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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

August 1, 2006

David Green
Regional Environmental Coordinator
AFRPA Western Region Execution Center
3411 Olson Street
McClellan, CA 95652-1003

RE: **Field Audit and Split Sampling Event Results For George AFB**

Dear Mr. Green:

The purpose of this letter is to summarize EPA's findings for the field audit, split sampling, and performance evaluation sampling activities conducted with your staff during the April 2006 groundwater sampling event. We are pleased to report that our review shows no data quality problems or laboratory concerns, and most of the field sampling activities generally adhered to the approved basewide Sampling and Analysis Plan (SAP) with the exception of the field procedures for well WZ-06.

The AF's modified purge approach at well WZ-06 is not a recognized process in the SAP. Instead of using the Micro-Purge procedure specified in the Basewide SAP (Hydorgeologic, 1998), AF's field crew placed the pump one foot from bottom of well and pumped at approximately 1.5 gallons per minute to purge about 75 gallons. When the water level recovered, pumping continued at about 0.25 gpm, and sample collection occurred upon stabilization of field parameters. The AF is requested to provide justifications for the modified purge approach used at WZ-06, and document the procedure in an addendum to the Basewide SAP.

EPA thanks the AF and staff for its support of the subject event. Because lab data quality should be an ongoing concern, EPA encourages the AF to remain vigilant with monitoring for sound laboratory practices. If you have any questions, please contact me at extension (415) 972-3193.

James Chang
Remedial Project Manager

cc (email):
Jehiel Cass – RWQCB

File: 055 field audit_split sampling results

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX LABORATORY
1337 S. 46TH STREET BLDG 201
RICHMOND, CA 94804-4698

MEMORANDUM

SUBJECT: Field Audit Report
Groundwater Monitoring Program, George Air Force Base, CA

FROM: Greg Nagle, Environmental Scientist
EPA Region 9 Laboratory (PMD-2)

THROUGH: Brenda Bettencourt, Director
EPA Region 9 Laboratory (PMD-2)

TO: James Chang, Remedial Project Manager
Superfund Division (SFD-8-1)

Attached is a split sample report for sampling performed the week of April 10th, 2006. This report details observation made during the groundwater sample collection process.

If there are further questions concerning this field-sampling audit, please call Greg Nagle at (510) 412-2334.

ATTACHMENT: Field Audit Report

George Air Force Base
Basewide Groundwater Monitoring Program
April 2006
Field Audit Report

Introduction:
On April 10th , 11th, and 12th of 2006, Greg Nagle of the USEPA Region 9 Laboratory Field and Biology (FAB) team performed a field audit of groundwater sampling procedures in support of the George Air Force Base Groundwater Monitoring Program. Mr. Nagle also obtained split samples during the course of the field audit. The EPA FAB team conducted the field audit and split sampling in accordance with the following documents:

Basewide Sampling and Analysis Plan (SAP), George Air Force Base, California HydroGeoLogic 1998.

Final 2003 Annual Sampling and Analysis Plan (SAP) Addendum Basewide Groundwater Monitoring Events, Operable Units 1, 2, and 3 George Air Force Base, California MWH Americas, Inc. July 2003.

Final Split Sampling Plan (SSP) Basewide Groundwater Monitoring Program, George Air Force Base, Victorville, California. (EPA Region 9 Field and Biology Team, April, 2006.)

The FAB team identifies deviations from the project planning documents referenced above as findings in accordance with the following criteria:

1. Procedure not performed as specified in plan.
2. Procedure performed inconsistent with procedure specified in plan.
3. Appropriate procedure performed, procedure not specified in plan.
4. Inappropriate procedure performed.

Audit Participants:

Project Management
Sam Grizzle – Site Manager, Montgomery Watson Harza (MWH)

Field Support Personnel
Cole Munson – Principal Owner/Lead Sampler, M&M Environmental
Marlin Ellis – Sampler, M&M Environmental

EPA Auditors
Greg Nagle – USEPA Region 9 Laboratory
Joe Eidelberg – UESPA Region 9 Quality Assurance Office (QAO)

The EPA auditors observed sampling procedures and obtained split samples at the following locations as specified in the SSP.

Well ID	Parameters	Description
FT-03	VOCs	OU 1/OU 3/FT-19 Upper Aquifer
MW-49	VOCs	OU 2/OU 3 Upper Aquifer
MW-69	VOCs	OU 2/OU 3 Upper Aquifer
NZ-27	VOCs	OU 1 Upper Aquifer
NZ-89	OCPs	OU 3 Upper Aquifer
NZ-107	VOCs, LF Surrogates	OU 1/OU 3 Lower Aquifer - Landfill
WZ-06	VOCs, Nat Att. Par	OU 3/Site OT-51 Upper Aquifer

Notes:
VOCs – Volatile Organic Compounds
LF – Landfill Surrogates (i.e., Chloride, Nitrate, Sulfate)
Nat Att. Par. – Natural Attenuation Parameters (Total Organic Carbon, Alkalinity, Nitrate, Total Dissolved Solids)
OCPs – Organochlorine Pesticides

Procedures

M&M collected all samples using the same portable submersible pump and control box. M&M calibrated field instruments, calculated purge volumes, followed sample collection/preservation protocols, and performed necessary decontamination procedures in between wells as specified in the planning documents. In so doing, M&M was able to collect sample from 3-4 wells per day.

MWH provided M&M with direction, answered questions, and reviewed paperwork during the course of sampling activities to ensure efficiency and adherence to plan specifications. MWH packed the coolers, filled out air bills, and delivered samples for overnight delivery. The laboratory received all samples within 24 hours of collection, at 4° C without incident.

Photographs, field logs, and chain-of-custody information gathered during the course of audit activities are presented as Exhibit A, B, and C respectively. Identified below are general and specific audit findings with recommendations for corrective action. None of the findings listed impact sample integrity.

General Findings:

1. The projects' contract laboratory, Applied Physics and Chemistry Labs (APCL), Chino California unexpectedly announced it would no longer accept samples for environmental analysis effective April 1st, 2006. MWH is sending samples to EMAX Laboratories, Torrance, California. MWH reportedly audited EMAX within the last year for other projects. EMAX has experience with the US Air Force analytical requirements and data deliverables.

2. One field team (2 employees') of M&M Environmental unexpectedly quit immediately prior to the field audit. At the time of the field audit, M&M Environmental employed one very experienced sampler and one sampler in training.

Specific Findings:

1. Field personnel failed to perform a calibration check for well stabilization parameters (i.e., pH, conductivity, turbidity and dissolved oxygen) at the end of the day on April 10th, 2006 as specified in Section 7.1.1.1 of the Basewide SAP (HydroGeologic, 1998).

2. At MWH's direction, field support personnel did not purge well WZ-06 using the Micro-Purge/Modified Micro-Purge procedure specified in section 6.1.1.1.2 of the Basewide SAP (HydroGeologic, 1998). Instead, MWH directed field personnel to place the pump one foot from the bottom of the well, and pump at a rate of approximately 1.5 gallons per minute (gpm) to purge roughly 75 gallons. When the water level recovered, pumping continued at a rate of approximately 0.25 gpm. Sample collection occurred upon stabilization of field parameters as specified 7.1 of the Basewide SAP Addendum (MWH, 2003). MWH modified this purge technique based on experience and data generated from previous sampling events.

3. The EPA QAO did not provide performance evaluation samples (PES) for all the chemical testing parameters as specified in the SSP. The QAO provides PES through Quality Assurance Testing Support (QATS) Contract Laboratory in Las Vegas, Nevada. EPA and the USAF field personnel submitted PES for volatile organic compounds, nitrate, and alkalinity only. The QATS Laboratory provided a PES for total organic carbon (TOC) as requested, however the container type and chemical preservative was inconsistent with that used by the field and specified in the SSP thus compromising the "double blind" PES submission. QATS provided the PES as directed by EPA.

Delete. EMAX is very pleased with the audit by at least fed. facilities.

Recommendations:

1. MWH should perform an audit of EMAX Laboratories and communicate any project specific requirements as soon as possible. Given the recent closing of APCL, EMAX may be experiencing a significant influx of work from other projects.

2. Given the recent turnover in sampling support at M&M Environmental, and to a lesser degree Specific Finding 1, MWH should continue to provide on-site oversight support.

3. MWH should provide justification for the modified purge approach used at WZ-06 and document the procedure in an addendum to the Basewide SAP.

4. The EPA QAO should provide PES as specified in the SSP, or communicate changes with field personnel in advance of field sampling activities.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX LABORATORY
1337 S. 46TH STREET BLDG 201
RICHMOND, CA 94804-4698

MEMORANDUM JUL 7 2006

SUBJECT: Split Sample Report
Basewide Groundwater Monitoring Program,
George Air Force Base, Victorville, CA

FROM: Greg Nagle, Environmental Scientist
EPA Region 9 Laboratory (MTS-2)

THROUGH: Brenda Bettencourt, Director
EPA Region 9 Laboratory (MTS-2)

TO: James Chang, Remedial Project Manager
Superfund Division (SFD-8-1)

The EPA Region 9 Laboratory Field and Biology Team collected groundwater split samples at George Air Force Base, Victorville, California the week of April 10th 2006. Attached is the Split Sample Report.

ATTACHMENT: Split Sample Report

George Air Force Base
Basewide Groundwater Monitoring Program
April 2006
Split Sample Report

Introduction:
On April 10th, 11th, and 12th of 2006, I, Greg Nagle of the USEPA Region 9 Laboratory Field and Biology (FAB) Team obtained split samples in support of the George Air Force Base (GAFB) Groundwater Monitoring Program. I also performed a field audit during the course of split sampling activities, reviewed the data, and prepared this report. The GAFB Team executed the sampling in accordance with the following documents:

Basewide Sampling and Analysis Plan (SAP), George Air Force Base, California HydroGeoLogic 1998.

Final 2003 Annual Sampling and Analysis Plan (SAP) Addendum Basewide Groundwater Monitoring Events, Operable Units 1, 2, and 3 George Air Force Base, California MWH Americas, Inc. July 2003.

Final Split Sampling Plan (SSP) Basewide Groundwater Monitoring Program, George Air Force Base, Victorville, California. (EPA Region 9 Field and Biology Team, April 2006.)

I obtained split samples at the following locations as specified in the SSP.

Well ID	Parameters	Description
FT-03	VOCs	OU 1/OU 3/FT-19 Upper Aquifer
MW-49	VOCs	OU 2/OU 3 Upper Aquifer
MW-69	VOCs	OU 2/OU 3 Upper Aquifer
NZ-27	VOCs	OU 1 Upper Aquifer
NZ-89	OCPs	OU 3 Upper Aquifer
NZ-107	VOCs, LF Surrogates	OU 1/OU 3 Lower Aquifer - Landfill
WZ-06	VOCs, Nat Att. Par	OU 3/Site OT-51 Upper Aquifer
MW-200	VOCs, Anions, TDS	Performance Evaluation (PE) Sample

Notes:
VOCs – Volatile Organic Compounds
OCPs – Organochlorine Pesticides
LF – Landfill Surrogates (i.e., Chloride, Nitrate, Sulfate)
Nat Att. Par. – Natural Attenuation Parameters (Total Organic Carbon, Alkalinity, Nitrate, Total Dissolved Solids)

Participants
A few day's prior to sampling, GAFBs' primary contract laboratory, Applied Physics and Chemistry Laboratory (APCL), Chino California, unexpectedly announced it would no longer accept samples for environmental analysis effective April 1st, 2006. The GAFB Team arranged for another laboratory (EMAX Laboratories) immediately prior to sampling.

George Air Force Base
Montgomery-Watson-Harza (MWH) – Field Oversight (under contract to GAFB)

M&M Environmental –Sample Collection (under contact to MWH)
EMAX Laboratories, Torrance, California – Chemical Testing (under contract to MWH)

EPA Region 9
Greg Nagle (EPA) – Field Oversight
A-4 Scientific, The Woodlands, Texas – VOC and OCPs (under contract to EPA)
USEPA Region 9 Laboratory, Richmond, California – Alkalinity, Anions, TOC, TDS

Split Sample Collection
M&M Environmental used a single portable centrifugal submersible pump, decontaminated between each well, prior to collection of the samples. At MWH's direction, M&M collected primary and split samples from each well into pre-preserved containers alternately (i.e., GAFB-EPA-GAFB-etc...,). Immediately thereafter, I placed the samples on ice and maintained chain-of-custody until shipment to the respective laboratories.

