FW: LOOK AHEAD - Aquifer Testing Report

Andress, Lane, NMENV

Wed 10/23/2019 4:46 PM

To:Allen, Pam, NMENV <pam.allen@state.nm.us>;

4 attachments

DQA Table 3 - Aquifer.pdf; DQA Table 4 - Aquifer.pdf; DQA Table 5 - Aquifer.pdf; KAFB-014-0001_App D_Samp_Data_Analysis.docx;

Pam,
Can you please add this email and attachments to the admin record?
Thanks,
Lane

Lane Andress, P.G.
NM Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6313

From: Cobrain, Dave, NMENV <dave.cobrain@state.nm.us>
Sent: Wednesday, October 23, 2019 4:03 PM
To: Andress, Lane, NMENV <Lane.Andress@state.nm.us>
Subject: FW: LOOK AHEAD - Aquifer Testing Report

Dave Cobrain
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East Bldg 1
Santa Fe, NM 87505-6313
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From: Kieling, John, NMENV <john.kieling@state.nm.us>
Sent: Tuesday, January 21, 2014 9:27 AM
To: Spalding, Susan (Spalding.Susan@epa.gov) <Spalding.Susan@epa.gov>; King, Laurie (king.laurie@epa.gov) <king.laurie@epa.gov>; Hubner, Tara (Hubner.Tara@epa.gov) <HubnerTara@epa.gov>; Torcoletti, Paul

<Torcoletti.Paul@epa.gov>; Ellinger, Scott (Ellinger.Scott@epa.gov) <Ellinger.Scott@epa.gov>
Cc: Blaine, Tom, NMENV <Tom.Blaine@state.nm.us>; Cobrain, Dave, NMENV <dave.cobrain@state.nm.us>; Reuter, Stephen, NMENV <stephen.reuter@state.nm.us>
Subject: RE: LOOK AHEAD - Aquifer Testing Report

Appendix D – Sampling Data and Analysis

From: Kieling, John, NMENV
Sent: Friday, January 17, 2014 2:50 PM
To: Spalding, Susan (Spalding.Susan@epa.gov); King, Laurie (king.laurie@epa.gov); Hubner, Tara (Hubner.Tara@epa.gov); Torcoletti, Paul; Ellinger, Scott (Ellinger.Scott@epa.gov)
Cc: Blaine, Tom, NMENV (Tom.Blaine@state.nm.us); Cobrain, Dave, NMENV; Reuter, Stephen, NMENV
Subject: FW: LOOK AHEAD - Aquifer Testing Report

Susan and others.
Attached is the Aquifer Test Report (in a draft form) regarding the Kirtland AFB fuel spill. I have ask the contractor to provide the appendices. Once we receive the appendices we will forward to EPA.

If you could please review and provide any comments on this document NMED would appreciate.

Thanks, John

John E. Kieling, Chief
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From: Agnew, Diane [mailto:diane.agnew@CBIFederalServices.com]
Sent: Wednesday, January 15, 2014 12:01 PM
To: Blaine, Tom, NMENV; Kieling, John, NMENV; Cobrain, Dave, NMENV; Reuter, Stephen, NMENV
Cc: Amdurer, Mike; Cooper, Thomas; Hobbs, Rachel G; BITNER, LUDIE W JR GS-13 USAF AFMC 377 MSG/CEIR; CLARK, SCOTT C GS-12 USAF AFMC 377 MSG/CEIR (scott.clark@us.af.mil); john.m.mcbee@usace.army.mil
Subject: LOOK AHEAD - Aquifer Testing Report

Hello:

Please see attached for the "Look Ahead" copy of the Aquifer Testing Results Report. Due to the size of appendices, they are not included in this look ahead copy.

We are asking for feedback by **COB Monday, January 21, 2014.**

Please let me know if you have any edits or comments.

Diane

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APPENDIX D

Data Quality Evaluation Report
Fourth Quarter 2013 Groundwater Aquifer Test Results

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ACRONYMS AND ABBREVIATIONS

%	percent
%D	percent difference
AFB	Air Force Base
BFF	Bulk Fuels Facility
CCV	continuing calibration verification
DoD	U.S. Department of Defense
EDB	1,2-dibromoethane/ethylene dibromide
EPA	U.S. Environmental Protection Agency
ICP	inductively coupled plasma
ICS	interference check sample
ICV	initial calibration verification
KAFB	Kirtland Air Force Base
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LOQ	limit of quantitation
µg/L	microgram per liter
mg/L	milligram per liter
MS	matrix spike
MSD	matrix spike duplicate
QAPjP	Quality Assurance Project Plan
QC	quality control
QSM	Quality Systems Manual
RPD	relative percent difference
RRF	relative response factor
SDG	sample delivery group
SM	Standard Method
SVOC	semivolatile organic compound
TPH	total petroleum hydrocarbon
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compound

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D. DATA QUALITY EVALUATION REPORT – FOURTH QUARTER CY 2013 AQUIFER TESTING RESULTS

1. LABORATORY DATA QUALITY SUMMARY

This laboratory data quality summary describes the findings of the review of data for the step-drawdown test and constant rate Sampling at well KAFB-106157 in October and December 2013, respectively, and is provided to document the quality of the analytical data used in the Fourth Quarter Calendar Year 2013 Aquifer Testing Results. Sampling procedures and overall quality control (QC) and quality assurance protocols for both the step-drawdown and constant rate test Sampling events are presented in the *Quality Assurance Project Plan, Bulk Fuels Facility (BFF) Spill, Solid Waste Management Units ST-106 and SS-111, Kirtland Air Force Base, Albuquerque, New Mexico* (U.S. Army Corps of Engineers [USACE], 2011).

The step-drawdown test was conducted on October 30, 2013, which included one groundwater sample collected from well KAFB-106157 and one effluent sample from each of the three carbon beds. The four groundwater samples were submitted to Empirical Laboratories LLC in Nashville, Tennessee, for analyses. The laboratory holds a current U.S. Department of Defense (DoD) Environmental Laboratory Accreditation Program certification to perform the listed analyses.

All groundwater samples were analyzed for the following list of parameters:

- Volatile organic compounds (VOCs) – U.S. Environmental Protection Agency (EPA) Method SW8260B
- 1,2-dibromoethane (EDB) – EPA Method SW8011
- Semivolatile organic compounds (SVOCs) – EPA Method SW8270D
- Total petroleum hydrocarbons (TPH) as gasoline (C6-C10) – EPA Method SW8015B
- TPH as diesel (C10-C28) – EPA Method SW8015B
- Total cations and dissolved iron and manganese – EPA Method SW6010B

- Anions (chloride and sulfate) – EPA Method 300.0
- Ammonia as nitrogen – Standard Method (SM) 4500 NH3BG
- Sulfide – SM4500 S2CF
- Nitrate and nitrite as nitrogen – EPA Method 353.2
- Carbonate and bicarbonate alkalinity – SM2320B

The constant rate test Sampling was performed between December 3 and 9, 2013. On a daily basis, four morning samples were collected from well KAFB-106157 and the effluent of each of the three carbon beds; while two afternoon samples were collected from well KAFB-106157 and the effluent of the third carbon bed. All groundwater samples were submitted to a State certified Laboratory, Hall Environmental Analysis Laboratory, in Albuquerque, New Mexico for analysis. Samples for the total sulfide, corrosivity, ignitibility, and reactivity cyanide and sulfide (RCI) were subcontracted to Anatek Labs, Inc. in Spokane Washington for analysis.

The morning samples from well KAFB-106157 and the effluent samples from the third carbon bed were analyzed for the following list of parameters:

- VOC – EPA Method SW8260B
- EDB – EPA Method 504.1
- SVOC – EPA Method SW8270C
- TPH as gasoline (C6-C10) – EPA Method SW8015D
- TPH as diesel (C10-C28) – EPA Method SW8015D
- Total cations and dissolved iron and manganese – EPA Method SW6010B
- Anions (chloride, sulfate and nitrate) – EPA Method 300.0
- Ammonia as nitrogen – SM 4500 NH3
- Sulfide – SM4500 S2CF
- Carbonate and bicarbonate alkalinity – SM2320B
- RCRA Metals – SW6010B and 7470
- Corrosivity – EPA Method 150.1
- Ignitibility – EPA Method SW1010
- Reactivity as cyanide and sulfide – SW7.3.4.2

The morning samples from the effluent of the first and second carbon beds were analyzed for the following parameters:

- VOC – EPA Method SW8260B
- EDB – EPA Method 504.1
- TPH as gasoline (C6-C10) – EPA Method SW8015D
- TPH as diesel (C10-C28) – EPA Method SW8015D

The afternoon samples from well KAFB-106157 and the effluent samples from the third carbon bed were analyzed for the following:

- VOC – EPA Method SW8260B
- EDB – EPA Method 504.1
- SVOC – EPA Method SW8270C
- TPH as gasoline (C6-C10) – EPA Method SW8015D
- TPH as diesel (C10-C28) – EPA Method SW8015D
- Total cations and dissolved iron and manganese – EPA Method SW6010B
- Anions (chloride, sulfate and nitrate) – EPA Method 300.0
- Ammonia as nitrogen – SM 4500 NH3
- Sulfide – SM4500 S2CF
- Carbonate and bicarbonate alkalinity – SM2320B

In addition to the above, the afternoon samples from the influent were analyzed for RCRA metals.

All analytical results reported from Empirical and Hall (including its subcontracted laboratory) were received in 15 sample delivery groups (SDGs). Appendix D – Table 1 (provided at the end of this report) summarizes each sample delivery group (SDG), including sample numbers, sample locations, sample collection dates, and SDG numbers. An EPA Level III data review was performed for all analytical results for each of the 15 SDGs from all laboratories. The review was performed in accordance with the guidelines and control criteria specified in the following documents:

- The Bulk Fuels Facility (BFF) Spill Quality Assurance Project Plan (QAPjP) (USACE, 2011)
- *DoD Quality Systems Manual for Environmental Laboratories, Version 4.2* (DoD, 2010)
- *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (2006), SW-846* (EPA, 1996 and updates)

- *Standard Methods for the Examination of Water and Wastewater (21st Edition)* (American Public Health Association et al., 2005)
- *Environmental Quality – Guidance for Evaluating Performance-Based Chemical Data*, EM 200-1-10 (USACE, 2005)
- *USEPA Contract Laboratory Program, National Functional Guidelines for Superfund Organic Methods Data Review, Final* (EPA, 2008)
- *USEPA Contract Laboratory Program, National Functional Guidelines for Inorganic Superfund Data Review, Final* (EPA, 2010)

The following QC elements were included in the EPA Level III data review:

- Sample preservation and sample extraction and analysis holding times
- Laboratory method blanks
- Initial and continuing calibration blanks (metals, anions, ammonia as nitrogen, and nitrate and nitrite as nitrogen analyses only)
- Surrogate recoveries (organic analyses)
- Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) recoveries
- Matrix spike (MS)/matrix spike duplicate (MSD) recoveries
- Relative percent differences (RPDs)
- Initial calibration and verifications
- Continuing calibration verifications (CCVs)
- Inductively coupled plasma (ICP) interference check samples (ICS) (metal analysis only)
- ICP serial dilutions (metal analysis only)
- Sample confirmation (EDB analysis only)
- Professional judgment
- Tentatively identified compounds
- Field blanks
- Field duplicates

Analytical data were reviewed in terms of precision, bias, representativeness, comparability, and completeness as follows:

- *Bias* is demonstrated by recovery of target analytes from fortified blank and sample matrices, LCS/LCSD, and MS/MSD, respectively. For organic methods, bias is also demonstrated through recovery of surrogates from each field and QC sample. The recovery of target analytes from fortified samples is compared with the acceptance criteria defined in the QAPjP (USACE, 2011) and DoD Quality Systems Manual (QSM) (DoD, 2010). When the acceptance criteria are not available in the QAPjP or DoD QSM, results are compared with the laboratory in-house control limits. When these criteria are not met, the data are qualified accordingly.
- *Precision* is expressed as the relative percent difference (RPD) between the results of replicate sample analyses: sample duplicates, LCSDs, and MSDs. When analyte RPDs exceed the acceptance criteria, the data are qualified accordingly.
- *Representativeness* of the samples submitted for analysis is ensured by adherence to standard sampling techniques and protocols.
- *Comparability* of sample results is ensured through the use of approved sampling and analysis methods.
- *Completeness* is expressed as a ratio of the number of usable data points to the total number of analytical data results.

The following sections present the EPA Level III data review findings. The discussion summarizes data quality exceedances and their potential impact on the quality and usability of analytical results. Appendix D – Table 2 presents definitions of data qualification and reason codes applied to the analytical results. Appendix D – Table 3 summarizes the qualified data. For informational purposes, qualified field QC data are also presented in this table.

