70-90	40-55	20-30
66----------	0-8	Fine sandy loam	SC-SM	A-2, A-4	0	80-100	75-100	55-70	25-40	20-30	5-10
Zia	8-60	Sandy loam, fine sandy loam.	SC-SM	A-2, A-4	0	80-100	75-100	60-75	25-45	20-30	5-10
70----------	0-6	Clay loam--------	CL	A-6, A-7	0	100	100	65-95	50-80	30-45	10-20
Catman	6-60	Clay----------	CH	A-7	0	100	100	90-100	80-90	60-70	30-40
72----------	0-10	Clay loam--------	CL	A-6, A-7	0	100	100	80-95	65-80	35-45	15-20
Catman Variant	10-60	Clay----------	CH	A-7	0	100	100	90-100	80-90	60-70	30-40
73----------	0-10	Sandy clay loam	CL	A-6, A-7	0	100	100	65-95	50-80	30-45	10-20
Catman	10-60	Clay----------	CH	A-7	0	100	100	90-100	80-90	60-70	30-40
75----------	0-6	Sandy clay loam	CL	A-6	0	80-100	75-100	70-85	50-80	30-40	15-20
Hickman	6-60	Stratified sandy loam to silty clay loam.	CL	A-6	0	80-100	75-100	60-75	50-65	25-40	10-20

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
100----------	0-4	Loam----------	CL-ML	A-4	0	90-100	90-100	85-100	60-80	20-30	5-10
Manzano	4-60	Loam, clay loam, silt loam.	CL	A-6	0	80-100	75-100	70-100	50-85	25-40	10-20
120*:											
Rock outcrop.											
Laporte---------	0-2	Very cobbly loam	SC-SM, GM-GC, GC, SC	A-4, A-6	30-45	60-75	55-70	40-60	35-50	25-35	5-15
	2-11	Gravelly loam, cobbly loam.	CL-ML, SC-SM, CL, SC	A-4, A-6	10-25	70-90	65-85	50-70	45-60	25-35	5-15
	11-15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
130*:											
Laporte---------	0-3	Gravelly loam----	CL-ML, ML, GM, GM-GC	A-4	0-15	60-90	60-75	45-60	40-55	20-30	NP-10
	3-11	Gravelly loam, cobbly loam.	CL-ML, SC-SM, CL, SC	A-4, A-6	10-25	70-90	65-85	50-70	45-60	25-35	5-15
	11-15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
200----------	0-2	Fine sandy loam	SC-SM, CL-ML	A-4	0	100	100	90-100	40-60	20-30	5-10
Penistaja	2-22	Sandy clay loam, clay loam.	CL, SC	A-6	0	100	100	95-100	45-75	30-35	10-15
	22-60	Sandy loam, fine sandy loam, sandy clay loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	100	100	70-95	30-55	20-30	5-15
205----------	0-3	Very gravelly sandy loam.	GM-GC	A-2	0-25	40-55	35-50	25-35	10-20	15-25	5-10
Ildefonso	3-60	Very gravelly loam, very gravelly sandy loam.	GM-GC	A-2, A-4	10-25	40-60	35-55	25-50	10-40	15-25	5-10
210*:											
Bond----------	0-7	Sandy loam-------	SM	A-2, A-4	0-15	100	95-100	60-75	30-50	15-25	NP-5
	7-16	Sandy clay loam, clay loam, loam.	SC, CL	A-2, A-6	0-15	80-100	70-100	60-75	30-60	20-35	10-20
	16-20	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Penistaja-------	0-3	Sandy loam-------	SC-SM, CL-ML	A-4	0	100	100	90-100	40-60	20-30	5-10
	3-30	Sandy clay loam, clay loam.	CL, SC	A-6	0	100	100	95-100	45-75	30-35	10-15
	30-60	Sandy loam, fine sandy loam, sandy clay loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	100	100	70-95	30-55	20-30	5-15
Rock outcrop.											

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
218*:											
Viuda	0-3	Very cobbly sandy loam.	GM-GC, SC-SM	A-2	30-50	50-75	45-70	40-55	15-30	20-30	5-10
	3-16	Clay, sandy clay	CL, CH	A-7	0-10	95-100	90-100	55-75	50-65	40-55	20-30
	16-19	Cobbly clay loam, sandy clay loam, clay loam.	CL	A-6	10-25	95-100	90-100	60-75	50-60	30-40	10-20
	19-23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Penistaja	0-2	Sandy loam	SC-SM, CL-ML	A-4	0	100	100	90-100	40-60	20-30	5-10
	2-24	Sandy clay loam, clay loam.	CL, SC	A-6	0	100	100	95-100	45-75	30-35	10-15
	24-60	Sandy loam, fine sandy loam, sandy clay loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	100	100	70-95	30-55	20-30	5-15
Rock outcrop.											
230*:											
Dumps.											
Pits.											
251*:											
Skyvillage	0-4	Sandy loam	SC-SM	A-4	0-10	95-100	85-100	60-80	35-50	20-25	5-10
	4-12	Fine sandy loam, sandy loam, loam.	SC-SM, CL-ML	A-4	0-10	95-100	85-100	60-85	35-65	20-30	5-10
	12-16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
Bond	0-4	Sandy loam	SM	A-2, A-4	0-15	100	95-100	60-75	30-50	15-25	NP-5
	4-10	Sandy clay loam, clay loam, loam.	SC, CL	A-2, A-6	0-15	80-100	80-100	60-75	30-60	20-35	10-20
	10-14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
257*:											
Sparank	0-2	Clay loam	CL	A-6, A-7	0	95-100	90-100	80-95	70-90	35-45	15-20
	2-60	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	95-100	90-100	80-95	70-90	40-55	15-30
San Mateo	0-2	Loam	CL-ML, CL	A-4, A-6	0	100	100	80-95	60-75	20-30	5-15
	2-29	Loam, sandy clay loam.	SC, CL	A-6	0	85-100	75-90	60-75	45-65	30-40	10-20
	29-60	Stratified sandy loam to silty clay loam.	CL	A-6	0	85-100	75-90	60-75	50-65	30-40	10-20
259 Mikim	0-4	Loam	ML, CL-ML	A-4	0-5	85-100	75-100	65-95	50-75	20-30	NP-10
	4-60	Sandy clay loam, clay loam.	CL-ML, CL	A-4, A-6	0-5	85-100	75-100	65-95	50-75	25-40	5-15

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
262*:											
Poley	0-2	Very cobbly loam	GM-GC	A-2, A-4	25-40	50-70	40-65	30-60	25-50	20-25	5-10
	2-18	Clay, clay loam, gravelly clay loam.	SC, CL, GC	A-6, A-7	0-15	70-100	60-100	50-90	40-80	30-45	15-30
	18-60	Loam	CL-ML	A-4	0-10	90-100	85-100	70-80	60-70	20-25	5-10
Pojoaque	0-3	Very cobbly loam	GM-GC, SC-SM	A-2, A-4	30-50	50-75	45-70	40-55	25-40	20-30	5-10
	3-60	Gravelly clay loam, gravelly sandy clay loam, cobbly clay loam.	SC-SM	A-2, A-4	10-25	70-90	65-85	55-65	30-50	25-30	5-10
264	0-4	Sandy loam	SC-SM	A-2, A-4	0-10	90-100	90-100	60-80	30-45	20-25	5-10
Tapia	4-23	Clay loam, sandy clay loam.	CL	A-6	0-10	90-100	85-100	75-90	55-75	30-40	10-20
	23-40	Cobbly sandy loam, very cobbly sandy clay loam, very cobbly sandy loam.	SC-SM, GM-GC	A-2	15-40	55-85	50-80	45-60	20-35	25-30	5-10
	40-60	Cobbly sand	SM	A-1, A-2	15-25	70-95	65-90	40-55	10-20	---	NP
270	0-5	Loam	CL	A-6	0-15	95-100	90-100	75-90	65-80	30-35	10-15
Charo	5-28	Clay loam, clay	CL, CH	A-7	0-15	95-100	90-100	85-95	75-85	40-60	20-30
	28-32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
272*:											
Cebolleta	0-2	Cobbly loam	CL-ML	A-4	30-40	85-95	80-90	70-85	60-75	20-25	5-10
	2-8	Very cobbly loam, very cobbly clay loam.	CL	A-6	45-55	75-90	70-85	60-75	50-65	25-35	10-20
	8-25	Very cobbly clay	SC, GC, CL, CH	A-7	40-55	55-85	50-80	45-70	40-60	45-60	20-30
	25-29	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Borrego	0-4	Gravelly loam	SC, GC	A-6	5-15	65-80	60-75	55-65	40-50	25-35	10-15
	4-18	Gravelly clay, clay, gravelly clay loam.	CL	A-7	0	70-100	70-90	65-85	55-80	40-50	20-25
	18-22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
276	0-3	Loam	ML, CL-ML	A-4	0-15	85-100	75-100	55-80	50-65	20-30	NP-10
Trag	3-24	Clay loam, loam, sandy clay loam.	CL-ML, CL	A-4, A-6	0-15	85-100	80-100	75-95	55-75	25-35	5-15
	24-60	Sandy clay loam, clay loam, loam.	SC	A-2, A-6	0-15	80-95	75-90	60-80	30-50	25-30	10-15

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
278*:											
Microy	0-3	Cobbly loam	CL-ML, CL	A-4, A-6	15-30	75-95	70-90	55-75	50-65	20-30	5-15
	3-28	Cobbly clay, gravelly clay loam.	CL, CH	A-7	15-30	75-95	70-90	60-80	55-75	40-55	20-30
	28-36	Very cobbly clay, cobbly clay.	CL, CH	A-7	25-30	65-95	60-90	55-75	50-65	45-55	20-30
	36-40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
282	0-4	Cobbly loam	CL-ML	A-4	30-40	85-95	80-90	70-85	60-75	20-25	5-10
Cebolleta	4-10	Very cobbly loam, very cobbly clay loam.	CL	A-6	45-55	75-90	70-85	60-75	50-65	25-35	10-20
	10-25	Very cobbly clay	SC, GC, CL, CH	A-7	40-55	55-85	50-80	45-70	40-60	45-60	20-30
	25-29	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
284*:											
Cebolleta	0-5	Very cobbly loam	GM-GC, SC-SM, CL-ML	A-4	40-45	55-85	50-80	45-65	40-55	20-25	5-10
	5-10	Very cobbly loam, very cobbly clay loam.	CL	A-6	45-55	75-90	70-85	60-75	50-65	25-35	10-20
	10-24	Very cobbly clay	SC, GC, CL, CH	A-6, A-7	40-55	55-85	50-80	45-70	40-60	35-55	20-40
	24-28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
286*:											
Cebolleta	0-3	Very cobbly loam	GM-GC, SC-SM, CL-ML	A-4	40-45	55-85	50-80	45-65	40-55	20-25	5-10
	3-9	Very cobbly loam, very cobbly clay loam.	CL	A-6	45-55	75-90	70-85	60-75	50-65	25-35	10-20
	9-28	Very cobbly clay	SC, GC, CL, CH	A-6, A-7	40-55	55-85	50-80	45-70	40-60	35-55	20-40
	28-32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Raton	0-3	Cobbly loam	CL	A-6	15-25	85-95	80-90	75-90	60-80	30-35	10-15
	3-10	Very stony clay, very cobbly clay loam.	CH, CL	A-7	50-80	85-95	80-90	75-90	65-85	40-60	20-30
	10-14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
290*:											
Paguate	0-3	Loam	CL	A-6	0-10	90-100	85-100	75-90	65-80	25-35	10-15
	3-8	Clay loam	CL	A-6, A-7	0-10	90-100	85-100	80-95	70-85	35-45	15-20
	8-19	Clay, gravelly clay, cobbly clay.	CL, CH	A-7	0-15	85-100	80-100	75-95	70-85	45-55	20-30
	19-33	Cobbly loam, clay loam, gravelly clay loam.	CL	A-6	0-25	80-90	70-85	65-80	60-75	30-40	10-20
	33-37	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Hackroy	0-3	Cobbly loam	CL-ML, CL	A-4, A-6	30-40	85-95	80-90	70-85	60-75	20-30	5-15
	3-14	Clay loam, clay	CL, CH	A-7	0	95-100	95-100	80-90	70-85	40-55	20-30
	14-18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
291 Paguate	0-5	Cobbly clay loam	CL	A-6	15-30	75-95	70-90	65-85	55-75	30-40	15-20
	5-26	Clay, gravelly clay, cobbly clay.	CL	A-7	0-25	75-100	70-100	65-95	60-85	40-50	20-30
	26-38	Gravelly loam, cobbly loam, clay loam.	CL	A-6	0-25	80-90	70-85	65-80	60-75	30-40	10-20
	38-42	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
294*:											
Parkay	0-2	Stony loam	CL	A-6	15-30	75-95	70-90	55-75	50-65	25-35	10-15
	2-23	Very cobbly sandy clay loam, very gravelly sandy clay loam, very cobbly clay loam.	GC, SC	A-2	25-45	50-70	45-65	40-60	20-35	30-40	10-20
	23-60	Very cobbly sandy clay loam, extremely cobbly sandy clay loam.	GC, SC	A-2, A-6	40-60	45-75	40-70	30-50	30-45	30-40	10-20
Rock outcrop.											
300 Saladon	0-4	Clay loam	CL	A-6, A-7	0	100	100	90-100	80-90	35-45	15-20
	4-60	Clay, sandy clay, clay loam.	CL, CH	A-7	0	80-100	75-100	70-90	50-80	45-55	20-30
310 Mirabal	0-3	Very gravelly loam.	GM-GC	A-2	10-25	40-60	35-55	30-45	20-35	20-25	5-10
	3-14	Very gravelly loam.	GM-GC	A-2, A-4	15-30	40-65	35-60	35-50	25-40	20-25	5-10
	14-21	Very cobbly sandy clay loam.	SC, GC	A-2, A-6	30-45	50-75	50-70	50-65	30-45	30-35	10-15
	21-25	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
315*:											
Abersito, cobbly	0-3	Very cobbly sandy clay loam.	SC, GC, CL	A-6	45-60	60-90	55-85	50-65	40-55	30-35	10-15
	3-9	Very cobbly fine sandy loam.	GM-GC, SC-SM	A-4, A-2	40-55	60-90	55-85	45-60	30-50	20-30	5-10
	9-24	Very cobbly clay	GC, CL, SC, CH	A-7	45-60	60-90	55-85	40-65	40-60	45-60	20-30
	24-28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Abersito	0-5	Gravelly loam	CL	A-6	5-15	65-80	60-75	55-70	50-65	25-35	10-15
	5-24	Very cobbly clay	GC, CL, SC, CH	A-7	45-60	60-90	55-85	40-65	40-60	45-60	20-30
	24-28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
320 Cinnadale	0-4	Gravelly very fine sandy loam.	SM, GM	A-2, A-4	0	65-80	60-75	55-70	30-50	20-25	NP-5
	4-12	Very channery loam, very channery silt loam.	GM	A-2, A-4	20-30	40-55	35-50	30-45	25-40	20-25	NP-5
	12-16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
325 Moreno Variant	0-7	Loam	SC-SM	A-4	0	95-100	90-100	45-55	40-50	20-25	5-10
	7-22	Very fine sandy loam.	SC-SM	A-4	0	95-100	90-100	80-90	35-40	20-25	5-10
	22-60	Sandy clay loam, clay loam.	SC	A-6	0	95-100	90-100	50-60	45-50	30-40	10-20
330 Moreno	0-14	Loam	CL	A-6	5-10	95-100	90-95	75-90	55-70	25-35	10-15
	14-35	Clay loam, clay, gravelly clay.	CL, CH	A-7	5-15	95-100	70-95	60-90	50-75	40-55	20-30
	35-60	Very gravelly clay loam.	GC	A-2	10-15	50-60	45-55	35-50	25-35	35-45	15-20
340 Yankee	0-3	Silty clay loam	CL	A-6	0	100	100	95-100	85-95	35-40	15-20
	3-60	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	100	100	90-100	75-95	40-60	20-30
350*:											
Rock outcrop.											
Stout	0-3	Sandy loam	SM	A-2, A-4	0	80-100	75-100	55-75	25-40	20-25	NP-5
	3-14	Sandy loam	SM	A-2, A-4	0	80-100	75-100	55-75	25-40	20-25	NP-5
	14-18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
406*:											
Poley	0-3	Very cobbly loam	GC, GM-GC, CL-ML, CL	A-4, A-6	30-45	60-75	55-70	50-65	40-55	20-30	5-15
	3-60	Clay, clay loam	CL, CH	A-7	0	95-100	90-100	80-90	70-80	40-60	25-35
Rock outcrop.											

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
407*:											
Viuda	0-3	Very cobbly silty clay loam.	GC, CL	A-6, A-7	30-50	50-75	45-70	45-60	35-60	35-45	15-20
	3-13	Clay, sandy clay	CL, CH	A-7	0-10	95-100	90-100	55-75	50-65	40-55	20-30
	13-17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
419	0-3	Silty clay loam	CL	A-6	0	100	100	90-100	80-90	30-40	10-20
Navajo	3-60	Silty clay, clay	CL	A-7	0	100	100	90-100	80-90	40-50	20-35
420*:											
Navajo	0-4	Clay loam	CL	A-6	0	100	100	85-95	75-85	30-40	10-20
	4-60	Silty clay, clay	CL	A-7	0	100	100	90-100	80-90	40-50	20-35
Suwanee	0-3	Silty clay loam	CL	A-6	0	100	100	90-100	80-90	35-40	15-20
	3-60	Stratified silty clay to loamy fine sand.	CL	A-6	0	100	100	80-95	50-60	25-40	10-20
424*:											
Mespun	0-2	Fine sand	SM	A-2	0	100	100	75-95	20-35	---	NP
	2-60	Fine sand, loamy fine sand, loamy sand.	SM	A-2	0	100	100	70-90	15-35	---	NP
Palma	0-4	Loamy fine sand	SM	A-2	0	100	100	50-75	20-30	15-20	NP-5
	4-60	Fine sandy loam, sandy loam.	SC-SM	A-4, A-2	0	100	100	65-75	30-40	15-25	5-10
426*:											
Sheppard	0-4	Loamy fine sand	SM	A-2	0	100	100	65-85	15-30	---	NP
	4-60	Loamy sand, loamy fine sand.	SM	A-2	0	100	100	65-85	15-30	---	NP
Shiprock	0-3	Sandy loam	SC-SM	A-2, A-4	0	100	100	75-90	30-50	20-30	5-10
	3-60	Sandy loam, fine sandy loam.	SC-SM	A-2, A-4	0	100	100	75-90	30-50	20-30	5-10
432*:											
Winona	0-3	Very gravelly loam.	GM-GC	A-2	15-25	45-65	40-60	30-45	20-35	20-25	5-10
	3-10	Very cobbly loam	GM-GC, SC-SM, GC	A-2, A-4, A-6	30-50	55-75	50-70	45-65	30-50	20-35	5-15
	10-14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
434*:											
Rizozo	0-2	Sandy loam	SC-SM, CL-ML	A-4	0-10	90-100	85-100	60-80	35-55	20-30	5-10
	2-10	Sandy loam, loam	SC-SM, CL-ML	A-4	0-10	90-100	85-100	65-85	40-60	25-30	5-10
	10-14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
446*:											
Harvey	0-2	Loam	CL-ML	A-4	0	80-100	80-100	70-100	50-80	25-30	5-10
	2-60	Clay loam, loam	CL, SC	A-6	0	80-100	80-100	70-100	45-80	25-40	10-20
Oelop	0-3	Loam	CL	A-6	0	100	100	85-95	60-75	25-35	10-15
	3-60	Loam, clay loam, silty clay loam.	CL	A-6	0	100	100	85-100	65-85	25-40	10-20
476	0-2	Loam	CL-ML	A-4	0	100	100	80-90	65-75	20-30	5-10
Saido	2-60	Gypsiferous material.	---	---	---	---	---	---	---	---	---
485*:											
Rock outcrop.											
Mion	0-3	Stony loam	CL-ML	A-4	15-40	90-100	80-90	60-70	50-60	25-30	5-10
	3-13	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	90-100	75-95	40-60	20-30
	13-17	Weathered bedrock	---	---	---	---	---	---	---	---	---
487*:											
Mion	0-1	Loam	CL	A-6	0	100	100	80-90	70-85	30-35	10-15
	1-16	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	100	90-100	75-95	45-55	20-30
	16-20	Weathered bedrock	---	---	---	---	---	---	---	---	---
Badland.											
500*:											
Timhus	0-5	Extremely gravelly loam.	GC	A-2	0-10	20-30	15-25	10-20	10-15	25-30	10-15
	5-20	Very gravelly loam.	GC	A-2	0-10	35-55	30-50	20-35	15-30	25-30	10-15
	20-29	Extremely gravelly loam.	GC	A-2	0-10	20-30	15-25	10-20	10-15	25-30	10-15
	29-60	Cinders	GP	A-1	0	5-15	0-10	0-5	0-5	---	NP
Bandera	0-3	Very gravelly loam.	GM-GC	A-2	0	35-60	25-50	20-45	10-35	20-25	5-10
	3-16	Very gravelly loam, gravelly loam.	GM-GC	A-2	0	35-60	25-50	20-45	10-35	20-25	5-10
	16-60	Cinders	GP	A-1	0	5-15	0-10	0-5	0-5	---	NP
505*:											
Flugle	0-5	Loamy fine sand	SM	A-2, A-4	0	100	90-100	75-90	25-40	15-20	NP-5
	5-41	Sandy clay loam, clay loam, loam.	CL, SC	A-6	0	100	90-100	60-80	40-60	30-40	10-20
	41-61	Sandy loam, fine sandy loam.	SC-SM	A-2, A-4	0	100	90-100	50-60	30-40	20-30	5-10
Goesling	0-5	Loamy fine sand	SM	A-2, A-4	0	100	90-100	75-90	25-40	15-20	NP-5
	5-18	Sandy clay loam, clay loam.	SC, CL	A-6	0	100	100	65-80	40-55	25-40	10-20
	18-60	Sandy loam, sandy clay loam, loam.	SC-SM, SC	A-2, A-4, A-1, A-6	0	100	100	40-55	20-40	25-35	5-15

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
514*:											
Raton	0-5	Very cobbly loam	CL	A-6	50-60	85-95	80-90	75-85	60-75	30-35	10-15
	5-13	Very cobbly clay	CH, CL	A-7	50-60	85-95	80-90	75-90	65-80	45-55	20-30
	13-17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
515*:											
Rock outcrop.											
Vessilla	0-3	Sandy loam	SC-SM	A-2	0-10	100	100	60-75	25-35	20-30	5-10
	3-15	Sandy loam, fine sandy loam.	SC-SM	A-2, A-4	0-10	90-100	85-100	60-80	25-40	15-25	5-10
	15-19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Mion	0-2	Loam	CL	A-6	0	100	100	80-90	70-85	30-35	10-15
	2-11	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	100	90-100	75-95	45-55	20-30
	11-15	Weathered bedrock	---	---	---	---	---	---	---	---	---
518*:											
Borrego	0-3	Loam	CL	A-6	0-5	100	100	90-100	70-80	30-40	10-20
	3-11	Gravelly clay, clay, clay loam.	CL	A-7	0	80-100	70-90	65-85	55-80	40-50	20-25
	11-15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Charo	0-2	Loam	CL	A-6	0-15	95-100	90-100	75-90	65-80	30-35	10-15
	2-27	Clay loam, clay	CL, CH	A-7	0-15	95-100	90-100	85-95	75-85	40-60	20-30
	27-31	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
520*:											
Celacy	0-2	Sandy loam	SC-SM	A-2, A-4	0-5	95-100	90-100	60-70	30-40	20-25	5-10
	2-24	Sandy clay loam, clay loam.	SC, CL	A-6	0	95-100	90-100	65-75	40-55	25-40	10-20
	24-28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Atarque	0-2	Fine sandy loam	SC-SM	A-4	0	100	100	70-85	40-50	20-25	5-10
	2-16	Sandy clay loam, clay loam.	SC, CL	A-6	0	100	100	80-95	40-60	30-40	10-20
	16-20	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
522*:											
Bandera, 30 to 45 percent slopes	0-8	Gravelly loam	GM-GC	A-4	0	60-70	50-60	40-50	35-45	20-25	5-10
	8-18	Very gravelly loam.	GM-GC	A-2	0	35-60	25-50	20-45	10-35	20-25	5-10
	18-60	Cinders	GP	A-1	0	5-15	0-10	0-5	0-5	---	NP

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
522*:											
Bandera, 15 to 30 percent slopes	0-9	Gravelly loam	GM-GC	A-4	0	60-70	50-60	40-50	35-45	20-25	5-10
	9-16	Very gravelly loam.	GM-GC	A-2	0	35-60	25-50	20-45	10-35	20-25	5-10
	16-60	Cinders	GP	A-1	0	5-15	0-10	0-5	0-5	---	NP
523*:											
Charo	0-2	Cobbly loam	CL	A-6	15-25	85-95	80-90	70-85	55-70	30-35	10-15
	2-28	Clay loam, clay	CL, CH	A-7	0-15	95-100	90-100	85-95	75-85	40-60	20-30
	28-32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Raton	0-7	Very cobbly loam	CL	A-6	50-60	85-95	80-90	75-85	60-75	30-35	10-15
	7-18	Very cobbly clay, very stony silty clay loam, extremely stony clay.	CH, CL	A-7	50-80	85-95	80-90	75-90	65-85	40-60	20-30
	18-22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
525*:											
Catman	0-3	Clay loam	CL	A-6, A-7	0	100	100	65-95	50-80	30-45	10-20
	3-60	Clay	CH	A-7	0	100	100	90-100	80-90	60-70	30-40
Silkie	0-4	Clay loam	CL	A-6, A-7	0	100	100	90-100	70-80	35-45	15-20
	4-60	Clay, clay loam	CL, CH	A-7	0	100	100	85-95	70-90	40-55	15-30
535	0-3	Loam	CL	A-6	0	100	100	80-90	65-75	25-35	10-15
Millpaw	3-29	Clay loam, clay, sandy clay.	CL, CH	A-7	0	100	100	85-95	75-90	40-55	20-30
	29-60	Sandy clay loam, clay loam, loam.	CL	A-6	0	95-100	90-100	70-90	50-70	25-40	10-20
536	0-3	Loam	CL	A-6	0	100	100	85-100	60-80	30-35	10-15
McGaffey	3-60	Loam, clay loam	CL	A-6	0	100	100	80-95	55-75	30-35	10-15
537*:											
Millpaw	0-2	Loam	CL	A-6	0	100	100	80-90	65-75	25-35	10-15
	2-37	Clay loam, clay, sandy clay.	CL, CH	A-7	0	100	100	85-95	75-90	40-55	20-30
	37-60	Sandy clay loam, clay loam, loam.	CL	A-6	0	95-100	90-100	70-90	50-70	25-40	10-20
Loarc	0-4	Fine sandy loam	SM, ML	A-4	0	100	95-100	80-90	45-55	20-25	NP-5
	4-60	Sandy clay loam, clay loam, gravelly sandy loam.	CL	A-6	0	75-90	70-85	60-75	50-60	25-40	10-20
540	0-5	Fine sandy loam	SC-SM	A-4, A-2	0-15	95-100	90-100	50-70	30-50	20-30	5-10
Montecito	5-30	Clay loam, clay	CL, CH	A-7	0-10	90-100	85-100	65-80	55-70	40-55	20-30
	30-60	Gravelly clay loam, gravelly sandy clay, clay loam.	CL, CH	A-7	10-15	65-90	60-85	55-75	50-70	40-55	20-30

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
550*:											
Nogal	0-1	Sandy loam	SC-SM	A-4	0	95-100	90-100	60-80	35-50	20-25	5-10
	1-31	Clay, clay loam, gravelly clay.	CL, CH, SC	A-7	0	85-100	60-100	50-70	40-60	45-60	20-30
	31-35	Weathered bedrock	---	---	---	---	---	---	---	---	---
Galestina	0-2	Sandy loam	SC-SM	A-2, A-4	0	100	100	60-75	30-45	20-30	5-10
	2-7	Loam, sandy clay loam, clay loam.	CL-ML, CL	A-4, A-6	0	100	100	85-95	60-75	25-35	5-15
	7-46	Clay, clay loam	CL, CH	A-6, A-7	0	100	100	90-100	75-95	35-55	15-30
	46-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
555*:											
Pinitos	0-2	Sandy loam	SC-SM	A-2, A-4	0	100	100	60-70	30-40	20-25	5-10
	2-24	Sandy clay loam, clay loam.	CL, SC	A-6	0	100	100	75-85	45-55	30-40	10-20
	24-60	Sandy loam, sandy clay loam.	SC-SM, SC	A-2, A-4, A-6	0	100	100	65-80	30-50	20-30	5-15
Ribera	0-3	Sandy loam	CL-ML, SC-SM	A-4	0	100	100	70-90	40-60	20-25	5-10
	3-39	Clay loam, sandy clay loam.	CL	A-6	0	100	100	85-95	50-75	30-35	10-15
	39-43	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
560*:											
Flugle	0-5	Loamy fine sand, fine sandy loam.	SM	A-2, A-4	0	100	90-100	75-90	25-40	15-20	NP-5
	5-37	Sandy clay loam, clay loam, loam.	CL, SC	A-6	0	100	90-100	60-80	40-60	30-40	10-20
	37-60	Sandy loam, fine sandy loam.	SC-SM	A-2, A-4	0	100	90-100	50-60	30-40	20-30	5-10
Teco	0-2	Sandy loam	SC-SM	A-2, A-4	0	100	100	60-70	30-40	20-30	5-10
	2-18	Clay, clay loam, sandy clay.	CL	A-7	0	95-100	90-100	80-100	60-80	40-50	20-25
	18-60	Gravelly very fine sandy loam, clay loam, sandy clay loam.	SC-SM, CL, GM-GC, SC	A-2, A-4, A-6	0-5	60-95	55-90	45-80	25-60	25-35	5-15
561*:											
Flugle	0-2	Sandy loam	SC-SM	A-2, A-4	0	100	90-100	50-60	30-40	20-25	5-10
	2-47	Sandy clay loam, clay loam, loam.	CL, SC	A-6	0	100	90-100	60-80	40-60	30-40	10-20
	47-60	Sandy loam, fine sandy loam.	SC-SM	A-2, A-4	0	100	90-100	50-60	30-40	20-30	5-10
Quintana	0-11	Fine sandy loam	CL-ML	A-4	0	100	100	75-90	50-65	20-30	5-10
	11-46	Sandy clay loam, loam, clay loam.	CL	A-6	0	100	100	70-85	55-70	30-40	10-20
	46-60	Sandy loam, fine sandy loam.	CL-ML, SC-SM	A-4	0	100	100	65-80	45-65	20-30	5-10
565 Quintana	0-4	Sandy loam	CL-ML, SC-SM	A-4	0	100	100	65-80	45-60	20-30	5-10
	4-21	Sandy clay loam, loam, clay loam.	CL	A-6	0	100	100	70-85	55-70	30-40	10-20
	21-60	Sandy loam, fine sandy loam.	CL-ML, SC-SM	A-4	0	100	100	65-80	45-65	20-30	5-10

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
570*:											
Torreon	0-2	Very cobbly loam	SC-SM, GM-GC	A-2, A-4	30-45	50-75	45-70	40-55	30-45	25-30	5-10
	2-25	Clay loam, clay	CL, CH	A-7	0-10	95-100	90-100	80-95	75-90	40-55	20-30
	25-60	Silty clay loam	CL	A-6, A-7	0-10	95-100	90-100	80-95	70-85	35-45	15-20
Rock outcrop.											
Cabezon	0-3	Very cobbly loam	SC, GC	A-6	40-55	55-85	50-80	40-60	35-50	25-35	10-15
	3-13	Clay loam, clay, sandy clay.	CL, CH	A-7	10-25	85-95	80-90	70-80	60-75	40-60	20-30
	13-17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
575*:											
Teco	0-6	Fine sandy loam	SC-SM	A-2, A-4	0	100	100	60-70	30-40	20-30	5-10
	6-24	Clay, clay loam, sandy clay.	CL	A-7	0	95-100	90-100	80-100	60-80	40-50	20-25
	24-60	Gravelly very fine sandy loam, clay loam, sandy clay loam.	SC-SM, CL, GM-GC, SC	A-2, A-4, A-6	0-5	60-95	55-90	45-80	25-60	25-35	5-15
Atarque	0-3	Fine sandy loam	SC-SM	A-4	0	100	100	70-85	40-50	20-25	5-10
	3-19	Sandy clay loam, clay loam.	SC, CL	A-6	0	100	100	80-95	40-60	30-40	10-20
	19-23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
576	0-3	Sandy loam	SC-SM	A-2, A-4	0	100	100	60-70	30-40	20-30	5-10
Teco	3-60	Clay, clay loam, sandy clay.	CL	A-7	0	95-100	90-100	80-100	60-80	40-50	20-25
577*:											
Cabezon	0-2	Very cobbly loam	SC, GC	A-6	40-55	55-85	50-80	40-60	35-50	25-35	10-15
	2-18	Cobbly clay loam, clay, sandy clay.	CL, CH	A-7	10-25	85-95	80-90	70-80	60-75	40-60	20-30
	18-22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Montecito	0-3	Clay loam	CL	A-6	0-15	95-100	90-100	80-90	55-65	30-35	10-15
	3-24	Clay loam	CL	A-7	0-10	90-100	85-100	75-85	60-70	40-45	15-20
	24-60	Sandy clay	SC, CL	A-7	0-10	90-100	85-100	60-70	40-55	40-45	15-20
Rock outcrop.											
579*:											
Cabezon	0-2	Very cobbly sandy loam.	SC-SM, GM-GC	A-2	40-55	55-85	50-80	35-55	25-35	20-30	5-10
	2-14	Cobbly clay loam, clay, sandy clay.	CL, CH	A-7	10-25	85-95	80-90	70-80	60-75	40-60	20-30
	14-18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
579*:											
Cantina	0-2	Sandy loam	SC-SM	A-2, A-4	0	100	100	60-75	30-40	25-30	5-10
	2-9	Sandy clay loam	SC	A-6	0	100	100	65-80	35-50	30-40	10-20
	9-31	Sandy clay, clay	CL, CH	A-7	0	100	100	70-85	55-70	40-60	15-30
	31-54	Sandy clay loam, sandy clay.	SC, CL	A-6, A-7	0	100	100	65-80	35-55	30-45	10-20
	54-58	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
581*:											
Laporte	0-1	Gravelly loam	CL-ML, ML, GM, GM-GC	A-4	0-15	60-90	60-75	45-60	40-55	20-30	NP-10
	1-18	Gravelly loam, cobbly loam.	CL-ML, SC-SM, CL, SC	A-4, A-6	10-25	70-90	65-85	50-70	45-60	25-35	5-15
	18-22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Vessilla	0-6	Sandy loam	SC-SM	A-2	0-10	100	100	60-75	25-35	20-30	5-10
	6-18	Sandy loam, fine sandy loam.	SC-SM	A-2, A-4	0-10	90-100	85-100	60-80	25-40	15-25	5-10
	18-22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
582	0-15	Fine sand	SM	A-2	0	100	100	80-95	20-30	---	NP
Kenray	15-60	Loamy sand, fine sand, sand.	SM	A-2, A-4	0	100	100	65-85	10-40	---	NP
585	0-2	Silt loam	CL-ML	A-4	0	100	100	95-100	80-95	25-30	5-10
Moncha	2-21	Silty clay loam, silt loam.	CL	A-6	0	100	100	95-100	80-95	30-35	10-15
	21-60	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	80-95	25-35	5-15
586*:											
Venadito	0-3	Clay loam	CL	A-6, A-7	0	100	100	85-95	75-85	35-45	15-20
	3-60	Clay	CH	A-7	0	100	100	95-100	85-95	55-65	30-40
Teco	0-3	Clay loam	CL	A-6	0	100	100	90-100	70-80	35-40	15-20
	3-60	Clay, clay loam, sandy clay.	CL	A-7	0	95-100	90-100	80-100	60-80	40-50	20-25
591*:											
Valnor	0-2	Clay loam	CL	A-6	0	90-100	75-100	60-75	50-65	30-40	10-20
	2-38	Clay, clay loam, sandy clay.	CL, CH	A-7	0	100	75-100	75-85	60-80	40-55	20-30
	38-42	Weathered bedrock	---	---	---	---	---	---	---	---	---
Techado	0-3	Channery clay loam.	CL, SC, GC	A-6	0	55-80	50-75	45-60	40-55	30-40	10-20
	3-16	Clay	CL, CH	A-7	0	80-100	75-100	70-85	65-80	40-55	20-35
	16-20	Weathered bedrock	---	---	---	---	---	---	---	---	---
610*:											
Grieta	0-8	Sandy loam	SC-SM	A-2, A-4	0	100	100	65-80	25-45	20-30	5-10
	8-28	Sandy clay loam, clay loam, fine sandy loam.	SC	A-6	0	90-100	85-100	75-90	35-50	25-40	10-20
	28-60	Sandy loam, coarse sandy loam.	SM, SC-SM	A-2	0	90-100	85-100	50-70	20-35	15-30	NP-10

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
610*:											
Shiprock	0-3	Sandy loam	SC-SM	A-2, A-4	0	100	100	75-90	30-50	20-30	5-10
	3-60	Sandy loam, fine sandy loam.	SC-SM	A-2, A-4	0	100	100	75-90	30-50	20-30	5-10
611*:											
Grieta	0-3	Sandy loam	SC-SM	A-2, A-4	0	100	100	65-80	25-45	20-30	5-10
	3-60	Sandy clay loam, clay loam, fine sandy loam.	SC	A-6	0	90-100	85-100	75-90	35-50	25-40	10-20
Kiki	0-6	Sandy loam	SC-SM	A-4	0	80-100	75-100	60-80	35-50	20-30	5-10
	6-14	Sandy clay loam, clay loam.	SC, CL	A-6	0	100	100	70-85	40-55	35-40	15-20
	14-24	Sandy clay loam, loam, clay loam.	SC, CL	A-6	0	100	100	65-80	35-55	30-40	10-15
	24-28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
615*:											
Trag	0-2	Cobbly loam	CL-ML	A-4	15-25	85-95	80-90	70-80	50-60	20-30	5-10
	2-35	Loam, clay loam, sandy clay loam.	CL-ML, CL	A-4, A-6	0-15	90-100	90-100	70-95	50-75	20-35	5-15
	35-60	Cobbly sandy loam	SM	A-2, A-4	15-30	85-90	75-90	50-70	25-40	20-25	NP-5
Techado	0-2	Cobbly clay loam	CL	A-6	15-30	80-100	70-90	60-80	50-70	30-40	10-20
	2-19	Clay loam, sandy clay.	CL	A-6, A-7	0	80-100	75-100	70-85	65-80	30-45	15-25
	19-38	Weathered bedrock	---	---	---	---	---	---	---	---	---
	38-42	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
618	0-12	Sandy loam	SM, SC-SM	A-2, A-4	0	95-100	90-100	60-80	30-50	20-30	NP-10
Netoma	12-60	Gypsiferous material.	---	---	---	---	---	---	---	---	---
619	0-4	Clay loam	CL	A-6, A-7	0	100	100	85-95	75-85	35-45	15-20
Venadito	4-60	Clay	CH	A-7	0	100	100	95-100	85-95	55-65	30-40
620*:											
Aparejo	0-2	Silt loam	CL	A-6	0	100	100	85-95	70-85	25-30	10-15
	2-18	Silty clay loam, silt loam, clay loam.	CL	A-6	0	100	100	90-100	80-90	25-40	10-20
	18-60	Silt loam, sandy clay loam, clay loam.	CL	A-6	0	100	100	85-100	65-85	25-35	10-15
Venadito	0-3	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	80-90	35-45	15-20
	3-60	Clay	CH	A-7	0	100	100	95-100	85-95	55-65	30-40
625*:											
Hagerman	0-6	Fine sandy loam	SC-SM	A-4	0	95-100	90-100	65-80	35-50	20-30	5-10
	6-34	Sandy clay loam, clay loam, sandy loam.	SC, CL	A-6	0	95-100	90-100	70-80	45-60	25-40	10-20
	34-38	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
625*:											
Bond	0-5	Sandy loam	SM	A-2, A-4	0-15	100	95-100	60-75	30-50	15-25	NP-5
	5-18	Sandy clay loam, clay loam, loam.	SC, CL	A-2, A-6	0-15	80-100	70-100	60-75	30-60	20-35	10-20
	18-22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
630*:											
Bond	0-2	Sandy loam	SM	A-2, A-4	0-15	100	95-100	60-75	30-50	15-25	NP-5
	2-19	Sandy clay loam, clay loam, loam.	SC, CL	A-2, A-6	0-15	80-100	70-100	60-75	30-60	20-35	10-20
	19-23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rizozo	0-2	Loam	CL, SC	A-6	0	80-95	75-90	65-85	45-75	25-35	10-15
	2-14	Loam, silt loam	GC, SC, CL	A-6	0-15	65-90	60-85	45-75	35-60	25-35	10-15
	14-18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
640*:											
Flaco	0-2	Loam	CL-ML, CL	A-4, A-6	0	80-100	75-100	65-90	55-70	20-35	5-15
	2-11	Loam, clay loam	CL	A-6	0-15	100	100	75-85	60-75	25-40	10-20
	11-29	Loam, clay loam, gravelly loam.	CL	A-6	0-15	75-100	65-100	60-85	50-75	25-35	10-15
	29-33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Berto	0-2	Loam	CL-ML	A-4	0-10	95-100	90-100	65-80	50-65	20-30	5-10
	2-11	Loam, clay loam	CL	A-6	0-10	95-100	90-100	70-85	55-70	25-35	10-15
	11-18	Cobbly loam, loam, cobbly clay loam.	CL	A-6	10-15	85-95	80-90	65-75	50-60	25-35	10-15
	18-22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
641*:											
Berto	0-2	Cobbly loam	CL-ML	A-4	15-25	95-100	90-100	65-80	50-65	20-30	5-10
	2-8	Loam, clay loam	CL	A-6	0-10	95-100	90-100	70-85	55-70	25-35	10-15
	8-16	Cobbly loam, loam, cobbly clay loam.	CL	A-6	10-15	85-95	80-90	65-75	50-60	25-35	10-15
	16-20	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Flaco	0-2	Cobbly loam	CL-ML, CL	A-4, A-6	20-25	70-95	60-90	60-75	50-65	20-30	5-15
	2-9	Loam, clay loam	CL	A-6	0-15	100	100	75-85	60-75	25-40	10-20
	9-26	Loam, clay loam, gravelly loam.	CL	A-6	0-15	75-100	65-100	60-85	50-75	25-35	10-15
	26-30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
645*:											
Penistaja	0-3	Sandy loam	SC-SM, CL-ML	A-4	0	100	100	90-100	40-60	20-30	5-10
	3-18	Sandy clay loam, clay loam.	CL, SC	A-6	0	100	100	95-100	45-75	30-35	10-15
	18-60	Sandy loam, fine sandy loam, sandy clay loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	100	100	70-95	30-55	20-30	5-15

See footnote at end of table.

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
645*:											
Oelop	0-3	Loam	CL	A-6	0	100	100	85-95	60-75	25-35	10-15
	3-60	Loam, clay loam, silty clay loam.	CL	A-6	0	100	100	85-100	65-85	25-40	10-20
650*:											
Winona	0-3	Very gravelly loam.	GM-GC	A-2	15-25	45-65	40-60	30-45	20-35	20-25	5-10
	3-15	Very cobbly loam	GM-GC, SC-SM, GC	A-2, A-4, A-6	30-50	55-75	50-70	45-65	30-50	20-35	5-15
	15-19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Tanbark	0-2	Loam	CL	A-6	0	100	100	90-100	70-90	25-35	10-15
	2-17	Gypsiferous material.	---	---	---	---	---	---	---	---	---
	17-21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
660*:											
Rana	0-3	Very cobbly clay	CH	A-7	45-55	75-90	70-85	65-80	60-75	60-70	30-40
	3-34	Clay	CH	A-7	0	100	100	90-100	90-100	65-75	35-45
	34-60	Clay	CH	A-7	0	95-100	90-100	85-95	80-90	65-75	35-45
Rock outcrop.											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
10*. Lava flows												
20---------- Penistaja	0-6	10-20	1.35-1.45	0.6-2.0	0.13-0.15	6.6-8.4	<2	Low-------	0.28	5	3	.8-2
	6-60	20-30	1.40-1.50	0.6-2.0	0.15-0.18	6.6-8.4	<2	Low-------	0.32			
21---------- Clovis	0-8	15-25	1.40-1.50	0.6-2.0	0.16-0.18	6.6-7.8	<2	Low-------	0.37	5	5	.9-2
	8-60	20-35	1.40-1.50	0.6-2.0	0.14-0.18	6.6-9.0	<2	Moderate	0.32			
25*:												
Hickman---------	0-4	15-27	1.05-1.15	0.6-2.0	0.15-0.17	7.4-8.4	<2	Low-------	0.37	5	5	2-4
	4-60	18-35	1.20-1.30	0.2-0.6	0.14-0.16	7.4-9.0	<2	Moderate	0.32			
Catman----------	0-12	30-40	1.40-1.50	0.2-0.6	0.19-0.21	6.6-7.8	2-8	Moderate	0.37	5	4L	.5-.9
	12-60	60-75	1.15-1.25	<0.06	0.13-0.15	6.6-8.4	2-8	High------	0.20			
30---------- Warm Springs	0-8	10-20	1.30-1.35	0.6-2.0	0.10-0.12	7.4-8.4	2-8	Low-------	0.37	3	4L	4-7
	8-36	18-25	1.25-1.30	0.6-2.0	0.08-0.12	7.9-9.0	2-8	Low-------	0.28			
	36-60	18-25	1.25-1.30	0.6-2.0	0.09-0.12	8.5-9.0	2-8	Low-------	0.28			
40---------- Aparejo	0-6	30-39	1.20-1.30	0.2-0.6	0.19-0.21	7.9-8.4	2-4	Moderate	0.32	5	4L	.5-.9
	6-47	18-35	1.20-1.30	0.2-0.6	0.19-0.21	7.9-8.4	2-4	Moderate	0.37			
	47-60	18-30	1.20-1.30	0.6-2.0	0.14-0.21	7.9-8.4	2-4	Low-------	0.32			
41---------- Aparejo	0-6	28-35	1.50-1.55	0.2-0.6	0.19-0.21	7.9-8.4	2-4	Moderate	0.32	5	4L	.5-.9
	6-42	25-35	1.50-1.55	0.2-0.6	0.15-0.20	7.9-8.4	2-4	Moderate	0.32			
	42-60	5-35	1.30-1.35	2.0-6.0	0.08-0.12	7.9-8.4	2-4	Low-------	0.28			
45---------- Aparejo	0-15	40-50	1.50-1.55	0.06-0.2	0.14-0.16	7.9-8.4	2-4	High------	0.20	5	4	.5-.9
	15-38	18-35	1.20-1.30	0.2-0.6	0.19-0.21	7.9-8.4	2-4	Moderate	0.37			
	38-60	18-30	1.20-1.30	0.6-2.0	0.14-0.21	7.9-8.4	2-4	Low-------	0.32			
50---------- Venadito	0-14	30-39	1.40-1.50	0.2-0.6	0.19-0.21	7.9-8.4	<2	Moderate	0.32	5	4L	<1
	14-60	60-80	1.15-1.25	<0.06	0.14-0.16	7.9-8.4	2-4	High------	0.20			
51---------- Venadito	0-19	25-34	1.40-1.50	0.6-2.0	0.14-0.16	7.9-8.4	<2	Low-------	0.32	5	5	<1
	19-60	60-80	1.15-1.25	<0.06	0.14-0.16	7.9-8.4	2-4	High------	0.20			
52---------- Venadito Variant	0-3	30-39	1.40-1.45	0.2-0.6	0.19-0.21	6.6-7.3	<2	Moderate	0.32	2	4L	.5-.9
	3-35	60-70	1.20-1.25	<0.06	0.14-0.16	6.6-7.8	<2	High------	0.20			
	35-39	---	---	---	---	---	---	----------	----			
55*:												
Glenberg--------	0-11	10-18	1.45-1.50	2.0-6.0	0.10-0.13	7.4-7.8	<4	Low-------	0.24	5	3	.5-1
	11-21	10-18	1.50-1.60	2.0-6.0	0.10-0.13	7.9-8.4	<4	Low-------	0.24			
	21-60	8-18	1.50-1.60	2.0-6.0	0.09-0.12	7.9-8.4	<4	Low-------	0.17			
San Mateo-------	0-4	20-30	1.35-1.45	0.6-2.0	0.14-0.16	7.4-8.4	<2	Low-------	0.32	5	4L	.5-.9
	4-60	18-35	1.35-1.45	0.6-2.0	0.15-0.17	7.4-9.0	2-4	Moderate	0.32			
56---------- Mespun	0-2	2-10	1.35-1.45	>20	0.06-0.08	6.1-7.8	<2	Low-------	0.17	5	2	.3-.5
	2-60	3-10	1.35-1.45	6.0-20	0.05-0.09	6.1-7.8	<2	Low-------	0.17			
57---------- San Mateo	0-6	27-35	1.35-1.45	0.2-0.6	0.19-0.21	7.4-8.4	<2	Moderate	0.24	5	4L	.5-.9
	6-60	18-35	1.35-1.45	0.6-2.0	0.15-0.17	7.4-9.0	2-4	Moderate	0.32			

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
58----------	0-4	20-30	1.35-1.45	0.6-2.0	0.14-0.16	7.4-8.4	<2	Low--------	0.32	5	4L	.5-.9
San Mateo	4-47	20-35	1.35-1.45	0.6-2.0	0.15-0.17	7.4-8.4	2-4	Moderate	0.32			
	47-60	18-35	1.35-1.45	0.6-2.0	0.15-0.17	7.4-9.0	2-4	Moderate	0.32			
60----------	0-10	30-40	1.35-1.45	0.2-0.6	0.19-0.21	7.4-8.4	2-4	Moderate	0.32	5	4L	1-2
Sparank	10-60	35-50	1.50-1.60	<0.06	0.16-0.18	7.4-8.4	2-4	High------	0.37			
61----------	0-10	30-40	1.35-1.40	0.2-0.6	0.19-0.21	7.4-7.8	4-8	Moderate	0.32	5	4L	.7-.9
Sparham	10-60	40-60	1.30-1.35	<0.06	0.14-0.17	7.4-7.8	4-16	High------	0.24			
62----------	0-5	25-35	1.30-1.40	0.6-2.0	0.04-0.06	7.9-9.0	>16	Moderate	0.32	5	5	1-2
Sparank	5-60	35-50	1.35-1.45	<0.06	0.04-0.06	7.9-9.0	>16	High------	0.37			
66----------	0-8	8-20	1.45-1.55	2.0-6.0	0.12-0.14	7.4-8.4	<2	Low--------	0.28	5	3	.5-.9
Zia	8-60	8-20	1.50-1.60	2.0-6.0	0.11-0.14	7.4-8.4	<2	Low--------	0.28			
70----------	0-6	25-40	1.40-1.50	0.2-0.6	0.14-0.20	6.6-7.8	2-8	Moderate	0.32	5	4L	.5-.9
Catman	6-60	60-75	1.15-1.25	<0.06	0.13-0.15	6.6-8.4	2-8	High------	0.20			
72----------	0-10	30-40	1.35-1.40	0.2-0.6	0.13-0.14	7.9-8.4	4-8	Moderate	0.32	5	4L	.5-.9
Catman Variant	10-60	60-70	1.20-1.25	<0.06	0.07-0.11	7.9-8.4	4-16	High------	0.20			
73----------	0-10	25-40	1.40-1.50	0.2-0.6	0.14-0.20	6.6-7.8	2-8	Moderate	0.32	5	4L	.5-.9
Catman	10-60	60-75	1.15-1.25	<0.06	0.13-0.15	6.6-8.4	2-8	High------	0.20			
75----------	0-6	28-35	1.20-1.30	0.2-0.6	0.18-0.20	7.4-8.4	<2	Moderate	0.32	5	6	2-4
Hickman	6-60	18-35	1.20-1.30	0.2-0.6	0.14-0.16	7.4-9.0	<2	Moderate	0.32			
100----------	0-4	10-25	1.20-1.30	0.6-2.0	0.16-0.18	6.6-7.8	<2	Low--------	0.37	5	6	2-3
Manzano	4-60	18-34	1.40-1.50	0.2-0.6	0.17-0.20	7.4-8.4	<2	Moderate	0.37			
120*:												
Rock outcrop.												
Laporte---------	0-2	15-25	1.35-1.40	0.6-2.0	0.08-0.12	7.4-8.4	<2	Low--------	0.10	1	7	1-2
	2-11	15-27	1.35-1.40	0.6-2.0	0.11-0.14	7.4-8.4	<2	Low--------	0.20			
	11-15	---	---	0.00-0.2	---	---	---	----------	----			
130*:												
Laporte---------	0-3	12-20	1.35-1.40	0.6-2.0	0.11-0.14	7.4-8.4	<2	Low--------	0.20	1	5	1-2
	3-11	15-27	1.35-1.40	0.6-2.0	0.11-0.14	7.4-8.4	<2	Low--------	0.20			
	11-15	---	---	0.00-0.2	---	---	---	----------	----			
Rock outcrop.												
200----------	0-2	10-20	1.35-1.45	0.6-2.0	0.13-0.15	6.6-8.4	<2	Low--------	0.28	5	3	.8-2
Penistaja	2-22	20-30	1.40-1.50	0.6-2.0	0.15-0.18	6.6-8.4	<2	Low--------	0.32			
	22-60	15-25	1.20-1.30	2.0-6.0	0.12-0.15	6.6-8.4	<2	Low--------	0.28			
205----------	0-3	8-18	1.45-1.55	2.0-6.0	0.04-0.08	7.4-7.8	<2	Low--------	0.10	5	6	.5-2
Ildefonso	3-60	20-25	1.45-1.55	2.0-6.0	0.04-0.08	7.9-9.0	<2	Low--------	0.10			
210*:												
Bond----------	0-7	8-17	1.45-1.55	0.6-2.0	0.12-0.14	6.6-7.8	<2	Low--------	0.28	1	3	.8-1
	7-16	20-35	1.45-1.55	0.2-0.6	0.11-0.13	6.6-8.4	<2	Moderate	0.28			
	16-20	---	---	---	---	---	---	----------	----			
Penistaja-------	0-3	10-20	1.35-1.45	0.6-2.0	0.13-0.15	6.6-8.4	<2	Low--------	0.28	5	3	.8-2
	3-30	20-30	1.40-1.50	0.6-2.0	0.15-0.18	6.6-8.4	<2	Low--------	0.32			
	30-60	15-25	1.20-1.30	2.0-6.0	0.12-0.15	6.6-8.4	<2	Low--------	0.28			

