ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532
Tustin, CA 92680
(714) 832-0064, Fax (714) 832-0067

Analysis Request and Chain of Custody Record

Lab Job No: _____
Page 1 of 1

REQUIRED TAT: 24 hr TAT on SOIL TRPH, STANDARD TAT [illegible]

CUSTOMER INFORMATION		PROJECT INFORMATION	
COMPANY:	Montgomery Watson	PROJECT NAME:	BOEING (FORMERLY MDAC)
SEND REPORT TO:	Fred Strauss	NUMBER:	1206035.01090010
ADDRESS:	250 N. Madison Ave. Pasadena, CA 91101	LOCATION:	Parcel 1A - Bldg. 45 Area
		ADDRESS:	19503 S. Normandie Ave. Los Angeles, CA
PHONE:	(818) 568-6582	SAMPLED BY:	AWN/IV/CW
FAX:	(818) 796-5941		

SAMPLE ID	NO. OF CONTAINERS	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	CONTAINER TYPE	PRES.	TRPH 418.1	VOCs 8260	SVOCs 8270	Title 22 Metals	8015 Gas	8015 Diesel	Pesticides 8080	PCBs 8080	Carbon Chain	REMARKS/PRECAUTIONS
B45T-GS-1-14'	2	8/21/97	1330	SOIL	2"x6" SS SLEEVE	ICE	X	X	X	X	X	X	X	X	X	
B45T-GS-2-14'	2		1335				X			X						
B45T-GS-3	2		1340				X			X						
B45T-GS-4-2'	2		1345				X			X						
Equipment Blank	9		1515	WATER	5 Ambers 1 Poly 3 VOAs	None HNO3 HCl	X	X	X	X	X	X	X	X	X	AWN
Rinsate Blank	9		1545				X	X	X	X	X	X	X	X		
Trip Blank	2		—		2 VOAs	HCl		X								

Total No. of Samples: 7

Method of Shipment: 1 COOLER VIA ORANGE COAST COURIER

Relinquished By:	Date/Time:	Received By:	Date/Time:
Ivan [illegible]	8/21/97 1700		
Relinquished By:	Date/Time:	Received By:	Date/Time:
		[illegible]	
Relinquished By:	Date/Time:	Received For Lab By:	Date/Time:
		[illegible]	8/21/97 17:00

Reporting Format: (check)
NORMAL _____ S.D. HMMD _____
RWQCB _____ OTHER _____

Sample Integrity: (check)
Intact _____ on ice _____

All samples remain the property of the client who is responsible f[illegible]posal. A disposal fee may be imposed if client fails to pickup samples.

BOE-C6-0152577

F A X

MONTGOMERY WATSON

250 N. Madison Avenue
Pasadena, California 91101

Tel: 818 568 6334
Fax: 818 796 5941

Date: 8/25/97

To: Mark Noorani

Fax No: (714) 832-0067

From: Steve Reiners

Reference: MDRC

Subject: Additional Analyses

No. of Pages: 1
(including cover)

Comments:

Please provide a letter explaining the reason for the high detection limits for Benzo(a)pyrene for the following samples:

5437 PL-B1-30' 227
PL-B1-40' 228

Also, please add a "compound detected" indicator arrow to the toluene result for sample PL-B1-40'.

Also, please cancel all previous analysis requests on the following samples and put these samples on HOLD:

B45T-GS-2-14'
B45T-GS-3

[redacted]

Finally, request for confirmation of Barium result for sample OA1-GS-31-4' was faxed on 8/6/97, and request for confirmation of Cobalt result for sample OA1-GS-76-8' was faxed on 8/18/97. Please confirm as requested.

Please call me at (818) 568-6334 to confirm your receipt of this fax.
Thanks!

If you do not receive all pages, or if there are any problems with this transmission, please call Brenda Whitney at 818-568-6514.

TOTAL P.01

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: Boeing (Formerly MDRC)
Client Project #: 1206035.01090010

Analysis Method: 418.1

Sample Description: Soil,

Laboratory Reference #: MWI 9487

Sampled: 08/21/97
Received: 08/21/97
Analyzed: 08/25/97
Reported: 08/25/97

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

Laboratory Sample Sumber	*Client Sample Number*	*Extractable Hydrocarbons mg/kg (ppm)*
97080361	B45T-GS-1-14'	19
97080362	B45T-GS-4-2'	N.D.

Detection Limit:	8.0

Analytes reported as N.D. were not present above the stated limit of detection.

ORANGE COAST ANALYTICAL

Mark Noorani
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
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4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: Boeing (Formerly MDRC)
Client Project #: 1206035.01090010

Sample Description: Soil, B45T-GS-4-2'

Sampled: 08/21/97
Received: 08/21/97
Analyzed: 08/29/97
Reported: 08/29/97

Laboratory Sample Number: 97080362
Laboratory Reference #: MWI 9487

CCR - METALS

Analyte	*EPA Method*	*STLC Limits mg/l*	*TTLC Limits mg/kg*	*Detection Limit mg/kg*	*Analysis Result mg/kg*
Antimony	6010	15	500	5.0	N.D.
Arsenic	6010	5.0	500	1.0	15
Barium	6010	100	10000	0.1	90
Beryllium	6010	0.75	75	0.1	N.D.
Cadmium	6010	1.0	100	0.1	N.D.
Chromium (VI)	7196	5.0	500	0.5	N.D.
Chromium Total	6010	560	2500	0.05	21
Cobalt	6010	80	8000	0.5	7.6
Copper	6010	25	2500	0.1	11
Lead	6010	5.0	1000	1.0	N.D.
Mercury	7471	0.2	20	0.01	N.D.
Molybdenum	6010	350	3500	0.5	N.D.
Nickel	6010	20	2000	0.5	8.6
Selenium	6010	1.0	100	1.0	N.D.
Silver	6010	5.0	500	0.1	N.D.
Thallium	6010	7.0	700	5.0	N.D.
Vanadium	6010	24	2400	0.5	27
Zinc	6010	250	5000	0.1	33

Analytes reported as N.D. were not present above the stated limit of detection.

ORANGE COAST ANALYTICAL

Mark Noorani
Laboratory Director

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4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: Boeing (Formerly MDRC)
Client Project #: 1206035.01090010

Analysis Method: 418.1

Sample Description: Water,

Laboratory Reference #: MWI 9487

Sampled: 08/21/97
Received: 08/21/97
Analyzed: 08/27/97
Reported: 08/29/97

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

Laboratory Sample Number	*Client Sample Number*	*Extractable Hydrocarbons mg/l (ppm)*
97080363	Equip Blank	N.D.
97080364	Rinsate Blank	N.D.
Detection Limit:		0.5

Analyte reported as N.D. was not present above the stated limit of detection.

ORANGE COAST ANALYTICAL

Mark Noorani
Laboratory Director

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3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: Boeing (MDRC)
Client Project #: 1206035.01090010

Analysis Method: EPA 3510/8015m

Sample Description: Water,

Laboratory Reference #: MWI 9487

Sampled: 08/21/97
Recevied: 08/21/97
Analyzed: 08/28/97
Reported: 08/29/97

DIESEL ANALYSIS (EPA 8015M)

Laboratory Sample Number	*Client Sample Number*	*Extractable Hydrocarbons (mg/l)*
97080363	Equip Blank	N.D.
97080364	Rinsate Blank	N.D.

Detection Limit:	0.5

Analytes reported as N.D. were not present above the stated limit of detection.

ORANGE COAST ANALYTICAL

Mark Noorani
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

LABORATORY REPORT FORM

Laboratory Name: ORANGE COAST ANALYTICAL, INC.

Address: 3002 Dow Suite 532 Tustin, CA 92780

Telephone: (714) 832-0064

Laboratory Certification (ELAP) No.: 1416 Expiration Date: 1999

Laboratory Director's Name (Print) : Mark Noorani

Client: Montgomery Watson

Project No.: 1206035.01090010

Project Name: The Boeing Company

Laboratory Reference: MWI 9821

Analytical Method: Title 22 Metals

Date Sampled: 12/16/97
Date Received: 12/16/97
Date Reported: 12/22/97

Sample Matrix: Water & Soil

Chain of Custody Received: Yes

Laboratory Director's Signature: Mark Noorani

METHOD ID	LIMIT1 SOIL	LIMIT1 WATER	LAB CAS ID	PF CODE	SURROG FLG	Units	LAB CHEM	97120469	97120470	97120471	97120472	97120473	QC(S) LAB SAMP NO	R1	T CONC	SL[a]	DL[a]	RECOVER
							SAMP TYPE	S	S	S	W	W						
							RES CODE	PP01	PP01	PP01	BF11	BR11						
							SAMP ID	B45T-GS-5-4'	OA2-GS-2-3'	OA2-GS-3-8'	EQUIP BLANK	RINSATE BLANK						
							SAMP DATE	12/16/97	12/16/97	12/16/97	12/16/97	12/16/97						
							SAMP TIME	13.00	13:15	14:25	14:50	15.00						
							SAMP DEPTH	4'	3'	8'								
							PRESERVED				, N, H	, N, H						
							ICED	Y	Y	Y	Y	Y						
							RECEIVED	12/16/97	12/16/97	12/16/97	12/16/97	12/16/97						
							REC TIME	15:20	15:20	15:20	15:20	15:20						
							BASIS	W	W	W	W	W						
							Tested											
418 1	8.0	0 5		T		ppm	Extractable Hydrocarbons											
							Tested	12/19/97	12/19/97	12/19/97	12/19/97	12/19/97	12/19/97					
6010	5.0	0.5		T		ppm	Antimony	<	<	<	<	<	97120492	0.0	5.0	4.6	4.7	92
6010	1.0	0.1		T		ppm	Arsenic	1.1	<	1.7	<	<	97120492	0.0	5.0	4.7	4.8	94
6010	0 1	0 01		T		ppm	Barium	89	89	81	<	<	97120492	3 9	10.0	13.6	13 8	97
6010	0.1	0.01		T		ppm	Beryllium	<	<	<	<	<	97120492	0 00	1.00	0 91	0 92	91
6010	0.1	0.01		T		ppm	Cadmium	<	<	0.17	<	<	97120492	0.00	1.00	0.97	0 98	97
							Tested	12/17/97	12/17/97	12/17/97	12/17/97	12/17/97	12/17/97					
7196	0.5	0 01		T		ppm	Chromium (VI)	<	<	<	<	<	97120470	0.00	1 00	1.00	1 00	100
							Tested	12/19/97	12/19/97	12/19/97	12/19/97	12/19/97	12/19/97					
6010	0 1	0 01		T		ppm	Chromium Total	14	16	15	<	<	97120492	0.72	1.00	1.58	1.61	86
6010	0 5	0 1		T		ppm	Cobalt	6.8	8 1	7.7	<	<	97120492	0.38	1.00	1.18	1.20	80
6010	0.1	0.01		T		ppm	Copper	13	12	23	<	<	97120492	0.77	1.00	1.71	1.73	94
6010	1 0	0.1		T		ppm	Lead	3.0	2.8	3.0	<	<	97120492	0.11	1.0	0.91	0 92	80
							Tested	12/17/97	12/17/97	12/17/97	12/17/97	12/17/97	12/17/97					
7471	0.01	0.002		T		ppm	Mercury	<	<	<	<	<	97120471	0.000	0.020	0.020	0.021	100
							Tested	12/19/97	12/19/97	12/19/97	12/19/97	12/19/97	12/19/97					
6010	0.5	0.1		T		ppm	Molybdenum	<	<	<	<	<	97120492	0.0	1 0	1.0	1.0	96
6010	0.5	0.1		T		ppm	Nickel	7.7	8.5	13	<	<	97120492	0 53	5 00	4.64	4.72	82
6010	1 0	0 1		T		ppm	Selenium	<	<	<	<	<	97120492	0 0	5 0	4 0	4 1	80
6010	0.1	0.1		T		ppm	Silver	<	<	<	<	<	97120492	0.0	2.5	2.4	2 4	94
6010	5.0	0.5		T		ppm	Thallium	<	<	<	<	<	97120492	0.0	5 0	4 0	4.1	80
6010	0.5	0.1		T		ppm	Vanadium	26	30	29	<	<	97120492	1.4	5.0	5.7	5.8	86
6010	0.1	0 01		T		ppm	Zinc	27	28	33	<	<	97120492	1.5	1.0	2 3	2.3	80
							Tested											
STLC		5.0		S		ppm	Antimony											
		1.0		S		ppm	Arsenic											
		0.1		S		ppm	Barium											
		0.1		S		ppm	Beryllium											
		0.1		S		ppm	Cadmium											
		0.5		S		ppm	Chromium (VI)											
		0.1		S		ppm	Chromium Total											
		0.5		S		ppm	Cobalt											
		0.1		S		ppm	Copper											

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		1.0		S	ppm	Lead
		0.01		S	ppm	Mercury
		0.5		S	ppm	Molybdenum
		0.5		S	ppm	Nickel
		1.0		S	ppm	Selenium
		0.1		S	ppm	Silver
		5.0		S	ppm	Thallium
		0.5		S	ppm	Vanadium
		0.1		S	ppm	Zinc
						Tested
TCLP		5.0		C	ppm	Antimony
		1.0		C	ppm	Arsenic
		0.1		C	ppm	Barium
		0.1		C	ppm	Beryllium
		0.1		C	ppm	Cadmium
		0.5		C	ppm	Chromium (VI)
		0.1		C	ppm	Chromium Total
		0.5		C	ppm	Cobalt
		0.1		C	ppm	Copper
		1.0		C	ppm	Lead
		0.01		C	ppm	Mercury
		0.5		C	ppm	Molybdenum
		0.5		C	ppm	Nickel
		1.0		C	ppm	Selenium
		0.1		C	ppm	Silver
		5.0		C	ppm	Thallium
		0.5		C	ppm	Vanadium
		0.1		C	ppm	Zinc
						Tested
						Dilution Factor
8260	2.5	0.5	71-43-2	T	ppb	Benzene
8260	2.5	0.5	75-27-4	T	ppb	Bromodichloromethane
8260	2.5	0.5	75-25-2	T	ppb	Bromoform
8260	2.5	1.0	74-83-9	T	ppb	Bromomethane
8260	5.0	0.5	75-15-0	T	ppb	Carbon Disulfide
8260	2.5	0.5	56-23-5	T	ppb	Carbon tetrachloride
8260	2.5	0.5	108-90-7	T	ppb	Chlorobenzene
8260	2.5	0.5	124-48-1	T	ppb	Chlorodibromomethane
8260	2.5	0.5	75-00-3	T	ppb	Chloroethane
8260	5.0	0.5	110-75-8	T	ppb	2-Chloroethyl vinyl ether
8260	2.5	0.5	67-66-3	T	ppb	Chloroform
8260	2.5	0.5	74-87-3	T	ppb	Chloromethane
8260	2.5	0.5	75-34-3	T	ppb	1,1-Dichloroethane
8260	2.5	0.5	107-06-2	T	ppb	1,2-Dichloroethane
8260	2.5	0.5	75-35-4	T	ppb	1,1-Dichloroethene
8260	2.5	0.5	156-60-5	T	ppb	Trans 1,2-Dichloroethene
8260	2.5	0.5	78-87-5	T	ppb	1,2-Dichloropropane
8260	2.5	0.5	10061-01-5	T	ppb	cis-1,3-Dichloropropene
8260	2.5	0.5	10061-02-6	T	ppb	trans-1,3-Dichloropropene
8260	2.5	0.5	100-41-4	T	ppb	Ethylbenzene