Quality Control Sample Collection
Trip blanks provided by MWH field office accompanied the sample containers to and from the field. I requested additional sample volume at wells NZ-107, WZ-06, and NZ-89 for matrix spike and duplicate analyses at the respective EPA laboratories. While in the field, the EPA Region 9 Quality Assurance Office (QAO) provided performance evaluation (PE) samples for VOC, OCP, alkalinity, and nitrate analysis (MW-200) for double-blind submission to appropriate laboratories.

Methods of Analysis

Volatile Organics
The method used for VOC analysis varied between the GAFB and EPA laboratories. EMAX (GAFB) analyzed the primary samples by SW8260B in accordance with project guidance documents, and A4 Scientific (EPA) analyzed the split samples by SOM01.1 in accordance with the contract laboratory program (CLP) statement of work (SOW) and the George AFB SSP. While the analytical technique used by both laboratories is essentially the same, Gas Chromatography/Mass Spectroscopy, there are differences in compounds reported.

Reported under SW8260B (but not on the SOM01.1 list)		**Reported under SOM01.1 (but not on the 8260B list)**
1,1,1,2-Tetrachloroethane	Dibromomethane	Freon 113 (1,1,2-Trichloro-1,2,2-trifluoroethane)
1,1-Dichloropropane	Hexachlorobutadiene	1,4-Dioxane
1,2,3-Trichlorpropane	Isopropylbenzene	2-Butanone
1,2,4-Trimethylbenzene	n-Butylbenzene	4-Methyl-2-Pentanone
1,3,5-Trimethylbenzene	n-Propylbenzene	Acetone
1-Chlorohexane	Naphthalene	Methyl Acetate
2,2-Dichloropropane	p-Cymene	
2-Chlorotoluene	s-Butylbenzene	
4-Chlorotoluene	t-Butylbenzene	
Bromobenzene		

The split sample comparison (Table 1) addresses only those compounds analyzed under SW8260B. Compounds not reported by the EPA contract laboratory are identified by an NR in the result field. Notably, Freon 113 (4.3 µg/L), reported under SOM01.1, is not reported under SW8260B, and n-

Butylbenzene (7.5 µg/L), reported under SW8260B, is not reported under SOM01.1. This is most evident in the PE sample (MW-200).

Organochlorine Pesticides

The method used for OCP analysis also varied between the two laboratories. EMAX analyzed the primary samples by SW8081A in accordance with project guidance documents, and A4 Scientific analyzed the split samples by SOM01.1 in accordance with the CLP SOW and the SSP. While the analytical technique used by both laboratories is essentially the same, Gas Chromatography/Electron Capture Detector, there is a notable reporting difference. Under SW8081A, the laboratory reports the sum of the chlordane isomers. This is not required under SOM01.1. Neither laboratory reported chlordane in any of the samples.

Split Sample Data Calculation/Evaluation

I calculated the relative percent difference (RPD) and evaluated the data as specified in the approved SSP as follows:

Calculation:

$$RPD = Abs([R1 - R2]/[R1+R2]/2) * 100\%$$

Where, R1 = primary result (GAFB)
R2 = split result (EPA)
Abs = absolute value

Evaluation:

Disagreement

- Difference in results is greater than two times the MDL when one result is less than the MDL
- RPD of results is greater than 100% if either result is greater than 2 times the MDL
- RPD of results is greater than 30% if both results are greater than 5 times the MDL

Major Disagreement

- Difference in results is greater than four times the MDL when one result is less than the MDL
- RPD of results is greater than 200% if either result is greater than 2 times the MDL
- RPD of results is greater than 60% if both results are greater than 5 times the MDL

1) The RPD is not calculated (NC) when no value is reported by either laboratory (both not detected).

2) The RPD is calculated using method detection limit (MDL) value when a positive result is reported by the one laboratory, and reported as not detected by the other.

A summary of outliers and a complete tabulation of primary and split results by parameter are provided in Table 1, Split Sample Comparison.

Summary

The primary results agree with the split results as defined above for all parameters except VOCs. Overall, the VOC split sample results are consistently lower than the primary results. While lower, the split sample results for field samples agreed with primary values with the exception of the

trichloroethylene (TCE) and chloroform results reported for MW-49 and NZ-27. Additionally, the majority of the results for the VOC PE sample (MW-200) did not agree. Twelve of the 15 compounds reported had values greater than 5 times the MDL, and an RPD exceeding 30 percent.

Trichloroethylene

At MW-49, both laboratories reported TCE values at greater than 5 times the MDL, and the RPD exceeded 30 percent. The deviation from the control limit for TCE is slight, (i.e., about 5 percent) and the disagreement is minor. Based on follow-up data provided by MWH, the primary values compare more closely to historic values (Attachment A – Follow-Up Data).

Chloroform

At MW-69 and NZ-27, the primary laboratory reported chloroform at just over 5 times the MDL, while the split laboratory did not detect chloroform in any of the samples. Although potentially a field contaminant from tap water used for decontamination, chloroform was not detected in the associated field blank. However, MWH reported that chloroform was detected at 0.22 µg/L in a non-associated equipment blank on April 28, 2006. Additionally, chloroform was not detected in the source water used for the final decontamination rinse, or any other associated laboratory blank (i.e., method or storage) or field blank (i.e., trip or equipment rinse). MWH has reported chloroform at these locations for the last two or more quarters (Attachment A – Follow-Up Data).

Methylene Chloride

I considered the methylene chloride reported in the split samples a laboratory contaminant as it was present at less than 5 times the concentration found in associated laboratory blanks (i.e., method and storage). Methylene chloride was not detected in the primary samples.

Performance Evaluation (PE) Sample

As stated above, 12 of the 15 compounds reported had values greater than 5 times the MDL, and an RPD exceeding 30 percent. The deviation from the control limit ranged from 2 to 14 percent. Again, the split results (EPA) are consistently lower than the primary results (GAFB). The EPA QAO scores and provides an assessment of each PE sample result based on a comparison to a nominal (calculated or "true") value. The QAO assessment of the PE samples is pending.

Table 1

Split Sample Comparison

SPLIT SAMPLE DATA OUTLIERS
APRIL 2006 BASEWIDE GROUNDWATER MONITORING EVENT
GEORGE AIR FORCE BASE, CALIFORNIA

MW-49
4/12/2006

	Primary (µg/L)			EPA Split (µg/L)				RPD
Analyte	**Result**	**RL**	**MDL**	**Result**	**RL**	**MDL**	**RPD**	**Limit**
Trichloroethylene (TCE)	**20**	0.5	0.2	**11**	0.5	0.2	**35**	**30**
Chloroform	**0.7**	0.4	0.2	ND	0.5	**0.2**	**63**	**30**

NZ-27
4/12/2006

	Primary (µg/L)			EPA Split (µg/L)				
Analyte	**Result**	**RL**	**MDL**	**Result**	**RL**	**MDL**	**RPD**	
Chloroform	**0.62**	0.4	0.2	ND	0.5	**0.2**	**58**	**30**

MW-200 (PE)
4/12/2006

	Primary (µg/L)			EPA Split (µg/L)				
Analyte	**Result**	**RL**	**MDL**	**Result**	**RL**	**MDL**	**RPD**	
1,2,3-Trichlorobenzene	**3.9**	0.5	0.2	**2.1**	0.5	0.2	**36**	**30**
1,2-Dichloropropane	**3.6**	0.4	0.2	**2.1**	0.5	0.2	**32**	**30**
1,3-Dichlorobenzene	**1.7**	1.2	0.78	**0.78**	0.5	0.2	**44**	**30**
Benzene	**3.7**	0.4	0.2	**2.0**	0.5	0.2	**36**	**30**
Carbon tetrachloride	**2.4**	0.4	0.2	**1.3**	0.5	0.2	**36**	**30**
Chlorobenzene	**4.4**	0.4	0.2	**2.5**	0.5	0.2	**34**	**30**
Ethylbenzene	**5.3**	0.6	0.2	**2.9**	0.5	0.2	**36**	**30**
m,p-Xylene	**5.3**	0.8	0.37	**3.1**	0.5	0.2	**32**	**30**
o-Xylene	**3.5**	1.1	0.2	**1.8**	0.5	0.2	**39**	**30**
Tetrachloroethylene (PCE)	**8.3**	1.4	0.2	**4.6**	0.5	0.2	**35**	**30**
Toluene	**7.3**	1.1	0.2	**4.2**	0.5	0.2	**33**	**30**
Trichloroethylene (TCE)	**13**	0.5	0.2	**7.3**	0.5	0.2	**34**	**30**

Notes:
µg/L - micrograms per liter
NA - Not Analyzed
NC - Not Calculated
ND - Not detected

SPLIT SAMPLE DATA COMPARISON FOR VOLATILES
APRIL 2006 BASEWIDE GROUNDWATER MONITORING EVENT
GEORGE AIR FORCE BASE, CALIFORNIA

	FT-03 4/11/2006						
	Primary (µg/L)			EPA Split (µg/L)			
Analyte	**Result**	**RL**	**MDL**	**Result**	**RL**	**MDL**	**RPD**
1,1,1,2-Tetrachloroethane	ND	0.5	0.2	NA	NA	NA	NA
1,1,1-Trichloroethane	ND	0.8	0.2	ND	0.5	0.2	NC
1,1,2,2-Tetrachloroethane	ND	0.4	0.2	ND	0.5	0.2	NC
1,1,2-Trichloroethane	ND	1	0.2	ND	0.5	0.2	NC
1,1-Dichloroethane	ND	0.4	0.2	ND	0.5	0.2	NC
1,1-Dichloroethene	ND	1.2	0.2	ND	0.5	0.2	NC
1,1-Dichloropropene	ND	1	0.2	NA	NA	NA	NA
1,2,3-Trichlorobenzene	ND	0.5	0.2	ND	0.5	0.2	NC
1,2,3-Trichloropropane	ND	3.2	0.5	ND	0.5	0.2	NC
1,2,4-Trichlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
1,2,4-Trimethylbenzene	ND	1.3	0.2	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	ND	2.6	0.5	ND	0.5	0.2	NC
1,2-Dibromoethane (EDB)	ND	0.6	0.2	ND	0.5	0.2	NC
1,2-Dichlorobenzene	ND	0.3	0.2	ND	0.5	0.2	NC
1,2-Dichloroethane	ND	0.5	0.2	ND	0.5	0.2	NC
1,2-Dichloropropane	ND	0.4	0.2	ND	0.5	0.2	NC
1,3,5-Trimethylbenzene	ND	0.5	0.2	NA	NA	NA	NA
1,3-Dichlorobenzene	ND	1.2	0.2	ND	0.5	0.2	NC
1,3-Dichloropropane	ND	0.4	0.2	ND	0.5	0.2	NC
1,4-Dichlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
1-Chlorohexane	ND	0.5	0.2	NA	NA	NA	NA
2,2-Dichloropropane	ND	3.5	0.2	NA	NA	NA	NA
2-Chlorotoluene	ND	0.4	0.2	NA	NA	NA	NA
4-Chlorotoluene	ND	0.6	0.2	NA	NA	NA	NA
Benzene	ND	0.4	0.2	ND	0.5	0.2	NC
Bromobenzene	ND	0.4	0.2	NA	NA	NA	NA
Bromochloromethane	ND	0.4	0.2	ND	0.5	0.2	NC
Bromodichloromethane	ND	0.8	0.2	ND	0.5	0.2	NC
Bromoform	ND	1.2	0.3	ND	0.5	0.2	NC
Bromomethane	ND	1.1	0.2	ND	0.5	0.2	NC
Carbon tetrachloride	ND	0.4	0.2	ND	0.5	0.2	NC
Chlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
Chloroethane	ND	1	0.2	ND	0.5	0.2	NC
Chloroform	**0.36**	0.4	0.2	ND	0.5	**0.2**	**35**
Chloromethane	ND	1.3	0.2	ND	0.5	0.2	NC
cis-1,2-Dichloroethylene	ND	1.2	0.2	ND	0.5	0.2	NC
cis-1,3-Dichloropropene	ND	0.5	0.2	ND	0.5	0.2	NC
Dibromochloromethane	ND	0.5	0.2	ND	0.5	0.2	NC
Dibromomethane	ND	2.4	0.2	NA	NA	NA	NA
Dichlorodifluoromethane	ND	1	0.3	ND	0.5	0.2	NC
Ethylbenzene	ND	0.6	0.2	ND	0.5	0.2	NC
Hexachlorobutadiene	ND	1.1	0.2	NA	NA	NA	NA
Isopropylbenzene (Cumene)	ND	0.5	0.2	NA	NA	NA	NA
m,p-Xylene	ND	0.8	0.37	ND	0.5	0.2	NC
Methylene chloride	ND	2.5	0.5	ND	**0.42B**	0.2	NC
n-Butylbenzene	ND	1.1	0.2	NA	NA	NA	NA
n-Propylbenzene	ND	0.4	0.2	NA	NA	NA	NA
Naphthalene	ND	1	0.5	NA	NA	NA	NA
o-Xylene	ND	1.1	0.2	ND	0.5	0.2	NC
p-Cymene (p-isopropyltoluene)	ND	1.2	0.2	NA	NA	NA	NA
sec-Butylbenzene	ND	1.3	0.2	NA	NA	NA	NA
Styrene	ND	0.4	0.2	ND	0.5	0.2	NC
t-Butylbenzene	ND	1.4	0.2	NA	NA	NA	NA
Tert-Butyl methyl ether	ND	0.5	0.2	ND	0.5	0.2	NC
Tetrachloroethylene (PCE)	**1.0**	1.4	0.2	**0.98**	0.5	0.2	**1.3**
Toluene	ND	1.1	0.2	ND	0.5	0.2	NC
trans-1,2-Dichloroethene	ND	0.6	0.2	ND	0.5	0.2	NC
trans-1,3-Dichloropropene	ND	0.5	0.2	ND	0.5	0.2	NC
Trichloroethylene (TCE)	**6.2**	0.5	0.2	**6**	0.5	0.2	**2.2**
Trichlorofluoromethane	ND	0.8	0.2	ND	0.5	0.2	NC
Vinyl chloride	ND	0.5	0.2	ND	0.5	0.2	NC