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
210*:												
Rock outcrop.												
218*:												
Viuda	0-3	10-20	1.35-1.40	2.0-6.0	0.05-0.07	7.4-7.8	<2	Low	0.10	1	6	.5-.9
	3-16	35-50	1.40-1.45	0.06-0.2	0.14-0.17	7.9-8.4	<2	High	0.20			
	16-19	20-35	1.45-1.50	0.6-2.0	0.15-0.17	7.9-8.4	<2	Moderate	0.15			
	19-23	---	---	---	---	---	---	---	---			
Penistaja	0-2	10-20	1.35-1.45	0.6-2.0	0.13-0.15	6.6-8.4	<2	Low	0.28	5	3	.8-2
	2-24	20-30	1.40-1.50	0.6-2.0	0.15-0.18	6.6-8.4	<2	Low	0.32			
	24-60	15-25	1.20-1.30	2.0-6.0	0.12-0.15	6.6-8.4	<2	Low	0.28			
Rock outcrop.												
230*:												
Dumps.												
Pits.												
251*:												
Skyvillage	0-4	10-15	1.35-1.45	2.0-6.0	0.11-0.13	7.4-8.4	<2	Low	0.28	1	3	1-2
	4-12	10-18	1.45-1.55	2.0-6.0	0.14-0.16	7.4-8.4	<2	Low	0.32			
	12-16	---	---	---	---	---	---	---	---			
Rock outcrop.												
Bond	0-4	8-17	1.45-1.55	0.6-2.0	0.12-0.14	6.6-7.8	<2	Low	0.28	1	3	.8-1
	4-10	20-35	1.45-1.55	0.2-0.6	0.11-0.13	6.6-8.4	<2	Moderate	0.28			
	10-14	---	---	---	---	---	---	---	---			
257*:												
Sparank	0-2	30-40	1.35-1.45	0.2-0.6	0.19-0.21	7.4-8.4	2-4	Moderate	0.32	5	4L	1-2
	2-60	35-50	1.50-1.60	<0.06	0.16-0.18	7.4-8.4	2-4	High	0.37			
San Mateo	0-2	15-25	1.35-1.45	0.6-2.0	0.16-0.18	7.4-8.4	<2	Low	0.37	5	4L	.5-.9
	2-29	20-35	1.35-1.45	0.6-2.0	0.15-0.17	7.4-8.4	2-4	Moderate	0.32			
	29-60	18-35	1.35-1.45	0.6-2.0	0.15-0.17	7.4-9.0	2-4	Moderate	0.32			
259	0-4	10-25	1.40-1.45	0.6-2.0	0.16-0.18	6.6-8.4	<2	Low	0.32	5	5	1-3
Mikim	4-60	18-32	1.35-1.45	0.6-2.0	0.14-0.16	7.4-9.0	<2	Low	0.32			
262*:												
Poley	0-2	15-25	1.20-1.25	0.6-2.0	0.06-0.12	6.1-7.8	<2	Moderate	0.10	5	8	1-2
	2-18	35-55	1.35-1.45	0.06-0.2	0.12-0.21	6.1-8.4	<4	High	0.20			
	18-60	15-25	1.45-1.55	0.6-2.0	0.14-0.18	7.9-8.4	<4	Moderate	0.37			
Pojoaque	0-3	18-27	1.30-1.35	0.6-2.0	0.08-0.10	7.4-7.8	<2	Low	0.10	5	6	.5-.9
	3-60	20-30	1.50-1.55	0.6-2.0	0.12-0.15	7.4-8.4	<2	Low	0.15			
264	0-4	10-18	1.30-1.35	2.0-6.0	0.11-0.13	7.4-7.8	<2	Low	0.24	4	3	.5-.9
Tapia	4-23	20-35	1.50-1.55	0.6-2.0	0.15-0.20	7.4-8.4	<2	Moderate	0.32			
	23-40	15-25	1.50-1.55	2.0-6.0	0.11-0.14	7.9-8.4	<2	Low	0.15			
	40-60	0-10	1.30-1.35	6.0-20	0.04-0.06	7.9-8.4	<2	Low	0.05			
270	0-5	20-27	1.30-1.40	0.6-2.0	0.16-0.18	6.6-7.3	<2	Low	0.37	2	6	1-2
Charo	5-28	35-60	1.35-1.45	0.06-0.2	0.15-0.18	6.6-7.8	<2	Moderate	0.28			
	28-32	---	---	---	---	---	---	---	---			

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
272*:												
Cebolleta-------	0-2	15-25	1.15-1.25	0.6-2.0	0.12-0.14	6.1-7.3	<2	Low-------	0.20	2	6	1-2
	2-8	20-40	1.20-1.30	0.2-0.6	0.09-0.11	6.1-7.3	<2	Moderate	0.10			
	8-25	40-60	1.30-1.40	0.06-0.2	0.08-0.10	6.1-7.8	<2	High------	0.05			
	25-29	---	---	---	---	---	---	----------	----			
Borrego---------	0-4	18-27	1.20-1.30	0.6-2.0	0.13-0.15	6.1-7.3	<2	Low-------	0.20	1	7	2-4
	4-18	35-45	1.40-1.50	<0.06	0.10-0.12	5.6-7.8	<2	High------	0.20			
	18-22	---	---	---	---	---	---	----------	----			
Rock outcrop.												
276----------	0-3	15-25	1.20-1.30	0.6-2.0	0.14-0.16	6.1-7.3	<2	Low-------	0.24	5	5	2-4
Trag	3-24	18-35	1.40-1.50	0.6-2.0	0.14-0.16	6.1-7.8	<2	Moderate	0.32			
	24-60	18-30	1.40-1.50	0.6-2.0	0.12-0.16	6.1-7.8	<2	Moderate	0.28			
278*:												
Microy----------	0-3	15-27	1.40-1.50	0.6-2.0	0.12-0.14	6.6-7.3	<2	Low-------	0.20	2	7	1-2
	3-28	35-50	1.35-1.45	0.06-0.2	0.10-0.12	6.6-7.8	<2	High------	0.10			
	28-36	40-50	1.40-1.50	0.06-0.2	0.09-0.11	7.4-7.8	<2	High------	0.05			
	36-40	---	---	---	---	---	---	----------	----			
Rock outcrop.												
282----------	0-4	15-25	1.15-1.25	0.6-2.0	0.12-0.14	6.1-7.3	<2	Low-------	0.20	2	6	1-2
Cebolleta	4-10	20-40	1.20-1.30	0.2-0.6	0.09-0.11	6.1-7.3	<2	Moderate	0.10			
	10-25	40-60	1.30-1.40	0.06-0.2	0.08-0.10	6.1-7.8	<2	High------	0.05			
	25-29	---	---	---	---	---	---	----------	----			
284*:												
Cebolleta-------	0-5	15-25	1.15-1.25	0.6-2.0	0.08-0.10	6.1-7.3	<2	Low-------	0.10	2	7	1-2
	5-10	20-40	1.20-1.30	0.2-0.6	0.09-0.11	6.1-7.3	<2	Moderate	0.10			
	10-24	40-60	1.30-1.40	0.06-0.2	0.08-0.10	6.1-7.3	<2	High------	0.05			
	24-28	---	---	---	---	---	---	----------	----			
Rock outcrop.												
286*:												
Cebolleta-------	0-3	15-25	1.15-1.25	0.6-2.0	0.08-0.10	6.1-7.3	<2	Low-------	0.10	2	7	1-2
	3-9	20-40	1.20-1.30	0.2-0.6	0.09-0.11	6.1-7.3	<2	Moderate	0.10			
	9-28	40-60	1.30-1.40	0.06-0.2	0.08-0.10	6.1-7.3	<2	High------	0.05			
	28-32	---	---	---	---	---	---	----------	----			
Raton----------	0-3	20-27	1.20-1.30	0.2-0.6	0.10-0.12	6.6-7.3	<2	Low-------	0.24	1	7	2-4
	3-10	35-55	1.35-1.45	0.06-0.2	0.08-0.09	6.6-7.3	<2	High------	0.10			
	10-14	---	---	---	---	---	---	----------	----			
290*:												
Paguate---------	0-3	18-26	1.15-1.25	0.6-2.0	0.14-0.18	6.6-7.8	<2	Low-------	0.37	2	6	1-2
	3-8	30-40	1.40-1.50	0.2-0.6	0.16-0.21	6.6-7.8	<2	Moderate	0.32			
	8-19	40-50	1.35-1.45	0.06-0.2	0.11-0.16	7.4-8.4	<2	High------	0.15			
	19-33	25-35	1.20-1.30	0.2-0.6	0.11-0.19	7.4-8.4	<2	Moderate	0.28			
	33-37	---	---	---	---	---	---	----------	----			
Hackroy---------	0-3	15-25	1.20-1.30	0.6-2.0	0.12-0.14	6.6-7.8	<2	Low-------	0.20	1	6	1-2
	3-14	35-50	1.40-1.50	0.06-0.2	0.15-0.20	6.6-7.8	<2	High------	0.32			
	14-18	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
291----------	0-5	27-35	1.25-1.35	0.2-0.6	0.12-0.17	6.6-7.8	<2	Moderate	0.32	2	8	1-2
Paguate	5-26	40-50	1.35-1.45	0.06-0.2	0.11-0.15	7.4-8.4	<2	High------	0.15			
	26-38	25-35	1.20-1.30	0.2-0.6	0.11-0.19	7.4-8.4	<2	Moderate	0.28			
	38-42	---	---	---	---	---	---	----------	----			
294*:												
Parkay----------	0-2	18-27	1.35-1.40	0.6-2.0	0.12-0.14	7.4-7.8	<2	Low-------	0.20	5	7	2-3
	2-23	20-35	1.50-1.55	0.6-2.0	0.07-0.09	6.1-7.3	<2	Low-------	0.10			
	23-60	20-35	1.50-1.55	0.6-2.0	0.06-0.08	6.1-7.3	<2	Low-------	0.10			
Rock outcrop.												
300----------	0-4	30-40	1.00-1.05	0.2-0.6	0.19-0.21	6.1-7.3	<2	Moderate	0.32	5	4	5-10
Saladon	4-60	35-50	1.35-1.45	<0.06	0.15-0.17	6.1-7.3	<2	High------	0.32			
310----------	0-3	10-18	1.40-1.50	0.6-2.0	0.09-0.10	6.1-6.5	<2	Low-------	0.10	2	7	1-2
Mirabal	3-14	10-18	1.40-1.50	0.6-2.0	0.09-0.10	6.1-6.5	<2	Low-------	0.10			
	14-21	20-25	1.25-1.35	0.6-2.0	0.07-0.09	6.1-6.5	<2	Low-------	0.10			
	21-25	---	---	---	---	---	---	----------	----			
315*:												
Abersito, cobbly	0-3	21-30	1.15-1.25	0.6-2.0	0.07-0.08	6.1-6.5	<2	Low-------	0.10	2	7	1-2
	3-9	10-19	1.40-1.50	2.0-6.0	0.07-0.08	6.1-6.5	<2	Low-------	0.10			
	9-24	40-55	1.40-1.50	0.06-0.2	0.07-0.08	6.1-6.5	<2	High------	0.05			
	24-28	---	---	---	---	---	---	----------	----			
Abersito--------	0-5	18-26	1.15-1.25	0.6-2.0	0.12-0.14	6.1-6.5	<2	Low-------	0.20	2	7	1-2
	5-24	40-55	1.40-1.50	0.06-0.2	0.07-0.08	6.1-6.5	<2	High------	0.05			
	24-28	---	---	---	---	---	---	----------	----			
Rock outcrop.												
320----------	0-4	10-15	1.35-1.45	2.0-6.0	0.12-0.14	6.6-7.3	<2	Low-------	0.28	1	4	1-2
Cinnadale	4-12	10-15	1.40-1.50	2.0-6.0	0.08-0.10	6.6-7.3	<2	Low-------	0.10			
	12-16	---	---	---	---	---	---	----------	----			
325----------	0-7	10-15	1.35-1.45	0.6-2.0	0.16-0.18	6.1-7.3	<2	Low-------	0.37	5	5	1-2
Moreno Variant	7-22	10-15	1.50-1.60	0.6-2.0	0.15-0.17	6.6-7.3	<2	Low-------	0.55			
	22-60	25-35	1.45-1.55	0.2-0.6	0.14-0.21	6.6-7.3	<2	Moderate	0.32			
330----------	0-14	18-27	1.15-1.25	0.6-2.0	0.16-0.18	6.6-7.3	<2	Low-------	0.37	5	6	1-2
Moreno	14-35	35-50	1.40-1.50	0.06-0.2	0.16-0.20	6.6-7.8	<2	High------	0.32			
	35-60	30-40	1.40-1.50	0.2-0.6	0.11-0.13	6.6-7.8	<2	Moderate	0.10			
340----------	0-3	30-35	1.40-1.50	0.2-0.6	0.19-0.21	6.6-7.3	<2	Moderate	0.37	5	6	1-2
Yankee	3-60	40-55	1.30-1.40	0.06-0.2	0.14-0.16	6.6-8.4	<2	High------	0.24			
350*:												
Rock outcrop.												
Stout----------	0-3	10-18	1.50-1.55	2.0-6.0	0.11-0.13	6.6-7.3	<2	Low-------	0.24	1	3	.5-.9
	3-14	10-18	1.50-1.55	2.0-6.0	0.11-0.13	6.6-7.3	<2	Low-------	0.24			
	14-18	---	---	---	---	---	---	----------	----			
406*:												
Poley----------	0-3	15-25	1.25-1.30	0.6-2.0	0.09-0.10	6.6-7.3	<2	Low-------	0.10	5	6	.5-.9
	3-60	30-55	1.40-1.45	0.06-0.2	0.14-0.16	7.4-9.0	<2	High------	0.28			
Rock outcrop.												

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
407*:												
Viuda	0-3	30-40	1.45-1.50	0.2-0.6	0.09-0.11	7.4-7.8	<2	Moderate	0.10	1	8	.5-.9
	3-13	35-50	1.40-1.45	0.06-0.2	0.14-0.17	7.9-8.4	<2	High	0.20			
	13-17	---	---	---	---	---	---	---	---			
Rock outcrop.												
419	0-3	30-39	1.40-1.45	0.2-0.6	0.14-0.18	7.4-7.8	4-8	Moderate	0.37	5	4L	.5-.9
Navajo	3-60	35-55	1.35-1.40	<0.06	0.11-0.15	7.4-8.4	4-8	High	0.20			
420*:												
Navajo	0-4	30-39	1.40-1.45	0.2-0.6	0.14-0.18	7.4-7.8	4-8	Moderate	0.32	5	4L	.5-.9
	4-60	35-55	1.35-1.40	<0.06	0.11-0.15	7.4-8.4	4-8	High	0.20			
Suwanee	0-3	28-35	1.20-1.30	0.2-0.6	0.19-0.21	7.4-7.8	2-4	Moderate	0.37	5	4L	.5-.9
	3-60	18-35	1.20-1.30	0.2-0.6	0.12-0.14	7.4-9.0	2-4	Moderate	0.24			
424*:												
Mespun	0-2	3-8	1.35-1.45	>20	0.05-0.07	6.1-7.8	<2	Low	0.17	5	1	.5-.7
	2-60	3-10	1.35-1.45	6.0-20	0.05-0.09	6.1-7.8	<2	Low	0.17			
Palma	0-4	5-10	1.70-1.75	6.0-20.	0.06-0.11	6.6-8.4	<2	Low	0.20	5	2	1-2
	4-60	10-20	1.65-1.70	2.0-6.0	0.13-0.17	7.4-8.4	<2	Low	0.28			
426*:												
Sheppard	0-4	5-10	1.45-1.60	6.0-20	0.06-0.08	7.4-8.4	<2	Low	0.15	5	2	<.5
	4-60	5-10	1.45-1.60	6.0-20	0.06-0.08	7.4-8.4	<2	Low	0.15			
Shiprock	0-3	10-20	1.45-1.55	2.0-6.0	0.09-0.12	7.4-8.4	<2	Low	0.28	5	3	.5-.6
	3-60	10-18	1.45-1.55	2.0-6.0	0.09-0.12	7.4-9.0	<4	Low	0.28			
432*:												
Winona	0-3	15-25	1.20-1.30	0.6-2.0	0.09-0.10	7.4-7.8	<2	Low	0.10	1	6	1-2
	3-10	15-30	1.20-1.30	0.6-2.0	0.09-0.10	7.4-8.4	<2	Low	0.10			
	10-14	---	---	---	---	---	---	---	---			
Rock outcrop.												
434*:												
Rizozo	0-2	10-20	1.40-1.50	2.0-6.0	0.11-0.13	7.4-8.4	<2	Low	0.24	1	3	.5-1
	2-10	15-24	1.35-1.45	2.0-6.0	0.11-0.15	7.4-8.4	<2	Low	0.24			
	10-14	---	---	---	---	---	---	---	---			
Rock outcrop.												
446*:												
Harvey	0-2	15-25	1.15-1.25	0.6-2.0	0.16-0.18	7.4-8.4	<2	Low	0.37	5	4L	1-2
	2-60	18-35	1.40-1.50	0.6-2.0	0.14-0.18	7.9-8.4	<2	Moderate	0.37			
Oelop	0-3	18-27	1.20-1.30	0.6-2.0	0.16-0.18	7.4-8.4	<2	Low	0.37	5	6	1-2
	3-60	18-35	1.45-1.55	0.2-0.6	0.17-0.20	7.4-8.4	2-4	Moderate	0.37			
476	0-2	10-20	1.50-1.60	0.6-2.0	0.16-0.18	7.4-8.4	2-4	Low	0.37	5	4L	.2-.6
Saldo	2-60	---	---	---	---	---	---	---	---			
485*:												
Rock outcrop.												
Mion	0-3	15-25	1.20-1.30	0.6-2.0	0.10-0.15	6.6-8.4	<2	Low	0.20	1	8	2-4
	3-13	35-55	1.35-1.45	<0.06	0.15-0.21	7.4-8.4	<2	High	0.17			
	13-17	---	---	---	---	---	---	---	---			

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
487*:												
Mion	0-1	20-27	1.30-1.40	0.6-2.0	0.16-0.18	7.4-8.4	<2	Low	0.37	1	4L	1-3
	1-16	38-55	1.35-1.45	<0.06	0.15-0.17	7.4-8.4	<2	High	0.32			
	16-20	---	---	---	---	---	---	---	---			
Badland.												
500*:												
Timhus	0-5	18-25	1.50-1.55	0.6-2.0	0.05-0.06	6.6-7.3	<2	Low	0.05	3	8	1-2
	5-20	18-25	1.50-1.55	0.6-2.0	0.08-0.09	7.4-8.4	<2	Low	0.10			
	20-29	18-25	1.50-1.55	0.6-2.0	0.05-0.06	7.9-8.4	<2	Low	0.05			
	29-60	---	1.00-1.10	6.0-20	0.01-0.03	7.9-8.4	<2	Low	0.02			
Bandera	0-3	10-15	1.10-1.20	0.6-2.0	0.06-0.12	6.6-8.4	<2	Low	0.10	1	7	2-3
	3-16	10-15	1.10-1.20	0.6-2.0	0.06-0.12	6.6-8.4	<2	Low	0.10			
	16-60	0-5	1.00-1.10	>20	0.01-0.03	6.6-8.4	<2	Low	0.02			
505*:												
Flugle	0-5	5-10	1.45-1.55	6.0-20	0.09-0.10	6.6-7.3	<2	Low	0.20	5	2	1-3
	5-41	20-35	1.45-1.55	0.6-2.0	0.16-0.18	6.6-8.4	<2	Moderate	0.37			
	41-61	10-20	1.45-1.55	0.6-2.0	0.11-0.13	7.4-8.4	<2	Low	0.24			
Goesling	0-5	5-10	1.45-1.55	6.0-20	0.09-0.10	6.6-7.8	<2	Low	0.20	5	2	1-3
	5-18	18-35	1.45-1.55	0.2-0.6	0.17-0.19	6.6-8.4	<2	Moderate	0.32			
	18-60	16-30	1.40-1.50	0.2-0.6	0.13-0.15	7.4-8.4	<2	Low	0.28			
514*:												
Raton	0-5	20-27	1.20-1.30	0.2-0.6	0.06-0.12	6.6-7.3	<2	Low	0.20	1	8	2-4
	5-13	40-55	1.35-1.45	0.06-0.2	0.05-0.10	6.6-7.3	<2	High	0.05			
	13-17	---	---	---	---	---	---	---	---			
Rock outcrop.												
515*:												
Rock outcrop.												
Vessilla	0-3	10-20	1.45-1.55	2.0-6.0	0.11-0.13	6.6-8.4	<2	Low	0.24	1	3	.6-.9
	3-15	8-18	1.50-1.60	2.0-6.0	0.13-0.15	7.4-8.4	<2	Low	0.28			
	15-19	---	---	---	---	---	---	---	---			
Mion	0-2	20-27	1.30-1.40	0.6-2.0	0.16-0.18	7.4-8.4	<2	Low	0.37	1	4L	1-3
	2-11	38-55	1.35-1.45	<0.06	0.15-0.17	7.4-8.4	<2	High	0.32			
	11-15	---	---	---	---	---	---	---	---			
518*:												
Borrego	0-3	20-35	1.20-1.30	0.2-0.6	0.13-0.15	6.1-7.3	<2	Moderate	0.37	1	6	2-4
	3-11	35-45	1.40-1.50	<0.06	0.10-0.12	5.6-7.8	<2	High	0.20			
	11-15	---	---	---	---	---	---	---	---			
Charo	0-2	20-27	1.30-1.40	0.6-2.0	0.16-0.18	6.6-7.3	<2	Low	0.37	2	6	1-2
	2-27	35-60	1.35-1.45	0.06-0.2	0.15-0.18	6.6-7.8	<2	Moderate	0.28			
	27-31	---	---	---	---	---	---	---	---			
Rock outcrop.												
520*:												
Celacy	0-2	15-18	1.35-1.45	2.0-6.0	0.11-0.13	7.4-7.8	<2	Low	0.24	2	3	1-3
	2-24	18-35	1.45-1.55	0.6-2.0	0.16-0.18	7.4-7.8	<2	Moderate	0.37			
	24-28	---	---	---	---	---	---	---	---			

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
520*:												
Atarque	0-2	10-18	1.40-1.50	2.0-6.0	0.13-0.15	6.6-7.3	<2	Low	0.28	1	3	.5-.9
	2-16	24-35	1.40-1.50	0.6-2.0	0.14-0.16	6.6-7.8	<2	Moderate	0.32			
	16-20	---	---	---	---	---	---	---	---			
522*:												
Bandera, 30 to 45 percent slopes	0-8	10-15	1.10-1.20	0.6-2.0	0.10-0.15	6.6-8.4	<2	Low	0.20	1	6	2-3
	8-18	10-15	1.10-1.20	0.6-2.0	0.06-0.12	6.6-8.4	<2	Low	0.10			
	18-60	0-5	1.00-1.10	>20	0.01-0.03	6.6-8.4	<2	Low	0.02			
Bandera, 15 to 30 percent slopes	0-9	10-15	1.10-1.20	0.6-2.0	0.10-0.15	6.6-8.4	<2	Low	0.20	1	6	2-3
	9-16	10-15	1.10-1.20	0.6-2.0	0.06-0.12	6.6-8.4	<2	Low	0.10			
	16-60	0-5	1.00-1.10	>20	0.01-0.03	6.6-8.4	<2	Low	0.02			
523*:												
Charo	0-2	20-27	1.30-1.40	0.6-2.0	0.13-0.15	6.6-7.3	<2	Low	0.20	2	7	1-2
	2-28	35-60	1.35-1.45	0.06-0.2	0.15-0.18	6.6-7.8	<2	Moderate	0.28			
	28-32	---	---	---	---	---	---	---	---			
Raton	0-7	20-27	1.20-1.30	0.2-0.6	0.10-0.12	6.6-7.3	<2	Low	0.20	1	8	2-4
	7-18	35-55	1.35-1.45	0.06-0.2	0.08-0.09	6.6-7.3	<2	High	0.10			
	18-22	---	---	---	---	---	---	---	---			
525*:												
Catman	0-3	25-40	1.40-1.50	0.2-0.6	0.14-0.20	6.6-7.8	2-8	Moderate	0.32	5	4L	.5-.9
	3-60	60-75	1.15-1.25	<0.06	0.13-0.15	6.6-8.4	2-8	High	0.20			
Silkie	0-4	30-40	1.35-1.45	0.06-0.2	0.19-0.21	7.4-7.8	<2	Moderate	0.32	5	6	.5-.9
	4-60	35-55	1.35-1.45	<0.06	0.16-0.18	6.6-7.8	<2	High	0.24			
535	0-3	18-25	1.15-1.25	0.6-2.0	0.16-0.18	7.4-7.8	<2	Low	0.37	5	6	2-3
Millpaw	3-29	35-50	1.40-1.50	0.06-0.2	0.17-0.19	7.4-7.8	<2	High	0.32			
	29-60	18-35	1.40-1.50	0.6-2.0	0.16-0.18	7.4-8.4	<2	Moderate	0.37			
536	0-3	20-27	1.25-1.35	0.6-2.0	0.17-0.19	6.6-8.4	<2	Low	0.43	5	6	2-3
McGaffey	3-60	20-30	1.40-1.50	0.6-2.0	0.17-0.19	6.6-8.4	<2	Low	0.37			
537*:												
Millpaw	0-2	18-25	1.15-1.25	0.6-2.0	0.16-0.18	7.4-7.8	<2	Low	0.37	5	6	2-3
	2-37	35-50	1.40-1.50	0.06-0.2	0.17-0.19	7.4-7.8	<2	High	0.32			
	37-60	18-35	1.40-1.50	0.6-2.0	0.16-0.18	7.4-8.4	<2	Moderate	0.37			
Loarc	0-4	10-15	1.35-1.45	2.0-6.0	0.13-0.15	6.6-7.3	<2	Low	0.28	5	3	1-3
	4-60	18-35	1.40-1.50	0.6-2.0	0.14-0.16	6.6-8.4	<2	Moderate	0.32			
540	0-5	10-20	1.40-1.50	2.0-6.0	0.11-0.13	6.6-7.8	<2	Low	0.28	5	3	.5-.9
Montecito	5-30	35-50	1.35-1.45	0.2-0.6	0.15-0.17	6.6-8.4	<2	High	0.32			
	30-60	35-50	1.35-1.45	0.2-0.6	0.12-0.14	7.4-8.4	<2	High	0.15			
550*:												
Nogal	0-1	10-18	1.45-1.55	2.0-6.0	0.11-0.13	6.6-7.3	<2	Low	0.24	2	3	1-2
	1-31	35-60	1.30-1.40	0.06-0.2	0.11-0.17	6.6-8.4	<2	High	0.24			
	31-35	---	---	---	---	---	---	---	---			

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
550*:												
Galestina	0-2	10-19	1.45-1.55	2.0-6.0	0.11-0.13	6.6-7.3	<2	Low	0.24	3	3	.5-.9
	2-7	15-30	1.25-1.35	0.6-2.0	0.16-0.18	6.6-7.8	<2	Moderate	0.37			
	7-46	35-60	1.35-1.50	0.06-0.2	0.16-0.18	6.6-7.8	<2	High	0.28			
	46-60	---	---	---	---	---	---	---	---			
555*:												
Pinitos	0-2	10-18	1.45-1.55	2.0-6.0	0.11-0.13	6.6-7.3	<2	Low	0.24	5	3	.5-.9
	2-24	20-35	1.40-1.50	0.6-2.0	0.17-0.19	6.6-7.8	<2	Moderate	0.32			
	24-60	15-25	1.40-1.50	2.0-6.0	0.13-0.15	7.4-7.8	<2	Low	0.28			
Ribera	0-3	12-18	1.30-1.40	0.6-2.0	0.13-0.16	6.6-7.8	<2	Low	0.28	2	3	.5-1
	3-39	20-30	1.20-1.30	0.6-2.0	0.16-0.19	6.6-8.4	<2	Low	0.32			
	39-43	---	---	---	---	---	---	---	---			
560*:												
Flugle	0-5	5-10	1.45-1.55	6.0-20	0.09-0.10	6.6-7.3	<2	Low	0.20	5	2	1-3
	5-37	20-35	1.45-1.55	0.6-2.0	0.16-0.18	6.6-8.4	<2	Moderate	0.37			
	37-60	10-20	1.45-1.55	0.6-2.0	0.11-0.13	7.4-8.4	<2	Low	0.24			
Teco	0-2	10-20	1.35-1.45	2.0-6.0	0.12-0.14	6.6-7.3	<2	Low	0.24	5	3	1-2
	2-18	35-45	1.45-1.55	0.2-0.6	0.15-0.18	7.4-8.4	<2	High	0.37			
	18-60	15-30	1.45-1.55	2.0-6.0	0.15-0.17	7.9-8.4	<2	Low	0.28			
561*:												
Flugle	0-2	10-17	1.35-1.45	2.0-6.0	0.11-0.13	6.6-7.3	<2	Low	0.24	5	3	1-3
	2-47	20-35	1.45-1.55	0.6-2.0	0.16-0.18	6.6-8.4	<2	Moderate	0.37			
	47-60	10-20	1.45-1.55	0.6-2.0	0.11-0.13	7.4-8.4	<2	Low	0.24			
Quintana	0-11	10-20	1.40-1.45	2.0-6.0	0.13-0.15	7.4-7.8	<2	Low	0.28	5	3	.5-.9
	11-46	20-35	1.35-1.40	0.6-2.0	0.14-0.16	7.9-8.4	<2	Moderate	0.32			
	46-60	10-20	1.40-1.45	2.0-6.0	0.11-0.13	7.9-8.4	<2	Low	0.24			
565	0-4	10-20	1.40-1.45	2.0-6.0	0.11-0.13	7.4-7.8	<2	Low	0.24	5	3	.5-.9
Quintana	4-21	20-35	1.35-1.40	0.6-2.0	0.14-0.16	7.9-8.4	<2	Moderate	0.32			
	21-60	10-20	1.40-1.45	2.0-6.0	0.11-0.13	7.9-8.4	<2	Low	0.24			
570*:												
Torreon	0-2	15-25	1.10-1.15	0.6-2.0	0.08-0.09	6.6-7.3	<2	Low	0.10	5	8	1-3
	2-25	35-50	1.25-1.30	0.06-0.2	0.14-0.16	6.6-7.8	<2	High	0.24			
	25-60	30-40	1.25-1.30	0.2-0.6	0.19-0.21	7.4-9.0	<2	Moderate	0.37			
Rock outcrop.												
Cabezon	0-3	18-27	1.25-1.40	0.6-2.0	0.09-0.11	6.1-7.8	<2	Low	0.10	1	8	1-2
	3-13	35-60	1.35-1.45	0.06-0.2	0.14-0.17	6.1-7.8	<2	High	0.24			
	13-17	---	---	---	---	---	---	---	---			
575*:												
Teco	0-6	10-20	1.35-1.45	2.0-6.0	0.12-0.14	6.6-7.3	<2	Low	0.24	5	3	1-2
	6-24	35-45	1.45-1.55	0.2-0.6	0.15-0.18	7.4-8.4	<2	High	0.37			
	24-60	15-30	1.45-1.55	2.0-6.0	0.15-0.17	7.9-8.4	<2	Low	0.28			
Atarque	0-3	10-18	1.40-1.50	2.0-6.0	0.13-0.15	6.6-7.3	<2	Low	0.28	1	3	.5-.9
	3-19	24-35	1.40-1.50	0.6-2.0	0.14-0.16	6.6-7.8	<2	Moderate	0.32			
	19-23	---	---	---	---	---	---	---	---			
576	0-3	10-20	1.35-1.45	2.0-6.0	0.12-0.14	6.6-7.3	<2	Low	0.24	5	3	1-2
Teco	3-60	35-45	1.45-1.55	0.2-0.6	0.15-0.18	7.4-8.4	<2	High	0.37			

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
577*:												
Cabezon	0-2	18-27	1.25-1.40	0.6-2.0	0.09-0.11	6.1-7.8	<2	Low	0.10	1	8	1-2
	2-18	35-60	1.35-1.45	0.06-0.2	0.14-0.17	6.1-7.8	<2	High	0.24			
	18-22	---	---	---	---	---	---	---	---			
Montecito	0-3	27-30	1.35-1.45	0.6-2.0	0.19-0.21	6.6-7.8	<2	Low	0.32	5	6	.5-.9
	3-24	35-40	1.45-1.55	0.2-0.6	0.19-0.21	6.6-8.4	<2	Moderate	0.32			
	24-60	35-40	1.45-1.55	0.2-0.6	0.15-0.17	7.4-8.4	<2	Moderate	0.32			
Rock outcrop.												
579*:												
Cabezon	0-2	10-20	1.25-1.40	2.0-6.0	0.06-0.08	6.1-7.8	<2	Low	0.10	1	8	1-2
	2-14	35-60	1.35-1.45	0.06-0.2	0.14-0.17	6.1-7.8	<2	High	0.24			
	14-18	---	---	---	---	---	---	---	---			
Cantina	0-2	15-20	1.45-1.55	2.0-6.0	0.11-0.13	6.6-7.3	<2	Low	0.24	3	3	1-2
	2-9	20-35	1.35-1.45	0.6-2.0	0.14-0.16	6.6-7.3	<2	Moderate	0.32			
	9-31	35-55	1.35-1.45	0.06-0.2	0.15-0.17	7.4-8.4	<2	High	0.28			
	31-54	25-40	1.40-1.50	0.6-2.0	0.15-0.17	7.9-8.4	<2	Moderate	0.32			
	54-58	---	---	---	---	---	---	---	---			
581*:												
Laporte	0-1	12-20	1.35-1.40	0.6-2.0	0.11-0.14	7.4-8.4	<2	Low	0.20	1	5	1-2
	1-18	15-27	1.35-1.40	0.6-2.0	0.11-0.14	7.4-8.4	<2	Low	0.20			
	18-22	---	---	0.00-0.2	---	---	---	---	---			
Vessilla	0-6	10-20	1.45-1.55	2.0-6.0	0.11-0.13	6.6-8.4	<2	Low	0.24	1	3	.6-.9
	6-18	8-18	1.50-1.60	2.0-6.0	0.13-0.15	7.4-8.4	<2	Low	0.28			
	18-22	---	---	---	---	---	---	---	---			
582	0-15	5-10	1.40-1.50	6.0-20	0.05-0.07	6.6-7.3	<2	Low	0.17	5	1	.5-.9
Kenray	15-60	5-12	1.55-1.65	6.0-20	0.06-0.08	6.6-7.3	<2	Low	0.17			
585	0-2	20-27	1.15-1.25	0.6-2.0	0.19-0.21	7.9-8.4	<2	Low	0.43	5	4L	.6-.9
Moncha	2-21	25-35	1.35-1.45	0.2-0.6	0.19-0.21	7.9-8.4	<2	Moderate	0.37			
	21-60	23-33	1.35-1.45	0.2-0.6	0.19-0.21	7.4-8.4	<2	Moderate	0.43			
586*:												
Venadito	0-3	30-39	1.40-1.50	0.2-0.6	0.19-0.21	7.9-8.4	<2	Moderate	0.32	5	4L	<1
	3-60	60-80	1.15-1.25	<0.06	0.14-0.16	7.9-8.4	2-4	High	0.20			
Teco	0-3	27-35	1.40-1.50	0.2-0.6	0.19-0.21	6.6-7.3	<2	Moderate	0.32	5	6	1-2
	3-60	35-45	1.45-1.55	0.2-0.6	0.15-0.18	7.4-8.4	<2	High	0.37			
591*:												
Valnor	0-2	20-35	1.35-1.45	0.2-0.6	0.19-0.21	6.6-7.3	<2	Moderate	0.32	2	6	2-4
	2-38	35-45	1.55-1.65	0.06-0.2	0.14-0.16	6.6-8.4	<2	High	0.32			
	38-42	---	---	---	---	---	---	---	---			
Techado	0-3	29-39	1.40-1.50	0.2-0.6	0.14-0.16	6.6-7.3	<2	Moderate	0.15	1	7	.5-.9
	3-16	40-55	1.40-1.50	0.06-0.2	0.13-0.15	6.6-7.3	<2	High	0.20			
	16-20	---	---	---	---	---	---	---	---			
610*:												
Grieta	0-8	10-20	1.45-1.55	2.0-6.0	0.11-0.13	7.4-8.4	<2	Low	0.24	5	3	.2-.5
	8-28	18-35	1.45-1.55	0.6-2.0	0.13-0.19	7.4-8.4	2-4	Low	0.32			
	28-60	5-20	1.55-1.65	2.0-6.0	0.08-0.10	7.4-8.4	2-4	Low	0.20			

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
									K	T		
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
610*:												
Shiprock	0-3	10-20	1.45-1.55	2.0-6.0	0.09-0.12	7.4-8.4	<2	Low	0.28	5	3	.5-.6
	3-60	10-18	1.45-1.55	2.0-6.0	0.09-0.12	7.4-9.0	<4	Low	0.28			
611*:												
Grieta	0-3	10-20	1.45-1.55	2.0-6.0	0.11-0.13	7.4-8.4	<2	Low	0.24	5	3	.2-.5
	3-60	18-35	1.45-1.55	0.6-2.0	0.13-0.19	7.4-8.4	2-4	Low	0.32			
Kiki	0-6	13-19	1.45-1.55	2.0-6.0	0.11-0.13	7.4-7.8	<2	Low	0.24	2	3	.3-.6
	6-14	28-35	1.45-1.55	0.6-2.0	0.17-0.19	7.4-7.8	<2	Moderate	0.32			
	14-24	21-32	1.45-1.55	0.6-2.0	0.14-0.16	7.4-7.8	<2	Moderate	0.32			
	24-28	---	---	---	---	---	---	---	---			
615*:												
Trag	0-2	15-20	1.10-1.20	0.6-2.0	0.12-0.14	6.1-7.3	<2	Low	0.15	5	5	2-4
	2-35	18-35	1.25-1.35	0.6-2.0	0.14-0.18	6.1-7.3	<2	Low	0.28			
	35-60	10-20	1.35-1.45	2.0-6.0	0.10-0.12	6.1-7.8	<2	Low	0.20			
Techado	0-2	30-40	1.40-1.50	0.2-0.6	0.12-0.17	6.6-7.3	<2	Moderate	0.15	1	8	.5-.9
	2-19	35-50	1.40-1.50	0.06-0.2	0.15-0.21	6.6-7.3	<2	High	0.32			
	19-38	---	---	---	---	---	---	---	---			
	38-42	---	---	---	---	---	---	---	---			
Rock outcrop.												
618	0-12	10-18	1.55-1.65	2.0-6.0	0.11-0.13	7.4-8.4	4-8	Low	0.24	5	3	.3-.5
Netoma	12-60	---	---	---	---	---	---	---	---			
619	0-4	30-39	1.40-1.50	0.2-0.6	0.19-0.21	7.9-8.4	<2	Moderate	0.32	5	4L	<1
Venadito	4-60	60-80	1.15-1.25	<0.06	0.14-0.16	7.9-8.4	2-4	High	0.20			
620*:												
Aparejo	0-2	18-25	1.20-1.30	0.6-2.0	0.19-0.21	7.9-8.4	2-4	Low	0.43	5	4L	.5-.9
	2-18	18-35	1.20-1.30	0.2-0.6	0.19-0.21	7.9-8.4	2-4	Moderate	0.37			
	18-60	18-30	1.20-1.30	0.6-2.0	0.14-0.21	7.9-8.4	2-4	Low	0.32			
Venadito	0-3	30-39	1.40-1.50	0.2-0.6	0.19-0.21	7.9-8.4	<2	Moderate	0.37	5	4L	<1
	3-60	60-80	1.15-1.25	<0.06	0.14-0.16	7.9-8.4	2-4	High	0.20			
625*:												
Hagerman	0-6	10-20	1.45-1.55	2.0-6.0	0.13-0.15	6.6-7.8	<2	Low	0.28	2	3	.8-.9
	6-34	18-35	1.40-1.50	0.6-2.0	0.15-0.17	6.6-8.4	<2	Moderate	0.32			
	34-38	---	---	---	---	---	---	---	---			
Bond	0-5	8-17	1.45-1.55	0.6-2.0	0.12-0.14	6.6-7.8	<2	Low	0.28	1	3	.8-1
	5-18	20-35	1.45-1.55	0.2-0.6	0.11-0.13	6.6-8.4	<2	Moderate	0.28			
	18-22	---	---	---	---	---	---	---	---			
630*:												
Bond	0-2	8-17	1.45-1.55	0.6-2.0	0.12-0.14	6.6-7.8	<2	Low	0.28	1	3	.8-1
	2-19	20-35	1.45-1.55	0.2-0.6	0.11-0.13	6.6-8.4	<2	Moderate	0.28			
	19-23	---	---	---	---	---	---	---	---			
Rizozo	0-2	18-27	1.25-1.35	0.6-2.0	0.15-0.17	7.4-8.4	<2	Low	0.43	1	4L	<1
	2-14	18-27	1.30-1.40	0.6-2.0	0.13-0.16	7.4-8.4	<2	Low	0.32			
	14-18	---	---	---	---	---	---	---	---			
Rock outcrop.												

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH	mmhos/cm					Pct
640*:												
Flaco	0-2	13-26	1.50-1.60	0.6-2.0	0.13-0.15	7.9-8.4	<2	Low	0.37	2	4L	1-2
	2-11	18-35	1.55-1.65	0.2-0.6	0.17-0.19	7.9-8.4	<2	Moderate	0.37			
	11-29	18-30	1.55-1.65	0.6-2.0	0.15-0.17	7.9-8.4	<2	Low	0.32			
	29-33	---	---	---	---	---	---	---	---			
Berto	0-2	12-20	1.35-1.45	0.6-2.0	0.15-0.17	7.4-7.8	<2	Low	0.37	1	4L	1-2
	2-11	18-30	1.40-1.50	0.6-2.0	0.17-0.19	7.9-8.4	<2	Low	0.37			
	11-18	18-30	1.40-1.50	0.6-2.0	0.16-0.18	7.9-8.4	<2	Low	0.20			
	18-22	---	---	---	---	---	---	---	---			
641*:												
Berto	0-2	8-20	1.35-1.45	0.6-2.0	0.13-0.15	7.9-8.4	<2	Low	0.20	1	4L	1-2
	2-8	18-30	1.40-1.50	0.6-2.0	0.17-0.19	7.9-8.4	<2	Low	0.37			
	8-16	18-30	1.40-1.50	0.6-2.0	0.16-0.18	7.9-8.4	<2	Low	0.20			
	16-20	---	---	---	---	---	---	---	---			
Flaco	0-2	13-26	1.15-1.25	0.6-2.0	0.12-0.14	7.9-8.4	<2	Low	0.20	2	8	1-2
	2-9	18-35	1.20-1.30	0.2-0.6	0.17-0.19	7.9-8.4	<2	Moderate	0.37			
	9-26	18-30	1.40-1.50	0.6-2.0	0.15-0.17	7.9-8.4	<2	Low	0.32			
	26-30	---	---	---	---	---	---	---	---			
645*:												
Penistaja	0-3	10-20	1.35-1.45	0.6-2.0	0.13-0.15	6.6-8.4	<2	Low	0.28	5	3	.8-2
	3-18	20-30	1.40-1.50	0.6-2.0	0.15-0.18	6.6-8.4	<2	Low	0.32			
	18-60	15-25	1.20-1.30	2.0-6.0	0.12-0.15	6.6-8.4	<2	Low	0.28			
Oelop	0-3	18-27	1.20-1.30	0.6-2.0	0.16-0.18	7.4-8.4	<2	Low	0.37	5	6	1-2
	3-60	18-35	1.45-1.55	0.2-0.6	0.17-0.20	7.4-8.4	2-4	Moderate	0.37			
650*:												
Winona	0-3	15-25	1.20-1.30	0.6-2.0	0.09-0.10	7.4-7.8	<2	Low	0.10	1	6	1-2
	3-15	15-30	1.20-1.30	0.6-2.0	0.09-0.10	7.4-8.4	<2	Low	0.10			
	15-19	---	---	---	---	---	---	---	---			
Tanbark	0-2	18-27	1.40-1.50	0.6-2.0	0.13-0.16	7.4-9.0	4-8	Low	0.43	1	4L	.3-.5
	2-17	---	---	---	---	---	---	---	---			
	17-21	---	---	---	---	---	---	---	---			
Rock outcrop.												
660*:												
Rana	0-3	60-70	1.15-1.25	<0.06	0.08-0.10	7.9-8.4	<2	High	0.05	5	5	.5-.9
	3-34	65-85	1.15-1.25	<0.06	0.14-0.16	7.9-9.0	2-4	High	0.20			
	34-60	65-85	1.15-1.25	<0.06	0.14-0.16	8.5-9.0	2-4	High	0.20			
Rock outcrop.												

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," and "apparent" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
10*. Lava flows												
20--- Penistaja	B	None	---	---	>6.0	---	---	>60	---	---	High	Low.
21--- Clovis	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
25*:												
Hickman	B	Occasional	Very brief	Jun-Aug	>6.0	---	---	>60	---	Low	High	Low.
Catman	D	Occasional	Long	Jul-Sep	>6.0	---	---	>60	---	Low	High	Moderate.
30--- Warm Springs	C	Frequent	Brief	Jul-Oct	1.0-2.5	Apparent	Apr-Sep	>60	---	High	High	Moderate.
40, 41, 45--- Aparejo	B	Occasional	Very brief	Jun-Sep	>6.0	---	---	>60	---	Moderate	High	Low.
50, 51--- Venadito	D	Occasional	Very brief	Jul-Sep	>6.0	---	---	>60	---	Low	High	Low.
52--- Venadito Variant	D	Occasional	Very brief	Jul-Sep	>6.0	---	---	20-40	Hard	Low	High	Low.
55*:												
Glenberg	B	Occasional	Very brief	Jul-Oct	>6.0	---	---	>60	---	Low	High	Low.
San Mateo	B	Occasional	Very brief	Jul-Sep	>6.0	---	---	>60	---	Low	High	Low.
56--- Mespun	A	None	---	---	>6.0	---	---	>60	---	Low	Moderate	Low.
57, 58--- San Mateo	B	Occasional	Very brief	Jul-Sep	>6.0	---	---	>60	---	Low	High	Low.
60--- Sparank	D	Occasional	Brief	Jul-Oct	>6.0	---	---	>60	---	Low	High	Low.
61--- Sparham	D	Occasional	Brief	Jun-Aug	3.0-4.0	Apparent	Apr-Sep	>60	---	Moderate	High	Moderate.

See footnote at end of table.

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
62--- Sparank	D	Occasional	Brief	Jul-Oct	>6.0	---	---	>60	---	Low	High	Low.
66--- Zia	B	None	--	---	>6.0	---	---	>60	---	Low	High	Low.
70--- Catman	D	Occasional	Long	Jul-Sep	>6.0	---	---	>60	---	Low	High	Moderate.
72--- Catman Variant	D	Occasional	Brief	Jun-Sep	2.0-4.0	Apparent	Apr-Sep	>60	---	High	High	Low.
73--- Catman	D	Occasional	Long	Jul-Sep	>6.0	---	---	>60	---	Low	High	Moderate.
75--- Hickman	B	Occasional	Very brief	Jun-Aug	>6.0	---	---	>60	---	Low	High	Low.
100--- Manzano	B	Occasional	Very brief	May-Oct	>6.0	---	---	>60	---	Moderate	High	Low.
120*: Rock outcrop.												
Laporte	D	None	---	---	>6.0	---	---	10-20	Hard	Low	High	Low.
130*: Laporte	D	None	---	---	>6.0	---	---	10-20	Hard	Low	High	Low.
Rock outcrop.												
200--- Penistaja	B	None	---	---	>6.0	---	---	>60	---	---	High	Low.
205--- Ildefonso	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
210*: Bond	D	None	---	---	>6.0	---	---	10-20	Hard	Low	High	Low.
Penistaja	B	None	---	---	>6.0	---	---	>60	---	---	High	Low.
Rock outcrop.												
218*: Viuda	D	None	---	--	>6.0	---	---	10-20	Hard	Low	High	Low.
Penistaja	B	None	---	---	>6.0	---	---	>60	---	---	High	Low.

See footnote at end of table.

22000297

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
218*:												
Rock outcrop.												
230*:												
Dumps.												
Pits.												
251*:												
Skyvillage	D	None	---	---	>6.0	---	---	10-20	Hard	Low	Moderate	Low.
Rock outcrop.												
Bond	D	None	---	---	>6.0	---	---	10-20	Hard	Low	High	Low.
257*:												
Sparank	D	Occasional	Brief	Jul-Oct	>6.0	---	---	>60	---	Low	High	Low.
San Mateo	B	Occasional	Very brief	Jul-Sep	>6.0	---	---	>60	---	Low	High	Low.
259	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
Mikim												
262*:												
Poley	C	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
Pojoaque	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
264	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
Tapia												
270	C	None	---	---	>6.0	---	---	20-40	Hard	Low	Moderate	Low.
Charo												
272*:												
Cebolleta	C	None	---	---	>6.0	---	---	20-40	Hard	Low	Moderate	Low.
Borrego	D	None	---	---	>6.0	---	---	10-20	Hard	Moderate	Moderate	Moderate.
Rock outcrop.												
276	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Trag												
278*:												
Microy	C	None	---	---	>6.0	---	---	20-40	Hard	Moderate	Moderate	Low.
Rock outcrop.												

See footnote at end of table.

22000298

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
282---------- Cebolleta	C	None---------	---	---	>6.0	---	---	20-40	Hard	Low------	Moderate	Low.
284*: Cebolleta------	C	None---------	---	---	>6.0	---	---	20-40	Hard	Low------	Moderate	Low.
Rock outcrop.												
286*: Cebolleta------	C	None---------	---	---	>6.0	---	---	20-40	Hard	Low------	Moderate	Low.
Raton----------	D	None---------	---	---	>6.0	---	---	6-20	Hard	Moderate	Moderate	Low.
290*: Paguate--------	C	None---------	---	---	>6.0	---	---	20-40	Hard	Low------	High-----	Low.
Hackroy--------	D	None---------	---	---	>6.0	---	---	10-20	Hard	Moderate	Moderate	Low.
291---------- Paguate	C	None---------	- -	---	>6.0	---	---	20-40	Hard	Low------	High-----	Low.
294*: Parkay---------	B	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Rock outcrop.												
300---------- Saladon	D	Rare---------	--	---	0-4.0	Apparent	Jun-Sep	>60	---	Moderate	Moderate	Low.
310---------- Mirabal	C	None---------	---	---	>6.0	---	---	20-40	Hard	Low------	Moderate	Low.
315*: Abersito, cobbly--------	C	None---------	---	---	>6.0	---	---	20-40	Hard	Low------	Moderate	Low.
Abersito-------	C	None---------	---	---	>6.0	---	---	20-40	Hard	Low------	Moderate	Low.
Rock outcrop.												
320---------- Cinnadale	D	None---------	---	---	>6.0	---	---	10-20	Hard	Moderate	Moderate	Low.
325---------- Moreno Variant	B	None---------	---	--	>6.0	---	---	>60	---	Moderate	Moderate	Low.
330---------- Moreno	C	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.

See footnote at end of table.

22000299

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
340---------- Yankee	D	None--------	---	---	>6.0	---	---	>60	---	Moderate	High-----	Low.
350*: Rock outcrop.												
Stout----------	D	None--------	---	---	>6.0	---	---	6-20	Hard	Moderate	Moderate	Low.
406*: Poley----------	D	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
Rock outcrop.												
407*: Viuda----------	D	None--------	---	---	>6.0	---	---	10-20	Hard	Low------	High-----	Low.
Rock outcrop.												
419---------- Navajo	D	Occasional	Very brief	Jul-Sep	>6.0	---	---	>60	---	Low------	High-----	Low.
420*: Navajo---------	D	Occasional	Very brief	Jul-Sep	>6.0	---	---	>60	---	Low------	High-----	Low.
Suwanee--------	B	Occasional	Very brief	Jun-Sep	>6.0	---	---	>60	---	Moderate	High-----	Low.
424*: Mespun---------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate	Low.
Palma----------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
426*: Sheppard-------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
Shiprock-------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.
432*: Winona---------	D	None--------	---	---	>6.0	---	---	5-20	Hard	Low------	High-----	Low.
Rock outcrop.												
434*: Rizozo---------	D	None--------	---	---	>6.0	---	---	4-20	Hard	Low------	Moderate	Low.
Rock outcrop.												
446*: Harvey---------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	High-----	Low.

See footnote at end of table.

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
446*:												
Oelop	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
476	B	None	---	---	>6.0	---	---	>60	---	Low	High	High.
Saido												
485*:												
Rock outcrop.												
Mion	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Low.
487*:												
Mion	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Low.
Badland.												
500*:												
Timhus	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate	Low.
Bandera	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
505*:												
Flugle	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Goesling	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
514*:												
Raton	D	None	---	---	>6.0	---	---	6-20	Hard	Moderate	Moderate	Low.
Rock outcrop.												
515*:												
Rock outcrop.												
Vessilla	D	None	---	---	>6.0	---	---	6-20	Soft	Low	High	Low.
Mion	D	None	---	---	>6.0	---	---	10-20	Soft	Low	High	Low.
518*:												
Borrego	D	None	---	---	>6.0	---	---	14-20	Hard	Moderate	Moderate	Moderate.
Charo	C	None	---	---	>6.0	---	---	20-40	Hard	Low	Moderate	Low.
Rock outcrop.												
520*:												
Celacy	C	None	---	---	>6.0	---	---	20-40	Hard	Moderate	High	Low.

See footnote at end of table.

22000301

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
520*:												
Atarque	D	None	---	---	>6.0	---	---	8-20	Hard	Low	Moderate	Low.
522*:												
Bandera, 30 to 45 percent slopes	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Bandera, 15 to 30 percent slopes	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
523*:												
Charo	C	None	---	---	>6.0	---	---	20-40	Hard	Low	Moderate	Low.
Raton	D	None	---	---	>6.0	---	---	6-20	Hard	Moderate	Moderate	Low.
525*:												
Catman	D	Occasional	Long	Jul-Sep	>6.0	---	---	>60	---	Low	High	Moderate.
Silkie	D	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
535--- Millpaw	C	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
536--- McGaffey	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
537*:												
Millpaw	C	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
Loarc	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
540--- Montecito	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
550*:												
Nogal	C	None	---	---	>6.0	---	---	20-40	Soft	Low	High	Low.
Galestina	C	None	---	---	>6.0	---	---	40-60	Soft	Low	Moderate	Low.
555*:												
Pinitos	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Ribera	C	None	---	---	>6.0	---	---	20-40	Hard	Moderate	High	Low.
560*:												
Flugle	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.

See footnote at end of table.

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
560*:												
Teco	B	None	---	---	>6.0	---	--	>60	---	Low	High	Low.
561*:												
Flugle	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Quintana	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
565 Quintana	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
570*:												
Torreon	D	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
Rock outcrop.												
Cabezon	D	None	---	---	>6.0	---	---	10-20	Hard	Low	Moderate	Low.
575*:												
Teco	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
Atarque	D	None	---	---	>6.0	---	---	8-20	Hard	Low	Moderate	Low.
576 Teco	B	None	---	--	>6.0	---	---	>60	---	Low	High	Low.
577*:												
Cabezon	D	None	---	---	>6.0	---	---	10-20	Hard	Low	Moderate	Low.
Montecito	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
Rock outcrop.												
579*:												
Cabezon	D	None	---	---	>6.0	---	---	10-20	Hard	Low	Moderate	Low.
Cantina	C	None	---	---	>6.0	---	---	40-60	Hard	Low	High	Low.
581*:												
Laporte	D	None	---	---	>6.0	---	---	10-20	Hard	Low	High	Low.
Vessilla	D	None	---	---	>6.0	---	---	6-20	Soft	Low	High	Low.
582 Kenray	A	None	---	---	>6.0	---	---	>60	---	Low	Moderate	Low.
585 Moncha	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.

See footnote at end of table.

22000303

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
586*:												
Venadito	D	Occasional	Very brief	Jul-Sep	>6.0	--	---	>60	---	Low	High	Low.
Teco	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
591*:												
Valnor	C	None	---	---	>6.0	---	---	20-40	Soft	Low	High	Low.
Techado	D	None	---	---	>6.0	---	---	10-20	Soft	Low	Moderate	Low.
610*:												
Grieta	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Shiprock	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
611*:												
Grieta	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Low.
Kiki	C	None	---	---	>6.0	---	---	20-40	Hard	Moderate	High	Low.
615*:												
Trag	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
Techado	D	None	---	---	>6.0	---	---	10-20	Soft	Low	Moderate	Low.
Rock outcrop.												
618 Netoma	B	None	---	---	>6.0	---	---	>60	---	Low	High	High.
619 Venadito	D	Occasional	Very brief	Jul-Sep	>6.0	---	---	>60	---	Low	High	Low.
620*:												
Aparejo	B	Occasional	Very brief	Jun-Sep	>6.0	---	---	>60	---	Moderate	High	Low.
Venadito	D	Occasional	Very brief	Jul-Sep	>6.0	---	---	>60	---	Low	High	Low.
625*:												
Hagerman	C	None	---	---	>6.0	---	---	20-40	Hard	Low	High	Low.
Bond	D	None	---	---	>6.0	---	---	10-20	Hard	Low	High	Low.
630*:												
Bond	D	None	---	---	>6.0	---	---	10-20	Hard	Low	High	Low.
Rizozo	D	None	---	---	>6.0	---	---	4-20	Hard	Low	High	Low.