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8260	5.0	2.5	75-09-2	T		ppb	Methylene chloride
8260	2.5	0.5	100-42-5	T		ppb	Styrene
8260	2.5	0.5	79-34-5	T		ppb	1,1,2,2-Tetrachloroethane
8260	2.5	0.5	127-18-4	T		ppb	Tetrachloroethene
8260	2.5	0.5	108-88-3	T		ppb	Toluene
8260	2.5	0.5	71-55-6	T		ppb	1,1,1-Trichloroethane
8260	2.5	0.5	79-00-5	T		ppb	1,1,2-Trichloroethane
8260	2.5	0.5	79-01-6	T		ppb	Trichloroethene
8260	5.0	0.5	75-69-4	T		ppb	Trichlorofluoromethane
8260	5.0	1.0	108-05-4	T		ppb	Vinyl acetate
8260	2.5	0.5	75-01-4	T		ppb	Vinyl chloride
8260	2.5	1.0	1330-20-7	T		ppb	Total Xylenes
8260	2.5	0.5	75-71-8	T		ppb	Dichlorodifluoromethane
8260	2.5	0.5	156-59-2	T		ppb	cis-1-2,-Dichloroethene
8260	2.5	0.5	594-20-7	T		ppb	2,2-Dichloropropane
8260	2.5	0.5	74-97-5	T		ppb	Bromochloromethane
8260	2.5	0.5	563-58-6	T		ppb	1,1-Dichloropropene
8260	2.5	0.5	74-95-3	T		ppb	Dibromomethane
8260	2.5	0.5	106-93-4	T		ppb	1,2-Dibromoethane
8260	2.5	0.5	142-28-9	T		ppb	1,3-Dichloropropane
8260	2.5	0.5	98-82-8	T		ppb	Isopropylbenzene
8260	2.5	0.5	79-34-5	T		ppb	1,1,2,2-Tetrachloroethane
8260	2.5	0.5	96-18-4	T		ppb	1,2,3-Trichloropropane
8260	2.5	0.5	108-86-1	T		ppb	Bromobenzene
8260	2.5	0.5	103-65-1	T		ppb	n-Propylbenzene
8260	2.5	0.5	95-49-8	T		ppb	2-Chlorotoluene
8260	2.5	0.5	108-67-8	T		ppb	1,3,5-Trimethylbenzene
8260	2.5	0.5	106-43-4	T		ppb	4-Chlorotoluene
8260	2.5	0.5	98-06-6	T		ppb	tert-Butylbenzene
8260	2.5	0.5	95-63-6	T		ppb	1,2,4-Trimethylbenzene
8260	2.5	0.5	135-98-8	T		ppb	sec-Butylbenzene
8260	2.5	0.5	99-87-6	T		ppb	4-Isopropyltoluene
8260	2.5	0.5	541-73-1	T		ppb	1,3-Dichlorobenzene
8260	2.5	0.5	106-46-7	T		ppb	1,4-Dichlorobenzene
8260	2.5	0.5	104-51-8	T		ppb	n-Butylbenzene
8260	2.5	0.5	95-50-1	T		ppb	1,2-Dichlorobenzene
8260	5.0	1.0	96-12-8	T		ppb	1,2-Dibromo-3-CPA
8260	2.5	0.5	120-82-1	T		ppb	1,2,4-Trichlorobenzene
8260	2.5	0.5	87-68-3	T		ppb	Hexachlorobutadiene
8260	2.5	0.5	91-20-3	T		ppb	Naphthalene
8260	2.5	0.5	87-61-6	T		ppb	1,2,3-Trichlorobenzene
					T	%	Dibromofluoromethane
					T	%	Toluene-d8
					T	%	4-Bromofluorobenzene
							Tested
							Dilution Factor
8270	100	5.0	83-32-9	T		ppb	Acenaphthene
8270	100	5.0	208-96-8	T		ppb	Acenaphthylene
8270	100	5.0	62-53-3	T		ppb	Aniline
8270	100	5.0	120-12-7	T		ppb	Anthracene
8270	500	50	65-85-0	T		ppb	Benzoic Acid

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8270	100	5.0	56-55-3	T	ppb	Benzo (a) anthracene	
8270	250	25	205-99-2	T	ppb	Benzo (b) fluoranthene	
8270	250	25	207-08-9	T	ppb	Benzo (k) fluoranthene	
8270	250	25	191-24-2	T	ppb	Benzo (g,h,i)perylene	
8270	250	25	50-32-8	T	ppb	Benzo (a) pyrene	
8270	100	50	100-51-6	T	ppb	Benzyl alcohol	
8270	100	5.0	111-91-1	T	ppb	Bis(2-chloroethoxy)methane	
8270	100	5.0	111-44-4	T	ppb	Bis(2-chloroethyl)ether	
8270	100	5.0	39638-32-9	T	ppb	Bis(2-chloroisopropyl)ether	
8270	100	3.0	117-81-7	T	ppb	Bis(2-ethylhexyl)phthalate	
8270	100	5.0	101-55-3	T	ppb	4-Bromophenyl phenyl ether	
8270	100	5.0	85-68-7	T	ppb	Butyl benzyl phthalate	
8270	100	5.0	106-47-8	T	ppb	4-Chloroaniline	
8270	100	5.0	91-58-7	T	ppb	2-Chloronaphthalene	
8270	100	5.0	59-50-7	T	ppb	4-Chloro-3-methylphenol	
8270	100	5.0	95-57-8	T	ppb	2-Chlorophenol	
8270	100	5.0	7005-72-3	T	ppb	4-Chlorophenyl phenyl ehter	
8270	100	5.0	218-0109	T	ppb	Chrysene	
8270	100	25	53-70-3	T	ppb	Dibenz(a,h)anthracene	
8270	100	5.0	132-64-9	T	ppb	Dibenzofuran	
8270	250	5.0	84-74-2	T	ppb	Di-N-butyl phthalate	
8270	100	5.0	541-73-1	T	ppb	1,3-Dichlorobenzene	
8270	100	5.0	106-46-7	T	ppb	1,4-Dichlorobenzene	
8270	100	5.0	95-50-1	T	ppb	1,2-Dichlorobenzene	
8270	100	5.0	91-94-1	T	ppb	3,3-Dichlorobenzidine	
8270	100	5.0	120-83-2	T	ppb	2,4-Dichlorophenol	
8270	100	5.0	84-66-2	T	ppb	Diethyl phthalate	
8270	100	5.0	105-67-9	T	ppb	2,4-Dimethylphenol	
8270	100	5.0	131-11-3	T	ppb	Dimethyl phthalate	
8270	100	50	534-52-1	T	ppb	4,6-Dinitro-2-methylphenol	
8270	100	50	51-28-5	T	ppb	2,4-Dinitrophenol	
8270	250	5.0	121-14-2	T	ppb	2,4-Dinitrotoluene	
8270	250	5.0	606-20-2	T	ppb	2,6-Dinitrotoluene	
8270	250	25	117-84-0	T	ppb	Di-N-octyl phthalate	
8270	100	5.0	206-44-0	T	ppb	Fluoranthene	
8270	100	5.0	86-73-7	T	ppb	Fluorene	
8270	100	5.0	118-74-1	T	ppb	Hexachlorobenzene	
8270	100	5.0	87-68-3	T	ppb	Hexachlorobutadiene	
8270	100	5.0	77-47-4	T	ppb	Hexachlorocyclopentadiene	
8270	100	5.0	67-72-1	T	ppb	Hexachloroethane	
8270	250	25	193-39-5	T	ppb	Indeno(1,2,3-cd)pyrene	
8270	100	5.0	78-59-1	T	ppb	Isophorone	
8270	100	5.0	91-57-6	T	ppb	2-Methylnaphthalene	
8270	100	5.0	95-48-7	T	ppb	2-Methylphenol	
8270	100	5.0	106-44-5	T	ppb	4-Methylphenol	
8270	100	5.0	91-20-3	T	ppb	Naphthalene	
8270	250	50	88-74-4	T	ppb	2-Nitroaniline	
8270	250	50	99-09-2	T	ppb	3-Nitroaniline	
8270	250	50	100-01-6	T	ppb	4-Nitroaniline	
8270	100	5.0	98-95-3	T	ppb	Nitrobenzene	
8270	100	5.0	88-75-5	T	ppb	2-Nitrophenol	
8270	100	50	100-02-7	T	ppb	4-Nitrophenol	
8270	100	5.0	86-30-6	T	ppb	N-Nitrosodiphenylamine	

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8270	100	5.0	621-64-7	T		ppb	N-Nitroso-di-N-propylamine
8270	100	5.0	62-75-9	T		ppb	N-Nitrosodimethylamine
8270	250	50	87-86-5	T		ppb	Pentachlorophenol
8270	100	5.0	85-01-8	T		ppb	Phenanthrene
8270	100	5.0	108-95-2	T		ppb	Phenol
8270	100	5.0	129-00-0	T		ppb	Pyrene
8270	100	5.0	120-82-1	T		ppb	1,2,4-Trichlorobenzene
8270	100	5.0	95-95-4	T		ppb	2,4,5-Trichlorophenol
8270	100	5.0	88-06-2	T		ppb	2,4,6-Trichlorophenol
							Tested
							Dilution Factor
8080	20	5.0	12674-11-2	T		ppb	PCB-1016
8080	20	5.0	11104-28-2	T		ppb	PCB-1221
8080	20	5.0	11141-16-5	T		ppb	PCB-1232
8080	20	5.0	53469-21-9	T		ppb	PCB-1242
8080	20	5.0	12672-29-6	T		ppb	PCB-1248
8080	20	5.0	11097-69-1	T		ppb	PCB-1254
8080	20	5.0	11096-82-5	T		ppb	PCB-1260
							Tested
							Dilution Factor
8080	1.0	0.1	309-00-2	T		ppb	Aldrin
8080	1.0	0.2	319-84-6	T		ppb	alpha-BHC
8080	1.0	0.2	319-85-7	T		ppb	beta-BHC
8080	2.0	0.2	319-86-8	T		ppb	gamma-BHC
8080	1.0	0.2	58-89-9	T		ppb	gamma-BHC (Lindane)
8080	10	0.2	57-74-9	T		ppb	Chlordane
8080	2.0	0.5	72-54-9	T		ppb	4,4'-DDD
8080	5.0	0.1	72-55-9	T		ppb	4,4'-DDE
8080	1.0	0.1	50-29-3	T		ppb	4,4'-DDT
8080	2.0	0.5	60-57-1	T		ppb	Dieldrin
8080	1.0	0.5	959-98-8	T		ppb	Endosulfan I
8080	2.0	0.5	33213-65-9	T		ppb	Endosulfan II
8080	10	0.5	1031-07-8	T		ppb	Endosulfan sulfate
8080	2.0	0.02	72-20-8	T		ppb	Endrin
8080	2.0	0.2	7421-93-4	T		ppb	Endrin aldehyde
8080	1.0	0.1	76-44-8	T		ppb	Heptachlor
8080	1.0	0.2	1024-57-3	T		ppb	Heptachlor epoxide
8080	30	9.0	72-43-5	T		ppb	Methoxychlor
8080	35	0.5	8001-35-2	T		ppb	Toxaphene
							Tested
8015m				T		ppm	Up to & Including C-12
8015m				T		ppm	C13-22
8015m				T		ppm	C23 & Higher
8015m	8.0	0.5		T		ppm	Total
							Tested
8015m	8.0	0.5		T		ppm	Diesel
							Tested
8015m	5.0	0.05		T		ppm	Gas

BOE-C6-0152588

MWI 9821

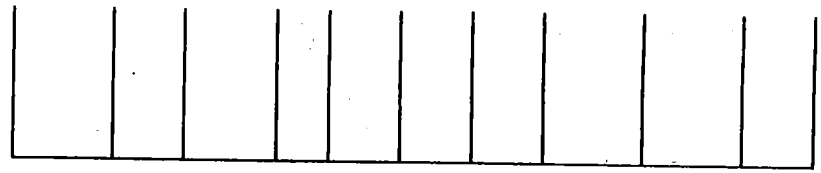
9060	5.0	1.0		T		ppm	***Tested*** TOC											
9081	1.0	1.0		T		ppm	***Tested*** Cation Exchange Capacity											

(a) QC units for Method 8270 are reported in ng

BOE-C6-0152589

		QC(W)							
D RECOVER	RPD	LAB SAMP NO	R1	T CONC	SL[a]	DL[a]	RECOVER	D RECOVER	RPD
		12/19/97							
94	2	97120496	0.00	3.00	2.92	3 22	97	107	10
96	2	97120496	0.00	1.00	1.02	1.10	102	110	8
99	1	97120496	0.000	0 100	0 089	0.100	89	100	12
92	1	97120496	0.00	0 100	0 099	0.11	99	110	11
98	1	97120496	0.00	0.100	0.11	0.12	110	120	9
		12/17/97							
100	0	97120472	0 00	0.50	0.51	0 51	102	102	0
		12/19/97							
89	2	97120496	0.00	0 100	0 096	0 11	96	110	14
82	2	97120496	0.00	0.100	0.097	0.11	97	110	13
96	1	97120496	0.000	0.100	0 098	0.110	98	110	12
81	1	97120496	0.00	1.00	0.92	1.02	92	102	10
		12/17/97							
105	5	OCA 100	0.000	0.020	0.019	0 020	95	100	5
		12/19/97							
97	1	97120496	0.00	1.00	0.97	1.10	97	110	13
84	2	97120496	0.00	0 50	0.49	0.56	98	112	13
82	1	97120496	0.00	1.00	0.98	1.10	98	110	12
94	0	97120496	0.00	0.50	0.49	0.56	98	112	13
81	1	97120496	0 00	3 00	2.97	3.26	99	109	9
88	1	97120496	0.00	0.50	0.46	0.52	92	104	12
82	1	97120496	0.000	0.100	0.099	0.110	99	110	11

BOE-C6-0152590



BOE-C6-0152595

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532
Tustin, CA 92680
(714) 832-0064, Fax (714) 832-0067

Analysis Request and Chain of Custody Record

Lab Job No: _____
Page 1 of 1

REQUIRED TAT: SEE REMARKS

CUSTOMER INFORMATION

COMPANY: Montgomery Watson
SEND REPORT TO: Fred Strauss
ADDRESS: 250 N Madison Ave
Pasadena, CA 91101
PHONE: (626) 568-6582 FAX: (626) 796-5941

PROJECT NAME: The Boeing Company
NUMBER: 12060035.01090010
LOCATION: C-6 (facility).
ADDRESS: 19503 S. Normandie Ave
Los Angeles, CA 90501
SAMPLED BY: IV/ AN/ CW.