1.1 Reason Codes

1.1.1 Sample Preservation and Sample Extraction and Analysis Holding Times (Reason Code H)

The sample coolers and samples contained within were received intact at the laboratory and were held within the required 0 to 6 degrees Celsius and were chemically preserved in accordance with EPA and SM preservation requirements. During the Constant Rate Sampling Event, elevated cooler temperatures

were observed for 10 coolers ranging from 9.8 to 15 degree Celsius exceeding the upper cooler temperature of 6 degree Celsius. It should be noted that the affected samples were properly preserved, kept on ice, and transported to a local laboratory, Hall, immediately after sample collection. Since the site is approximately 10 miles from the laboratory, there is insufficient time for the affected samples to be cooled within the acceptable temperature control range. As documented on the laboratory sample receipt form, cooling effect had begun when samples were received by the laboratory.

Sample holding times were evaluated by comparing the sample collection dates to the sample extraction and analysis dates. Extraction and analysis holding times were reviewed for all samples to determine the validity of the sample results. Analysis holding time exceedances were observed for groundwater sample analyzed for pH. The affected sample numbers, holding time outliers, and analysis holding time requirement are summarized below:

Analytical Method	Affected Sample Number	Holding Time Outlier	Holding Time Requirement
EPA150.1	CRT0001	1 day	1 day
	CRT0004	1 day	1 day
	CRT0007	4 days	1 day
	CRT0010	4 days	1 day
	CRT0013	3 days	1 day
	CRT0016	3 days	1 day
	CRT0019	5 days	1 day
	CRT0022	6 days	1 day
	CRT0025	3 days	1 day
	CRT0028	3 days	1 day
	CRT0031	5 days	1 day
	CRT0034	5 days	1 day
	CRT0037	2 days	1 day
	CRT0040	2 days	1 day

As a result of the holding time exceedances, pH results in the affected samples were qualified as estimated (J). During the constant rate test sampling event, the pH was measured in the field as one of the water quality parameters. pH results from both the laboratory and field measurements were compared and found to be similar. Therefore, it does appear that the holding time exceedances have an adverse impact

on the data quality of the sample results due to additional sample storage. Except where noted, the extraction and analysis holding-time requirements were achieved for all other samples and for all other all methods.

1.1.2 Laboratory Method Blanks (Reason Code B1)

The field sample results were evaluated with respect to the laboratory method blank prepared and analyzed for each analytical batch and for each analytical method. Positive analyte detections in laboratory method blanks were observed for EPA Methods SW8260B and SW6010B. Specific contaminants, the detected levels, and the LOQs are summarized as follows:

Analytical Method	Laboratory QC Batch #	Contaminant	Contaminant Level (µg/L)	LOQ (µg/L)
SW8260B	R15345	Chloromethane	0.32	3
SW6010B	10625	Silver	0.0049 mg/L	0.005 mg/L
SW6010B	10704	Barium	0.00081 mg/L	0.02 mg/L

µg/L micrograms per liter
mg/L micrograms per liter

Based on the DoD QSM requirements (2010), laboratory method blank concentrations are considered acceptable when contaminant levels in the blank are less than one-half the LOQ for target analytes and less than the LOQ for common laboratory contaminants, such as acetone and methylene chloride. As indicated in the preceding table, the laboratory method blank levels for the analytes chloromethane and barium were below one-half the LOQ and acceptable, while the laboratory blank concentration for silver exceeded the blank acceptable criteria.

As a result of the method blank detections, one detected result for silver and one detected result for chloromethane in an associated sample was qualified as non-detected (U) at the LOQ. This blank qualification has no impact on the data usability. The concentrations of barium in samples well exceeded

five times the correspond level observed in the blank, and thus, the sample results were not affected by the laboratory method blank detection, and no data qualification was warranted.

Except where noted, no other target analytes were detected in any laboratory method blanks for semivolatile organic compounds (SVOC), EDB, TPH as gasoline and diesel, ammonia as nitrogen, sulfide, anions, nitrate and nitrite as nitrogen, and alkalinity analyses.

1.1.3 Initial and Continuing Calibration Blanks (Reason Code B2)

In addition to the laboratory method blanks for metals, anions, nitrate and nitrite as nitrogen, and ammonia as nitrogen analyses, initial and continuing calibration blank results were reviewed to ensure that the instrument was free of contamination prior to the analyses. All initial and continuing calibration blanks were free of metals, anions, nitrate and nitrite as nitrogen, and ammonia as nitrogen.

1.1.4 Surrogate Recoveries (Reason Code S)

Surrogate standards are organic compounds added to field and laboratory QC samples for organic analysis to evaluate the matrix effect and method performance on an individual sample basis. Surrogate recovery outliers were observed for some samples analyzed for volatile organic compounds (VOC), SVOC, and TPH as gasoline as presented below.

Analytical Method	Parameter	Sample Number	Surrogate Recovery Outlier (%)	Control Limit (%)
SW8260B	VOC	CRT0001	4-Bromofluorobenzene: 282%	75-120%
SW8260B	VOC	CRT0005	4-Bromofluorobenzene: 327%	75-120%
SW8260B	VOC	CRT0007	4-Bromofluorobenzene: 301%	75-120%
SW8260B	VOC	CRT0011	4-Bromofluorobenzene: 285%	75-120%
SW8260B	VOC	CRT0013	4-Bromofluorobenzene: 272%	75-120%
SW8260B	VOC	CRT0017	4-Bromofluorobenzene: 252%	75-120%
SW8260B	VOC	CRT0019	4-Bromofluorobenzene: 244%	75-120%
SW8260B	VOC	CRT0023	4-Bromofluorobenzene: 271%	75-120%
SW8260B	VOC	CRT0025	4-Bromofluorobenzene: 275%	75-120%
SW8260B	VOC	CRT0029	4-Bromofluorobenzene: 259%	75-120%
SW8260B	VOC	CRT0031	4-Bromofluorobenzene: 251%	75-120%
SW8260B	VOC	CRT0035	4-Bromofluorobenzene: 258%	75-120%
SW8260B	VOC	CRT0037	4-Bromofluorobenzene: 247%	75-120%

Analytical Method	Parameter	Sample Number	Surrogate Recovery Outlier (%)	Control Limit (%)
SW8015B	TPH as Gasoline	CRT0001	4-Bromofluorobenzene: 270%	70-130%
SW8015B	TPH as Gasoline	CRT0005	4-Bromofluorobenzene: 321%	70-130%
SW8015B	TPH as Gasoline	CRT0007	4-Bromofluorobenzene: 312%	70-130%
SW8015B	TPH as Gasoline	CRT0011	4-Bromofluorobenzene: 310 %	70-130%
SW8015B	TPH as Gasoline	CRT0013	4-Bromofluorobenzene: 291 %	70-130%
SW8015B	TPH as Gasoline	CRT0017	4-Bromofluorobenzene: 258 %	70-130%
SW8015B	TPH as Gasoline	CRT0019	4-Bromofluorobenzene: 244%	70-130%
SW8015B	TPH as Gasoline	CRT0023	4-Bromofluorobenzene: 261%	70-130%
SW8015B	TPH as Gasoline	CRT0025	4-Bromofluorobenzene: 285%	70-130%
SW8015B	TPH as Gasoline	CRT0029	4-Bromofluorobenzene: 254%	70-130%
SW8015B	TPH as Gasoline	CRT0031	4-Bromofluorobenzene: 251%	70-130%
SW8015B	TPH as Gasoline	CRT0035	4-Bromofluorobenzene: 274%	70-130%
SW8015B	TPH as Gasoline	CRT0037	4-Bromofluorobenzene: 251%	70-130%
SW8270C	SVOC	CRT0004	2-Fluorophenol: 6.53%	20-110%
SW8270C	SVOC	CRT0004	Phenol-d5: 0%	23-75%
SW8270C	SVOC	CRT0006	2-Fluorophenol: 10.1%	20-110%
SW8270C	SVOC	CRT0006	Phenol-d5: 0.05%	23-75%
SW8270C	SVOC	CRT0010	2-Fluorophenol: 10.1%	20-110%
SW8270C	SVOC	CRT0010	Phenol-d5: 0.05%	23-75%

The listed samples analyzed for VOC and TPH gasoline were collected from well KAFB-106157. As presented above, the surrogate 4-bromofluorobenzene in these VOC samples was consistently recovered higher than the upper control limit, while the remaining surrogates 1,2-dichloroethane-D4, dibromofluoromethane, and toluene-d8 were recovered within the accuracy specifications. As documented in the laboratory case narrative, the elevated surrogate recoveries could be attributed to a matrix effect, which affected the accuracy of the sample analysis. As a result of the biased surrogate recoveries, the detected results for VOC and TPH as gasoline in the mentioned samples were qualified as estimated (J+) with a potential high bias. The biased surrogate recoveries have no impact on the data quality of the non-detected results in listed samples.

Low or no recoveries of the surrogates in the acidic fraction were reported for three SVOC samples. As documented in the laboratory case narrative, the poor recoveries were due to a matrix effect in the samples. SVOCs in the acidic fraction were not detected in the three samples and their LOQs were consequently qualified as estimated (UJ) as a result of the non-compliant surrogate recoveries. Since SVOC in the acidic fraction have not been detected at well KAFB-106157 for the entire constant rate test

sampling event or have been identified as chemicals of concern for the site, it is unlikely that false negative results have been reported from the laboratory due to the poor surrogate recoveries. The qualified data is still usable to meet the project data quality objectives. Surrogates in the neutral/base fraction in the same three samples were acceptable and thus the data quality of the SVOCs in the neutral/base fraction is not affected. With the exception of the three samples, surrogates in both the acidic and neutral/base fractions were recovered within the acceptance criteria for all other SVOC samples, which demonstrate that in absence of matrix interference sample extraction procedures were effective.

Except where noted above, surrogates in all other samples for organic analyses were recovered within the accuracy specifications.

1.1.5 Laboratory Control Sample/Laboratory Control Sample Duplicate Recoveries and Precisions (Reason Codes L and D3)

The LCS is an aliquot of analyte-free matrix spiked with target analytes that is prepared with each analytical batch for each analytical method. The recovery of target analytes from the LCS analysis is a measurement of method performance in an interference-free sample matrix. Non-compliant LCS recoveries and precisions were reported for EPA Method SW8260B. The non-compliant LCS results are presented as follows:

Analytical Method	Laboratory QC Batch #	LCS Recovery Outlier (%)	Control Limit (%)
SW8260B	3K01014	Naphthalene: 189%	44-140%
	3K05007	Acetone: 148/108%	40-140%
	3K05007	Acetone: RPD 31%	RPD: 31%

As shown in the table, the reported LCS bias and precision results for acetone exceeded its accuracy and precision control limits. As a result, the detected results for acetone were qualified as estimated (J+). This data qualification was applied to the detected results for acetone in all samples in the non-compliant

batch. The high biased LCS recovery was also noted for naphthalene. As the analyte was not detected in any samples in the batch, the high biased LCS recovery did not affect the data quality of the sample results. It should be noted that surrogates in all VOC samples qualified for the LCS recovery or precision outliers were recovered within the accuracy specifications, thus indicating effective sample preparation procedures for the VOC analysis.

The LCS accuracy and precision results meet the acceptance criteria for SVOC, TPH as gasoline and diesel, metals, ammonia as nitrogen, sulfide, alkalinity, nitrate as nitrogen, anions, and RCI analyses. Additionally, the LCS bias and precision results are within the acceptable control criteria for both the primary and secondary columns for the EDB analysis by EPA Methods SW8011 and 504.1.

1.1.6 Matrix Spike/Matrix Spike Duplicate Recoveries and Precisions (Reason Codes M and D2)

The MS and MSD samples are a portion of a field sample spiked with target analytes that are prepared with each analytical and with each method. The MS/MSD results are used to evaluate any bias introduced to the method due to matrix interference, and to measure bias and precision for each analytical batch.

During the step-drawdown and constant rate test events, laboratory performed MS/MSD analyses for Kirtland Air Force Base (AFB) BFF Spill site-specific groundwater samples to verify the presence of a matrix effect and its potential impact on the precision and bias of the analytical results.