See footnote at end of table.

TABLE 14.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
630*:												
Rock outcrop.												
640*:												
Flaco	C	None	---	---	>6.0	---	---	20-40	Hard	Moderate	High	Low.
Berto	D	None	---	---	>6.0	---	---	11-20	Hard	Moderate	High	Low.
641*:												
Berto	D	None	---	---	>6.0	---	---	11-20	Hard	Moderate	High	Low.
Flaco	C	None	---	---	>6.0	---	---	20-40	Hard	Moderate	High	Low.
645*:												
Penistaja	B	None	---	---	>6.0	---	---	>60	---	---	High	Low.
Oelop	B	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
650*:												
Winona	D	None	---	---	>6.0	---	---	5-20	Hard	Low	High	Low.
Tanbark	D	None	---	---	>6.0	---	---	10-20	Hard	Low	High	High.
Rock outcrop.												
660*:												
Rana	D	None	---	---	>6.0	---	---	>60	---	Low	High	Low.
Rock outcrop.												

* See description of the map unit for composition and behavior characteristics of the map unit.

22000305

TABLE 15.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Abersito	Clayey-skeletal, mixed Mollic Eutroboralfs
Aparejo	Fine-loamy, mixed (calcareous), mesic Typic Ustifluvents
Atarque	Loamy, mixed, mesic Lithic Haplustalfs
Bandera	Loamy-skeletal over fragmental, mixed Entic Haploborolls
Berto	Loamy, mixed, mesic Lithic Ustollic Haplargids
Bond	Loamy, mixed, mesic Lithic Ustollic Haplargids
*Borrego	Clayey, mixed Lithic Eutroboralfs
Cabezon	Clayey, montmorillonitic, mesic Lithic Argiustolls
Cantina	Fine, mixed, mesic Aridic Argiustolls
Catman	Very fine, montmorillonitic, mesic Udorthentic Chromusterts
Catman Variant	Very fine, montmorillonitic, mesic Mollic Ustifluvents
Cebolleta	Clayey-skeletal, mixed Typic Argiborolls
Celacy	Fine-loamy, mixed, mesic Aridic Haplustalfs
Charo	Fine, mixed Typic Argiborolls
Cinnadale	Loamy-skeletal, mixed, frigid Lithic Ustochrepts
*Clovis	Fine-loamy, mixed, mesic Ustollic Haplargids
Flaco	Fine-loamy, mixed, mesic Ustollic Haplargids
Flugle	Fine-loamy, mixed, mesic Aridic Haplustalfs
Galestina	Fine, mixed, mesic Aridic Paleustalfs
Glenberg	Coarse-loamy, mixed (calcareous), mesic Ustic Torrifluvents
Goesling	Fine-loamy, mixed, mesic Aridic Haplustalfs
Grieta	Fine-loamy, mixed, mesic Typic Haplargids
Hackroy	Clayey, mixed, mesic Lithic Haplustalfs
Hagerman	Fine-loamy, mixed, mesic Ustollic Haplargids
Harvey	Fine-loamy, mixed, mesic Ustollic Calciorthids
Hickman	Fine-loamy, mixed (calcareous), mesic Typic Ustifluvents
*Ildefonso	Loamy-skeletal, mixed, mesic Ustollic Calciorthids
Kenray	Mixed, frigid Typic Ustipsamments
Kiki	Fine-loamy, mixed, mesic Typic Haplargids
Laporte	Loamy, carbonatic, mesic Lithic Haplustolls
Loarc	Fine-loamy, mixed, mesic Aridic Argiustolls
*Manzano	Fine-loamy, mixed, mesic Cumulic Haplustolls
McGaffey	Fine-loamy, mixed Cumulic Haploborolls
Mespun	Mixed, mesic Ustic Torripsamments
Microy	Fine, mixed Typic Argiborolls
Mikim	Fine-loamy, mixed (calcareous), mesic Ustic Torriorthents
Millpaw	Fine, mixed, mesic Pachic Argiustolls
Mion	Clayey, mixed (calcareous), mesic, shallow Ustic Torriorthents
Mirabal	Loamy-skeletal, mixed, nonacid, frigid Typic Ustorthents
Moncha	Fine-silty, mixed, mesic Aridic Haplustalfs
Montecito	Fine, mixed, mesic Aridic Haplustalfs
Moreno	Fine, mixed Typic Argiborolls
Moreno Variant	Fine-loamy, mixed Mollic Eutroboralfs
Navajo	Fine, mixed (calcareous), mesic Vertic Torrifluvents
Netoma	Coarse-loamy, gypsic, mesic Typic Gypsiorthids
Nogal	Fine, mixed, mesic Aridic Haplustalfs
Oelop	Fine-loamy, mixed, mesic Ustollic Haplargids
Paguate	Fine, mixed, mesic Aridic Haplustalfs
Palma	Coarse-loamy, mixed, mesic Ustollic Haplargids
Parkay	Loamy-skeletal, mixed Argic Pachic Cryoborolls
Penistaja	Fine-loamy, mixed, mesic Ustollic Haplargids
Pinitos	Fine-loamy, mixed, mesic Aridic Haplustalfs
Pojoaque	Fine-loamy, mixed (calcareous), mesic Ustic Torriorthents
Poley	Fine, mixed, mesic Ustollic Haplargids
*Quintana	Fine-loamy, mixed, mesic Typic Ustochrepts
Rana	Very fine, montmorillonitic (calcareous), mesic Ustertic Torriorthents
Raton	Clayey-skeletal, mixed Lithic Argiborolls
Ribera	Fine-loamy, mixed, mesic Aridic Haplustalfs
*Rizozo	Loamy, mixed (calcareous), mesic Lithic Ustic Torriorthents
Saido	Coarse-silty, gypsic, mesic Typic Gypsiorthids

TABLE 15.--CLASSIFICATION OF THE SOILS--Continued

Soil name	Family or higher taxonomic class
*Saladon	Fine, montmorillonitic Typic Cryaquolls
San Mateo	Fine-loamy, mixed (calcareous), mesic Ustic Torrifluvents
Sheppard	Mixed, mesic Typic Torripsamments
Shiprock	Coarse-loamy, mixed, mesic Typic Haplargids
Silkie	Fine, mixed, mesic Vertic Haplustalfs
Skyvillage	Loamy, mixed (calcareous), mesic Lithic Ustic Torriorthents
Sparank	Fine, mixed (calcareous), mesic Ustic Torrifluvents
Sparham	Fine, mixed (calcareous), mesic Typic Ustifluvents
Stout	Loamy, mixed, nonacid, frigid Lithic Ustorthents
Suwanee	Fine-loamy, mixed (calcareous), mesic Ustic Torrifluvents
Tanbark	Loamy, gypsic, mesic, shallow Ustic Torriorthents
Tapia	Fine-loamy, mixed, mesic Ustollic Haplargids
Techado	Clayey, mixed, nonacid, frigid, shallow Typic Ustorthents
Teco	Fine, mixed, mesic Aridic Haplustalfs
Timhus	Loamy-skeletal over fragmental, mixed, mesic Aridic Ustochrepts
Torreon	Fine, montmorillonitic, mesic Aridic Argiustolls
*Trag	Fine-loamy, mixed Typic Argiborolls
Valnor	Fine, mixed Mollic Eutroboralfs
Venadito	Very fine, montmorillonitic, mesic Udorthentic Chromusterts
Venadito Variant	Very fine, montmorillonitic, mesic Udic Chromusterts
Vessilla	Loamy, mixed (calcareous), mesic Lithic Ustorthents
Viuda	Clayey, mixed, mesic Lithic Ustollic Haplargids
Warm Springs	Fine-loamy, mixed, mesic Aquic Calciustolls
Winona	Loamy-skeletal, carbonatic, mesic Lithic Ustollic Calciorthids
*Yankee	Fine, mixed Vertic Argiborolls
Zia	Coarse-loamy, mixed (calcareous), mesic Ustic Torriorthents

*U.S. G.P.O.:1993-341-646:80003/SCS

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MEMORANDUM

To: **Michelle Brown**

From: **Curtis L. Francisco**
Water Quality Specialist

Date: **03-15-2010**

Subject: **Fishing in the Rio Paguate and Rio San Jose**

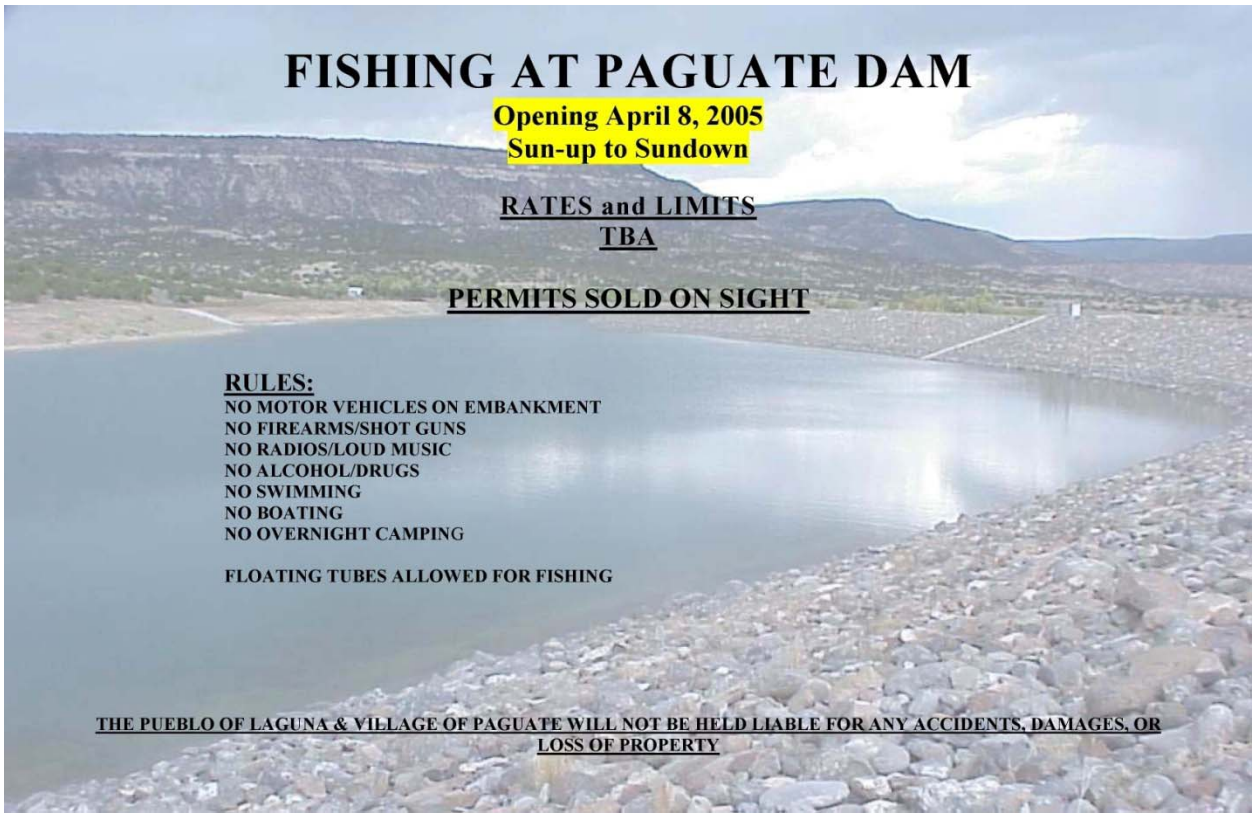
This memo is to document that fishing does occur on the Rio Paguate and Rio San Jose. The Rio Paguate above the mine is a high quality cold water fishery and has long been thought to hold a hybrid species of fish, the native trout and imported rainbow, but has not been documented by the fish and wild life service. Fish do occur in the upper reaches and are of some sort of trout species. They were being caught in the Paguate Lake prior to stocking the lake with Rainbow and Blue Channel Catfish by village members. The segments of the Rio Paguate below the mine and in the area of the Paguate Reservoir AKA Mesita Dam are also used by locals to catch catfish, bluegill and what I believe to be crappie because of the symbiotic relationship with wading birds such as herons where the fishes eggs stick to the legs of the birds and are dropped off in new bodies of water and the fish populate them. The Rio San Jose is also fished but for the same species of fish that are found in the lower reaches of the Rio Paguate. The water is warmer and shallower and is 100 percent diverted for irrigation during the growing season. The only day water is not diverted is on Sunday and is allowed to return to its natural channel.

It is important to note that fishing is only officially allowed in the Paguate Lake and operated by the Village of Paguate the other water bodies are under the jurisdiction of the Natural Resources Program but they do not issue permits for any of the other water bodies on the reservation.

The pools that collect water below the Mesita Dam and in the Rio San Jose below the convergence with the Rio Paguate are continually wet and filled with groundwater that is seeping through the Mesita Dam when up steam diversion for irrigation is taking place.

Fishing in the Rio Paguate below the mine is discouraged as is in the Rio San Jose however, residents still fish and consume the fish caught there, evidence has been observed numerous times on the Rio Paguate at and around the Mesita Dam and at the Village of Mesita at the Rio San Jose Irrigation Diversion which is below the convergence with the Rio Paguate.

Traditional uses and taking of water fowl have been also been observed on a routine and continuing basis.



The Paguate Lake is not the same as the Paguate Reservoir (AKA Mesita Dam), while they are on the same stream the Rio Paguate the Lake is above the mine and above the village of Paguate near the mouth of Paguate Canyon. The Paguate Reservoir AKA Mesita Dam is below the mine closer to the village of Mesita. This reservoir was constructed for the village of Mesita irrigation use. The water in the Rio San Jose is completely diverted up stream so there is not flow except for water coming from the Rio Paguate held by the Mesita Dam about one mile north of the convergence point of the Rio San Jose and Rio Paguate. There is a small irrigation division dam on the Rio San Jose at the village of Mesita where the water is put into the irrigation system is referred to as the Mesita Diversion. Three separate structures three separate locations.

Soil Cleanup Criteria in 40 CFR Part 192

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Signed 2/12/98

Directive no. 9200.4-25

MEMORANDUM

SUBJECT: Use of Soil Cleanup Criteria in 40 CFR Part 192 as Remediation Goals for CERCLA Sites

FROM: Stephen D. Luftig, Director
Office of Superfund Remediation Technology Innovation

Larry Weinstock, Acting Director
Office of Radiation and Indoor AirM

TO: Addressees

PURPOSE

This memorandum addresses the use of the soil cleanup criteria in 40 CFR Part 192 when setting remediation goals at CERCLA sites with radioactive contamination. In particular, it clarifies the intent of 40 CFR Part 192 in setting remediation levels for subsurface soil. It does not address the applicability or intent of other standards contained in 40 CFR Part 192, nor does it address setting remediation goals for contaminated media other than soil. This document provides guidance to EPA staff. It also provides guidance to the public and to the regulated community on how EPA intends that the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) be implemented. The guidance is designed to describe EPA's national policy on these issues. The document does not, however, substitute for EPA's statutes or regulations, nor is it a regulation itself. Thus, it cannot impose legally-binding requirements on EPA, States, or the regulated community, and may not apply to a particular situation based upon the circumstances. EPA may change this guidance in the future, as appropriate.

BACKGROUND

All remedial actions at CERCLA sites must be protective of human health and the environment and comply with applicable or relevant and appropriate requirements (ARARs) unless a waiver is justified. Cleanup levels for response actions under CERCLA are developed based on site-specific risk assessments, ARARs, and/or to-be-considered materials (TBCs). The determination of whether a requirement is applicable, or relevant and appropriate, must be made on a site-specific basis (see 40 CFR Part 300.400(g)).

On January 5, 1983, EPA promulgated in Subpart B of 40 CFR Part 192 (48 FR 590 to 606) *Standards for Cleanup of Land and Buildings Contaminated with Residual Radioactive Materials from Inactive Uranium Processing Sites.* These standards were developed pursuant to Section 275 of the Atomic Energy Act (42

U.S.C. 2022), as amended by Section 206 of the Uranium Mill Tailings Radiation Control Act of 1978 (42 U.S.C. 7918).

These standards were developed specifically for the cleanup of uranium mill tailings at 24 sites designated under Section 102(a)(1) of UMTRCA (Title I sites). The purpose of these standards was to limit the risk from inhalation of radon decay products in houses built on land contaminated with tailings, and to limit gamma radiation exposure of people using contaminated land (see 48 FR 600). The list of 24 Title I sites is a closed set chosen in 1979 that cannot be added to. It includes the so-called "vicinity" sites at which cleanup of specified off-site properties for unrestricted use is authorized.

Subpart B of 40 CFR Part 192 contains two different soil standards. The **concentration criterion for surface soil** (5 pCi/g of radium-226) is a health-based standard. The relevant source of health risk for surface soil is exposure to gamma radiation, which is the basis for this standard. This basis is noted in the preamble to the final rule (see 48 FR 600) and is discussed in greater detail in the Final Environmental Impact Statement (FEIS) which was conducted as part of the rulemaking process (see the FEIS at pp. 57, 111-112, and 134-137). This standard for a single radioisotope (radium-226) was developed to control the hazard from gamma radiation.

The **concentration criterion for subsurface soil** in Subpart B (15 pCi/g of radium-226) is not a health-based standard, but rather was developed for use in limited circumstances, explained below, to allow the use of field measurements rather than laboratory analyses to determine when buried tailings had been detected. The basis for this criterion is documented in the materials accompanying the promulgation of Subpart B (see 48 FR 600, the FEIS at pp. 134-137 and D-51 to D-52, and *Findings of an Ad Hoc Technical Group on Cleanup of Open Land Contaminated with Uranium Mill Tailings, EPA, 1981, Docket A-79-25*).

The criterion for subsurface soil was derived as a tool for use in locating and remediating discrete deposits of high activity tailings (typically 300-1,000 pCi/g) in subsurface locations at mill sites or at vicinity properties. The criterion for subsurface soil in Subpart B was originally proposed as 5 pCi/g (46 FR 2562). The criterion in the final rule was changed, not because of a reassessment of the level of contamination that would present a threat to health, but rather in order to reduce the cost to DOE of locating buried tailings; EPA's analysis found that by cleaning up this highly active waste, located using the 15 pCi/g finding tool, DOE would achieve essentially the same degree of cleanup that would result at the Title I sites as originally proposed under the 5 pCi/g criterion (see 48 FR 600 and FEIS p. D-51).

When examining the costs and benefits of alternative standards ranging from 5 to 30 pCi/g, the analysis for the final rulemaking found that the amount of buried tailings to be removed varies only slightly with the limit selected (see 48 FR 600). This indicates that there was expected to be little subsurface contamination ranging from 5 to 30 pCi/g at the Title I sites regulated under this rule. The rule was not developed for situations where significant quantities of contamination exist between 5 and 30 pCi/g. EPA considered significant residual contamination of up to 15 pCi/g of radium-226 to generally be hazardous to build on, but concluded that there would be very little contamination in this range at Title I sites. A concentration of 15 pCi/g was considered likely to occur only in thin layers at the edges of more concentrated deposits that would be cleaned up under a 15 pCi/g criterion (see FEIS p. 136-137). EPA's analysis for the rule determined that a 5 pCi/g, rather than 15 pCi/g, criterion for subsurface soil "would require more skill and training of personnel, and greater use of expensive measuring techniques, but cleanup would only be marginally more complete" (see FEIS p. 136). The 15 pCi/g criterion is therefore only suitable for use, as a cost effective tool to locate and remediate radioactive waste, when most or all subsurface contamination is at a level greater than 30 pCi/g and is not expected to be significantly admixed with clean soil. In this situation, removing all subsurface contamination detected at 15 pCi/g or above will reduce residual contamination to nearly zero.

The 5 pCi/g and 15 pCi/g standards were initially developed for a single radioisotope (radium-226) to control the hazard from radiation. In Subpart E of 40 CFR Part 192 (48 FR 45947) *Standards for Management of Thorium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954, as Amended,* EPA determined that these standards were suitable for remediation of radium-228 at Title II sites (see 48 FR 45944 and the FEIS for *Standards for the Control of Byproduct Materials from Uranium or Processing (40 CFR 192) Volume I, Appendix G: Thorium Mill Tailings)*.

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Attainment of the 5 pCi/g and 15 pCi/g UMTRCA standards was intended to signify that a Title I site had been cleaned up to a level suitable for unrestricted use. However, in Subpart C of 40 CFR Part 192, alternative site-specific standards may be established under some special circumstances that allow the selection and performance of remedial actions that come as close as reasonably achievable to meeting the UMTRCA standards. In general, these "supplemental standards" were not expected to be used often. They were designed for situations in which worker safety would be adversely impacted or clearly greater environmental harm would result from the remedial action necessary to attain the standards, for situations in which the materials do not pose a clear present or future hazard and improvements could be achieved only at unreasonably high cost, or where concentrations of other radionuclides are sufficiently high to constitute a significant radiation hazard.

OBJECTIVE

The objective of this memorandum is to provide guidance regarding the circumstances under which the soil cleanup criteria in 40 CFR Part 192 should be considered an ARAR in developing a response action under CERCLA.

IMPLEMENTATION

The following subsections will clarify the use of 40 CFR Part 192 in setting remediation levels for subsurface soil.

UMTRCA as an Applicable Requirement

The standards contained within Subpart B of 40 CFR Part 192 are potentially applicable requirements only for the Title I sites designated under Section 102(a)(1) of UMTRCA. The standards contained within Subparts D and E of 40 CFR Part 192 are potentially applicable requirements only for the Title II sites designated under Section 206 of UMTRCA.

UMTRCA as a Relevant and Appropriate Requirement

If the contaminants at a site are the same (i.e., radium-226, radium-228, and/or thorium) and the distribution of contamination is similar to that existing at Title I sites as described in 40 CFR Part 192 (i.e., little subsurface contamination from 5 to 30 pCi/g), then the 15 pCi/g standard is a potentially relevant and appropriate requirement for the site. As explained above, under these circumstances the 15 pCi/g standard would be expected to achieve an actual subsurface cleanup level of below 5 pCi/g in practice.

If it is determined, either in the course of further study, or even during remedial action, that subsurface contamination exists at a level between 5 pCi/g to 15 pCi/g averaged over areas of 100 square meters (the averaging areas provided for in the Part 192 rules), this indicates that conditions at the site are probably not sufficiently similar to an UMTRCA site to consider the subsurface contamination standard under 40 CFR Part 192 a relevant and appropriate requirement. If such a finding had been made, the ARAR determination should be reconsidered and a cleanup level for the subsurface contamination may have to be established based on a site-specific risk assessment.

For the same reasons, the 15 pCi/g standard should not generally be considered relevant and appropriate as a standard for backfill material. Since EPA's expectation in promulgating Part 192 was that cleanups of subsurface soil contamination would, in practice, achieve a protective level of 5 pCi/g under the circumstances presented at UMTRCA sites, it would not generally be appropriate to allow backfilling with material with concentrations higher than 5 pCi/g.

Where UMTRCA is not an ARAR

If the radioactive contamination at the site is unlike that at the uranium mill tailings sites regulated under 40 CFR 192, in that significant subsurface contamination exists at a level between 5 pCi/g to 30 pCi/g, the use of the 15 pCi/g standard is not generally appropriate.

240003

In this situation, we recommend 5 pCi/g as a suitable cleanup level for subsurface contamination, if a site-specific risk assessment demonstrates that 5 pCi/g is protective 2, on the basis that the preamble to 40 CFR 192 indicates that even with a standard of 15 pCi/g, almost all contamination was expected to be remediated to a level of 5 pCi/g. The level of 5 pCi/g was the actual health-based level that was expected to be achieved when implementing 40 CFR 192.

Where RADIUM-226, RADIUM-228, and/or THORIUM are Commingled

Because the risk from uranium and thorium byproducts is additive, and because the 5 pCi/g and 15 pCi/g standards are based on total acceptable risk, whenever the 5 pCi/g and/or 15 pCi/g standards are used as relevant and appropriate requirements (or TBC's) at CERCLA sites with some combination of radium-226 and radium-228, these soil standards should apply to the combined level of contamination of radium-226 and radium-228.

It should be noted that to meet a permanent clean-up objective for radium -226 and radium-228 of 5 pCi/g, there needs to be reasonable assurance that the preceding radionuclides in the series will not be left behind at levels that will permit the combined radium activity to build-up to levels exceeding 5 pCi/g after completion of the response action. At a minimum, this would generally mean that thorium-230 (the parent of radium-226) and thorium-232 (the parent of radium-228) should be cleaned up to the same concentrations as their radium progeny. Therefore, whenever the 5 pCi/g and/or 15 pCi/g standards are used as relevant and appropriate requirements (or TBC's) at CERCLA sites with some combination of thorium-230 and thorium-232, these soil standards should apply to the combined level of contamination of thorium-230 and thorium-232.

Supplemental Standards

If supplemental standards in 40 CFR Part 192, Subpart C, are used in conjunction with the above standards for the remediation of soil, institutional controls should generally be included as a component of cleanup alternatives in order to ensure the response will be protective over time. The requirement for 5-year reviews (see 40 CFR 300.430(f)(4)(ii)) would apply if the use of supplemental standards were to result in waste being left on-site at levels that would require limited use and restricted exposure to ensure protectiveness.

FURTHER INFORMATION

The subject matter specialists for this directive are Stuart Walker of OSRTI (703-603-8748) and John Karhnak of ORIA (202-564-9280). General questions about this directive, should be directed to 1-800-424-9346.

Addressees
National Superfund Policy Managers
Superfund Branch Chiefs (Regions I-X)
Superfund Branch Chiefs, Office of Regional Counsel (Regions I-X)
Radiation Program Managers (Regions I, IV, V, VI, VII, X)
Radiation Branch Chief (Region II)
Residential Domain Section Chief (Region III)
Radiation and Indoor Air Program Branch Chief (Region VIII)
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CC:
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240004

Joanna Gibson, HOSC/OSRTI
Earl Salo, OGC

http://www.epa.gov/superfund/health/conmedia/soil/cleanup.htm
Last updated on Wednesday, March 17, 2010

1 To-be-considered material (TBCs) are non-promulgated advisories or guidance issued by Federal or State governments that are not legally binding and do not have the status of potential ARARs. However, TBCs will be considered along with ARARs as part of the site risk assessment and may be used in determining the necessary level of cleanup for protection of health and the environment.

2 For further information regarding protective cleanups at CERCLA sites, see the memo from Stephen D. Luftig and Larry Weinstock to the Regions; "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination" (OSWER Directive 9200.4-18), August 22, 1997.

3 For further information regarding protective cleanups at CERCLA sites, see the memo from Stephen D. Luftig and Larry Weinstock to the Regions; "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination" (OSWER Directive 9200.4-18), August 22, 1997.

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DATA QUALITY ASSURANCE REVIEW

SITE NAME	Jackpile-Paguate Uranium Mine		
CERCLIS	NMN000607033		
WORK ORDER NUMBER	20406.012.019.0514.01	TDD NUMBER	TO-0019-10-02-02
PROJECT NUMBER		SDG NUMBER	1003045

Weston Solutions, Inc. (WESTON®) has completed a QA review for Work Order Number 20406.012.019.0514.01, SDG No.1003045, Jackpile-Paguate Uranium Mine. Twenty five samples were analyzed for metals by ALS Laboratory Group. Sample numbers are listed below.

SAMPLE NUMBERS

Rinsate 030210	RM-SED-BG	RM-SW-BG
RSJ-SED-03	RSJ-SED-BG	RSJ-SW-03
RSJ-SW-BG	MD-SED-0-2'	MD-SED-2-4'
MD-SED-4-6'	PR-SED-01	RP-SED-BG
RP-SED-BGD	RP-SW-BG	RP-SW-BGD
RSJ-SED-02	WR-SED-0-2'	WR-SED-3'
WR-SED-5.5'	PR-SW-01	RP-SED-03
RP-SW-03	RSJ-SED-01	RSJ-SW-01
RSJ-SW-02		

This data package was validated to determine if Quality Control (QC) specifications were achieved, following *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (October, 1999), *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (July, 2002), *USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data Review* (August, 2002), *Quality Assurance/Quality Control Guidance for Removal Activities* (April, 1990), and the Regional Protocol for Holding Times, Blanks, and VOA Preservation (April 13, 1989). Specific data qualifications are listed in the following discussion.

REVIEWER	Gloria J. Switalski	DATE	March 19, 2010

250001

Gloria J. Switalski

Data Qualifiers

Data Qualifier Definitions were supplied by the Office of Solid Waste and Emergency Response (September 1989) and are included in the Functional Guidelines. Data qualifiers may be combined (UJ, QJ) with the corresponding combination of meanings. Additional qualifier may be added to provide additional, more specific information (JL, UB, QJK), modifying the meaning of the primary qualifier. Addition qualifiers utilized by WESTON are H, L, K, B, Q, and D.

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation or detection limit, which has been adjusted for sample weight/sample volume, extraction volume, percent solids, sample dilution or other analysis specific parameters.

An additional qualifier, "B", may be appended to indicate that while the analyte was detected in the sample, the presence of the analyte may be attributable to blank contamination and the analyte is therefore considered undetected with the sample detection or quantitation limit for the analyte being elevated.

J - The analyte was analyzed for, but the associated numerical value may not be consistent with the amount actually present in the environmental sample or may not be consistent with the sample detection or quantitation limit. The value is an estimated quantity. The data should be seriously considered for decision-making and are usable for many purposes.

An additional qualifier will be appended to the "J" qualifier that indicates the bias in the reported results:

L Low bias

H High bias

K Unknown bias

Q The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.

The L and H qualifier will only be employed when a single qualification is required. When more than one quality control parameter affects the analytical result and a conflict results in assigning a bias, the result will be flagged JK.

R - Quality Control indicates that data are unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte has not been verified. Resampling and reanalysis are necessary for verification to confirm or deny the presence of an analyte.

N - The analysis indicates the presence of analyte for which there is presumptive evidence to make a "tentative identification."

D - The concentration reported was determined in the re-analysis of the sample at a secondary dilution.

METALS DATA EVALUATION

1. Analytical Method:

Samples were prepared and analyzed for ICP metals using the procedures specified in **SW-846 Method 6010B.** Samples were prepared and analyzed for mercury using the procedures specified in **SW-846 Method 7470A or 7471A.**

2. Holding Times:

All samples met established holding time criteria of 180 days for ICP metals and 28 days for mercury. Aqueous samples were preserved in the field with nitric acid. No qualifications are placed on the data.

3. Initial Calibration:

ICP initial calibration included a blank and one standard and initial calibration verification (ICV) results fell within the control limits of 90 to 110 percent of the true values. Mercury initial calibration included a blank and five standards and the correlation coefficient was greater than 0.995. No qualifications are placed on the data.

4. Continuing Calibration:

All ICP results fell within the control limits of 90% to 110% of the true values. All mercury results fell within the control limits of 80% to 120% of the true values. No qualifications are placed on the data.

5. CRDL Standard:

All results for the CRDL standard were within the control limits of 70% to 130% of the true values or the sample results were greater than the CRDL action level. No qualifications are placed on the data.

6. Blanks:

A. Laboratory Blanks:

No target analytes were detected in the calibration or preparation blank(s) associated with this analytical package or the sample results were greater than the blank action concentration. No qualifications are placed on the data.

B. Field Blanks:

No target analytes were detected in the following field blank associated with this analytical package: Rinsate 030210. No qualifications are placed on the data.

7. ICP Interference Check:

All results for the Interference Check Sample were within the control limits of 80% to 120% of the true values. No qualifications are placed on the data.

8. Laboratory Control Sample (LCS):

The recoveries for the LCS were within the 80-120% control limit. No qualifications are placed on the data.

9. Duplicate Sample Analysis:

A. Laboratory Duplicate Analysis:

Sample Rinsate 030210 underwent duplicate analysis for the aqueous matrix for ICP metals and mercury and sample RSJ-SED-03 underwent duplicate analysis for the sediment matrix for ICP metals and mercury. The Relative Percent Difference (RPD) values for the duplicate sample analyses were within QC criteria of less than 20% for aqueous samples and less than 35% for sediment samples for concentrations greater than five times the reporting limit (RL). For sample concentrations less than five times the RL, the QC criteria are within ± the RL for the aqueous matrix or ± two times the RL for the sediment matrix.

B. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis:

Sample Rinsate 030210 underwent MS/MSD analysis for the aqueous matrix for ICP metals and mercury and sample RSJ-SED-03 underwent MS/MSD analysis for the sediment matrix for ICP metals and mercury. RPD criteria were met for all analytes. No qualifications are placed on the data.

C. Field Duplicate Analysis:

The following sample pair was submitted as field duplicates for the sediment matrix: RP-SED-BG/RP-SED-BGD. The following sample pair was submitted as field duplicates for the aqueous matrix: RP-SW-BG/RP-SW-BGD. The RPD values for the field duplicate sample analyses were within the criteria of less than 30% for aqueous samples and less than 50% for sediment samples for concentrations greater than five times the RL. For sample concentrations less than five times the RL, the absolute difference between the samples is less than two times the RL for aqueous samples or less than 3.5 times the RL for sediment samples. No qualifications are placed on the data.

10. Spiked Sample Analysis:

Sample Rinsate 030210 underwent MS/MSD analysis for the aqueous matrix for ICP metals and mercury and sample RSJ-SED-03 underwent MS/MSD analysis for the sediment matrix for ICP metals and mercury. The spike recoveries for the following analyte was outside of the 75%-125% QC recovery limits for analytes whose sample concentration did not exceed the spike concentration by a factor of 4 times or more:

ANALYTE	MATRIX	% RECOVERY	AFFECTED SAMPLES	QUALIFIER FLAG
Antimony	Sediment	64/54	All Sediments	UJL

The post spike recovery for antimony was acceptable indicating possible digestion problems.

11. ICP Serial Dilution:

Samples Rinsate 030210 and RSJ-SED-03 underwent serial dilution. The Percent Difference (%D) values for ICP serial dilution analysis were within the QC limits of 10% for all analytes with concentrations greater than 50 times their method detection limit (MDL).

12. Sample Quantitation and RLs

Concentrations of all reported analytes were correctly calculated.

13. Laboratory Contact

The laboratory was contacted on March 18, 2010 regarding the lack of calculated recoveries for the CRI standards analyzed with this analytical package. An acceptable response was received on March 18, 2010.

14. Overall Assessment:

Antimony results were estimated in all sediment samples due to poor MS/MSD recoveries.

The analytical data is acceptable for use with the qualifications listed above.

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: Rinsate 030210
Lab ID: 1003045-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 04-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100304-3
QCBatchID: IP100304-3-1
Run ID: IT100304-2A1
Cleanup: NONE
Basis: As Received
File Name: 100304A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.2	0.2	U	
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	1	1	U	
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.1	0.1	U	
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	1	1	U	
7439-96-5	MANGANESE	1	0.01	0.01	U	
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	1	1	U	
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	1	1	U	
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group – FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RM-SED-BG
Lab ID: 1003045-2

Sample Matrix: SEDIMENT
% Moisture: 35.4
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.005 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	8400	31		
7440-36-0	ANTIMONY	1	3.1	3.1	~~U~~ VJL	
7440-38-2	ARSENIC	1	6.9	1.5		
7440-39-3	BARIUM	1	100	15		
7440-41-7	BERYLLIUM	1	0.77	0.77	U	
7440-43-9	CADMIUM	1	0.77	0.77	U	
7440-70-2	CALCIUM	1	20000	150		
7440-47-3	CHROMIUM	1	8.8	1.5		
7440-48-4	COBALT	1	6.6	1.5		
7440-50-8	COPPER	1	12	1.5		
7439-89-6	IRON	1	23000	15		
7439-92-1	LEAD	1	12	0.46		
7439-95-4	MAGNESIUM	1	5400	150		
7439-96-5	MANGANESE	1	200	1.5		
7440-02-0	NICKEL	1	13	3.1		
7440-09-7	POTASSIUM	1	1800	150		
7782-49-2	SELENIUM	1	0.77	0.77	U	
7440-22-4	SILVER	1	1.5	1.5	U	
7440-23-5	SODIUM	1	310	150		
7440-28-0	THALLIUM	1	1.5	1.5	U	
7440-62-2	VANADIUM	1	21	1.5		
7440-66-6	ZINC	1	46	3.1		

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Data Package ID: *IT1003045-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RM-SW-BG
Lab ID: 1003045-3

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 04-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100304-3
QCBatchID: IP100304-3-1
Run ID: IT100304-2A1
Cleanup: NONE
Basis: As Received
File Name: 100304A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.2	0.2	U	
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	100	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.18	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	56	1		
7439-96-5	MANGANESE	1	0.027	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	5.9	1		
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	94	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RSJ-SED-03
Lab ID: 1003045-4

Sample Matrix: SEDIMENT
% Moisture: 8.0
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.004 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	2800	22		
7440-36-0	ANTIMONY	1	2.2	2.2 ~~U~~ VJL		N
7440-38-2	ARSENIC	1	1.5	1.1		
7440-39-3	BARIUM	1	77	11		
7440-41-7	BERYLLIUM	1	0.54	0.54	U	
7440-43-9	CADMIUM	1	0.54	0.54	U	
7440-70-2	CALCIUM	1	6200	110		
7440-47-3	CHROMIUM	1	2.6	1.1		
7440-48-4	COBALT	1	1.6	1.1		
7440-50-8	COPPER	1	2.4	1.1		
7439-89-6	IRON	1	5100	11		*
7439-92-1	LEAD	1	2.9	0.32		*
7439-95-4	MAGNESIUM	1	1300	110		*
7439-96-5	MANGANESE	1	75	1.1		
7440-02-0	NICKEL	1	3.2	2.2		
7440-09-7	POTASSIUM	1	580	110		*
7782-49-2	SELENIUM	1	0.54	0.54	U	
7440-22-4	SILVER	1	1.1	1.1	U	
7440-23-5	SODIUM	1	160	110		
7440-28-0	THALLIUM	1	1.1	1.1	U	
7440-62-2	VANADIUM	1	6.9	1.1		
7440-66-6	ZINC	1	10	2.2		

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RSJ-SED-BG
Lab ID: 1003045-5

Sample Matrix: SEDIMENT
% Moisture: 29.2
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.041 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	5400	27		
7440-36-0	ANTIMONY	1	2.7	2.7 ~~U~~ UJL		
7440-38-2	ARSENIC	1	2.3	1.4		
7440-39-3	BARIUM	1	100	14		
7440-41-7	BERYLLIUM	1	0.68	0.68	U	
7440-43-9	CADMIUM	1	0.68	0.68	U	
7440-70-2	CALCIUM	1	14000	140		
7440-47-3	CHROMIUM	1	4.2	1.4		
7440-48-4	COBALT	1	2.9	1.4		
7440-50-8	COPPER	1	4.8	1.4		
7439-89-6	IRON	1	8500	14		
7439-92-1	LEAD	1	5.6	0.41		
7439-95-4	MAGNESIUM	1	2700	140		
7439-96-5	MANGANESE	1	160	1.4		
7440-02-0	NICKEL	1	5.2	2.7		
7440-09-7	POTASSIUM	1	1200	140		
7782-49-2	SELENIUM	1	0.68	0.68	U	
7440-22-4	SILVER	1	1.4	1.4	U	
7440-23-5	SODIUM	1	280	140		
7440-28-0	THALLIUM	1	1.4	1.4	U	
7440-62-2	VANADIUM	1	12	1.4		
7440-66-6	ZINC	1	18	2.7		

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Data Package ID: *IT1003045-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RSJ-SW-03
Lab ID: 1003045-6

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 04-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100304-3
QCBatchID: IP100304-3-1
Run ID: IT100304-2A1
Cleanup: NONE
Basis: As Received
File Name: 100304A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.43	0.2		
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	100	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.32	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	55	1		
7439-96-5	MANGANESE	1	0.023	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	8	1		
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	180	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

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Data Package ID: *IT1003045-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RSJ-SW-BG
Lab ID: 1003045-7

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 04-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100304-3
QCBatchID: IP100304-3-1
Run ID: IT100304-2A1
Cleanup: NONE
Basis: As Received
File Name: 100304A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.77	0.2		
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	98	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.53	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	53	1		
7439-96-5	MANGANESE	1	0.056	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	7.8	1		
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	170	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: MD-SED-0-2'
Lab ID: 1003045-8

Sample Matrix: SEDIMENT
% Moisture: 25.8
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.022 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	9600	26		
7440-36-0	ANTIMONY	1	2.6	2.6	~~U~~ VJL	
7440-38-2	ARSENIC	1	4.7	1.3		
7440-39-3	BARIUM	1	120	13		
7440-41-7	BERYLLIUM	1	0.67	0.66		
7440-43-9	CADMIUM	1	0.66	0.66	U	
7440-70-2	CALCIUM	1	13000	130		
7440-47-3	CHROMIUM	1	8	1.3		
7440-48-4	COBALT	1	5.2	1.3		
7440-50-8	COPPER	1	9	1.3		
7439-89-6	IRON	1	17000	13		
7439-92-1	LEAD	1	10	0.4		
7439-95-4	MAGNESIUM	1	3600	130		
7439-96-5	MANGANESE	1	120	1.3		
7440-02-0	NICKEL	1	11	2.6		
7440-09-7	POTASSIUM	1	1900	130		
7782-49-2	SELENIUM	1	0.72	0.66		
7440-22-4	SILVER	1	1.3	1.3	U	
7440-23-5	SODIUM	1	210	130		
7440-28-0	THALLIUM	1	1.3	1.3	U	
7440-62-2	VANADIUM	1	19	1.3		
7440-66-6	ZINC	1	34	2.6		

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: MD-SED-2-4'
Lab ID: 1003045-9

Sample Matrix: SEDIMENT
% Moisture: 16.4
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.034 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	4700	23		
7440-36-0	ANTIMONY	1	2.3	2.3	~~U~~ UJL	
7440-38-2	ARSENIC	1	1.5	1.2		
7440-39-3	BARIUM	1	130	12		
7440-41-7	BERYLLIUM	1	0.58	0.58	U	
7440-43-9	CADMIUM	1	0.58	0.58	U	
7440-70-2	CALCIUM	1	9300	120		
7440-47-3	CHROMIUM	1	4.1	1.2		
7440-48-4	COBALT	1	2.1	1.2		
7440-50-8	COPPER	1	2.7	1.2		
7439-89-6	IRON	1	6800	12		
7439-92-1	LEAD	1	3.8	0.35		
7439-95-4	MAGNESIUM	1	1600	120		
7439-96-5	MANGANESE	1	79	1.2		
7440-02-0	NICKEL	1	4.7	2.3		
7440-09-7	POTASSIUM	1	810	120		
7782-49-2	SELENIUM	1	0.58	0.58	U	
7440-22-4	SILVER	1	1.2	1.2	U	
7440-23-5	SODIUM	1	120	120	U	
7440-28-0	THALLIUM	1	1.2	1.2	U	
7440-62-2	VANADIUM	1	12	1.2		
7440-66-6	ZINC	1	12	2.3		

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: MD-SED-4-6'
Lab ID: 1003045-10

Sample Matrix: SEDIMENT
% Moisture: 16.9
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.009 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	6500	24		
7440-36-0	ANTIMONY	1	2.4	2.4	~~U~~ UJL	
7440-38-2	ARSENIC	1	2.1	1.2		
7440-39-3	BARIUM	1	100	12		
7440-41-7	BERYLLIUM	1	0.6	0.6	U	
7440-43-9	CADMIUM	1	0.6	0.6	U	
7440-70-2	CALCIUM	1	8700	120		
7440-47-3	CHROMIUM	1	3.9	1.2		
7440-48-4	COBALT	1	2.6	1.2		
7440-50-8	COPPER	1	1.8	1.2		
7439-89-6	IRON	1	6700	12		
7439-92-1	LEAD	1	4.5	0.36		
7439-95-4	MAGNESIUM	1	1800	120		
7439-96-5	MANGANESE	1	69	1.2		
7440-02-0	NICKEL	1	4.9	2.4		
7440-09-7	POTASSIUM	1	940	120		
7782-49-2	SELENIUM	1	0.6	0.6	U	
7440-22-4	SILVER	1	1.2	1.2	U	
7440-23-5	SODIUM	1	150	120		
7440-28-0	THALLIUM	1	1.2	1.2	U	
7440-62-2	VANADIUM	1	11	1.2		
7440-66-6	ZINC	1	11	2.4		

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: PR-SED-01
Lab ID: 1003045-11

Sample Matrix: SEDIMENT
% Moisture: 21.5
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.018 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	2400	25		
7440-36-0	ANTIMONY	1	2.5	2.5	~~U~~ UJL	
7440-38-2	ARSENIC	1	1.3	1.3	U	
7440-39-3	BARIUM	1	24	13		
7440-41-7	BERYLLIUM	1	0.63	0.63	U	
7440-43-9	CADMIUM	1	0.63	0.63	U	
7440-70-2	CALCIUM	1	19000	130		
7440-47-3	CHROMIUM	1	1.3	1.3	U	
7440-48-4	COBALT	1	2.2	1.3		
7440-50-8	COPPER	1	2.2	1.3		
7439-89-6	IRON	1	3700	13		
7439-92-1	LEAD	1	4	0.38		
7439-95-4	MAGNESIUM	1	2400	130		
7439-96-5	MANGANESE	1	500	1.3		
7440-02-0	NICKEL	1	2.9	2.5		
7440-09-7	POTASSIUM	1	450	130		
7782-49-2	SELENIUM	1	0.63	0.63	U	
7440-22-4	SILVER	1	1.3	1.3	U	
7440-23-5	SODIUM	1	1500	130		
7440-28-0	THALLIUM	1	1.3	1.3	U	
7440-62-2	VANADIUM	1	6.1	1.3		
7440-66-6	ZINC	1	7	2.5		

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SED-BG
Lab ID: 1003045-12

Sample Matrix: SEDIMENT
% Moisture: 29.6
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.02 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	6800	28		
7440-36-0	ANTIMONY	1	2.8	2.8	~~U~~ VJL	
7440-38-2	ARSENIC	1	6.8	1.4		
7440-39-3	BARIUM	1	88	14		
7440-41-7	BERYLLIUM	1	0.7	0.7	U	
7440-43-9	CADMIUM	1	0.7	0.7	U	
7440-70-2	CALCIUM	1	16000	140		
7440-47-3	CHROMIUM	1	6.9	1.4		
7440-48-4	COBALT	1	6.5	1.4		
7440-50-8	COPPER	1	7.5	1.4		
7439-89-6	IRON	1	24000	14		
7439-92-1	LEAD	1	9.3	0.42		
7439-95-4	MAGNESIUM	1	4100	140		
7439-96-5	MANGANESE	1	220	1.4		
7440-02-0	NICKEL	1	11	2.8		
7440-09-7	POTASSIUM	1	1300	140		
7782-49-2	SELENIUM	1	0.9	0.7		
7440-22-4	SILVER	1	1.4	1.4	U	
7440-23-5	SODIUM	1	280	140		
7440-28-0	THALLIUM	1	1.4	1.4	U	
7440-62-2	VANADIUM	1	23	1.4		
7440-66-6	ZINC	1	40	2.8		

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SED-BGD
Lab ID: 1003045-13

Sample Matrix: SEDIMENT
% Moisture: 35.8
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.014 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	7300	31		
7440-36-0	ANTIMONY	1	3.1	3.1	~~U~~ UJL	
7440-38-2	ARSENIC	1	5.4	1.5		
7440-39-3	BARIUM	1	110	15		
7440-41-7	BERYLLIUM	1	0.77	0.77	U	
7440-43-9	CADMIUM	1	0.77	0.77	U	
7440-70-2	CALCIUM	1	18000	150		
7440-47-3	CHROMIUM	1	7.7	1.5		
7440-48-4	COBALT	1	5.9	1.5		
7440-50-8	COPPER	1	8.7	1.5		
7439-89-6	IRON	1	20000	15		
7439-92-1	LEAD	1	9.9	0.46		
7439-95-4	MAGNESIUM	1	4600	150		
7439-96-5	MANGANESE	1	270	1.5		
7440-02-0	NICKEL	1	11	3.1		
7440-09-7	POTASSIUM	1	1600	150		
7782-49-2	SELENIUM	1	0.77	0.77	U	
7440-22-4	SILVER	1	1.5	1.5	U	
7440-23-5	SODIUM	1	150	150	U	
7440-28-0	THALLIUM	1	1.5	1.5	U	
7440-62-2	VANADIUM	1	22	1.5		
7440-66-6	ZINC	1	39	3.1		

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Data Package ID: *IT1003045-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SW-BG
Lab ID: 1003045-14

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 04-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100304-3
QCBatchID: IP100304-3-1
Run ID: IT100304-2A1
Cleanup: NONE
Basis: As Received
File Name: 100304A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.2	0.2	U	
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	54	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.27	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	19	1		
7439-96-5	MANGANESE	1	0.045	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	3.7	1		
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	21	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

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Data Package ID: *IT1003045-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SW-BGD
Lab ID: 1003045-15

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 04-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100304-3
QCBatchID: IP100304-3-1
Run ID: IT100304-2A1
Cleanup: NONE
Basis: As Received
File Name: 100304A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.2	0.2	U	
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	54	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.26	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	19	1		
7439-96-5	MANGANESE	1	0.044	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	3.7	1		
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	21	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RSJ-SED-02
Lab ID: 1003045-16

Sample Matrix: SEDIMENT
% Moisture: 40.2
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.019 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	9800	33		
7440-36-0	ANTIMONY	1	3.3	3.3	~~U~~ VJL	
7440-38-2	ARSENIC	1	5.2	1.6		
7440-39-3	BARIUM	1	150	16		
7440-41-7	BERYLLIUM	1	0.82	0.82	U	
7440-43-9	CADMIUM	1	0.82	0.82	U	
7440-70-2	CALCIUM	1	25000	160		
7440-47-3	CHROMIUM	1	7.7	1.6		
7440-48-4	COBALT	1	6.1	1.6		
7440-50-8	COPPER	1	11	1.6		
7439-89-6	IRON	1	18000	16		
7439-92-1	LEAD	1	11	0.49		
7439-95-4	MAGNESIUM	1	5000	160		
7439-96-5	MANGANESE	1	360	1.6		
7440-02-0	NICKEL	1	10	3.3		
7440-09-7	POTASSIUM	1	2200	160		
7782-49-2	SELENIUM	1	0.82	0.82	U	
7440-22-4	SILVER	1	1.6	1.6	U	
7440-23-5	SODIUM	1	500	160		
7440-28-0	THALLIUM	1	1.6	1.6	U	
7440-62-2	VANADIUM	1	19	1.6		
7440-66-6	ZINC	1	39	3.3		

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: WR-SED-0-2'
Lab ID: 1003045-17

Sample Matrix: SEDIMENT
% Moisture: 5.1
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.036 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	2500	20		
7440-36-0	ANTIMONY	1	2	2	~~U~~ UJL	
7440-38-2	ARSENIC	1	1.3	1		
7440-39-3	BARIUM	1	170	10		
7440-41-7	BERYLLIUM	1	0.51	0.51	U	
7440-43-9	CADMIUM	1	0.51	0.51	U	
7440-70-2	CALCIUM	1	8100	100		
7440-47-3	CHROMIUM	1	4.4	1		
7440-48-4	COBALT	1	2	1		
7440-50-8	COPPER	1	2.6	1		
7439-89-6	IRON	1	6700	10		
7439-92-1	LEAD	1	3.4	0.3		
7439-95-4	MAGNESIUM	1	1200	100		
7439-96-5	MANGANESE	1	100	1		
7440-02-0	NICKEL	1	3.3	2		
7440-09-7	POTASSIUM	1	700	100		
7782-49-2	SELENIUM	1	0.51	0.51	U	
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	1	1	1	U	
7440-62-2	VANADIUM	1	12	1		
7440-66-6	ZINC	1	12	2		

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: WR-SED-3'
Lab ID: 1003045-18

Sample Matrix: SEDIMENT
% Moisture: 19.9
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.036 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	660	24		
7440-36-0	ANTIMONY	1	2.4	2.4	~~U~~ UJL	
7440-38-2	ARSENIC	1	1.2	1.2	U	
7440-39-3	BARIUM	1	56	12		
7440-41-7	BERYLLIUM	1	0.6	0.6	U	
7440-43-9	CADMIUM	1	0.6	0.6	U	
7440-70-2	CALCIUM	1	4200	120		
7440-47-3	CHROMIUM	1	1.2	1.2	U	
7440-48-4	COBALT	1	1.2	1.2	U	
7440-50-8	COPPER	1	1.2	1.2	U	
7439-89-6	IRON	1	1400	12		
7439-92-1	LEAD	1	0.95	0.36		
7439-95-4	MAGNESIUM	1	320	120		
7439-96-5	MANGANESE	1	32	1.2		
7440-02-0	NICKEL	1	2.4	2.4	U	
7440-09-7	POTASSIUM	1	120	120	U	
7782-49-2	SELENIUM	1	0.6	0.6	U	
7440-22-4	SILVER	1	1.2	1.2	U	
7440-23-5	SODIUM	1	120	120	U	
7440-28-0	THALLIUM	1	1.2	1.2	U	
7440-62-2	VANADIUM	1	2.4	1.2		
7440-66-6	ZINC	1	3.1	2.4		

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: WR-SED-5.5'
Lab ID: 1003045-19

Sample Matrix: SEDIMENT
% Moisture: 19.5
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.041 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	660	24		
7440-36-0	ANTIMONY	1	2.4	2.4	UJL	
7440-38-2	ARSENIC	1	1.2	1.2	U	
7440-39-3	BARIUM	1	73	12		
7440-41-7	BERYLLIUM	1	0.6	0.6	U	
7440-43-9	CADMIUM	1	0.6	0.6	U	
7440-70-2	CALCIUM	1	4300	120		
7440-47-3	CHROMIUM	1	1.2	1.2	U	
7440-48-4	COBALT	1	1.2	1.2	U	
7440-50-8	COPPER	1	1.2	1.2	U	
7439-89-6	IRON	1	1800	12		
7439-92-1	LEAD	1	1.2	0.36		
7439-95-4	MAGNESIUM	1	340	120		
7439-96-5	MANGANESE	1	40	1.2		
7440-02-0	NICKEL	1	2.4	2.4	U	
7440-09-7	POTASSIUM	1	120	120	U	
7782-49-2	SELENIUM	1	0.6	0.6	U	
7440-22-4	SILVER	1	1.2	1.2	U	
7440-23-5	SODIUM	1	120	120	U	
7440-28-0	THALLIUM	1	1.2	1.2	U	
7440-62-2	VANADIUM	1	3.5	1.2		
7440-66-6	ZINC	1	2.6	2.4		

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Data Package ID: *IT1003045-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: PR-SW-01
Lab ID: 1003045-20

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 04-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100304-3
QCBatchID: IP100304-3-1
Run ID: IT100304-2A1
Cleanup: NONE
Basis: As Received
File Name: 100304A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.2	0.2	U	
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	440	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.1	0.1	U	
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	230	1		
7439-96-5	MANGANESE	1	0.25	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	19	1		
7782-49-2	SELENIUM	1	0.01	0.005		
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	100	420	100		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SED-03
Lab ID: 1003045-21

Sample Matrix: SEDIMENT
% Moisture: 39.4
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.023 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	11000	32		
7440-36-0	ANTIMONY	1	3.2	3.2	~~U~~ UJL	
7440-38-2	ARSENIC	1	7.9	1.6		
7440-39-3	BARIUM	1	130	16		
7440-41-7	BERYLLIUM	1	0.9	0.81		
7440-43-9	CADMIUM	1	0.81	0.81	U	
7440-70-2	CALCIUM	1	27000	160		
7440-47-3	CHROMIUM	1	9.8	1.6		
7440-48-4	COBALT	1	7.3	1.6		
7440-50-8	COPPER	1	14	1.6		
7439-89-6	IRON	1	24000	16		
7439-92-1	LEAD	1	15	0.48		
7439-95-4	MAGNESIUM	1	6700	160		
7439-96-5	MANGANESE	1	260	1.6		
7440-02-0	NICKEL	1	14	3.2		
7440-09-7	POTASSIUM	1	2500	160		
7782-49-2	SELENIUM	1	1.6	0.81		
7440-22-4	SILVER	1	1.6	1.6	U	
7440-23-5	SODIUM	1	470	160		
7440-28-0	THALLIUM	1	1.6	1.6	U	
7440-62-2	VANADIUM	1	23	1.6		
7440-66-6	ZINC	1	50	3.2		

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Data Package ID: *IT1003045-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SW-03
Lab ID: 1003045-22

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 04-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100304-3
QCBatchID: IP100304-3-1
Run ID: IT100304-2A1
Cleanup: NONE
Basis: As Received
File Name: 100304A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.2	0.2	U	
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	150	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.1	0.1	U	
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	91	1		
7439-96-5	MANGANESE	1	0.01	0.01	U	
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	13	1		
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	140	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

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Data Package ID: *IT1003045-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RSJ-SED-01
Lab ID: 1003045-23

Sample Matrix: SEDIMENT
% Moisture: 22.8
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 05-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100304-4
QCBatchID: IP100304-4-1
Run ID: IT100305-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100305A.