SAMPLE ID		DATE	TIME	MATRIX	CONTAINER	PRESERVATIVE	TRPH 418.1	Title 22 Metals	VOCs 8260	SVOCs 8270	PCBs 8080	Pesticides 8080	REMARKS/PRECAUTIONS
B45T-GS-5-4'	1	12/16/97	1300	SOIL	2"x6" acetate	ICE	X						Results due by Mon. 12/22/97 @ 0900 hrs
OA2-GS-2-3'	1	12/16/97	1315	SOIL	↓		X						↓
OA2-GS-3-8'	1	12/16/97	1425	SOIL			X						
EQUIPMENT BLANK	1	12/16/97	1450	WATER	1 poly	HNO_3	X						Standard TAT
RINSATE BLANK	1	12/16/97	1500	WATER	1 poly	HNO_3	X						↓
~~TRIP BLANK~~	~~2~~	~~12/16/97~~		~~WATER~~	~~2 VOAs~~	~~HCl~~			X				AWN 12/16/97

Total No. of Samples: 65 AWN 12/16/97

Method of Shipment:

Relinquished By:	Date/Time:	Received By:	Date/Time:
Christopher Wong	12/16/97 15:20		

Reporting Format: (check)
NORMAL _____ S.D. HMMD _____
RWQCB _____ OTHER _____

Sample Integrity: (check)
Intact _____ on ice _____

All samples remain the property of the client who is responsible for [illegible]al. A disposal fee may be imposed if client fails to pickup samples.

BOE-C6-0152596

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: Boeing (Formerly MDRC)
Client Project #: 1206035.01090010

Analysis Method: EPA 5030/8015m

Sample Description: Water,

Laboratory Reference #: MWI 9487

Sampled: 08/21/97
Recevied: 08/21/97
Analyzed: 08/29/97
Reported: 08/29/97

VOLATILE FUEL HYDROCARBONS (EPA 8015M)

Laboratory Sample Number	*Client Sample Number*	*Volatile Fuel Hydrocarbons (ug/l) (ppb)*
97080363	Equip Blank	N.D.
97080364	Rinsate Blank	N.D.

Detection Limit:	50

Volatile Fuel Hydrocarbons are quantitated against a gasoline standard.
Hydrocarbons detected by this method range from C6 to C14.
Analytes reported as N.D. were not present above the stated limit of detection.

ORANGE COAST ANALYTICAL

Mark Noorani
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: Boeing (Formerly MDRC)
Client Project #: 1206035.01090010

Sample Description: Water, Equip Blank

Sampled: 08/21/97
Received: 08/21/97
Analyzed: 08/26/97
Reported: 08/29/97

Laboratory Sample Number: 97080363
Laboratory Reference #: MWI 9487

CCR - METALS

Analyte	*EPA Method*	*Detection Limit mg/l*	*Analysis Result mg/l*
Antimony	6010	0.5	N.D.
Arsenic	6010	0.1	N.D.
Barium	6010	0.01	N.D.
Beryllium	6010	0.01	N.D.
Cadmium	6010	0.01	N.D.
Chromium (VI)	7196	0.01	N.D.
Chromium Total	6010	0.01	N.D.
Cobalt	6010	0.05	N.D.
Copper	6010	0.01	N.D.
Lead	6010	0.1	N.D.
Mercury	7471	0.002	N.D.
Molybdenum	6010	0.1	N.D.
Nickel	6010	0.05	N.D.
Selenium	6010	0.1	N.D.
Silver	6010	0.05	N.D.
Thallium	6010	0.5	N.D.
Vanadium	6010	0.1	N.D.
Zinc	6010	0.01	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

ORANGE COAST ANALYTICAL

Mark Noorani
Laboratory Director

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3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: Boeing (Formerly MDRC)
Client Project #: 1206035.01090010

Sample Description: Water, Rinsate Blank

Sampled: 08/21/97
Received: 08/21/97
Analyzed: 08/26/97
Reported: 08/29/97

Laboratory Sample Number: 97080364
Laboratory Reference #: MWI 9487

CCR - METALS

Analyte	*EPA Method*	*Detection Limit mg/l*	*Analysis Result mg/l*
Antimony	6010	0.5	N.D.
Arsenic	6010	0.1	N.D.
Barium	6010	0.01	N.D.
Beryllium	6010	0.01	N.D.
Cadmium	6010	0.01	N.D.
Chromium (VI)	7196	0.01	N.D.
Chromium Total	6010	0.01	N.D.
Cobalt	6010	0.05	N.D.
Copper	6010	0.01	N.D.
Lead	6010	0.1	N.D.
Mercury	7471	0.002	N.D.
Molybdenum	6010	0.1	N.D.
Nickel	6010	0.05	N.D.
Selenium	6010	0.1	N.D.
Silver	6010	0.05	N.D.
Thallium	6010	0.5	N.D.
Vanadium	6010	0.1	N.D.
Zinc	6010	0.01	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

ORANGE COAST ANALYTICAL

Mark Noorani
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: ***Boeing (Formerly MDRC)***
Client Project #: 1206035.01090010

Sampled: 08/21/97
Received: 08/21/97
Analyzed: 08/26/97
Reported: 08/29/97

Sample Description: Water, Equip Blank
Laboratory Sample Number: 97080363
Laboratory Reference #: MWI 9487

VOLATILE ORGANICS BY GC/MS (EPA 8260)

ANALYTE	*CAS NUMBER*	*DETECTION Limit (ug/l)*	*SAMPLE RESULTS (ug/l)*
Benzene	71-43-2	0.5	N.D.
Bromodichloromethane	75-27-4	0.5	N.D.
Bromoform	75-25-2	0.5	N.D.
Bromomethane	74-83-9	1.0	N.D.
Carbon Disulfide	75-15-0	0.5	N.D.
Carbon tetrachloride	56-23-5	0.5	N.D.
Chlorobenzene	108-90-7	0.5	N.D.
Chlorodibromomethane	124-48-1	0.5	N.D.
Chloroethane	75-00-3	0.5	N.D.
2-Chloroethyl vinyl ether	110-75-8	0.5	N.D.
Chloroform	67-66-3	0.5	N.D.
Chloromethane	74-87-3	0.5	N.D.
1,1-Dichloroethane	75-34-3	0.5	N.D.
1,2-Dichloroethane	107-06-2	0.5	N.D.
1,1-Dichloroethene	75-35-4	0.5	N.D.
Trans 1,2-Dichloroethene	156-60-5	0.5	N.D.
1,2-Dichloropropane	78-87-5	0.5	N.D.
cis-1,3-Dichloropropene	10061-01-5	0.5	N.D.
trans-1,3-Dichloropropene	10061-02-6	0.5	N.D.
Ethylbenzene	100-41-4	0.5	N.D.
Methylene chloride	75-09-2	2.5	N.D.
Styrene	100-42-5	0.5	N.D.
1,1,2,2-Tetrachloroethane	79-34-5	0.5	N.D.
Tetrachloroethene	127-18-4	0.5	N.D.
Toluene	108-88-3	0.5	N.D.
1,1,1-Trichloroethane	71-55-6	0.5	N.D.
1,1,2-Trichloroethane	79-00-5	0.5	N.D.
Trichloroethene	79-01-6	0.5	N.D.
Trichlorofluoromethane	75-69-4	0.5	N.D.
Vinyl acetate	108-05-4	1.0	N.D.
Vinyl chloride	75-01-4	0.5	N.D.
Total Xylenes	1330-20-7	1.0	N.D.
Dichlorodifluoromethane	75-71-8	0.5	N.D.
cis-1-2,-Dichloroethene	156-59-2	0.5	N.D.
2,2-Dichloropropane	594-20-7	0.5	N.D.
Bromochloromethane	74-97-5	0.5	N.D.
1,1-Dichloropropene	563-58-6	0.5	N.D.
Dibromomethane	74-95-3	0.5	N.D.
1,2-Dibromoethane	106-93-4	0.5	N.D.

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

VOLATILE ORGANICS BY GC/MS (EPA 8260) (continued)

Sample Description: Water, Equip Blank
Laboratory Sample #: 97080363

ANALYTE	CAS NUMBER	DETECTION Limit (ug/l)	SAMPLE RESULTS (ug/l)
1,3-Dichloropropane	142-28-9	0.5	N.D.
Isopropylbenzene	98-82-8	0.5	N.D.
1.1.2.2-Tetrachloroethane	79-34-5	0.5	N.D.
1,2,3-Trichloropropane	96-18-4	0.5	N.D.
Bromobenzene	108-86-1	0.5	N.D.
n-Propylbenzene	103-65-1	0.5	N.D.
2-Chlorotoluene	95-49-8	0.5	N.D.
1,3,5-Trimethylbenzene	108-67-8	0.5	N.D.
4-Chlorotoluene	106-43-4	0.5	N.D.
tert-Butylbenzene	98-06-6	0.5	N.D.
1,2,4-Trimethylbenzene	95-63-6	0.5	N.D.
sec-Butylbenzene	135-98-8	0.5	N.D.
4-Isopropyltoluene	99-87-6	0.5	N.D.
1,3-Dichlorobenzene	541-73-1	0.5	N.D.
1,4-Dichlorobenzene	106-46-7	0.5	N.D.
n-Butylbenzene	104-51-8	0.5	N.D.
1,2-Dichlorobenzene	95-50-1	0.5	N.D.
1-2-Dibromo-3-CPA	96-12-8	1.0	N.D.
1,2,4-Trichlorobenzene	120-82-1	0.5	N.D.
Hexachlorobutadiene	87-68-3	0.5	N.D.
Naphthalene	91-20-3	0.5	N.D.
1,2,3-Trichlorobenzene	87-61-6	0.5	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

Orange Coast Analytical

Mark Noorani
Laboratory Director

Surrogate Recoveries	%
Dibromofluoromethane	95
Toluene-d8	100
4-Bromofluorobenzene	94

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: ***Boeing (Formerly MDRC)***
Client Project #: 1206035.01090010

Sample Description: Water, Rinsate Blank
Laboratory Sample Number: 97080364
Laboratory Reference #: MWI 9487

Sampled: 08/21/97
Received: 08/21/97
Analyzed: 08/26/97
Reported: 08/29/97

VOLATILE ORGANICS BY GC/MS (EPA 8260)

ANALYTE	***CAS NUMBER***	***DETECTION Limit (ug/l)***	***SAMPLE RESULTS (ug/l)***
Benzene	71-43-2	0.5	N.D.
Bromodichloromethane	75-27-4	0.5	N.D.
Bromoform	75-25-2	0.5	N.D.
Bromomethane	74-83-9	1.0	N.D.
Carbon Disulfide	75-15-0	0.5	N.D.
Carbon tetrachloride	56-23-5	0.5	N.D.
Chlorobenzene	108-90-7	0.5	N.D.
Chlorodibromomethane	124-48-1	0.5	N.D.
Chloroethane	75-00-3	0.5	N.D.
2-Chloroethyl vinyl ether	110-75-8	0.5	N.D.
Chloroform	67-66-3	0.5	N.D.
Chloromethane	74-87-3	0.5	N.D.
1,1-Dichloroethane	75-34-3	0.5	N.D.
1,2-Dichloroethane	107-06-2	0.5	N.D.
1,1-Dichloroethene	75-35-4	0.5	N.D.
Trans 1,2-Dichloroethene	156-60-5	0.5	N.D.
1,2-Dichloropropane	78-87-5	0.5	N.D.
cis-1,3-Dichloropropene	10061-01-5	0.5	N.D.
trans-1,3-Dichloropropene	10061-02-6	0.5	N.D.
Ethylbenzene	100-41-4	0.5	N.D.
Methylene chloride	75-09-2	2.5	N.D.
Styrene	100-42-5	0.5	N.D.
1,1,2,2-Tetrachloroethane	79-34-5	0.5	N.D.
Tetrachloroethene	127-18-4	0.5	N.D.
Toluene	108-88-3	0.5	N.D.
1,1,1-Trichloroethane	71-55-6	0.5	N.D.
1,1,2-Trichloroethane	79-00-5	0.5	N.D.
Trichloroethene	79-01-6	0.5	N.D.
Trichlorofluoromethane	75-69-4	0.5	N.D.
Vinyl acetate	108-05-4	1.0	N.D.
Vinyl chloride	75-01-4	0.5	N.D.
Total Xylenes	1330-20-7	1.0	N.D.
Dichlorodifluoromethane	75-71-8	0.5	N.D.
cis-1-2,-Dichloroethene	156-59-2	0.5	N.D.
2,2-Dichloropropane	594-20-7	0.5	N.D.
Bromochloromethane	74-97-5	0.5	N.D.
1,1-Dichloropropene	563-58-6	0.5	N.D.
Dibromomethane	74-95-3	0.5	N.D.
1,2-Dibromoethane	106-93-4	0.5	N.D.