The following Kirtland AFB BFF Spill site-specific groundwater samples were spiked for MS/MSD analysis:

Well Location	Sample Number	MS/MSD Analysis
KAFB-106557	106157-ST-04	Dissolved iron and Manganese
KAFB-106557	106157-ST-01	Ammonia as nitrogen
KAFB-106157	CRT0001	VOC and alkalinity

Well Location	Sample Number	MS/MSD Analysis
KAFB-106157-C1	CRT0002	TPH as gasoline and EDB
KAFB-106157-C3	CRT0004	RCRA Metals
KAFB-106157	CRT0005	TPH as diesel, ammonia as nitrogen, and EDB
KAFB-106157-C3	CRT0006	VOC, dissolved iron and manganese, and anions
KAFB-106157	CRT0007	Alkalinity
KAFB-106157-C1	CRT0008	TPH as gasoline
KAFB-106157-C3	CRT0010	RCRA metals
KAFB-106157	CRT0011	TPH as diesel and gasoline, RCRA metals, and anions
KAFB-106157-C3	CRT0012	EDB
KAFB-106157	CRT0013	Alkalinity
KAFB-106157-C1	CRT0014	VOC
KAFB-106157	CRT0017	VOC, dissolved iron and manganese, and ammonia as nitrogen
KAFB-106157-C3	CRT0018	TPH as diesel, EDB, anions, and RCRA metals
KAFB-106157	CRT0019	TPH as gasoline
KAFB-106157-C3	CRT0022	Dissolved iron and manganese
KAFB-106157	CRT0023	VOCs and TPH as diesel
KAFB-106157-C3	CRT0024	EDB
KAFB-106157	CRT0025	TPH as gasoline
KAFB-106157-C3	CRT0028	Mercury, dissolved iron and manganese, and alkalinity
KAFB-106157	CRT0029	Mercury
KAFB-106157-C3	CRT0030	TPH as diesel
KAFB-106157-C1	CRT0032	TPH as gasoline
KAFB-106157-C3	CRT0034	Dissolved iron and manganese
KAFB-106157	CRT0035	RCRA metals, TPH as gasoline and diesel, and VOC
KAFB-106157	CRT0037	Metals, ammonia as nitrogen, and alkalinity
KAFB-106157-C1	CRT0038	TPH as gasoline
KAFB-106157-C3	CRT0041	Dissolved iron and manganese, and ammonia as nitrogen

The majority of the MS results meet the established bias and precision requirements; however, MS recovery or precision biases were observed for the VOC, EDB, and TPH as gasoline and diesel analyses, which are summarized as follows:

Method	MA/MSD Sample ID	MS/MSD Recovery Outlier (%)	Control Range
SW8260B	CRT0006	Toluene: 0%	70-125%
	CRT0006	1,1-Dichloroethene: 0%	70-130%
	CRT0035	Benzene: 47/27%	75-125%
EPA504.1	CRT0005	EDB: 196%	52-125%
EPA8015D	CRT0011	TPH as gasoline: 126/133%	70-130%
	CRT0025	TPH as gasoline: 23.6/46.7%	70-130%
	CRT0023	TPH as diesel: 93/52%	72-158%

With the exceptions of toluene and 1,1-dichloroethene in the spiked sample (CRT0006) and TPH as gasoline in the spiked sample (CRT0025), the reported MS/MSD recoveries did not significantly deviate from the upper or lower control limit. As a result of the low-biased MS recoveries indicated in the table,

the detected results and the LOQ for non-detected results were qualified as estimated (J-) and (UJ), respectively. The high biased MS recoveries also led to qualification of the detected results as estimated (J+). This data qualification was applied to the results of the listed analytes in the spiked samples only. As discussed in the previous section, elevated surrogate recoveries were also noted in VOC sample (CRT0035) and TPH as gasoline samples (CRT0011 and CRT0025). Both surrogate and MS recovery outliers confirm the matrix effect in the samples from well KAFB-106157. While no recoveries were reported for toluene and 1,1-dichloroethene in the spiked sample (CTT0006), it is unlikely that false negative results have been reported from the laboratory as the analytes toluene and 1,1-dichloroethene have been consistently not detected in all VOC samples for the entire constant rate test sampling event.

As shown in the preceding table, the reported MS and MSD recoveries for benzene in the spiked sample (CRT0035) ere outside the accuracy specifications. The non-compliant MS results could be attributed to a matrix effect. In the spiked sample, the parent concentration of benzene exceeds four times the spiked level. The elevated sample concentration produced matrix interference, which led to the non-compliant MS recoveries. Because the sample concentration is greater than four times the spiked level, no data qualification was applied to the results of benzene.

In all cases, the associated LCS results were within the established control criteria indicating acceptable laboratory method performance for VOC, EDB, and TPH as gasoline and diesel analyses. Except as noted, the MS precision and bias results are acceptable for all other analyses.

1.1.7 Initial Calibration (Reason Code G)

Instrument calibration is performed for VOC, SVOC, EDB, TPH as gasoline and diesel, metals, anion, ammonia as nitrogen, and nitrate and nitrite as nitrogen analyses according to the EPA method requirements (EPA, 1996). The linear analytical range is established for each method by analysis of calibration standards prepared at increasing concentrations that cover the expected sample concentrations.

The acceptability of the initial calibration is determined by calculation of a percent relative standard deviation or coefficient. The initial calibration results are acceptable for all the listed methods.

Immediately after the initial calibration for each chemical data analysis, an initial calibration verification (ICV) was conducted at the mid-point of instrument calibration range by using a second source calibration standard to verify the accuracy of the initial calibration. The review indicated acceptable ICV results for all target analytes.

1.1.8 Continuing Calibration Verification (Reason Code C)

Routinely during sample analysis, the stability of the analytical system is monitored by analysis of continuing calibration standards at concentrations near the mid-point of the instrument calibration range. The percent difference (%D) values between the relative response factor (RRF) in the initial calibration and the RRF in the continuing calibration exceeded the acceptance criteria for VOC and SVOC. The CCV outliers that resulted in data qualification are summarized as follows:

Analytical Method	Calibration ID/Date	CCV Outlier, D (%)	Control Limit (%)
SW8260B	3K230803-CCV1	Acetone: +36.8%	<20%
	12/3/2013	Acetone: -21.3%	<20%
	12/4/2013	Acetone: -34.1%	<20%
	12/4/2013	2-Butanone: -22.6%	<20%
	12/5/2013	Acetone: -37.1%	<20%
	12/5/2013	2-Butanone: -23.6%	<20%
	12/5/2013	2-Mehtylnaphthalene: -25.5%	<20%
	12/5/2013	1-Methylnaphthalene: -23.1%	<20%
	12/6/2013	Acetone: -27.8%	<20%
	12/6/2013	2-Methylnaphthalene: -22%	<20%
	12/7/2013	Acetone: -21.1%	<20%
	12/9/2013	1,2,4-Trichlorobenzene: -23.2%	<20%
SW8270C	12/6/2013	Bis(2-chloroisopropyl)ether: -30.1%	<20%
	12/8/2013	Bis(2-chloroisopropyl)ether: -25.5%	<20%
	12/8/2013	2,4-Dinitrophenol: -24.9%	<20%
	12/8/2013	3,3'-Dichlorobenzidine: -24.2%	<20%
	12/10/2013	Bis(2-chloroisopropyl)ether: -35.8%	<20%

ID identification

As a result of the low-biased %D values, the detected results and the LOQs for the non-detected analytes were qualified as estimated (J-) and (UJ), respectively. The high-biased %D values led to qualification of the detected results as estimated (J+), but do not affect the not detected results. This data qualification was applied to the results of the listed analytes in all samples associated with the non-compliant CCVs. In all cases, the degree of the CCV outliers is minor and does not affect the data usability.

Additionally, high-biased %D values were reported for other VOC and SVOC analytes. Because these analytes were not detected in samples associated with the CCV outliers, the high-biased %D values do not affect the sample results, and therefore, did not warrant any data qualification. Except as noted, the CCV results are acceptable for all other analyses.

1.1.9 Interference Check Samples (Reason Code O)

The ICS verifies the inter-element and background correction factors. An ICS was analyzed at the required frequencies, and all ICS results are within the established control limit for EPA Method SW6010B.

1.1.10 ICP Serial Dilutions (Reason Code A)

The ICP serial dilution determines whether significant physical or chemical interferences exist due to sample matrix. An ICP serial dilution was performed on one project sample collected during step-drawdown test event. The ICP serial dilution results meet the accuracy goal with the following exception:

Analytical Method	ICP Serial Sample ID	ICP Serial Dilution Outlier (%)	Control Limit (%)
EPA 6010B	KAFB-106157-ST-04	Manganese: 11.7%	<10%

ID identification

The ICP serial dilution outlier led to qualification of the detected manganese result as estimated (J) in the affected sample. As required by the site-specific BFF Spill QAPjP (USACE, 2011) and DoD QSM

(2010), the laboratory performed the post-digestion spike analysis on the non-compliant sample and reported acceptable post-digestion spike recoveries for the analyte. The ICP serial dilution results meet the accuracy goal for all other metals.

1.1.11 Sample Confirmation (Reason Code D)

As required by the DoD and EPA, when samples are analyzed by either a gas chromatography or high-performance liquid chromatography method, all positive results, with the exception of TPH as gasoline and diesel, must be confirmed by a second column or a different detector. For both the step-drawdown and constant rate test events, all positive EDB results analyzed by EPA Method SW8011 or EPA Method 504.1 were confirmed by a second column, and the precision results between the primary and secondary columns are within the precision control limit for all the detected samples.

The analyte EDB was analyzed in all groundwater samples by both EPA Methods SW8011/EPA 504.1 and SW8260B. During the data review, the EDB results for the analysis by EPA Method SW8011/EPA504.1 were also compared with the EDB results analyzed by EPA Method SW8260B. In cases where the analyte is detected by both EPA Methods SW8011/EPA504.1 and SW8260B, the detected EDB results between the two methods are comparable and in agreement.

1.1.12 Professional Judgment (Reason Code P)

During the data review process, it was noted that trace levels of bromoform, bromodichloromethane, dibromochloromethane, carbon techloride, chloromethane or 4-chlorotoluene were reported in some effluent samples collected after the third carbon bed. These analytes however were not present in well KAFB-106157 or in the effluent samples collected from the first or second carbon beds. As the carbon beds are designed to reduce and remove VOC contaminants from the groundwater, contaminants after the third carbon bed are not expected. Prior to the constant rate test sampling event, manganese concentrations in a few grab samples were collected and found to be greater than the New Mexico

groundwater protection standards. Bleach was then added in order to reduce the manganese concentration in the groundwater. Following manganese treatment, the treated water was introduced to the carbon beds. The bleach residue in the carbon beds resulted in the byproducts of halogenated VOC such as bromoform and dibromochloromethane. Since the trace concentrations of the halogenated VOC were due to the bleach, not contaminants from the groundwater, data qualification was applied to the results of the analytes as estimated (J). Acetone and 2-butanone were detected above the LOQ after each of the three carbon beds during the step-drawdown test event. These two analytes however were not present in the groundwater from well KAFB-106157. The detections of the acetone and 2-butanone in the effluent samples could be attributed to the adhesive material used in sample ports and were consequently qualified as estimated (J).

As shown in the laboratory report, the concentrations of total sulfide and reactive sulfide in the effluent sample CRT0016 from the third carbon bed were 0.781 mg/L and 9.6 mg/L, respectively. Because this pair of results are not technically possible and are inconsistent with the remaining total and reactive sulfide results reported from the same sampling event, the laboratory re-prepared and re-analyzed the sample after the analysis holding time had expired. The re-analysis was performed on a different container from the same sample. Based on the re-analysis, the total sulfide concentration was approximately 5 mg/L and did not confirm the originally reported result. Due to lack of sample volume, the reactive sulfide analysis was not repeated. Possible explanations for the data errors could be laboratory analysis errors or different samples in the containers submitted to the laboratory for the total and reactive sulfide analysis. The results of the total sulfide and reactive sulfide in the original sample CRT0016 were qualified as not usable due to analysis or sampling errors.

1.1.13 Tentatively Identified Compounds

SVOC analytes 1,1-biphenyl, 1,2-diphenylhydrazine, 2,2’-oxybis-1-chloropropane, acetophenone, atrazine, benzaldehyde, and caprolactam have been monitored and reported for the Quarterly

Groundwater Monitoring Program, these analytes however are not included in the SVOC standard that Hall laboratory uses for the SVOC analysis. In order to verify the presence or absence of these SVOC compounds, the laboratory reviewed unknown peaks on the SVOC chromatograms and concluded that these SVOC analytes were not present in any of the SVOC samples collected during the constant rate test sampling event.