Sample Aliquot: 1.041 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	2100	25		
7440-36-0	ANTIMONY	1	2.5	2.5	~~U~~ UJL	
7440-38-2	ARSENIC	1	1.3	1.2		
7440-39-3	BARIUM	1	73	12		
7440-41-7	BERYLLIUM	1	0.62	0.62	U	
7440-43-9	CADMIUM	1	0.62	0.62	U	
7440-70-2	CALCIUM	1	6900	120		
7440-47-3	CHROMIUM	1	1.5	1.2		
7440-48-4	COBALT	1	1.2	1.2	U	
7440-50-8	COPPER	1	1.5	1.2		
7439-89-6	IRON	1	3700	12		
7439-92-1	LEAD	1	2.4	0.37		
7439-95-4	MAGNESIUM	1	1100	120		
7439-96-5	MANGANESE	1	83	1.2		
7440-02-0	NICKEL	1	2.5	2.5	U	
7440-09-7	POTASSIUM	1	440	120		
7782-49-2	SELENIUM	1	0.62	0.62	U	
7440-22-4	SILVER	1	1.2	1.2	U	
7440-23-5	SODIUM	1	130	120		
7440-28-0	THALLIUM	1	1.2	1.2	U	
7440-62-2	VANADIUM	1	5	1.2		
7440-66-6	ZINC	1	7.4	2.5		

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Data Package ID: *IT1003045-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RSJ-SW-01
Lab ID: 1003045-24

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 04-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100304-3
QCBatchID: IP100304-3-1
Run ID: IT100304-2A1
Cleanup: NONE
Basis: As Received
File Name: 100304A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.61	0.2		
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	98	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.46	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	53	1		
7439-96-5	MANGANESE	1	0.045	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	7.8	1		
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	170	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

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Data Package ID: *IT1003045-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003045
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RSJ-SW-02
Lab ID: 1003045-25

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 02-Mar-10
Date Extracted: 04-Mar-10
Date Analyzed: 04-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100304-3
QCBatchID: IP100304-3-1
Run ID: IT100304-2A1
Cleanup: NONE
Basis: As Received
File Name: 100304A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.72	0.2		
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	96	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.52	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	52	1		
7439-96-5	MANGANESE	1	0.042	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	7.9	1		
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	170	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

3/17/10

Data Package ID: *IT1003045-1*

Total MERCURY

Method SW7470A

Sample Results

Lab Name: ALS Laboratory Group -- FC
Client Name: Weston Solutions, Inc.
Client Project ID: Paguate TO0019100202
Work Order Number: 1003045
Reporting Basis: As Received
Prep Method: METHOD
Final Volume: 20 g
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
Rinsate 030210	1003045-1	03/02/2010	03/04/2010	03/05/2010	N/A	1	0.0002	0.0002	U	20 g
RM-SW-BG	1003045-3	03/02/2010	03/04/2010	03/05/2010	N/A	1	0.0002	0.0002	U	20 g
RSJ-SW-03	1003045-6	03/02/2010	03/04/2010	03/05/2010	N/A	1	0.0002	0.0002	U	20 g
RSJ-SW-BG	1003045-7	03/02/2010	03/04/2010	03/05/2010	N/A	1	0.0002	0.0002	U	20 g
RP-SW-BG	1003045-14	03/02/2010	03/04/2010	03/05/2010	N/A	1	0.0002	0.0002	U	20 g
RP-SW-BGD	1003045-15	03/02/2010	03/04/2010	03/05/2010	N/A	1	0.0002	0.0002	U	20 g
PR-SW-01	1003045-20	03/02/2010	03/04/2010	03/05/2010	N/A	1	0.0002	0.0002	U	20 g
RP-SW-03	1003045-22	03/02/2010	03/04/2010	03/05/2010	N/A	1	0.0002	0.0002	U	20 g
RSJ-SW-01	1003045-24	03/02/2010	03/04/2010	03/05/2010	N/A	1	0.0002	0.0002	U	20 g
RSJ-SW-02	1003045-25	03/02/2010	03/04/2010	03/05/2010	N/A	1	0.0002	0.0002	U	20 g

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

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Data Package ID: *HG1003045-1*

Total MERCURY

Method SW7471A

Sample Results

Lab Name: ALS Laboratory Group -- FC
Client Name: Weston Solutions, Inc.
Client Project ID: Paguate TO0019100202
Work Order Number: 1003045 **Final Volume:** 100 g
Reporting Basis: Dry Weight **Matrix:** SEDIMENT
Prep Method: METHOD **Result Units:** MG/KG

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
RM-SED-BG	1003045-2	03/02/2010	03/04/2010	03/05/2010	35.4	1	0.051	0.051	U	0.607 g
RSJ-SED-03	1003045-4	03/02/2010	03/04/2010	03/05/2010	8.0	1	0.036	0.036	U	0.603 g
RSJ-SED-BG	1003045-5	03/02/2010	03/04/2010	03/05/2010	29.2	1	0.047	0.047	U	0.604 g
MD-SED-0-2'	1003045-8	03/02/2010	03/04/2010	03/05/2010	25.8	1	0.045	0.045	U	0.602 g
MD-SED-2-4'	1003045-9	03/02/2010	03/04/2010	03/05/2010	16.4	1	0.04	0.04	U	0.6 g
MD-SED-4-6'	1003045-10	03/02/2010	03/04/2010	03/05/2010	16.9	1	0.04	0.04	U	0.605 g
PR-SED-01	1003045-11	03/02/2010	03/04/2010	03/05/2010	21.5	1	0.042	0.042	U	0.604 g
RP-SED-BG	1003045-12	03/02/2010	03/04/2010	03/05/2010	29.6	1	0.047	0.047	U	0.606 g
RP-SED-BGD	1003045-13	03/02/2010	03/04/2010	03/05/2010	35.8	1	0.051	0.051	U	0.605 g
RSJ-SED-02	1003045-16	03/02/2010	03/04/2010	03/05/2010	40.2	1	0.055	0.055	U	0.604 g
WR-SED-0-2'	1003045-17	03/02/2010	03/04/2010	03/05/2010	5.1	1	0.035	0.035	U	0.601 g
WR-SED-3'	1003045-18	03/02/2010	03/04/2010	03/05/2010	19.9	1	0.042	0.042	U	0.601 g
WR-SED-5.5'	1003045-19	03/02/2010	03/04/2010	03/05/2010	19.5	1	0.041	0.041	U	0.601 g
RP-SED-03	1003045-21	03/02/2010	03/04/2010	03/05/2010	39.4	1	0.055	0.055	U	0.601 g
RSJ-SED-01	1003045-23	03/02/2010	03/04/2010	03/05/2010	22.8	1	0.043	0.043	U	0.601 g

Comments:

3/17/10

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *HG1003045-1*

DATA QUALITY ASSURANCE REVIEW

SITE NAME	Jackpile-Paguate Uranium Mine		
CERCLIS	NMN000607033		
WORK ORDER NUMBER	20406.012.019.0514.01	TDD NUMBER	TO-0019-10-02-02
PROJECT NUMBER		SDG NUMBER	1003045

Weston Solutions, Inc. (WESTON®) has completed a QA review for Work Order Number 20406.012.019.0514.01, SDG No.1003045, Jackpile-Paguate Uranium Mine. Twenty five samples were analyzed for cyanide by ALS Laboratory Group. Sample numbers are listed below.

SAMPLE NUMBERS

Rinsate 030210	RM-SED-BG	RM-SW-BG
RSJ-SED-03	RSJ-SED-BG	RSJ-SW-03
RSJ-SW-BG	MD-SED-0-2'	MD-SED-2-4'
MD-SED-4-6'	PR-SED-01	RP-SED-BG
RP-SED-BGD	RP-SW-BG	RP-SW-BGD
RSJ-SED-02	WR-SED-0-2'	WR-SED-3'
WR-SED-5.5'	PR-SW-01	RP-SED-03
RP-SW-03	RSJ-SED-01	RSJ-SW-01
RSJ-SW-02		

This data package was validated to determine if Quality Control (QC) specifications were achieved, following *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (October, 1999), *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (July, 2002), *USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data Review* (August, 2002), *Quality Assurance/Quality Control Guidance for Removal Activities* (April, 1990), and the Regional Protocol for Holding Times, Blanks, and VOA Preservation (April 13, 1989). Specific data qualifications are listed in the following discussion.

REVIEWER	Gloria J. Switalski	DATE	March 19, 2010

2500033

Gloria J. Switalski

Data Qualifiers

Data Qualifier Definitions were supplied by the Office of Solid Waste and Emergency Response (September 1989) and are included in the Functional Guidelines. Data qualifiers may be combined (UJ, QJ) with the corresponding combination of meanings. Additional qualifier may be added to provide additional, more specific information (JL, UB, QJK), modifying the meaning of the primary qualifier. Addition qualifiers utilized by WESTON are H, L, K, B, Q, and D.

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation or detection limit, which has been adjusted for sample weight/sample volume, extraction volume, percent solids, sample dilution or other analysis specific parameters.

An additional qualifier, "B", may be appended to indicate that while the analyte was detected in the sample, the presence of the analyte may be attributable to blank contamination and the analyte is therefore considered undetected with the sample detection or quantitation limit for the analyte being elevated.

J - The analyte was analyzed for, but the associated numerical value may not be consistent with the amount actually present in the environmental sample or may not be consistent with the sample detection or quantitation limit. The value is an estimated quantity. The data should be seriously considered for decision-making and are usable for many purposes.

An additional qualifier will be appended to the "J" qualifier that indicates the bias in the reported results:

L Low bias

H High bias

K Unknown bias

Q The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.

The L and H qualifier will only be employed when a single qualification is required. When more than one quality control parameter affects the analytical result and a conflict results in assigning a bias, the result will be flagged JK.

R - Quality Control indicates that data are unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte has not been verified. Resampling and reanalysis are necessary for verification to confirm or deny the presence of an analyte.

N - The analysis indicates the presence of analyte for which there is presumptive evidence to make a "tentative identification."

D - The concentration reported was determined in the re-analysis of the sample at a secondary dilution.

CYANIDE DATA EVALUATION

1. Analytical Method:

Samples were prepared and analyzed for cyanide using the procedures specified in **SW-846 Method 9014**.

2. Holding Times:

All samples met established holding time criteria of 14 days for cyanide. Aqueous samples were preserved in the field with sodium hydroxide. Aqueous samples RM-SW-BG, RSJ-SW-03, RSJ-SW-BG, RP-SW-BGD, PR-SW-01, RP-SW-03, RSJ-SW-01, and RSJ-SW-02 were received at pH <12. The non-detected cyanide results in samples RM-SW-BG, RSJ-SW-03, RSJ-SW-BG, RP-SW-BGD, PR-SW-01, RP-SW-03, RSJ-SW-01, and RSJ-SW-02 were estimated (UJL) since the samples were not preserved to pH >12. Samples were maintained at 4°C±2°C. No further qualifications are placed on the data.

3. Initial Calibration:

Cyanide initial calibration included a blank and at least three standards. The initial calibration correlation coefficients for cyanide were greater than 0.995. The initial calibration verification results fell within the control limits of 85% to 115% of the true value. No qualifications are placed on the data.

4. Continuing Calibration:

All cyanide results fell within the control limits of 85% to 115% of the true value. No qualifications are placed on the data.

5. Blanks:

A. Laboratory Blanks:

Cyanide was not detected in the calibration and preparation blanks. No qualifications are placed on the data.

B. Field Blanks:

No cyanide was detected in the following field blank associated with this analytical package: Rinsate 030210. No qualifications are placed on the data.

6. Laboratory Control Sample (LCS):

The recoveries for the LCS were within the established control limits. No qualifications are placed on the data.

7. Duplicate Sample Analysis:

A. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis:

Sample RM-SED-BG underwent MS/MSD analysis for the sediment matrix. Sample RSJ-SW-03 underwent MS/MSD analysis for the aqueous matrix. The Relative Percent Difference (RPD) values for

the duplicate sample analyses were within QC criteria of less than 20% for aqueous samples and less than 35% for sediment samples for concentrations greater than five times the reporting limit (RL). For sample concentrations less than five times the RL, the QC criteria are within ± the RL for the aqueous matrix or ± two times the RL for the sediment matrix.

B. Field Duplicate Analysis:

The following sample pair was submitted as field duplicates for the sediment matrix: RP-SED-BG/RP-SED-BGD. The following sample pair was submitted as field duplicates for the aqueous matrix: RP-SW-BG/RP-SW-BGD. The RPD values for the field duplicate sample analyses were within the criteria of less than 30% for aqueous samples and less than 50% for sediment samples for concentrations greater than five times the RL. For sample concentrations less than five times the RL, the absolute difference between the samples is less than two times the RL for aqueous samples or less than 3.5 times the RL for sediment samples. No qualifications are placed on the data.

8. Spiked Sample Analysis:

Sample RM-SED-BG underwent MS/MSD analysis for the sediment matrix. Sample RSJ-SW-03 underwent MS/MSD analysis for the aqueous matrix. The spike recoveries for cyanide were within the control limit of 75% to 125% or the sample concentration exceeded the spike concentration by a factor of 4 times or more. No qualifications are placed on the data.

9. Sample Quantitation and Reporting Limits:

All samples for cyanide were reported as non-detect.

10. Laboratory Contact

No laboratory contact was required.

11. Overall Assessment:

The non-detected cyanide results in aqueous samples RM-SW-BG, RSJ-SW-03, RSJ-SW-BG, RP-SW-BGD, PR-SW-01, RP-SW-03, RSJ-SW-01, and RSJ-SW-02 were estimated (UJL) since the samples were not preserved to pH >12.

The analytical data is acceptable for use with the qualifications listed above.

CYANIDE, TOTAL

Method SW9014

Sample Results

Lab Name: ALS Laboratory Group -- FC
Client Name: Weston Solutions, Inc.
Client Project ID: Paguate TO0019100202
Work Order Number: 1003045
Reporting Basis: As Received
Prep Method: SW9010
Final Volume: 50 ml
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
Rinsate 030210	1003045-1	03/02/2010	03/05/2010	03/05/2010	N/A	1	0.01	0.01	U	50 ml
RM-SW-BG	1003045-3	03/02/2010	03/05/2010	03/05/2010	N/A	1	0.01	0.01	J	VJL 50 ml
RSJ-SW-03	1003045-6	03/02/2010	03/05/2010	03/05/2010	N/A	1	0.01	0.01	J	VJL 50 ml
RSJ-SW-BG	1003045-7	03/02/2010	03/05/2010	03/05/2010	N/A	1	0.01	0.01	J	VJL 50 ml
RP-SW-BG	1003045-14	03/02/2010	03/05/2010	03/05/2010	N/A	1	0.01	0.01	U	50 ml
RP-SW-BGD	1003045-15	03/02/2010	03/05/2010	03/05/2010	N/A	1	0.01	0.01	J	VJL 50 ml
PR-SW-01	1003045-20	03/02/2010	03/05/2010	03/05/2010	N/A	1	0.01	0.01	J	VJL 50 ml
RP-SW-03	1003045-22	03/02/2010	03/05/2010	03/05/2010	N/A	1	0.01	0.01	J	VJL 50 ml
RSJ-SW-01	1003045-24	03/02/2010	03/05/2010	03/05/2010	N/A	1	0.01	0.01	J	VJL 50 ml
RSJ-SW-02	1003045-25	03/02/2010	03/05/2010	03/05/2010	N/A	1	0.01	0.01	J	VJL 50 ml

3/17/10

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *cn1003045-1*

CYANIDE, TOTAL

Method SW9014

Sample Results

Lab Name: ALS Laboratory Group -- FC
Client Name: Weston Solutions, Inc.
Client Project ID: Paguate TO0019100202
Work Order Number: 1003045
Reporting Basis: Dry Weight
Prep Method: SW9010B

Final Volume: 50 ml
Matrix: SEDIMENT
Result Units: MG/KG

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
RM-SED-BG	1003045-2	03/02/2010	03/08/2010	03/08/2010	35.4	1	0.77	0.77	U	1 g
RSJ-SED-03	1003045-4	03/02/2010	03/08/2010	03/08/2010	8.0	1	0.54	0.54	U	1 g
RSJ-SED-BG	1003045-5	03/02/2010	03/08/2010	03/08/2010	29.2	1	0.71	0.71	U	1 g
MD-SED-0-2'	1003045-8	03/02/2010	03/08/2010	03/08/2010	25.8	1	0.67	0.67	U	1 g
MD-SED-2-4'	1003045-9	03/02/2010	03/08/2010	03/08/2010	16.4	1	0.6	0.6	U	1 g
MD-SED-4-6'	1003045-10	03/02/2010	03/08/2010	03/08/2010	16.9	1	0.6	0.6	U	1 g
PR-SED-01	1003045-11	03/02/2010	03/08/2010	03/08/2010	21.5	1	0.64	0.64	U	1 g
RP-SED-BG	1003045-12	03/02/2010	03/08/2010	03/08/2010	29.6	1	0.71	0.71	U	1 g
RP-SED-BGD	1003045-13	03/02/2010	03/08/2010	03/08/2010	35.8	1	0.78	0.78	U	1 g
RSJ-SED-02	1003045-16	03/02/2010	03/08/2010	03/08/2010	40.2	1	0.84	0.84	U	1 g
WR-SED-0-2'	1003045-17	03/02/2010	03/08/2010	03/08/2010	5.1	1	0.53	0.53	U	1 g
WR-SED-3'	1003045-18	03/02/2010	03/08/2010	03/08/2010	19.9	1	0.62	0.62	U	1 g
WR-SED-5.5'	1003045-19	03/02/2010	03/08/2010	03/08/2010	19.5	1	0.62	0.62	U	1 g
RP-SED-03	1003045-21	03/02/2010	03/08/2010	03/08/2010	39.4	1	0.83	0.83	U	1 g
RSJ-SED-01	1003045-23	03/02/2010	03/08/2010	03/08/2010	22.8	1	0.65	0.65	U	1 g

3/17/10

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *cn1003045-1*

1003045

CHAIN OF CUSTODY RECORD

No: TO0019100202-03/03/10-0005

Site #: TO0019100202
Contact Name: Weston Soloutions, Inc.
Contact Phone: Kristie Warr 832-444-7976

Lab: ALS
Lab Phone: 970.490.1511

Lab #	Sample #	Analyses	Analyses Turnaround Time	Analyses Turnaround Time Units	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
1	Rinsate 030210	TAL Metals + Mercury	3	Days	Water	3/2/2010	18:20	1	1 L poly	HNO3 pH<2		
	Rinsate 030210	Total Cyanide	3	Days	Water	3/2/2010	18:20	1	250 mL	NaOH		
	Rinsate 030210	Isotopic Uranium	3	Days	Water	3/2/2010	18:20	1	1 L poly	HNO3 pH<2		
2	RM-SED-BG	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	10:12	1	16 oz	4 C	24uR/hr	
3	RM-SW-BG	TAL Metals + Mercury	3	Days	Water	3/2/2010	10:12	1	1 L poly	HNO3 pH<2	24 uR/hr	
	RM-SW-BG	Total Cyanide	3	Days	Water	3/2/2010	10:12	1	250 mL	NaOH	24 uR/hr	
	RM-SW-BG	Isotopic Uranium	3	Days	Water	3/2/2010	10:12	1	1 L poly	HNO3 pH<2	24 uR/hr	
4	RSJ-SED-03	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	10:37	1	16 oz	4 C	8 uR/hr	
5	RSJ-SED-BG	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	11:46	1	16 oz	4 C	23 uR/hr	
6	RSJ-SW-03	TAL Metals + Mercury	3	Days	Water	3/2/2010	10:37	1	1 L poly	HNO3 pH<2	8 uR/hr	
	RSJ-SW-03	Total Cyanide	3	Days	Water	3/2/2010	10:37	1	250 mL	NaOH	8 uR/hr	
	RSJ-SW-03	Isotopic Uranium	3	Days	Water	3/2/2010	10:37	1	1 L poly	HNO3 pH<2	8 uR/hr	

Special Instructions: please email preliminary results to kristie.warr@westonsolutions.com and michelle.brown@westonsolutions.com

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
			Cheryl Trimble	3-4-10	755						

2500039

1003045

CHAIN OF CUSTODY RECORD

No: TO0019100202-03/03/10-0005

Site #: TO0019100202

Contact Name: Weston Soloutions, Inc.

Lab: ALS

Contact Phone: Kristie Warr 832-444-7976

Lab Phone: 970.490.1511

Lab #	Sample #	Analyses	Analyses Turnaround Time	Analyses Turnaround Time Units	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
(7)	RSJ-SW-BG	TAL Metals + Mercury	3	Days	Water	3/2/2010	11:46	1	1 L poly	HNO3 pH<2	23 uR/hr	
↓	RSJ-SW-BG	Total Cyanide	3	Days	Water	3/2/2010	11:46	1	250 mL	NaOH	23 uR/hr	
	RSJ-SW-BG	Isotopic Uranium	3	Days	Water	3/2/2010	11:46	1	1 L poly	HNO3 pH<2	23 uR/hr	

Special Instructions: please email preliminary results to kristie.warr@westonsolutions.com and michelle.brown@westonsolutions.com

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
			Cheryl Trumble	3-4-10	755						

2500040

2500040

1003045

CHAIN OF CUSTODY RECORD

No: TO0019100202-03/03/10-0004

Site #: TO0019100202

Contact Name: Weston Solutions, Inc.

Lab: ALS

Contact Phone: Kristie Warr 832.444.7976.

Lab Phone: 970.490.1511

Lab #	Sample #	Analyses	Analyses Turnaround Time	Analyses Turnaround Time Units	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
8	MD-SED-0-2'	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	16:45	1	16 oz	4 C	20 uR/hr	
9	MD-SED-2-4'	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	17:00	1	16 oz	4 C	17 uR/hr	
10	MD-SED-4-6'	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	17:15	1	16 oz	4 C	18 uR/hr	
11	PR-SED-01	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	15:30	1	16 oz	4 C	9 uR/hr	
12	RP-SED-BG	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	09:29	1	16 oz	4 C	20 uR/hr	
13	RP-SED-BGD	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	09:29	1	16 oz	4 C	20 uR/hr	
14	RP-SW-BG	TAL Metals + Mercury	3	Days	Water	3/2/2010	09:29	1	1 L poly	HNO3 pH<2	20 uR/hr	
	RP-SW-BG	Total Cyanide	3	Days	Water	3/2/2010	09:29	1	250 mL	NaOH	20 uR/hr	
	RP-SW-BG	Isotopic Uranium	3	Days	Water	3/2/2010	09:29	1	1 L poly	HNO3 pH<2	20 uR/hr	
15	RP-SW-BGD	TAL Metals + Mercury	3	Days	Water	3/2/2010	09:29	1	1 L poly	HNO3 pH<2	20 uR/hr	
	RP-SW-BGD	Total Cyanide	3	Days	Water	3/2/2010	09:29	1	250 mL	NaOH	20 uR/hr	
	RP-SW-BGD	Isotopic Uranium	3	Days	Water	3/2/2010	09:29	1	1 L poly	HNO3 pH<2	20 uR/hr	
16	RSJ-SED-02	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	15:15	1	16 oz	4 C	28 uR/hr	

Special Instructions: please email preliminary results to kristie.warr@westonsolutions.com and michelle.brown@westonsolutions.com

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
			Cheryl Trimble	3-4-10	755						

2500041

2500041

1003045

CHAIN OF CUSTODY RECORD

No: TO0019100202-03/03/10-0004

Site #: TO0019100202

Contact Name: Weston Solutions, Inc.

Lab: ALS

Contact Phone: Kristie Warr 832.444.7976.

Lab Phone: 970.490.1511

Lab #	Sample #	Analyses	Analyses Turnaround Time	Analyses Turnaround Time Units	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
(17)	WR-SED-0-2'	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	11:03	1	16 oz	4 C	9.5 uR/hr	
(18)	WR-SED-3'	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	11:10	1	16 oz	4 C	8 uR/hr	
(19)	WR-SED-5.5'	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	11:15	1	16 oz	4 C	9 uR/hr	

Special Instructions: please email preliminary results to kristie.warr@westonsolutions.com and michelle.brown@westonsolutions.com

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
			Cheryl Trimble	3-4-10	755						

2500042

2500042

1003045

CHAIN OF CUSTODY RECORD

No: TO0019100202-03/02/10-0001

Site #: TO0019100202

Contact Name: Weston Soloutions, Inc.

Lab: ALS

Contact Phone: Kristie Warr 832-444-7976

Lab Phone: 970.490.1511

Lab #	Sample #	Analyses	Analyses Turnaround Time	Analyses Turnaround Time Units	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
20	PR-SW-01	TAL Metals + Mercury	3	Days	Water	3/2/2010	15:26	1	1 L poly	HNO3 pH<2	9 uR/hr	
	PR-SW-01	Total Cyanide	3	Days	Water	3/2/2010	15:26	1	250 mL	NaOH	9 uR/hr	
	PR-SW-01	Isotopic Uranium	3	Days	Water	3/2/2010	15:26	1	1 L poly	HNO3 pH<2	9 uR/hr	
21	RP-SED-03	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	17:10	1	16 oz	4 C	22 uR/hr	
22	RP-SW-03	TAL Metals + Mercury	3	Days	Water	3/2/2010	17:10	1	1 L poly	HNO3 pH<2	22 uR/hr	
	RP-SW-03	Total Cyanide	3	Days	Water	3/2/2010	17:10	1	250 mL	NaOH	22 uR/hr	
	RP-SW-03	Isotopic Uranium	3	Days	Water	3/2/2010	17:10	1	1 L poly	HNO3 pH<2	22 uR/hr	
23	RSJ-SED-01	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/2/2010	16:13	1	16 oz	4 C	16 uR/hr	
24	RSJ-SW-01	TAL Metals + Mercury	3	Days	Water	3/2/2010	16:13	1	1 L poly	HNO3 pH<2	23 uR/hr	
	RSJ-SW-01	Total Cyanide	3	Days	Water	3/2/2010	16:13	1	250 mL	NaOH	23 uR/hr	
	RSJ-SW-01	Isotopic Uranium	3	Days	Water	3/2/2010	16:13	1	1 L poly	HNO3 pH<2	23 uR/hr	

Special Instructions: please email preliminary results to kristie.warr@westonsolutions.com and michelle.brown@westonsolutions.com

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time
			Cheryl Trimble	3-4-10	755

Items/Reason	Relinquished By	Date	Received by	Date	Time

2500043

2500043

1003045

CHAIN OF CUSTODY RECORD

No: TO0019100202-03/02/10-0001

Site #: TO0019100202

Contact Name: Weston Soloutions, Inc.

Lab: ALS

Contact Phone: Kristie Warr 832-444-7976

Lab Phone: 970.490.1511

Lab #	Sample #	Analyses	Analyses Turnaround Time	Analyses Turnaround Time Units	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
29	RSJ-SW-02	TAL Metals + Mercury	3	Days	Water	3/2/2010	15:15	1	1 L poly	HNO3 pH<2	28 uR/hr	
	RSJ-SW-02	Total Cyanide	3	Days	Water	3/2/2010	15:15	1	250 mL	NaOH	28 uR/hr	
	RSJ-SW-02	Isotopic Uranium	3	Days	Water	3/2/2010	15:15	1	1 L poly	HNO3 pH<2	28 uR/hr	

Special Instructions: please email preliminary results to kristie.warr@westonsolutions.com and michelle.brown@westonsolutions.com

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
			Cheryl Trimble	3-4-10	755						

2500044

2500044

DATA QUALITY ASSURANCE REVIEW

SITE NAME Jackpile-Paguate Uranium Mine

CERCLIS NMN000607033

WORK ORDER NUMBER 20406.012.019.0514.01 TDD NUMBER TO-0019-10-02-02

PROJECT NUMBER SDG NUMBER 1003063

Weston Solutions, Inc. (WESTON®) has completed a QA review for Work Order Number 20406.012.019.0514.01, SDG No.1003063, Jackpile-Paguate Uranium Mine. Eighteen samples were analyzed for metals by ALS Laboratory Group. Sample numbers are listed below.

SAMPLE NUMBERS

JM-SS-04	JM-SS-05	RM-JM-SED
RP-SW-02	JM-SED-02	JM-SS-03
JM-SW-02	RP-JM-SED	RP-JM-SED-01
RP-JM-SW	RP-JM-SW-01	RP-SED-01
RP-SED-01D	JM-SS-01	RM-JM-SW
RP-SED-02	RP-SW-01	RP-SW-01D

This data package was validated to determine if Quality Control (QC) specifications were achieved, following *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (October, 1999), *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (July, 2002), *USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data Review* (August, 2002), *Quality Assurance/Quality Control Guidance for Removal Activities* (April, 1990), and the Regional Protocol for Holding Times, Blanks, and VOA Preservation (April 13, 1989). Specific data qualifications are listed in the following discussion.

REVIEWER Gloria J. Switalski DATE March 19, 2010

Data Qualifiers

Data Qualifier Definitions were supplied by the Office of Solid Waste and Emergency Response (September 1989) and are included in the Functional Guidelines. Data qualifiers may be combined (UJ, QJ) with the corresponding combination of meanings. Additional qualifier may be added to provide additional, more specific information (JL, UB, QJK), modifying the meaning of the primary qualifier. Addition qualifiers utilized by WESTON are H, L, K, B, Q, and D.

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation or detection limit, which has been adjusted for sample weight/sample volume, extraction volume, percent solids, sample dilution or other analysis specific parameters.

An additional qualifier, "B", may be appended to indicate that while the analyte was detected in the sample, the presence of the analyte may be attributable to blank contamination and the analyte is therefore considered undetected with the sample detection or quantitation limit for the analyte being elevated.

J - The analyte was analyzed for, but the associated numerical value may not be consistent with the amount actually present in the environmental sample or may not be consistent with the sample detection or quantitation limit. The value is an estimated quantity. The data should be seriously considered for decision-making and are usable for many purposes.

An additional qualifier will be appended to the "J" qualifier that indicates the bias in the reported results:

L Low bias

H High bias

K Unknown bias

Q The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.

The L and H qualifier will only be employed when a single qualification is required. When more than one quality control parameter affects the analytical result and a conflict results in assigning a bias, the result will be flagged JK.

R - Quality Control indicates that data are unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte has not been verified. Resampling and reanalysis are necessary for verification to confirm or deny the presence of an analyte.

N - The analysis indicates the presence of analyte for which there is presumptive evidence to make a "tentative identification."

D - The concentration reported was determined in the re-analysis of the sample at a secondary dilution.

METALS DATA EVALUATION

1. Analytical Method:

Samples were prepared and analyzed for ICP metals using the procedures specified in **SW-846 Method 6010B.** Samples were prepared and analyzed for mercury using the procedures specified in **SW-846 Method 7470A or 7471A.**

2. Holding Times:

All samples met established holding time criteria of 180 days for ICP metals and 28 days for mercury. No qualifications are placed on the data. Aqueous samples were preserved in the field with nitric acid. Aqueous sample JM-SW-02 was received at pH >2. The detected and non-detected analyte results in sample JM-SW-02 was estimated (JL/UJL) since the sample was not preserved to pH <2.

3. Initial Calibration:

ICP initial calibration included a blank and one standard and initial calibration verification (ICV) results fell within the control limits of 90 to 110 percent of the true values. Mercury initial calibration included a blank and five standards and the correlation coefficient was greater than 0.995. No qualifications are placed on the data.

4. Continuing Calibration:

All ICP results fell within the control limits of 90% to 110% of the true values. All mercury results fell within the control limits of 80% to 120% of the true values. No qualifications are placed on the data.

5. CRDL Standard:

All results for the CRDL standard were within the control limits of 70% to 130% of the true values or the sample results were greater than the CRDL action level. No qualifications are placed on the data.

6. Blanks:

A. Laboratory Blanks:

No target analytes were detected in the calibration or preparation blank(s) associated with this analytical package or the sample results were greater than the blank action concentration. No qualifications are placed on the data.

B. Field Blanks:

No metals field blank samples were submitted with this analytical package. No qualifications are placed on the data.

7. ICP Interference Check:

All results for the Interference Check Sample were within the control limits of 80% to 120% of the true values. No qualifications are placed on the data.

8. Laboratory Control Sample (LCS):

The recoveries for the LCS were within the 80-120% control limit. No qualifications are placed on the data.

9. Duplicate Sample Analysis:

A. Laboratory Duplicate Analysis:

Sample RP-SW-02 underwent duplicate analysis for the aqueous matrix for ICP metals and mercury and sample RP-SED-02 underwent duplicate analysis for the sediment matrix for ICP metals and mercury. The Relative Percent Difference (RPD) values for the duplicate sample analyses were within QC criteria of less than 20% for aqueous samples and less than 35% for sediment samples for concentrations greater than five times the reporting limit (RL). For sample concentrations less than five times the RL, the QC criteria are within ± the RL for the aqueous matrix or ± two times the RL for the sediment matrix.

B. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis:

Sample RP-SW-02 underwent MS/MSD analysis for the aqueous matrix for ICP metals and mercury and sample RP-SED-02 underwent MS/MSD analysis for the sediment matrix for ICP metals and mercury. RPD criteria were met for all analytes. No qualifications are placed on the data.

C. Field Duplicate Analysis:

The following sample pair was submitted as field duplicates for the sediment matrix: RP-SED-01/RP-SED-01D. The following sample pair was submitted as field duplicates for the aqueous matrix: RP-SW-01/RP-SW-01D. The RPD values for the field duplicate sample analyses were within the criteria of less than 30% for aqueous samples and less than 50% for sediment samples for concentrations greater than five times the RL. For sample concentrations less than five times the RL, the absolute difference between the samples is less than two times the RL for aqueous samples or less than 3.5 times the RL for sediment samples. No qualifications are placed on the data.

10. Spiked Sample Analysis:

Sample RP-SW-02 underwent MS/MSD analysis for the aqueous matrix for ICP metals and mercury and sample RP-SED-02 underwent MS/MSD analysis for the sediment matrix for ICP metals and mercury. The spike recoveries for the following analyte was outside of the 75%-125% QC recovery limits for analytes whose sample concentration did not exceed the spike concentration by a factor of 4 times or more:

ANALYTE	MATRIX	% RECOVERY	AFFECTED SAMPLES	QUALIFIER FLAG
Antimony	Sediment	46/74	All Sediments	UJL

The post spike recovery for antimony was acceptable indicating possible digestion problems.

11. ICP Serial Dilution:

Samples RP-SW-02 and RP-SED-02 underwent serial dilution. The Percent Difference (%D) values for ICP serial dilution analysis were within the QC limits of 10% for all analytes with concentrations greater than 50 times their method detection limit (MDL).

12. Sample Quantitation and RLs

Concentrations of all reported analytes were correctly calculated.

13. Laboratory Contact

The laboratory was contacted on March 18, 2010 regarding the lack of calculated recoveries for the CRI standards analyzed with this analytical package. An acceptable response was received on March 18, 2010.

14. Overall Assessment:

Detected and non-detected results in aqueous sample JM-SW-02 were estimated since the sample was not preserved to pH <2.

Antimony results were estimated in all sediment samples due to poor MS/MSD recoveries.

The analytical data is acceptable for use with the qualifications listed above.

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SW-02
Lab ID: 1003063-4

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100308-1
QCBatchID: IP100308-1-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: As Received
File Name: 100309A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.37	0.2		
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	140	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.61	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	90	1		
7439-96-5	MANGANESE	1	0.087	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	7.5	1		
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	120	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

3/18/10

Data Package ID: *IT1003063-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: JM-SW-02
Lab ID: 1003063-7

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100308-1
QCBatchID: IP100308-1-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: As Received
File Name: 100309A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	3.5	0.2	JL	
7440-36-0	ANTIMONY	1	0.02	0.02 U	UJL	
7440-38-2	ARSENIC	1	0.01	0.01 U		
7440-39-3	BARIUM	1	0.1	0.1 U		
7440-41-7	BERYLLIUM	1	0.005	0.005 U		
7440-43-9	CADMIUM	1	0.005	0.005 U	J	
7440-70-2	CALCIUM	100	750	100	JL	
7440-47-3	CHROMIUM	1	0.01	0.01 U	UJL	
7440-48-4	COBALT	1	0.023	0.01	JL	
7440-50-8	COPPER	1	0.01	0.01 U	UJL	
7439-89-6	IRON	1	10	0.1	JL	
7439-92-1	LEAD	1	0.003	0.003 U	UJL	
7439-95-4	MAGNESIUM	100	1900	100	JL	
7439-96-5	MANGANESE	1	1.3	0.01	JL	
7440-02-0	NICKEL	1	0.02	0.02 U	UJL	
7440-09-7	POTASSIUM	1	57	1	JL	
7782-49-2	SELENIUM	1	0.005	0.005 U	UJL	
7440-22-4	SILVER	1	0.01	0.01 U	UJL	
7440-23-5	SODIUM	100	1400	100	JL	
7440-28-0	THALLIUM	1	0.01	0.01 U	UJL	
7440-62-2	VANADIUM	1	0.01	0.01 U	UJL	
7440-66-6	ZINC	1	0.026	0.02	JL	

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Data Package ID: *IT1003063-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-JM-SW
Lab ID: 1003063-10

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100308-1
QCBatchID: IP100308-1-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: As Received
File Name: 100309A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.4	0.2		
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	130	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.74	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	52	1		
7439-96-5	MANGANESE	1	0.14	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	6.1	1		
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	46	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

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Data Package ID: *IT1003063-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-JM-SW-01
Lab ID: 1003063-11

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100308-1
QCBatchID: IP100308-1-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: As Received
File Name: 100309A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.2	0.2	U	
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	130	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.33	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	74	1		
7439-96-5	MANGANESE	1	0.095	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	7	1		
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	98	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

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Data Package ID: *IT1003063-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group – FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RM-JM-SW
Lab ID: 1003063-15

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100308-1
QCBatchID: IP100308-1-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: As Received
File Name: 100309A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.2	0.2	U	
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	130	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.2	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	90	1		
7439-96-5	MANGANESE	1	0.072	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	7.6	1		
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	140	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

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Data Package ID: *IT1003063-1*

Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SW-01
Lab ID: 1003063-17

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100308-1
QCBatchID: IP100308-1-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: As Received
File Name: 100309A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.2	0.2	U	
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	140	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.4	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	93	1		
7439-96-5	MANGANESE	1	0.19	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	7.4	1		
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	120	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

Data Package ID: *IT1003063-1*

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Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SW-01D
Lab ID: 1003063-18

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3005 Rev A

Prep Batch: IP100308-1
QCBatchID: IP100308-1-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: As Received
File Name: 100309A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.2	0.2	U	
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	140	1		
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.41	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	91	1		
7439-96-5	MANGANESE	1	0.19	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	7.4	1		
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	120	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

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Data Package ID: *IT1003063-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: JM-SS-04
Lab ID: 1003063-1

Sample Matrix: SOIL
% Moisture: 3.5
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100308-4
QCBatchID: IP100308-4-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100309A.

Sample Aliquot: 1.012 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	2400	20		
7440-36-0	ANTIMONY	1	2	2	U	
7440-38-2	ARSENIC	1	2.9	1		
7440-39-3	BARIUM	1	22	10		
7440-41-7	BERYLLIUM	1	0.51	0.51	U	
7440-43-9	CADMIUM	1	0.51	0.51	U	
7440-70-2	CALCIUM	1	5000	100		
7440-47-3	CHROMIUM	1	1.6	1		
7440-48-4	COBALT	1	3.2	1		
7440-50-8	COPPER	1	9.5	1		
7439-89-6	IRON	1	6300	10		
7439-92-1	LEAD	1	6.4	0.31		
7439-95-4	MAGNESIUM	1	2900	100		
7439-96-5	MANGANESE	1	50	1		
7440-02-0	NICKEL	1	3.5	2		
7440-09-7	POTASSIUM	1	470	100		
7782-49-2	SELENIUM	1	0.51	0.51	U	
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	1	1	1	U	
7440-62-2	VANADIUM	1	3.7	1		
7440-66-6	ZINC	1	46	2		

Data Package ID: *IT1003063-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: JM-SS-05
Lab ID: 1003063-2

Sample Matrix: SOIL
% Moisture: 1.9
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100308-4
QCBatchID: IP100308-4-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100309A.

Sample Aliquot: 1.005 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	1900	20		
7440-36-0	ANTIMONY	1	2	2	U	
7440-38-2	ARSENIC	1	1.6	1		
7440-39-3	BARIUM	1	30	10		
7440-41-7	BERYLLIUM	1	0.51	0.51	U	
7440-43-9	CADMIUM	1	0.51	0.51	U	
7440-70-2	CALCIUM	1	910	100		
7440-47-3	CHROMIUM	1	1.2	1		
7440-48-4	COBALT	1	1	1	U	
7440-50-8	COPPER	1	1.2	1		
7439-89-6	IRON	1	3700	10		
7439-92-1	LEAD	1	9.2	0.3		
7439-95-4	MAGNESIUM	1	730	100		
7439-96-5	MANGANESE	1	25	1		
7440-02-0	NICKEL	1	2	2	U	
7440-09-7	POTASSIUM	1	370	100		
7782-49-2	SELENIUM	1	0.51	0.51	U	
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	1	1	1	U	
7440-62-2	VANADIUM	1	90	1		
7440-66-6	ZINC	1	3.3	2		

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Data Package ID: *IT1003063-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group – FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RM-JM-SED
Lab ID: 1003063-3

Sample Matrix: SEDIMENT
% Moisture: 35.7
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100308-4
QCBatchID: IP100308-4-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100309A.

Sample Aliquot: 1.016 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	8100	31		
7440-36-0	ANTIMONY	1	3.1	3.1	~~U~~ UJL	
7440-38-2	ARSENIC	1	6.5	1.5		
7440-39-3	BARIUM	1	75	15		
7440-41-7	BERYLLIUM	1	0.77	0.77	U	
7440-43-9	CADMIUM	1	0.77	0.77	U	
7440-70-2	CALCIUM	1	18000	150		
7440-47-3	CHROMIUM	1	8.3	1.5		
7440-48-4	COBALT	1	6.4	1.5		
7440-50-8	COPPER	1	12	1.5		
7439-89-6	IRON	1	21000	15		
7439-92-1	LEAD	1	12	0.46		
7439-95-4	MAGNESIUM	1	5300	150		
7439-96-5	MANGANESE	1	220	1.5		
7440-02-0	NICKEL	1	13	3.1		
7440-09-7	POTASSIUM	1	1700	150		
7782-49-2	SELENIUM	1	0.77	0.77	U	
7440-22-4	SILVER	1	1.5	1.5	U	
7440-23-5	SODIUM	1	370	150		
7440-28-0	THALLIUM	1	1.5	1.5	U	
7440-62-2	VANADIUM	1	18	1.5		
7440-66-6	ZINC	1	44	3.1		

Data Package ID: *IT1003063-1*

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Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: JM-SED-02
Lab ID: 1003063-5

Sample Matrix: SOIL
% Moisture: 42.7
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100308-4
QCBatchID: IP100308-4-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100309A.

Sample Aliquot: 1.035 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	6700	34		
7440-36-0	ANTIMONY	1	3.4	3.4	U	
7440-38-2	ARSENIC	1	10	1.7		
7440-39-3	BARIUM	1	32	17		
7440-41-7	BERYLLIUM	1	0.84	0.84	U	
7440-43-9	CADMIUM	1	0.84	0.84	U	
7440-70-2	CALCIUM	1	40000	170		
7440-47-3	CHROMIUM	1	5.8	1.7		
7440-48-4	COBALT	1	5.7	1.7		
7440-50-8	COPPER	1	8.2	1.7		
7439-89-6	IRON	1	17000	17		
7439-92-1	LEAD	1	10	0.51		
7439-95-4	MAGNESIUM	1	13000	170		
7439-96-5	MANGANESE	1	270	1.7		
7440-02-0	NICKEL	1	11	3.4		
7440-09-7	POTASSIUM	1	1700	170		
7782-49-2	SELENIUM	1	3.4	0.84		
7440-22-4	SILVER	1	1.7	1.7	U	
7440-23-5	SODIUM	1	2200	170		
7440-28-0	THALLIUM	1	1.7	1.7	U	
7440-62-2	VANADIUM	1	15	1.7		
7440-66-6	ZINC	1	36	3.4		

Data Package ID: *IT1003063-1*

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Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: JM-SS-03
Lab ID: 1003063-6

Sample Matrix: SOIL
% Moisture: 4.2
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100308-4
QCBatchID: IP100308-4-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100309A.

Sample Aliquot: 1.005 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	3100	21		
7440-36-0	ANTIMONY	1	2.1	2.1	U	
7440-38-2	ARSENIC	1	2.9	1		
7440-39-3	BARIUM	1	58	10		
7440-41-7	BERYLLIUM	1	0.52	0.52	U	
7440-43-9	CADMIUM	1	0.52	0.52	U	
7440-70-2	CALCIUM	1	8700	100		
7440-47-3	CHROMIUM	1	3.2	1		
7440-48-4	COBALT	1	2.9	1		
7440-50-8	COPPER	1	3.9	1		
7439-89-6	IRON	1	9000	10		
7439-92-1	LEAD	1	8.3	0.31		
7439-95-4	MAGNESIUM	1	3000	100		
7439-96-5	MANGANESE	1	84	1		
7440-02-0	NICKEL	1	4.5	2.1		
7440-09-7	POTASSIUM	1	630	100		
7782-49-2	SELENIUM	1	1.9	0.52		
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	270	100		
7440-28-0	THALLIUM	1	1	1	U	
7440-62-2	VANADIUM	1	20	1		
7440-66-6	ZINC	1	16	2.1		

Data Package ID: *IT1003063-1*

3/18/10

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-JM-SED
Lab ID: 1003063-8

Sample Matrix: SEDIMENT
% Moisture: 31.7
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100308-4
QCBatchID: IP100308-4-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100309A.

Sample Aliquot: 1.009 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	5900	29		
7440-36-0	ANTIMONY	1	2.9	2.9	~~U~~ UJL	
7440-38-2	ARSENIC	1	5.4	1.5		
7440-39-3	BARIUM	1	110	15		
7440-41-7	BERYLLIUM	1	0.73	0.73	U	
7440-43-9	CADMIUM	1	0.73	0.73	U	
7440-70-2	CALCIUM	1	15000	150		
7440-47-3	CHROMIUM	1	6	1.5		
7440-48-4	COBALT	1	5.5	1.5		
7440-50-8	COPPER	1	9.6	1.5		
7439-89-6	IRON	1	21000	15		
7439-92-1	LEAD	1	9.5	0.44		
7439-95-4	MAGNESIUM	1	4200	150		
7439-96-5	MANGANESE	1	240	1.5		
7440-02-0	NICKEL	1	10	2.9		
7440-09-7	POTASSIUM	1	1200	150		
7782-49-2	SELENIUM	1	0.93	0.73		
7440-22-4	SILVER	1	1.5	1.5	U	
7440-23-5	SODIUM	1	310	150		
7440-28-0	THALLIUM	1	1.5	1.5	U	
7440-62-2	VANADIUM	1	17	1.5		
7440-66-6	ZINC	1	40	2.9		

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Data Package ID: *IT1003063-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-JM-SED-01
Lab ID: 1003063-9

Sample Matrix: SEDIMENT
% Moisture: 27.1
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100308-4
QCBatchID: IP100308-4-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100309A.

Sample Aliquot: 1.003 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	5000	27		
7440-36-0	ANTIMONY	1	2.7	2.7	~~U~~ WJL	
7440-38-2	ARSENIC	1	4.8	1.4		
7440-39-3	BARIUM	1	56	14		
7440-41-7	BERYLLIUM	1	0.68	0.68	U	
7440-43-9	CADMIUM	1	0.68	0.68	U	
7440-70-2	CALCIUM	1	38000	140		
7440-47-3	CHROMIUM	1	7.7	1.4		
7440-48-4	COBALT	1	5.2	1.4		
7440-50-8	COPPER	1	7.5	1.4		
7439-89-6	IRON	1	17000	14		
7439-92-1	LEAD	1	7.2	0.41		
7439-95-4	MAGNESIUM	1	4600	140		
7439-96-5	MANGANESE	1	180	1.4		
7440-02-0	NICKEL	1	11	2.7		
7440-09-7	POTASSIUM	1	950	140		
7782-49-2	SELENIUM	1	0.79	0.68		
7440-22-4	SILVER	1	1.4	1.4	U	
7440-23-5	SODIUM	1	300	140		
7440-28-0	THALLIUM	1	1.4	1.4	U	
7440-62-2	VANADIUM	1	18	1.4		
7440-66-6	ZINC	1	29	2.7		

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Data Package ID: *IT1003063-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SED-01
Lab ID: 1003063-12

Sample Matrix: SEDIMENT
% Moisture: 27.3
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100308-4
QCBatchID: IP100308-4-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100309A.

Sample Aliquot: 1.023 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	4700	27		
7440-36-0	ANTIMONY	1	2.7	2.7	J VJL	
7440-38-2	ARSENIC	1	4.3	1.3		
7440-39-3	BARIUM	1	66	13		
7440-41-7	BERYLLIUM	1	0.67	0.67	U	
7440-43-9	CADMIUM	1	0.67	0.67	U	
7440-70-2	CALCIUM	1	15000	130		
7440-47-3	CHROMIUM	1	6	1.3		
7440-48-4	COBALT	1	3.8	1.3		
7440-50-8	COPPER	1	5.9	1.3		
7439-89-6	IRON	1	13000	13		
7439-92-1	LEAD	1	8.3	0.4		
7439-95-4	MAGNESIUM	1	3700	130		
7439-96-5	MANGANESE	1	180	1.3		
7440-02-0	NICKEL	1	7	2.7		
7440-09-7	POTASSIUM	1	1000	130		
7782-49-2	SELENIUM	1	0.67	0.67	U	
7440-22-4	SILVER	1	1.3	1.3	U	
7440-23-5	SODIUM	1	190	130		
7440-28-0	THALLIUM	1	1.3	1.3	U	
7440-62-2	VANADIUM	1	14	1.3		
7440-66-6	ZINC	1	25	2.7		

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Data Package ID: *IT1003063-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group – FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SED-01D
Lab ID: 1003063-13

Sample Matrix: SEDIMENT
% Moisture: 26.9
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100308-4
QCBatchID: IP100308-4-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100309A.

Sample Aliquot: 1.125 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	4300	24		
7440-36-0	ANTIMONY	1	2.4	2.4	~~U~~ VJL	
7440-38-2	ARSENIC	1	4.3	1.2		
7440-39-3	BARIUM	1	76	12		
7440-41-7	BERYLLIUM	1	0.61	0.61	U	
7440-43-9	CADMIUM	1	0.61	0.61	U	
7440-70-2	CALCIUM	1	17000	120		
7440-47-3	CHROMIUM	1	4.9	1.2		
7440-48-4	COBALT	1	3.9	1.2		
7440-50-8	COPPER	1	5.4	1.2		
7439-89-6	IRON	1	14000	12		
7439-92-1	LEAD	1	7.1	0.36		
7439-95-4	MAGNESIUM	1	3300	120		
7439-96-5	MANGANESE	1	200	1.2		
7440-02-0	NICKEL	1	7.3	2.4		
7440-09-7	POTASSIUM	1	930	120		
7782-49-2	SELENIUM	1	0.61	0.61	U	
7440-22-4	SILVER	1	1.2	1.2	U	
7440-23-5	SODIUM	1	180	120		
7440-28-0	THALLIUM	1	1.2	1.2	U	
7440-62-2	VANADIUM	1	13	1.2		
7440-66-6	ZINC	1	24	2.4		

Data Package ID: *IT1003063-1*

3/18/10

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: JM-SS-01
Lab ID: 1003063-14

Sample Matrix: SOIL
% Moisture: 2.4
Date Collected: 04-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100308-4
QCBatchID: IP100308-4-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100309A.

Sample Aliquot: 1.015 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	1900	20		
7440-36-0	ANTIMONY	1	2	2	U	
7440-38-2	ARSENIC	1	2.9	1		
7440-39-3	BARIUM	1	53	10		
7440-41-7	BERYLLIUM	1	0.5	0.5	U	
7440-43-9	CADMIUM	1	0.5	0.5	U	
7440-70-2	CALCIUM	1	930	100		
7440-47-3	CHROMIUM	1	1	1	U	
7440-48-4	COBALT	1	1.7	1		
7440-50-8	COPPER	1	3.2	1		
7439-89-6	IRON	1	3400	10		
7439-92-1	LEAD	1	5.4	0.3		
7439-95-4	MAGNESIUM	1	780	100		
7439-96-5	MANGANESE	1	16	1		
7440-02-0	NICKEL	1	2	2	U	
7440-09-7	POTASSIUM	1	350	100		
7782-49-2	SELENIUM	1	1.6	0.5		
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	1	1	1	U	
7440-62-2	VANADIUM	1	30	1		
7440-66-6	ZINC	1	4.9	2		

3/18/10

Data Package ID: *IT1003063-1*

Total ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Laboratory Group -- FC
Work Order Number: 1003063
Client Name: Weston Solutions, Inc.
ClientProject ID: Paguate TO0019100202

Field ID: RP-SED-02
Lab ID: 1003063-16

Sample Matrix: SEDIMENT
% Moisture: 32.5
Date Collected: 03-Mar-10
Date Extracted: 08-Mar-10
Date Analyzed: 09-Mar-10
Prep Method: SW3050 Rev B

Prep Batch: IP100308-4
QCBatchID: IP100308-4-1
Run ID: IT100309-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 100309A.