Notes:
µg/L - micrograms per liter
NA - Not Analyzed
NC - Not Calculated
ND - Not detected
B - Laboratory Contaminant

SPLIT SAMPLE DATA COMPARISON FOR VOLATILES
APRIL 2006 BASEWIDE GROUNDWATER MONITORING EVENT
GEORGE AIR FORCE BASE, CALIFORNIA

MW-49
4/12/2006

	Primary (µg/L)			EPA Split (µg/L)			
Analyte	**Result**	**RL**	**MDL**	**Result**	**RL**	**MDL**	**RPD**
1,1,1,2-Tetrachloroethane	ND	0.5	0.2	NA	NA	NA	NA
1,1,1-Trichloroethane	ND	0.8	0.2	ND	0.5	0.2	NC
1,1,2,2-Tetrachloroethane	ND	0.4	0.2	ND	0.5	0.2	NC
1,1,2-Trichloroethane	ND	1	0.2	ND	0.5	0.2	NC
1,1-Dichloroethane	ND	0.4	0.2	ND	0.5	0.2	NC
1,1-Dichloroethene	ND	1.2	0.2	ND	0.5	0.2	NC
1,1-Dichloropropene	ND	1	0.2	NA	NA	NA	NA
1,2,3-Trichlorobenzene	ND	0.5	0.2	ND	0.5	0.2	NC
1,2,3-Trichloropropane	ND	3.2	0.5	ND	0.5	0.2	NC
1,2,4-Trichlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
1,2,4-Trimethylbenzene	ND	1.3	0.2	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	ND	2.6	0.5	ND	0.5	0.2	NC
1,2-Dibromoethane (EDB)	ND	0.6	0.2	ND	0.5	0.2	NC
1,2-Dichlorobenzene	ND	0.3	0.2	ND	0.5	0.2	NC
1,2-Dichloroethane	ND	0.5	0.2	ND	0.5	0.2	NC
1,2-Dichloropropane	ND	0.4	0.2	ND	0.5	0.2	NC
1,3,5-Trimethylbenzene	ND	0.5	0.2	NA	NA	NA	NA
1,3-Dichlorobenzene	ND	1.2	0.2	ND	0.5	0.2	NC
1,3-Dichloropropane	ND	0.4	0.2	ND	0.5	0.2	NC
1,4-Dichlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
1-Chlorohexane	ND	0.5	0.2	NA	NA	NA	NA
2,2-Dichloropropane	ND	3.5	0.2	NA	NA	NA	NA
2-Chlorotoluene	ND	0.4	0.2	NA	NA	NA	NA
4-Chlorotoluene	ND	0.6	0.2	NA	NA	NA	NA
Benzene	ND	0.4	0.2	ND	0.5	0.2	NC
Bromobenzene	ND	0.4	0.2	NA	NA	NA	NA
Bromochloromethane	ND	0.4	0.2	ND	0.5	0.2	NC
Bromodichloromethane	ND	0.8	0.2	ND	0.5	0.2	NC
Bromoform	ND	1.2	0.3	ND	0.5	0.2	NC
Bromomethane	ND	1.1	0.2	ND	0.5	0.2	NC
Carbon tetrachloride	ND	0.4	0.2	ND	0.5	0.2	NC
Chlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
Chloroethane	ND	1	0.2	ND	0.5	0.2	NC
Chloroform	**0.7**	0.4	0.2	ND	0.5	**0.2**	**63**
Chloromethane	ND	1.3	0.2	ND	0.5	0.2	NC
cis-1,2-Dichloroethylene	ND	1.2	0.2	ND	0.5	0.2	NC
cis-1,3-Dichloropropene	ND	0.5	0.2	ND	0.5	0.2	NC
Dibromochloromethane	ND	0.5	0.2	ND	0.5	0.2	NC
Dibromomethane	ND	2.4	0.2	NA	NA	NA	NA
Dichlorodifluoromethane	ND	1	0.3	ND	0.5	0.2	NC
Ethylbenzene	ND	0.6	0.2	ND	0.5	0.2	NC
Hexachlorobutadiene	ND	1.1	0.2	NA	NA	NA	NA
Isopropylbenzene (Cumene)	ND	0.5	0.2	NA	NA	NA	NA
m,p-Xylene	ND	0.8	0.37	ND	0.5	0.2	NC
Methylene chloride	ND	2.5	0.5	ND	**0.39B**	0.2	NC
n-Butylbenzene	ND	1.1	0.2	NA	NA	NA	NA
n-Propylbenzene	ND	0.4	0.2	NA	NA	NA	NA
Naphthalene	ND	1	0.5	NA	NA	NA	NA
o-Xylene	ND	1.1	0.2	ND	0.5	0.2	NC
p-Cymene (p-isopropyltoluene)	ND	1.2	0.2	NA	NA	NA	NA
sec-Butylbenzene	ND	1.3	0.2	NA	NA	NA	NA
Styrene	ND	0.4	0.2	ND	0.5	0.2	NC
t-Butylbenzene	ND	1.4	0.2	NA	NA	NA	NA
Tert-Butyl methyl ether	ND	0.5	0.2	ND	0.5	0.2	NC
Tetrachloroethylene (PCE)	ND	1.4	0.2	ND	0.5	0.2	NC
Toluene	ND	1.1	0.2	ND	0.5	0.2	NC
trans-1,2-Dichloroethene	ND	0.6	0.2	ND	0.5	0.2	NC
trans-1,3-Dichloropropene	ND	0.5	0.2	ND	0.5	0.2	NC
Trichloroethylene (TCE)	**20**	0.5	0.2	**11**	0.5	0.2	**35**
Trichlorofluoromethane	ND	0.8	0.2	ND	0.5	0.2	NC
Vinyl chloride	ND	0.5	0.2	ND	0.5	0.2	NC

Notes:
µg/L - micrograms per liter
NA - Not Analyzed
NC - Not Calculated
ND - Not detected

SPLIT SAMPLE DATA COMPARISON FOR VOLATILES
APRIL 2006 BASEWIDE GROUNDWATER MONITORING EVENT
GEORGE AIR FORCE BASE, CALIFORNIA

MW-69
4/11/2006

	Primary (µg/L)			EPA Split (µg/L)			
Analyte	**Result**	**RL**	**MDL**	**Result**	**RL**	**MDL**	**RPD**
1,1,1,2-Tetrachloroethane	ND	0.5	0.2	NA	NA	NA	NA
1,1,1-Trichloroethane	ND	0.8	0.2	ND	0.5	0.2	NC
1,1,2,2-Tetrachloroethane	ND	0.4	0.2	ND	0.5	0.2	NC
1,1,2-Trichloroethane	ND	1	0.2	ND	0.5	0.2	NC
1,1-Dichloroethane	ND	0.4	0.2	ND	0.5	0.2	NC
1,1-Dichloroethene	ND	1.2	0.2	ND	0.5	0.2	NC
1,1-Dichloropropene	ND	1	0.2	NA	NA	NA	NA
1,2,3-Trichlorobenzene	ND	0.5	0.2	ND	0.5	0.2	NC
1,2,3-Trichloropropane	ND	3.2	0.5	ND	0.5	0.2	NC
1,2,4-Trichlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
1,2,4-Trimethylbenzene	ND	1.3	0.2	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	ND	2.6	0.5	ND	0.5	0.2	NC
1,2-Dibromoethane (EDB)	ND	0.6	0.2	ND	0.5	0.2	NC
1,2-Dichlorobenzene	ND	0.3	0.2	ND	0.5	0.2	NC
1,2-Dichloroethane	ND	0.5	0.2	ND	0.5	0.2	NC
1,2-Dichloropropane	ND	0.4	0.2	ND	0.5	0.2	NC
1,3,5-Trimethylbenzene	ND	0.5	0.2	NA	NA	NA	NA
1,3-Dichlorobenzene	ND	1.2	0.2	ND	0.5	0.2	NC
1,3-Dichloropropane	ND	0.4	0.2	ND	0.5	0.2	NC
1,4-Dichlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
1-Chlorohexane	ND	0.5	0.2	NA	NA	NA	NA
2,2-Dichloropropane	ND	3.5	0.2	NA	NA	NA	NA
2-Chlorotoluene	ND	0.4	0.2	NA	NA	NA	NA
4-Chlorotoluene	ND	0.6	0.2	NA	NA	NA	NA
Benzene	ND	0.4	0.2	ND	0.5	0.2	NC
Bromobenzene	ND	0.4	0.2	NA	NA	NA	NA
Bromochloromethane	ND	0.4	0.2	ND	0.5	0.2	NC
Bromodichloromethane	ND	0.8	0.2	ND	0.5	0.2	NC
Bromoform	ND	1.2	0.3	ND	0.5	0.2	NC
Bromomethane	ND	1.1	0.2	ND	0.5	0.2	NC
Carbon tetrachloride	ND	0.4	0.2	ND	0.5	0.2	NC
Chlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
Chloroethane	ND	1	0.2	ND	0.5	0.2	NC
Chloroform	ND	0.4	0.2	ND	0.5	0.2	NC
Chloromethane	ND	1.3	0.2	ND	0.5	0.2	NC
cis-1,2-Dichloroethylene	ND	1.2	0.2	ND	0.5	0.2	NC
cis-1,3-Dichloropropene	ND	0.5	0.2	ND	0.5	0.2	NC
Dibromochloromethane	ND	0.5	0.2	ND	0.5	0.2	NC
Dibromomethane	ND	2.4	0.2	NA	NA	NA	NA
Dichlorodifluoromethane	ND	1	0.3	ND	0.5	0.2	NC
Ethylbenzene	ND	0.6	0.2	ND	0.5	0.2	NC
Hexachlorobutadiene	ND	1.1	0.2	NA	NA	NA	NA
Isopropylbenzene (Cumene)	ND	0.5	0.2	NA	NA	NA	NA
m,p-Xylene	ND	0.8	0.37	ND	0.5	0.2	NC
Methylene chloride	ND	2.5	0.5	ND	**0.35B**	0.2	NC
n-Butylbenzene	ND	1.1	0.2	NA	NA	NA	NA
n-Propylbenzene	ND	0.4	0.2	NA	NA	NA	NA
Naphthalene	ND	1	0.5	NA	NA	NA	NA
o-Xylene	ND	1.1	0.2	ND	0.5	0.2	NC
p-Cymene (p-isopropyltoluene)	ND	1.2	0.2	NA	NA	NA	NA
sec-Butylbenzene	ND	1.3	0.2	NA	NA	NA	NA
Styrene	ND	0.4	0.2	ND	0.5	0.2	NC
t-Butylbenzene	ND	1.4	0.2	NA	NA	NA	NA
Tert-Butyl methyl ether	**24**	0.5	0.2	**30**	0.5	0.2	**15**
Tetrachloroethylene (PCE)	ND	1.4	0.2	ND	0.5	0.2	NC
Toluene	ND	1.1	0.2	ND	0.5	0.2	NC
trans-1,2-Dichloroethene	ND	0.6	0.2	ND	0.5	0.2	NC
trans-1,3-Dichloropropene	ND	0.5	0.2	ND	0.5	0.2	NC
Trichloroethylene (TCE)	ND J	0.5	0.2	ND	0.5	0.2	NC
Trichlorofluoromethane	ND	0.8	0.2	ND	0.5	0.2	NC
Vinyl chloride	ND	0.5	0.2	ND	0.5	0.2	NC