1.1.14 Trip Blanks (Reason Code K3)

Trip blanks were prepared by the laboratory and stored with the groundwater samples collected for VOC analysis. One trip blank was submitted with VOC sample collected for the step drawdown test and was also shipped with VOC sample for each trip during the constant rate test Sampling event, which resulted in a total of 15 trip blanks for both the sampling events. The trip blanks were analyzed for VOC only. Appendix B – Table 4 summarizes the detected trip blank results and associated sample results. Positive results in the trip blank are presented as follows:

Analytical Method	Trip Bank Number	Contaminant	Detection (µg/L)	LOQ (µg/L)
SW8260B	CRT8001	Methylene Chloride	0.58	3
	CRT8002	Methylene Chloride	0.58	3
	CRT8003	Methylene Chloride	0.66	3
	CRT8004	Chloromethane	0.39	3
	CRT8004	Methylene Chloride	0.56	3
	CRT8005	Methylene Chloride	0.56	3
	CRT8006	Methylene Chloride	0.54	3
	CRT8007	Methylene Chloride	0.55	3
	CRT8008	Methylene Chloride	0.57	3
	CRT8009	Methylene Chloride	0.63	3
	CRT8010	Methylene Chloride	0.71	3
	CRT8011	Methylene Chloride	0.65	3
	CRT8012	Methylene Chloride	0.6	3
	CRT8013	Methylene Chloride	0.58	3
	CRT8014	Methylene Chloride	0.59	3

µg/L microgram per liter

The above trip blank detections are considered acceptable as the concentrations in the blank are less than one of the LOQ for chloromethane and less than LOQ for common laboratory contaminant methylene

chloride. As summarized in Appendix B – Table 4, the analytes methylene chloride and chloromethane were not detected in any samples shipped with the blanks, and thus the sample results were not affected by the trip blank detections. No VOCs were detected in the remaining one blank. Therefore, the trip blank results are acceptable and demonstrate that valid sample storage and shipping procedures are being implemented.

1.1.15 Equipment Rinse Blanks (Reason Code K1)

Equipment rinse blanks are designed to check for contamination from sampling equipment, and the results for the equipment rinse blanks are used to evaluate the efficiency of equipment decontamination procedures.

During the step-drawdown and constant rate test events, dedicated sampling equipment was used to collect all of the groundwater samples. As no cross-contamination between wells could occur, no equipment rinse blanks were necessary in these cases.

1.1.16 Field Duplicates

No field duplicates were collected during the step-drawdown and constant rate test events . As discussed in the previous sections, laboratory precision results between LCS and LCSD recoveries, and site specific matrix spike precision results met the precision goal for all methods and for all batches with the exception of one minor LCSD RPD outlier for acetone. Overall, the precision results demonstrate acceptable analytical precision for all methods.

1.2 Completeness

The following sections present a discussion of contractual, analytical, and technical completeness for the step-drawdown and constant rate test events . Completeness calculations were performed only for the groundwater samples that are used for project decisions. For informational purposes, completeness

calculations were also calculated for the field QC samples. Completeness results are presented in Appendix D – Table 5.

1.2.1 Contractual Completeness

Contractual completeness is a quantitative determination of the number of unqualified results compared to the total number of sample results expressed as a percentage, based on data qualified for QC outliers related to method performance. These include data qualified for calibration or preparation blank contamination, missed holding times, and non-compliant LCS recovery and/or precision. The contractual completeness goal is 95 percent. Contractual completeness is calculated as follows:

$$\% \text{ Contractual Completeness} = \frac{\text{Number of Unqualified Results}}{\text{Total Number of Results}} \times 100$$

For the step-drawdown test sampling event, the contractual completeness goal was achieved as follows:

- VOC by EPA Method SW8260B – 99.6%
- Other Methods – 100%

For the constant rate test sampling event, the contractual completeness goal was achieved as follows:

- pH by EPA Method 150.1 – 0%
- Metals by EPA Methods SW6010B – 99.7%
- Other Methods – 100%

Due to the holding time outliers, the 95 percent contractual completeness goal was missed for the pH analysis. As presented above, the 95 percent contractual completeness requirement was achieved for all other methods.

1.2.2 Analytical Completeness

Analytical completeness is a quantitative measure of the number of unqualified data results compared to the total number of results expressed as a percentage, based on the target analytes qualified for exceedances of QC requirements based on calibration, LCS, MS/MSD, surrogate, method precision, and laboratory method blank contamination results. The analytical completeness goal is 90 percent for the project. Analytical completeness is calculated as follows:

$$\% \text{ Analytical Completeness} = \frac{\text{Number of Unqualified Results}}{\text{Total Number of Results}} \times 100$$

For the step-drawdown testing event, the analytical completeness goal was achieved as follows:

- Metals by EPA Method 6010B – 96.4%
- VOC by EPA Method 8260B – 97.3%
- Other Methods – 100%

For the constant rate test sampling event, the analytical completeness goal was achieved as follows:

- pH by EPA Method 150.1 – 0%
- EDB by EPA Method 504.1 – 97.6%
- Metals by EPA Method 6010B – 99.7%
- TPH as gasoline and diesel by EPA Method 8015D – 82.9%
- VOC by EPA Method 8260B – 90.2%
- SVOC by EPA Method 8270C – 95.8%
- Other Methods – 100%

Largely due to the holding time outliers and non-compliant surrogate recoveries, the 90 percent analytical completeness objective was not achieved for the pH analysis (0 percent) and for the TPH as gasoline and diesel analysis (82.9 percent). As shown above, the 90 percent analytical completeness objective was achieved for all other methods. While the results of pH, TPH as gasoline and diesel, metals, EDB, VOC, and SVOC in a few samples were qualified as estimated or non-detected due to QC outliers discussed in

the previous sections, the data usability of the qualified data is not affected. Qualified data are still usable to achieve the project data quality objectives.

1.2.3 Technical Completeness

Technical completeness is a quantitative measure of the data usability based on the number of rejected data compared to the total number of sample results. The technical completeness goal for each method is equal to or greater than 95 percent. The technical completeness calculation considers all data that are not rejected to be usable. The technical completeness is calculated as follows:

$$\% \text{ Technical Completeness} = \frac{\text{Number of Usable Results}}{\text{Total Number of Results}} \times 100$$

As discussed in the previous sections, the results of the total sulfide and reactive sulfide in one sample are not usable due to laboratory analysis errors or sampling errors. The technical completeness was still met for the total sulfide analysis (96.3 percent) and for the reactive sulfide analysis (96.4 percent). Despite the exceedances noted, the technical completeness was 100 percent for all other methods exceeding the 95 percent technical completeness objective. Therefore, the project data quality objectives were achieved for the step-drawdown test and constant rate test sampling events.

1.3 Summary

The analytical data reported for the step-drawdown and constant rate test sampling events have been reviewed for precision, bias, representativeness, comparability, and completeness. Data quality exceedances consist of elevated cooler temperatures, missed hold time, biased surrogate, LCS, and MS/MSD recoveries or precision; continuing calibration outliers; low-level laboratory and field blank contamination, and analysis or sampling errors. The affected data were qualified as estimated, not-detected, or rejected. With the exception of the total sulfide and reactive sulfide in sample CRT0016, the

degree of these data quality exceedances was minor, and the data usability was not affected. The results of the total and reactive sulfide in the original sample CRT0016 were not usable. The 95 percent technical completeness goal was exceeded for all methods for the step-drawdown and constant rate test sampling events. Except where noted, all data are usable for their intended purposes.

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TABLES

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List of Appendix D Tables

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Appendix D – Table 1. Groundwater Sample Delivery Group
Fourth Quarter CY 2013 Aquifer Test Sampling

Step-Drawdown Test				
Sample Location	**Sample Date**	**Sample Number**	**Sample Delivery Group**	**Matrix**
KAFB-106157	10/30/2013	106157-ST-01	1310287	WATER
KAFB-106157	10/30/2013	106157-ST-02	1310287	WATER
KAFB-106157	10/30/2013	106157-ST-03	1310287	WATER
KAFB-106157	10/30/2013	106157-ST-04	1310287	WATER
Constant Rate Test				
KAFB-106157	12/3/2013	CRT0001	1312087	WATER
KAFB-106157	12/3/2013	CRT0005	1312124	WATER
KAFB-106157	12/4/2013	CRT0007	1312126	WATER
KAFB-106157	12/4/2013	CRT0011	1312179	WATER
KAFB-106157	12/5/2013	CRT0013	1312193	WATER
KAFB-106157	12/5/2013	CRT0017	1312233	WATER
KAFB-106157	12/6/2013	CRT0019	1312261	WATER
KAFB-106157	12/6/2013	CRT0023	1312279	WATER
KAFB-106157	12/7/2013	CRT0025	1312280	WATER
KAFB-106157	12/7/2013	CRT0029	1312281	WATER
KAFB-106157	12/8/2013	CRT0031	1312282	WATER
KAFB-106157	12/8/2013	CRT0035	1312292	WATER
KAFB-106157	12/9/2013	CRT0037	1312297	WATER
KAFB-106157-C1	12/3/2013	CRT0002	1312087	WATER
KAFB-106157-C1	12/4/2013	CRT0008	1312126	WATER
KAFB-106157-C1	12/5/2013	CRT0014	1312193	WATER
KAFB-106157-C1	12/6/2013	CRT0020	1312261	WATER
KAFB-106157-C1	12/7/2013	CRT0026	1312280	WATER
KAFB-106157-C1	12/8/2013	CRT0032	1312282	WATER
KAFB-106157-C1	12/9/2013	CRT0038	1312297	WATER
KAFB-106157-C2	12/3/2013	CRT0003	1312087	WATER
KAFB-106157-C2	12/4/2013	CRT0009	1312126	WATER
KAFB-106157-C2	12/5/2013	CRT0015	1312193	WATER
KAFB-106157-C2	12/6/2013	CRT0021	1312261	WATER
KAFB-106157-C2	12/7/2013	CRT0027	1312280	WATER
KAFB-106157-C2	12/8/2013	CRT0033	1312282	WATER
KAFB-106157-C2	12/9/2013	CRT0039	1312297	WATER
KAFB-106157-C3	12/3/2013	CRT0004	1312087	WATER
KAFB-106157-C3	12/3/2013	CRT0006	1312124	WATER
KAFB-106157-C3	12/4/2013	CRT0010	1312126	WATER
KAFB-106157-C3	12/4/2013	CRT0012	1312179	WATER
KAFB-106157-C3	12/5/2013	CRT0016	1312193	WATER
KAFB-106157-C3	12/5/2013	CRT0018	1312233	WATER
KAFB-106157-C3	12/6/2013	CRT0022	1312261	WATER
KAFB-106157-C3	12/6/2013	CRT0024	1312279	WATER
KAFB-106157-C3	12/7/2013	CRT0028	1312280	WATER
KAFB-106157-C3	12/7/2013	CRT0030	1312281	WATER
KAFB-106157-C3	12/8/2013	CRT0034	1312282	WATER
KAFB-106157-C3	12/8/2013	CRT0036	1312292	WATER
KAFB-106157-C3	12/9/2013	CRT0040	1312297	WATER
KAFB-106157-C3	12/9/2013	CRT0041	1312314	WATER

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Appendix D – Table 2. Data Qualification Flags and Reason Codes

Data Qualifier Definitions for Organic Data Review

Qualifier	Definition
	No Qualifier indicates that the data are acceptable both qualitatively and quantitatively.
U	The analyte was analyzed for but was not detected above the reported limit of quantitation.
J	The analyte was analyzed for and was positively identified, but the reported numerical value may not be consistent with the amount actually present in the environmental sample. Results are estimated, although the data are considered usable and may be used as appropriate to meet project objectives. Results are qualitatively acceptable and quantitatively uncertain.
J-	The analyte was positively identified; the associated numerical value is its approximate concentration with a low bias in the sample.
J+	The analyte was positively identified; the associated numerical value is its approximate concentration with a high bias in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified," and the associated value represents its approximate concentration.
UJ	The analyte was not detected above the reported limit of quantitation. However, the reported limit of quantitation is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The analyte was analyzed for, but the presence or absence of the analyte has not been verified. Resampling and reanalysis may be necessary to confirm or deny the presence of the analyte. Results are rejected, and data are unusable for any purposes.

Data Qualifier Definitions For Inorganic Data Review

Qualifier	Definition
	No Qualifier indicates that the data are acceptable both qualitatively and quantitatively.
U	The analyte was analyzed for but was not detected above the level of the reported value. The reported value is the limit of quantitation for water and soil for all the analytes except cyanide (CN) and mercury (Hg). For CN and Hg, the reported value is the contract-required detection limit.
J	The analyte was analyzed for and was positively identified, but the reported numerical value may not be consistent with the amount actually present in the environmental sample. Results are estimated, although the data are considered usable and may be used as appropriate to meet project objectives. Results are qualitatively acceptable and quantitatively uncertain.
J-	The analyte was positively identified; the associated numerical value is its approximate concentration with a low bias in the sample.
J+	The analyte was positively identified; the associated numerical value is its approximate concentration with a high bias in the sample.
UJ	The analyte was analyzed for but was not detected above the reported value. The reported value may not accurately or precisely represent the sample limit of quantitation.
R	The analyte was analyzed for, but the presence or absence of the analyte has not been verified. Resampling and reanalysis may be necessary to confirm or deny the presence of the analyte. Results are rejected, and data are unusable for any purposes.