Sample Aliquot: 1.022 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	6400	29		
7440-36-0	ANTIMONY	1	2.9	2.9	~~J~~ VJL	N
7440-38-2	ARSENIC	1	5.7	1.5		
7440-39-3	BARIUM	1	110	15		
7440-41-7	BERYLLIUM	1	0.73	0.73	U	
7440-43-9	CADMIUM	1	0.73	0.73	U	
7440-70-2	CALCIUM	1	22000	150		N
7440-47-3	CHROMIUM	1	6.4	1.5		
7440-48-4	COBALT	1	5.3	1.5		
7440-50-8	COPPER	1	9.3	1.5		
7439-89-6	IRON	1	17000	15		
7439-92-1	LEAD	1	11	0.44		
7439-95-4	MAGNESIUM	1	5100	150		
7439-96-5	MANGANESE	1	210	1.5		
7440-02-0	NICKEL	1	9.8	2.9		
7440-09-7	POTASSIUM	1	1400	150		
7782-49-2	SELENIUM	1	0.73	0.73	U	
7440-22-4	SILVER	1	1.5	1.5	U	
7440-23-5	SODIUM	1	270	150		
7440-28-0	THALLIUM	1	1.5	1.5	U	
7440-62-2	VANADIUM	1	16	1.5		
7440-66-6	ZINC	1	36	2.9		

Data Package ID: *IT1003063-1*

3/19/10

Total MERCURY

Method SW7470A

Sample Results

Lab Name: ALS Laboratory Group -- FC
Client Name: Weston Solutions, Inc.
Client Project ID: Paguate TO0019100202
Work Order Number: 1003063 **Final Volume:** 20 g
Reporting Basis: As Received **Matrix:** WATER
Prep Method: METHOD **Result Units:** MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
RP-SW-02	1003063-4	03/03/2010	03/08/2010	03/08/2010	N/A	1	0.0002	0.0002	U	20 g
JM-SW-02	1003063-7	03/03/2010	03/08/2010	03/08/2010	N/A	1	0.0002	0.0002	U	20 g
RP-JM-SW	1003063-10	03/03/2010	03/08/2010	03/08/2010	N/A	1	0.0002	0.0002	U	20 g
RP-JM-SW-01	1003063-11	03/03/2010	03/08/2010	03/08/2010	N/A	1	0.0002	0.0002	U	20 g
RM-JM-SW	1003063-15	03/03/2010	03/08/2010	03/08/2010	N/A	1	0.0002	0.0002	U	20 g
RP-SW-01	1003063-17	03/03/2010	03/08/2010	03/08/2010	N/A	1	0.0002	0.0002	U	20 g
RP-SW-01D	1003063-18	03/03/2010	03/08/2010	03/08/2010	N/A	1	0.0002	0.0002	U	20 g

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *HG1003063-1*

3/18/10

Total MERCURY

Method SW7471A

Sample Results

Lab Name: ALS Laboratory Group -- FC
Client Name: Weston Solutions, Inc.
Client Project ID: Paguate TO0019100202
Work Order Number: 1003063 **Final Volume:** 100 g
Reporting Basis: Dry Weight **Matrix:** SEDIMENT
Prep Method: METHOD **Result Units:** MG/KG

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
RM-JM-SED	1003063-3	03/03/2010	03/08/2010	03/08/2010	35.7	1	0.051	0.051	U	0.608 g
RP-JM-SED	1003063-8	03/03/2010	03/08/2010	03/08/2010	31.7	1	0.049	0.049	U	0.602 g
RP-JM-SED-01	1003063-9	03/03/2010	03/08/2010	03/08/2010	27.1	1	0.045	0.045	U	0.609 g
RP-SED-01	1003063-12	03/03/2010	03/08/2010	03/08/2010	27.3	1	0.045	0.045	U	0.607 g
RP-SED-01D	1003063-13	03/03/2010	03/08/2010	03/08/2010	26.9	1	0.045	0.045	U	0.604 g
RP-SED-02	1003063-16	03/03/2010	03/08/2010	03/08/2010	32.5	1	0.049	0.049	U	0.6 g

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

3/8/10

Data Package ID: *HG1003063-1*

Total MERCURY

Method SW7471A

Sample Results

Lab Name: ALS Laboratory Group -- FC
Client Name: Weston Solutions, Inc.
Client Project ID: Paguate TO0019100202
Work Order Number: 1003063 **Final Volume:** 100 g
Reporting Basis: Dry Weight **Matrix:** SOIL
Prep Method: METHOD **Result Units:** MG/KG

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
JM-SS-04	1003063-1	03/03/2010	03/08/2010	03/08/2010	3.5	1	0.034	0.034	U	0.604 g
JM-SS-05	1003063-2	03/03/2010	03/08/2010	03/08/2010	1.9	1	0.034	0.034	U	0.603 g
JM-SED-02	1003063-5	03/03/2010	03/08/2010	03/08/2010	42.7	1	0.058	0.058	U	0.606 g
JM-SS-03	1003063-6	03/03/2010	03/08/2010	03/08/2010	4.2	1	0.035	0.035	U	0.604 g
JM-SS-01	1003063-14	03/04/2010	03/08/2010	03/08/2010	2.4	1	0.034	0.034	U	0.605 g

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *HG1003063-1*

3/18/10

DATA QUALITY ASSURANCE REVIEW

SITE NAME Jackpile-Paguate Uranium Mine

CERCLIS NMN000607033

WORK ORDER NUMBER 20406.012.019.0514.01 TDD NUMBER TO-0019-10-02-02

PROJECT NUMBER SDG NUMBER 1003063

Weston Solutions, Inc. (WESTON®) has completed a QA review for Work Order Number 20406.012.019.0514.01, SDG No.1003063, Jackpile-Paguate Uranium Mine. Eighteen samples were analyzed for cyanide by ALS Laboratory Group. Sample numbers are listed below.

SAMPLE NUMBERS

JM-SS-04	JM-SS-05	RM-JM-SED
RP-SW-02	JM-SED-02	JM-SS-03
JM-SW-02	RP-JM-SED	RP-JM-SED-01
RP-JM-SW	RP-JM-SW-01	RP-SED-01
RP-SED-01D	JM-SS-01	RM-JM-SW
RP-SED-02	RP-SW-01	RP-SW-01D

This data package was validated to determine if Quality Control (QC) specifications were achieved, following *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (October, 1999), *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (July, 2002), *USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data Review* (August, 2002), *Quality Assurance/Quality Control Guidance for Removal Activities* (April, 1990), and the Regional Protocol for Holding Times, Blanks, and VOA Preservation (April 13, 1989). Specific data qualifications are listed in the following discussion.

REVIEWER Gloria J. Switalski DATE March 19, 2010

Data Qualifiers

Data Qualifier Definitions were supplied by the Office of Solid Waste and Emergency Response (September 1989) and are included in the Functional Guidelines. Data qualifiers may be combined (UJ, QJ) with the corresponding combination of meanings. Additional qualifier may be added to provide additional, more specific information (JL, UB, QJK), modifying the meaning of the primary qualifier. Addition qualifiers utilized by WESTON are H, L, K, B, Q, and D.

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation or detection limit, which has been adjusted for sample weight/sample volume, extraction volume, percent solids, sample dilution or other analysis specific parameters.

An additional qualifier, "B", may be appended to indicate that while the analyte was detected in the sample, the presence of the analyte may be attributable to blank contamination and the analyte is therefore considered undetected with the sample detection or quantitation limit for the analyte being elevated.

J - The analyte was analyzed for, but the associated numerical value may not be consistent with the amount actually present in the environmental sample or may not be consistent with the sample detection or quantitation limit. The value is an estimated quantity. The data should be seriously considered for decision-making and are usable for many purposes.

An additional qualifier will be appended to the "J" qualifier that indicates the bias in the reported results:

L Low bias

H High bias

K Unknown bias

Q The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.

The L and H qualifier will only be employed when a single qualification is required. When more than one quality control parameter affects the analytical result and a conflict results in assigning a bias, the result will be flagged JK.

R - Quality Control indicates that data are unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte has not been verified. Resampling and reanalysis are necessary for verification to confirm or deny the presence of an analyte.

N - The analysis indicates the presence of analyte for which there is presumptive evidence to make a "tentative identification."

D - The concentration reported was determined in the re-analysis of the sample at a secondary dilution.

CYANIDE DATA EVALUATION

1. Analytical Method:

Samples were prepared and analyzed for cyanide using the procedures specified in **SW-846 Method 9014**.

2. Holding Times:

All samples met established holding time criteria of 14 days for cyanide. Aqueous samples were preserved in the field with sodium hydroxide. Aqueous sample JM-SW-02 was received at pH <12. The non-detected cyanide result in sample JM-SW-02 was estimated (UJL) since the sample was not preserved to pH >12. Samples were maintained at 4°C±2°C. No further qualifications are placed on the data.

3. Initial Calibration:

Cyanide initial calibration included a blank and at least three standards. The initial calibration correlation coefficients for cyanide were greater than 0.995. The initial calibration verification results fell within the control limits of 85% to 115% of the true value. No qualifications are placed on the data.

4. Continuing Calibration:

All cyanide results fell within the control limits of 85% to 115% of the true value. No qualifications are placed on the data.

5. Blanks:

A. Laboratory Blanks:

Cyanide was not detected in the calibration and preparation blanks. No qualifications are placed on the data.

B. Field Blanks:

No cyanide field blank samples were submitted with this analytical package. No qualifications are placed on the data.

6. Laboratory Control Sample (LCS):

The recoveries for the LCS were within the established control limits. No qualifications are placed on the data.

7. Duplicate Sample Analysis:

A. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis:

Sample RP-SED-02 underwent MS/MSD analysis for the sediment matrix. Sample RP-SW-02 underwent MS/MSD analysis for the aqueous matrix. The Relative Percent Difference (RPD) values for the duplicate sample analyses were within QC criteria of less than 20% for aqueous samples and less than

35% for sediment samples for concentrations greater than five times the reporting limit (RL). For sample concentrations less than five times the RL, the QC criteria are within ± the RL for the aqueous matrix or ± two times the RL for the sediment matrix.

B. Field Duplicate Analysis:

The following sample pair was submitted as field duplicates for the sediment matrix: RP-SED-01/RP-SED-01D. The following sample pair was submitted as field duplicates for the aqueous matrix: RP-SW-01/RP-SW-01D. The RPD values for the field duplicate sample analyses were within the criteria of less than 30% for aqueous samples and less than 50% for sediment samples for concentrations greater than five times the RL. For sample concentrations less than five times the RL, the absolute difference between the samples is less than two times the RL for aqueous samples or less than 3.5 times the RL for sediment samples. No qualifications are placed on the data.

8. Spiked Sample Analysis:

Sample RP-SED-02 underwent MS/MSD analysis for the sediment matrix. Sample RP-SW-02 underwent MS/MSD analysis for the aqueous matrix. The spike recoveries for cyanide were within the control limit of 75% to 125% or the sample concentration exceeded the spike concentration by a factor of 4 times or more. No qualifications are placed on the data.

9. Sample Quantitation and Reporting Limits:

All samples for cyanide were reported as non-detect.

10. Laboratory Contact

No laboratory contact was required.

11. Overall Assessment:

The non-detected cyanide result in aqueous sample JM-SW-02 was estimated (UJL) since the sample was not preserved to pH >12.

The analytical data is acceptable for use with the qualifications listed above.

CYANIDE, TOTAL

Method SW9014

Sample Results

Lab Name: ALS Laboratory Group – FC
Client Name: Weston Solutions, Inc.
Client Project ID: Paguate TO0019100202
Work Order Number: 1003063
Reporting Basis: Dry Weight
Prep Method: SW9010
Final Volume: 50 ml
Matrix: SOIL
Result Units: MG/KG

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
JM-SS-04	1003063-1	03/03/2010	03/10/2010	03/10/2010	3.5	1	0.52	0.52	U	1 g
JM-SS-05	1003063-2	03/03/2010	03/10/2010	03/10/2010	1.9	1	0.51	0.51	U	1 g
JM-SED-02	1003063-5	03/03/2010	03/10/2010	03/10/2010	42.7	1	0.87	0.87	U	1 g
JM-SS-03	1003063-6	03/03/2010	03/10/2010	03/10/2010	4.2	1	0.52	0.52	U	1 g
JM-SS-01	1003063-14	03/04/2010	03/10/2010	03/10/2010	2.4	1	0.51	0.51	U	1 g

3/18/10

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *cn1003063-1*

CYANIDE, TOTAL

Method SW9014

Sample Results

Lab Name: ALS Laboratory Group -- FC
Client Name: Weston Solutions, Inc.
Client Project ID: Paguate TO0019100202
Work Order Number: 1003063
Reporting Basis: Dry Weight
Prep Method: SW9010
Final Volume: 50 ml
Matrix: SEDIMENT
Result Units: MG/KG

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
RM-JM-SED	1003063-3	03/03/2010	03/10/2010	03/10/2010	35.7	1	0.78	0.78	U	1 g
RP-JM-SED	1003063-8	03/03/2010	03/10/2010	03/10/2010	31.7	1	0.73	0.73	U	1 g
RP-JM-SED-01	1003063-9	03/03/2010	03/10/2010	03/10/2010	27.1	1	0.69	0.69	U	1 g
RP-SED-01	1003063-12	03/03/2010	03/10/2010	03/10/2010	27.3	1	0.69	0.69	U	1 g
RP-SED-01D	1003063-13	03/03/2010	03/10/2010	03/10/2010	26.9	1	0.68	0.68	U	1 g
RP-SED-02	1003063-16	03/03/2010	03/10/2010	03/10/2010	32.5	1	0.74	0.74	U	1 g

3/18/10

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *cn1003063-1*

CYANIDE, TOTAL

Method SW9014

Sample Results

Lab Name: ALS Laboratory Group -- FC
Client Name: Weston Solutions, Inc.
Client Project ID: Paguate TO0019100202
Work Order Number: 1003063
Reporting Basis: As Received
Prep Method: SW9010
Final Volume: 50 ml
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
RP-SW-02	1003063-4	03/03/2010	03/09/2010	03/09/2010	N/A	1	0.01	0.01	U	50 ml
JM-SW-02	1003063-7	03/03/2010	03/09/2010	03/09/2010	N/A	1	0.01	0.01	~~U~~ VJL	50 ml
RP-JM-SW	1003063-10	03/03/2010	03/09/2010	03/09/2010	N/A	1	0.01	0.01	U	50 ml
RP-JM-SW-01	1003063-11	03/03/2010	03/09/2010	03/09/2010	N/A	1	0.01	0.01	U	50 ml
RM-JM-SW	1003063-15	03/03/2010	03/09/2010	03/09/2010	N/A	1	0.01	0.01	U	50 ml
RP-SW-01	1003063-17	03/03/2010	03/09/2010	03/09/2010	N/A	1	0.01	0.01	U	50 ml
RP-SW-01D	1003063-18	03/03/2010	03/09/2010	03/09/2010	N/A	1	0.01	0.01	U	50 ml

3/18/10

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *cn1003063-1*

1003063

CHAIN OF CUSTODY RECORD

No: TO0019100202-03/04/10-0006

Site #: TO0019100202

Contact Name: Weston Soloutions, Inc.

Lab: ALS

Contact Phone: Kristie Warr 832-444-7976

Lab Phone: 970.490.1511

Lab #	Sample #	Analyses	Analyses Turnaround Time	Analyses Turnaround Time Units	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
1	JM-SS-04	TAL Metals + Hg + CN + Iso U	3	Days	Soil	3/3/2010	11:01	1	16 oz	4 C	46 uR/hr	
2	JM-SS-05	TAL Metals + Hg + CN + Iso U	3	Days	Soil	3/3/2010	10:40	1	16 oz	4 C	109 uR/hr	
3	RM-JM-SED	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/3/2010	15:29	1	16 oz	4 C	26 uR/hr	
4	RP-SW-02	TAL Metals + Mercury	3	Days	Water	3/3/2010	10:30	1	1 L poly	HNO3 pH<2	8 uR/hr	Y
↓	RP-SW-02	Total Cyanide	3	Days	Water	3/3/2010	10:30	1	250 mL	NaOH	8 uR/hr	Y
↓	RP-SW-02	Isotopic Uranium	3	Days	Water	3/3/2010	10:30	1	1 L poly	HNO3 pH<2	8 uR/hr	Y

Special Instructions: please email preliminary results to kristie.warr@westonsolutions.com and michelle.brown@westonsolutions.com

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		03.04.10		3.5.10	0735						

2500078

2500078

1003063

CHAIN OF CUSTODY RECORD

No: TO0019100202-03/04/10-0007

Site #: TO0019100202

Contact Name: Weston Soloutions, Inc.

Contact Phone: Kristie Warr 832-444-7976

Lab: ALS

Lab Phone: 970.490.1511

Lab #	Sample #	Analyses	Analyses Turnaround Time	Analyses Turnaround Time Units	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
5	JM-SED-02	TAL Metals + Hg + CN + Iso U	3	Days	Soil	3/3/2010	15:35	1	16 oz	4 C	20 uR/hr	
6	JM-SS-03	TAL Metals + Hg + CN + Iso U	3	Days	Soil	3/3/2010	11:47	1	16 oz	4 C	80 uR/hr	
7	JM-SW-02	TAL Metals + Mercury	3	Days	Water	3/3/2010	15:35	1	1 L poly	HNO3 pH<2	20 uR/hr	
↓	JM-SW-02	Total Cyanide	3	Days	Water	3/3/2010	15:35	1	250 mL	NaOH	20 uR/hr	
↓	JM-SW-02	Isotopic Uranium	3	Days	Water	3/3/2010	15:35	1	1 L poly	HNO3 pH<2	20 uR/hr	
8	RP-JM-SED	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/3/2010	14:32	1	16 oz	4 C	27 uR/hr	
9	RP-JM-SED-01	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/3/2010	15:11	1	16 oz	4 C	19 uR/hr	
10	RP-JM-SW	TAL Metals + Mercury	3	Days	Water	3/3/2010	14:32	1	1 L poly	HNO3 pH<2	27 uR/hr	
↓	RP-JM-SW	Total Cyanide	3	Days	Water	3/3/2010	14:32	1	250 mL	NaOH	27 uR/hr	
↓	RP-JM-SW	Isotopic Uranium	3	Days	Water	3/3/2010	14:32	1	1 L poly	HNO3 pH<2	27 uR/hr	
11	RP-JM-SW-01	TAL Metals + Mercury	3	Days	Water	3/3/2010	15:11	1	1 L poly	HNO3 pH<2	19 uR/hr	
↓	RP-JM-SW-01	Total Cyanide	3	Days	Water	3/3/2010	15:11	1	250 mL	NaOH	19 uR/hr	

Special Instructions: please email preliminary results to kristie.warr@westonsolutions.com and michelle.brown@westonsolutions.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		03.04.10		3.5.10	0735						

2500079

1003063

CHAIN OF CUSTODY RECORD

No: TO0019100202-03/04/10-0007

Site #: TO0019100202

Contact Name: Weston Soloutions, Inc.

Lab: ALS

Contact Phone: Kristie Warr 832-444-7976

Lab Phone: 970.490.1511

Lab #	Sample #	Analyses	Analyses Turnaround Time	Analyses Turnaround Time Units	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
11	RP-JM-SW-01	Isotopic Uranium	3	Days	Water	3/3/2010	15:11	1	1 L poly	HNO3 pH<2	19 uR/hr	
12	RP-SED-01	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/3/2010	11:35	1	16 oz	4 C	18 uR/hr	
13	RP-SED-01D	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/3/2010	11:35	1	16 oz	4 C	8 uR/hr	

Special Instructions: please email preliminary results to kristie.warr@westonsolutions.com and michelle.brown@westonsolutions.com

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		03.04.10		3.5.10	0735						

2500080

2500080

1003063

CHAIN OF CUSTODY RECORD

No: TO0019100202-03/04/10-0008

Site #: TO0019100202

Contact Name: Weston Solutions, Inc.

Lab: ALS

Contact Phone: Kristie Warr 832-444-7976

Lab Phone: 970.490.1511

Lab #	Sample #	Analyses	Analyses Turnaround Time	Analyses Turnaround Time Units	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
14	JM-SS-01	TAL Metals + Hg + CN + Iso U	3	Days	Soil	3/4/2010	09:50	1	16 oz	4 C	56 uR/hr	
15	RM-JM-SW	TAL Metals + Mercury	3	Days	Water	3/3/2010	15:29	1	1 L poly	HNO3 pH<2	26 uR/hr	
	RM-JM-SW	Total Cyanide	3	Days	Water	3/3/2010	15:29	1	250 mL	NaOH	26 uR/hr	
	RM-JM-SW	Isotopic Uranium	3	Days	Water	3/3/2010	15:29	1	1 L poly	HNO3 pH<2	26 uR/hr	
16	RP-SED-02	TAL Metals + Hg + CN + Iso U	3	Days	Sediment	3/3/2010	10:30	1	16 oz	4 C	8 uR/hr	Y
17	RP-SW-01	TAL Metals + Mercury	3	Days	Water	3/3/2010	11:35	1	1 L poly	HNO3 pH<2	18 uR/hr	
	RP-SW-01	Total Cyanide	3	Days	Water	3/3/2010	11:35	1	250 mL	NaOH	18 uR/hr	
	RP-SW-01	Isotopic Uranium	3	Days	Water	3/3/2010	11:35	1	1 L poly	HNO3 pH<2	18 uR/hr	
18	RP-SW-01D	TAL Metals + Mercury	3	Days	Water	3/3/2010	11:35	1	1 L poly	HNO3 pH<2	18 uR/hr	
	RP-SW-01D	Total Cyanide	3	Days	Water	3/3/2010	11:35	1	250 mL	NaOH	18 uR/hr	
	RP-SW-01D	Isotopic Uranium	3	Days	Water	3/3/2010	11:35	1	1 L poly	HNO3 pH<2	18 uR/hr	

Special Instructions: please email preliminary results to kristie.warr@westonsolutions.com and michelle.brown@westonsolutions.com

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	Melinda Wolfe	03/04/10		3.5.10	0735						

2500081

Review of Radiochemistry Data Reports, Work Orders 1003045 and 1003063, Related to the Paquate Uranium Mine Site
Completed by Nels R. Johnson, C.H.P., Weston Solutions, Inc.
24 March 2010

I. Sample Description

These data sets were for soil, sediment, and water samples submitted to ALS Laboratory Group in early March, 2010 for isotopic uranium analysis. All analyses were performed by alpha spectrometry for U-234, -235, and 238. Review of all data indicated reasonable laboratory sensitivities for this analytical technique. Sample sizes were normally 500 g for solids and 1 L for water. Aliquot sizes were normally 1 g for solids and 1 ml for liquids. Water samples were not filtered by the lab, but may have been field filtered. Significant sedimentation in water samples was not observed by the lab.

II. Data Evaluation Technique

As these samples were collected from the vicinity of a uranium mine site, it is reasonable to assume that elevated concentrations of uranium could be detected, and possibly elevated concentrations of uranium progeny. It is also reasonable to assume that the isotopic ratios of U-234, -235, and -238 would be consistent with natural uranium. The two ratios which were used to test the reasonableness of the lab data are as follows:

1. On an activity basis, the U-234 and U-238 should be in equilibrium.
2. On a mass basis, the U-235 should be 0.71% of the U-238.

Other criteria which were considered when evaluating the lab data include the following:

1. The natural background concentration for U-238 (or U-234) in New Mexico soil is about 1 pCi/g , and ranges from 0.7 to 1.5 pCi/g, unless the area is influenced by natural outcroppings of uranium mineralization which could present near the Paquate site.
2. The normal gamma exposure rate within the ALS laboratory was about 8 to 9 uR/h. As part of the log in procedure at the lab, the exposure rate on the side of the sample container was measured and recorded. If elevated exposure rates were measured (greater than 15 uR/h), it can be assumed that significant gamma emitting radioactivity is present in the sample. This is a qualitative, not quantitative, assessment.

III. Data Analysis

Work Order 1003045
This data set was for 10 water samples and 15 sediment samples. A detailed data evaluation was performed on 7 water samples and 10 sediment samples.

Sediment: All of the sediment samples had concentrations of about 1 pCi/g, or that considered the natural background for the area. The concentrations ranged from a low of 0.3 pCi/g to a maximum of 2.5 pCi/g. In all samples, the concentrations of U-234 and U-238 were about equal, in equilibrium. The concentrations of U-235 may be biased slightly high, ranging from 0.6% to 1.7% by weight of the U-238 concentration. However, as the U-234 and U-238 were in equilibrium, it can be concluded that material is not “enriched”. Of the 15 sediment samples submitted to the lab, 10 had elevated gamma exposure readings on the side of the container, ranging from 16 to 28 uR/h. These exposure rates are inconsistent with the analytical data where all of the soil concentrations are at or near background levels. Based on this inconsistency, it is believed that gamma-emitting radionuclides other than natural uranium are present in the sample.
Water: Of the 10 water samples submitted, 2 appeared to have elevated U-238 activity of 19 and 75 pCi/l, respectively. All of the other samples contained about 1 pCi/l. The natural background for uranium in water in this area is unknown, but for reference, the USNRC regulatory limit for U-238 in water discharged to the general environment is 300 pCi/l (reference 10CFR20, Appendix B, Table 2). The U-234 to U-238 ratio in the 2 elevated water samples appeared to indicate equilibrium, whereas the ratio in the low-level samples appeared to have a positive bias of 2 to 3. There is no obvious cause for this inconsistency, and may be an artifact of the low concentrations detected. The U-235 to U-238 by weight ratis ranged from about 0.8% to 1.4%. However, this inconsistency is believed to be an artifact of the analyses, and not indicative that the uranium is enriched. Of the 10 water samples submitted, 7 had elevated gamma exposure readings on the side of the sample container, ranging from 20 to 28 uR/h. This may indicate the presence of gamma-emitting radionuclides other than natural uranium in the sample.

Work Order 1003063
This data set was for 6 sediment, 5 soil, and 7 water samples. A detailed evaluation was performed on 5 sediment, 3 soil, and 6 water samples. Of the18 samples submitted to the lab, 15 exhibited an elevated gamma exposure rate on the side of the sample container. The maximum exposure rate recorded was 109 uR/h from soil sample JM-SS-05.
Sediment: Of the 5 of the sediment samples evaluated, all exhibited elevated gamma exposure rates ranging from 18 to 26 uR/h. However, U-238 concentrations were about 1 pCi/g , or what is expected for background, in 4 of the samples. The 1 sample with elevated U-238 had a concentration of about 120 pCi/g, and an exposure rate of 20 uR/h. The U-234 to U-238 ratios in all 5 samples indicated these isotopes were in equilibrium, and the U-235 to U-238 ratios on a weight basis ranged from 0.6% to 1.0%.

Soil: Of the 3 soil samples evaluated, all exhibited elevated gamma exposure rates ranging from 46 to 109 uR/h. Isotopic uranium results were also elevated ranging from about 4 to 90 pCi/g. The U-234 to U-238 ratios in all 3 samples indicated these samples were in equilibrium, and the U-235 to U-238 ratios on a weight basis were all about 0.7%.
Water: Of the 6 water samples evaluated, 5 exhibited elevated gamma exposure rates ranging from 19 to 27 uR/h. Isotopic analysis of all 6 samples appeared to indicate elevated uranium activity, even the 1 sample exhibiting a background gamma exposure rate. The reason for this inconsistency is not obvious. Isotopic results for 5 of the water samples were closely grouped, ranging from about 19 pCi/l to 60 pCi/l, while 1 sample contained about 3000 pCi/l. The exposure rate on the side of this sample was 20 uR/h. The U-234 and U-238 concentrations in all 6 samples were in close agreement, indicating equilibrium, and the U-235 to U-238 ratios on a weight basis ranged from 0.6% to 0.8%.

IV. Conclusions and Recommendations
Based upon the evaluation tests described in section II, these data appear valid. It appears that some of the samples contain elevated concentrations of natural uranium, while others contain concentrations normally observed at natural background levels for these isotopes.
The most significant inconsistency observed with the data are the differences in gamma exposure rates on the sides of the sample containers versus the isotopic analysis. The reason for this inconsistency cannot be determined from the existing data. However, it is believed that the source of the elevated gamma exposure rates are from radioisotopes other than natural uranium in these samples, probably Ra-226 and its progeny. It is therefore recommended that these samples also be analyzed by gamma spectrometry to identify all of the contributing isotopes, and specifically to perform the gamma spectrometry with the 20 to 30 day holding time to allow the ingrowth of Rn222 progeny to quantify the Ra-226. It is also recommended that the Th-234 daughter of U-238 be quantified during gamma spectrometry. While this isotope has a relatively high detection limit of a few pCi/g by this technique, and therefore is not able to accurately quantify those samples with background levels of U-238, it will serve to validate the results of those samples with elevated uranium.

Year End Program Report FY 09
SURFACE WATER MONITORING PROGRAM

P.O. Box 194
Laguna, New Mexico

February 2010

270001

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Introduction

This report is the culmination of the three and one half rounds of sampling, three quarterly reports and the efforts of work done under the Pueblo of Laguna (Pueblo) Clean Water Act § 106 Surface Water Quality Monitoring Program. This report also serves as the fourth quarterly report.

The Pueblo of Laguna (KA-WAIKA-MAH) is a federally recognized Indian Tribe located in West-Central New Mexico on the Colorado Plateau. The Pueblo is one of the 19 federally recognized Pueblos in the state. The name of the Laguna Pueblo People is derived from the Spanish word for Lake (Lagoon). As well, the name in the Keresan language is KA-WAIKA-MAH and the literal translation is "people from the lake" or "people of the lake". The Laguna People have always been farmers, livestock tenders, and caretakers of the land, but most of all, we prize the human attribute of thought and hard work. KA-WAIKA was the first of the Pueblos to adopt a written Constitution in 1908. This constitution was replaced under the Indian Reorganization Act of 1934, revised in 1958, and amended once again in 1984.

Laguna Reservation lands comprise approximately 550,000 acres in Trust and approximately 150,000 acres of State and Bureau of Land Management tracts for a total of nearly 700,000 total, situated within four New Mexican counties; Cibola, Valencia, Bernalillo and Sandoval. There are six main villages within the reservation boundaries: Seama (TSE-AH-MAH) (the western-most), Paguate (GWEE-STCHGEE), Encinal (BUU-NEE-GUY-AH), Paraje (TSE-MUU-NAH), Laguna (KA-WAIKA), and Mesita (HAA-TSAH-DTH) (the eastern-most). There are also several sub-divisions and scattered homes between the main villages. "The Village of Laguna is, and shall continue to be, the Capital of the Pueblo of Laguna",[1] which is located approximately 55 miles west of Albuquerque on Interstate-40.

The lithological setting of the Pueblo of Laguna Indian reservation is distinctive and the landscapes are commonly a complex response to variations in rock types and to primary and secondary structures within the units. Secondary structures are heavily influenced by diastrophic and exogenic processes. The deformation, uplift, doming, volcanism and at times intense lateral deformation produce large-scale secondary structures that respond to geomorpholoigical processes in complex variations which create our distinctive terrain and unique morphological structures. Lithological controls over landforms produce a wide variation of structures and these variations may be associated with a wide range of discrete regions that can be identified from distinctive outcrops of a few square meters to uniformatity over hundreds of square kilometers. It

[1] Pueblo of Laguna, Constitution of the Pueblo of Laguna, June 6, 1984, page4

is important of recognize some of the major geomorphic features associated with arenaceous, argillaceous, calcareous, igneous, and metamorphic rocks. These will impact the rate of weathering which has a direct impact to the rates at which weathered material is removed from its location of break-up to deposition. This will also be a major influence on infiltration, percolation, permeability, and porosity. The influence continues and impacts surface water, shallow groundwater and medium to deep ground water respond accordingly as well as quality and quantity. Weathering is an unfixed mix of both chemical and mechanical processes. All these factors impact fluid movements. A liquid is transported thorough open channels where the flow is confined and although the depth, velocity, and flow in the channel can be measured the study can be rendered hazardous in arid and semi arid climates. Uplift mechanisms can be categorized for purposes of simplicity as eustatic, isostatic, tectonic and orogenic. These mechanisms are all factors in the development of drainage basins and stream channels. Denudation chronology, direct observation/ measurement, mathematical simulations and application of the ergodic hypothesis are some of the methods used to try to visualize the long-term evolution of the landforms. Morphgenetics are important to consider regarding questions concerning climatic geomorphology. The morphometrics portions are greatly impacted by climatic influences. These influences may either be directly related through precipitation intensity or indirectly through vegetation. The morphogenetic region in which the Pueblo of Laguna is located is classified as Semi-Arid to Arid. The geomorphic processes associated with this region are listed as follows:

- Frost Weathering (minimal except at higher latitudes)
- Mechanical Weathering (minimal to moderate, especially thermal and salt)
- Chemical Weathering (minimal to moderate)
- Mass Wasting (moderate but infrequent)
- Fluvial Processes (Maximum but episodic in the form of sheet wash, gulling and ephemeral stream action giving high overall erosion rates)
- Glacial Scour (nil)
- Wind Action (Moderate to Maximum)

The morphological features associates with this region are listed as follows:

- Pediments (1° to 4°)
- Cliffs and angular talus slopes (25° to 35°)
- Inselbergs
- Integrated ephemeral stream systems
- Arroyos
- Badlands
- Alluvial fan

- Local dunes

The following diagram was first demonstrated by Hjulström, which was elaborated by Sundborg (1956) which relates critical velocity to the sediment size at which erosion of sedimentary particles will begin for both wind and water.

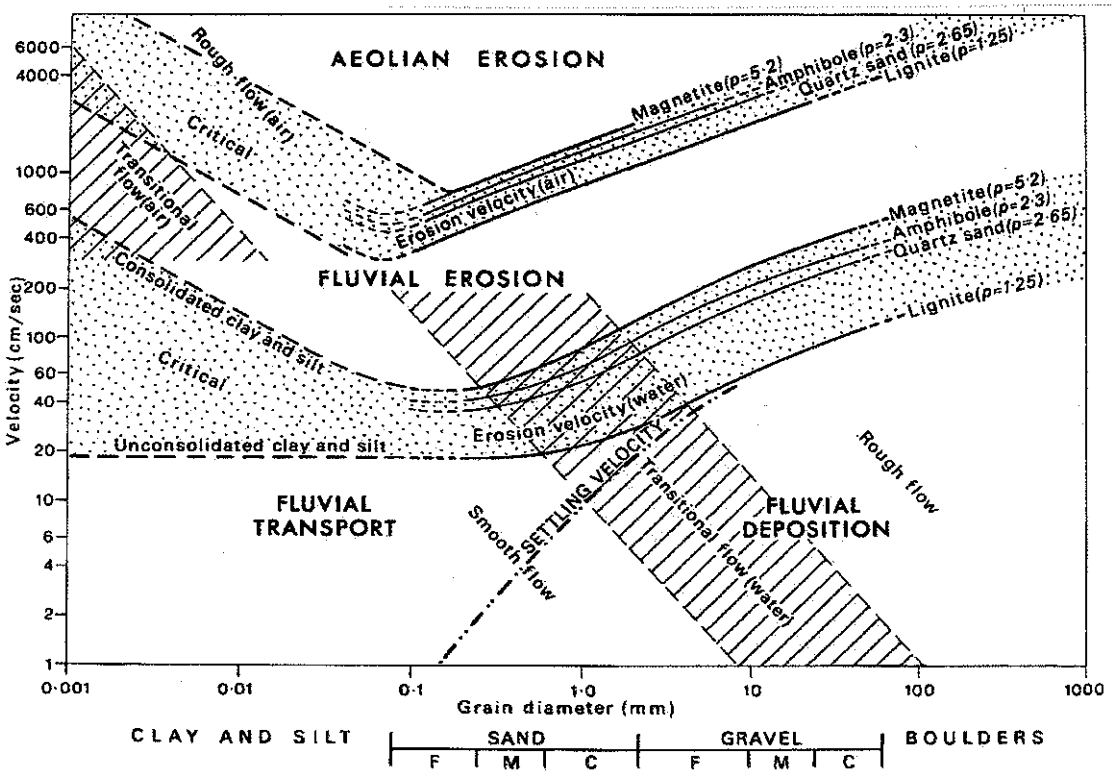


Figure 12.14 Curves showing relations of grain size to critical fluvial and aeolian erosion velocity for uniform materials of differing densities. The critical fluvial erosion velocity refers to a height of 1 m above the river bed. The two critical zones around these curves and the settling velocity curve for particles in water delimit the four regimes of fluvial deposition, fluvial transport, fluvial erosion and aeolian erosion.
Source: Sundborg, 1956, figure 16, p. 197.

Potable and non-potable water is in very limited supply across the Pueblo, making it a highly valuable resource. Drinking water is derived from shallow surficial aquifers and surface water springs, drinking water wells are screened in the shallow alluvial aquifers along surface water pathways with one exception. The Village of Encinal uses surface water collected from springs in the Encinal Canyon which infiltrates from surface water through at least two basalt units and possibly sandstone prior to use. This source is currently being used to improve the water quality of the valley system which is degraded. Therefore, the Pueblos' drinking water aquifers and supply system are vulnerable to contamination from surface sources. There are two primary watersheds that drain the Pueblo lands: the Rio Puerco and the Rio San Jose. The Rio San Jose drains from the west towards the east, joining up with the Rio Puerco, which drains from the north towards the south. The Rio Puerco then goes on to a confluence with the Rio Grande. Together, the Rio San Jose and the Rio Puerco form a sub basin of the Rio Grande basin. The Rio Puerco

is one of the main tributaries of the Rio Grande, entering the river near Bernardo, New Mexico. It supplies more than 70% of the suspended sediment entering the Rio Grande above Elephant Butte reservoir. The Pueblo's lands are in the eastern and central portions of these watersheds.

The U.S. EPA's Index of Watershed Indicators classifies the Pueblo's watersheds as having "More Serious Problems – Low Vulnerability to Pollutant Stressors", and assigns the watersheds a score of 5 on a scale of 1-10. The problems stem primarily from erosion, loss of riparian vegetation, intrusion of non-native species (i.e. Salt Cedar) and high sediment loads. However, there are a few possibilities for the discharge of pollutants. There have been no fish advisories for these watersheds. The Jackpile uranium mine on the Pueblo has been mostly reclaimed and is shown on the attached aerial photo. However, discharges from this mine, as well as from similar mines and mills upstream of the Pueblo, have affected the Pueblo's watersheds. Currently, there are two regulated point source effluent dischargers, one on the Rio San Jose at the Dancing Eagle Casino and on the Rio Puerco at the Route 66 Casino. There is always the likelihood of spills and accidental releases on the U.S. Interstate Highway 40 and Railroad systems, which bisect the Pueblo lands.

Methodology

Analytical Sample Collection

The methodology used by the POL staff in collection and physical parameter monitoring includes the following:

1. Peristaltic Pump with poly and silicone tubing
2. YSI 650 Multi-probe system with 6820 Multi-parameter Sonde
3. YSI 6160 Flow Cell
4. Latex Gloves and other PPE
5. Coolers for sample collection
6. Ice for sample preservation and drink/food ice chest cooling
7. Pruning shears and various hand tools
8. 5 lb sledge hammer
9. 4 wheel drive vehicle

An analytical laboratory was contracted for the analytical portions, which include the following:

- Isotopic Uranium (U^{238}, U^{235} and U^{234})
- Total Nitrogen which includes
    - Ammonia
    - Total Kjeldahl Nitrogen
    - NO_2 (Nitrite) and NO_3 (Nitrate)
- Total Phosphorous
- Fecal/E. Coli

The following analysis will be added in 2010 to the list of analytical samples collected and analyzed as part of the Surface Water Quality Program this will consist of:

- PCB, Toxapene, Chlordane
- Chlorinated Acids
- Regulated SVOC
- Carbamated Pesticides
- Diquat
- Endothall
- Glyphosate
- DRO/GRO
- High Explosive
- TTHM's
- PAH

The laboratory was tasked with providing all sample containers, preservatives, coolers chains-of-custody forms and receipt of samples by the laboratory was done on Pueblo land. The sampling procedures

identified in the Quality Assurance Project Plan (QAPP) QTRAK #08-132 approved February 2008 were followed with the exception of submerging the sample container in the water body. As can be observed from the previous site photographs it is not possible to submerge a sample container in most water bodies present on the Pueblo of Laguna Indian lands. Dipping of samples using a sterile disposable container was not appropriate. This action disturbed the sediment in the bed of the stream; therefore, a peristaltic pump was used in the collection of most surface water samples. The use of the peristaltic pump also allowed for the use of an inline 0.45 micron filter where required for field filtering. All samples collected for this year are for inorganic analysis therefore the use of the poly tubing will not affect the data, however as time progress and different analysis are required, Teflon tubing will be used which will not affect semi volatile or volatile organic analysis, this will be added next year.

Physical Parameters

Surface water will be monitored for the following parameters:

- Flow rate, noted as presence or absence of water with detectable flow
- Dissolved Oxygen in percent and mg/L,
- Atmospheric pressure in Atmospheres,
- Temperature in degrees C,
- pH,
- Specific Conductance in mS/cm,
- Conductance in mS/cm,
- Resistivity in KOhm/cm,
- Oxidation Reduction Potential in mV,
- TDS in g/L
- Salinity in ppt
- Turbidity in NTU,

Attempts have been made to monitor locations on a bi-monthly basis, which has proved to be difficult given sample location dispersion, weather conditions and distance to each location. Sample collection for physical data parameters and/or analytical has proven to be non-feasible during late fall, winter and early spring months. The locations at high elevations are inaccessible due to snow and most water is frozen. The lower elevation locations are only accessible during later afternoon thawing but limited daylight make the return trip in the dark and dangerous. The following graphic show the elevation of all 33 sampling locations in feet above sea level the miles were from point to point on the map. Since the locations are not in a straight liner progression it was not possible to map them in this fashion, nor was it possible to map them in actual miles from point to point road miles. The sample location map is located in the Discussion section of this report.

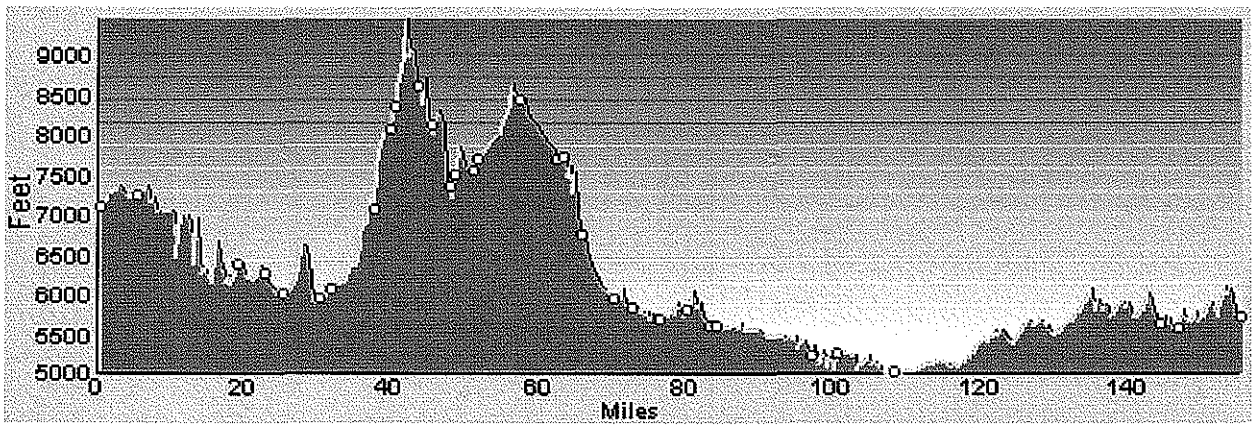
Ambient Toxicity Sample Collection

Ambient Toxicity testing is provided by U.S. EPA Region 6 at no cost to the Pueblo of Laguna, however the Pueblo must pay for containers, coolers, ice, bags, and shipping costs. Ambient Toxicity is considered most useful when utilized in concert with a comprehensive suite of physical, chemical and biological indicators, as a diagnostic tool where water quality problems have been identified by other indicators, and as a complement to biological assessment to determine whether or not previously identified toxicity problems have been eliminated. In addition to the following: (1) known or suspected toxicity and supporting information, (2) proposed uses of toxicity data for 305(b) and, in particular, 303(d) assessments, (3) past utility of toxicity data, and/or (4) proposed chemical analyses and/or toxicity identification evaluations (TIEs) in the event of recurring toxicity. EPA will conduct a 96-hour acute tests for test organisms *Ceriodaphnia dubia* and *Pimephales promelas* see "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition", EPA-821-R-02-012, October 2002. In cases where recurrent toxicity in water or sediment has occurred in a water body, it is recommend that a more intensive chemical analyses and/or TIEs be conducted. Special assistance from EPA Houston Lab may be available for chemical analyses if the Tribe does not have lab capability or resources to conduct such analyses.

2009 Ambient Toxicity Testing Schedule for the Pueblo of Laguna

Location	Water Samples				Sediment Samples				Number of Samples per Location	
	Round 1	Round 2	Round 3	Round 4	Round 1	Round 2	Round 3	Round 4		
RPG-02	1	1	1	1	1		1		Water	Sediment
Date	4/13/2009	6/1/2009	8/3/2009	10/5/2009	4/13/2009	N/A	8/3/2009	N/A	4	2
RPG-03	1	1	1	1	1		1			
Date	4/13/2009	6/1/2009	8/3/2009	10/5/2009	4/13/2009	N/A	8/3/2009	N/A	4	2
WCC-01	1	1	1	1	1		1			
Date	4/20/2009	6/1/2009	8/17/2009	10/5/2009	4/20/2009	N/A	8/17/2009	N/A	4	2
Total Number of Samples per Year									18	

Sample Location by Elevations Distribution



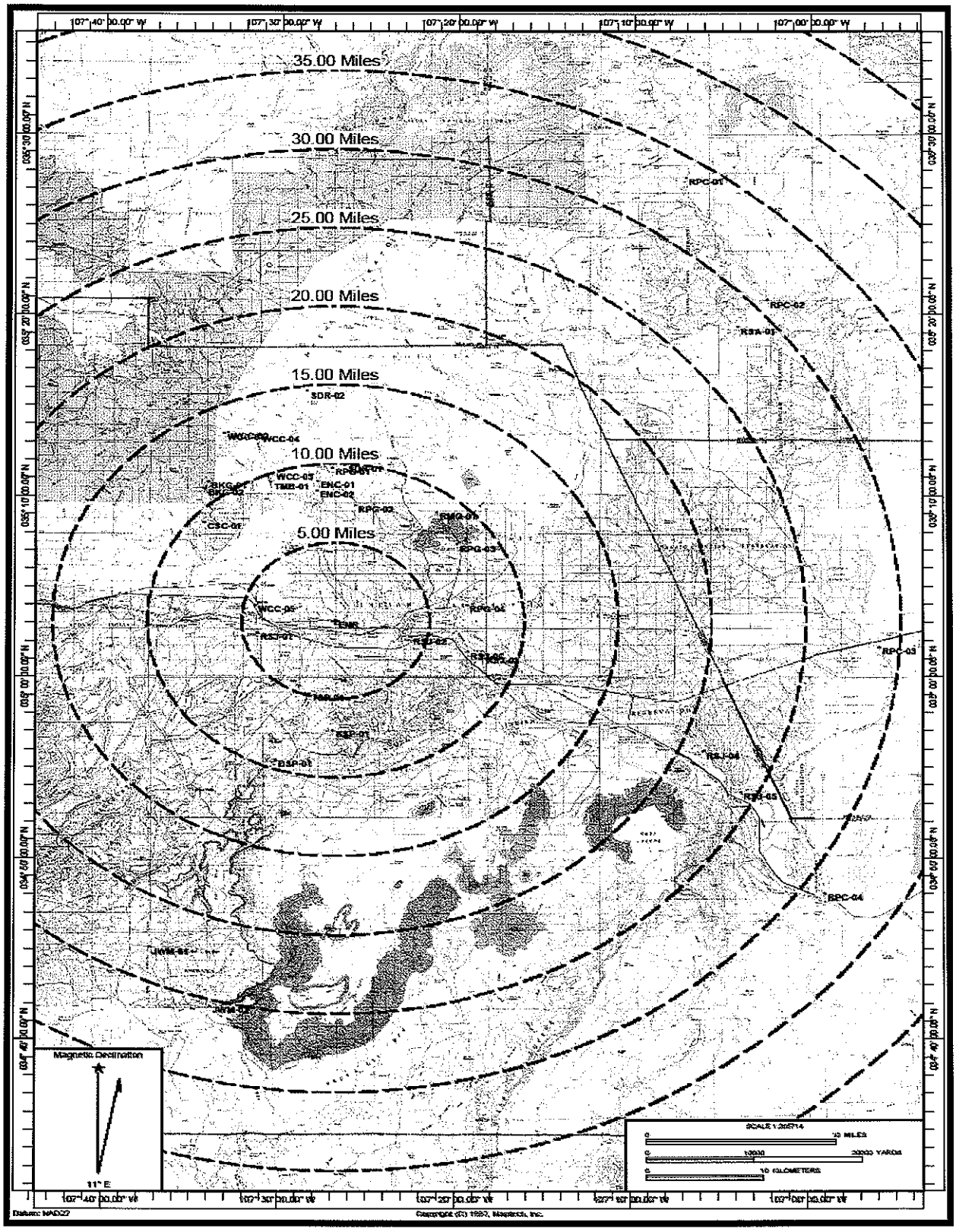
This distribution is in feet above sea level starting at the lowest point in elevation which is 5000 feet to a high of nearly 9000 feet. The distance is from point to point and is over 150 miles but this does not reflect actual distance driven which is much greater. The distance of 150 miles is a good daily average driven to collect Physical parameter data and analytical samples during a round of sampling activities at the Pueblo of Laguna.

This location specific data takes into consideration areas where sewage lagoons are located close to surface water bodies and where the potential for impact is greatest. Data from suspect locations will not be included in the "background" database. Background location had been chosen in areas where very limited impact from human activity is possible and wildlife and geologic setting are the defining factors.

Physical parameter data collection as identified in the QAPP, is to be collected on a bi-monthly basis, however this has proven to be problematic. Many locations are not accessible at all times and those with cultural/religious uses are not accessible during these types of functions. Weather is a major factor in determining access to a location. Hot summer days and high Evaportranspiration rates diminish flow in shallow surface water bodies to damp soil in many of the locations; however, these locations are important and are retained as locations. These conditions are noted and recorded in the logbook and noted in the Quarterly Progress Reports.

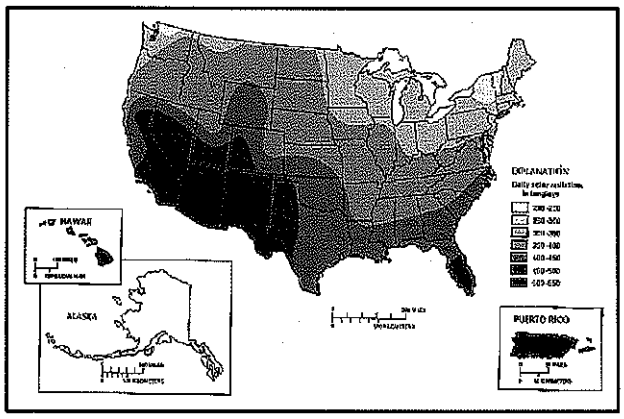
Whenever possible physical parameters and analytical sample collection are combined to save time and improve field efficiency. The following map shows the dispersion of sampling locations and distance from a fixed point which it the Environmental Program Office location. It should be noted that the base maps used by the Terrain Navigator Pro software are USGS Quadrangles the 1:100000 Scale and the 7.5 Minute Series at 1:24000 which have not been updated and not show the current land holding of the Pueblo of Laguna but all points on the map are on Laguna Land either Trust or Fee Simple. The only points on Tribal Trust land are the Silver Dollar Ranch, SDR-01, SDR-02, and RPG-01; however, the process to place this land into trust status has begun and should be completed within the next 5 years. Efforts are being made to acquire updated land status maps from the Bureau of Indian Affairs, Laguna Agency.

2009 Sampling Location

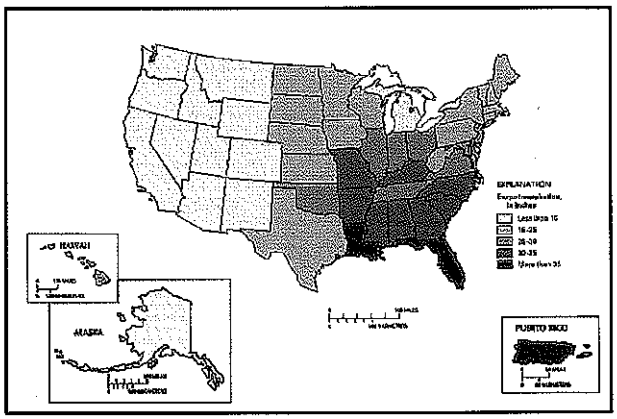


Evaportranspiration

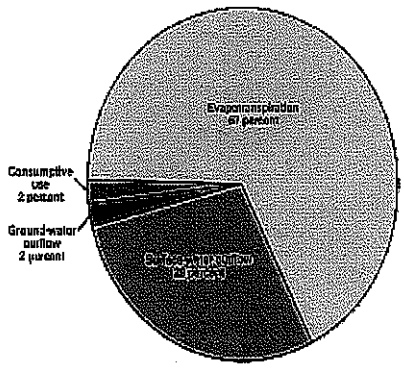
Apart from precipitation, evaportranspiration is the next major component in the hydrologic budget. Evaportranspiration involves the process of evaporation from open bodies of water, wetlands, snow cover, and bare soil and the process of transpiration from vegetation. The principal climatic factors influencing evapotranspiration are solar radiation and wind speed. In the conterminous United States, evapotranspiration averages about 67 percent of the average annual precipitation and ranges from 40 percent of the precipitation in the Northwest and Northeast to about 100 percent of the precipitation in the Southwest.



Mean daily solar radiation in the United States and Puerto Rico.(Source: Data from the U.S. Department of Commerce, 1968).



Estimated mean annual evapotranspiration in the United States and Puerto Rico. (Source: Data compiled from U.S. Geological Survey, 1990).



Average disposition of 4200 billion gallons per day of precipitation in the conterminous United States. (source: Data from U.S. Geological Survey, 1990)

Estimates of the mean annual evaportranspiration have been derived from hydrologic budgets for each State. These estimates indicate that statewide evaportranspiration within the United States ranges from about 10 inches per year in the Southwest to about 35 inches per year in the Southeast. However, in

selected areas of the Southwest where moisture is available and solar radiation is high, evapotranspiration rates in salt cedar are estimated to be about 56 inches per year.

Seasonal trends in evapotranspiration follow the seasonal trends in air temperature-maximum rates occur during the summer months, and minimum rates during the winter months. Advanced Very High Resolution Radiometer instruments installed on polar-orbiting satellites provide relative measurements of plant vigor, density of vegetation cover, and the seasonal duration of vegetation growth. These measurements also monitor the spatial and temporal persistence of drought for large areas.

Changes in evapotranspiration during a drought depend largely on the availability of moisture at the onset of a drought and the severity and duration of a drought. Evaporation from open bodies of water during a drought increases, but transpiration by plants, particularly shallow-rooted plants, generally decreases (*U.S. Geological Survey Water-Supply Paper 2375, p. 99-104.*.).

Discussion

The 33 sites currently monitored within the Pueblo of Laguna Indian Reservation lands cover the full spectrum of environments, climates, terrains, and water quality. The locations range from an Alpine zone in the upper elevations where pine, spruce, aspen, and fur are the dominate tree types to Northern Chihuahuan Desert grasslands characterized by plateaus, rolling hills, and basin floors where the soils are relatively deep. Blue Grama, *Bouteloua gracilis*, is the dominant species here. Surface water sources within the Pueblo of Laguna lands vary greatly. The higher elevations are characterized by braided high velocity, cold-water streams and the low elevations are characterized by ephemeral streams called arroyos. Springs are the sole source of water on several of these surface water bodies, many of which dry up completely during the summer months. The flora and fauna associated with these zones vary with elevation, terrain, and uses. In many instances, only plants are associated with the surface water bodies, (Arroyos) and many of the springs, which are isolated dry up during the summer or reduce to shallow pools with little to no aquatic life. Evaluations of current sites monitored revealed two streams and one spring hold the possibility of supporting fish species and have enough water year round to support these aquatic ecosystems. These are the Rio Paguate, Water Canyon Creek and Dipping Vat Spring on the Rio San Jose at RSJ04. Cultural and Traditional uses of these water bodies and all water bodies on the Pueblo of Laguna Indian Reservation Lands will be denoted as a "Yes" or "No" answer and under no circumstances will details of Cultural and Traditional use be elaborated upon. Do any water bodies monitored during the Tribal Fiscal Year 2009 of the CWA § 106 Water Quality Program have Cultural and Traditional uses? Yes.