ORANGE COAST ANALYTICAL, INC.
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VOLATILE ORGANICS BY GC/MS (EPA 8260) (continued)

Sample Description: Water, Rinsate Blank
Laboratory Sample #: 97080364

ANALYTE	*CAS NUMBER*	*DETECTION Limit (ug/l)*	*SAMPLE RESULTS (ug/l)*
1,3-Dichloropropane	142-28-9	0.5	N.D.
Isopropylbenzene	98-82-8	0.5	N.D.
1.1.2.2-Tetrachloroethane	79-34-5	0.5	N.D.
1,2,3-Trichloropropane	96-18-4	0.5	N.D.
Bromobenzene	108-86-1	0.5	N.D.
n-Propylbenzene	103-65-1	0.5	N.D.
2-Chlorotoluene	95-49-8	0.5	N.D.
1,3,5-Trimethylbenzene	108-67-8	0.5	N.D.
4-Chlorotoluene	106-43-4	0.5	N.D.
tert-Butylbenzene	98-06-6	0.5	N.D.
1,2,4-Trimethylbenzene	95-63-6	0.5	N.D.
sec-Butylbenzene	135-98-8	0.5	N.D.
4-Isopropyltoluene	99-87-6	0.5	N.D.
1,3-Dichlorobenzene	541-73-1	0.5	N.D.
1,4-Dichlorobenzene	106-46-7	0.5	N.D.
n-Butylbenzene	104-51-8	0.5	N.D.
1,2-Dichlorobenzene	95-50-1	0.5	N.D.
1-2-Dibromo-3-CPA	96-12-8	1.0	N.D.
1,2,4-Trichlorobenzene	120-82-1	0.5	N.D.
Hexachlorobutadiene	87-68-3	0.5	N.D.
Naphthalene	91-20-3	0.5	N.D.
1,2,3-Trichlorobenzene	87-61-6	0.5	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

Orange Coast Analytical

Mark Noorani
Laboratory Director

Surrogate Recoveries	%
Dibromofluoromethane	93
Toluene-d8	101
4-Bromofluorobenzene	92

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Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: ***Boeing (Formerly MDRC)***
Client Project #: 1206035.01090010

Sampled: 08/21/97
Received: 08/21/97
Analyzed: 08/26/97
Reported: 08/29/97

Sample Description: Water, Trip Blank
Laboratory Sample Number: 97080365
Laboratory Reference #: MWI 9487

VOLATILE ORGANICS BY GC/MS (EPA 8260)

ANALYTE	*CAS NUMBER*	*DETECTION Limit (ug/l)*	*SAMPLE RESULTS (ug/l)*
Benzene	71-43-2	0.5	N.D.
Bromodichloromethane	75-27-4	0.5	N.D.
Bromoform	75-25-2	0.5	N.D.
Bromomethane	74-83-9	1.0	N.D.
Carbon Disulfide	75-15-0	0.5	N.D.
Carbon tetrachloride	56-23-5	0.5	N.D.
Chlorobenzene	108-90-7	0.5	N.D.
Chlorodibromomethane	124-48-1	0.5	N.D.
Chloroethane	75-00-3	0.5	N.D.
2-Chloroethyl vinyl ether	110-75-8	0.5	N.D.
Chloroform	67-66-3	0.5	N.D.
Chloromethane	74-87-3	0.5	N.D.
1,1-Dichloroethane	75-34-3	0.5	N.D.
1,2-Dichloroethane	107-06-2	0.5	N.D.
1,1-Dichloroethene	75-35-4	0.5	N.D.
Trans 1,2-Dichloroethene	156-60-5	0.5	N.D.
1,2-Dichloropropane	78-87-5	0.5	N.D.
cis-1,3-Dichloropropene	10061-01-5	0.5	N.D.
trans-1,3-Dichloropropene	10061-02-6	0.5	N.D.
Ethylbenzene	100-41-4	0.5	N.D.
Methylene chloride	75-09-2	2.5	N.D.
Styrene	100-42-5	0.5	N.D.
1,1,2,2-Tetrachloroethane	79-34-5	0.5	N.D.
Tetrachloroethene	127-18-4	0.5	N.D.
Toluene	108-88-3	0.5	N.D.
1,1,1-Trichloroethane	71-55-6	0.5	N.D.
1,1,2-Trichloroethane	79-00-5	0.5	N.D.
Trichloroethene	79-01-6	0.5	N.D.
Trichlorofluoromethane	75-69-4	0.5	N.D.
Vinyl acetate	108-05-4	1.0	N.D.
Vinyl chloride	75-01-4	0.5	N.D.
Total Xylenes	1330-20-7	1.0	N.D.
Dichlorodifluoromethane	75-71-8	0.5	N.D.
cis-1-2,-Dichloroethene	156-59-2	0.5	N.D.
2,2-Dichloropropane	594-20-7	0.5	N.D.
Bromochloromethane	74-97-5	0.5	N.D.
1,1-Dichloropropene	563-58-6	0.5	N.D.
Dibromomethane	74-95-3	0.5	N.D.
1,2-Dibromoethane	106-93-4	0.5	N.D.

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VOLATILE ORGANICS BY GC/MS (EPA 8260) (continued)

Sample Description: Water, Trip Blank
Laboratory Sample #: 97080365

ANALYTE	CAS NUMBER	DETECTION Limit (ug/l)	SAMPLE RESULTS (ug/l)
1,3-Dichloropropane	142-28-9	0.5	N.D.
Isopropylbenzene	98-82-8	0.5	N.D.
1.1.2.2-Tetrachloroethane	79-34-5	0.5	N.D.
1,2,3-Trichloropropane	96-18-4	0.5	N.D.
Bromobenzene	108-86-1	0.5	N.D.
n-Propylbenzene	103-65-1	0.5	N.D.
2-Chlorotoluene	95-49-8	0.5	N.D.
1,3,5-Trimethylbenzene	108-67-8	0.5	N.D.
4-Chlorotoluene	106-43-4	0.5	N.D.
tert-Butylbenzene	98-06-6	0.5	N.D.
1,2,4-Trimethylbenzene	95-63-6	0.5	N.D.
sec-Butylbenzene	135-98-8	0.5	N.D.
4-Isopropyltoluene	99-87-6	0.5	N.D.
1,3-Dichlorobenzene	541-73-1	0.5	N.D.
1,4-Dichlorobenzene	106-46-7	0.5	N.D.
n-Butylbenzene	104-51-8	0.5	N.D.
1,2-Dichlorobenzene	95-50-1	0.5	N.D.
1-2-Dibromo-3-CPA	96-12-8	1.0	N.D.
1,2,4-Trichlorobenzene	120-82-1	0.5	N.D.
Hexachlorobutadiene	87-68-3	0.5	N.D.
Naphthalene	91-20-3	0.5	N.D.
1,2,3-Trichlorobenzene	87-61-6	0.5	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

Orange Coast Analytical

Mark Noorani
Laboratory Director

Surrogate Recoveries	%
Dibromofluoromethane	94
Toluene-d8	101
4-Bromofluorobenzene	92

ORANGE COAST ANALYTICAL, INC.
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4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: Boeing (Formerly MDRC)
Client Project #: 1206035.01090010

Sample Description: Water, Equip Blank
Laboratory Sample Number: 97080363
Laboratory Reference #: MWI 9487

Sampled: 08/21/97
Received: 08/21/97
Analyzed: 08/29/97
Reported: 08/29/97

SEMI VOLATILE ORGANICS BY GC/MS (EPA 8270)

ANALYTE	*CAS NUMBER*	*DETECTION Limit (ug/l)*	*SAMPLE RESULTS (ug/l)*
Acenaphthene	83-32-9	5.0	N.D.
Acenaphthylene	208-96-8	5.0	N.D.
Aniline	62-53-3	5.0	N.D.
Anthracene	120-12-7	5.0	N.D.
Benzoic Acid	65-85-0	50	N.D.
Benzo (a) anthracene	56-55-3	5.0	N.D.
Benzo (b) fluoranthene	205-99-2	25	N.D.
Benzo (k) fluoranthene	207-08-9	25	N.D.
Benzo (g,h,i)perylene	191-24-2	25	N.D.
Benzo (a) pyrene	50-32-8	25	N.D.
Benzyl alcohol	100-51-6	50	N.D.
Bis(2-chloroethoxy)methane	111-91-1	5.0	N.D.
Bis(2-chloroethyl)ether	111-44-4	5.0	N.D.
Bis(2-chloroisopropyl)ether	39638-32-9	5.0	N.D.
Bis(2-ethylhexyl)phthalate	117-81-7	3.0	N.D.
4-Bromophenyl phenyl ether	101-55-3	5.0	N.D.
Butyl benzyl phthalate	85-68-7	5.0	N.D.
4-Chloroaniline	106-47-8	5.0	N.D.
2-Chloronaphthalene	91-58-7	5.0	N.D.
4-Chloro-3-methylphenol	59-50-7	5.0	N.D.
2-Chlorophenol	95-57-8	5.0	N.D.
4-Chlorophenyl phenyl ehter	7005-72-3	5.0	N.D.
Chrysene	218-0109	5.0	N.D.
Dibenz(a,h)anthracene	53-70-3	25	N.D.
Dibenzofuran	132-64-9	5.0	N.D.
Di-N-butyl phthalate	84-74-2	5.0	N.D.
1,3-Dichlorobenzene	541-73-1	5.0	N.D.
1,4-Dichlorobenzene	106-46-7	5.0	N.D.
1,2-Dichlorobenzene	95-50-1	5.0	N.D.
3,3-Dichlorobenzidine	91-94-1	5.0	N.D.
2,4-Dichlorophenol	120-83-2	5.0	N.D.
Diethyl phthalate	84-66-2	5.0	N.D.
2,4-Dimethylphenol	105-67-9	5.0	N.D.
Dimethyl phthalate	131-11-3	5.0	N.D.
4,6-Dinitro-2-methylphenol	534-52-1	50	N.D.
2,4-Dinitrophenol	51-28-5	50	N.D.

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SEMI-VOLATILE ORGANICS BY GC/MS (EPA 8270) (continued)

Sample Description: Water, Equip Blank
Laboratory Sample #: 97080363

ANALYTE	CAS NUMBER	DETECTION Limit (ug/l)	SAMPLE RESULTS (ug/l)
2,4-Dinitrotoluene	121-14-2	5.0	N.D.
2,6-Dinitrotoluene	606-20-2	5.0	N.D.
Di-N-octyl phthalate	117-84-0	25	N.D.
Fluoranthene	206-44-0	5.0	N.D.
Fluorene	86-73-7	5.0	N.D.
Hexachlorobenzene	118-74-1	5.0	N.D.
Hexachlorobutadiene	87-68-3	5.0	N.D.
Hexachlorocyclopentadiene	77-47-4	5.0	N.D.
Hexachloroethane	67-72-1	5.0	N.D.
Indeno(1,2,3-cd)pyrene	193-39-5	25	N.D.
Isophorone	78-59-1	5.0	N.D.
2-Methylnaphthalene	91-57-6	5.0	N.D.
2-Methylphenol	95-48-7	5.0	N.D.
4-Methylphenol	106-44-5	5.0	N.D.
Naphthalene	91-20-3	5.0	N.D.
2-Nitroaniline	88-74-4	50	N.D.
3-Nitroaniline	99-09-2	50	N.D.
4-Nitroaniline	100-01-6	50	N.D.
Nitrobenzene	98-95-3	5.0	N.D.
2-Nitrophenol	88-75-5	5.0	N.D.
4-Nitrophenol	100-02-7	50	N.D.
N-Nitrosodiphenylamine	86-30-6	5.0	N.D.
N-Nitroso-di-N-propylamine	621-64-7	5.0	N.D.
N-Nitrosodimethylamine	62-75-9	5.0	N.D.
Pentachlorophenol	87-86-5	50	N.D.
Phenanthrene	85-01-8	5.0	N.D.
Phenol	108-95-2	5.0	N.D.
Pyrene	129-00-0	5.0	N.D.
1,2,4-Trichlorobenzene	120-82-1	5.0	N.D.
2,4,5-Trichlorophenol	95-95-4	5.0	N.D.
2,4,6-Trichlorophenol	88-06-2	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

Orange Coast Analytical

Mark Noorani
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: Boeing (Formerly MDRC)
Client Project #: 1206035.01090010

Sample Description: Water, Rinsate Blank
Laboratory Sample Number: 97080364
Laboratory Reference #: MWI 9487

Sampled: 08/21/97
Received: 08/21/97
Analyzed: 08/29/97
Reported: 08/29/97

SEMI VOLATILE ORGANICS BY GC/MS (EPA 8270)

ANALYTE	*CAS NUMBER*	*DETECTION Limit (ug/l)*	*SAMPLE RESULTS (ug/l)*
Acenaphthene	83-32-9	5.0	N.D.
Acenaphthylene	208-96-8	5.0	N.D.
Aniline	62-53-3	5.0	N.D.
Anthracene	120-12-7	5.0	N.D.
Benzoic Acid	65-85-0	50	N.D.
Benzo (a) anthracene	56-55-3	5.0	N.D.
Benzo (b) fluoranthene	205-99-2	25	N.D.
Benzo (k) fluoranthene	207-08-9	25	N.D.
Benzo (g,h,i)perylene	191-24-2	25	N.D.
Benzo (a) pyrene	50-32-8	25	N.D.
Benzyl alcohol	100-51-6	50	N.D.
Bis(2-chloroethoxy)methane	111-91-1	5.0	N.D.
Bis(2-chloroethyl)ether	111-44-4	5.0	N.D.
Bis(2-chloroisopropyl)ether	39638-32-9	5.0	N.D.
Bis(2-ethylhexyl)phthalate	117-81-7	3.0	N.D.
4-Bromophenyl phenyl ether	101-55-3	5.0	N.D.
Butyl benzyl phthalate	85-68-7	5.0	N.D.
4-Chloroaniline	106-47-8	5.0	N.D.
2-Chloronaphthalene	91-58-7	5.0	N.D.
4-Chloro-3-methylphenol	59-50-7	5.0	N.D.
2-Chlorophenol	95-57-8	5.0	N.D.
4-Chlorophenyl phenyl ehter	7005-72-3	5.0	N.D.
Chrysene	218-0109	5.0	N.D.
Dibenz(a,h)anthracene	53-70-3	25	N.D.
Dibenzofuran	132-64-9	5.0	N.D.
Di-N-butyl phthalate	84-74-2	5.0	N.D.
1,3-Dichlorobenzene	541-73-1	5.0	N.D.
1,4-Dichlorobenzene	106-46-7	5.0	N.D.
1,2-Dichlorobenzene	95-50-1	5.0	N.D.
3,3-Dichlorobenzidine	91-94-1	5.0	N.D.
2,4-Dichlorophenol	120-83-2	5.0	N.D.
Diethyl phthalate	84-66-2	5.0	N.D.
2,4-Dimethylphenol	105-67-9	5.0	N.D.
Dimethyl phthalate	131-11-3	5.0	N.D.
4,6-Dinitro-2-methylphenol	534-52-1	50	N.D.
2,4-Dinitrophenol	51-28-5	50	N.D.