Appendix D – Table 2. Data Qualification Flags and Reason Codes (concluded)

Reason Codes for Data Review and Validation

Reason Code	Description
A	Serial dilution outside criteria (Level IV).
B1	Method blank contaminants above reporting limit.
B2	Calibration blank contaminants above reporting limit.
B2, Bias Flag "-"	Calibration blank indicates negative interference; false negatives may be present.
C	Calibration outside control limits.
D	Sample results precision between primary and secondary columns outside control limit.
D1	Sample duplicate RPD outside control limit.
D2	Matrix duplicate RPD outside control limit.
D3	Laboratory control sample duplicate RPD outside control limit.
E	The sample results exceed the linear calibration range of the instrument.
F	Hydrocarbon pattern does not match hydrocarbon pattern in the standard.
G1	Initial calibration relative standard deviation outside control limit.
G2	Initial continuing calibration RRF outside control limit.
G3	Continuing calibration RRF outside control limit.
H	Holding time exceeded.
I	Internal standard recovery outside control limit.
K1	Equipment rinsate contamination.
K2	Ambient blank contamination.
K3	Trip blank contamination.
L	LCS outside control limits.
M	MS outside control limits.
O	Interference check sample outside acceptance criteria.
P	Analyte qualified based on the professional judgment of the reviewer.
S	Surrogate recovery outside control limit.
T	Temperature outside acceptance criteria.
Tr	Value reported detected between the detection limit and LOQ.
W	Pesticide breakdown outside criteria (Level IV).
X	Raised reporting limit due to matrix interference or high analyte concentration.
Y	Analyte was not confirmed by a second column.

Appendix D - Table 3
Qualified Data Summary
Fourth Quarter CY 2013 Aquifer Testing Results
Kirtland Air Force Base

Sample ID	Sample Type	Sample Date	Analyte	SDG	Result	DL	LOQ	Dilution	Units	Qualifier
Step Testing - Environmental Samples										
Reason Code A		**Method SW6010B-DISS**								
106157-ST-04	REG	10/30/2013	Manganese	1310287	324	3	15	1	ug/L	J
Reason Code CP		**Method SW8260B**								
106157-ST-02	REG	10/30/2013	Acetone	1310287	15.4	2.5	10	1	ug/L	J
106157-ST-03	REG	10/30/2013	Acetone	1310287	136	2.5	10	1	ug/L	J
106157-ST-04	REG	10/30/2013	Acetone	1310287	83.8	2.5	10	1	ug/L	J
Reason Code D3LTr		**Method SW8260B**								
106157-ST-01	REG	10/30/2013	Acetone	1310287	20.8	6.25	25	2.5	ug/L	J+
Reason Code P		**Method SW8260B**								
106157-ST-02	REG	10/30/2013	2-Butanone	1310287	12.4	2.5	10	1	ug/L	J
106157-ST-03	REG	10/30/2013	2-Butanone	1310287	129	2.5	10	1	ug/L	J
106157-ST-04	REG	10/30/2013	2-Butanone	1310287	66.8	2.5	10	1	ug/L	J
Constant Rate - Environmental Samples										
Reason Code B1		**Method SW6010B**								
CRT0001	REG	12/3/2013	Silver	1312087	ND	0.00052	0.005	1	mg/L	U
Reason Code B1		**Method SW8260B**								
CRT0041	REG	12/9/2013	Chloromethane	1312314	ND	0.36814	3	1	ug/L	U
Reason Code C		**Method SW8260B**								
CRT0002	REG	12/3/2013	Acetone	1312087	ND	1.72049	10	1	ug/L	UJ
CRT0003	REG	12/3/2013	Acetone	1312087	ND	1.72049	10	1	ug/L	UJ
CRT0005	REG	12/3/2013	2-Butanone	1312124	ND	0.99961	10	1	ug/L	UJ
CRT0006	REG	12/3/2013	2-Butanone	1312124	ND	0.99961	10	1	ug/L	UJ
CRT0006	REG	12/3/2013	Acetone	1312124	ND	1.72049	10	1	ug/L	UJ
CRT0007	REG	12/4/2013	2-Butanone	1312126	ND	0.99961	10	1	ug/L	UJ
CRT0008	REG	12/4/2013	2-Butanone	1312126	ND	0.99961	10	1	ug/L	UJ
CRT0008	REG	12/4/2013	Acetone	1312126	ND	1.72049	10	1	ug/L	UJ
CRT0009	REG	12/4/2013	2-Butanone	1312126	ND	0.99961	10	1	ug/L	UJ
CRT0009	REG	12/4/2013	Acetone	1312126	ND	1.72049	10	1	ug/L	UJ
CRT0010	REG	12/4/2013	2-Butanone	1312126	ND	0.99961	10	1	ug/L	UJ
CRT0010	REG	12/4/2013	Acetone	1312126	ND	1.72049	10	1	ug/L	UJ
CRT0014	REG	12/5/2013	1-Methyl naphthalene	1312193	ND	0.41112	4	1	ug/L	UJ
CRT0014	REG	12/5/2013	2-Butanone	1312193	ND	0.99961	10	1	ug/L	UJ
CRT0014	REG	12/5/2013	2-Methylnaphthalene	1312193	ND	0.38802	4	1	ug/L	UJ
CRT0014	REG	12/5/2013	Acetone	1312193	ND	1.72049	10	1	ug/L	UJ
CRT0015	REG	12/5/2013	1-Methyl naphthalene	1312193	ND	0.41112	4	1	ug/L	UJ
CRT0015	REG	12/5/2013	2-Butanone	1312193	ND	0.99961	10	1	ug/L	UJ
CRT0015	REG	12/5/2013	2-Methylnaphthalene	1312193	ND	0.38802	4	1	ug/L	UJ

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Sample ID	Sample Type	Sample Date	Analyte	SDG	Result	DL	LOQ	Dilution	Units	Qualifier
Constant Rate - Environmental Samples										
Reason Code C		**Method SW8260B**								
CRT0015	REG	12/5/2013	Acetone	1312193	ND	1.72049	10	1	ug/L	UJ
CRT0016	REG	12/5/2013	1-Methyl naphthalene	1312193	ND	0.41112	4	1	ug/L	UJ
CRT0016	REG	12/5/2013	2-Butanone	1312193	ND	0.99961	10	1	ug/L	UJ
CRT0016	REG	12/5/2013	2-Methylnaphthalene	1312193	ND	0.38802	4	1	ug/L	UJ
CRT0016	REG	12/5/2013	Acetone	1312193	ND	1.72049	10	1	ug/L	UJ
CRT0018	REG	12/5/2013	2-Methylnaphthalene	1312233	ND	0.38802	4	1	ug/L	UJ
CRT0018	REG	12/5/2013	Acetone	1312233	ND	1.72049	10	1	ug/L	UJ
CRT0021	REG	12/6/2013	Acetone	1312261	ND	1.72049	10	1	ug/L	UJ
CRT0022	REG	12/6/2013	Acetone	1312261	ND	1.72049	10	1	ug/L	UJ
CRT0023	REG	12/6/2013	2-Butanone	1312279	ND	0.99961	10	1	ug/L	UJ
CRT0024	REG	12/6/2013	1-Methyl naphthalene	1312279	ND	0.41112	4	1	ug/L	UJ
CRT0024	REG	12/6/2013	2-Butanone	1312279	ND	0.99961	10	1	ug/L	UJ
CRT0024	REG	12/6/2013	2-Methylnaphthalene	1312279	ND	0.38802	4	1	ug/L	UJ
Reason Code C		**Method SW8270C**								
CRT0011	REG	12/4/2013	2,4-Dinitrophenol	1312179	ND	3.20139	5	1	ug/L	UJ
CRT0011	REG	12/4/2013	Bis(2-chloroisopropyl)ether	1312179	ND	3.28706	5	1	ug/L	UJ
CRT0012	REG	12/4/2013	2,4-Dinitrophenol	1312179	ND	3.20139	5	1	ug/L	UJ
CRT0012	REG	12/4/2013	Bis(2-chloroisopropyl)ether	1312179	ND	3.28706	5	1	ug/L	UJ
CRT0013	REG	12/5/2013	Bis(2-chloroisopropyl)ether	1312193	ND	3.28706	5	1	ug/L	UJ
CRT0016	REG	12/5/2013	Bis(2-chloroisopropyl)ether	1312193	ND	3.28706	5	1	ug/L	UJ
CRT0017	REG	12/5/2013	Bis(2-chloroisopropyl)ether	1312233	ND	3.28706	5	1	ug/L	UJ
CRT0018	REG	12/5/2013	Bis(2-chloroisopropyl)ether	1312233	ND	3.28706	5	1	ug/L	UJ
CRT0019	REG	12/6/2013	Bis(2-chloroisopropyl)ether	1312261	ND	3.28706	5	1	ug/L	UJ
CRT0022	REG	12/6/2013	Bis(2-chloroisopropyl)ether	1312261	ND	3.28706	5	1	ug/L	UJ
CRT0025	REG	12/7/2013	2,4-Dinitrophenol	1312280	ND	3.20139	5	1	ug/L	UJ
CRT0025	REG	12/7/2013	3,3'-Dichlorobenzidine	1312280	ND	3.72639	5	1	ug/L	UJ
CRT0025	REG	12/7/2013	Bis(2-chloroisopropyl)ether	1312280	ND	3.28706	5	1	ug/L	UJ
CRT0028	REG	12/7/2013	2,4-Dinitrophenol	1312280	ND	3.20139	5	1	ug/L	UJ
CRT0028	REG	12/7/2013	3,3'-Dichlorobenzidine	1312280	ND	3.72639	5	1	ug/L	UJ
CRT0028	REG	12/7/2013	Bis(2-chloroisopropyl)ether	1312280	ND	3.28706	5	1	ug/L	UJ
CRT0029	REG	12/7/2013	2,4-Dinitrophenol	1312281	ND	3.20139	5	1	ug/L	UJ
CRT0029	REG	12/7/2013	3,3'-Dichlorobenzidine	1312281	ND	3.72639	5	1	ug/L	UJ
CRT0029	REG	12/7/2013	Bis(2-chloroisopropyl)ether	1312281	ND	3.28706	5	1	ug/L	UJ
CRT0030	REG	12/7/2013	2,4-Dinitrophenol	1312281	ND	3.20139	5	1	ug/L	UJ
CRT0030	REG	12/7/2013	3,3'-Dichlorobenzidine	1312281	ND	3.72639	5	1	ug/L	UJ
CRT0030	REG	12/7/2013	Bis(2-chloroisopropyl)ether	1312281	ND	3.28706	5	1	ug/L	UJ
CRT0031	REG	12/8/2013	2,4-Dinitrophenol	1312282	ND	3.20139	5	1	ug/L	UJ

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Sample ID	Sample Type	Sample Date	Analyte	SDG	Result	DL	LOQ	Dilution	Units	Qualifier
Constant Rate - Environmental Samples										
Reason Code C		**Method SW8270C**								
CRT0031	REG	12/8/2013	3,3'-Dichlorobenzidine	1312282	ND	3.72639	5	1	ug/L	UJ
CRT0031	REG	12/8/2013	Bis(2-chloroisopropyl)ether	1312282	ND	3.28706	5	1	ug/L	UJ
CRT0034	REG	12/8/2013	2,4-Dinitrophenol	1312282	ND	3.20139	5	1	ug/L	UJ
CRT0034	REG	12/8/2013	3,3'-Dichlorobenzidine	1312282	ND	3.72639	5	1	ug/L	UJ
CRT0034	REG	12/8/2013	Bis(2-chloroisopropyl)ether	1312282	ND	3.28706	5	1	ug/L	UJ
CRT0035	REG	12/8/2013	Bis(2-chloroisopropyl)ether	1312292	ND	3.28706	5	1	ug/L	UJ
CRT0036	REG	12/8/2013	Bis(2-chloroisopropyl)ether	1312292	ND	3.28706	5	1	ug/L	UJ
CRT0037	REG	12/9/2013	Bis(2-chloroisopropyl)ether	1312297	ND	3.28706	5	1	ug/L	UJ
CRT0040	REG	12/9/2013	Bis(2-chloroisopropyl)ether	1312297	ND	3.28706	5	1	ug/L	UJ
Reason Code CS		**Method SW8260B**								
CRT0001	REG	12/3/2013	Acetone	1312087	18	1.72049	10	1	ug/L	J
CRT0005	REG	12/3/2013	Acetone	1312124	17	1.72049	10	1	ug/L	J
CRT0007	REG	12/4/2013	Acetone	1312126	20	1.72049	10	1	ug/L	J
CRT0011	REG	12/4/2013	Acetone	1312179	26	1.72049	10	1	ug/L	J
CRT0013	REG	12/5/2013	1-Methyl naphthalene	1312193	12	0.41112	4	1	ug/L	J
CRT0013	REG	12/5/2013	2-Methylnaphthalene	1312193	4.4	0.38802	4	1	ug/L	J
CRT0013	REG	12/5/2013	Acetone	1312193	26	1.72049	10	1	ug/L	J
CRT0017	REG	12/5/2013	2-Methylnaphthalene	1312233	4.3	0.38802	4	1	ug/L	J
CRT0017	REG	12/5/2013	Acetone	1312233	21	1.72049	10	1	ug/L	J
CRT0019	REG	12/6/2013	Acetone	1312261	22	1.72049	10	1	ug/L	J
CRT0023	REG	12/6/2013	1-Methyl naphthalene	1312279	11	0.41112	4	1	ug/L	J
CRT0023	REG	12/6/2013	2-Methylnaphthalene	1312279	4	0.38802	4	1	ug/L	J
CRT0023	REG	12/6/2013	Acetone	1312279	22	1.72049	10	1	ug/L	J
CRT0037	REG	12/9/2013	1,2,4-Trimethylbenzene	1312297	1.7	0.50502	1	1	ug/L	J+
Reason Code CSTr		**Method SW8260B**								
CRT0004	REG	12/3/2013	Acetone	1312087	2.5	1.72049	10	1	ug/L	J
CRT0013	REG	12/5/2013	2-Butanone	1312193	2.6	0.99961	10	1	ug/L	J
CRT0024	REG	12/6/2013	Acetone	1312279	2.1	1.72049	10	1	ug/L	J
Reason Code CTr		**Method SW8260B**								
CRT0012	REG	12/4/2013	Acetone	1312179	3	1.72049	10	1	ug/L	J-
CRT0020	REG	12/6/2013	Acetone	1312261	5.6	1.72049	10	1	ug/L	J-
Reason Code H		**Method E150.1**								
CRT0001	REG	12/3/2013	pH	1312087	7.5	0.1	0.1	1	PH UNITS	J
CRT0004	REG	12/3/2013	pH	1312087	8.95	0.1	0.1	1	PH UNITS	J
CRT0007	REG	12/4/2013	pH	1312126	7.38	0.1	0.1	1	PH UNITS	J
CRT0010	REG	12/4/2013	pH	1312126	8.46	0.1	0.1	1	PH UNITS	J