Notes:
µg/L - micrograms per liter
NA - Not Analyzed
NC - Not Calculated
ND - Not detected

SPLIT SAMPLE DATA COMPARISON FOR VOLATILES
APRIL 2006 BASEWIDE GROUNDWATER MONITORING EVENT
GEORGE AIR FORCE BASE, CALIFORNIA

NZ-107
4/10/2006

	Primary (µg/L)			EPA Split (µg/L)			
Analyte	**Result**	**RL**	**MDL**	**Result**	**RL**	**MDL**	**RPD**
1,1,1,2-Tetrachloroethane	ND	0.5	0.2	NA	NA	NA	NA
1,1,1-Trichloroethane	ND	0.8	0.2	ND	0.5	0.2	NC
1,1,2,2-Tetrachloroethane	ND	0.4	0.2	ND	0.5	0.2	NC
1,1,2-Trichloroethane	ND	1	0.2	ND	0.5	0.2	NC
1,1-Dichloroethane	**0.22**	0.4	0.2	**0.17**	0.5	0.2	**16**
1,1-Dichloroethene	ND	1.2	0.2	ND	0.5	0.2	NC
1,1-Dichloropropene	ND	1	0.2	NA	NA	NA	NA
1,2,3-Trichlorobenzene	ND	0.5	0.2	ND	0.5	0.2	NC
1,2,3-Trichloropropane	ND	3.2	0.5	ND	0.5	0.2	NC
1,2,4-Trichlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
1,2,4-Trimethylbenzene	ND	1.3	0.2	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	ND	2.6	0.5	ND	0.5	0.2	NC
1,2-Dibromoethane (EDB)	ND	0.6	0.2	ND	0.5	0.2	NC
1,2-Dichlorobenzene	ND	0.3	0.2	ND	0.5	0.2	NC
1,2-Dichloroethane	ND	0.5	0.2	ND	0.5	0.2	NC
1,2-Dichloropropane	ND	0.4	0.2	ND	0.5	0.2	NC
1,3,5-Trimethylbenzene	ND	0.5	0.2	NA	NA	NA	NA
1,3-Dichlorobenzene	ND	1.2	0.2	ND	0.5	0.2	NC
1,3-Dichloropropane	ND	0.4	0.2	ND	0.5	0.2	NC
1,4-Dichlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
1-Chlorohexane	ND	0.5	0.2	NA	NA	NA	NA
2,2-Dichloropropane	ND	3.5	0.2	NA	NA	NA	NA
2-Chlorotoluene	ND	0.4	0.2	NA	NA	NA	NA
4-Chlorotoluene	ND	0.6	0.2	NA	NA	NA	NA
Benzene	ND	0.4	0.2	ND	0.5	0.2	NC
Bromobenzene	ND	0.4	0.2	NA	NA	NA	NA
Bromochloromethane	ND	0.4	0.2	ND	0.5	0.2	NC
Bromodichloromethane	ND	0.8	0.2	ND	0.5	0.2	NC
Bromoform	ND	1.2	0.3	ND	0.5	0.2	NC
Bromomethane	ND	1.1	0.2	ND	0.5	0.2	NC
Carbon tetrachloride	ND	0.4	0.2	ND	0.5	0.2	NC
Chlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
Chloroethane	ND	1	0.2	ND	0.5	0.2	NC
Chloroform	**0.21**	0.4	0.2	ND	0.5	**0.2**	**3**
Chloromethane	ND	1.3	0.2	ND	0.5	0.2	NC
cis-1,2-Dichloroethylene	**0.22**	1.2	0.2	**0.2**	0.5	0.2	**6**
cis-1,3-Dichloropropene	ND	0.5	0.2	ND	0.5	0.2	NC
Dibromochloromethane	ND	0.5	0.2	ND	0.5	0.2	NC
Dibromomethane	ND	2.4	0.2	NA	NA	NA	NA
Dichlorodifluoromethane	ND	1	0.3	ND	0.5	0.2	NC
Ethylbenzene	ND	0.6	0.2	ND	0.5	0.2	NC
Hexachlorobutadiene	ND	1.1	0.2	NA	NA	NA	NA
Isopropylbenzene (Cumene)	ND	0.5	0.2	NA	NA	NA	NA
m,p-Xylene	ND	0.8	0.37	ND	0.5	0.2	NC
Methylene chloride	ND	2.5	0.5	ND	**0.33B**	0.2	NC
n-Butylbenzene	ND	1.1	0.2	NA	NA	NA	NA
n-Propylbenzene	ND	0.4	0.2	NA	NA	NA	NA
Naphthalene	ND	1	0.5	NA	NA	NA	NA
o-Xylene	ND	1.1	0.2	ND	0.5	0.2	NC
p-Cymene (p-isopropyltoluene)	ND	1.2	0.2	NA	NA	NA	NA
sec-Butylbenzene	ND	1.3	0.2	NA	NA	NA	NA
Styrene	ND	0.4	0.2	ND	0.5	0.2	NC
t-Butylbenzene	ND	1.4	0.2	NA	NA	NA	NA
Tert-Butyl methyl ether	ND	0.5	0.2	ND	0.5	0.2	NC
Tetrachloroethylene (PCE)	ND	1.4	0.2	ND	0.5	0.2	NC
Toluene	ND	1.1	0.2	ND	0.5	0.2	NC
trans-1,2-Dichloroethene	ND	0.6	0.2	ND	0.5	0.2	NC
trans-1,3-Dichloropropene	ND	0.5	0.2	ND	0.5	0.2	NC
Trichloroethylene (TCE)	**7.3**	0.5	0.2	**5.3**	0.5	0.2	**20**
Trichlorofluoromethane	ND	0.8	0.2	ND	0.5	0.2	NC
Vinyl chloride	ND	0.5	0.2	ND	0.5	0.2	NC

Notes:
µg/L - micrograms per liter
NA - Not Analyzed
NC - Not Calculated
ND - Not detected

SPLIT SAMPLE DATA COMPARISON FOR VOLATILES
APRIL 2006 BASEWIDE GROUNDWATER MONITORING EVENT
GEORGE AIR FORCE BASE, CALIFORNIA

	NZ-27 4/12/2006						
	Primary (µg/L)			EPA Split (µg/L)			
Analyte	**Result**	**RL**	**MDL**	**Result**	**RL**	**MDL**	**RPD**
1,1,1,2-Tetrachloroethane	ND	0.5	0.2	NA	NA	NA	NA
1,1,1-Trichloroethane	ND	0.8	0.2	ND	0.5	0.2	NC
1,1,2,2-Tetrachloroethane	ND	0.4	0.2	ND	0.5	0.2	NC
1,1,2-Trichloroethane	ND	1	0.2	ND	0.5	0.2	NC
1,1-Dichloroethane	ND	0.4	0.2	ND	0.5	0.2	NC
1,1-Dichloroethene	ND	1.2	0.2	ND	0.5	0.2	NC
1,1-Dichloropropene	ND	1	0.2	NA	NA	NA	NA
1,2,3-Trichlorobenzene	ND	0.5	0.2	ND	0.5	0.2	NC
1,2,3-Trichloropropane	ND	3.2	0.5	ND	0.5	0.2	NC
1,2,4-Trichlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
1,2,4-Trimethylbenzene	ND	1.3	0.2	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	ND	2.6	0.5	ND	0.5	0.2	NC
1,2-Dibromoethane (EDB)	ND	0.6	0.2	ND	0.5	0.2	NC
1,2-Dichlorobenzene	ND	0.3	0.2	ND	0.5	0.2	NC
1,2-Dichloroethane	ND	0.5	0.2	ND	0.5	0.2	NC
1,2-Dichloropropane	ND	0.4	0.2	ND	0.5	0.2	NC
1,3,5-Trimethylbenzene	ND	0.5	0.2	NA	NA	NA	NA
1,3-Dichlorobenzene	ND	1.2	0.2	ND	0.5	0.2	NC
1,3-Dichloropropane	ND	0.4	0.2	ND	0.5	0.2	NC
1,4-Dichlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
1-Chlorohexane	ND	0.5	0.2	NA	NA	NA	NA
2,2-Dichloropropane	ND	3.5	0.2	NA	NA	NA	NA
2-Chlorotoluene	ND	0.4	0.2	NA	NA	NA	NA
4-Chlorotoluene	ND	0.6	0.2	NA	NA	NA	NA
Benzene	ND	0.4	0.2	ND	0.5	0.2	NC
Bromobenzene	ND	0.4	0.2	NA	NA	NA	NA
Bromochloromethane	ND	0.4	0.2	ND	0.5	0.2	NC
Bromodichloromethane	ND	0.8	0.2	ND	0.5	0.2	NC
Bromoform	ND	1.2	0.3	ND	0.5	0.2	NC
Bromomethane	ND	1.1	0.2	ND	0.5	0.2	NC
Carbon tetrachloride	ND	0.4	0.2	ND	0.5	0.2	NC
Chlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
Chloroethane	ND	1	0.2	ND	0.5	0.2	NC
Chloroform	**0.62**	0.4	0.2	ND	0.5	**0.2**	**58**
Chloromethane	ND	1.3	0.2	ND	0.5	0.2	NC
cis-1,2-Dichloroethylene	**2.7**	1.2	0.2	**1.9**	0.5	0.2	**22**
cis-1,3-Dichloropropene	ND	0.5	0.2	ND	0.5	0.2	NC
Dibromochloromethane	ND	0.5	0.2	ND	0.5	0.2	NC
Dibromomethane	ND	2.4	0.2	NA	NA	NA	NA
Dichlorodifluoromethane	ND R	1	0.3	ND	0.5	0.2	NC
Ethylbenzene	ND	0.6	0.2	ND	0.5	0.2	NC
Hexachlorobutadiene	ND	1.1	0.2	NA	NA	NA	NA
Isopropylbenzene (Cumene)	ND	0.5	0.2	NA	NA	NA	NA
m,p-Xylene	ND	0.8	0.37	ND	0.5	0.2	NC
Methylene chloride	ND	2.5	0.5	ND	**0.37B**	0.2	NC
n-Butylbenzene	ND	1.1	0.2	NA	NA	NA	NA
n-Propylbenzene	ND	0.4	0.2	NA	NA	NA	NA
Naphthalene	ND	1	0.5	NA	NA	NA	NA
o-Xylene	ND	1.1	0.2	ND	0.5	0.2	NC
p-Cymene (p-isopropyltoluene)	ND	1.2	0.2	NA	NA	NA	NA
sec-Butylbenzene	ND	1.3	0.2	NA	NA	NA	NA
Styrene	ND	0.4	0.2	ND	0.5	0.2	NC
t-Butylbenzene	ND	1.4	0.2	NA	NA	NA	NA
Tert-Butyl methyl ether	ND	0.5	0.2	ND	0.5	0.2	NC
Tetrachloroethylene (PCE)	ND	1.4	0.2	ND	0.5	0.2	NC
Toluene	ND	1.1	0.2	ND	0.5	0.2	NC
trans-1,2-Dichloroethene	ND	0.6	0.2	ND	0.5	0.2	NC
trans-1,3-Dichloropropene	ND	0.5	0.2	ND	0.5	0.2	NC
Trichloroethylene (TCE)	**140**	5	2	**91**	0.5	0.2	**26**
Trichlorofluoromethane	ND	0.8	0.2	ND	0.5	0.2	NC
Vinyl chloride	ND	0.5	0.2	ND	0.5	0.2	NC