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4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

SEMI-VOLATILE ORGANICS BY GC/MS (EPA 8270) (continued)

Sample Description: Water, Rinsate Blank
Laboratory Sample #: 97080364

ANALYTE	CAS NUMBER	DETECTION Limit (ug/l)	SAMPLE RESULTS (ug/l)
2,4-Dinitrotoluene	121-14-2	5.0	N.D.
2,6-Dinitrotoluene	606-20-2	5.0	N.D.
Di-N-octyl phthalate	117-84-0	25	N.D.
Fluoranthene	206-44-0	5.0	N.D.
Fluorene	86-73-7	5.0	N.D.
Hexachlorobenzene	118-74-1	5.0	N.D.
Hexachlorobutadiene	87-68-3	5.0	N.D.
Hexachlorocyclopentadiene	77-47-4	5.0	N.D.
Hexachloroethane	67-72-1	5.0	N.D.
Indeno(1,2,3-cd)pyrene	193-39-5	25	N.D.
Isophorone	78-59-1	5.0	N.D.
2-Methylnaphthalene	91-57-6	5.0	N.D.
2-Methylphenol	95-48-7	5.0	N.D.
4-Methylphenol	106-44-5	5.0	N.D.
Naphthalene	91-20-3	5.0	N.D.
2-Nitroaniline	88-74-4	50	N.D.
3-Nitroaniline	99-09-2	50	N.D.
4-Nitroaniline	100-01-6	50	N.D.
Nitrobenzene	98-95-3	5.0	N.D.
2-Nitrophenol	88-75-5	5.0	N.D.
4-Nitrophenol	100-02-7	50	N.D.
N-Nitrosodiphenylamine	86-30-6	5.0	N.D.
N-Nitroso-di-N-propylamine	621-64-7	5.0	N.D.
N-Nitrosodimethylamine	62-75-9	5.0	N.D.
Pentachlorophenol	87-86-5	50	N.D.
Phenanthrene	85-01-8	5.0	N.D.
Phenol	108-95-2	5.0	N.D.
Pyrene	129-00-0	5.0	N.D.
1,2,4-Trichlorobenzene	120-82-1	5.0	N.D.
2,4,5-Trichlorophenol	95-95-4	5.0	N.D.
2,4,6-Trichlorophenol	88-06-2	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

Orange Coast Analytical

Mark Noorani
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: Boeing (Formerly MDRC)
Client Project #: 1206035.01090010

Sample Description: Water, Equip Blank

Sampled: 08/21/97
Recevied: 08/21/97
Analyzed: 08/29/97
Reported: 08/29/97

Laboratory Sample Number: 97080363
Laboratory Reference #: MWI 9487

ORGANOCHLORINE PESTICIDES (EPA 8080)

Analyte	*CAS NUMBER*	*DETECTION LIMITS (ug/l)*	*SAMPLE RESULTS (ug/l)*
Aldrin	309-00-2	0.1	N.D.
alpha-BHC	319-84-6	0.2	N.D.
beta-BHC	319-85-7	0.2	N.D.
gamma-BHC	319-86-8	0.2	N.D.
gamma-BHC (Lindane)	58-89-9	0.2	N.D.
Chlordane	57-74-9	0.2	N.D.
4,4'-DDD	72-54-9	0.5	N.D.
4,4'-DDE	72-55-9	0.1	N.D.
4,4'-DDT	50-29-3	0.1	N.D.
Dieldrin	60-57-1	0.5	N.D.
Endosulfan I	959-98-8	0.5	N.D.
Endosulfan II	33213-65-9	0.5	N.D.
Endosulfan sulfate	1031-07-8	0.5	N.D.
Endrin	72-20-8	0.02	N.D.
Endrin aldehyde	7421-93-4	0.2	N.D.
Heptachlor	76-44-8	0.1	N.D.
Heptachlor epoxide	1024-57-3	0.2	N.D.
Methoxychlor	72-43-5	9.0	N.D.
Toxaphene	8001-35-2	0.5	

Analytes reported as N.D. were not present above the stated limit of detection.

ORANGE COAST ANALYTICAL

Mark Noorani
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: Boeing (Formerly MDRC)
Client Project #: 1206035.01090010

Sample Description: Water, Rinsate Blank

Sampled: 08/21/97
Recevied: 08/21/97
Analyzed: 08/29/97
Reported: 08/29/97

Laboratory Sample Number: 97080364
Laboratory Reference #: MWI 9487

ORGANOCHLORINE PESTICIDES (EPA 8080)

Analyte	*CAS NUMBER*	*DETECTION LIMITS (ug/l)*	*SAMPLE RESULTS (ug/l)*
Aldrin	309-00-2	0.1	N.D.
alpha-BHC	319-84-6	0.2	N.D.
beta-BHC	319-85-7	0.2	N.D.
gamma-BHC	319-86-8	0.2	N.D.
gamma-BHC (Lindane)	58-89-9	0.2	N.D.
Chlordane	57-74-9	0.2	N.D.
4,4'-DDD	72-54-9	0.5	N.D.
4,4'-DDE	72-55-9	0.1	N.D.
4,4'-DDT	50-29-3	0.1	N.D.
Dieldrin	60-57-1	0.5	N.D.
Endosulfan I	959-98-8	0.5	N.D.
Endosulfan II	33213-65-9	0.5	N.D.
Endosulfan sulfate	1031-07-8	0.5	N.D.
Endrin	72-20-8	0.02	N.D.
Endrin aldehyde	7421-93-4	0.2	N.D.
Heptachlor	76-44-8	0.1	N.D.
Heptachlor epoxide	1024-57-3	0.2	N.D.
Methoxychlor	72-43-5	9.0	N.D.
Toxaphene	8001-35-2	0.5	

Analytes reported as N.D. were not present above the stated limit of detection.

ORANGE COAST ANALYTICAL

Mark Noorani
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: Boeing (Formerly MDRC)
Client Project #: 1206035.01090010

Sample Description: Water, Equip Blank

Sampled: 08/21/97
Recevied: 08/21/97
Analyzed: 08/29/97
Reported: 8-2-9-97

Laboratory Sample Number: 97080363
Laboratory Reference #: MWI 9487

PCB'S (EPA 8080)

Analyte	*CAS NUMBER*	*DETECTION LIMITS (ug/l)*	*SAMPLE RESULTS (ug/l)*
PCB-1016	12674-11-2	5.0	N.D.
PCB-1221	11104-28-2	5.0	N.D.
PCB-1232	11141-16-5	5.0	N.D.
PCB-1242	53469-21-9	5.0	N.D.
PCB-1248	12672-29-6	5.0	N.D.
PCB-1254	11097-69-1	5.0	N.D.
PCB-1260	11096-82-5	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

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Mark Noorani
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

Montgomery Watson
ATTN: Mr. Fred Strauss
250 N. Madison Ave.
Pasadena, CA 91101

Client Project ID: Boeing (Formerly MDRC)
Client Project #: 1206035.01090010

Sample Description: Water, Rinsate Blank

Sampled: 08/21/97
Recevied: 08/21/97
Analyzed: 08/29/97
Reported: 08/29/97

Laboratory Sample Number: 97080364
Laboratory Reference #: MWI 9487

PCB'S (EPA 8080)

Analyte	*CAS NUMBER*	*DETECTION LIMITS (ug/l)*	*SAMPLE RESULTS (ug/l)*
PCB-1016	12674-11-2	5.0	N.D.
PCB-1221	11104-28-2	5.0	N.D.
PCB-1232	11141-16-5	5.0	N.D.
PCB-1242	53469-21-9	5.0	N.D.
PCB-1248	12672-29-6	5.0	N.D.
PCB-1254	11097-69-1	5.0	N.D.
PCB-1260	11096-82-5	5.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

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Mark Noorani
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Semi-Volatile Organics by GC/MS (EPA 8270)

Date of Analysis : 08/29/97
Laboratory Sample No : 97080361
Laboratory Reference No : MWI 9487

Analyte	R1 (ng)	SP (ng)	MS (ng)	MSD (ng)	PR1 %	PR2 %	RPD %
1,4-Dichlorobenzene	0.0	50	28	33	56	66	16
n-Nitroso-di-n-Propylamine	0.0	50	35	36	70	72	3
1,2,4-Trichlorobenzene	0.0	50	31	36	62	72	15
Acenaphthene	0.0	50	33	37	66	74	11
Pyrene	0.0	50	35	40	70	80	13
Pentachlorophenol	0.0	100	54	50	54	50	8
4-Chloro-3-Methylphenol	0.0	100	63	66	63	66	5
2-Chlorophenol	0.0	100	49	57	49	57	15
Phenol	0.0	100	44	51	44	51	15

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

ORANGE COAST ANALYTICAL

MARK NOORANI
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Semi-Volatile Organics by GC/MS (EPA 8270)

Date of Analysis : 08/29/97
Laboratory Sample No : OCA 100
Laboratory Reference No : MWI 9487

Analyte	R1 (ng)	SP (ng)	MS (ng)	MSD (ng)	PR1 %	PR2 %	RPD %
1,4-Dichlorobenzene	0.0	50	34	29	68	58	16
n-Nitroso-di-n-Propylamine	0.0	50	39	40	78	80	3
1,2,4-Trichlorobenzene	0.0	50	37	31	74	62	18
Acenaphthene	0.0	50	40	37	80	74	8
Pyrene	0.0	50	45	39	90	78	14
Pentachlorophenol	0.0	100	72	66	72	66	9
4-Chloro-3-Methylphenol	0.0	100	72	66	72	66	9
2-Chlorophenol	0.0	100	68	61	68	61	11
Phenol	0.0	100	24	19	24	19	23

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

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Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Organochlorine Pesticides (EPA 8080)

Date of Analysis : 08/29/97
Laboratory Sample No : OCA 100
Laboratory Reference No : MWI 9487

Analyte	R1 (ppb)	SP (ppb)	MS (ppb)	MSD (ppb)	PR1 %	PR2 %	RPD %
4,4'-DDT	0.0	1.00	0.71	0.78	71	78	9

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

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MARK NOORANI
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : PCB 'S (EPA 8080)

Date of Analysis : 08/26/97
Laboratory Sample No : 97080371
Laboratory Reference No : MWI 9487

Analyte	R1 (ppb)	SP (ppb)	MS (ppb)	MSD (ppb)	PR1 %	PR2 %	RPD %
PCB-1260	0.0	250	290	280	116	112	4

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

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Mark Noorani

MARK NOORANI
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : PCB 'S (EPA 8080)

Date of Analysis : 08/29/97
Laboratory Sample No : OCA 100
Laboratory Reference No : MWI 9487

Analyte	R1 (ppb)	SP (ppb)	MS (ppb)	MSD (ppb)	PR1 %	PR2 %	RPD %
PCB-1260	0.0	20	14	16	70	80	13

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

ORANGE COAST ANALYTICAL

MARK NOORANI
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Extractable Fuel Hydrocarbons (EPA 8015m)

Date of Analysis : 08/27/97
Laboratory Sample No : OCA 200
Laboratory Reference No : MWI 9487

Analyte	R1 (ppb)	SP (ppb)	MS (ppb)	MSD (ppb)	PR1 %	PR2 %	RPD %
Hydrocarbons	0.0	100	81	96	81	96	17

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

ORANGE COAST ANALYTICAL

Mark Noorani

MARK NOORANI
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Extractable Fuel Hydrocarbons (EPA 8015m)

Date of Analysis : 08/28/97
Laboratory Sample No : OCA 100
Laboratory Reference No : MWI 9487

Analyte	R1 (ppb)	SP (ppb)	MS (ppb)	MSD (ppb)	PR1 %	PR2 %	RPD %
Hydrocarbons	0.0	5.0	2.4	2.7	48	54	12

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

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Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Metals

Date of Analysis : 08/29/97
Laboratory Sample No : 97080361
Laboratory Reference No : MWI 9487

Analyte	R1 (ppm)	SP (ppm)	MS (ppm)	MSD (ppm)	PR1 %	PR2 %	RPD %
Antimony	0.0	30.0	28.5	28.5	95	95	0
Arsenic	0.0	10.0	9.6	9.2	96	92	4
Barium	8.6	10.0	19.4	17.9	108	93	8
Beryllium	0.00	1.00	1.00	0.94	100	94	6
Cadmium	0.00	1.00	0.95	0.95	95	95	0
Chromium (Total)	2.00	5.00	6.80	6.70	96	94	1
Chromium (VI)	0.00	1.00	0.85	0.81	85	81	5
Cobalt	0.67	1.00	1.56	1.59	89	92	2
Copper	0.90	1.00	1.90	1.83	100	93	4
Lead	0.00	10.0	8.0	8.5	80	85	6
Mercury	0.000	0.020	0.019	0.020	95	100	5
Molybdenum	0.0	10.0	9.6	9.1	96	91	5
Nickel	0.92	5.00	5.4	5.4	89	89	1
Selenium	0.0	10.0	8.2	8.7	82	87	6
Silver	0.0	5.0	3.8	3.7	76	74	3
Thallium	0.0	30.0	22.5	23.7	75	79	5
Vanadium	2.4	5.0	7.1	7.2	94	96	1
Zinc	3.4	5.0	8.3	8.0	98	92	4

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

ORANGE COAST ANALYTICAL

MARK NOORANI
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Metals

Date of Analysis : 08/26/97
Laboratory Sample No : 97080303
Laboratory Reference No : MWI 9487