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Sample ID	Sample Type	Sample Date	Analyte	SDG	Result	DL	LOQ	Dilution	Units	Qualifier
Constant Rate - Environmental Samples										
Reason Code H		**Method E150.1**								
CRT0013	REG	12/5/2013	pH	1312193	7.38	0.1	0.1	1	PH UNITS	J
CRT0016	REG	12/5/2013	pH	1312193	8.38	0.1	0.1	1	PH UNITS	J
CRT0019	REG	12/6/2013	pH	1312261	7.08	0.1	0.1	1	PH UNITS	J
CRT0022	REG	12/6/2013	pH	1312261	7.67	0.1	0.1	1	PH UNITS	J
CRT0025	REG	12/7/2013	pH	1312280	6.91	0.1	0.1	1	PH UNITS	J
CRT0028	REG	12/7/2013	pH	1312280	7.47	0.1	0.1	1	PH UNITS	J
CRT0031	REG	12/8/2013	pH	1312282	6.93	0.1	0.1	1	PH UNITS	J
CRT0034	REG	12/8/2013	pH	1312282	7.44	0.1	0.1	1	PH UNITS	J
CRT0037	REG	12/9/2013	pH	1312297	7	0.1	0.1	1	PH UNITS	J
CRT0040	REG	12/9/2013	pH	1312297	7.54	0.1	0.1	1	PH UNITS	J
Reason Code M		**Method E504.1**								
CRT0005	REG	12/3/2013	1,2-Dibromoethane	1312124	1.1	0.03818	0.1	10	ug/L	J+
Reason Code M		**Method SW8015**								
CRT0023	REG	12/6/2013	Diesel Range Organics (DRO)	1312279	4.5	0.136	0.2	1	mg/L	J-
Reason Code M		**Method SW8260B**								
CRT0006	REG	12/3/2013	1,1-Dichloroethene	1312124	ND	0.47675	1	1	ug/L	UJ
CRT0006	REG	12/3/2013	Toluene	1312124	ND	0.44071	1	1	ug/L	UJ
Reason Code MS		**Method SW8015**								
CRT0011	REG	12/4/2013	Gasoline Range Organics (GRO)	1312179	3.7	0.0092	0.05	1	mg/L	J+
CRT0025	REG	12/7/2013	Gasoline Range Organics (GRO)	1312280	3.5	0.0092	0.05	1	mg/L	J
Reason Code P		**Method SM4500S2F**								
CRT0016	REG	12/5/2013	Sulfide, total	1312193	0.78	0	0.21	1	mg/L	R
Reason Code P		**Method SW7.3.4.2**								
CRT0016	REG	12/5/2013	Reactive Sulfide	1312193	9.6	1	2	1	mg/L	R
Reason Code P		**Method SW8260B**								
CRT0004	REG	12/3/2013	Bromodichloromethane	1312087	1.4	0.48603	1	1	ug/L	J
CRT0004	REG	12/3/2013	Bromoform	1312087	7.2	0.37055	1	1	ug/L	J
CRT0004	REG	12/3/2013	Dibromochloromethane	1312087	3.8	0.50162	1	1	ug/L	J
CRT0006	REG	12/3/2013	Bromoform	1312124	3.1	0.37055	1	1	ug/L	J
CRT0006	REG	12/3/2013	Dibromochloromethane	1312124	1.5	0.50162	1	1	ug/L	J
CRT0012	REG	12/4/2013	Carbon tetrachloride	1312179	2.7	0.45807	1	1	ug/L	J
CRT0012	REG	12/4/2013	Chloromethane	1312179	31	0.36814	3	1	ug/L	J
CRT0016	REG	12/5/2013	Dibromochloromethane	1312193	1.2	0.50162	1	1	ug/L	J
CRT0024	REG	12/6/2013	Bromoform	1312279	1.2	0.37055	1	1	ug/L	J
CRT0024	REG	12/6/2013	Dibromochloromethane	1312279	1.1	0.50162	1	1	ug/L	J

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Sample ID	Sample Type	Sample Date	Analyte	SDG	Result	DL	LOQ	Dilution	Units	Qualifier
Constant Rate - Environmental Samples										
Reason Code PTr		**Method SW8260B**								
CRT0006	REG	12/3/2013	Bromodichloromethane	1312124	0.61	0.48603	1	1	ug/L	J
CRT0010	REG	12/4/2013	Chloromethane	1312126	0.47	0.36814	3	1	ug/L	J
CRT0012	REG	12/4/2013	Bromodichloromethane	1312179	0.6	0.48603	1	1	ug/L	J
CRT0012	REG	12/4/2013	Bromoform	1312179	0.86	0.37055	1	1	ug/L	J
CRT0012	REG	12/4/2013	Dibromochloromethane	1312179	0.85	0.50162	1	1	ug/L	J
CRT0016	REG	12/5/2013	Bromodichloromethane	1312193	0.6	0.48603	1	1	ug/L	J
CRT0016	REG	12/5/2013	Bromoform	1312193	0.85	0.37055	1	1	ug/L	J
CRT0016	REG	12/5/2013	Chloromethane	1312193	0.56	0.36814	3	1	ug/L	J
CRT0018	REG	12/5/2013	4-Chlorotoluene	1312233	0.7	0.43497	1	1	ug/L	J
CRT0018	REG	12/5/2013	Bromoform	1312233	0.71	0.37055	1	1	ug/L	J
CRT0018	REG	12/5/2013	Dibromochloromethane	1312233	0.7	0.50162	1	1	ug/L	J
CRT0024	REG	12/6/2013	4-Chlorotoluene	1312279	0.72	0.43497	1	1	ug/L	J
CRT0024	REG	12/6/2013	Bromodichloromethane	1312279	0.52	0.48603	1	1	ug/L	J
CRT0028	REG	12/7/2013	Bromoform	1312280	0.89	0.37055	1	1	ug/L	J
CRT0028	REG	12/7/2013	Dibromochloromethane	1312280	0.7	0.50162	1	1	ug/L	J
CRT0030	REG	12/7/2013	4-Chlorotoluene	1312281	0.73	0.43497	1	1	ug/L	J
CRT0030	REG	12/7/2013	Bromoform	1312281	0.78	0.37055	1	1	ug/L	J
CRT0030	REG	12/7/2013	Dibromochloromethane	1312281	0.8	0.50162	1	1	ug/L	J
CRT0034	REG	12/8/2013	Bromoform	1312282	0.44	0.37055	1	1	ug/L	J
Reason Code S		**Method SW8015**								
CRT0001	REG	12/3/2013	Gasoline Range Organics (GRO)	1312087	3.5	0.0092	0.05	1	mg/L	J+
CRT0005	REG	12/3/2013	Gasoline Range Organics (GRO)	1312124	4	0.0092	0.05	1	mg/L	J+
CRT0007	REG	12/4/2013	Gasoline Range Organics (GRO)	1312126	3.9	0.0092	0.05	1	mg/L	J+
CRT0013	REG	12/5/2013	Gasoline Range Organics (GRO)	1312193	3.6	0.0092	0.05	1	mg/L	J+
CRT0017	REG	12/5/2013	Gasoline Range Organics (GRO)	1312233	3.3	0.0092	0.05	1	mg/L	J+
CRT0019	REG	12/6/2013	Gasoline Range Organics (GRO)	1312261	3.4	0.0092	0.05	1	mg/L	J+
CRT0023	REG	12/6/2013	Gasoline Range Organics (GRO)	1312279	3.3	0.0092	0.05	1	mg/L	J+
CRT0029	REG	12/7/2013	Gasoline Range Organics (GRO)	1312281	3.2	0.0092	0.05	1	mg/L	J+
CRT0031	REG	12/8/2013	Gasoline Range Organics (GRO)	1312282	3.3	0.0092	0.05	1	mg/L	J+
CRT0035	REG	12/8/2013	Gasoline Range Organics (GRO)	1312292	3.2	0.0092	0.05	1	mg/L	J+
CRT0037	REG	12/9/2013	Gasoline Range Organics (GRO)	1312297	3.1	0.0092	0.05	1	mg/L	J+
Reason Code S		**Method SW8260B**								
CRT0001	REG	12/3/2013	1,2-Dichloroethane	1312087	2.3	0.32638	1	1	ug/L	J+
CRT0001	REG	12/3/2013	1,3,5-Trimethylbenzene	1312087	4.6	0.39755	1	1	ug/L	J+
CRT0001	REG	12/3/2013	1-Methyl naphthalene	1312087	11	0.41112	4	1	ug/L	J+
CRT0001	REG	12/3/2013	Benzene	1312087	90	0.45764	1	1	ug/L	J+