Notes:
µg/L - micrograms per liter
NA - Not Analyzed
NC - Not Calculated
ND - Not detected

SPLIT SAMPLE DATA COMPARISON FOR VOLATILES
APRIL 2006 BASEWIDE GROUNDWATER MONITORING EVENT
GEORGE AIR FORCE BASE, CALIFORNIA

	WZ-06 4/12/2006						
	Primary (µg/L)			EPA Split (µg/L)			
Analyte	**Result**	**RL**	**MDL**	**Result**	**RL**	**MDL**	**RPD**
1,1,1,2-Tetrachloroethane	ND	0.5	0.2	NA	NA	NA	NA
1,1,1-Trichloroethane	ND	0.8	0.2	ND	0.5	0.2	NC
1,1,2,2-Tetrachloroethane	ND	0.4	0.2	ND	0.5	0.2	NC
1,1,2-Trichloroethane	ND	1	0.2	ND	0.5	0.2	NC
1,1-Dichloroethane	ND	0.4	0.2	ND	0.5	0.2	NC
1,1-Dichloroethene	ND	1.2	0.2	ND	0.5	0.2	NC
1,1-Dichloropropene	ND	1	0.2	NA	NA	NA	NA
1,2,3-Trichlorobenzene	ND	0.5	0.2	ND	0.5	0.2	NC
1,2,3-Trichloropropane	ND	3.2	0.5	ND	0.5	0.2	NC
1,2,4-Trichlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
1,2,4-Trimethylbenzene	ND	1.3	0.2	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	ND	2.6	0.5	ND	0.5	0.2	NC
1,2-Dibromoethane (EDB)	ND	0.6	0.2	ND	0.5	0.2	NC
1,2-Dichlorobenzene	ND	0.3	0.2	ND	0.5	0.2	NC
1,2-Dichloroethane	ND	0.5	0.2	ND	0.5	0.2	NC
1,2-Dichloropropane	ND	0.4	0.2	ND	0.5	0.2	NC
1,3,5-Trimethylbenzene	ND	0.5	0.2	NA	NA	NA	NA
1,3-Dichlorobenzene	ND	1.2	0.2	ND	0.5	0.2	NC
1,3-Dichloropropane	ND	0.4	0.2	ND	0.5	0.2	NC
1,4-Dichlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
1-Chlorohexane	ND	0.5	0.2	NA	NA	NA	NA
2,2-Dichloropropane	ND	3.5	0.2	NA	NA	NA	NA
2-Chlorotoluene	ND	0.4	0.2	NA	NA	NA	NA
4-Chlorotoluene	ND	0.6	0.2	NA	NA	NA	NA
Benzene	ND	0.4	0.2	ND	0.5	0.2	NC
Bromobenzene	ND	0.4	0.2	NA	NA	NA	NA
Bromochloromethane	ND	0.4	0.2	ND	0.5	0.2	NC
Bromodichloromethane	ND	0.8	0.2	ND	0.5	0.2	NC
Bromoform	ND	1.2	0.3	ND	0.5	0.2	NC
Bromomethane	ND	1.1	0.2	ND	0.5	0.2	NC
Carbon tetrachloride	ND	0.4	0.2	ND	0.5	0.2	NC
Chlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
Chloroethane	ND	1	0.2	ND	0.5	0.2	NC
Chloroform	ND	0.4	0.2	ND	0.5	0.2	NC
Chloromethane	ND	1.3	0.2	ND	0.5	0.2	NC
cis-1,2-Dichloroethylene	ND	1.2	0.2	ND	0.5	0.2	NC
cis-1,3-Dichloropropene	ND	0.5	0.2	ND	0.5	0.2	NC
Dibromochloromethane	ND	0.5	0.2	ND	0.5	0.2	NC
Dibromomethane	ND	2.4	0.2	NA	NA	NA	NA
Dichlorodifluoromethane	ND	1	0.3	ND	0.5	0.2	NC
Ethylbenzene	ND	0.6	0.2	ND	0.5	0.2	NC
Hexachlorobutadiene	ND	1.1	0.2	NA	NA	NA	NA
Isopropylbenzene (Cumene)	ND	0.5	0.2	NA	NA	NA	NA
m,p-Xylene	ND	0.8	0.37	ND	0.5	0.2	NC
Methylene chloride	ND	2.5	0.5	ND	**0.24B**	0.2	NC
n-Butylbenzene	ND	1.1	0.2	NA	NA	NA	NA
n-Propylbenzene	ND	0.4	0.2	NA	NA	NA	NA
Naphthalene	ND	1	0.5	NA	NA	NA	NA
o-Xylene	ND	1.1	0.2	ND	0.5	0.2	NC
p-Cymene (p-isopropyltoluene)	ND	1.2	0.2	NA	NA	NA	NA
sec-Butylbenzene	ND	1.3	0.2	NA	NA	NA	NA
Styrene	ND	0.4	0.2	ND	0.5	0.2	NC
t-Butylbenzene	ND	1.4	0.2	NA	NA	NA	NA
Tert-Butyl methyl ether	ND	0.5	0.2	ND	0.5	0.2	NC
Tetrachloroethylene (PCE)	ND	1.4	0.2	ND	0.5	0.2	NC
Toluene	ND	1.1	0.2	ND	0.5	0.2	NC
trans-1,2-Dichloroethene	ND	0.6	0.2	ND	0.5	0.2	NC
trans-1,3-Dichloropropene	ND	0.5	0.2	ND	0.5	0.2	NC
Trichloroethylene (TCE)	ND	0.5	0.2	ND	0.5	0.2	NC
Trichlorofluoromethane	ND	0.8	0.2	ND	0.5	0.2	NC
Vinyl chloride	ND	0.5	0.2	ND	0.5	0.2	NC

Notes:
µg/L - micrograms per liter
NA - Not Analyzed
NC - Not Calculated
ND - Not detected

B - Detected in associated laboratory blank

SPLIT SAMPLE DATA COMPARISON FOR VOLATILES
APRIL 2006 BASEWIDE GROUNDWATER MONITORING EVENT
GEORGE AIR FORCE BASE, CALIFORNIA

	MW-200 (PE) 4/12/2006						
	Primary (µg/L)			EPA Split (µg/L)			
Analyte	**Result**	**RL**	**MDL**	**Result**	**RL**	**MDL**	**RPD**
1,1,1,2-Tetrachloroethane	ND	0.5	0.2	NA	NA	NA	NA
1,1,1-Trichloroethane	ND	0.8	0.2	ND	0.5	0.2	NC
1,1,2,2-Tetrachloroethane	ND	0.4	0.2	ND	0.5	0.2	NC
1,1,2-Trichloroethane	ND	1	0.2	ND	0.5	0.2	NC
1,1-Dichloroethane	ND	0.4	0.2	ND	0.5	0.2	NC
1,1-Dichloroethene	ND	1.2	0.2	ND	0.5	0.2	NC
1,1-Dichloropropene	ND	1	0.2	NA	NA	NA	NA
1,2,3-Trichlorobenzene	**3.9**	0.5	0.2	**2.1**	0.5	0.2	**36**
1,2,3-Trichloropropane	ND	3.2	0.5	ND	0.5	0.2	NC
1,2,4-Trichlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
1,2,4-Trimethylbenzene	ND	1.3	0.2	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	ND	2.6	0.5	ND	0.5	0.2	NC
1,2-Dibromoethane (EDB)	ND	0.6	0.2	ND	0.5	0.2	NC
1,2-Dichlorobenzene	**6.2**	0.3	0.2	**3.8**	0.5	0.2	**30**
1,2-Dichloroethane	ND	0.5	0.2	ND	0.5	0.2	NC
1,2-Dichloropropane	**3.6**	0.4	0.2	**2.1**	0.5	0.2	**32**
1,3,5-Trimethylbenzene	ND	0.5	0.2	NA	NA	NA	NA
1,3-Dichlorobenzene	**1.7**	1.2	0.78	**0.78**	0.5	0.2	**44**
1,3-Dichloropropane	ND	0.4	0.2	ND	0.5	0.2	NC
1,4-Dichlorobenzene	ND	0.4	0.2	ND	0.5	0.2	NC
1-Chlorohexane	ND	0.5	0.2	NA	NA	NA	NA
2,2-Dichloropropane	ND	3.5	0.2	NA	NA	NA	NA
2-Chlorotoluene	ND	0.4	0.2	NA	NA	NA	NA
4-Chlorotoluene	ND	0.6	0.2	NA	NA	NA	NA
Benzene	**3.7**	0.4	0.2	**2.0**	0.5	0.2	**36**
Bromobenzene	**4.6**	0.4	0.2	**3.7 (TIC)**	NA	NA	NA
Bromochloromethane	ND	0.4	0.2	ND	0.5	0.2	NC
Bromodichloromethane	ND	0.8	0.2	ND	0.5	0.2	NC
Bromoform	ND	1.2	0.3	ND	0.5	0.2	NC
Bromomethane	ND	1.1	0.2	ND	0.5	0.2	NC
Carbon tetrachloride	**2.4**	0.4	0.2	**1.3**	0.5	0.2	**36**
Chlorobenzene	**4.4**	0.4	0.2	**2.5**	0.5	0.2	**34**
Chloroethane	**8.9**	1	0.2	**7.2**	0.5	0.2	**14**
Chloroform	ND	0.4	0.2	ND	0.5	0.2	NC
Chloromethane	ND	1.3	0.2	ND	0.5	0.2	NC
cis-1,2-Dichloroethylene	ND	1.2	0.2	ND	0.5	0.2	NC
cis-1,3-Dichloropropene	ND	0.5	0.2	ND	0.5	0.2	NC
Dibromochloromethane	ND	0.5	0.2	ND	0.5	0.2	NC
Dibromomethane	ND	2.4	0.2	NA	NA	NA	NA
Dichlorodifluoromethane	ND	1	0.3	ND	0.5	0.2	NC
Ethylbenzene	**5.3**	0.6	0.2	**2.9**	0.5	0.2	**36**
Hexachlorobutadiene	ND	1.1	0.2	NA	NA	NA	NA
Isopropylbenzene (Cumene)	ND	0.5	0.2	NA	NA	NA	NA
m,p-Xylene	**5.3**	0.8	0.37	**3.1**	0.5	0.2	**32**
Methylene chloride	ND	2.5	0.5	ND	**0.3B**	0.2	NC
n-Butylbenzene	**7.5**	1.1	0.2	NA	NA	NA	NA
n-Propylbenzene	ND	0.4	0.2	NA	NA	NA	NA
Naphthalene	ND	1	0.5	NA	NA	NA	NA
o-Xylene	**3.5**	1.1	0.2	**1.8**	0.5	0.2	**39**
p-Cymene (p-isopropyltoluene)	ND	1.2	0.2	NA	NA	NA	NA
sec-Butylbenzene	ND	1.3	0.2	NA	NA	NA	NA
Styrene	ND	0.4	0.2	ND	0.5	0.2	NC
t-Butylbenzene	ND	1.4	0.2	NA	NA	NA	NA
Tert-Butyl methyl ether	**15**	0.5	0.2	**12**	0.5	0.2	**14**
Tetrachloroethylene (PCE)	**8.3**	1.4	0.2	**4.6**	0.5	0.2	**35**
Toluene	**7.3**	1.1	0.2	**4.2**	0.5	0.2	**33**
trans-1,2-Dichloroethene	ND	0.6	0.2	ND	0.5	0.2	NC
trans-1,3-Dichloropropene	ND	0.5	0.2	ND	0.5	0.2	NC
Trichloroethylene (TCE)	**13**	0.5	0.2	**7.3**	0.5	0.2	**34**
Trichlorofluoromethane	ND	0.8	0.2	ND	0.5	0.2	NC
Vinyl chloride	ND	0.5	0.2	ND	0.5	0.2	NC