Analyte	R1 (ppm)	SP (ppm)	MS (ppm)	MSD (ppm)	PR1 %	PR2 %	RPD %
Antimony	0.00	3.00	3.10	2.90	103	97	7
Arsenic	0.00	1.00	1.13	1.20	113	120	6
Barium	0.000	0.100	0.100	0.099	100	99	1
Beryllium	0.00	0.100	0.106	0.101	106	101	5
Cadmium	0.00	0.100	0.113	0.103	113	103	9
Chromium (VI)	0.00	0.50	0.49	0.48	98	96	2
Chromium (Total)	0.00	0.100	0.100	0.095	100	95	5
Cobalt	0.00	0.100	0.093	0.096	93	96	3
Copper	0.000	0.100	0.100	0.100	100	100	0
Lead	0.00	1.00	0.99	1.06	99	106	7
Mercury	0.000	0.020	0.021	0.022	105	110	5
Molybdenum	0.00	1.00	1.09	1.04	109	104	5
Nickel	0.00	0.50	0.46	0.50	92	100	8
Selenium	0.00	1.00	1.12	1.06	112	106	6
Silver	0.00	0.50	0.50	0.49	100	98	2
Thallium	0.00	3.00	3.10	2.80	103	93	10
Vanadium	0.00	0.50	0.51	0.49	102	98	4
Zinc	0.000	0.100	0.088	0.086	88	86	2

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

ORANGE COAST ANALYTICAL

Mark Noorani

MARK NOORANI
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Total Recoverable Petroleum Hydrocarbons (EPA 418.1)

Date of Analysis : 08/25/97
Laboratory Sample No : 97080294
Laboratory Reference No : MWI 9487

Analyte	R1 (ppm)	SP (ppm)	MS (ppm)	MSD (ppm)	PR1 %	PR2 %	RPD %
Hydrocarbons	0.0	100	96	99	96	99	3

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

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Mark Noorani

MARK NOORANI
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Total Recoverable Petroleum Hydrocarbons (EPA 418.1)

Date of Analysis : 08/27/97
Laboratory Sample No : OCA 100
Laboratory Reference No : MWI 9487

Analyte	R1 (ppm)	SP (ppm)	MS (ppm)	MSD (ppm)	PR1 %	PR2 %	RPD %
Hydrocarbons	0.0	2.5	2.5	2.4	100	96	4

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

ORANGE COAST ANALYTICAL

MARK NOORANI
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Volatile Organics by GC/MS (EPA 8260)

Date of Analysis : 08/25/97
Laboratory Sample No : 97080323
Laboratory Reference No : MWI 9487

Analyte	R1 (ppb)	SP (ppb)	MS (ppb)	MSD (ppb)	PR1 %	PR2 %	RPD %
Benzene	0.0	50	46	47	92	94	2
1,1-Dichloroethene	0.0	50	44	42	88	84	5
Trichloroethene	0.0	50	48	51	96	102	6
Toluene	0.0	50	47	48	94	96	2
Chlorobenzene	0.0	50	48	49	96	98	2

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

ORANGE COAST ANALYTICAL

Mark Noorani

MARK NOORANI
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Volatile Organics by GC/MS (EPA 8260)

Date of Analysis : 08/26/97
Laboratory Sample No : 97080365
Laboratory Reference No : MWI 9487

Analyte	R1 (ppb)	SP (ppb)	MS (ppb)	MSD (ppb)	PR1 %	PR2 %	RPD %
Benzene	0.0	20	17	18	85	90	6
1,1-Dichloroethene	0.0	20	15	16	75	80	6
Trichloroethene	0.0	20	16	17	80	85	6
Toluene	0.0	20	18	19	90	95	5
Chlorobenzene	0.0	20	18	19	90	95	5

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

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MARK NOORANI
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Volatile Fuel Hydrocarbons (EPA 5030 / 8015m)

Date of Analysis : 08/28/97
Laboratory Sample No : OCA 200
Laboratory Reference No : MWI 9487

Analyte	R1 (ppm)	SP (ppm)	MS (ppm)	MSD (ppm)	PR1 %	PR2 %	RPD %
Hydrocarbons	0	50	45	42	90	84	7

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

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Laboratory Director

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3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Volatile Fuel Hydrocarbons (EPA 5030 / 8015m)

Date of Analysis : 08/29/97
Laboratory Sample No : OCA 100
Laboratory Reference No : MWI 9487

Analyte	R1 (ppb)	SP (ppb)	MS (ppb)	MSD (ppb)	PR1 %	PR2 %	RPD %
Hydrocarbons	0	250	223	186	89	74	18

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

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Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Volatile Organic Compounds (EPA 8010/8020)

Date of Analysis : 05/09/97
Laboratory Sample No : 97050075
Laboratory Reference No : KJC 9030

Analyte	R1 (ppb)	SP (ppb)	MS (ppb)	MSD (ppb)	PR1 %	PR2 %	RPD %
Benzene	0.0	10.0	9.4	9.4	94	94	0
1,1-Dichloroethane	0.0	5.0	4.9	4.9	98	98	0
Trichloroethene	0.0	5.0	4.9	5.0	98	100	2
Tetrachloroethene	0.0	5.0	5.2	5.3	104	106	2
Toluene	0.0	10.0	10.0	10.0	100	100	0

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

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MARK NOORANI
Laboratory Director

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3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : PCB 'S (EPA 8080)

Date of Analysis : 05/08/97
Laboratory Sample No : 97050171
Laboratory Reference No : KJC 9030

Analyte	R1 (ppb)	SP (ppb)	MS (ppb)	MSD (ppb)	PR1 %	PR2 %	RPD %
PCB-1260	0.0	250	120	170	48	68	34

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

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ORANGE COAST ANALYTICAL, INC.
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4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Metals

Date of Analysis : 05/12/97
Laboratory Sample No : 97050162
Laboratory Reference No :KJC 9030

Analyte	R1 (ppm)	SP (ppm)	MS (ppm)	MSD (ppm)	PR1 %	PR2 %	RPD %
Antimony	0.0	30.0	28.0	29.0	93	97	4
Arsenic	0.0	10.0	12.0	12.0	120	120	0
Barium	13.0	10.0	21.0	21.0	80	80	0
Beryllium	0.00	1.00	0.93	0.95	93	95	2
Cadmium	0.00	1.00	1.06	1.07	106	107	1
Chromium (Total)	3.0	5.0	7.7	8.0	94	100	4
Chromium (VI)	0.00	1.00	0.93	0.98	93	98	5
Cobalt	0.74	1.00	1.64	1.66	90	92	1
Copper	1.50	1.00	2.50	2.60	100	110	4
Lead	0.0	10.0	8.9	8.8	89	88	1
Mercury	0.000	0.020	0.021	0.024	105	120	13
Molybdenum	0.0	10.0	8.7	8.6	87	86	1
Nickel	1.30	5.00	5.60	5.60	86	86	0
Selenium	0.0	10.0	9.3	8.9	93	89	4
Silver	0.0	5.0	5.1	4.9	102	98	4
Thallium	0.0	30.0	26.0	26.0	87	87	0
Vanadium	3.2	5.0	8.1	8.1	98	98	0
Zinc	4.6	5.0	9.6	9.4	100	96	2

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

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4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Metals

Date of Analysis : 05/12/97
Laboratory Sample No : 97050179
Laboratory Reference No :KJC 9030

Analyte	R1 (ppm)	SP (ppm)	MS (ppm)	MSD (ppm)	PR1 %	PR2 %	RPD %
Antimony	0.0	30.0	28.0	28.0	93	93	0
Arsenic	0.0	10.0	8.6	8.6	86	86	0
Barium	7.7	10.0	18.0	17.0	103	93	6
Beryllium	0.00	1.00	1.04	1.05	104	105	1
Cadmium	0.00	1.00	1.11	1.03	111	103	7
Chromium (Total)	2.3	5.0	7.5	7.7	104	108	3
Chromium (VI)	0.00	1.00	0.98	0.86	98	86	13
Cobalt	0.58	1.00	1.58	1.59	100	101	1
Copper	1.00	1.00	2.20	2.17	120	117	1
Lead	0.0	10.0	9.8	9.8	98	98	0
Mercury	0.000	0.020	0.022	0.024	110	120	9
Molybdenum	0.0	10.0	8.9	8.9	89	89	0
Nickel	1.00	5.00	5.80	5.70	96	94	2
Selenium	0.0	10.0	10.0	8.8	100	88	13
Silver	0.0	5.0	5.1	5.0	102	100	2
Thallium	0.0	30.0	25.0	24.0	83	80	4
Vanadium	2.4	5.0	7.6	7.9	104	110	4
Zinc	3.5	5.0	9.0	9.3	110	116	3

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

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4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Total Recoverable Petroleum Hydrocarbons (EPA 418.1)

Date of Analysis : 05/09/97
Laboratory Sample No : 97050162
Laboratory Reference No : KJC 9030

Analyte	R1 (ppm)	SP (ppm)	MS (ppm)	MSD (ppm)	PR1 %	PR2 %	RPD %
Hydrocarbons	0.0	100	104	101	104	101	3

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

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Laboratory Director

ORANGE COAST ANALYTICAL, INC.
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4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Total Recoverable Petroleum Hydrocarbons (EPA 418.1)

Date of Analysis : 05/09/97
Laboratory Sample No : 97050169
Laboratory Reference No : KJC 9030

Analyte	R1 (ppm)	SP (ppm)	MS (ppm)	MSD (ppm)	PR1 %	PR2 %	RPD %
Hydrocarbons	0.0	100	103	100	103	100	3

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

ORANGE COAST ANALYTICAL

Mark Noorani

MARK NOORANI
Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532, Tustin, CA 92780 (714) 832-0064 Fax (714) 832-0067
4620 E. Elwood, Suite 4, Phoenix, AZ 85040 (602) 736-0960 Fax (602) 736-0970

QC DATA REPORT

Analysis : Semi-Volatile Organics by GC/MS (EPA 8270)

Date of Analysis : 05/13/97
Laboratory Sample No : 97050184
Laboratory Reference No : KJC 9030

Analyte	R1 (ng)	SP (ng)	MS (ng)	MSD (ng)	PR1 %	PR2 %	RPD %
1,4-Dichlorobenzene	0.0	50	45	45	90	90	0
n-Nitroso-di-n-propylamine	0.0	50	56	55	112	110	2
1,2,4-Trichlorobenzene	0.0	50	45	44	90	88	2
Acenaphthene	0.0	50	47	46	94	92	2
Pyrene	0.0	50	43	43	86	86	0
Pentachlorophenol	0.0	100	85	92	85	92	8
4-Chloro-3-Methylphenol	0.0	100	80	82	80	82	2
2-Chlorophenol	0.0	100	80	81	80	81	1
Phenol	0.0	100	73	75	73	75	3

Definition of Terms :

R1	Results Of First Analysis
SP	Spike Concentration Added to Sample
MS	Matrix Spike Results
MSD	Matrix Spike Duplicate Results
PR1	Percent Recovery Of MS: {(MS-R1) / SP} x100
PR2	Percent Recovery Of MSD: {(MSD-R1) / SP} x 100
RPD	Relative Percent Difference: {(MS-MSD) / (MS+MSD)} x 100 x 2

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Laboratory Director

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532
Tustin, CA 92680
(714) 832-0064, Fax (714) 832-0067

Ana[illegible] [illegible]uest and Chain of [illegible]stody Record

Lab Job No: _____
Page 2 3

REQUIRED TAT: _____

CUSTOMER INFORMATION		PROJECT INFORMATION	
COMPANY:	Kennedy / Jenks	PROJECT NAME:	DAC
SEND REPORT TO:		NUMBER:	974002.00
ADDRESS:		LOCATION:	Area 5
		ADDRESS:	
PHONE:	FAX:	SAMPLED BY:	DMS

ANALYSIS/METHOD REQUEST

SAMPLE ID	NO. OF CONTAINERS	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	CONTAINER TYPE	PRES.	8010/8020	418.1	Metals	pH	8270	PCBs 8080			REMARKS/PRECAUTIONS
2BB-5-22-10	1	5/7/97	1135	Soil	Stainless Steel		X	X	X	X	X				
-15	1		1215				X	X	X	X	X				
-20	1		1240				X	X	X	X	X				
-25	1		1250				X	X	X	X	X				
2BB-5-21-1	1		1310				X	X	X	X	X				
-4	1		1315				X	X	X	X	X				
-10	1	1 Jenks	1320				X	X	X	X	X				
-15	1	DAC - 974002	1330				X	X	X	X	X				
-20	1	5/7/97	1335				X	X	X	X	X				
-25	1		1345				X	X	X	X	X				
2BB-2-2-1	2BB-2-2-1		1555				[illegible]					X			
-4	1		1600									X			
-10	1		1605									X			
EB-1	2		1620	Water	VOA		X								

Total No. of Samples:		Method of Shipment:		
Relinquished By: Dale M. S[illegible]	Date/Time: 5/7/97 1625	Received By:	Date/Time:	Reporting Format: (check) NORMAL _____ S.D. HMMD _____
Relinquished By:	Date/Time:	Received By:	Date/Time:	RWQCB _____ OTHER _____
Relinquished By:	Date/Time:	Received For Lab By: [illegible]	Date/Time: 5/7/97 16:30	Sample Integrity: (check) intact _____ on ice _____

All samples remain the property of the client who is responsible for disposal. A disposal fee may be imposed if client fails to pickup samples.