Analytical data and Physical parameter data collection for the Tribal Fiscal Year 2009 is not complete and will not be added in this report until it is completed. Round one through Round three data, in hard copy

format, for will be attached as an appendix to this report, partial data from Round 4 will be included and the remaining data will be collected in the spring prior to the start of Round One of the 2010 sampling schedule. It will be added as an addendum at a later date. The analytical data collected in round one shows major changes in water samples collected from all sites. The sites designated as Back Ground have little to no interference from upstream sources both surface and ground water is derived from snowmelt and rain. It is suspected that any metal levels may be elevated due to development practices implemented by the U.S. Forest Service; this development also limits the influence of biological vectors such as wildlife, aquatic species, and the environment. Additionally the New Mexico Bureau of Geology and Mineral Resources in conjunction with the U.S. Geological Survey are up-dating geological maps in the Mt. Taylor and Lobo Canyon Quadrangles. These 7.5 minute quadrangle maps overlap onto Pueblo of Laguna lands. One of the objectives of this mapping is to better understand the movement of surface water and groundwater due to the complex nature of a composite volcanic field and its interaction on the surrounding bedrock. This will help the Pueblo of Laguna better identify recharge zones and aquifer connections and the complex relationship between surface water and groundwater within the Mt Taylor Volcanic field on and off reservation lands. More analytical sampling is required to determine if any problems exist in the waters of the Pueblo of Laguna. Currently assistance is being sought with the New Mexico Bureau of Geology and Mineral Resources to obtain additional analytical analysis on water bodies classified as important by the Pueblo of Laguna. Determinations of naturally occurring constituents are still being compiled and evaluations for additional analytical parameters for upcoming years evaluated. Studies of naturally occurring contaminants and compounds are continually evaluated to determine if any adverse effects are observed and if so can be recorded. The addition of manmade organic, volatile and semi-volatile organic compounds are to be added to the 2010 sampling schedule which will require a substantial increase in the analytical budget and would be proposed for the surface water systems that are currently used by the Pueblo of Laguna for drinking and ceremonial use. These surface water bodies feed the shallow alluvial aquifers where groundwater is drawn for the domestic drinking water supply system of the Pueblo.

Turbidity is still proven problematic; most locations have water that is above 50 NTU. The YSI 650 Multi-parameter probe and 6820 Multi-parameter Sonde which can read Turbidity up to 1000 NTU has helped but in many stream especially the Rio Puerco is still beyond the ability of this Sonde. Additionally physical parameter data collection is not possible in arroyos when there is flow. This flow typically is a flood induced by heavy precipitation and the velocity of the water is very physically powerful. Attempts were made to collect from bridges; however, the sediment load was so great that and the particle size were slightly greater than the diameter of the collection tube that it plugged the tube. The bed load was so high that the 6820 Multi-parameter Sonde was buried in sediment within seconds and adequate reading were not possible, attempts were made to hold the Sonde above the steam bed but the velocity of the water was so great it caused the Sonde to hydroplane on the surface. The velocity of the water

made it impossible to be near the edge of the stream as the bank was being undercut and continually collapsing into the stream.

In summary there is physical, ambient toxicity, and analytical sample data to determine problem areas on surface water bodies across the Pueblo of Laguna reservation lands. The Rio Paguate has good quality water above the mine however, below the mine the quality drops dramatically. The level of Isotopic Uranium in the water peaked this year at 394.90 µg/L at RPG-03 and 147.28 at RPG-04 on 06/25/2008. The levels on 05/28/2008 were 327.52 µg/L at RPG-03 and 227.38 µg/L. The quantity has varied greatly as well this year with higher than normal turbidity levels during the summer months when flow is diminished. This is most likely due to the drought and this being one of the permanent streams emanating from Mt. Taylor has seen increased use by wildlife and livestock. This level impacts not only the Rio Paguate but the Rio San Jose below their convergence points and the Rio Puerco then the Rio Grande. The Rio Moquino has showed measurable levels of Isotopic Uranium all year long with a peak level of 9.93 µg/L on 05/28/2008. The Rio San Jose at RSJ-04 showed elevated levels on 06/26/2008 of 13.08 µg/L which is at a sampling location more than 15 miles downstream and diluted by two large springs and several minor ones. The quantity of water in the Water Canyon Creek has fluctuated greatly throughout the year with variability in the quality as well. The main problem with this stream system is the diversion of 100% of the flow by the Cubero Land Grant Community. Encinal Creek has also remained fairly constant throughout the year as well compounded by high evaportranspiration rates and infiltration resulting in limited flow. The two points at Jack Ward Mesa have varied greatly all year, it is expected that this is due to geology and natural causes. The Rio San Jose has varied greatly as well and this is due to numerous factors. The Rio Puerco and Rio Salado vary greatly as well, however this is mostly due to the presence or absence of water. There has been very limited flow all year in the Rio Salado and it has remained dry due to 100% containment by the Juan Tafoya Land Grant Community (AKA Marquez). The numerous springs including background have not fluctuated as greatly but difference can be attributed to the drought conditions experienced this year which impact quality, flow and quantity.

Arroyo Cutting

An arroyo is a nearly vertically walled, flat floored stream channel that forms in fine, cohesive, easily eroded material. Arroyos can cut as deeply as 65 feet into the valley floor, are often wider than 165 feet, and can be hundreds of miles long. Arroyos exist throughout the western United States, but are most common in arid and semi-arid climates in the Southwest. The rapid widening and deepening of arroyos have both changed the physical environment and been a costly nuisance in the west since European settlement began in the mid 1800's.

Causes of Arroyo Formation

Three factors may cause arroyo formation, but the relative contribution of each is difficult to discern. The main factor is thought to be a change in climate that produced unusually heavy rainfall. Land-use practices, such as grazing, may have enhanced arroyo formation in the southwest during the most recent period of erosion (A.D. 1865-1915). A natural cycle of erosion and deposition caused by internal adjustments to the channel system is a third possibility (Graf, 1988; Schumm and Hadley, 1957).

Climate

Flooding caused by heavy rain may produce arroyos. Although climate records in the southwest were not systematically kept before 1900, recent studies have found evidence for unusually heavy rainfall in Tucson, Arizona during the late 1800's (Betancourt and Turner, 1993). This rainfall was caused by strong and frequent ENSO (El Nino Southern Oscillation) events, suggesting that heavy rain was a regional phenomenon. Thus, the climate of the Southwest during the most recent period of arroyo entrenchment was conducive to large floods (Hereford, 1993). Drainages may have been especially vulnerable to arroyo cutting, if unusually wet ENSO conditions occurred immediately following a period of below normal precipitation. During a dry period, the enervated vegetation would not have its normal capacity to protect the soil from rain-drop impact or to absorb and slow runoff.

Land Use

With the settlement of the West came the rapid introduction of cattle, sheep, and horses. From 1870 to 1890 the number of livestock in New Mexico increased from 300,000 to 2,300,000 (Peterson, 1950). Similar increases were reported in other Western states during this time. Valley floors, which were the most dependable forage areas for the animals, were quickly overgrazed. The fragile vegetation was consumed, and the soil was compacted and left extremely susceptible to erosion. To further exacerbate the soil conditions, both humans and livestock created trails along stream channels and nearby hillsides forming small ditches, leaving the land surface susceptible to arroyo formation.

Nevertheless, earlier periods of arroyo formation predated the introduction of livestock, and thus overgrazing cannot be solely responsible. Spanish and Mexican ranchers, moreover, introduced large numbers of livestock in the 1700's without associated erosion. For these reasons, other factors such as climate change may have played a more important role in arroyo formation.

Effects of Arroyo Cutting

Swamps in the Southwest during the Last Century

Observations before 1865 describe verdant river bed marshes, known as cienegas, containing beaver ponds, fish, and tall grasses which were nourished by high water tables (Bryan, 1925). These marshes have since been drained by arroyos, altering the flora and fauna of the area by widening and deepening the original stream channel.

Decreased Agricultural Productivity

Arroyo formation can be very destructive to agriculture. As soon as arroyo cutting begins, the surrounding water table is lowered making irrigation difficult. Arroyos can quickly remove as much as 25% of their valley floor (Cooke and Reeves, 1976, p. 3), covering downstream agricultural land with unwanted flood-borne sediment. This sediment does not improve the fertility of the underlying alluvial soil because it contains large quantities of sand and gravel that originate from subsoil and deposits of soil forming materials (Cooperrider and Hendricks, 1937).

Flooding

The often excessive deposits of sediment from upstream arroyo formation can decrease flood protection by reducing the natural regulatory functions of stream channels and riparian habitat. Sediment from upstream arroyo erosion fills channels that otherwise would store flood water. Arroyos also increase flood severity by changing the geometry of the stream channel. Development of an arroyo in a previously braided or meandering drainage straightens and shortens the channel which limits flood water dispersal and increases velocity and increases the cutting or in sizing of the active channel. The scouring of the channel removes the alluvial materials in which vegetation takes hold and destabilizes the banks. A blockage of the channel in this stage can result in massive deposition of several feet bed load over the limited vegetation which may be present and lateral flooding with catastrophic effects.

Displacement of People

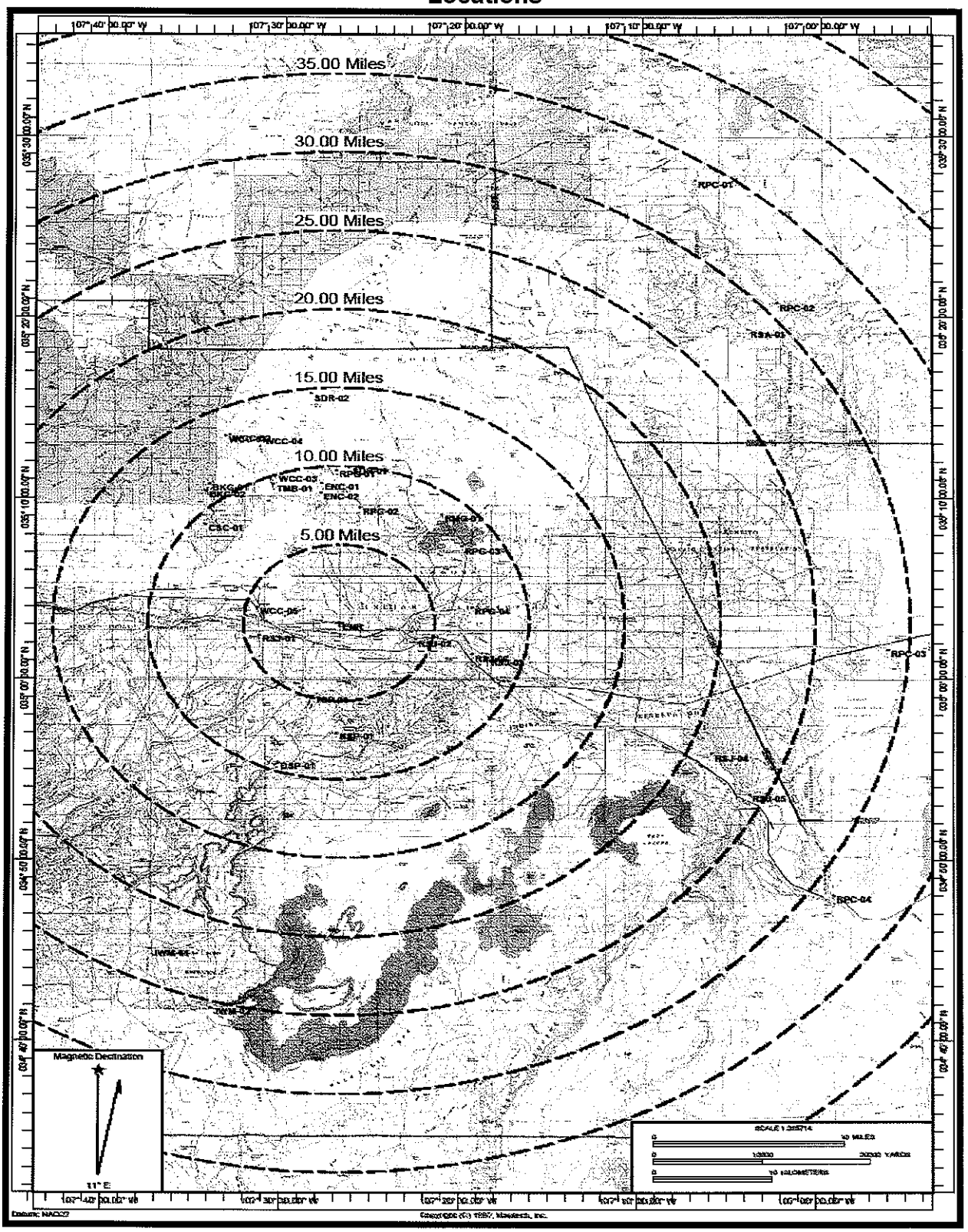
Because of the loss of land to arroyos and the increased difficulties of farming, humans have occasionally been forced to either change their agricultural practices or to relocate. Where farming practices were depended on irrigation, problems of increasingly fluctuating and decreasingly reliable water sources, and difficulties of transferring water to fields, drove out farmers or forced a change to grazing (Gregory and Moore, 1931). Other damages include destruction to roads, railroads, bridges, culverts, fences, and irrigation works. In the late 1880's, the entrenchment of the Rio Puerco in New Mexico forced the desertion of the towns of San Ignacio, San Fernando y Blas, and San Francisco (Bryan, 1925).

Prehistoric arroyo cutting may have been one of the main factors leading to abandonment of southern Utah and northern Arizona by the Puebloan People (Hereford et al., 1995).[2]

Not to Scale

[2] USGS Rio Puerco On-line Web site http://esp.cr.usgs.gov/rio_puerco

Tribal FY 2009 CWA § 106 Water Quality Program Sampling & Monitoring Locations

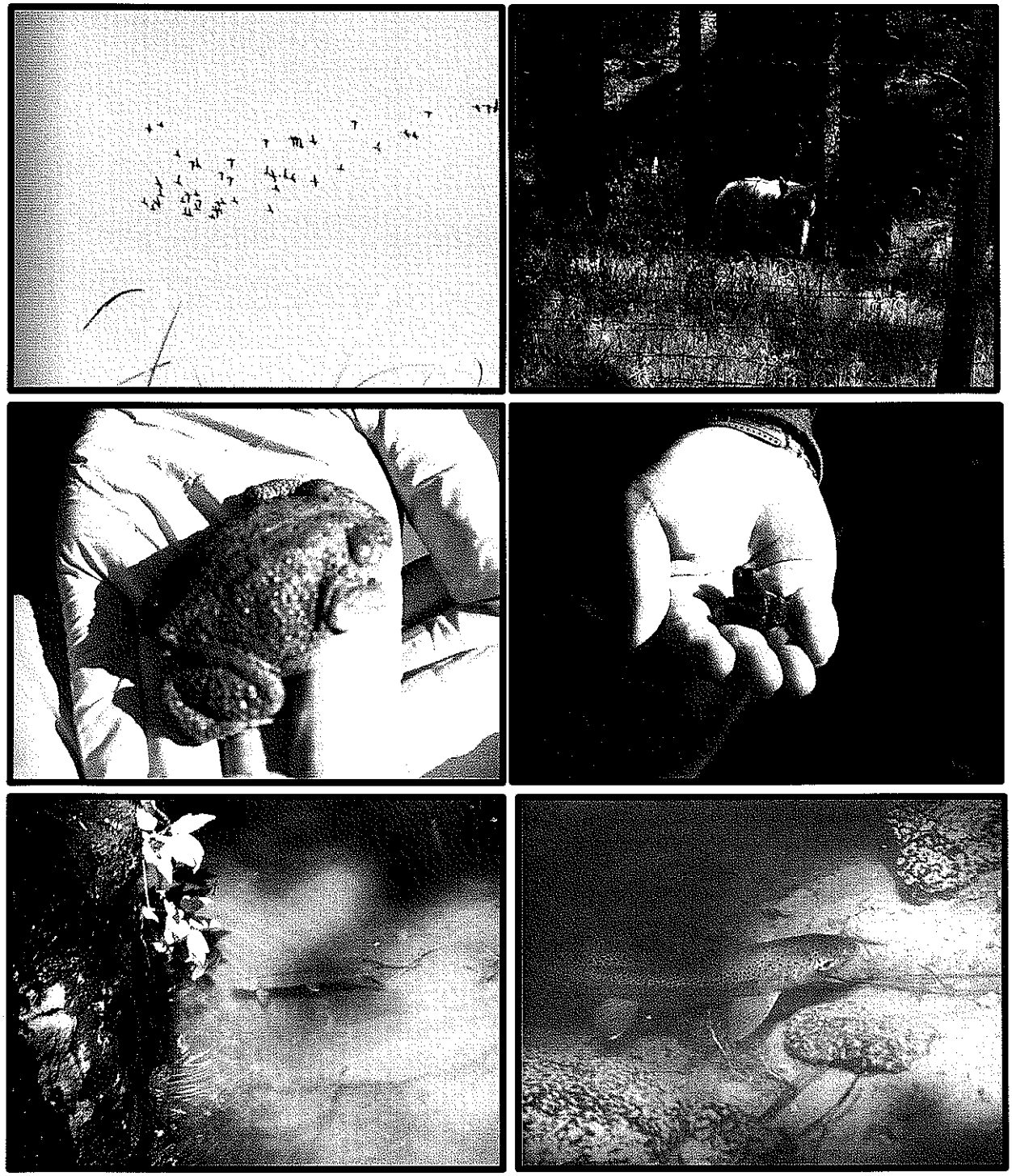


Macro invertebrates and Fish Habitats

The Rio San Jose and the Rio Puerco watersheds, which are both sub-watersheds of the Rio Grande Basin system, receive water from sources passing through or originating on Pueblo of Laguna Indian lands. The stream systems which comprise these watersheds vary with regard to the size of the basin, elevation, seasonal flow rates, ownership and resource management schemes, and of course, aquatic bio-diversity.

There are perennial, spring-fed and snow run-off, cold-water streams which support native and introduced trout species (Genus: *Salmo)*, of New Mexico and the elements of primary production, which these trout feed on. These stream systems vary from one (foot) in diameter, to approximately 12 feet in diameter, with varying levels of stream depth and flow rates. There is also variation in the pools, riffles, eddies, as well as, available fish cover and habitat. Additionally, there have been occurrences of catfish (Genus: *Ictalurus*) and Bluegill (Genus: *Lepomis*) in the Rio Paguate and Rio San Jose stream systems.

There are also areas of the stream systems, which have become "choked" with vegetation and silt. These choked areas of the stream system are primarily upstream of the Pueblo of Laguna's external boundary fence. Within the Pueblo of Laguna's boundaries, in the Water Canyon stream system, there are a series of high elevation, small, in-line ponds, which vary in size, depth, and habitat. There are some seasonal occurrences of algal blooms in this pond series, which effects aquatic life. Inhabitants of these high-mountain ponds include, but are not limited to, mudpuppies (Genus: *Necturus*), Gastropods (snails), crayfish (Order: Decapoda), and Leopard Frogs (Genus: *Rana*), and these ponds are regularly visited by bear, deer, mountain lion, turkey, ducks, geese, crows, eagles, hawks and elk.



The Pueblo of Laguna's Environmental and Natural Resource Teams are presently designing a complete aquatic biodiversity inventory to be conducted as funding becomes available. Currently it is hoped to contract for a preliminary Macro invertebrate study to be done in 2010.

Conclusions

The Pueblo of Laguna Surface Water Quality Monitoring program has experienced set back but has met or exceeded all goals for the § 106 Clean Water Act Grant for FY 2008-2009. The water quality specialist and colleges have collected 3 full rounds of analytical samples and partial data from round 4. Round 4 will be completed in the spring of 2010 prior to starting Round 1 of the 2010 rounds of analytical data collection. All attempted to collect bi-monthly physical parameter data in addition 4 rounds of Ambient Toxicity sampling data have been made, however due to injuries sustained during round 4 analytical and physical parameter collection had to be suspended. All data, analytical and physical is attached to this report with the remainder to be added at a later date. In addition, all quarterly reports have been submitted for this grant year, with the exception of this Year End Report. The result of the analytical sampling and physical parameter monitoring is indicating great diversity within the waters of the Pueblo of Laguna. Variations in surface water bodies with hydrologic links to groundwater in many cases are becoming evident, which has been suspected and now confirmed.

As discussed in the introduction section the hydrogeology of the Pueblo of Laguna Reservation lands is unique and complex. Pristine conditions are no longer possible due to the extensive mining that occurred in the Grants Mineral Belt. Contamination from mining activities, population centers, National Laboratories, highways, detonation of nuclear weapons within the state of New Mexico, etc., have wide reaching effects and directly impact the air quality which in turn affects meteoric waters which are part of the hydrologic cycle. The first atomic bombs detonated were within the State of New Mexico, the first at Los Alamos National Laboratory and the second at the Trinity Site on the White Sands Missile Range. Much of the uranium needed for these weapons was mined from Pueblo lands and the effects of which are just beginning to express themselves within the population that mined this ore.

The use of surface water by the Pueblo of Laguna people had not changed much since before New Mexico became a State in 1912. These uses include irrigation of farmland, livestock watering, drinking water supplies, and cultural and traditional uses. Introduction of drinking water and waste water systems by the Indian Health Service in the 1960's have had dramatic effects on the limited, high quality water supplies on Pueblo lands. Demand for drinking water has grown logarithmically since its introduction with similar detrimental effects on source areas. Impacts from septic and sewage lagoons is not fully know but is expected to have been negative. Demands for water in the semi-arid climate of the southwest are growing both on and off the reservation. Large metropolitan areas demands for clean drinking water have exceeded the capability of the source supply and these areas are now looking towards Indian lands to fulfill their needs, with no regard to the needs of the Tribes for the same resource. It is extremely important for Tribes, specifically the Pueblo of Laguna to protect and determine the quality and quantity of its waters both surface and subsurface. It is also important to understand the impact of contaminants on the hydrologic cycle, and how these contaminants will influence human health and the environment.

Total Uranium Results in Micrograms/Liter

YEAR		2005			2006			2007				2008				2009			
Sample Location		Round 1	Round 2	Round 3	Round 1	Round2	Round 3	Round 1	Round 2	Round 3	Round 4	Round 1	Round 2	Round 3	Round 4	Round 1	Round 2	Round 3	Round 4
RPG-02	U-234	0.446	0.241	0.268		0.309									0.693				
	U-235	0.038	-0.080	0.013		0.017									0.760				
	U-238	0.027	-0.011	0.162		0.167									18.000				
Total Uranium		**0.511**	**0.150**	**0.443**		**0.493**									**19.453**				
RPG-022	U-234			191.333															
Duplicate Sample	U-235			-0.015															
	U-238			0.096															
Total Uranium				191.414															
RPG-03	U-234	23.710				56.652	25.187	3.000	53.820	5.007	0.016	87.333	92.667	0.003	0.027	0.014	0.004	98.482	39.579
	U-235	1.117				2.384	1.017	-0.032	2.822	0.463	1.600	4.720	5.353	0.000	4.530	2.330	0.633	3.652	1.462
	U-238	20.793				53.773	23.085	1.107	53.560	5.860	309.000	72.667	88.000	0.003	448.000	230.000	63.800	89.200	35.568
Total Uranium		45.620				112.809	49.289	**4.074**	110.202	**11.330**	310.616	164.720	186.020	**0.007**	452.557	232.344	64.437	191.334	76.609
RPG-033	U-234	22.248				48.717	23.943					88.000				0.015			
Duplicate Sample	U-235	1.268				2.282	0.955					4.853				2.500			
	U-238	20.251				46.180	22.354					88.000				236.000			
Total Uranium		43.767				97.179	47.252					180.853				238.515			
RPG-04	U-234	6.914						14.600	5.569	4.353	0.010	0.136	36.533	0.034	0.008	0.013	0.008	72.939	11.358
	U-235	0.416						0.800	0.357	0.274	1.340	-0.008	1.493	2.208	1.170	1.440	1.460	2.314	0.347
	U-238	3.807						12.800	4.210	3.013	168.000	0.039	32.333	0.029	136.000	216.000	123.000	59.445	10.202
Total Uranium		**11.137**						**28.200**	**10.136**	**7.641**	169.350	**0.167**	70.360	**2.271**	137.178	217.453	124.468	134.698	**21.907**
RPG-044	U-234	8.008														0.000			
Duplicate Sample	U-235	0.221														-0.003			
in 09 a Blank	U-238	11.667														0.066			
Total Uranium		**19.896**														**0.063**			
RSJ-03	U-234					0.747	2.258												
	U-235					0.009	0.075												
	U-238					0.515	1.073												
Total Uranium						**1.271**	**3.406**												
RSJ-033	U-234					0.833	1.649												
Duplicate Sample	U-235					-0.017	0.115												
	U-238					0.315	0.873												
Total Uranium						**1.131**	**2.637**												
RSJ-04	U-234	9.435	4.813			1.294	3.824	4.680	4.081	3.640	0.001	5.340	4.700	2.440	0.001	0.001	0.001	12.936	
	U-235	0.547	0.119			0.043	0.081	0.205	0.189	0.333	0.160	0.256	0.174	0.169	0.160	0.122	0.181	0.248	
	U-238	8.311	2.842			0.675	1.707	2.400	3.036	2.300	14.600	3.093	2.907	1.960	13.800	7.420	11.900	8.431	
Total Uranium		**18.293**	**7.774**			**2.012**	**5.612**	**7.285**	**7.306**	**6.273**	**14.761**	**8.689**	**7.781**	**4.569**	**13.961**	**7.543**	**12.082**	**21.615**	
RSJ-044	U-234	3.917	4.227																
Duplicate Sample	U-235	0.123	0.098																
	U-238	2.872	2.351																
Total Uranium		**6.911**	**6.676**																
RPC-04	U-234				5.598		3.762												
	U-235				0.187		0.041												
	U-238				2.828		2.020												
Total Uranium					**8.613**		**5.823**												
RMQ-01	U-234	*5.310*	*5.452*		*5.873*	*5.598*	*2.732*	0.002	0.001	0.001	0.000	0.001	0.001	0.000		0.001	0.001	2.984	5.972
	U-235	*0.394*	*0.000*		*0.086*	*0.153*	*0.061*	0.232	0.156	0.156	0.000	1.177	0.120	0.078		0.183	0.062	0.000	0.118
	U-238	*3.456*	*2.535*		*2.686*	*2.900*	*1.298*	30.904	8.551	8.551	0.005	8.971	7.706	5.471		6.800	6.100	1.578	2.970
Total Uranium		***9.160***	***7.987***	*no water*	***8.645***	***8.651***	***4.091***	31.138	**6.400**	**8.708**	**0.005**	**10.148**	**7.826**	**5.549**	*no water*	**6.984**	**6.162**	**4.562**	**9.060**

Notice: Under SDWA, the MCL for Total Uranium = 30 Micrograms/Liter

Notice: RMQ-01 results for 2005 and 2006 are in pCi/Liter

2700023

2700023

Appendix A

Quarterly Reports

First Quarter Progress Report

CWA § 106 Water Quality Program

October 2008 – December 2008

Assistance Agreement No. I-96676201-0

2700025

Objective 1: Maintain and Continue to Build Surface Water Quality Program

Sub Objectives:

1.1 Provide Administrative/Technical Support for Water Quality Program

1.2 Build, Maintain and Expand Technical Reference Library

1.3 Build Analytical/Physical Parameter Data Base

1.4 Discussion

Related Activities completed during this quarter:

Sampling continued during this quarter, along with physical parameter data collection utilizing the YSI Multiparameter Display System (MDS) with Model 6820 multi-probe compact Sonde for the fourth round of year 2007-2008. The Pueblo of Laguna fiscal year was re-aligned with the calendar year in 2005 so the Pueblo fiscal year policies must be followed. All analytical results are in the process of retrofitting for loading into the Enviro Data database. All data will require the addition of a Station Location Identification code. This will be accomplished by using the areas of the reservation attached in the list as a part of this report along with the up-date site location map. This will be addressed in the QAPP QTRAK #08-132 revision. Preparation of the 2009 Ambient Toxicity Sample will be developed based on the allocation of 18 samples offered by U.S. EPA Region 6.

Discussion:

The CWA § 106 Water Quality Program Year-End Report is in the final stages of completion. The report will be submitted to the Pueblo of Laguna Governor John E. Antonio for approval and signature prior to submittal in the next quarter to Region VI for approval.

Training is an on going process and will be included in work activities as needed for refresher and improving job performance. Training maybe done in-house, obtained through the Bureau of Indian Affairs (BIA), Indian Heath Service (IHS), OETA, EPA etc., or other provider on a no-cost basis for current staff and new staff as added. The addition of the Environmental Technician last year has been a tremendous asset to the program. Fieldwork could not have been completed without this person, however as the program grows this position will be required on a full time basis not just 50%.

The Enviro Data software is required for the maintenance and development of the master database. It became apparent last quarter during the development of the Year End Report that a more effective means of maintaining the database was required. Queries for data proved to be a labor-intensive task, which left little to no time for other data QA. The software is custom built to the need and specifications set for by the Pueblo of Laguna Surface Water Quality Program and have the capability to grow for use by the other

Environmental programs. The investment of time to set up the parameters for data storage will require more training but will be beneficial in the end for the program; data can be retrieved with ease and compared to the baseline, which is still under development, as well as manipulated for inclusion in reports etc. The addition of a Station Location Identifier is needed to upload past and current data and efforts are under way to retrofit previous year's data with inclusion of this identifier and addressed in the QAPP for future data collection efforts.

Work on the Technical Reference Library is an ongoing process and is in dire need of additional space. Office space is at a premium and is vital that documents housed there be readily available when needed. Whenever possible large new documents added are stored electronically to save space, however, it is not cost effective or feasible to convert old documents to electronic format. This process is only expected to grow and is nearly at a critical level for space.

Collection of analytical and physical parameter data for the 2009-2010 sampling year was not feasible for the later part of the first quarter of the new fiscal year due to weather. This issue is addressed in the revisions to the QAPP, #08-132 currently under revision for submittal and approval for the 2009 sampling year for the Pueblo of Laguna Surface Water Quality Monitoring Program.

New lands were purchased and new sampling locations are being added from these areas.

Objective 2: Develop Program Design for Water Quality Monitoring

Sub Objectives:

2.1 Update Quality Assurance Project Plan

2.2 Discussion

Related Activities Completed during this quarter:

The QAPP #08-132 is currently in review and revision for submittal for the start of sampling activities under the 2009/2010 sampling rounds

Discussion:

A revised version of the QAPP QTRAK # 08-132 will be submitted to Region VI for approval prior to start of work scheduled to be tentatively for March 2009. Only minor changes are needed for this revision and the process suggested by Mr. Don Johnson, Region 6 Quality Assurance Manager would be utilized for a more efficient approval. These include the addition of Staff from the Office of Environmental and Technical Assistance (OETA) to serve as the Quality Control/Quality Assurance (QA/QC) officer. Ms. Margaret Chavez has been designated as the QA/QC person for the Surface Water

Quality Monitoring program. A bio with Ms. Chavez's qualifications will be obtained and included as well as her signature on the signature page of the QAPP.

Objective 3: Implement Basic Water Quality Monitoring Program

Sub Objectives:

3.1 Conduct Field Data Collection-Physical Parameters

3.2 Conduct Field Data Collection-Analytical Parameters

3.3 Discussion

Related Activities Completed during this quarter:

The only physical and analytical data collection that occurred during this period was those to complete the activities of sampling year 2008-2009.

Discussion:

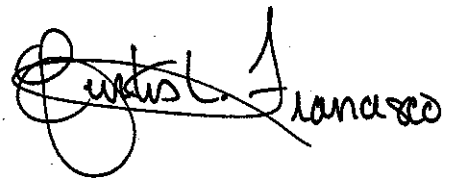
Field activities are tentatively scheduled to begin, barring weather, during the first week of March. The weather is the prime factor for not entering the field. High winds with blowing dust in the lower elevations and blowing snow in the higher provide the potential to stall all efforts for an early start to the sampling season.

The Environmental Technician position was filled during the latter part of last summer. Training is an on-going process for the staff to build capabilities and responsibilities within the program. The Environmental Technician position is currently filled by the addition of Ms. Dorothy N. Beecher therefore, the scope of the program will grow to encompass all of the lands controlled by the Pueblo of Laguna and new land acquisitions as they arise. Off-reservation sources of water that affect the Pueblo of Laguna are also considered and coordinated with State of New Mexico Environment department on these areas. These coordination efforts will be on a case-by-case basis. Training on the Multi-Parameter Probe started and will continue with each of the rounds of sampling and as the QAPP revised.

All analytical data received from the laboratory has been reviewed and being retrofitted for inclusion into the Master Data Base. As mentioned earlier it was discovered that all data would require the addition of a Station Location Identifier for inclusion in the Enviro Data database. This glitch will be addressed in the revision to the QAPP, which is currently being up-dated with the assistance of the Office of Environmental and Technical Assistance (OETA) who will provide the QA/QC office position need for the program. All associated Physical Parameter data have been archived and site location maps have been up-dated to reflect current conditions.

Conclusions and Summary:

This concludes all activities reportable for the first Quarter of FY 2009.

Submitted by: 

Printed Name: Curtis L. Francisco

Title: Water Quality Specialist

Reviewed by:

Printed Name: Barbara Cywinska-Bernacik

Title: Enviro. Program Manager

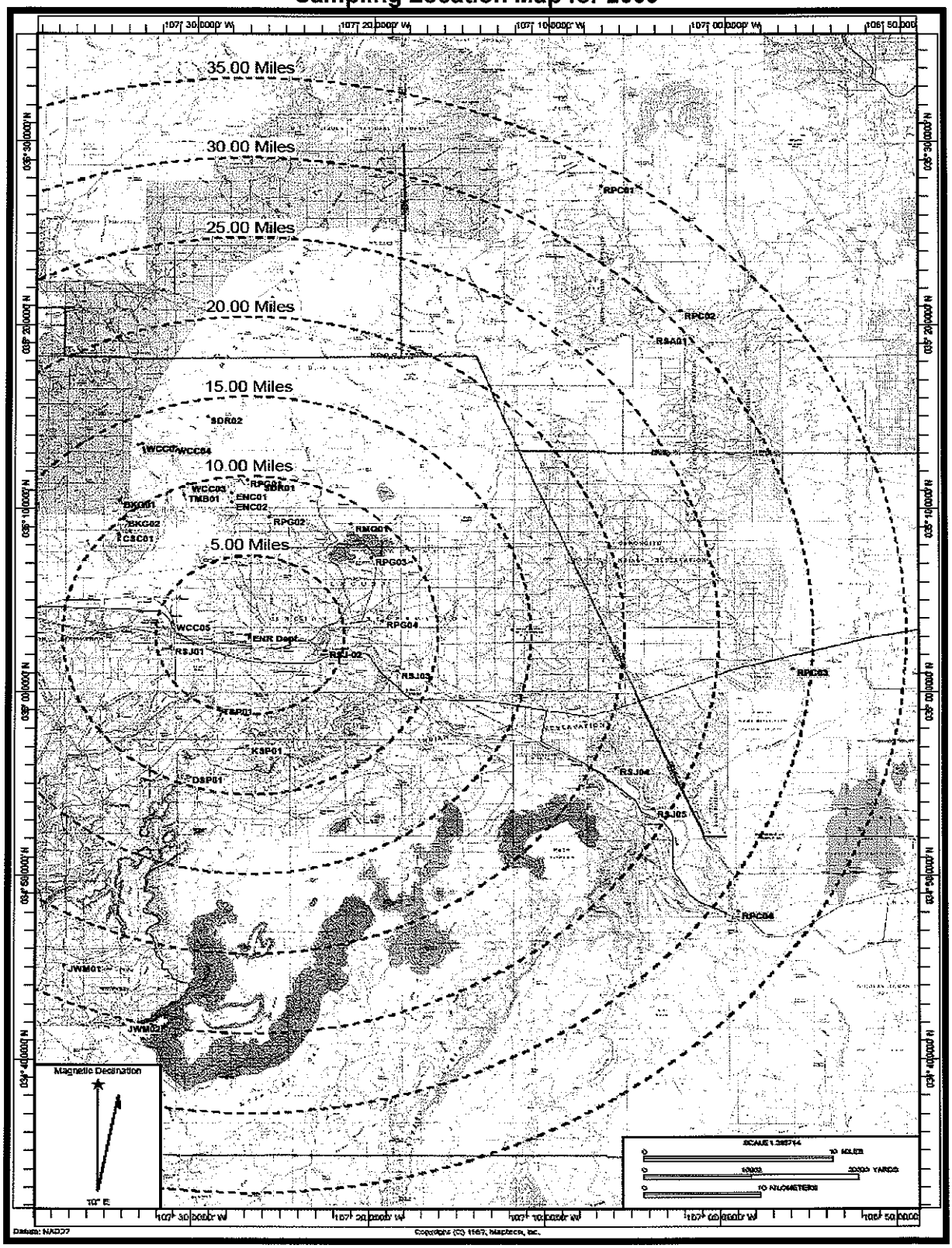
Date: February 9, 2009

ATTACHMENTS

Site Analytical Sampling Location List

No.	Site Name	Site ID	Latitude	Longitude	Analytical Method	Classification
1.0	Rio San Jose #1	RSJ01	35°03'15.26"	107°32'39.40"	Fecal/E. Coli, Total Nitrogen, Total Phosphrous	Existing
2.0	Rio San Jose #2	RSJ02	35°03'25.50"	107°32'39.60"	Fecal/E. Coli, Total Nitrogen, Total Phosphrous	Existing
3.0	Water Canyon #5	WCC05	35°03'45.56"	107°31'22.80"	Fecal/E. Coli, Total Nitrogen, Total Phosphrous	Existing
4.0	Rio Paguate #2	RPG02	35°10'30.46"	107°26'52.83"	Fecal/E. Coli, Total Nitrogen, Total Phosphrous	Existing
5.0	Rio Moquino #1	RMQ01	35°09'11.81"	107°21'18.57"	Isotipic Uranium, Fecal/E. Coli, Total Nitrogen, Total Phosphorous	Existing
6.0	Rio Paguate #3	RPG03	35°07'08.70"	107°19'58.93"	Isotipic Uranium, Fecal/E. Coli, Total Nitrogen, Total Phosphorous	Existing
7.0	Rio Paguate #4	RPG04	35°04'04.25"	107°19'37.11"	Isotipic Uranium, Fecal/E. Coli, Total Nitrogen, Total Phosphorous	Existing
8.0	Rio San Jose #4	RSJ04	34°55'58.24"	107°06'16.86"	Isotopic Uranium, Fecal/E. Coli, Total Nitrogen, Total Phosphorous	Existing
9.0	Rio Puerco #2	RPC02	35°20'50.87"	107°02'32.91"	Physical Parameters	Existing
10.0	Background #1	BKG01	35°10'52.45"	107°34'12.36"	Physical Parameters	Relocated
11.0	Background #2	BKG02	35°10'28.10"	107°34'21.80"	Physical Parameters	Relocated
12.0	Encinal #2	ENC02	35°10'52.96"	107°28'00.76"	Physical Parameters	Existing
13.0	Rio San Jose #3	RSJ03	35°01'13.29"	107°18'35.99"	Physical Parameters	Existing
14.0	Timber Creek	TMB01	35°10'06.65"	107°31'48.73"	Physical Parameters	Existing
15.0	Water Canyon #1	WCC01	35°13'34.52"	107°32'58.55"	Physical Parameters	Existing
16.0	Water Canyon #3	WCC03	35°12'39.56"	107°31'12.89"	Physical Parameters	Existing
17.0	Rio Puerco #1	RPC01	35°27'39.07"	107°07'06.43"	Physical Parameters	Existing
18.0	Rio Puerco #3	RPC03	35°01'38.98"	106°56'26.92"	Physical Parameters	Existing
19.0	Seco Canyon #1	CSC01	35°10'07.40"	107°34'12.90"	Physical Parameters	Existing
20.0	Dripping Spring	DSP01	34°55'26.80"	107°30'19.46"	Physical Parameters	Existing
21.0	Encinal #1	ENC01	35°11'14.21"	107°28'56.90"	Physical Parameters	Existing
22.0	Rio San Jose #5	RSJ05	34°53'38.52"	107°04'11.34"	Physical Parameters	Existing
23.0	Turquoise Spring	TSP01	34°59'07.47"	107°28'30.83"	Physical Parameters	Existing
24.0	Water Canyon #2	WCC02	35°13'19.28"	107°31'14.13"	Physical Parameters	Existing
25.0	Water Canyon #4	WCC04	35°13'25.92"	107°31'20.25"	Physical Parameters	Existing
26.0	Rio Puerco #4	RPC04	34°34'58.92"	106°59'27.93"	Physical Parameters	Existing
27.0	Kemp Santiago Spring	KSP01	34°57'04.20"	107°27'06.03"	Physical Parameters	Existing
28.0	Jack Wards #1	JWM01	34°45'08.35"	107°34'23.27"	Physical Parameters	Existing
29.0	Jack Wards #2	JWM02	34°41'54.21"	107°33'59.26"	Physical Parameters	Existing
30.0	Rio Paguate #1	RPG01	35°11'38.31"	107°27'10.01"	Physical Parameters	Existing
31.0	Silver Dollar Ranch #1	SDR01	35°11'23.70"	107°26'24.01"	Physical Parameters	New
32.0	Silver Dollar Ranch #2	SDR02	35°15'03.82"	107°29'24.02"	Physical Parameters	New
33.0	Rio Salado #1	RSA01	35°19'23.29"	107°04'13.10"	Physical Parameters	Existing

Sampling Location Map for 2009



Ambient Toxicity Sampling Schedule

2009 Ambient Toxicity Testing Schedule for the Pueblo of Laguna

Location	Water Samples				Sediment Samples				Number of Samples per Location	
	Round 1	Round 2	Round 3	Round 4	Round 1	Round 2	Round 3	Round 4	Water	Sediment
RPG-02	1	1	1	1	1		1			
Date	4/13/2009	6/1/2009	8/3/2009	10/5/2009	4/13/2009	N/A	8/3/2009	N/A	4	2
RPG-03	1	1	1	1	1		1			
Date	4/13/2009	6/1/2009	8/3/2009	10/5/2009	4/13/2009	N/A	8/3/2009	N/A	4	2
WCC-01	1	1	1	1	1		1			
Date	4/20/2009	6/1/2009	8/17/2009	10/5/2009	4/20/2009	N/A	8/17/2009	N/A	4	2
Total Number of Samples per Year									18	

Second Quarter Progress Report

CWA § 106 Water Quality Program

January 2009-March 2009

Assistance Agreement No. I-96676201-0

Objective 1: Maintain and Continue to Build Surface Water Quality Program

Sub Objectives:

1.1 Provide Administrative/Technical Support for Water Quality Program

1.2 Build, Maintain and Expand Technical Reference Library

1.3 Build Analytical/Physical Parameter Data Base

1.4 Discussion

Related Activities completed during this quarter:

Sampling for round one began during this quarter, along with physical parameter data collection utilizing the YSI Multiparameter Display System (MDS) with Model 6820 multi-probe compact Sonde for year 2009 and the Ambient Toxicity Sample collection. The Pueblo of Laguna re-aligned it fiscal year with the calendar year in 2005 so the Pueblo fiscal year policies must be followed. All analytical and physical parameter results are in the process of retrofitting for loading into the Enviro Data database. All data will require the addition of a Station Location Identification code. These and other sample/data collection protocols are addressed in the QAPP QTRAK #08-132 revision, which was submitted in February for comment/approval.

Discussion:

The CWA § 106 Water Quality Program Year-End Report has been completed and submitted.

The Pueblo of Laguna Tribal Council approved the waving of Indirect Cost for the CWA § 106 Water Quality Program application for FY 2010 funding, a copy of the Resolution No. 36-09 is attached. Also attached is a summary of the levels of Isotopic Uranium results.

Training is an on going process and will be included in work activities as needed for refresher and improving job performance. Training maybe done in-house, obtained through the Bureau of Indian Affairs (BIA), Indian Heath Service (IHS), OETA, EPA etc., or other provider on a no-cost basis for current staff and new staff as added. The addition of the Environmental Technician last year has been a tremendous asset to the program. Fieldwork could not have been completed without this person, however as the program grows and changes to the GAP program assistance continue this position will be required on a full time basis not just 50%.

The Enviro Data software is required for the maintenance and development of the master database. It became apparent last quarter during the development of the Year End Report that a more effective means of maintaining the database was required. Queries for data proved to be a labor-intensive task, which left little to no time for other data QA. The

software is custom built to the specifications set by the Pueblo of Laguna Surface Water Quality Program and has the capability to expand to serve all of the Pueblo's Environmental programs. The investment of time to set up the parameters for data storage will require more training but will be beneficial in the end for the program; data retrieval and analysis will become much more addressable. A baseline, for comparison is still under development.

Work on the Technical Reference Library is an ongoing process and is in dire need of additional space. Office space is at a premium and is vital that documents housed there be readily available when needed. Whenever possible large new documents added are stored electronically to save space, however, it is not cost effective or feasible to convert old documents to electronic format. The Technical Reference Library continues to grow and is at a critical level for space.

Collection of analytical and physical parameter data for the 2009-2010 sampling year began on March 2, 2009.

Acquisition of ancestral lands of the Pueblo of Laguna is high in priority and as new lands acquisitions occur, additional sampling locations well be assessed for addition from these areas.

Objective 2: Develop Program Design for Water Quality Monitoring

Sub Objectives:

2.1 Update Quality Assurance Project Plan

2.2 Discussion

Related Activities Completed during this quarter:

The QAPP #08-132 is currently in review and revision for submittal. Start of sampling activities under the 2009/2010 sampling rounds will be handled under the previous version until updates are received.

Discussion:

A revised version of the QAPP QTRAK # 08-132 has been submitted to Region VI for approval prior to start of work scheduled to be tentatively for March 2009. Only minor changes occurred for this revision. These include the addition of Staff from the Office of Environmental and Technical Assistance (OETA) to serve as the Quality Control/Quality Assurance (QA/QC) officer. Ms. Margaret Chavez will function as the QA/QC person for the Surface Water Quality Monitoring program.

Objective 3: Implement Basic Water Quality Monitoring Program

Sub Objectives:

3.1 Conduct Field Data Collection-Physical Parameters

3.2 Conduct Field Data Collection-Analytical Parameters

3.3 Discussion

Related Activities Completed during this quarter:

Round one for year, 2009 began on March 2, 2009, as did Round 1 collection of Ambient Toxicity sample collection.

Discussion:

Field activities begin with very few bad weather delays. The weather is the prime factor for not entering the field. High winds with blowing dust in the lower elevations and blowing snow in the higher provide the potential safety delays for staff. In spite of some severe weather, sampling activities started for round one on March 2 with an expected conclusion of the round in April.

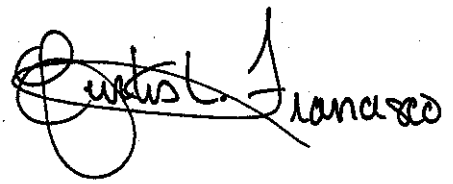
Training is an on-going process for the staff to build capabilities and responsibilities within the program. The Environmental Technician Ms. Dorothy N. Beecher has been busy with program training and the completion of her Associate Degree set for April 2009. This will enhance the scope of the program to encompass all of the lands controlled by the Pueblo of Laguna and new land acquisitions as they arise.

Off-reservation sources of water that affect the Pueblo of Laguna are monitored and coordinated with State of New Mexico Environment department or neighboring Pueblo's on these areas. These coordination efforts will be on a case-by-case basis. Training on the Multi-Parameter Probe started and will continue with each of the rounds of sampling and as the QAPP revised.

A meeting tentatively scheduled for April 2009 with the New Mexico Office of the State Geologist, New Mexico Bureau of Geology and Mineral Resources, and New Mexico Institute of Mining and Technology to further address issues that face the Pueblo of Laguna regarding Uranium Mining Legacy issue. The renewed interest in Uranium Mining in the Grants Mineral Belt is of great concern for the Pueblo.

Conclusions and Summary:

This concludes all activities reportable for the second Quarter of FY 2009.

Submitted by: 

Printed Name: Curtis L. Francisco

Title: Water Quality Specialist

Reviewed by:

Printed Name: Barbara Cywinska-Bernacik

Title: Environmental Program Manager

Date: April 23, 2009

ATTACHMENTS

PUEBLO OF LAGUNA
P.O. Box 194
LAGUNA, NEW MEXICO 87026

Office of
The Governor
The Secretary
The Treasurer

(505)552-6654
FAX: (505)552-6941

PUEBLO OF LAGUNA

Resolution No. 36-09

Re: Approval of Wavier of Indirect Cost for the EPA CWA Section 106 Grant

At a duly called meeting of the Pueblo of Laguna Tribal Council held on the 21 day of April, 2009, the following resolution was adopted.

WHEREAS, the Pueblo of Laguna has a negotiated Indirect Cost rate of 39.62% and is required to charge this rate on contracts; and

WHEREAS, the Pueblo of Laguna has an EPA CWA Section 106 grant application for the period October 1, 2009 to September 30, 2010; and

WHEREAS, the EPA CWA Section 106 base funding remained on the same level during the last several years and IDC rate has risen to the current rate of 39.62%; and

WHEREAS, inflation has increased during this same period creating a diminished cash amount available for direct contract dollars; and

WHEREAS, the Environmental Department is requesting a waiver of IDC charges to this grant period so that direct program operations are not adversely impacted by the high IDC rate and to allow more direct funding to assist in meeting the proposed scope of work and all grant requirements; and

WHEREAS, the finance staff has reviewed the grant application summary form which included the waiver of IDC and has identified the Tribal Overhead Budget as the source to offset the shortfall due to the waiver of IDC.

NOW, THERFORE, BE IT RESOLVED, that the Tribal Council approves the waiver of IDC for EPA CWA Section 106 grant and funding period of October 1, 2009 to September 20, 2010.

BE IT FURTHER RESOLVED, that the Treasurer and CFO are directed and authorized to charge the amount of IDC waived under this grant to the Tribal Overhead Budget.

BE IT FURTHER RESOLVED, that the Governor is directed and authorized to take all actions necessary to submit the application and to carry out the scope of work as approved by the funding source.

Governor

Council Member

Council Member

ATTEST:

Tribal Secretary

CERTIFICATION

The foregoing resolution was enacted upon by the Pueblo of Laguna Tribal Council on the 21 day of April, 2009, by a vote of 20 for and 0 opposed, at a duly called meeting at which a quorum of the Council was present.

Governor

ATTEST:

Tribal Secretary

Total Uranium Results in Micrograms/Liter															
YEAR		2005			2006			2007				2008			
Sample Location	U	Round 1	Round 2	Round 3	Round 1	Round2	Round 3	Round 1	Round 2	Round 3	Round 4	Round 1	Round 2	Round 3	Round 4
RPG-02	U-234	0.446	0.241	0.268		0.309									0.693
	U-235	0.038	-0.080	0.013		0.017									0.760
	U-238	0.027	-0.011	0.162		0.167									18.000
	Total U	0.511	0.150	0.443		0.493									19.453
RPG-022	U-234			191.333											
	U-235			-0.015											
	U-238			0.096											
	Total U			191.414											
RPG-03	U-234	23.710				56.652	25.187	3.000	53.820	5.007	0.016	87.333	92.667	0.003	0.027
	U-235	1.117				2.384	1.017	-0.032	2.822	0.463	1.600	4.720	5.353	0.000	4.530
	U-238	20.793				53.773	23.085	1.107	53.560	5.860	309.000	72.667	88.000	0.003	448.000
	Total U	45.620				112.809	49.289	4.074	110.202	11.330	310.616	164.720	186.020	0.007	452.557
RPG-033	U-234	22.248				48.717	23.943					88.000			
	U-235	1.268				2.282	0.955					4.853			
	U-238	20.251				46.180	22.354					88.000			
	Total U	43.767				97.179	47.252					180.853			
RPG-04	U-234	6.914						14.600	5.569	4.353	0.010	0.136	36.533	0.034	0.008
	U-235	0.416						0.800	0.357	0.274	1.340	-0.008	1.493	2.208	1.170
	U-238	3.807						12.800	4.210	3.013	168.000	0.039	32.333	0.029	136.000
	Total U	11.137						28.200	10.136	7.641	169.350	0.167	70.360	2.271	137.178
RPG-044	U-234	8.008													
	U-235	0.221													
	U-238	11.667													
	Total U	19.896													
RSJ-03	U-234					0.747	2.258								
	U-235					0.009	0.075								
	U-238					0.515	1.073								
	Total U					1.271	3.406								
RSJ-033	U-234					0.833	1.649								
	U-235					-0.017	0.115								
	U-238					0.315	0.873								
	Total U					1.131	2.637								
RSJ-04	U-234	9.435	4.813			1.294	3.824	4.680	4.081	3.640	0.001	5.340	4.700	1.627	0.001
	U-235	0.547	0.119			0.043	0.081	0.205	0.189	0.333	0.160	0.256	0.174	0.113	0.160
	U-238	8.311	2.842			0.675	1.707	2.400	3.036	2.300	14.600	3.093	2.907	1.307	13.800
	Total U	18.293	7.774			2.012	5.612	7.285	7.306	6.273	14.761	8.689	7.781	3.047	13.961
RSJ-044	U-234	3.917	4.227												
	U-235	0.123	0.098												
	U-238	2.872	2.351												
	Total U	6.911	6.676												
RPC-04	U-234				5.598		3.762								
	U-235				0.187		0.041								
	U-238				2.828		2.020								
	Total U				8.613		5.823								

2700042

LEGEND:

RPG-02	Rio Paguate above the former Jackpile mine
RPG-022	Duplicate sample of RPG-02
RPG-03	Rio Paguate below the former Jackpile mine
RPG-033	Duplicate sample of RPG-03
RPG-04	Rio Paguate at Mesita Dam
RPG-044	Duplicate sample of RPG-04
RSJ-03	Rio San Jose at Mesita bridge
RSJ-033	Duplicate sample of RSJ-03
RSJ-04	Rio San Jose below the Dipping Vat Spring on Sedillo Grant
RSJ-044	Duplicate sample of RSJ-04
RPC-04	Rio Puerco below confluence point with Rio San Jose

Isotopic Uranium tested:	U-234, U-235, U-238
Total Uranium:	Total U = U-234 + U-235 + U-238

No data on some rounds means that either there was not enough water to collect the sample or the sampling location was removed from the list due to the limited funding.

Laboratories used for the radiological data analysis were as follows:
- American Radiological Services for 2005, 2006, and 2007
- Eberline Laboratories subcontracted by the Assaigai Analytical Laboratories for 2008

NOTICES:

1. Clean Water Act (CWA) does not have isotopic uranium standards for surface water.
2. Under Safe Drinking Water Act (SDWA) Maximum Contaminant Level (MCL) for Isotopic Uranium in Potable Water =30 micrograms/liter
3. Numbers mark in RED indicate the results above the MCL for potable water.

2700043

Third Quarter Progress Report

CWA § 106 Water Quality Program

April 2009-June 2009

Assistance Agreement No. I-96676201-0

Objective 1: Maintain and Continue to Build Surface Water Quality Program

Sub Objectives:

1.1 Provide Administrative/Technical Support for Water Quality Program

1.2 Build, Maintain and Expand Technical Reference Library

1.3 Build Analytical/Physical Parameter Data Base

1.4 Discussion

Related Activities completed during this quarter:

Sampling for round one and two have been completed, along with physical parameter data collection utilizing the YSI Multiparameter Display System (MDS) with Model 6820 multi-probe compact Sonde for year 2009 and the Ambient Toxicity Sample collection. The Pueblo of Laguna re-aligned it fiscal year with the calendar year in 2005 so the Pueblo fiscal year policies must be followed. All analytical and physical parameter results are in the process of retrofitting for loading into the Enviro Data database. This process will continue into the future with new physical data collected with the YSI since it only allows for a 5-digit identifier. All data will require the addition of a Station Location Identification code. These and other sample/data collection protocol modifications have been identified in the QAPP QTRAK #08-132 revision, submitted in February for comment/approval.

Discussion:

Training is an ongoing process and will be included in work activities as needed for refresher and improving job performance. Training maybe done in-house, obtained through the Bureau of Indian Affairs (BIA), Indian Heath Service (IHS), OETA, EPA etc., or other provider on a no-cost basis for current staff and new staff as added. The addition of the Environmental Technician last year has been a tremendous asset to the program. Fieldwork could not have been completed without this person, however as the program grows and changes to the GAP program assistance continue this position will be required on a full time basis not just 50%.