Notes:
µg/L - micrograms per liter
NA - Not Analyzed
NC - Not Calculated
ND - Not detected

SPLIT SAMPLE DATA COMPARISON FOR OC PESTICIDES
APRIL 2006 BASEWIDE GROUNDWATER MONITORING EVENT
GEORGE AIR FORCE BASE, CALIFORNIA

NZ-89
4/11/2006

	Primary (µg/L)			EPA Split (µg/L)			
Analyte	**Result**	**RL**	**MDL**	**Result**	**RL**	**MDL**	**RPD**
Aldrin	ND	0.0094	0.0038	ND	0.05	0.025	NC
Alpha endosulfan	ND	0.0094	0.0038	ND	0.05	0.025	NC
alpha-BHC	ND	0.0094	0.0038	ND	0.05	0.025	NC
alpha-Chlordane	ND	0.0094	0.0038	ND	0.05	0.025	NC
Beta endosulfan	ND	0.0094	0.0038	ND	0.05	0.025	NC
beta-BHC	ND	0.0094	0.0038	ND	0.05	0.025	NC
delta-BHC	ND	0.0094	0.0038	ND	0.05	0.025	NC
Dieldrin	**0.21**	0.0094	0.0038	**0.26**	0.1	0.05	**15**
Endosulfan sulfate	ND	0.0094	0.0038	ND	0.05	0.025	NC
Endrin	ND	0.0094	0.0038	ND	0.05	0.025	NC
Endrin aldehyde	ND	0.0094	0.0038	ND	0.05	0.025	NC
gamma-BHC (Lindane)	ND	0.0094	0.0038	ND	0.05	0.025	NC
gamma-Chlordane	ND	0.0094	0.0038	ND	0.05	0.025	NC
Heptachlor	ND	0.0094	0.0038	ND	0.05	0.025	NC
Heptachlor epoxide	ND	0.0094	0.0038	ND	0.05	0.025	NC
Methoxychlor	ND	0.047	0.0094	ND	0.1	0.05	NC
p,p'-DDD	ND	0.0094	0.0038	ND	0.05	0.025	NC
p,p'-DDE	ND	0.0094	0.0038	ND	0.05	0.025	NC
p,p'-DDT	ND	0.0094	0.0038	ND	0.05	0.025	NC
Sum Of Chlordane Isomers By Eia	ND	0.094	0.056	NA	NA	0.025	NC
Toxaphene	ND	2.8	0.19	ND	0.5	0.25	NC

Notes:
µg/L - micrograms per liter
NA - Not Analyzed
NC - Not Calculated
ND - Not detected

SPLIT SAMPLE DATA COMPARISON FOR WET CHEMISTRY
APRIL 2006 BASEWIDE GROUNDWATER MONITORING EVENT
GEORGE AIR FORCE BASE, CALIFORNIA

		NZ-107 4/10/2006						
		Primary (mg/L)			EPA Split (mg/L)			
Analyte	**Method**	**Result**	**RL**	**MDL**	**Result**	**RL**	**MDL**	**RPD**
Chloride	SW9056	**55.9**	10	1	**57**	10	5	**1**
Nitrogen, nitrate	SW9056	**11.6**	10	0.5	**13**	10	5	**8**
Sulfate	SW9056	**83.9**	10	2.5	**85**	10	5	**1**
Total dissolved solids	E160.1	**540**	10	5	**520**	10	5	**3**
Alkalinity, total (as CaCO3)	E310.1	NA	NA	NA	NA	NA	NA	NC
TOC	SW9060	NA	NA	NA	NA	NA	NA	NC

Notes:
mg/L - milligrams per liter
NA - Not Analyzed
NC - Not Calculated
ND - Not detected

SPLIT SAMPLE DATA COMPARISON FOR WET CHEMISTRY
APRIL 2006 BASEWIDE GROUNDWATER MONITORING EVENT
GEORGE AIR FORCE BASE, CALIFORNIA

		WZ-06 4/12/2006						
		Primary (mg/L)			EPA Split (mg/L)			
Analyte	**Method**	**Result**	**RL**	**MDL**	**Result**	**RL**	**MDL**	**RPD**
Chloride	SW9056	NA	NA	NA	NA	NA	NA	NC
Nitrogen, nitrate	SW9056	**4.63**	1	0.05	**4.9**	0.1	0.05	**4**
Sulfate	SW9056	NA	NA	NA	NA	NA	NA	NC
Total dissolved solids	E160.1	NA	NA	NA	NA	NA	NA	NC
Alkalinity, total (as CaCO3)	E310.1	**120**	5	1	**130**	10	5	**5**
TOC	SW9060	ND	1	0.5	ND	2	1	**NC**

Notes:
mg/L - milligrams per liter
NA - Not Analyzed
NC - Not Calculated
ND - Not detected

SPLIT SAMPLE DATA COMPARISON FOR WET CHEMISTRY
APRIL 2006 BASEWIDE GROUNDWATER MONITORING EVENT
GEORGE AIR FORCE BASE, CALIFORNIA

		MW-200 4/12/2006						
		Primary (mg/L)			EPA Split (mg/L)			
Analyte	**Method**	**Result**	**RL**	**MDL**	**Result**	**RL**	**MDL**	**RPD**
Chloride	SW9056	NA	NA	NA	NA	NA	NA	NC
Nitrogen, nitrate	SW9056	**2**	1	0.05	**2.2**	0.1	0.05	**6**
Sulfate	SW9056	NA	NA	NA	NA	NA	NA	NC
Total dissolved solids	E160.1	NA	NA	NA	NA	NA	NA	NC
Alkalinity, total (as CaCO3)	E310.1	**136**	5	1	**150**	10	5	**7**
TOC	SW9060	NA	NA	NA	NA	NA	NA	NC

Notes:
mg/L - milligrams per liter
NA - Not Analyzed
NC - Not Calculated
ND - Not detected

Attachment A

Follow-Up Data

Follow-up Data Provided by Montgomery Watson Harza

MW-49	4/20/2004	Trichloroethylene (TCE)	**26.7**	UG/L
	10/15/2004	Trichloroethylene (TCE)	**33.1 M**	UG/L
	4/7/2005	Trichloroethylene (TCE)	**18.4**	UG/L
	10/13/2005	Trichloroethylene (TCE)	**18.3**	UG/L
	4/12/2006	Trichloroethylene (TCE)	**20**	UG/L
NZ-27	5/10/2004	Trichloroethylene (TCE)	**177**	UG/L
	11/4/2004	Trichloroethylene (TCE)	**232**	UG/L
	4/26/2005	Trichloroethylene (TCE)	**154**	UG/L
	10/28/2005	Trichloroethylene (TCE)	**136**	UG/L
	4/12/2006	Trichloroethylene (TCE)	**140**	UG/L
FT-03	4/28/2004	Chloroform	< 0.3	UG/L
	10/22/2004	Chloroform	< 0.3	UG/L
	4/14/2005	Chloroform	< 0.3	UG/L
	10/20/2005	Chloroform	< 0.3	UG/L
	4/11/2006	Chloroform	**0.36 F**	UG/L
MW-49	4/20/2004	Chloroform	**0.76**	UG/L
	10/15/2004	Chloroform	**0.48**	UG/L
	4/7/2005	Chloroform	**0.58**	UG/L
	10/13/2005	Chloroform	**0.57**	UG/L
	4/12/2006	Chloroform	**0.7**	UG/L
MW-69	4/30/2004	Chloroform	< 0.3	UG/L
	10/28/2004	Chloroform	< 0.3	UG/L
	4/18/2005	Chloroform	< 0.3	UG/L
	10/24/2005	Chloroform	< 0.3	UG/L
	4/11/2006	Chloroform	< 0.40	UG/L
NZ-107	4/16/2004	Chloroform	< 0.3	UG/L
	10/12/2004	Chloroform	< 0.3	UG/L
	4/5/2005	Chloroform	< 0.3	UG/L
	10/17/2005	Chloroform	< 0.3	UG/L
	4/10/2006	Chloroform	**0.21 F**	UG/L
NZ-27	5/10/2004	Chloroform	< 0.3	UG/L
	11/4/2004	Chloroform	< 0.3	UG/L
	4/26/2005	Chloroform	**0.52**	UG/L
	10/28/2005	Chloroform	**0.49**	UG/L
	4/12/2006	Chloroform	**0.62**	UG/L
WZ-06	4/29/2004	Chloroform	< 0.3	UG/L
	11/2/2004	Chloroform	< 0.3	UG/L
	4/21/2005	Chloroform	< 0.3	UG/L
	10/28/2005	Chloroform	< 0.3	UG/L
	4/12/2006	Chloroform	< 0.40	UG/L

F = Denotes detected between method detection limit and quantitation limit
M = Denotes possible matrix interference.

FINAL
SPLIT SAMPLING PLAN

GEORGE AIR FORCE BASE
San Bernardino, California

BASEWIDE
GROUNDWATER MONITORING PROGRAM
APRIL 2006

Prepared by:
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Mr. Joe Eidelberg Date
Quality Assurance Officer
U.S. EPA Region 9 Quality Assurance Office

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1 Introduction

The United States Environmental Protection Agency (USEPA) Region 9 Laboratory, Field and Biology (FAB) team prepared this Split Sampling Plan (SSP) at the request of the USEPA Region 9 Federal Facilities Cleanup Branch. The purpose of the SSP is to specify the anticipated split sample locations, present the data comparison criteria, and itemize the logistical support needed from the US Air Force (USAF) sampling contractor. This SSP is applicable to groundwater sampling activities at George Air Force Base, California in the spring of 2006. This sampling event is part of a larger ongoing comprehensive quarterly groundwater-monitoring program.

The FAB team will obtain split samples for volatile organic compounds (VOCs), organochlorine pesticides (OCPs), natural attenuation parameters, and landfill metal surrogates. USEPA will conduct sample analysis under the Contract Laboratory Program (CLP), and at the USEPA Region 9 Laboratory in Richmond, California.

The FAB team will also conduct a field audit concurrent with the split sampling. The purpose of the field audit is to verify the adherence to the procedures set forth in the approved sampling and analysis plan (SAP) by the field sampling team under contact to the USAF. The FAB team will conduct the field audit for adherence to the following documents.

Basewide Sampling and Analysis Plan, George Air Force Base, California HydroGeoLogic 1998.

Final 2003 Annual Sampling and Analysis Plan Addendum Basewide Groundwater Monitoring Events, Operable Units 1, 2, and 3 George Air Force Base, California MWH Americas, Inc. July 2003.

Based on discussions with the USAF, and their sampling contractor, Montgomery Watson-Harza (MWH), the field audit and collection of split samples will occur during the week of April 10th, 2006.

2 Site Location and Background

George Air Force Base is located in San Bernardino County approximately eight miles northwest of Victorville, California (Figure 1). The trichloroethylene (TCE) groundwater monitoring data presented in the addendum to the Basewide Sampling and Analysis Plan (hereafter referred to as the SAP) dates back to 1992. Section 2.0 of the SAP presents additional project background.