BOE-C6-0152636

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532
Tustin, CA 92680
(714) 832-0064, Fax (714) 832-0067

Analysis Request and Chain of Custody Record

Lab Job No: _____
Page 1 3

REQUIRED TAT: _____

CUSTOMER INFORMATION	PROJECT INFORMATION
COMPANY: Kennedy/Jenks	PROJECT NAME: DAC
SEND REPORT TO:	NUMBER: 974002.00
ADDRESS:	LOCATION: Area 1A & Area 5
	ADDRESS:
PHONE: FAX:	SAMPLED BY: DMS

SAMPLE ID	NO. OF CONTAINERS	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	CONTAINER TYPE	PRES.	8010/8020	418.1	Metals	8080 PCBs	PH	8270			REMARKS/PRECAUTIONS
2BB-1A-19-1	1	5/7/97	0755	Soil	Stainless Steel		X	X	X	X					
-4	1		0805				X	X	X	X					
-10	1		0810				X	X	X	X					
-15	1		0820				X	X	X	X					
-20	1		0830				X	X	X	X					
-25	1		0840				X	X	X	X					
2BB-1A-18-1	1		0905				X	X	X	X					
-4	1		0915				X	X	X	X					
-10	1		0925				X	X	X	X					
-15	1		0930				X	X	X	X					
-20	1		0940				X	X	X	X					
-25	1		0950				X	X	X	X					
2BB-5-22-1	1		1115				X	X	X		X	X			
-4	1		1125				X	X	X		X	X			

Total No. of Samples:

Method of Shipment:

Relinquished By:	Date/Time:	Received By:	Date/Time:
Dale M. [illegible]	5/7/97 1625		
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received For Lab By: [illegible]	Date/Time: 5/7/97 16:30

Reporting Format: (check)
NORMAL _____ S.D. HMMD _____
RWQCB _____ OTHER _____

Sample Integrity: (check)
intact _____ on ice _____

All samples remain the property of the client who is responsible for disposal. A disposal fee may be imposed if client fails to pickup samples.

BOE-C6-0152637

ORANGE COAST ANALYTICAL, INC.
3002 Dow, Suite 532
Tustin, CA 92680
(714) 832-0064, Fax (714) 832-0067

Analysis Request and Chain of Custody Record

Lab Job No: 3
Page 3

REQUIRED TAT:

CUSTOMER INFORMATION		PROJECT INFORMATION	
COMPANY:	Kennedy/Jenks	PROJECT NAME:	DAC
SEND REPORT TO:		NUMBER:	974002-00
ADDRESS:		LOCATION:	—
		ADDRESS:	
PHONE:	FAX:	SAMPLED BY:	DMS

SAMPLE ID	NO. OF CONTAINERS	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	CONTAINER TYPE	PRES.	ANALYSIS/METHOD REQUEST 8010/8020	REMARKS/PRECAUTIONS
TB-197	1	5/7/97	—	Water	VOA		X	
TB-198	1	"	—	"	VOA		X	

Total No. of Samples:		Method of Shipment:	
Relinquished By: Dale M. Sy	Date/Time: 5/7/97 1630	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received For Lab By: mirdam.	Date/Time: 5/7/97 16:30

Reporting Format: (check)
NORMAL _____ S.D. HMMD _____
RWQCB _____ OTHER _____

Sample Integrity: (check)
intact _____ on ice _____

All samples remain the property of the client who is responsible for disposal. A disposal fee may be imposed if client fails to pickup samples.

APPENDIX C
Kennedy/Jenks Consultants Standard Operating Guides

document2

DRAFT

SOG-1

KENNEDY/JENKS CONSULTANTS
STANDARD OPERATING GUIDELINES

PERSONNEL DECONTAMINATION

INTRODUCTION

This guideline describes field procedures typically followed by Kennedy/Jenks Consultants for personnel decontamination. Decontamination of personnel is critical to health and safety during and after environmental fieldwork. It protects personnel from hazardous substances that can contaminate and eventually permeate protective clothing, respiratory equipment, tools, vehicles, and other equipment used onsite. Decontamination reduces exposure of site personnel to such substances by minimizing the transfer of harmful materials into clean areas and preventing the mixing of incompatible chemicals. It also protects the community by preventing uncontrolled transportation of contaminants from the site.

RECOMMENDED EQUIPMENT

The materials, equipment, and facilities described in the following list are not required in every case of personnel decontamination. However, they represent all that might be required for sites where maximum decontamination procedures are necessary.

- Drop cloths (plastic or other suitable material) on which heavily contaminated equipment and outer protective clothing can be deposited.
- Collection containers, such as drums or suitably lined trash cans, for storing disposable clothing, heavily contaminated personal protective clothing, or equipment that must be discarded.
- Lined box with absorbent for wiping or rinsing off gross contaminants and liquid contaminants.
- Large tubs to hold wash and rinse solutions; tubs should be at least large enough to hold a worker's booted foot and allow full access for washing.
- Non-phosphate wash solutions (e.g., Alconox, Liquinox) to wash off debris and chemicals and reduce hazards associated with any contaminants.

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- Rinse solutions (e.g., potable or distilled water) to remove contaminants and contaminated wash solutions.
- Long-handled soft-bristled brushes to wash and rinse off contaminants.
- Paper or cloth towels for drying protective clothing and equipment.
- Lockers or containers for storage of decontaminated non-disposable clothing (e.g., hard hat, boots) and equipment.
- Department of Transportation (DOT)-approved containers for contaminated wash and rinse solutions.
- Plastic sheeting, sealed pads with drains, or other appropriate means of secondary containment of contaminated wash and rinse solutions that might be spilled during decontamination.
- Shower facilities for full body wash or, at a minimum, wash sinks available to personnel.
- Soap or wash solution, wash cloths, and towels for personnel.
- Lockers or containers for clean clothing and personal item storage.

LEVEL C DECONTAMINATION PROCEDURES

At a minimum, the following procedures apply when operating in a Level C exclusion zone:

1. Deposit items used onsite on plastic drop cloth. Segregation at the drop site reduces the probability of cross-contamination.
2. Scrub outer boots, gloves, and splash suit with decontamination solution or detergent water. Rinse items with generous amounts of water. Follow this step scrupulously for protective clothing that is not disposable.
3. Remove outer boots and gloves. Deposit or discard them in container with plastic liner.
4. To continue decontamination outside the exclusion zone, change canister or mask when leaving the zone. Upon re-entering, remember to gear up again.

5. Remove boots, chemical-resistant splash suit, and inner gloves and deposit them in separate containers lined with plastic.

6. Remove respirator by taking off facepiece. Avoid touching the face with the fingers. Deposit the facepiece on a plastic sheet.

7. As a field wash, clean hands and face thoroughly and shower as soon as possible. Wash respirator facepiece with respirator cleaning solution.

8. Ensure that all decontamination procedures are in accordance with the project sampling and analysis plan and Kennedy/Jenks Consultants Standard Operating Guideline, Investigation-Derived Residuals (Unit 9.0).

LEVEL D DECONTAMINATION PROCEDURES

If operating in a Level D area, perform the following procedures before leaving the site:

1. Wash and rinse all reusable equipment and garments. If gear is to be used elsewhere, wash it with detergent and then rinse with generous amounts of water.

2. If grossly contaminated, discard disposable protective clothing in appropriate container.

3. Wash hands and face thoroughly, and shower as soon as possible.

SPECIAL NOTES

When working in an exclusion zone, be sure that the decontamination area is placed in an upwind direction (plus or minus 20 degrees) from the site.

INVESTIGATION-DERIVED WASTES

Refer to the specific project sampling and analysis plan for details of disposition of investigation-derived wastes.

EMERGENCY DECONTAMINATION PROCEDURES

1. If the decontamination procedure is essential to the life saving process, decontamination must be performed immediately.

2. If a heat-related illness develops, protective clothing should be removed as soon as possible. Protective clothing and equipment should be washed, rinsed, and/or cut off.

3. If medical treatment is required to save a life, decontamination should be delayed until the victim is stabilized, or until decontamination will not interfere with medical treatment.

4. Dispose of contaminated clothing and equipment properly.

5. Alert medical personnel to the emergency.

6. Instruct medical personnel about potential contamination.

7. Instruct medical personnel about specific decontamination procedures.

REFERENCES

NIOSH/OSHA/USCG/EPA. 1985. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. Washington, D.C. Federal Way).

U.S. Environmental Protection Agency. 1988. Standard Operating Safety Guidelines. United States Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, DC.

SOG-3

KENNEDY/JENKS CONSULTANTS
STANDARD OPERATING GUIDELINES

SAMPLE PACKAGING AND SHIPPING

INTRODUCTION

This standard operating guide presents methods for shipping non-hazardous materials, including most environmental samples, via UPS, Federal Express and Greyhound. Many local laboratories offer courier service as well.

EQUIPMENT

- Coolers
- Sorbent material
- Bubble-wrap
- Strapping tape
- Labels and pens
- Chain-of-Custody forms
- Chain-of-Custody seals
- UPS, Greyhound, or Federal Express manifests

Samples shipped to the Pacific Environmental Laboratory (PEL) in San Francisco (CA) can be shipped with the United Parcel Service (UPS) or Federal Express on a next-day basis unless other arrangements are agreed to. Greyhound should only be used if there is direct service (e.g. Sacramento or Bakersfield to San Francisco). Ordinary coolers without drain plugs or with sealed drain plugs similar to coolers used for refrigerating food while camping can normally be used to ship non-hazardous samples. Specific requirements for packaging materials only apply if the samples being shipped are known to be hazardous materials as defined in 49 CFR 171.8 (samples are not considered hazardous waste and therefore manifest requirements do not apply). UPS holds shippers responsible for damage occurring in the event of accidents when a hazardous material is shipped as a non-hazardous material. Samples which obviously are hazardous materials should therefore be shipped as such, and samples which most likely are not hazardous materials should be shipped in coolers. Guidelines for shipping hazardous materials by UPS are provided in the Guide for Shipping Hazardous Materials available from UPS.

Specific labels are used for shipments of hazardous materials which the Field Services Supervisor is responsible for providing.

Procedures further described below therefore pertain to samples being shipped as nonhazardous materials.

Absorbent pads should be placed in the bottom of the shipping container to absorb liquids in the event of the jar breakage. Liquid samples in glass jars should also be wrapped in plastic bubble wrap. Volatile organics analysis (VOA) vials should be packed in sponge holders. An equal weight of ice substitute should be used to keep the samples below 4 degrees centigrade for the duration of the shipment (up to 48 hours). Labels of samples may get wet (which is typical) and should be covered with clear tape. Strong tape should be used to tape the coolers closed. Transportation regulations and UPS guidelines require absorbent capacity of the material to equal the amount of liquid being shipped; each pad absorbs approximately 1 quart of liquid. Designated shipping to a coordinator who is responsible for all shipment of samples for your projects.

Chain-of-custody analysis request sample disposition forms must accompany shipments of samples to the PEL in San Francisco. This form must accompany shipments to laboratories, in addition to other requirements of the laboratories. The form is self explanatory; if you have questions talk to the sample custodian at PEL . Keep copies of all forms you send. The sample disposition section of the form requires us to specify whether unused portions of samples will be returned to the client, to us, or disposed of by the lab, in which case the lab assesses a $5 per sample disposal fee.

Samples should be preserved in accordance with requirements specified in the EPA requirements. Pay attention to where different kinds of acids and flammable are stored (e.g., nitric acid and nitrate compounds are not to be kept or shipped with hydrochloric acid and sulfuric acid).

DRAFT

SOG-11

KENNEDY/JENKS CONSULTANTS
STANDARD OPERATING GUIDELINE

BORING AND SUBSURFACE SOIL SAMPLING

INTRODUCTION

This guideline describes the equipment and procedures that are used by Kennedy/Jenks Consultants personnel for drilling and for collecting soil samples.

EQUIPMENT

- Drill rigs and associated drilling and sampling equipment as specified in workplan:
  - Hollow stem auger
  - Air-rotary casing hammer
  - Dual tube percussion hammer
  - Cable tool
  - Mud rotary
  - Reverse rotary
- CME, 5 ft x 94 mm continuous-core barrels (hollow-stem auger)
- 2.5-inch or 2.0-inch I.D. split-spoon drive sampler
- 2.5-inch or 2.0-inch brass liners and sealing materials (plastic end caps, Teflon seals, silicon tape, zip-lock plastic bags)
- Large capacity stainless steel borehole bailer
- Foxboro FID-Organic Vapor Analyzer (OVA)
- HNU PID-Organic Vapor Analyzer
- OVM
- Sampler cleaning equipment

BOE-C6-0152646

- Steamcleaner
- Generator
- Stiff-bristle brushes
- Buckets
- High purity phosphate-free liquid soap, such as Liquinox
- Methanol (if necessary)
- 0.1N nitric acid (if necessary)
- Deionized water
- Potable water

- Insulated sample storage and shipping containers

- Personal protective equipment (refer to project site safety plan)

TYPICAL PROCEDURE

1. Obtain applicable drilling and well construction permits prior to mobilization.

2. Clear drilling locations for underground utilities and structures by Underground Service Alert (USA) and subcontractors.

3. Have all downhole equipment steamcleaned prior to drilling each boring.

4. Ensure that soil borings not to be completed as monitoring wells are drilled with an auger drill rig, using hollow stem augers of appropriate size.

5. Make sure that borings not completed as monitoring wells are grouted to the surface, using a neat cement-bentonite grout (containing approximately 5 percent bentonite).

6. Ensure that borings made to construct shallow monitoring wells are drilled with an auger drill rig that uses hollow stem augers of appropriate size to provide an annular space of a minimum of 2 inches between borehole wall and well casing.

7. Verify that drill borings used to construct deeper monitoring wells are drilled with a dual tube percussion hammer or air-rotary casing hammer, using a steel drive casing of appropriate size, or with hollow stem augers through a steel conductor casing.

8. Collect soil samples for lithologic logging purposes with a CME continuous coring system in 5-foot increments.

9. Collect soil samples for lithologic logging and chemical and physical analyses by driving a split-spoon drive sampler, in 2.5-foot to 5-foot increments, below the depth of the auger bit with a rig-mounted hammer. Record the standard penetration resistance. If the sample is pushed rather than driven, be sure to record the push force.

10. When drilling with air-driven drill rigs, collect soil samples for lithologic logging purposes from the cyclone separator discharge on the dual tube percussion hammer, which separates air from formation cuttings as the drive casing is advanced.

11. Have the soils classified in the field in approximate accordance with the visual-manual procedure of the Unified Soil Classification System (ASTM D-2488-90) and the Munsell Color Classification.

12. Prior to each sampling event, wash the split-spoon drive sampler and brass liners with high purity phosphate-free soap, and double-rinse them with deionized water and methanol and/or 0.1N nitric acid, as appropriate.

13. At each sampling interval, collect soil in one brass liner for potential laboratory analysis. Cover this sample in Teflon sheets, seal it with plastic caps, and wrap it with silicon tape. Place a completed sample label on the brass liner. Then see that the samples are placed in appropriate containers and stored at approximately 4 °C.

14. As a field screening procedure (if applicable), at each sampling interval put the soil from one of the brass liners into an airtight container and allow it to equilibrate. After this, use an OVA to monitor the headspace in the container. If significant organic vapors are detected with the OVA, save the appropriate brass sample liners for potential laboratory analysis.