The Enviro Data software is required for the maintenance and development of the master database. It became apparent last quarter during the development of the Year End Report that a more effective means of maintaining the database was required. Queries for data proved to be a labor-intensive task, which left little to no time for other data QA. The software is custom built to the specifications set by the Pueblo of Laguna Surface Water Quality Program and has the capability to expand to serve all of the Pueblo's Environmental programs. The investment of time to set up the parameters for data storage will require more training but will be beneficial in the end for the program; data retrieval and analysis will become much more addressable. A baseline, for comparison is still under development.

Work on the Technical Reference Library is an ongoing process and is in dire need of additional space. Office space is at a premium and is vital that documents housed there be readily available when needed. Whenever possible large new documents added are stored electronically to save space, however, it is not cost effective or feasible to convert old documents to electronic format. The Technical Reference Library continues to grow and is at a critical level for space.

Acquisition of ancestral lands of the Pueblo of Laguna is high in priority and as new lands acquisitions occur, additional sampling locations well be assessed for addition from these areas.

Objective 2: Develop Program Design for Water Quality Monitoring

Sub Objectives:

2.1 Update Quality Assurance Project Plan

2.2 Discussion

Related Activities Completed during this quarter:

The QAPP #08-132 is currently in review and revision for submittal. Start of sampling activities under the 2009/2010 sampling rounds will be handled under the previous version until updates are received.

Discussion:

A revised version of the QAPP QTRAK # 08-132 has been submitted to Region VI for approval prior to start of work scheduled to be tentatively for March 2009. Only minor changes occurred for this revision. These include the addition of Staff from the Office of Environmental and Technical Assistance (OETA) to serve as the Quality Control/Quality Assurance (QA/QC) officer. Ms. Margaret Chavez will function as the QA/QC person for the Surface Water Quality Monitoring program.

Objective 3: Implement Basic Water Quality Monitoring Program

Sub Objectives:

3.1 Conduct Field Data Collection-Physical Parameters

3.2 Conduct Field Data Collection-Analytical Parameters

3.3 Training

3.4 Discussion

Related Activities Completed during this quarter:

Rounds 1 and 2 analytical and physical parameter data collection is completed for year, 2009. As have Rounds 1 and 2 collection of Ambient Toxicity samples.

Discussion:

Field activities begin with very few bad weather delays. The weather is the prime factor for not entering the field. High winds with blowing dust in the lower elevations and blowing snow in the higher provide the potential safety delays for staff. Hot weather is now the prime factor to deal with in fieldwork, heat stress and heat stoke are every present dangers with the high temperatures. The physical demands of fieldwork has been taken into account stressful activity is slowed to allow staff to become exhausted and subject to heat stress or stoke, plenty of fluids are consumed while in the field. More snakes have been encountered during the second round of field activities but no bites have occurred staff keeps a watchful eye for poisonous and non-poisonous snakes while in the field near any source of water as this environment attracts the rodents on which they feed.

Training is an on-going process for the staff to build capabilities and responsibilities within the program. Both Mr. Curtis L. Francisco and Ms. Dorothy N. Beecher attended the Surface Water Monitoring Seminar in Bandera, Texas and the Water Quality Academy in Arlington Virginia during this quarter. The knowledge gained at these trainings will assist the staff in better understanding all aspects of program operations; this will enhance the scope of the program to encompass all of the lands controlled by the Pueblo of Laguna and new land acquisitions as they arise.

Off-reservation sources of water that affect the Pueblo of Laguna are monitored and coordinated with State of New Mexico Environment department or neighboring Pueblo's on these areas. These coordination efforts will be on a case-by-case basis. Training on the Multi-Parameter Probe started and will continue with each of the rounds of sampling and as the QAPP revised.

Year End Program Report FY 08
SURFACE WATER MONITORING PROGRAM

P.O. Box 194
Laguna, New Mexico

March 31, 2009

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Introduction

This report is the culmination of the four rounds of sampling, three quarterly reports and the efforts of work done under the Pueblo of Laguna Clean Water Act § 106 Surface Water Quality Monitoring Program.

The Pueblo of Laguna (KA-WAIKA-MAH) is a federally recognized Indian Tribe located in West-Central New Mexico on the Colorado Plateau. The Pueblo is one of the 19 federally recognized Pueblos in the state. The name of the Laguna Pueblo People is derived from the Spanish word for Lake (Lagoon). As well, the name in the Keresan language is KA-WAIKA-MAH and the literal translation is "people from the lake" or "people of the lake". The Laguna People have always been farmers both dry land and irrigation, and livestock tenders but most of all, we prize the human attribute of thought. KA-WAIKA was the first of the Pueblos to adopt a written Constitution in 1908. This constitution was replaced under the Indian Reorganization Act of 1934, revised in 1958, and amended once again in 1984.

Laguna Reservation lands comprise approximately 550,000 acres in Trust and approximately 150,000 acres of State and Bureau of Land Management tracts for a total of nearly 700,000 total, situated within four New Mexican counties; Cibola, Valencia, Bernalillo and Sandoval**.** There are six main villages within the reservation boundaries: Seama (TSE-AH-MAH) (the western-most), Paguate (GWEE-STCHGEE), Encinal (BUU-NEE-GUY-AH), Paraje (TSE-MUU-NAH), Laguna (KA-WAIKA), and Mesita (HAA-TSAH-DTH) (the eastern-most). There are also several sub-divisions and scattered homes between the main villages. "The Village of Laguna is, and shall continue to be, the Capital of the Pueblo of Laguna",[1] which is located approximately 55 miles west of Albuquerque on Interstate-40.

The lithological setting of the Pueblo of Laguna Indian reservation is distinctive and the landscapes are commonly a complex response to variations in rock types and to primary and secondary structures within the units. Secondary structures are heavily influenced by diastrophic and exogenic processes. The deformation, uplift, doming, volcanism and at times intense lateral deformation produce large-scale secondary structures that respond to geomorpholoigical processes in complex variations which create our distinctive terrain. Lithological controls over landforms produce a large number of variations and these variations may be associated with a wide range of discrete regions that can be identified from distinctive outcrops of a few square meters to uniformativity over hundreds of square kilometers. It is important of recognize some of the major geomorphic features associated with arenaceous, argillaceous, calcareous, igneous, and metamorphic rocks. These will impact the rate of weathering which are related to the rates at which weathered material is removed from its location of break-up to deposition and influence infiltration, percolation, permeability, and porosity. As well surface water, shallow groundwater and

[1] Pueblo of Laguna, Constitution of the Pueblo of Laguna, June 6, 1984, page4

medium to deep ground water respond accordingly. Weathering is an unfixed mix of both chemical and mechanical processes. All these factors impact fluid movements. A liquid is transported thorough open channels where the flow is confined and although the depth, velocity, and flow in the channel can be measured the study can be rendered hazardous in arid and semi arid climates. Uplift mechanisms can be categorized for purposes of simplicity as eustatic, isostatic, tectonic and orogenic. These mechanisms are all factors in the development of drainage basins and stream channels. Denudation chronology, direct observation and measurement, mathematical simulations and application of the ergodic hypothesis are some of the methods used to try to visualize the long-term evolution of the landforms. Morphgenetics are important to consider regarding questions concerning climatic geomorphology. The morphometrics portions are greatly impacted by climatic influences. These influenced may either be directly related through precipitation intensity or indirectly through vegetation. The morphogenetic region in which the Pueblo of Laguna is located is classified as Semi-Arid to Arid. The geomorphic processes associated with this region are listed as follows:

- Frost Weathering (minimal except at higher latitudes)
- Mechanical Weathering (minimal to moderate, especially thermal and salt)
- Chemical Weathering (minimal to moderate)
- Mass Wasting (moderate but infrequent)
- Fluvial Processes (Maximum but episodic in the form of sheet wash, gullying and ephemeral stream action giving high overall erosion rates)
- Glacial Scour (nil)
- Wind Action (Moderate to Maximum)

The morphological features associates with this region are listed as follows:

- Pediments (1˚ to 4˚)
- Cliffs and angular talus slopes (25˚ to 35˚)
- Inselbergs
- Integrated ephemeral stream systems
- Arroyos
- Badlands
- Alluvial fan
- Local dunes

The following diagram was first demonstrated by Hjulström, which was elaborated by Sundborg (1956) which relates critical velocity to the sediment size at which erosion of sedimentary particles will begin for both wind and water.

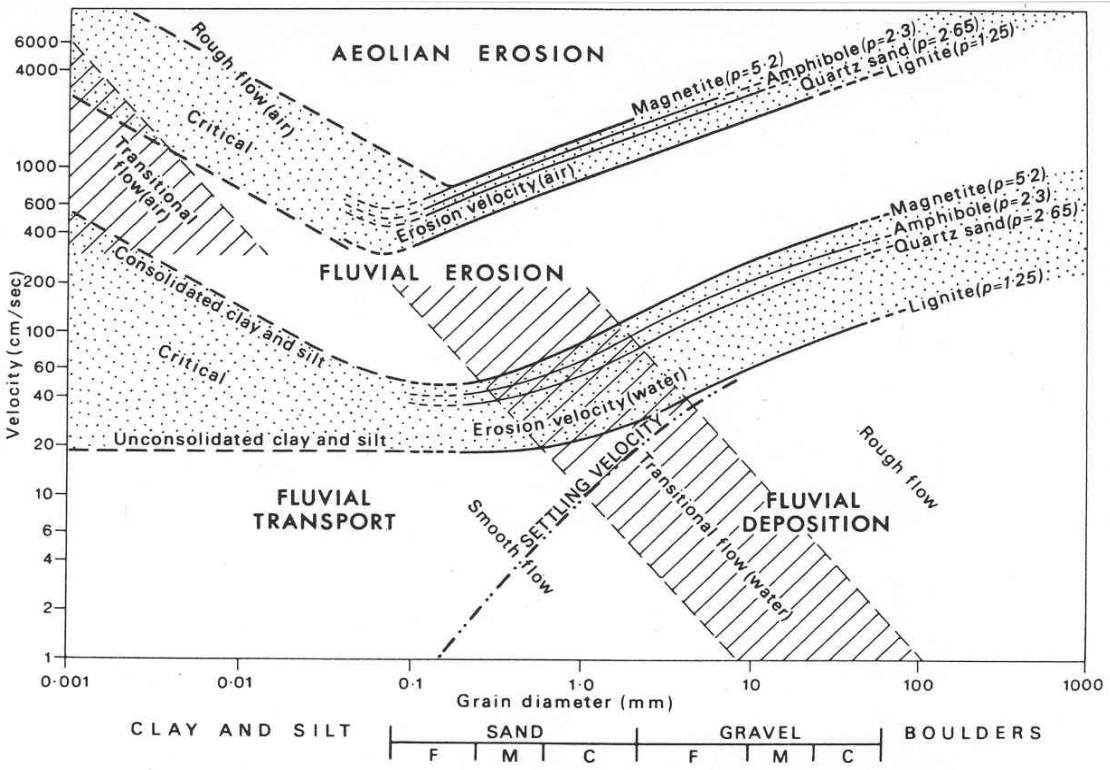


Figure 12.14 Curves showing relations of grain size to critical fluvial and aeolian erosion velocity for uniform materials of differing densities. The critical fluvial erosion velocity refers to a height of 1 m above the river bed. The two critical zones around these curves and the settling velocity curve for particles in water delimit the four regimes of fluvial deposition, fluvial transport, fluvial erosion and aeolian erosion.
Source: Sundborg, 1956, figure 16, p. 197.

Potable and non-potable water is in very limited supply at the POL, making it a highly valuable resource. Drinking water comes from its shallow surficial aquifers, drinking water wells are screened in the shallow alluvial aquifers along surface water pathways with one exception. The Village of Encinal uses surface water collected from springs in the Encinal Canyon which infiltrates from surface water through at least two basalt units and possibly sandstone prior to use. This source is currently being used to improve the quality of the valley system which is degraded. Therefore, the POL's drinking water aquifers and supply system is vulnerable to contamination from surface sources. There are two primary watersheds that drain the POL lands: the Rio Puerco and the Rio San Jose. The Rio San Jose drains from the west towards the east, joining up with the Rio Puerco, which drains from the north towards the south. The Rio Puerco then goes on to a confluence with the Rio Grande. Together, the Rio San Jose and the Rio Puerco form a part of the Rio Grande basin. The Rio Puerco is one of the main tributaries of the Rio Grande, entering the river near Bernardo, New Mexico. It supplies more than 70% of the suspended sediment entering the Rio Grande above Elephant Butte reservoir. The Pueblo's lands are in the eastern and central portions of these watersheds.

The U.S. EPA's Index of Watershed Indicators classifies the POL's watersheds as having "More Serious Problems – Low Vulnerability to Pollutant Stressors", and assigns the watersheds a score of 5 on a scale

of 1-10. The problems stem primarily from erosion, loss of riparian vegetation, intrusion of non-native species (i.e. Salt Cedar) and high sediment loads. However, there are a few possibilities for the discharge of pollutants. There have been no fish advisories for these watersheds. A uranium mine on the Pueblo has been mostly reclaimed. However, discharges from this mine, as well as from similar mines and mills upstream of the POL, could have affected the Pueblo's watersheds. Currently, there are two regulated point source effluent dischargers, one on the Rio San Jose at the Dancing Eagle Casino and on the Rio Puerco at the Route 66 Casino. There is always the likelihood of spills and accidental releases on the U.S. Interstate Highway 40 and Railroad systems, which bisect the POL's lands.

Physical and Analytical Parameters Locations

The Pueblo of Laguna Water Quality Specialist, Environmental Director, Environmental Specialist, Environmental Technician, and two Pueblo member students in the Santa Fe Indian School I-TEST

program collected four rounds of analytical samples and bi-monthly physical parameter data for 30 sites on the POL lands. The locations are summarized in the following table.

No.	Site Name	Site ID	Latitude	Longitude	Analytical Method	Classification	Area of the Reservation
1.0	Rio San Jose #1	RSJ01	35°03'15.26"	107°32'39.40"	Fecal/E. Coli, Total Nitrogen, Total Phosphrous	Existing	Reservation Proper
2.0	Rio San Jose #2	RSJ02	35°03'25.50"	107°32'39.60"	Fecal/E. Coli, Total Nitrogen, Total Phosphrous	Existing	Reservation Proper
3.0	Water Canyon #5	WCC05	35°03'45.56"	107°31'22.80"	Fecal/E. Coli, Total Nitrogen, Total Phosphrous	Existing	Reservation Proper
4.0	Rio Paguate #2	RPG02	35°10'30.46"	107°26'52.83"	Fecal/E. Coli, Total Nitrogen, Total Phosphrous	Existing	Paguate Purchase
5.0	Rio Moquino #1	RMQ01	35°09'11.81"	107°21'18.57"	Isotipic Uranium, Fecal/E. Coli, Total Nitrogen, Total Phosphorous	Existing	Paguate Purchase
6.0	Rio Paguate #3	RPG03	35°07'08.70"	107°19'58.93"	Isotipic Uranium, Fecal/E. Coli, Total Nitrogen, Total Phosphorous	Existing	Paguate Purchase
7.0	Rio Paguate #4	RPG04	35°04'04.25"	107°19'37.11"	Isotipic Uranium, Fecal/E. Coli, Total Nitrogen, Total Phosphorous	Existing	Paguate Purchase
8.0	Rio San Jose #4	RSJ04	34°55'58.24"	107°06'16.86"	Isotopic Uranium, Fecal/E. Coli, Total Nitrogen, Total Phosphorous	Existing	Sedillo Grant
9.0	Rio Puerco #2	RPC02	35°20'50.87"	107°02'32.91"	Physical Parameters	Existing	Montano Grant
10.0	Background #1	BKG01	35°10'52.45"	107°34'12.36"	Physical Parameters	Relocated	Seco Canyon
11.0	Background #2	BKG02	35°10'28.10"	107°34'21.80"	Physical Parameters	Relocated	Seco Canyon
12.0	Encinal #2	ENC02	35°10'52.96"	107°28'00.76"	Physical Parameters	Existing	Paguate Purchase
13.0	Rio San Jose #3	RSJ03	35°01'13.29"	107°18'35.99"	Physical Parameters	Existing	Reservation Proper
14.0	Timber Creek	TMB01	35°10'05.65"	107°31'48.73"	Physical Parameters	Existing	Mt. Taylor Ranch
15.0	Water Canyon #1	WCC01	35°13'34.52"	107°32'58.55"	Physical Parameters	Existing	Mt. Taylor Ranch
16.0	Water Canyon #3	WCC03	35°12'39.56"	107°31'12.89"	Physical Parameters	Existing	Mt. Taylor Ranch
17.0	Rio Puerco #1	RPC01	35°27'39.07"	107°07'06.43"	Physical Parameters	Existing	Sanchez/Major's Ranch
18.0	Rio Puerco #3	RPC03	35°01'38.98"	106°56'26.92"	Physical Parameters	Existing	Sedillo Grant
19.0	Seco Canyon #1	CSC01	35°10'07.40"	107°34'12.90"	Physical Parameters	Existing	Seco Canyon
20.0	Dripping Spring	DSP01	34°55'26.80"	107°30'19.46"	Physical Parameters	Existing	Reservation Proper
21.0	Encinal #1	ENC01	35°11'14.21"	107°28'56.90"	Physical Parameters	Existing	Paguate Purchase
22.0	Rio San Jose #5	RSJ05	34°53'38.52"	107°04'11.34"	Physical Parameters	Existing	Reservation Proper
23.0	Turquoise Spring	TSP01	34°59'07.47"	107°28'30.83"	Physical Parameters	Existing	Reservation Proper
24.0	Water Canyon #2	WCC02	35°13'19.28"	107°31'14.13"	Physical Parameters	Existing	Mt. Taylor Ranch
25.0	Water Canyon #4	WCC04	35°13'25.92"	107°31'20.25"	Physical Parameters	Existing	Reservation Proper
26.0	Rio Puerco #4	RPC04	34°34'58.92"	106°59'27.93"	Physical Parameters	Existing	Sedillo Grant
27.0	Kemp Santiago Spring	KSP01	34°57'04.20"	107°27'06.03"	Physical Parameters	Existing	Reservation Proper
28.0	Jack Wards #1	JWM01	34°45'08.35"	107°34'23.27"	Physical Parameters	Existing	Jack Wards Mesa
29.0	Jack Wards #2	JWM02	34°41'54.21"	107°33'59.26"	Physical Parameters	Existing	Jack Wards Mesa
30.0	Rio Salado #1	RSA01	35°19'23.29"	107°04'13.10"	Physical Parameters	Existing	Armjilo Ranch

BKG-01

BKG-02

CSC-01

DSP-01

ENC-01

ENC-02

RMQ-01

RPG-02

RPG-03

RPG-04

RSJ-01

RSJ-02

RSJ-03

RSJ-04

RSJ-05

TMB-01

TSP-02

KSP-01

WCC-01

WCC-02

WCC-03

WCC-04

WCC-05

RSA-01

RPC-01

RPC-02

RPC-03

RPC-04

JWM-01

JWM-02

Methodology

Analytical Sample Collection

The methodology used by the POL staff in collection and physical parameter monitoring includes the following:

1. Peristaltic Pump with poly and silicone tubing
2. YSI 650 Multiprobe system with 6820 Multiparameter Sonde
3. YSI 6160 Flow Cell
4. Latex Gloves and other PPE
5. Coolers for sample collection
6. Ice for sample preservation and drink/food ice chest cooling
7. Pruning sheers and various hand tools
8. 5 lb sledge hammer
9. 4 wheel drive vehicle

An analytical laboratory was contracted for the analytical portions, which include the following:

- Isotopic Uranium (U^{238}, U^{235} and U^{234})
- Total Nitrogen which includes
    - Ammonia
    - Total Kjehdahl Nitrogen
    - NO_2 (Nitrite) and NO_3 (Nitrate)
- Total Phosphorous
- Fecal/E. Coli

The laboratory was tasked with providing all sample containers, preservatives, coolers chains-of-custody forms and receipt of samples by the laboratory was done on Pueblo land. The sampling procedures identified in the Quality Assurance Project Plan (QAPP) QTRAK #08-132 approved February 2008 were followed with the exception of submerging the sample container in the water body. As can be observed from the previous site photographs it is not possible to submerge a sample container in most water bodies present on the Pueblo of Laguna Indian lands. Dipping of samples using a sterile disposable container was not appropriate. This action disturbed the sediment in the bed of the stream; therefore, a peristaltic pump was used in the collection of most surface water samples. The use of the peristaltic pump also allowed for the use of an inline 0.45 micron filter where required for field filtering. All samples collected for this year are for inorganic analysis therefore the use of the poly tubing will not affect the data, however as time progress and different analysis are required, Teflon tubing will be used which will not affect semi volatile or volatile organic analysis.

Physical Parameters

Surface water will be monitored for the following parameters:

- Flow rate, noted as presence or absence of water with detectable flow
- Dissolved Oxygen in percent and mg/L,
- Atmospheric pressure in Atmospheres,
- Temperature in degrees C,
- pH,
- Specific Conductance in mS/cm,
- Conductance in mS/cm,
- Resistivity in KOhm/cm,
- Oxidation Reduction Potential in mV,
- TDS in g/L
- Salinity in ppt
- Turbidity in NTU,

Attempted have been made to monitor locations on a bi-monthly basis, which has proved to be difficult given sample location dispersion, weather conditions and distance to each location. Sample collection for physical data parameters and/or analytical has proven to be non-feasible during late fall, winter and early spring months. The locations at high elevations are inaccessible due to snow and most water is frozen. The lower elevation locations are only accessible during later afternoon thawing but limited daylight make the return trip in the dark and dangerous. The following graphic show the elevation of all 30 sampling locations in feet above sea level the miles were from point to point on the map. Since the locations are not in a straight liner progression it was not possible to map them in this fashion, nor was it possible to map them in actual miles from point to point road miles. The sample location map is located in the Discussion section of this report.

Ambient Toxicity Sample Collection

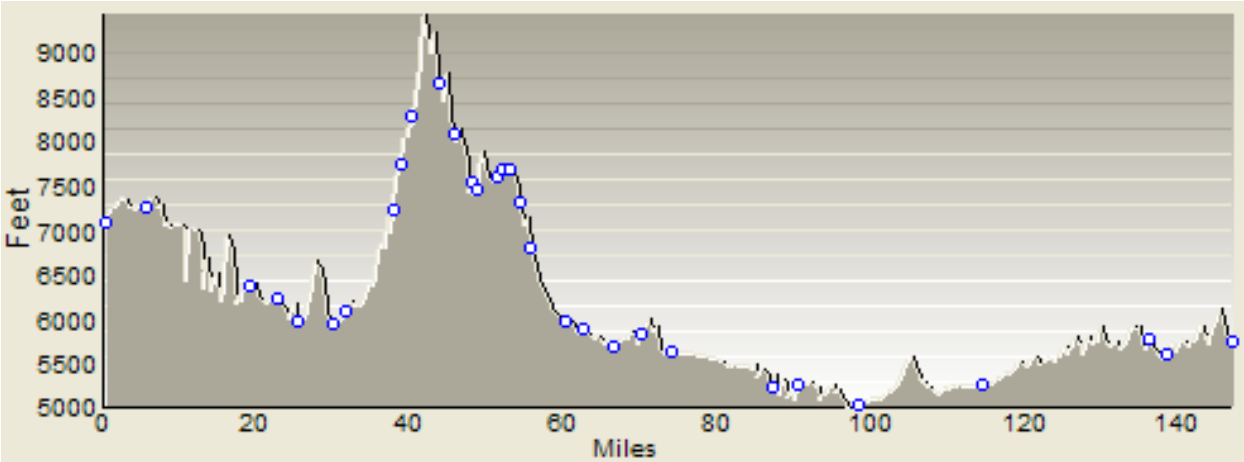
Ambient Toxicity testing is provided by U.S. EPA Region 6 at not cost to the Pueblo of Laguna, however the Pueblo must pay for containers, coolers, ice, bags, and shipping costs. Ambient Toxicity is considered most useful when utilized in concert with a comprehensive suite of physical, chemical and biological indicators, as a diagnostic tool where water quality problems have been identified by other indicators, and as a complement to biological assessment to determine whether or not previously identified toxicity problems have been eliminated. In addition to the following: (1) known or suspected toxicity and supporting information, (2) proposed uses of toxicity data for 305(b) and, in particular, 303(d) assessments, (3) past utility of toxicity data, and/or (4) proposed chemical analyses and/or toxicity identification evaluations (TIEs) in the event of recurring toxicity. EPA will conduct a 96-hour acute tests

for test organisms *Ceriodaphnia dubia* and *Pimephales promelas* (*see* "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition", EPA-821-R-02-012, October 2002. In cases where recurrent toxicity in water or sediment has occurred in a water body, it is recommend that a more intensive chemical analyses and/or TIEs be conducted. Special assistance from EPA Houston Lab may be available for chemical analyses if the Tribe does not have lab capability or resources to conduct such analyses.

2008 Ambient Toxicity Testing Schedule for the Pueblo of Laguna

Location	Water Samples				Sediment Samples				Number of Samples per location
	Round 1	Round 2	Round 3	Round 4	Round 1	Round 2	Round 3	Round 4	
RPG-03	1	1	1	1	1		1		6
Date	3/10/2008	5/5/2008	7/7/2008	8/4/2008	3/10/2008		7/7/2008		
RPG-04	1	1	1	1	1		1		6
Date	3/10/2008	5/5/2008	7/7/2008	8/4/2008	3/10/2008		7/7/2008		
RSJ-04	1	1	1	1	1		1		6
Date	3/24/2008	5/5/2008	7/21/2008	8/4/2008	3/24/2008		7/21/2008		
Total Number of Samples per Year									18

Sample Distribution and Physical Parameter Data

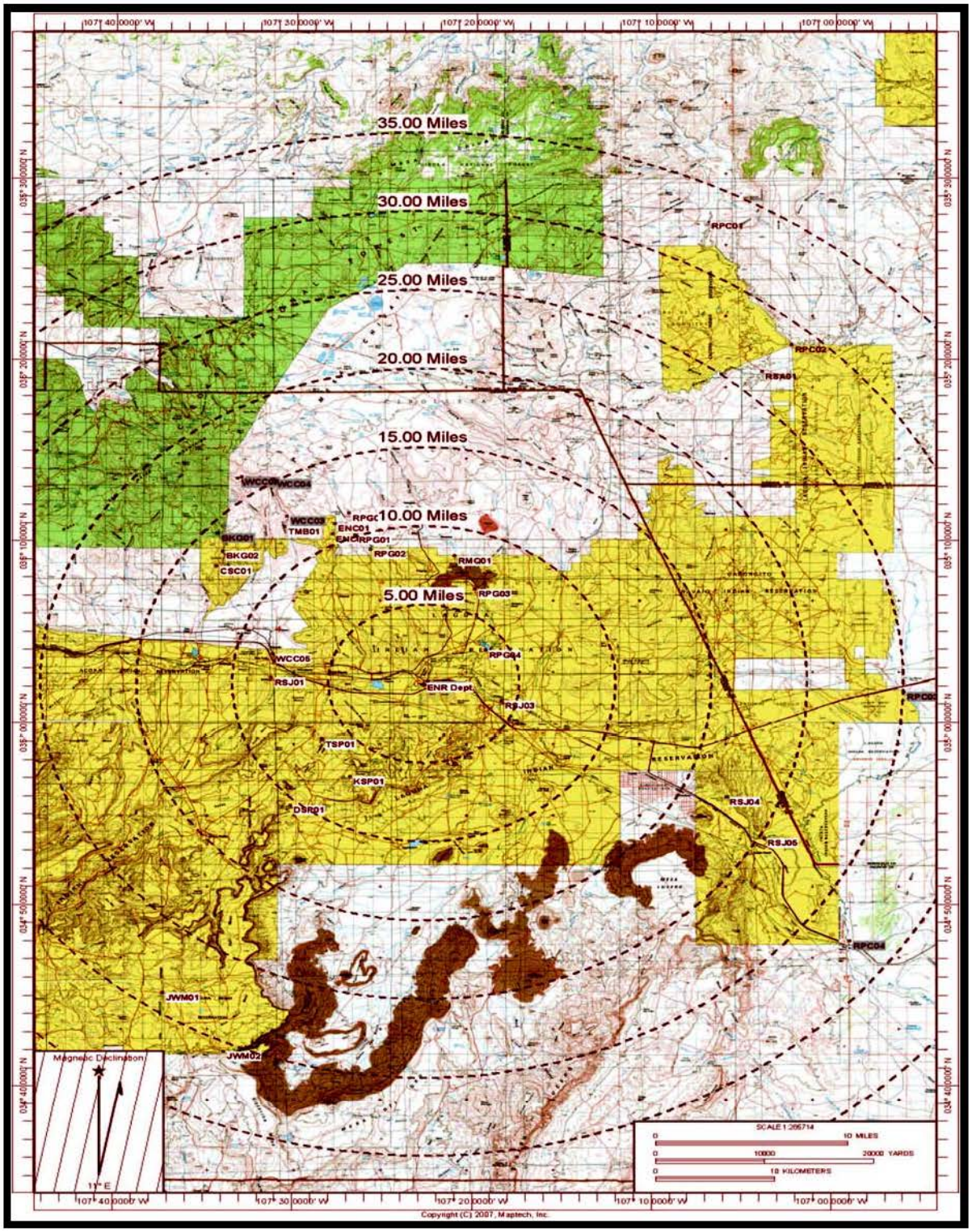


This location specific data takes into consideration areas where sewage lagoons are located close to surface water bodies and where the potential for impact is greatest. Data from suspect locations will not be included in the "background" database. Background location had been chosen in areas where very limited impact from human activity is possible and wildlife and geologic setting are the defining factors.

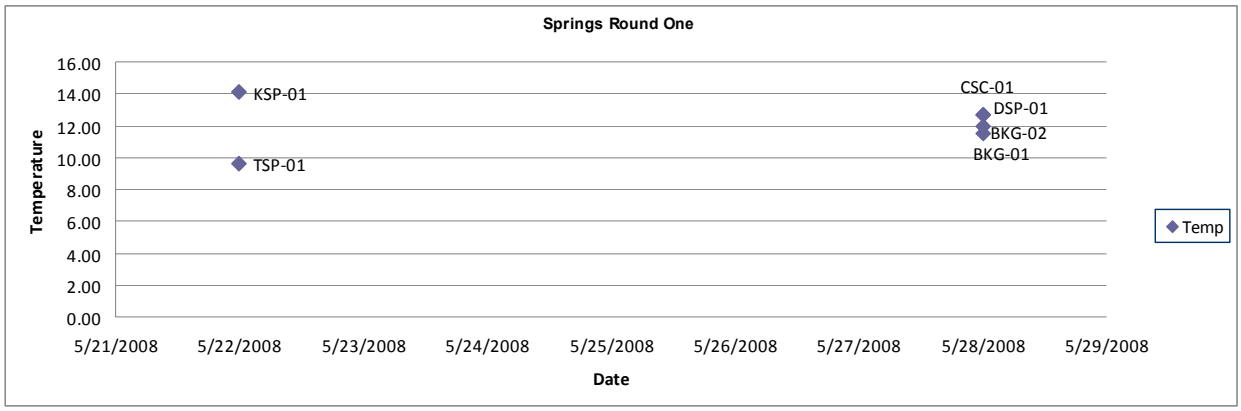
Physical parameter data collection as identified in the QAPP, is to be collected on a bi-monthly basis, however this has proven to be problematic. Many locations are not accessible at all times and those with cultural/religious uses are not accessible during these types of functions. Weather is a major factor in determining access to a location. Hot summer days and high evapotransporation rates diminish flow in shallow surface water bodies to damp soil in many of the locations; however, these locations are

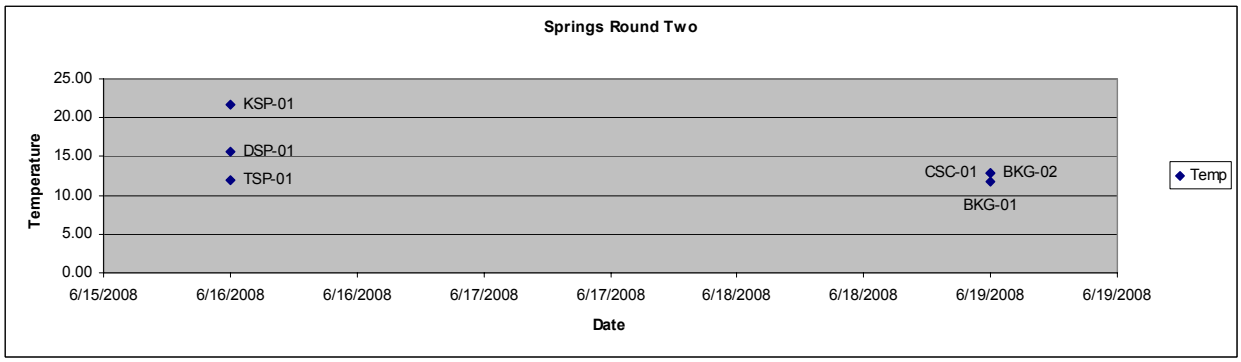
important and are retained as locations. These conditions are noted and recorded in the logbook and noted in the Quarterly Progress Reports.

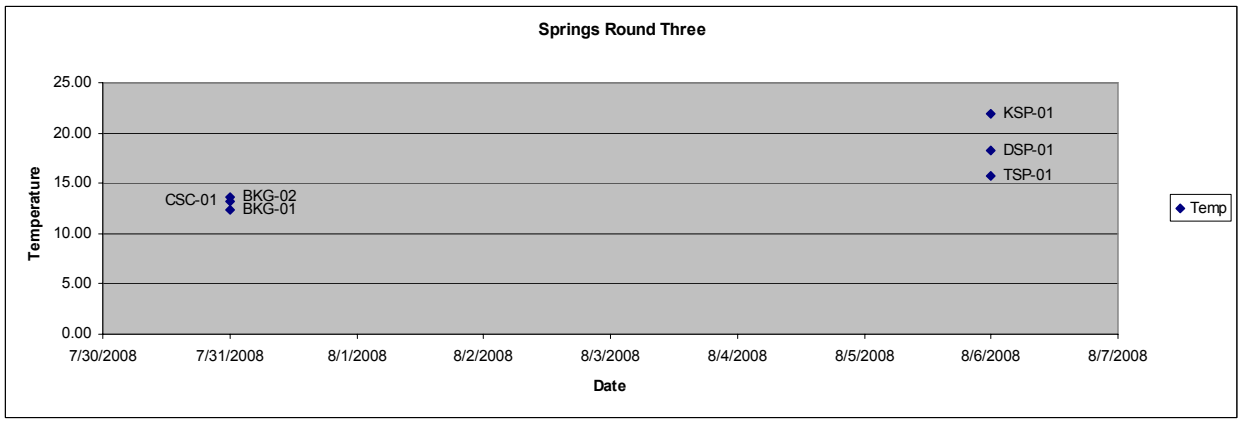
When ever possible physical parameters and analytical sample collection are combined to save time and improve field efficiency.

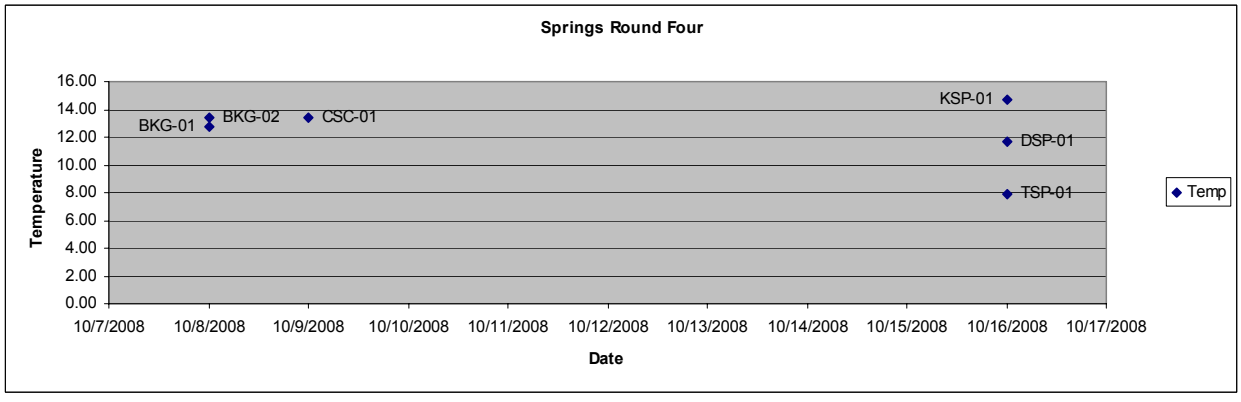


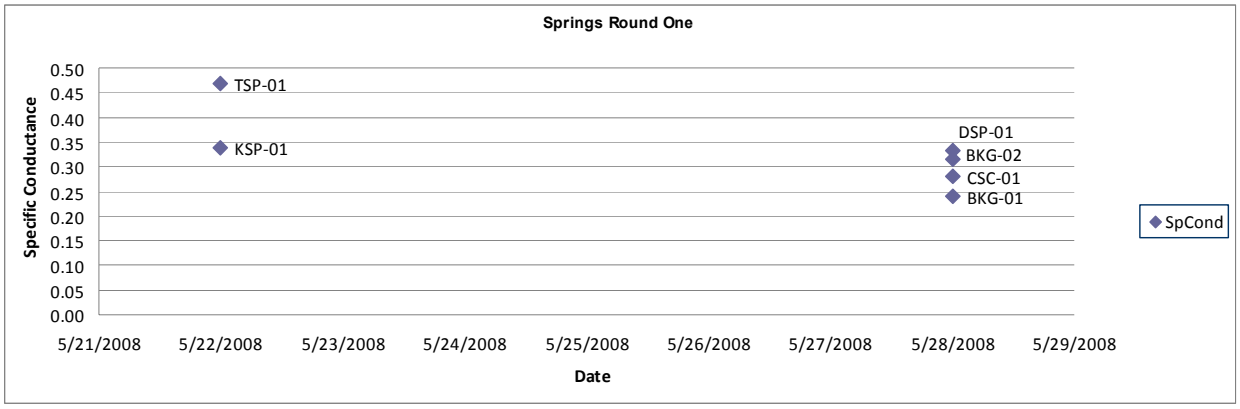
Springs


Springs Round One
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Temperature
KSP-01
TSP-01
CSC-01
DSP-01
BKG-02
BKG-01
Temp
5/21/2008
5/22/2008
5/23/2008
5/24/2008
5/25/2008
5/26/2008
5/27/2008
5/28/2008
5/29/2008
Date


Springs Round Two
25.00
20.00
15.00
10.00
5.00
0.00
Temperature
KSP-01
DSP-01
TSP-01
CSC-01
BKG-02
BKG-01
Temp
6/15/2008
6/16/2008
6/16/2008
6/17/2008
6/17/2008
6/18/2008
6/18/2008
6/19/2008
6/19/2008
Date


Springs Round Three
25.00
20.00
15.00
10.00
5.00
0.00
Temperature
CSC-01
BKG-02
BKG-01
KSP-01
DSP-01
TSP-01
Temp
7/30/2008
7/31/2008
8/1/2008
8/2/2008
8/3/2008
8/4/2008
8/5/2008
8/6/2008
8/7/2008
Date


Springs Round Four
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Temperature
BKG-01
BKG-02
CSC-01
KSP-01
DSP-01
TSP-01
Temp
10/7/2008
10/8/2008
10/9/2008
10/10/2008
10/11/2008
10/12/2008
10/13/2008
10/14/2008
10/15/2008
10/16/2008
10/17/2008
Date


Springs Round One
Specific Conductance
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
TSP-01
KSP-01
DSP-01
BKG-02
CSC-01
BKG-01
5/21/2008
5/22/2008
5/23/2008
5/24/2008
5/25/2008
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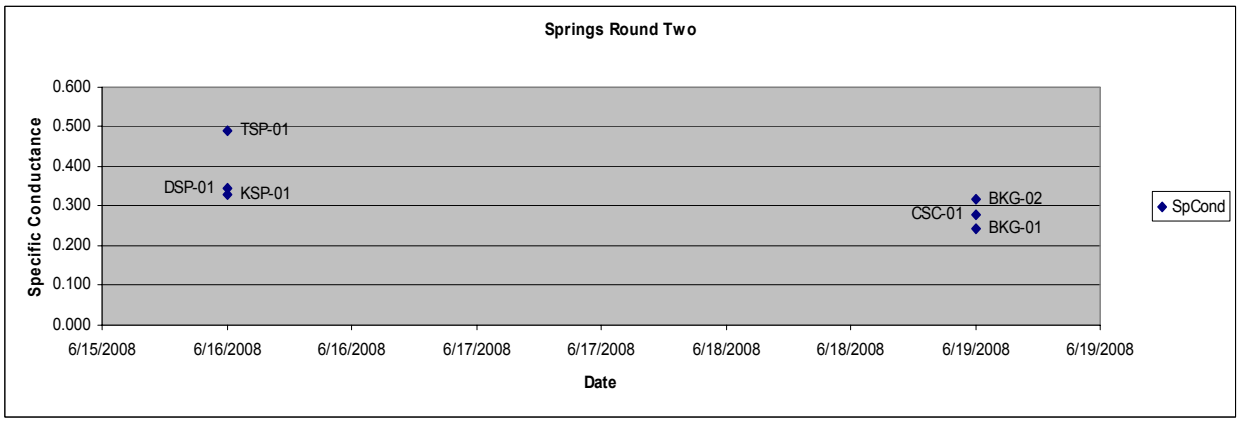
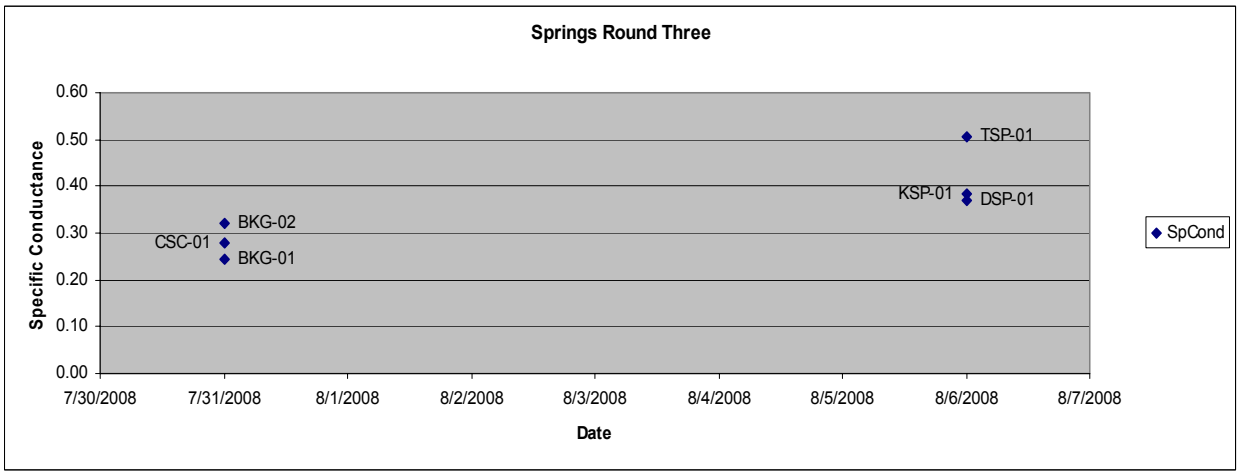
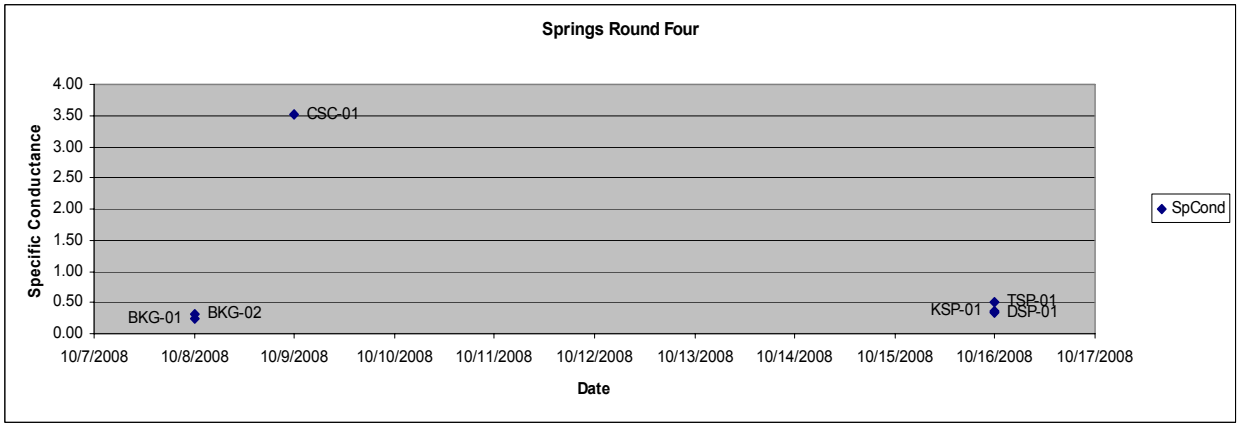
5/27/2008
5/28/2008
5/29/2008
Date
SpCond


Springs Round Two
Specific Conductance
0.600
0.500
0.400
0.300
0.200
0.100
0.000
TSP-01
DSP-01
KSP-01
BKG-02
CSC-01
BKG-01
6/15/2008
6/16/2008
6/16/2008
6/17/2008
6/17/2008
6/18/2008
6/18/2008
6/19/2008
6/19/2008
Date
SpCond


Springs Round Three
Specific Conductance
0.60
0.50
0.40
0.30
0.20
0.10
0.00
TSP-01
KSP-01
DSP-01
BKG-02
CSC-01
BKG-01
7/30/2008
7/31/2008
8/1/2008
8/2/2008
8/3/2008
8/4/2008
8/5/2008
8/6/2008
8/7/2008
Date
SpCond


Springs Round Four
Specific Conductance
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
CSC-01
BKG-01
BKG-02
KSP-01
TSP-01
DSP-01
10/7/2008
10/8/2008
10/9/2008
10/10/2008
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10/13/2008
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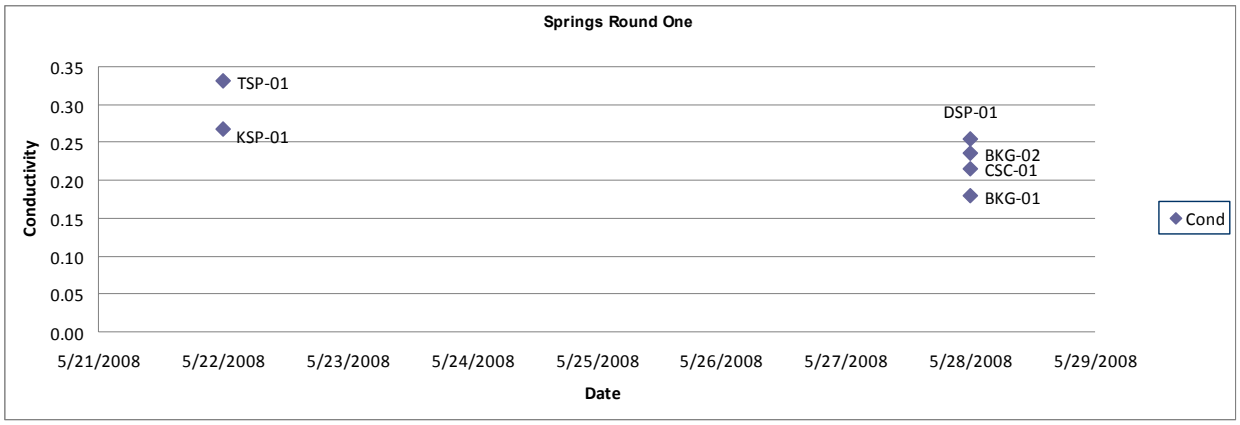
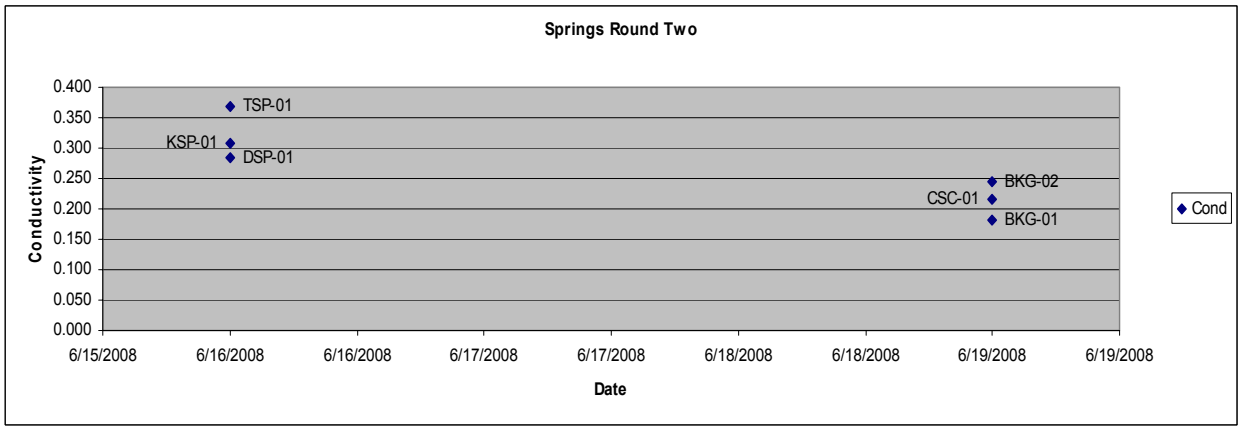
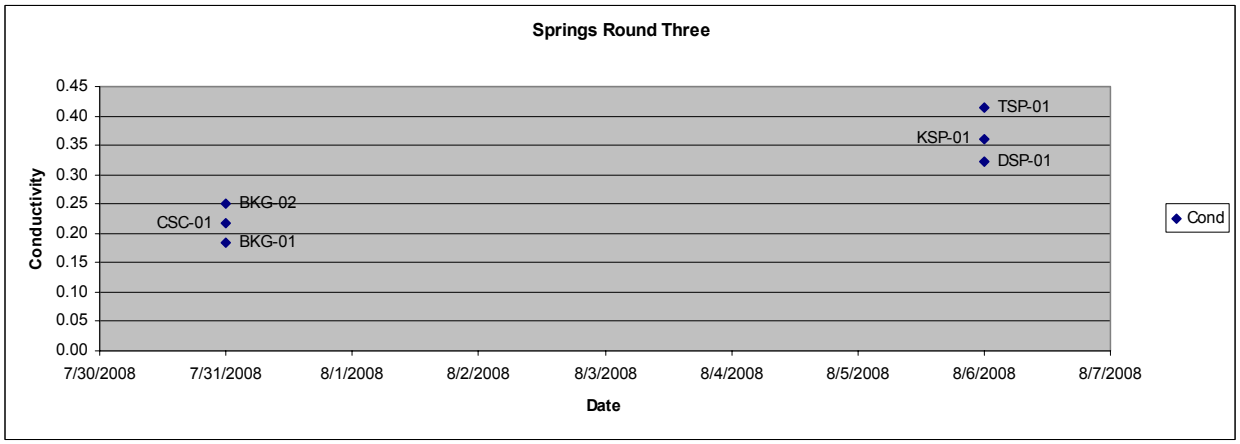
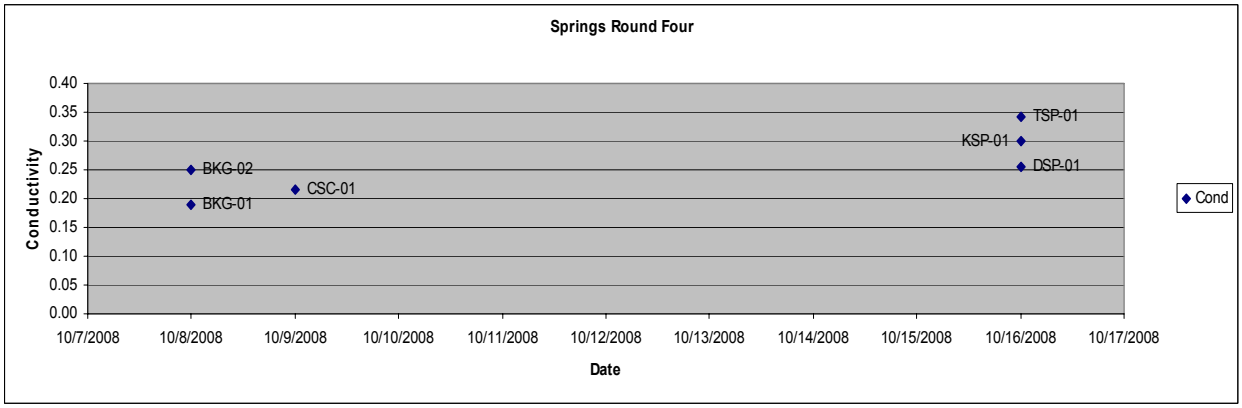
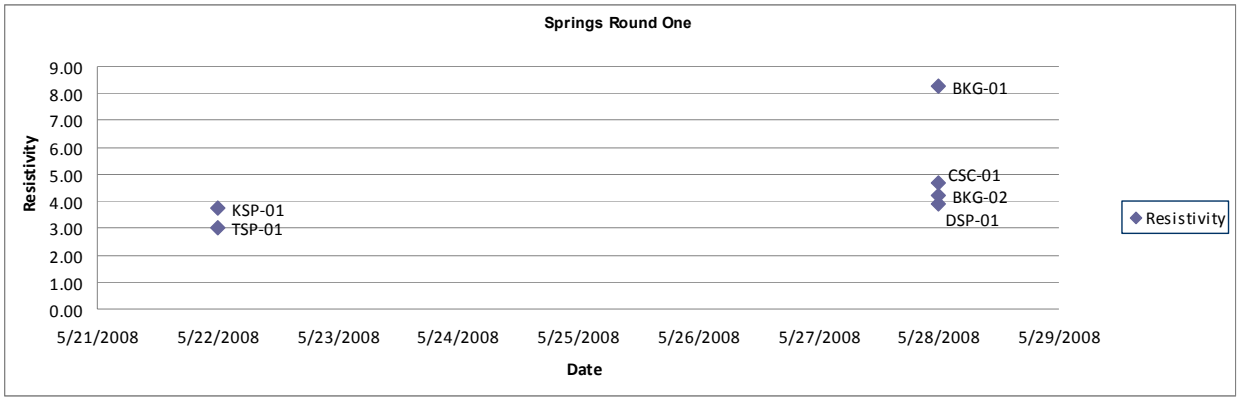
10/16/2008
10/17/2008
Date
SpCond

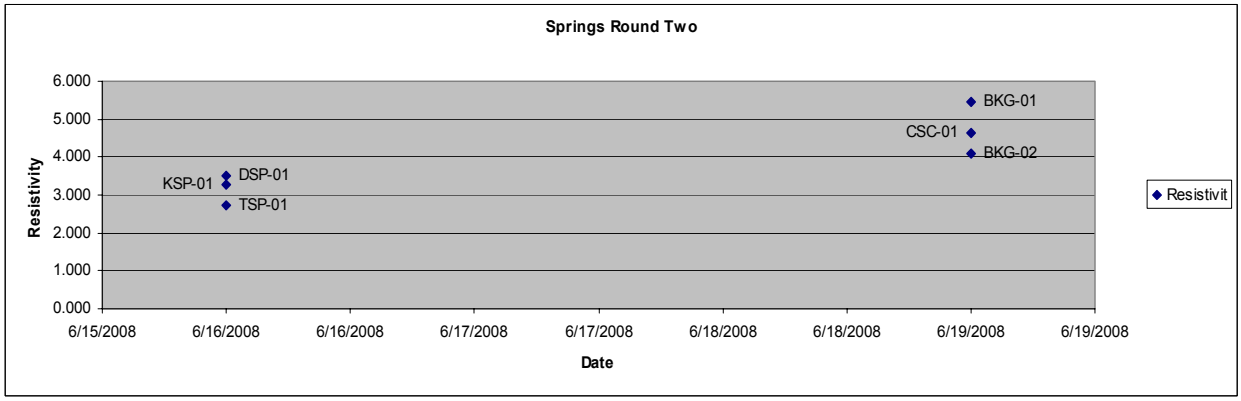

Springs Round One
Conductivity
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
TSP-01
KSP-01
DSP-01
BKG-02
CSC-01
BKG-01
Cond
5/21/2008
5/22/2008
5/23/2008
5/24/2008
5/25/2008
5/26/2008
5/27/2008
5/28/2008
5/29/2008
Date