The USAF prepared the addendum to the SAP to guide basewide groundwater monitoring activities at operable units (OU) 1, 2, and 3, (Figure 2, MWH) and other focused lower aquifer monitoring events. The FAB team prepared this SSP for use in conjunction with the Basewide SAP. The EPA Region 9 audit team will perform the field audit to determine adherence to the procedures specified in Section 5 (Field Operations), Section 6 (Environmental Sampling), Section 7 (Field Measurements), and Section 8 (Record Keeping) of the SAP.

3 Scope and Objectives

The scope of the split sampling includes analysis of groundwater samples and performance evaluation (PE) samples for VOCs (primarily TCE), OCPs (primarily Dieldren), natural attenuation parameters (i.e., alkalinity, total organic carbon, and nitrate), and landfill surrogates (i.e., chloride, nitrate, sulfate, and total dissolved solids). The objective of the split sampling is to determine if the values reported by the USAF are comparable to those values obtained by the USEPA. The scope of the field audit includes sample collection, preservation, handling, equipment decontamination, packing, shipment, and documentation procedures specified in the SAP. The objective of the field audit is to verify that the USAF sampling contractor follows the approved procedures specified in the SAP and published EPA guidance.

The USAF agreed to provide necessary sample containers and chemical preservatives. The FAB team representative will receive the split samples collected by the USAF sampling contractor label, pack, and, ship the samples to the designated laboratory. Attachment 1 - Split Sampling Summary identifies the locations (wells) of split samples collection and field oversight. Attachment 2 – Target Analyte List presents the list of analytes for each analytical procedure specified above.

4 Rationale for Sample Locations and Field Audit

4.1 Groundwater Samples

Based on previous sampling activities at George AFB, the sampling approach is limited to dedicated and non-dedicated, low-flow submersible Grundfos™ pumps. USEPA chose sample locations to cover most of the chemical tests performed at George AFB under the Basewide Groundwater-Monitoring Program, and the range of TCE concentrations in the upper and lower aquifer at OU's 1, 2 and 3. Based on discussions with MWH, the wells identified for split sampling are as follows:

Well ID	Parameters	Description
FT-03	VOCs	OU 1/OU 3/FT-19
MW-49	VOCs	OU 2/OU 3 Upper Aquifer
MW-69	VOCs	OU 2/OU 3 Upper Aquifer
NZ-27	VOCs	OU 1 Upper Aquifer
NZ-89	OCPs	OU 3 Upper Aquifer
NZ-107	VOCs, LF Surrogates	OU 1/OU 3 Lower Aquifer - Landfill
WZ-06	VOCs, Nat Att. Par	OU 3/Site OT-51 Upper Aquifer

The FAB team representative will obtain sample at a minimum of seven well locations. Additional split samples will only be obtained at the direction of the USEPA RPM.

4.2 Field Audit

Mr. Greg Nagle of the USEPA Region 9 FAB team and Mr. Joe Eidelberg of the USEPA Region 9 Quality Assurance Office (QAO) will conduct the field audit. The USEPA auditors will conduct the field audits to determine whether the sample collection procedures

performed are in accordance with the Basewide SAP, and published EPA guidance. Most critical for the sampling of VOCs are measures that minimize the agitation of water samples that will volatilize the VOCs. The USEPA auditors will communicate any critical deviations from approved procedures to the USEPA Remedial Project Manager (RPM) James Chang, while in the field for timely resolution with the USAF.

5 Field Methods and Procedures

5.1 Sample Collection

The FAB team representative will obtain samples collected by the USAF contractor using both dedicated and non-dedicated, low-flow submersible Grundfos™ pumps. Sample volumes, container types, and preservation requirements are specified in Attachment A. The USAF contractor will fill sample containers alternately, with the USAF sample collected first, followed by the sample for the USEPA, and then fill the second USAF sample and so on. The FAB team representative observing the sample collection will take custody of one set of sample containers as sampling at a given well is completed. The FAB team representative will appropriately label the sample containers. The FAB team representative will also be responsible for chain-of-custody (COC) using Forms II Lite software and maintaining other field documentation as project records.

5.2 Quality Control Samples

Appropriate quality control (QC) samples for this project will include a trip blank and a temperature blank for each shipment, and a matrix spike/matrix spike duplicate for each analytical method. The FAB team will not obtain a field duplicate sample. Attachment 1 lists the QC samples to be collected for this split sampling event. The USAF agreed to provide a trip and temperature blank for each day split samples are collected.

5.3 Performance Evaluation Samples

The USEPA will provide a performance evaluation (PE) sample for VOCs, OCPs, alkalinity, total organic carbon, chloride, nitrate, sulfate, and total dissolved solids for analysis by both the USEPA laboratories and USAF laboratory. The USEPA FAB team and USAF sampling contractor will submit PE samples to the respective laboratories with sample shipments using the same sample container types used for the primary and split samples. Both the USEPA and the USAF contractor will submit these samples with fictitious sample identifiers so that the laboratory cannot readily identify them as PE samples. USEPA refers to this technique as "double blind" submission. The USEPA QAO may request containers from the USAF contractor in advance so that the Quality Assurance Technical Support (QATS) contractor can prepare the PE samples in the same container type as used in the field. The USEPA QAO will provide a PE Sample Report to the USEPA RPM under separately.

5.4 Methods of Analysis

The USEPA will analyze the VOC, OCP samples using the CLP as designated by the Region 9 Regional Sample Control Coordinator (RSCC) and the EPA Region 9 laboratory will analyze the natural attenuation parameters, and landfill metals surrogates as summarized below.

Parameter	Laboratory	Method of Analysis
Volatile Organic Compounds (VOC)	CLP	SOM01.1
Organochlorine Pesticides (OCP)	CLP	SOM01.1
Total Alkalinity	EPA Region 9	SM2320
Chloride, Nitrate, Sulfate	EPA Region 9	EPA 300.0
Total Dissolved Solids	EPA Region 9	EPA 160.1
Total Organic Carbon	EPA Region 9	EPA 415.1

Attachment 1 presents anticipated split sample locations, container type, sample volume, chemical preservation, and holding time requirements. Attachment 2 provides a list of analytes and quantitation limits.

USEPA reviews all data generated by the CLP to a computer-aided data review and evaluation system (CADRE). The USEPA Region 9 EPA Region 9 laboratory manually reviews data in accordance with SOPs 846 Internal Laboratory EPA Review of ESAT and EPA Generated Data, and 845 Final Chemistry Review and Report Generation. If the results of the split sampling indicate discrepancies between USAF and USEPA laboratory results, additional manual data review and/or external data validation may be required.

5.5 Packing and Shipping

The FAB team will ship coolers containing sufficient ice to keep the samples at 4±2°C. The ice in the cooler will be double-bagged to prevent leakage. The cooler will have a custody seal affixed across the cooler lid. The samples will remain in the custody of a FAB team representative until relinquished for shipment to the laboratory. The FAB team representative will ship all samples using an overnight carrier. A COC form will accompany the samples from the point of origin to the designated laboratory. The FAB team will place the COC in a plastic bag taped to the inside of the cooler lid. If samples are shipped on a Friday, the RSCC will be contacted and information regarding Saturday delivery.

5.6 Support Required from Air Force Contractor

As discussed in above, the USEPA will require field assistance from the USAF sampling contractor. This support includes providing sample containers, chemical preservative, and split groundwater sample from each of the wells specified in Attachment 1. Based on the split samples anticipated, USEPA is requesting the following:

#	Type	Chemical Preservative
39	40 mL Borosilicate glass vials	Hydrochloric Acid (HCl)
8	1 Liter Borosilicate Glass	none
8	500 mL High Density Polyethylene	none

The USEPA Region 9 QAO may request a set of containers in advance so the QATS laboratory can prepare the PE samples in the same container type as that used in the field. The USEPA is also requesting trip blanks and temperature blanks each day samples are collected. The USEPA may also request advice and directions from USAF sampling contractor regarding the acquisition of ice and other materials near the sampling locations.

As noted in Section 5.3, the USEPA requests the USAF provide for the analysis of a PE sample for each chemical parameter. A USEPA representative will provide these PE samples during the course of split sampling/field audit activities.

The USEPA requests that USAF provide the validated results of analysis to the USEPA RPM as soon as possible. Finally, for reasons discussed in Section 6 (below), the data submission should also include the Method Detection Limit (MDL) for each analyte/parameter.

6 Data Evaluation and Reporting

The FAB team will compare results obtained by the USEPA to the results provided by the USAF, and determine if the results are comparable using the criteria below.

Disagreement	Major Disagreement
Difference between results is greater than two times the MDL when one result is less than the MDL	Difference between results is greater than four times the MDL when one result is less than the MDL
RPD of results is greater than 100% if either result is less than 5 times the MDL	RPD of results is greater than 200% if either result is less than 5 times the MDL
RPD of results is greater than 30% if both results are greater than 5 times the MDL	RPD of results is greater than 60% if both results are greater than 5 times the MDL

$$RPD = abs (R1 - R2)/ (R1+R2)/2) * 100\%$$

Where,

R1 = result 1 R2 = result 2
MDL = Method Detection Limit
RPD = Relative Percent Difference

Upon receipt of USEPA and USAF data sets, the FAB team will generate a Split Sampling Report containing all the split and primary sample results, calculated RPD, an evaluation of any outliers, and an overall assessment of the sample data. The FAB team will also prepare a Field Audit Report documenting all findings made in the field. The Field Audit Report and Split Sample Report will be prepared separately.

7 Personnel

Mr. Greg Nagle of the USEPA Region 9 FAB team and Mr. Joe Eidelberg of the USEPA Region 9 QAO will conduct the field audit. Mr. Nagle will also be responsible for all split sampling related activities, coordinating field activities with the USAF sampling contractor and preparation of the Split Sampling and Field Audit Reports. Mr. Eidelberg will be also

responsible for coordinating PE sample acquisition and final reconciliation of audit findings. Mr. James Chang, EPA RPM will be responsible for transmitting the audit findings, the split sample results, and the PE sample results to the USAF.

8 Health and Safety

The USEPA audit team will adhere to the site-specific health and safety plans and will attend the daily tailgate health and safety briefing as required. Level D personal protection will be required.

9 Schedule

Split sampling activities will take place during the week of April 10th, 2006 and should be complete within two to three days time. The FAB team will submit a Field Audit Report within 21 days of the field audit. Standard laboratory turn-around times are typically 30 days from verified sample receipt of the last sample in a sample delivery group. The FAB team will inform the US EPA RPM when all of the analytical data has been received. The FAB team will submit the Split Sample Report to Mr. James Chang within 21 days of receipt of the laboratory EPA data or the USAF, whichever occurs later. The anticipated schedule is as follows:

Activity	Date
Sample collection begins	April 10th, 2006
Sample collections ends	April 13th, 2006
All samples received by labs	April 14th, 2006
Field Audit Report to EPA RPM	May 5th, 2006
All data received from labs	May 19th, 2006
Split Sample Report to EPA RPM	June 9th, 2006

The anticipated dates above are subject to change.

10 References

Basewide Sampling and Analysis Plan, George Air Force Base, California. HydroGeoLogic 1998.

Final 2003 Annual Sampling and Analysis Plan Addendum Basewide Groundwater Monitoring Events, Operable Units 1, 2 and 3 George Air Force Base, California. MWH Americas, Inc. July 2003.

U.S. EPA. Quality Assurance Oversight Plan for George/Norton AFB, October 1998.