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Sample ID	Sample Type	Sample Date	Analyte	SDG	Result	DL	LOQ	Dilution	Units	Qualifier
Constant Rate - Environmental Samples										
Reason Code S		**Method SW8260B**								
CRT0001	REG	12/3/2013	Ethylbenzene	1312087	18	0.44713	1	1	ug/L	J+
CRT0001	REG	12/3/2013	Isopropylbenzene	1312087	37	0.51672	1	1	ug/L	J+
CRT0001	REG	12/3/2013	Naphthalene	1312087	6.9	0.29277	2	1	ug/L	J+
CRT0001	REG	12/3/2013	n-Butylbenzene	1312087	3.5	0.40981	3	1	ug/L	J+
CRT0001	REG	12/3/2013	n-Propylbenzene	1312087	22	0.41009	1	1	ug/L	J+
CRT0001	REG	12/3/2013	p-Isopropyltoluene	1312087	2.5	0.45397	1	1	ug/L	J+
CRT0001	REG	12/3/2013	sec-Butylbenzene	1312087	5.6	0.42801	1	1	ug/L	J+
CRT0001	REG	12/3/2013	Xylenes (total)	1312087	3	1.44441	1.5	1	ug/L	J+
CRT0005	REG	12/3/2013	1,2,4-Trimethylbenzene	1312124	1.5	0.50502	1	1	ug/L	J+
CRT0005	REG	12/3/2013	1,2-Dichloroethane	1312124	2.7	0.32638	1	1	ug/L	J+
CRT0005	REG	12/3/2013	1,3,5-Trimethylbenzene	1312124	5.4	0.39755	1	1	ug/L	J+
CRT0005	REG	12/3/2013	1-Methyl naphthalene	1312124	12	0.41112	4	1	ug/L	J+
CRT0005	REG	12/3/2013	2-Methylnaphthalene	1312124	4.2	0.38802	4	1	ug/L	J+
CRT0005	REG	12/3/2013	Benzene	1312124	120	4.57637	10	10	ug/L	J+
CRT0005	REG	12/3/2013	Ethylbenzene	1312124	23	0.44713	1	1	ug/L	J+
CRT0005	REG	12/3/2013	Isopropylbenzene	1312124	41	0.51672	1	1	ug/L	J+
CRT0005	REG	12/3/2013	Naphthalene	1312124	6.4	0.29277	2	1	ug/L	J+
CRT0005	REG	12/3/2013	n-Propylbenzene	1312124	21	0.41009	1	1	ug/L	J+
CRT0005	REG	12/3/2013	p-Isopropyltoluene	1312124	2.7	0.45397	1	1	ug/L	J+
CRT0005	REG	12/3/2013	sec-Butylbenzene	1312124	5.7	0.42801	1	1	ug/L	J+
CRT0005	REG	12/3/2013	Xylenes (total)	1312124	5.1	1.44441	1.5	1	ug/L	J+
CRT0007	REG	12/4/2013	1,2,4-Trimethylbenzene	1312126	1.4	0.50502	1	1	ug/L	J+
CRT0007	REG	12/4/2013	1,2-Dichloroethane	1312126	2.6	0.32638	1	1	ug/L	J+
CRT0007	REG	12/4/2013	1,3,5-Trimethylbenzene	1312126	5.2	0.39755	1	1	ug/L	J+
CRT0007	REG	12/4/2013	1-Methyl naphthalene	1312126	12	0.41112	4	1	ug/L	J+
CRT0007	REG	12/4/2013	2-Methylnaphthalene	1312126	4.2	0.38802	4	1	ug/L	J+
CRT0007	REG	12/4/2013	Benzene	1312126	120	4.57637	10	10	ug/L	J+
CRT0007	REG	12/4/2013	Ethylbenzene	1312126	22	0.44713	1	1	ug/L	J+
CRT0007	REG	12/4/2013	Isopropylbenzene	1312126	37	0.51672	1	1	ug/L	J+
CRT0007	REG	12/4/2013	Naphthalene	1312126	6.9	0.29277	2	1	ug/L	J+
CRT0007	REG	12/4/2013	n-Propylbenzene	1312126	20	0.41009	1	1	ug/L	J+
CRT0007	REG	12/4/2013	p-Isopropyltoluene	1312126	2.5	0.45397	1	1	ug/L	J+
CRT0007	REG	12/4/2013	sec-Butylbenzene	1312126	5	0.42801	1	1	ug/L	J+
CRT0007	REG	12/4/2013	Xylenes (total)	1312126	5.7	1.44441	1.5	1	ug/L	J+
CRT0011	REG	12/4/2013	1,2,4-Trimethylbenzene	1312179	1.5	0.50502	1	1	ug/L	J+
CRT0011	REG	12/4/2013	1,3,5-Trimethylbenzene	1312179	4.9	0.39755	1	1	ug/L	J+
CRT0011	REG	12/4/2013	1-Methyl naphthalene	1312179	12	0.41112	4	1	ug/L	J+

Appendix D - Table 3
Qualified Data Summary
Fourth Quarter CY 2013 Aquifer Testing Results
Kirtland Air Force Base

Sample ID	Sample Type	Sample Date	Analyte	SDG	Result	DL	LOQ	Dilution	Units	Qualifier
Constant Rate - Environmental Samples										
Reason Code S		**Method SW8260B**								
CRT0011	REG	12/4/2013	2-Methylnaphthalene	1312179	4.4	0.38802	4	1	ug/L	J+
CRT0011	REG	12/4/2013	Benzene	1312179	120	4.57637	10	10	ug/L	J+
CRT0011	REG	12/4/2013	Ethylbenzene	1312179	20	0.44713	1	1	ug/L	J+
CRT0011	REG	12/4/2013	Isopropylbenzene	1312179	34	0.51672	1	1	ug/L	J+
CRT0011	REG	12/4/2013	Naphthalene	1312179	7	0.29277	2	1	ug/L	J+
CRT0011	REG	12/4/2013	n-Propylbenzene	1312179	18	0.41009	1	1	ug/L	J+
CRT0011	REG	12/4/2013	p-Isopropyltoluene	1312179	2.4	0.45397	1	1	ug/L	J+
CRT0011	REG	12/4/2013	sec-Butylbenzene	1312179	4.8	0.42801	1	1	ug/L	J+
CRT0011	REG	12/4/2013	Xylenes (total)	1312179	5.4	1.44441	1.5	1	ug/L	J+
CRT0013	REG	12/5/2013	1,2,4-Trimethylbenzene	1312193	1.8	0.50502	1	1	ug/L	J+
CRT0013	REG	12/5/2013	1,2-Dichloroethane	1312193	2.4	0.32638	1	1	ug/L	J+
CRT0013	REG	12/5/2013	1,3,5-Trimethylbenzene	1312193	5.5	0.39755	1	1	ug/L	J+
CRT0013	REG	12/5/2013	Benzene	1312193	120	4.57637	10	10	ug/L	J+
CRT0013	REG	12/5/2013	Ethylbenzene	1312193	19	0.44713	1	1	ug/L	J+
CRT0013	REG	12/5/2013	Isopropylbenzene	1312193	31	0.51672	1	1	ug/L	J+
CRT0013	REG	12/5/2013	Naphthalene	1312193	7.5	0.29277	2	1	ug/L	J+
CRT0013	REG	12/5/2013	n-Propylbenzene	1312193	17	0.41009	1	1	ug/L	J+
CRT0013	REG	12/5/2013	p-Isopropyltoluene	1312193	2.6	0.45397	1	1	ug/L	J+
CRT0013	REG	12/5/2013	sec-Butylbenzene	1312193	4.7	0.42801	1	1	ug/L	J+
CRT0013	REG	12/5/2013	Xylenes (total)	1312193	5.8	1.44441	1.5	1	ug/L	J+
CRT0017	REG	12/5/2013	1,2,4-Trimethylbenzene	1312233	1.9	0.50502	1	1	ug/L	J+
CRT0017	REG	12/5/2013	1,2-Dichloroethane	1312233	2.5	0.32638	1	1	ug/L	J+
CRT0017	REG	12/5/2013	1,3,5-Trimethylbenzene	1312233	5.4	0.39755	1	1	ug/L	J+
CRT0017	REG	12/5/2013	1-Methyl naphthalene	1312233	12	0.41112	4	1	ug/L	J+
CRT0017	REG	12/5/2013	Benzene	1312233	120	4.57637	10	10	ug/L	J+
CRT0017	REG	12/5/2013	Ethylbenzene	1312233	19	0.44713	1	1	ug/L	J+
CRT0017	REG	12/5/2013	Isopropylbenzene	1312233	29	0.51672	1	1	ug/L	J+
CRT0017	REG	12/5/2013	Naphthalene	1312233	6.8	0.29277	2	1	ug/L	J+
CRT0017	REG	12/5/2013	n-Propylbenzene	1312233	16	0.41009	1	1	ug/L	J+
CRT0017	REG	12/5/2013	p-Isopropyltoluene	1312233	2.6	0.45397	1	1	ug/L	J+
CRT0017	REG	12/5/2013	sec-Butylbenzene	1312233	4.7	0.42801	1	1	ug/L	J+
CRT0017	REG	12/5/2013	Xylenes (total)	1312233	5.9	1.44441	1.5	1	ug/L	J+
CRT0019	REG	12/6/2013	1,2,4-Trimethylbenzene	1312261	1.7	0.50502	1	1	ug/L	J+
CRT0019	REG	12/6/2013	1,2-Dibromoethane	1312261	1.1	0.45086	1	1	ug/L	J+
CRT0019	REG	12/6/2013	1,2-Dichloroethane	1312261	2.5	0.32638	1	1	ug/L	J+
CRT0019	REG	12/6/2013	1,3,5-Trimethylbenzene	1312261	5.2	0.39755	1	1	ug/L	J+
CRT0019	REG	12/6/2013	1-Methyl naphthalene	1312261	11	0.41112	4	1	ug/L	J+

Appendix D - Table 3
Qualified Data Summary
Fourth Quarter CY 2013 Aquifer Testing Results
Kirtland Air Force Base

Sample ID	Sample Type	Sample Date	Analyte	SDG	Result	DL	LOQ	Dilution	Units	Qualifier
Constant Rate - Environmental Samples										
Reason Code S		**Method SW8260B**								
CRT0019	REG	12/6/2013	2-Methylnaphthalene	1312261	4.1	0.38802	4	1	ug/L	J+
CRT0019	REG	12/6/2013	Benzene	1312261	99	4.57637	10	10	ug/L	J+
CRT0019	REG	12/6/2013	Ethylbenzene	1312261	18	0.44713	1	1	ug/L	J+
CRT0019	REG	12/6/2013	Isopropylbenzene	1312261	27	0.51672	1	1	ug/L	J+
CRT0019	REG	12/6/2013	Naphthalene	1312261	7	0.29277	2	1	ug/L	J+
CRT0019	REG	12/6/2013	n-Propylbenzene	1312261	15	0.41009	1	1	ug/L	J+
CRT0019	REG	12/6/2013	p-Isopropyltoluene	1312261	2.5	0.45397	1	1	ug/L	J+
CRT0019	REG	12/6/2013	sec-Butylbenzene	1312261	4.2	0.42801	1	1	ug/L	J+
CRT0019	REG	12/6/2013	Xylenes (total)	1312261	6.1	1.44441	1.5	1	ug/L	J+
CRT0023	REG	12/6/2013	1,2,4-Trimethylbenzene	1312279	1.9	0.50502	1	1	ug/L	J+
CRT0023	REG	12/6/2013	1,2-Dibromoethane	1312279	1.1	0.45086	1	1	ug/L	J+
CRT0023	REG	12/6/2013	1,2-Dichloroethane	1312279	2.3	0.32638	1	1	ug/L	J+
CRT0023	REG	12/6/2013	1,3,5-Trimethylbenzene	1312279	5.2	0.39755	1	1	ug/L	J+
CRT0023	REG	12/6/2013	Benzene	1312279	92	4.57637	10	10	ug/L	J+
CRT0023	REG	12/6/2013	Ethylbenzene	1312279	16	0.44713	1	1	ug/L	J+
CRT0023	REG	12/6/2013	Isopropylbenzene	1312279	26	0.51672	1	1	ug/L	J+
CRT0023	REG	12/6/2013	Naphthalene	1312279	7.1	0.29277	2	1	ug/L	J+
CRT0023	REG	12/6/2013	n-Propylbenzene	1312279	14	0.41009	1	1	ug/L	J+
CRT0023	REG	12/6/2013	p-Isopropyltoluene	1312279	2.5	0.45397	1	1	ug/L	J+
CRT0023	REG	12/6/2013	sec-Butylbenzene	1312279	4.1	0.42801	1	1	ug/L	J+
CRT0023	REG	12/6/2013	Xylenes (total)	1312279	6.2	1.44441	1.5	1	ug/L	J+
CRT0025	REG	12/7/2013	1,2,4-Trimethylbenzene	1312280	1.9	0.50502	1	1	ug/L	J+
CRT0025	REG	12/7/2013	1,2-Dichloroethane	1312280	2.4	0.32638	1	1	ug/L	J+
CRT0025	REG	12/7/2013	1,3,5-Trimethylbenzene	1312280	5	0.39755	1	1	ug/L	J+
CRT0025	REG	12/7/2013	1-Methyl naphthalene	1312280	11	0.41112	4	1	ug/L	J+
CRT0025	REG	12/7/2013	2-Methylnaphthalene	1312280	4	0.38802	4	1	ug/L	J+
CRT0025	REG	12/7/2013	Acetone	1312280	25	1.72049	10	1	ug/L	J+
CRT0025	REG	12/7/2013	Benzene	1312280	91	0.45764	1	1	ug/L	J+
CRT0025	REG	12/7/2013	Ethylbenzene	1312280	16	0.44713	1	1	ug/L	J+
CRT0025	REG	12/7/2013	Isopropylbenzene	1312280	24	0.51672	1	1	ug/L	J+
CRT0025	REG	12/7/2013	Naphthalene	1312280	6.6	0.29277	2	1	ug/L	J+
CRT0025	REG	12/7/2013	n-Propylbenzene	1312280	13	0.41009	1	1	ug/L	J+
CRT0025	REG	12/7/2013	p-Isopropyltoluene	1312280	2.5	0.45397	1	1	ug/L	J+
CRT0025	REG	12/7/2013	sec-Butylbenzene	1312280	3.9	0.42801	1	1	ug/L	J+
CRT0025	REG	12/7/2013	Xylenes (total)	1312280	6	1.44441	1.5	1	ug/L	J+
CRT0029	REG	12/7/2013	1,2,4-Trimethylbenzene	1312281	1.7	0.50502	1	1	ug/L	J+
CRT0029	REG	12/7/2013	1,2-Dibromoethane	1312281	1.1	0.45086	1	1	ug/L	J+

Appendix D - Table 3
Qualified Data Summary
Fourth Quarter CY 2013 Aquifer Testing Results
Kirtland Air Force Base