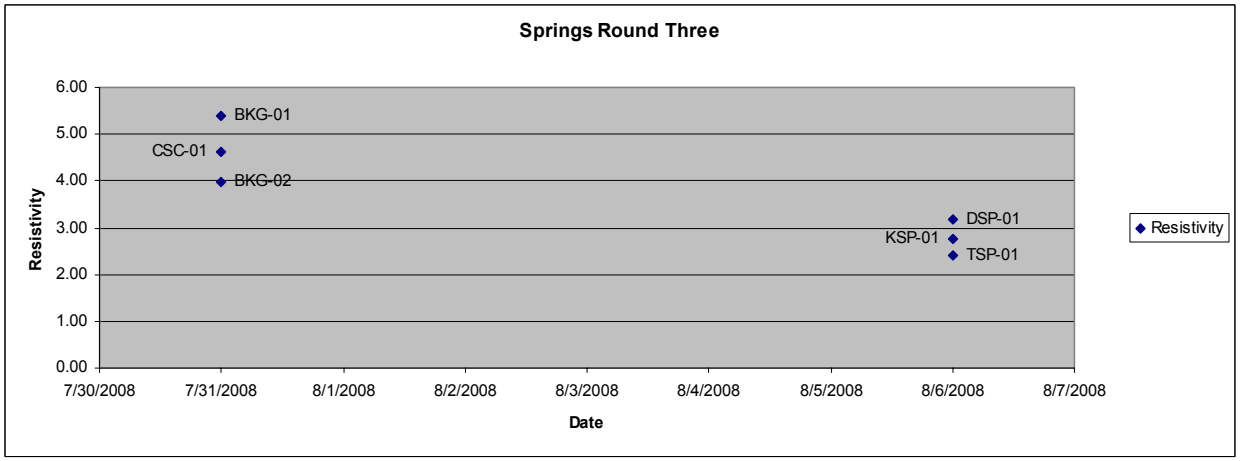

Springs Round Two
Conductivity
0.400
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
TSP-01
KSP-01
DSP-01
BKG-02
CSC-01
BKG-01
Cond
6/15/2008
6/16/2008
6/16/2008
6/17/2008
6/17/2008
6/18/2008
6/18/2008
6/19/2008
6/19/2008
Date

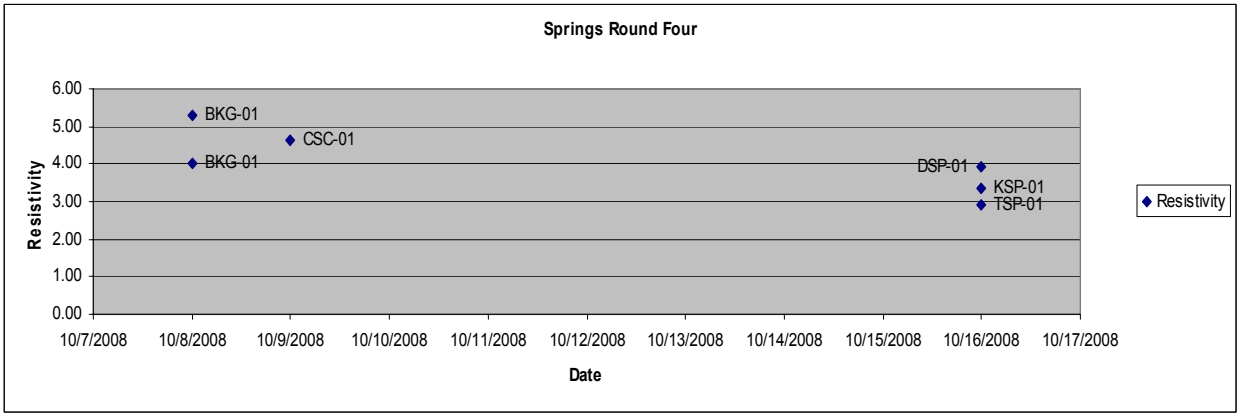

Springs Round Three
Conductivity
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
TSP-01
KSP-01
DSP-01
BKG-02
CSC-01
BKG-01
Cond
7/30/2008
7/31/2008
8/1/2008
8/2/2008
8/3/2008
8/4/2008
8/5/2008
8/6/2008
8/7/2008
Date

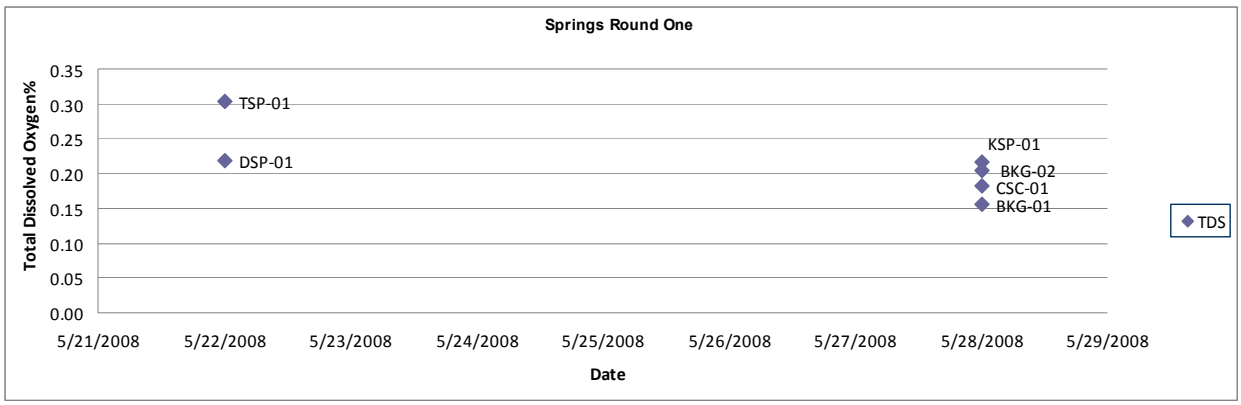

Springs Round Four
Conductivity
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
TSP-01
KSP-01
DSP-01
BKG-02
CSC-01
BKG-01
Cond
10/7/2008
10/8/2008
10/9/2008
10/10/2008
10/11/2008
10/12/2008
10/13/2008
10/14/2008
10/15/2008
10/16/2008
10/17/2008
Date

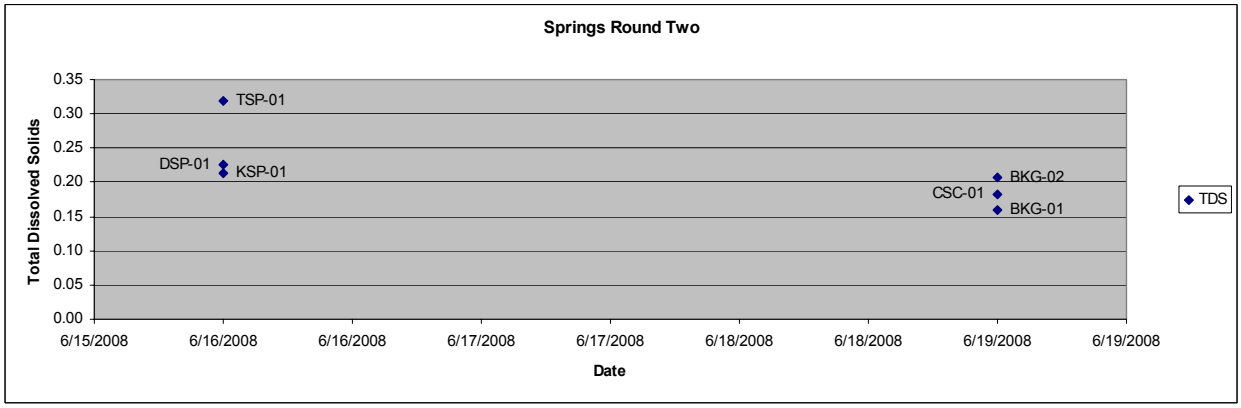

Springs Round One
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Resistivity
BKG-01
CSC-01
BKG-02
DSP-01
KSP-01
TSP-01
5/21/2008
5/22/2008
5/23/2008
5/24/2008
5/25/2008
5/26/2008
5/27/2008
5/28/2008
5/29/2008
Date
Resistivity

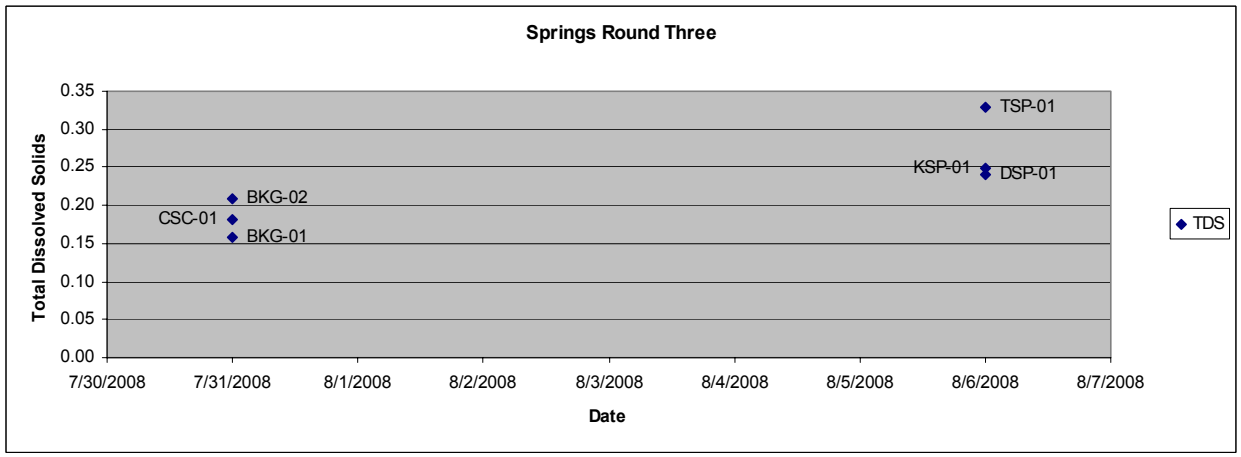

Springs Round Two
6.000
5.000
4.000
3.000
2.000
1.000
0.000
Resistivity
BKG-01
CSC-01
BKG-02
KSP-01
DSP-01
TSP-01
6/15/2008
6/16/2008
6/16/2008
6/17/2008
6/17/2008
6/18/2008
6/18/2008
6/19/2008
6/19/2008
Date
Resistivit

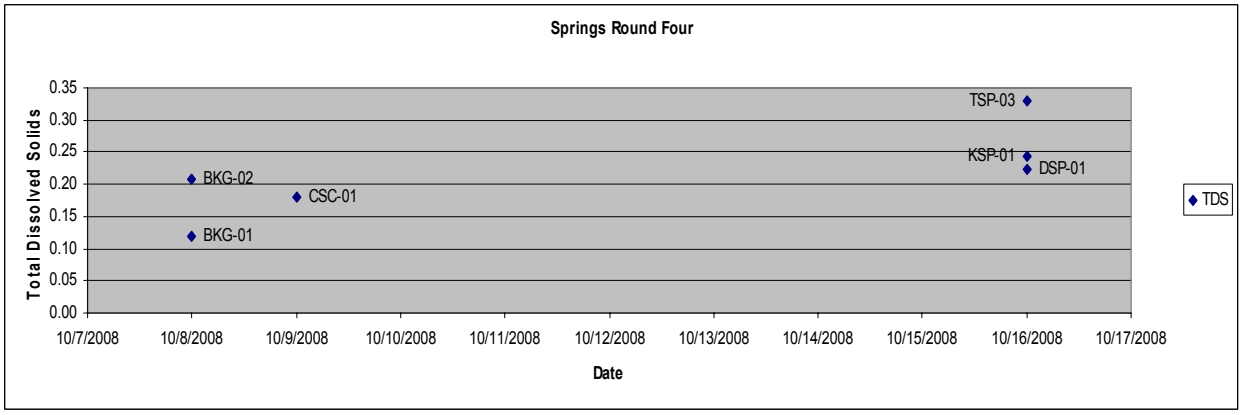

Springs Round Three
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Resistivity
BKG-01
CSC-01
BKG-02
DSP-01
KSP-01
TSP-01
7/30/2008
7/31/2008
8/1/2008
8/2/2008
8/3/2008
8/4/2008
8/5/2008
8/6/2008
8/7/2008
Date
Resistivity

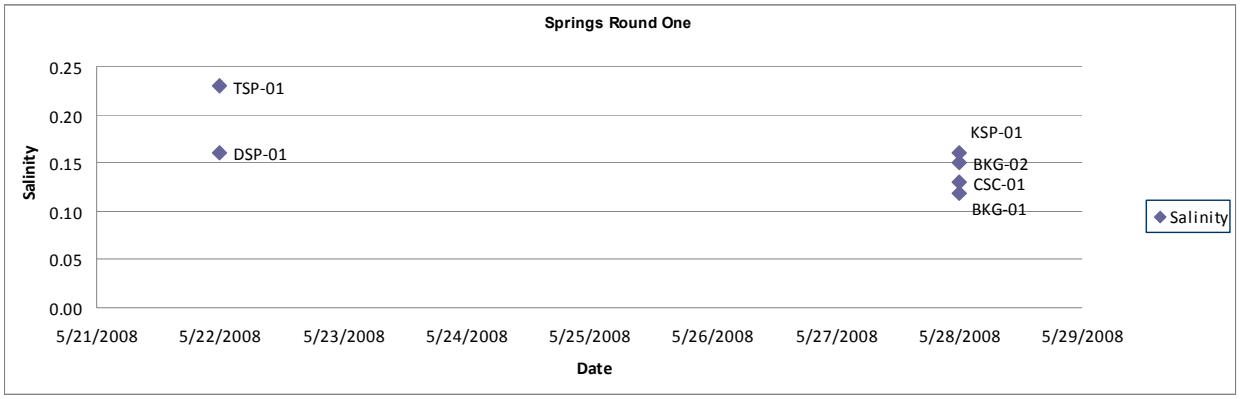

Springs Round Four
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Resistivity
BKG-01
CSC-01
BKG-01
DSP-01
KSP-01
TSP-01
10/7/2008
10/8/2008
10/9/2008
10/10/2008
10/11/2008
10/12/2008
10/13/2008
10/14/2008
10/15/2008
10/16/2008
10/17/2008
Date
Resistivity

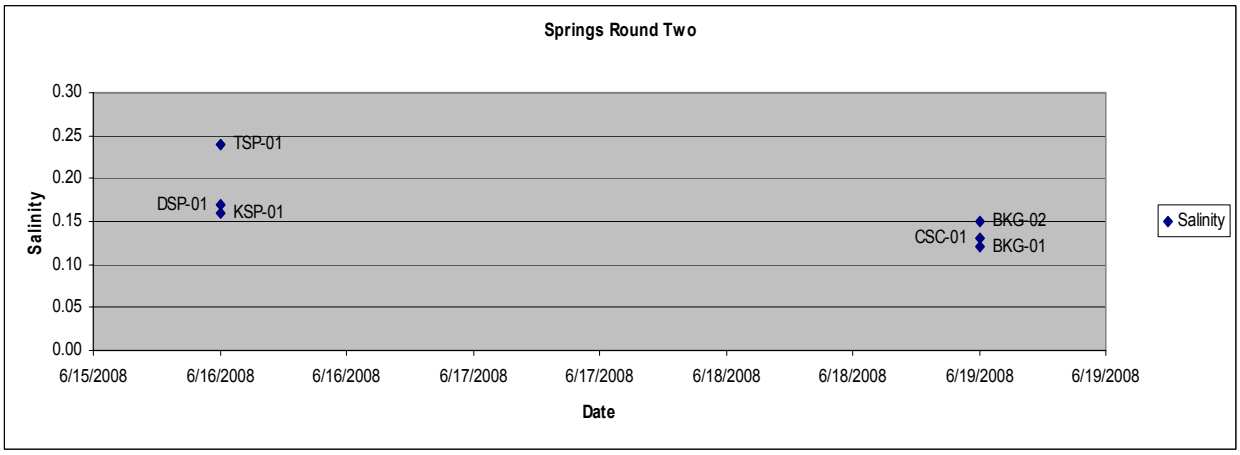

Springs Round One
Total Dissolved Oxygen%
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
TSP-01
DSP-01
KSP-01
BKG-02
CSC-01
BKG-01
TDS
5/21/2008
5/22/2008
5/23/2008
5/24/2008
5/25/2008
5/26/2008
5/27/2008
5/28/2008
5/29/2008
Date

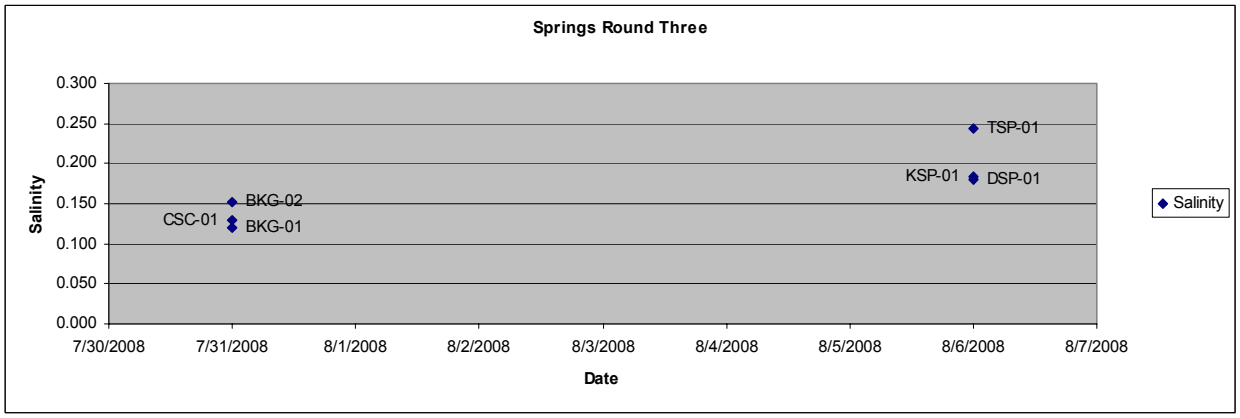

Springs Round Two
Total Dissolved Solids
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
TSP-01
DSP-01
KSP-01
BKG-02
CSC-01
BKG-01
TDS
6/15/2008
6/16/2008
6/16/2008
6/17/2008
6/17/2008
6/18/2008
6/18/2008
6/19/2008
6/19/2008
Date

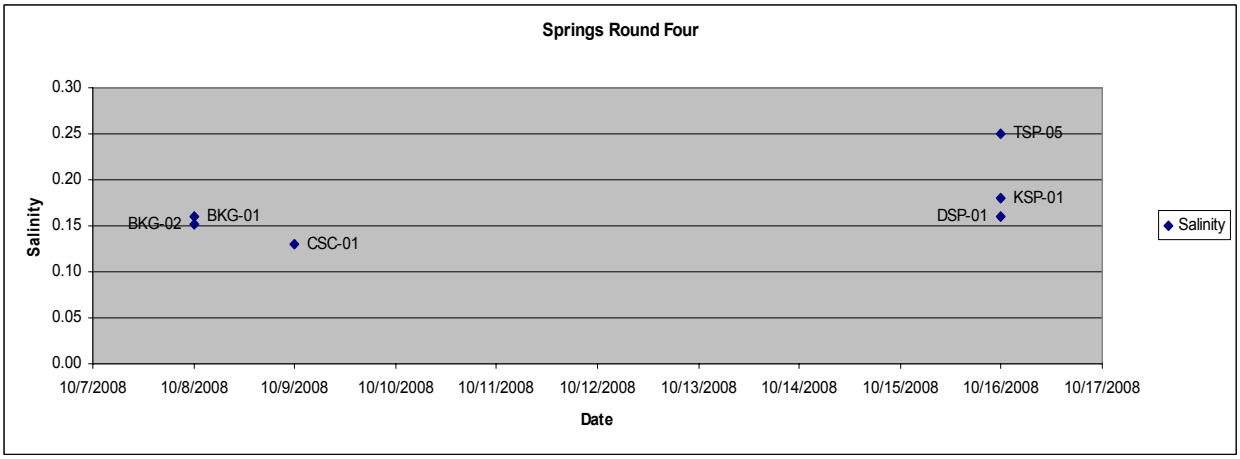

Springs Round Three
Total Dissolved Solids
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
TSP-01
KSP-01
DSP-01
BKG-02
CSC-01
BKG-01
TDS
7/30/2008
7/31/2008
8/1/2008
8/2/2008
8/3/2008
8/4/2008
8/5/2008
8/6/2008
8/7/2008
Date

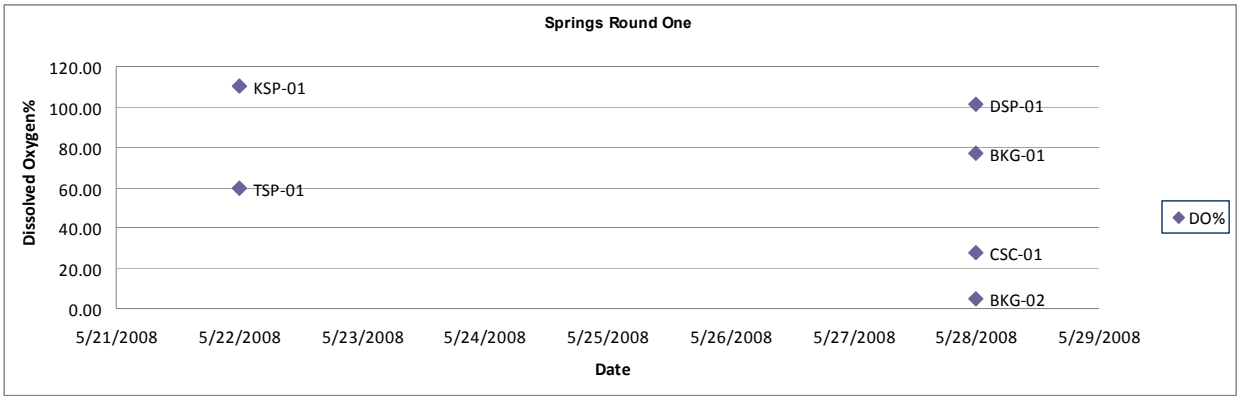

Springs Round Four
Total Dissolved Solids
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
TSP-03
KSP-01
DSP-01
BKG-02
CSC-01
BKG-01
TDS
10/7/2008
10/8/2008
10/9/2008
10/10/2008
10/11/2008
10/12/2008
10/13/2008
10/14/2008
10/15/2008
10/16/2008
10/17/2008
Date

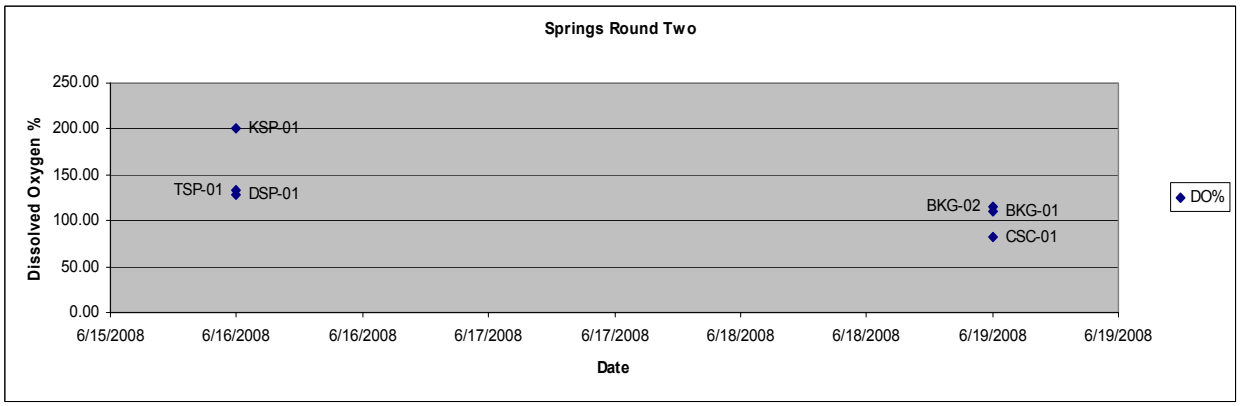

Springs Round One
0.25
0.20
0.15
0.10
0.05
0.00
Salinity
TSP-01
DSP-01
KSP-01
BKG-02
CSC-01
BKG-01
Salinity
5/21/2008
5/22/2008
5/23/2008
5/24/2008
5/25/2008
5/26/2008
5/27/2008
5/28/2008
5/29/2008
Date

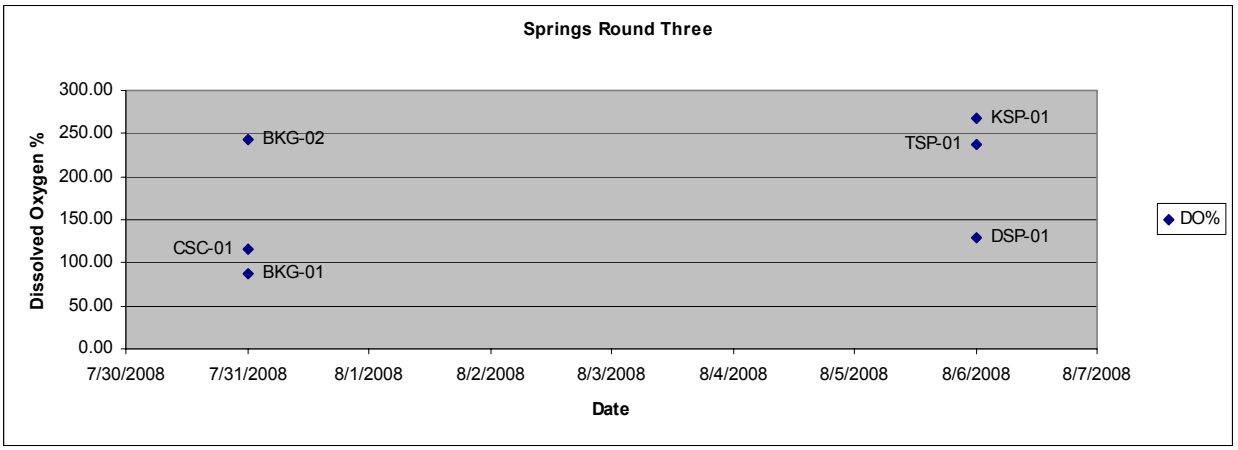

Springs Round Two
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Salinity
TSP-01
DSP-01
KSP-01
BKG-02
CSC-01
BKG-01
Salinity
6/15/2008
6/16/2008
6/16/2008
6/17/2008
6/17/2008
6/18/2008
6/18/2008
6/19/2008
6/19/2008
Date

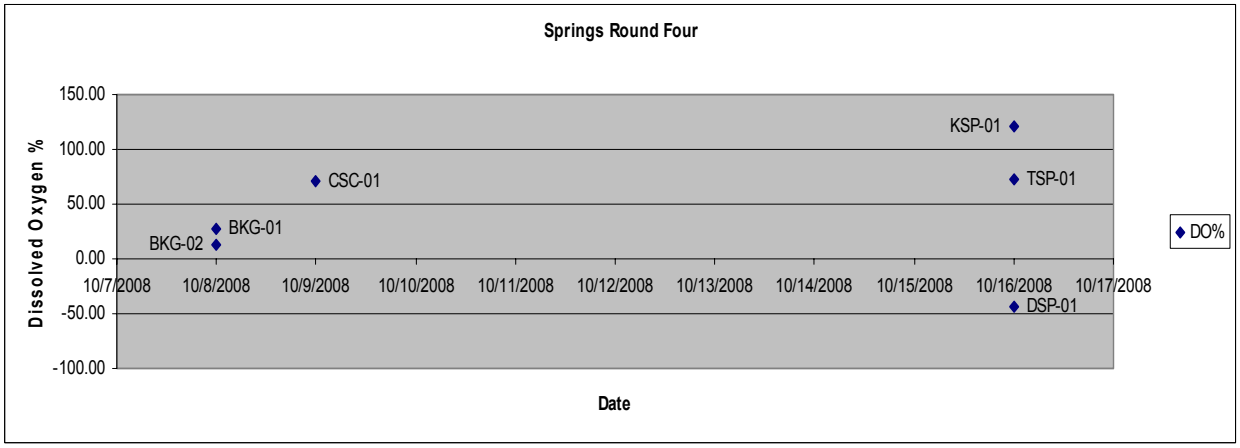

Springs Round Three
0.300
0.250
0.200
0.150
0.100
0.050
0.000
Salinity
TSP-01
KSP-01
DSP-01
BKG-02
CSC-01
BKG-01
Salinity
7/30/2008
7/31/2008
8/1/2008
8/2/2008
8/3/2008
8/4/2008
8/5/2008
8/6/2008
8/7/2008
Date

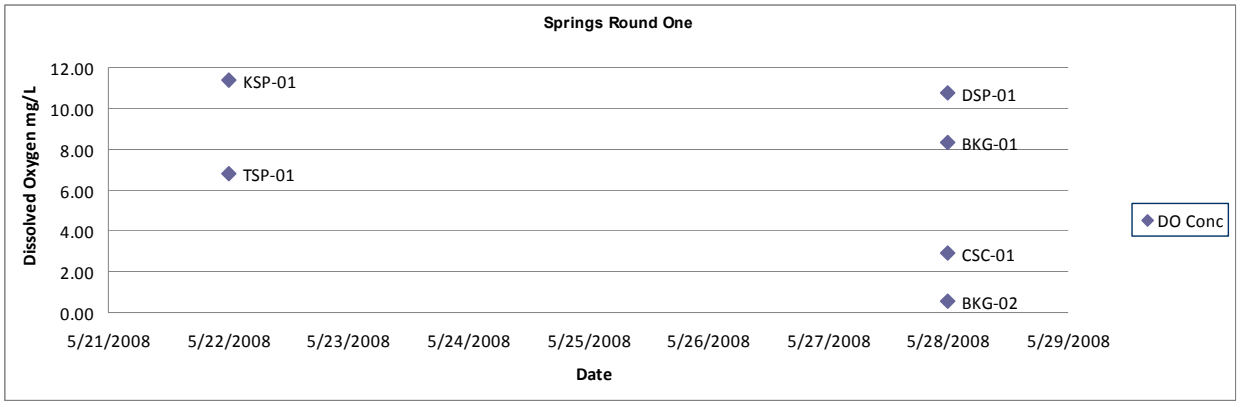

Springs Round Four
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Salinity
TSP-05
KSP-01
DSP-01
BKG-02
BKG-01
CSC-01
Salinity
10/7/2008
10/8/2008
10/9/2008
10/10/2008
10/11/2008
10/12/2008
10/13/2008
10/14/2008
10/15/2008
10/16/2008
10/17/2008
Date

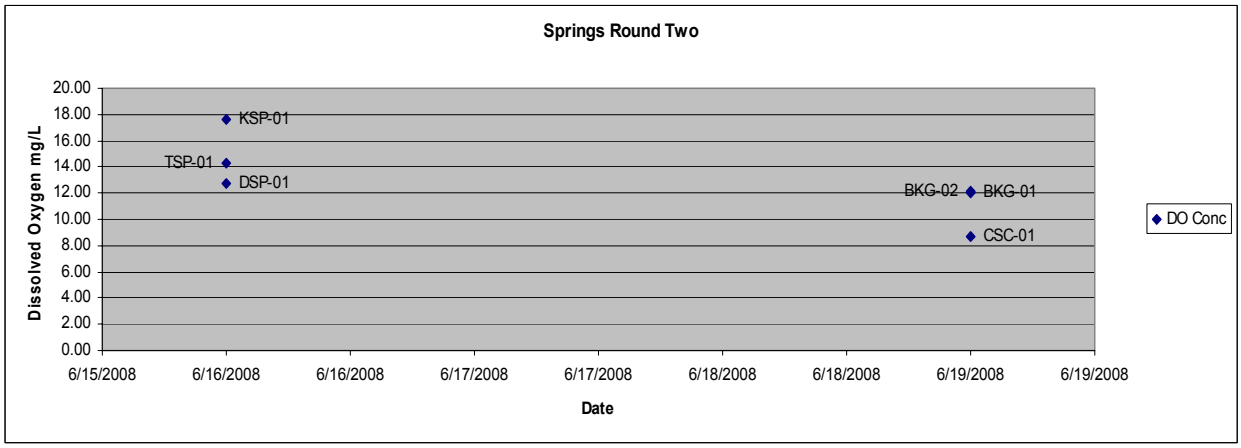

Springs Round One
Dissolved Oxygen%
120.00
100.00
80.00
60.00
40.00
20.00
0.00
KSP-01
TSP-01
DSP-01
BKG-01
CSC-01
BKG-02
5/21/2008
5/22/2008
5/23/2008
5/24/2008
5/25/2008
5/26/2008
5/27/2008
5/28/2008
5/29/2008
Date
DO%

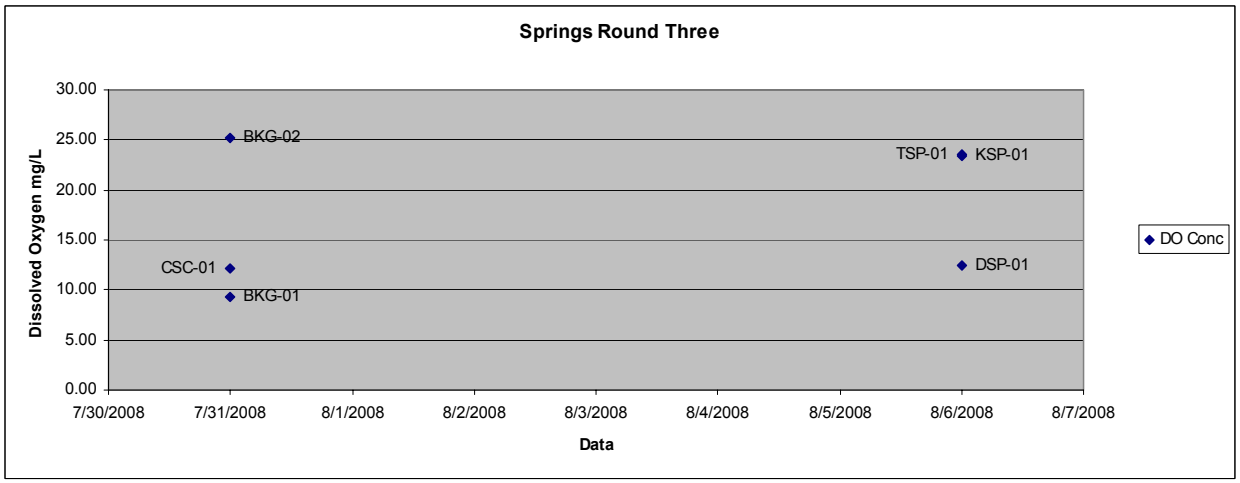

Springs Round Two
Dissolved Oxygen %
250.00
200.00
150.00
100.00
50.00
0.00
KSP-01
TSP-01
DSP-01
BKG-02
BKG-01
CSC-01
6/15/2008
6/16/2008
6/16/2008
6/17/2008
6/17/2008
6/18/2008
6/18/2008
6/19/2008
6/19/2008
Date
DO%

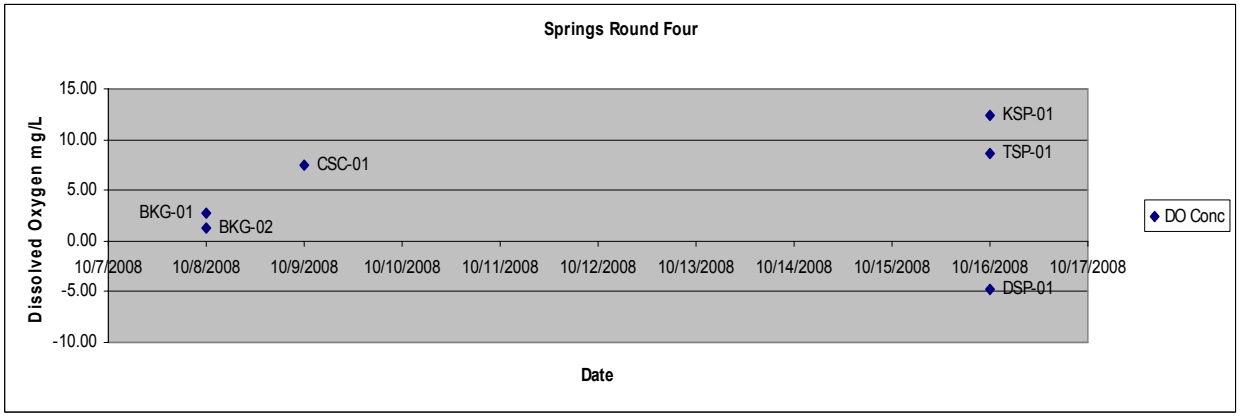

Springs Round Three
Dissolved Oxygen %
300.00
250.00
200.00
150.00
100.00
50.00
0.00
BKG-02
KSP-01
TSP-01
CSC-01
DSP-01
BKG-01
7/30/2008
7/31/2008
8/1/2008
8/2/2008
8/3/2008
8/4/2008
8/5/2008
8/6/2008
8/7/2008
Date
DO%

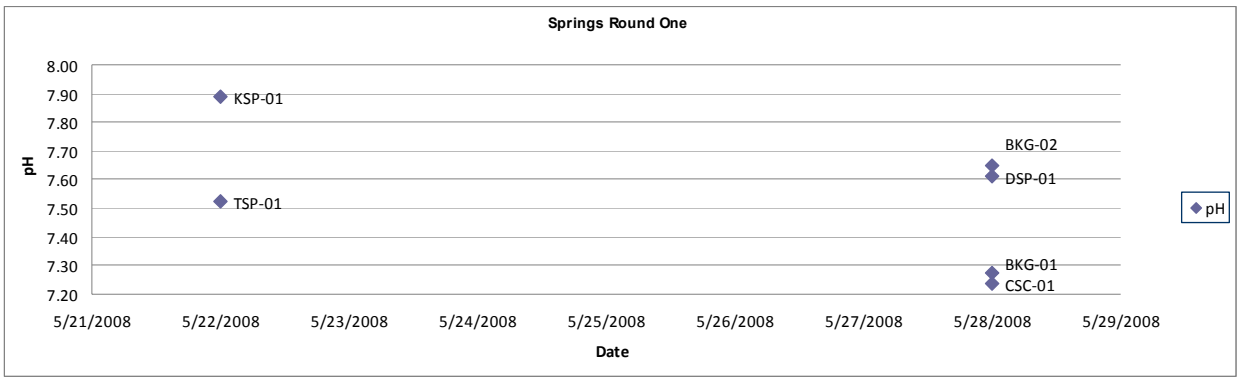

Springs Round Four
Dissolved Oxygen %
150.00
100.00
50.00
0.00
-50.00
-100.00
KSP-01
CSC-01
TSP-01
BKG-01
BKG-02
DSP-01
10/7/2008
10/8/2008
10/9/2008
10/10/2008
10/11/2008
10/12/2008
10/13/2008
10/14/2008
10/15/2008
10/16/2008
10/17/2008
Date
DO%

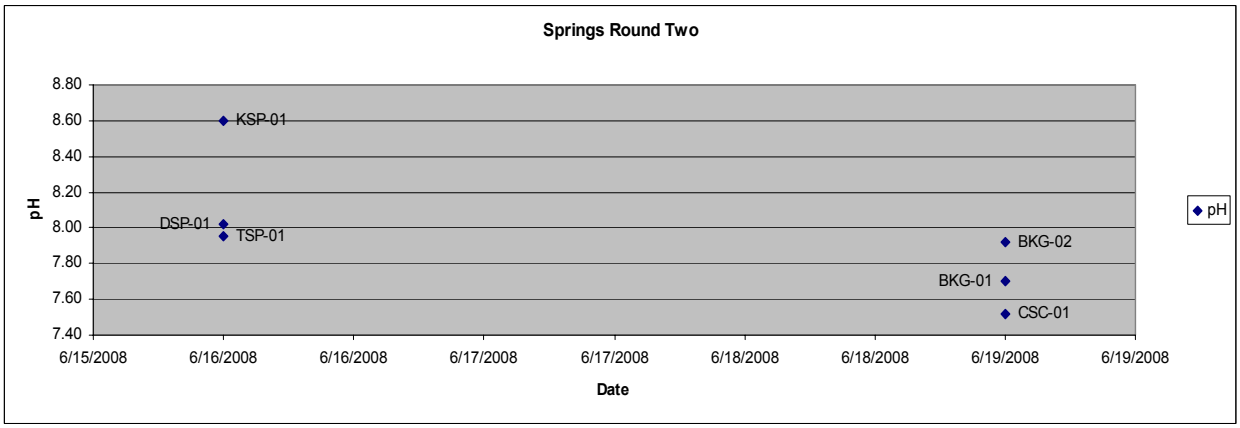

Springs Round One
Dissolved Oxygen mg/L
12.00
10.00
8.00
6.00
4.00
2.00
0.00
KSP-01
DSP-01
BKG-01
TSP-01
CSC-01
BKG-02
5/21/2008
5/22/2008
5/23/2008
5/24/2008
5/25/2008
5/26/2008
5/27/2008
5/28/2008
5/29/2008
Date
DO Conc

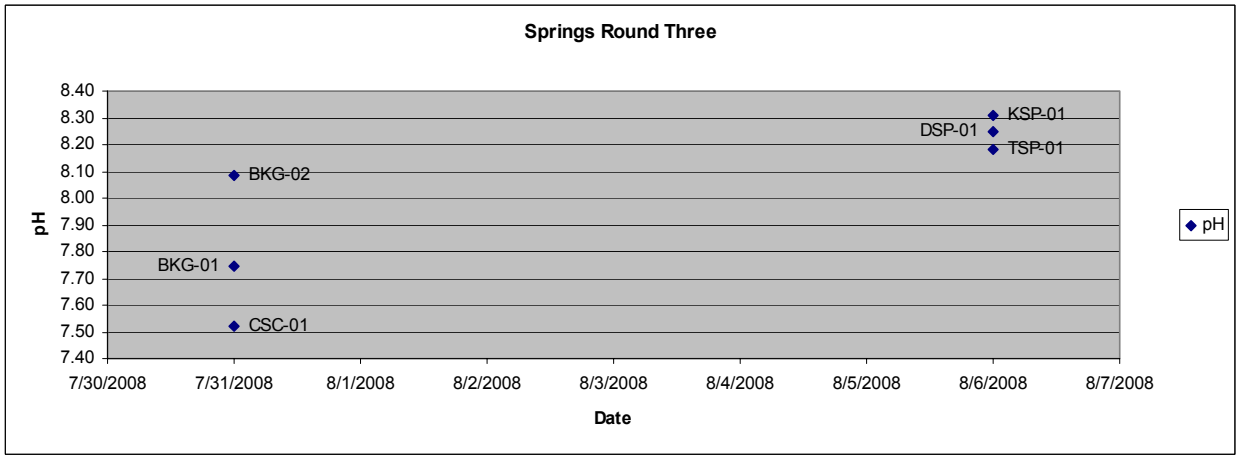

Springs Round Two
Dissolved Oxygen mg/L
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
KSP-01
TSP-01
DSP-01
BKG-02
BKG-01
CSC-01
6/15/2008
6/16/2008
6/16/2008
6/17/2008
6/17/2008
6/18/2008
6/18/2008
6/19/2008
6/19/2008
Date
DO Conc

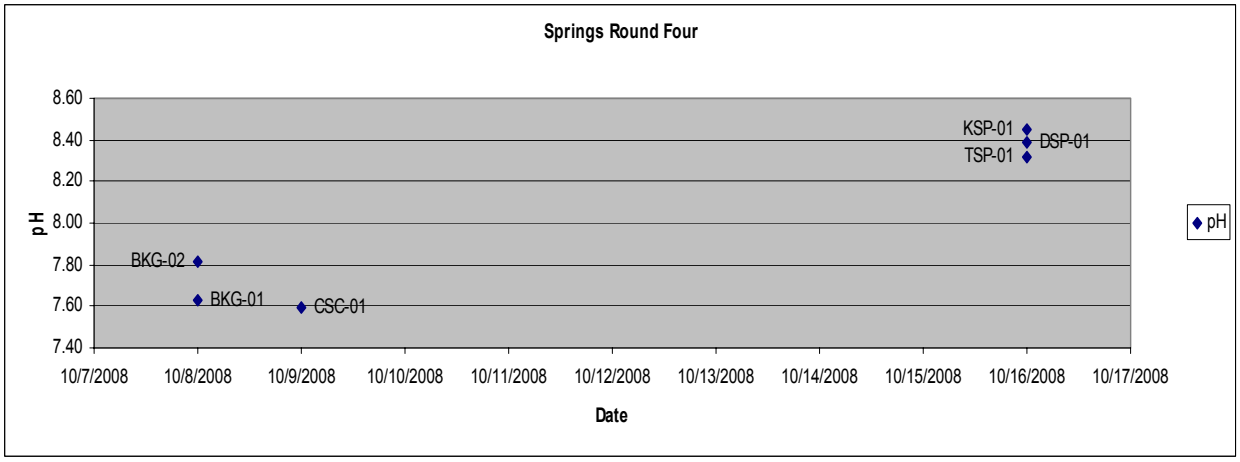

Springs Round Three
Dissolved Oxygen mg/L
30.00
25.00
20.00
15.00
10.00
5.00
0.00
BKG-02
TSP-01
KSP-01
CSC-01
DSP-01
BKG-01
7/30/2008
7/31/2008
8/1/2008
8/2/2008
8/3/2008
8/4/2008
8/5/2008
8/6/2008
8/7/2008
Data
DO Conc

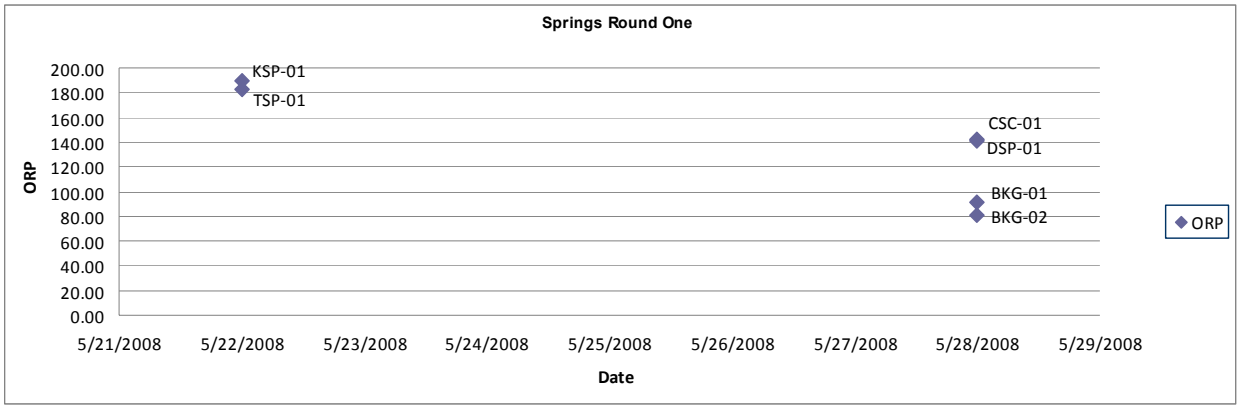

Springs Round Four
Dissolved Oxygen mg/L
15.00
10.00
5.00
0.00
-5.00
-10.00
KSP-01
TSP-01
CSC-01
BKG-01
BKG-02
DSP-01
10/7/2008
10/8/2008
10/9/2008
10/10/2008
10/11/2008
10/12/2008
10/13/2008
10/14/2008
10/15/2008
10/16/2008
10/17/2008
Date
DO Conc

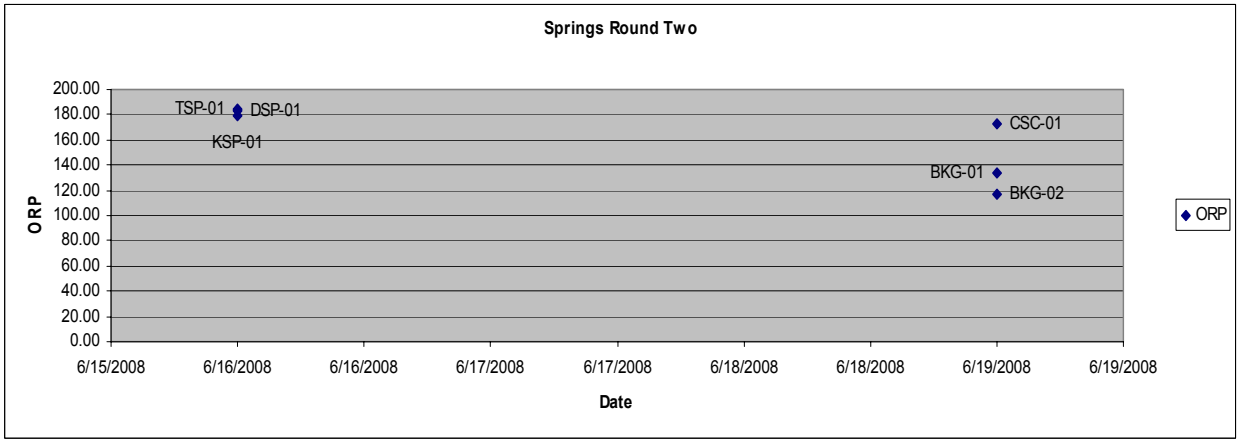

Springs Round One
8.00
7.90
7.80
7.70
7.60
7.50
7.40
7.30
7.20
pH
KSP-01
TSP-01
BKG-02
DSP-01
BKG-01
CSC-01
5/21/2008
5/22/2008
5/23/2008
5/24/2008
5/25/2008
5/26/2008
5/27/2008
5/28/2008
5/29/2008
Date
pH

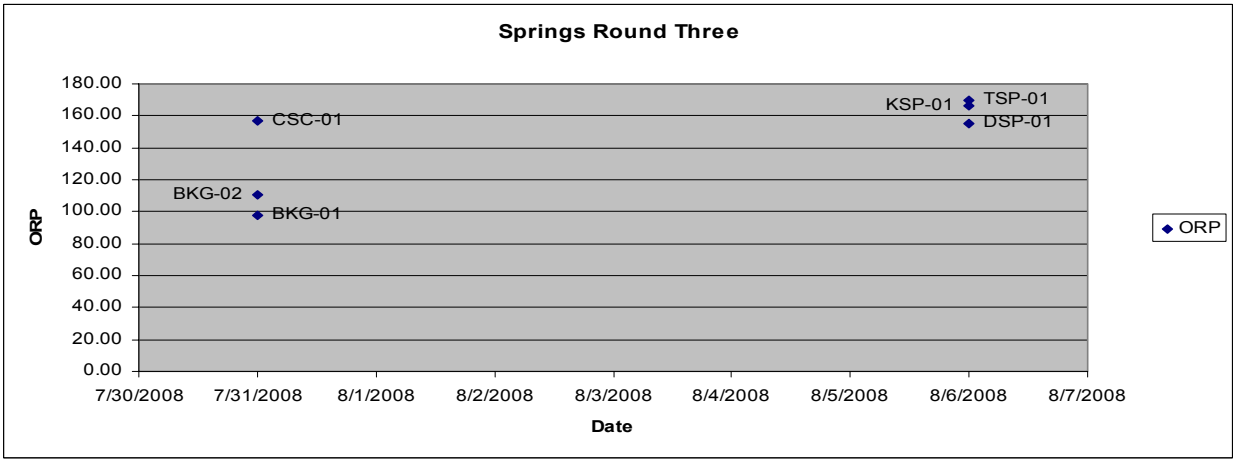

Springs Round Two
8.80
8.60
8.40
8.20
8.00
7.80
7.60
7.40
pH
KSP-01
DSP-01
TSP-01
BKG-02
BKG-01
CSC-01
6/15/2008
6/16/2008
6/16/2008
6/17/2008
6/17/2008
6/18/2008
6/18/2008
6/19/2008
6/19/2008
Date
pH

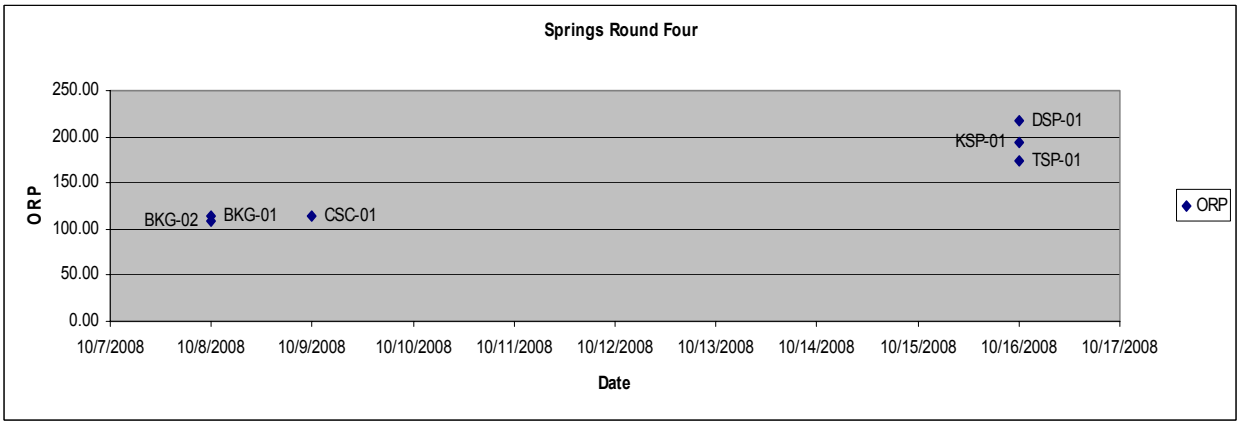

Springs Round Three
8.40
8.30
8.20
8.10
8.00
7.90
7.80
7.70
7.60
7.50
7.40
pH
KSP-01
DSP-01
TSP-01
BKG-02
BKG-01
CSC-01
7/30/2008
7/31/2008
8/1/2008
8/2/2008
8/3/2008
8/4/2008
8/5/2008
8/6/2008
8/7/2008
Date
pH


Springs Round Four
8.60
8.40
8.20
8.00
7.80
7.60
7.40
pH
KSP-01
DSP-01
TSP-01
BKG-02
BKG-01
CSC-01
10/7/2008
10/8/2008
10/9/2008
10/10/2008
10/11/2008
10/12/2008
10/13/2008
10/14/2008
10/15/2008
10/16/2008
10/17/2008
Date
pH


Springs Round One
ORP
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
KSP-01
TSP-01
CSC-01
DSP-01
BKG-01
BKG-02
5/21/2008
5/22/2008
5/23/2008
5/24/2008
5/25/2008
5/26/2008
5/27/2008
5/28/2008
5/29/2008
Date
ORP


Springs Round Two
ORP
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
TSP-01
DSP-01
KSP-01
CSC-01
BKG-01
BKG-02
6/15/2008
6/16/2008
6/16/2008
6/17/2008
6/17/2008
6/18/2008
6/18/2008
6/19/2008
6/19/2008
Date
ORP


Springs Round Three
ORP
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
CSC-01
KSP-01
TSP-01
DSP-01
BKG-02
BKG-01
7/30/2008
7/31/2008
8/1/2008
8/2/2008
8/3/2008
8/4/2008
8/5/2008
8/6/2008
8/7/2008
Date
ORP


Springs Round Four
ORP
250.00
200.00
150.00
100.00
50.00
0.00
DSP-01
KSP-01
TSP-01
BKG-02
BKG-01
CSC-01
10/7/2008
10/8/2008
10/9/2008
10/10/2008
10/11/2008
10/12/2008
10/13/2008
10/14/2008
10/15/2008
10/16/2008
10/17/2008
Date
ORP