15. Complete chain of custody forms in the field and transport the samples in insulated containers, at an internal temperature of approximately 4 °C, to the selected laboratory.

16. If applicable, as described in the site safety plan, use an OVA to analyze in situ air samples from the breathing zone, the inside of the augers or casing, and other locations as necessary.

INSTALLATION AND TESTING OF ISOLATION CASING

1. Upon completion of the initial small-diameter boring, use a rotary drill bit of appropriate diameter to ream the boring to a depth (to be determined). Use a

bentonite mud mixture, in accordance with standard drilling practice, to maintain hole stability and to minimize infiltration and development of a mud cake on the borehole wall.

2. When reaming is completed, install isolation casing in the boring. Use conductor casing of an appropriate grade of 14-inch-diameter steel with a wall thickness of 0.25 inch, per the following specifications:

   a. Sections are 20, 10, or 5 feet in length.

   b. Casing sections are beveled or butt-jointed.

   c. Field joints are arc-welded with 70 percent weld penetration, having a minimum of two passes per circumference.

   d. Welding rod is compatible with casing material.

   e. Joints are watertight.

   f. Casing centralizers are set on the bottom, middle, and top of the total casing length. Centralizers are installed in sets of four, spaced at 90°, and attached at the bottom by a tack weld. They are flanged 2 inches at the top and bottom to contact the borehole wall.

3. Make volumetric calculations prior to grouting, to estimate the total volume of grout required to fill the annular space. The amount of grout actually used must be compared with this estimate. Ensure that the grout meets the following specifications:

   a. Volumes of grout used must be within 10 percent of estimated value.

   b. The grout consists of ASTM C150 Type II cement and water at a ratio of 5 gal. of water per 94 lb sack of cement, weighing approximately 118 lb per ft. Approximately 5 lb of powdered bentonite for each sack of cement is mixed into the grout.

Note that leakage tests or a bond log might be required to validate the grout seal.

4. Grout conductor casing into place by one of the following methods:

   a. Pressure-grout from the bottom of the casing, using a packer or Braden-head to force the grout into the annular space between the conductor casing and the borehole wall.

   b. Fill the casing with grout and use a spacer plug apparatus to force the grout into the annular space between the conductor casing and the borehole wall. The spacer plug must be composed of a material that can be left in the boring and later drilled through to complete it.

5. After allowing the grout to set, continue drilling with an appropriate diameter hollow stem auger. A rotary bit can be used initially to drill through any grout that might have hardened in, or directly below, the casing.

EQUIPMENT CLEANING

1. Prior to drilling each boring, steamclean downhole equipment (augers, well casing, sampler).

2. Before collection of each drilling sample, steamclean or wash sampling equipment (sampler and brass liners) with a brush, in a solution of high purity phosphate-free soap and potable water. Rinse the equipment with potable water and methanol and/or 0.1N nitric acid, as appropriate. Follow this with double-rinsing using distilled water.

3. Before leaving the site at completion of drilling, steamclean downhole equipment and vehicles that require cleaning.

INVESTIGATION-DERIVED RESIDUALS

Place soil cuttings and other residuals in appropriately labeled containers for disposition by the client. All soil samples transported to the laboratory must be returned to the client for disposition. Kennedy/Jenks Consultants is available to assist the client with options for disposition of residuals.

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SOG-20B

KENNEDY/JENKS CONSULTANTS
STANDARD OPERATING GUIDELINE

HANDLING AND DISPOSAL OF INVESTIGATION-DERIVED WASTE

INTRODUCTION

Environmental site investigations usually result in generation of some regulated waste, particularly if the project involves drilling and construction of monitoring wells. Any potentially hazardous or dangerous material that is generated during a site investigation must be handled and disposed of in accordance with applicable regulations (22 CCR, Chapter 30). This guideline provides a procedure to be used for dealing with investigation-derived wastes that have the potential of being classified as hazardous or dangerous, including soil cuttings, well development water, and decontamination water.

EQUIPMENT

- DOT-approved packaging (typically DOT 17E or 17H drums)
- Funnel
- Bushing wrench
- 15/16-inch socket wrench
- Shovel
- Appropriate markers (spray paint, paint pen)
- Plastic sheeting
- Drip pans
- Pallets

TYPICAL PROCEDURES

Preparing Containers

1. Place each container on a pallet if it is to be moved with a fork lift after it is full.

2. Place plastic sheeting under containers for soil and drip pans under containers used to hold water.

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3. Ensure that packaging materials are compatible with the wastes to be stored in them. Bung-type drums should be used to contain liquids. If a liquid is corrosive, a plastic or polymer drum should be used.

   Solids should be placed in open-top drums. Liners are placed in the drums if the solid material is corrosive or contains free liquids. Gaskets are also used on open-top drums.

Storing Wastes

1. As waste materials are generated, place them directly into storage containers.

2. Do not fill storage drums completely. Provide sufficient outage so that the containers will not be overfull if their contents expand.

3. After filling a storage drum, seal it securely, using a bung wrench or socket wrench, for a bung-type or open-top drum, respectively.

4. Label drums or other packages containing hazardous or dangerous materials and mark them for storage or shipment. To comply with marking and labeling requirements, affix a properly filled out yellow hazardous waste marker and a DOT hazard class label to each waste container. Do not mark drums with Kennedy/Jenks Consultants' name. All waste belongs to the client. Mark accumulation start-date.

5. During an ongoing investigation, use a paint marker to mark the contents, station number, date, and quantity of material on each drum or other container. Do not mix investigation-derived wastes with one another or with other materials. Do not place items such as Tyvek, gloves, equipment, or trash into drums containing soils or liquids, and do not mix water and soil. Disposable protective clothing, trash, soil, and water materials should be disposed of in separate containers.

6. Upon completion of field work, or the portion of the project that generates wastes, notify the client as to the location, number, contents, and waste type of waste containers. Remind the client of the obligation to dispose of wastes in a timely manner and in accordance with applicable regulations.

REGULATIONS

22 CCR, Chapter 30 California Hazardous Waste Regulations.

49 CFR 100-177, Federal Transportation of Hazardous Materials Regulations.

EPA Region X, Technical Assistance Team. 1984. Manual for Sampling, Packaging, and Shipping Hazardous Materials. Seattle, WA: EPA.

SOG-21

KENNEDY/JENKS CONSULTANTS
STANDARD OPERATING GUIDELINE

BOREHOLE LOGGING

INTRODUCTION

This guideline describes procedures followed by Kennedy/Jenks Consultants personnel for classifying soils and for preparing borehole logs and other types of soil reports. It assists in obtaining uniform descriptions of soils encountered during borehole programs and enhances consistency among Kennedy/Jenks Consultants personnel and among projects.

Borehole logging is the systematic observation and recording of geologic and hydrogeologic information from subsurface borings and excavations. As adopted by Kennedy/Jenks Consultants, and in accordance with general practices followed by the profession, the Unified Soil Classification System (USCS), (ASTM D 2488-90) is used to identify, classify, and describe soils.

RECOMMENDED MINIMUM REQUIREMENTS

Soil classification and borehole logging should be conducted by a geologist or another professional trained in the classification of soils.

EQUIPMENT

- Boring log forms (1st and 2nd sheet, K/J Form F-40.1, 40.2)
- Daily inspection report forms (K/J Form F-3, F-4)
- Chain of custody forms/request for analysis forms
- USCS (ASTM D 2488-90) Table and Classification Chart
- Soil color chart (i.e., Munsell)
- American Geological Institute (AGI) data sheets

- Graph paper
- Engineer's scale
- Previous project reports and boring logs
- Pocket knife or putty knife
- Hand lens
- Supply of clean water
- Dilute HCL
- Gloves (latex, nitrile as described in project Health & Safety Plan)
- Personal protective clothing and equipment, as described in the project Health & Safety Plan
- Sample containers (brass, steel or aluminum liners, plastic or glass jars)
- Decontamination equipment and supplies
- Aluminum foil, teflon sheets and paper towels

TYPICAL PROCEDURES

Soil Classification

Soils are typically logged in conjunction with advancing boreholes and sampling subsurface soils. Although the guideline focuses on classifying soil samples obtained from boreholes, this particular procedure also applies to soils and sediments collected using other techniques (e.g., post hole digger, scoop, Van Veen sampler, and backhoe).

The USCS categorizes soils into 15 basic groups, each with distinct geologic and engineering properties. The following steps are required to classify a soil sample:

1. Observe basic properties and characteristics of the soil. These include grain- size grading and distribution and influence of moisture on fine-grained soil.

2. Assign the soil a USCS classification and denote it by the standard group name and symbol.

3. Provide a written description to differentiate between soils in the same group, if necessary.

Many soils have characteristics that are not clearly associated with a specific soil group. These soils might be near the borderline between groups, based on either grain-size grading and distribution, or plasticity characteristics. In this case, assigning dual group names and symbols might be appropriate (e.g., GW/GC or ML/CL).

The three basic soil groups are:

- Coarse-Grained Soils. For soils in this group, more than half of the material is larger than No. 200 sieve (0.074 mm).

- Fine-Grained Soils. For soils in this group, one half or more of the material is smaller than No. 200 sieve (0.074 mm).

- Highly Organic Soils. This group includes soils with high organic content, such as peat.

  Note: No. 200 sieve is the smallest size that can be seen with the naked eye.

Classification of Coarse-Grained Soils

Coarse-grained soils are classified on the basis of:

1. Grain size and distribution
2. Quantity of fine-grained material (i.e., silt and clay)
3. Character of fine-grained material

Classification uses the following symbols:

Basic Symbols	Modifying Symbols
G - gravel	W - well graded
S - sand	P - poorly graded
	M - with silt fines
	C - with clay fines

The following are basic facts about coarse-grained soil classification:

- The basic symbol G is used if the estimated percentage of gravel is greater than that for sand. In contrast, the symbol S is used when the estimated percentage of sand is greater than the percentage of gravel.

- Gravels range in size from 3 in. to 1/4 in. (No. 4 sieve). Sands range in size from No. 4 sieve to No. 200 sieve. Use the Grain Size Scale Used by Engineers (ASTM Standards D422-63 and D643-78) to further classify grain size as specified by the USCS.

  Note: This grain size scale differs from the Modified Wentworth Scale used in teaching most geologists. Also, it introduces a distinction between sorting and grading.

- The modifying symbol W indicates good representation of all particle sizes.

- The modifying symbol P indicates that there is a predominant excess or absence of particle sizes.

- The symbol W or P is only used when there is less than 15 percent fines in a sample.

- Modifying symbol M is used if fines have little or no plasticity (silty).

- Modifying symbol C is used if fines have low to high plasticity (clayey).

- The following rules apply for the written description of the soil group name:

Types of Soil	Rule
Sands and gravels (clean)	Less than 5 percent fines
Sands (or gravels) with fines	5 to 15 percent fines
Silty (or clayey) sands or gravels	Greater than 15 percent fines

- Other descriptive information includes:

  - Color
  - Maximum grain size
  - Composition of grains
  - Approximate percentage of gravel, sand, and fines (use a percentage estimation chart)

Modifiers	Description
Trace	Less than 5 percent
Few	5 to 10 percent
Little	15 to 25 percent
Some	30 to 45 percent
Mostly	50 to 100 percent

  - Mineralogy
  - Grain shape (round, subround, angular, subangular)
  - Moisture (dry, moist, wet)
  - Structure
  - Organic material
  - Odor

Classification of Fine-Grained Soils

Fine-grained soils are classified on the basis of:

1. Liquid limit
2. Plasticity

Classification uses the following symbols:

Basic Symbols	Modifying Symbols
M - silt	L - low liquid limit
C - clay	H - high liquid limit
O - organic	
Pt - peat	

The following are basic facts about fine-grained soil classification:

- The basic symbol M is used if the soil is mostly silt, while symbol C applies if it consists mostly of clay. Use of symbol O indicates that

organic matter is present in an amount sufficient to influence soil properties. The symbol Pt indicates soil that consists mostly of organic material.

- Modifying symbols are based on the following hand tests conducted on a soil sample:

  - Dry strength (crushing resistance)
  - Dilatency (reaction to shaking)
  - Toughness (consistency near plastic limit)

- Soil designated ML has little or no plasticity and can be recognized by slight dry strength, quick dilatency, and slight toughness.

- CL indicates soil with slight to medium plasticity, which can be recognized by medium to high dry strength, very slow dilatency, and medium toughness.

- OL is used to describe a soil that is less plastic than CL soil and can be recognized by slight to medium dry strength, medium to slow dilatency, and slight toughness.

- MH soil has slight to medium plasticity and can be recognized by low dry strength, slow dilatency, and slight to medium toughness.

- Soil designated CH has high plasticity and is recognizable by its high dry strength, no dilatency, and high toughness.

- OH soil is less plastic than CH soil and can be recognized by medium to high dry strength, slow dilatency, and slight to medium toughness.

- Other descriptive information includes:

  - Color
  - Moisture
  - Consistency (very soft, soft, firm, hard, very hard)
  - Structure
  - Compactness (loose, dense) for silts
  - Cementation (uses hydrogen chloride)
  - Odor

Logging Refuse

This procedure applies to the logging of subsurface samples collected from a landfill or other waste disposal site:

1. Observe refuse as it is brought up by the hollow stem auger or bucket auger.

2. If necessary, place the refuse in a plastic bag to examine the sample.

3. Record observations according to the following:

   - Composition (by relative volume), e.g., paper, wood, plastic, cloth, cement, construction debris. Use such terms as "mostly" or "at least half." Do not use percentages.

   - Moisture content: dry, damp, moist, wet.

   - State of decomposition: highly decomposed, moderately decomposed, slightly decomposed, etc.

   - Color: obvious mottling included.

   - Texture: spongy, plastic (cohesive), friable.

   - Odor.

   - Combustible gas indicator readings (measure downhole).

   - Miscellaneous: dates of periodicals and newspapers, degree of drilling effort (easy, difficult, very difficult).

REFERENCES

"Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)." ASTM D-2488-90.

Compton, R. R. 1962. Manual of Field Geology. New York: John Wiley & Sons, Inc.

U.S. Department of the Interior. 1989. Earth Manual. Washington, D.C.: Water and Power Resources Service.

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