Figure 1 - George Air Force Base

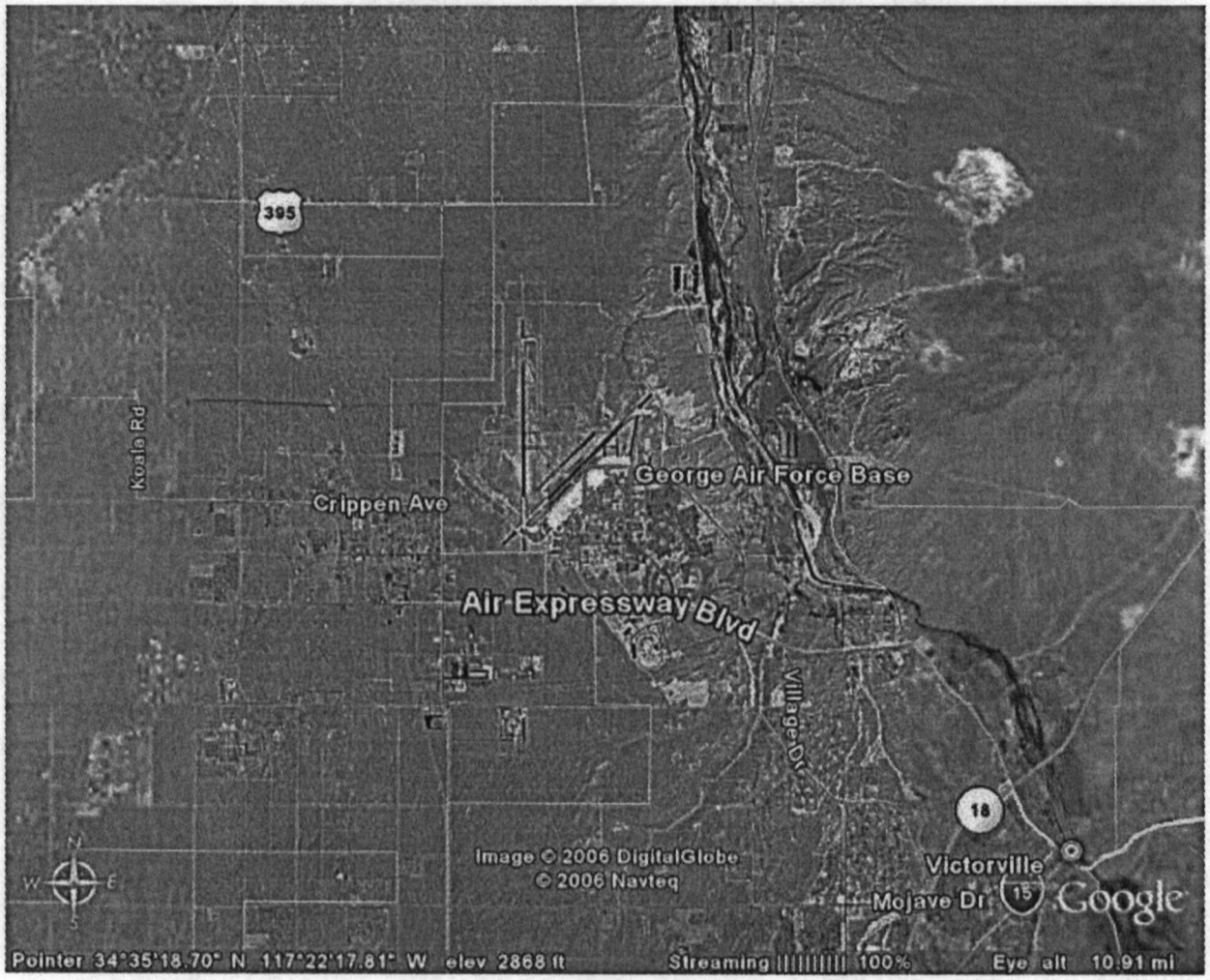
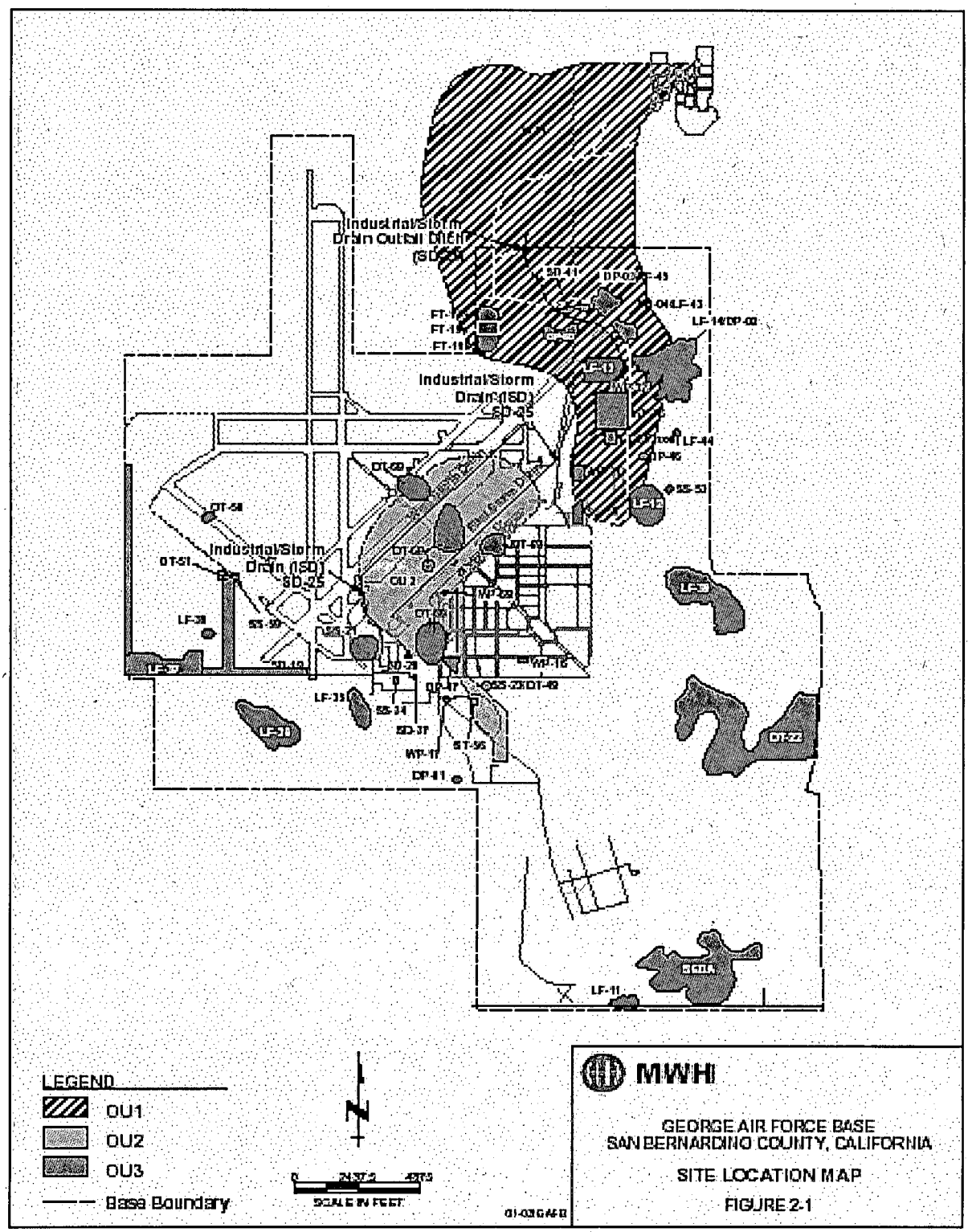


Figure 2 – Operable Units



Attachment 1 - Split Sample Summary
George Air Force Base, April 2006

Sampling Location	Aquifer	Operable Unit/Site	VOCs SOM01.1 (3X40 ml vial) HCl to pH < 2 Hold = 14 days	OCPs SOM01.1 No chem. pres (2 X 1L) Hold = 7 Days	TOC[a] (3X40 ml vial) HCl to pH < 2 Hold = 28 Days	Alkalinity & Nitrate[a] No chem. pres (500 mL poly) Hold = 14 days & 48 hrs	Anions & TDS[b] No chem. pres (500 mL poly) Hold = 48 hrs & 7 days
FT-03	Upper	OU1,OU3/Site FT-19	1				
MW-49	Upper	OU2/OT-69	1				
MW-69	Upper	OU2	1				
NZ-27	Upper	OU1	1				
NZ-89	Upper	Pesticide AOC		1			
NZ-89 MS/MSD	Upper	Pesticide AOC		2			
NZ-107	Lower	OU1/LF-14	1				1
NZ-107 MS/MSD	Lower	OU1/LF-14	2				2
WZ-06	Upper	OU3/OT-51	1		1	1	
WZ-06 MS/MSD	Upper	OU3/OT-51			2	4	
PE (MW200)	NA	NA	1	1	1	1	1
		Total Samples	**9**	**4**	**4**	**4**	**4**
		Total Containers	**27**	**8**	**12**	**4**	**4**

Notes:
a - Natural Attenuation Parameters include; Alkalinity by SM 2320, Total Organic Carbon (TOC) by EPA Method 415.1 and Nitrate by EPA Method 300.0
b - Landfill (LF) Metal Surrogates include; Anions analyzed by EPA Method and Total Dissolved Solids (TDS) by E160.1
MS/MSD - Matrix Spike/Matrix Spike Duplicate
Hold = Holding Time

Attachment 2 - Target Analyte List

Target Analytes

Volatile Organic Compounds (SOM01.1)

	Quantitation Limit (ug/L)		Quantitation Limit (ug/L)
Dichlorodifluoromethane	0.50	Methylcyclohexane	0.50
Chloromethane	0.50	1,2-Dichloropropane	0.50
Vinyl Chloride	0.50	Bromodichloromethane	0.50
Bromomethane	0.50	cis-1,3-Dichloropropene	0.50
Chloroethane	0.50	4-Methyl-2-pentanone	5.00
Trichlorofluoromethane	0.50	Toluene	0.50
1,1-Dicholoroethene	0.50	trans-1,3-Dichloropropene	0.50
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	1,1,2-Trichloroethane	0.50
Acetone	5.0	Tetrachloroethane	0.50
Carbon Disulfide	0.50	2-Hexanone	5.0
Methyl acetate	0.50	Dibromochloromethane	0.50
Methylene chloride	0.50	1,2-Dibromomethane	0.50
trans-1,2-Dichloroethene	0.50	Chlorobenzene	0.50
Methyl tert-butyl ether	0.50	Ethylbenzene	0.50
1,1-Dichloroethane	0.50	o-Xylene	0.50
cis-1,2-Dichloroethene	0.50	m, p-Xylene	0.50
2-Butanone	5.00	Styrene	0.50
Bromochloromethane	0.50	Bromoform	0.50
Chloroform	0.50	Isopropylbenzene	0.50
1,1,1-Trichloroethane	0.50	1,1,2,2-Tetrachloroethane	0.50
Cyclohexane	0.50	1,3-Dichlorobenzene	0.50
Carbon tetrachloride	0.50	Dichlorobenzene	0.50
Benzene	0.50	1,2-Dichlorobenzene	0.50
1,2-Dichloroethane	0.50	1,2-Dibromo-3-chloropropane	0.50
1,4-Dioxane	20	1,2,4-Trichlorobenzene	0.50
Trichloroethene	0.50	Trichlorobenzene	0.50

Organochlorine Pesticides (SOM01.1)

	Quantitation Limit (ug/L)		Quantitation Limit (ug/L)
alpha-BHC	0.050	Endosulfan II	0.10
beta-BHC	0.050	4-4'-DDD	0.10
delta-BHC	0.050	Endosulfan sulfate	0.10
gamma-BHC (Lindane)	0.050	4-4'-DDT	0.10
Heptachlor	0.050	Methoxychlor	0.50
Aldrin	0.050	Endrin ketone	0.10
Heptachlor epoxide	0.050	Endrin aldehyde	0.10
Endosulfan I	0.050	alpha-Chlordane	0.050
Dieldrin	0.10	gamma-Chlordane	0.050
4,4'-DDE	0.10	Toxaphene	5.0
Endrin	0.10		

Target Analytes

Natural Attenuation Parameters	Quantitation Limit (mg/L)
Alkalinity (SM2320)	5.0
Nitrate (E300.0)	0.1
Total Organic Carbon (E415.1)	2.0

Landfill Metal Surrogates	Quantitation Limit (mg/L)
Chloride (E300.0)	0.5
Nitrate (E300.0)	0.1
Sulfate (E300.0)	0.5
Total Dissolved Solids (E160.1)	10