Sample ID	Sample Type	Sample Date	Analyte	SDG	Result	DL	LOQ	Dilution	Units	Qualifier
Constant Rate - Environmental Samples										
Reason Code S		**Method SW8260B**								
CRT0029	REG	12/7/2013	1,2-Dichloroethane	1312281	2.4	0.32638	1	1	ug/L	J+
CRT0029	REG	12/7/2013	1,3,5-Trimethylbenzene	1312281	4.7	0.39755	1	1	ug/L	J+
CRT0029	REG	12/7/2013	1-Methyl naphthalene	1312281	10	0.41112	4	1	ug/L	J+
CRT0029	REG	12/7/2013	Acetone	1312281	20	1.72049	10	1	ug/L	J+
CRT0029	REG	12/7/2013	Benzene	1312281	88	0.45764	1	1	ug/L	J+
CRT0029	REG	12/7/2013	Ethylbenzene	1312281	15	0.44713	1	1	ug/L	J+
CRT0029	REG	12/7/2013	Isopropylbenzene	1312281	22	0.51672	1	1	ug/L	J+
CRT0029	REG	12/7/2013	Naphthalene	1312281	5.9	0.29277	2	1	ug/L	J+
CRT0029	REG	12/7/2013	n-Propylbenzene	1312281	13	0.41009	1	1	ug/L	J+
CRT0029	REG	12/7/2013	p-Isopropyltoluene	1312281	2.5	0.45397	1	1	ug/L	J+
CRT0029	REG	12/7/2013	sec-Butylbenzene	1312281	3.8	0.42801	1	1	ug/L	J+
CRT0029	REG	12/7/2013	Xylenes (total)	1312281	6.2	1.44441	1.5	1	ug/L	J+
CRT0031	REG	12/8/2013	1,2,4-Trimethylbenzene	1312282	1.7	0.50502	1	1	ug/L	J+
CRT0031	REG	12/8/2013	1,2-Dichloroethane	1312282	2.3	0.32638	1	1	ug/L	J+
CRT0031	REG	12/8/2013	1,3,5-Trimethylbenzene	1312282	4.5	0.39755	1	1	ug/L	J+
CRT0031	REG	12/8/2013	1-Methyl naphthalene	1312282	9.4	0.41112	4	1	ug/L	J+
CRT0031	REG	12/8/2013	Acetone	1312282	21	1.72049	10	1	ug/L	J+
CRT0031	REG	12/8/2013	Benzene	1312282	85	0.45764	1	1	ug/L	J+
CRT0031	REG	12/8/2013	Ethylbenzene	1312282	14	0.44713	1	1	ug/L	J+
CRT0031	REG	12/8/2013	Isopropylbenzene	1312282	21	0.51672	1	1	ug/L	J+
CRT0031	REG	12/8/2013	Naphthalene	1312282	5.7	0.29277	2	1	ug/L	J+
CRT0031	REG	12/8/2013	n-Propylbenzene	1312282	12	0.41009	1	1	ug/L	J+
CRT0031	REG	12/8/2013	p-Isopropyltoluene	1312282	2.4	0.45397	1	1	ug/L	J+
CRT0031	REG	12/8/2013	sec-Butylbenzene	1312282	3.6	0.42801	1	1	ug/L	J+
CRT0031	REG	12/8/2013	Xylenes (total)	1312282	6.6	1.44441	1.5	1	ug/L	J+
CRT0035	REG	12/8/2013	1,2,4-Trimethylbenzene	1312292	1.9	0.50502	1	1	ug/L	J+
CRT0035	REG	12/8/2013	1,2-Dichloroethane	1312292	2.3	0.32638	1	1	ug/L	J+
CRT0035	REG	12/8/2013	1,3,5-Trimethylbenzene	1312292	4.7	0.39755	1	1	ug/L	J+
CRT0035	REG	12/8/2013	1-Methyl naphthalene	1312292	9.7	0.41112	4	1	ug/L	J+
CRT0035	REG	12/8/2013	Acetone	1312292	19	1.72049	10	1	ug/L	J+
CRT0035	REG	12/8/2013	Benzene	1312292	86	0.45764	1	1	ug/L	J+
CRT0035	REG	12/8/2013	Ethylbenzene	1312292	14	0.44713	1	1	ug/L	J+
CRT0035	REG	12/8/2013	Isopropylbenzene	1312292	22	0.51672	1	1	ug/L	J+
CRT0035	REG	12/8/2013	Naphthalene	1312292	5.7	0.29277	2	1	ug/L	J+
CRT0035	REG	12/8/2013	n-Propylbenzene	1312292	12	0.41009	1	1	ug/L	J+
CRT0035	REG	12/8/2013	p-Isopropyltoluene	1312292	2.6	0.45397	1	1	ug/L	J+
CRT0035	REG	12/8/2013	sec-Butylbenzene	1312292	3.4	0.42801	1	1	ug/L	J+

Appendix D - Table 3
Qualified Data Summary
Fourth Quarter CY 2013 Aquifer Testing Results
Kirtland Air Force Base

Sample ID	Sample Type	Sample Date	Analyte	SDG	Result	DL	LOQ	Dilution	Units	Qualifier
Constant Rate - Environmental Samples										
Reason Code S		**Method SW8260B**								
CRT0035	REG	12/8/2013	Xylenes (total)	1312292	6.4	1.44441	1.5	1	ug/L	J+
CRT0037	REG	12/9/2013	1,2-Dichloroethane	1312297	2.3	0.32638	1	1	ug/L	J+
CRT0037	REG	12/9/2013	1,3,5-Trimethylbenzene	1312297	4.3	0.39755	1	1	ug/L	J+
CRT0037	REG	12/9/2013	1-Methyl naphthalene	1312297	8.8	0.41112	4	1	ug/L	J+
CRT0037	REG	12/9/2013	Acetone	1312297	22	1.72049	10	1	ug/L	J+
CRT0037	REG	12/9/2013	Benzene	1312297	83	0.45764	1	1	ug/L	J+
CRT0037	REG	12/9/2013	Ethylbenzene	1312297	12	0.44713	1	1	ug/L	J+
CRT0037	REG	12/9/2013	Isopropylbenzene	1312297	20	0.51672	1	1	ug/L	J+
CRT0037	REG	12/9/2013	Naphthalene	1312297	5.2	0.29277	2	1	ug/L	J+
CRT0037	REG	12/9/2013	n-Propylbenzene	1312297	11	0.41009	1	1	ug/L	J+
CRT0037	REG	12/9/2013	p-Isopropyltoluene	1312297	2.5	0.45397	1	1	ug/L	J+
CRT0037	REG	12/9/2013	sec-Butylbenzene	1312297	3.1	0.42801	1	1	ug/L	J+
CRT0037	REG	12/9/2013	Xylenes (total)	1312297	6.4	1.44441	1.5	1	ug/L	J+
Reason Code S		**Method SW8270C**								
CRT0004	REG	12/3/2013	2,4,5-Trichlorophenol	1312087	ND	2.39185	5	1	ug/L	UJ
CRT0004	REG	12/3/2013	2,4,6-Trichlorophenol	1312087	ND	2.62494	5	1	ug/L	UJ
CRT0004	REG	12/3/2013	2,4-Dichlorophenol	1312087	ND	2.17752	5	1	ug/L	UJ
CRT0004	REG	12/3/2013	2,4-Dimethylphenol	1312087	ND	2.94515	5	1	ug/L	UJ
CRT0004	REG	12/3/2013	2,4-Dinitrophenol	1312087	ND	3.20139	5	1	ug/L	UJ
CRT0004	REG	12/3/2013	2-Chlorophenol	1312087	ND	2.66978	5	1	ug/L	UJ
CRT0004	REG	12/3/2013	2-Methylphenol	1312087	ND	2.71381	5	1	ug/L	UJ
CRT0004	REG	12/3/2013	2-Nitrophenol	1312087	ND	2.33542	5	1	ug/L	UJ
CRT0004	REG	12/3/2013	3+4-Methylphenol	1312087	ND	3.7405	5	1	ug/L	UJ
CRT0004	REG	12/3/2013	4,6-Dinitro-2-methylphenol	1312087	ND	1.39598	5	1	ug/L	UJ
CRT0004	REG	12/3/2013	4-Chloro-3-methylphenol	1312087	ND	2.65175	5	1	ug/L	UJ
CRT0004	REG	12/3/2013	4-Nitrophenol	1312087	ND	2.13508	5	1	ug/L	UJ
CRT0004	REG	12/3/2013	Benzoic acid	1312087	ND	5.73381	40	1	ug/L	UJ
CRT0004	REG	12/3/2013	Phenol	1312087	ND	2.21134	5	1	ug/L	UJ
CRT0006	REG	12/3/2013	2,4,5-Trichlorophenol	1312124	ND	2.39185	5	1	ug/L	UJ
CRT0006	REG	12/3/2013	2,4,6-Trichlorophenol	1312124	ND	2.62494	5	1	ug/L	UJ
CRT0006	REG	12/3/2013	2,4-Dichlorophenol	1312124	ND	2.17752	5	1	ug/L	UJ
CRT0006	REG	12/3/2013	2,4-Dimethylphenol	1312124	ND	2.94515	5	1	ug/L	UJ
CRT0006	REG	12/3/2013	2,4-Dinitrophenol	1312124	ND	3.20139	5	1	ug/L	UJ
CRT0006	REG	12/3/2013	2-Chlorophenol	1312124	ND	2.66978	5	1	ug/L	UJ
CRT0006	REG	12/3/2013	2-Methylphenol	1312124	ND	2.71381	5	1	ug/L	UJ
CRT0006	REG	12/3/2013	2-Nitrophenol	1312124	ND	2.33542	5	1	ug/L	UJ
CRT0006	REG	12/3/2013	3+4-Methylphenol	1312124	ND	3.7405	5	1	ug/L	UJ

Appendix D - Table 3
Qualified Data Summary
Fourth Quarter CY 2013 Aquifer Testing Results
Kirtland Air Force Base

Sample ID	Sample Type	Sample Date	Analyte	SDG	Result	DL	LOQ	Dilution	Units	Qualifier
Constant Rate - Environmental Samples										
Reason Code S		**Method SW8270C**								
CRT0006	REG	12/3/2013	4,6-Dinitro-2-methylphenol	1312124	ND	1.39598	5	1	ug/L	UJ
CRT0006	REG	12/3/2013	4-Chloro-3-methylphenol	1312124	ND	2.65175	5	1	ug/L	UJ
CRT0006	REG	12/3/2013	4-Nitrophenol	1312124	ND	2.13508	5	1	ug/L	UJ
CRT0006	REG	12/3/2013	Benzoic acid	1312124	ND	5.73381	40	1	ug/L	UJ
CRT0006	REG	12/3/2013	Pentachlorophenol	1312124	ND	1.4378	5	1	ug/L	UJ
CRT0006	REG	12/3/2013	Phenol	1312124	ND	2.21134	5	1	ug/L	UJ
CRT0010	REG	12/4/2013	2,4,5-Trichlorophenol	1312126	ND	2.39185	5	1	ug/L	UJ
CRT0010	REG	12/4/2013	2,4,6-Trichlorophenol	1312126	ND	2.62494	5	1	ug/L	UJ
CRT0010	REG	12/4/2013	2,4-Dichlorophenol	1312126	ND	2.17752	5	1	ug/L	UJ
CRT0010	REG	12/4/2013	2,4-Dimethylphenol	1312126	ND	2.94515	5	1	ug/L	UJ
CRT0010	REG	12/4/2013	2,4-Dinitrophenol	1312126	ND	3.20139	5	1	ug/L	UJ
CRT0010	REG	12/4/2013	2-Chlorophenol	1312126	ND	2.66978	5	1	ug/L	UJ
CRT0010	REG	12/4/2013	2-Methylphenol	1312126	ND	2.71381	5	1	ug/L	UJ
CRT0010	REG	12/4/2013	2-Nitrophenol	1312126	ND	2.33542	5	1	ug/L	UJ
CRT0010	REG	12/4/2013	3+4-Methylphenol	1312126	ND	3.7405	5	1	ug/L	UJ
CRT0010	REG	12/4/2013	4,6-Dinitro-2-methylphenol	1312126	ND	1.39598	5	1	ug/L	UJ
CRT0010	REG	12/4/2013	4-Chloro-3-methylphenol	1312126	ND	2.65175	5	1	ug/L	UJ
CRT0010	REG	12/4/2013	4-Nitrophenol	1312126	ND	2.13508	5	1	ug/L	UJ
CRT0010	REG	12/4/2013	Benzoic acid	1312126	ND	5.73381	40	1	ug/L	UJ
CRT0010	REG	12/4/2013	Pentachlorophenol	1312126	ND	1.4378	5	1	ug/L	UJ
CRT0010	REG	12/4/2013	Phenol	1312126	ND	2.21134	5	1	ug/L	UJ
Reason Code STr		**Method SW8260B**								
CRT0001	REG	12/3/2013	1,2,4-Trimethylbenzene	1312087	0.96	0.50502	1	1	ug/L	J+
CRT0001	REG	12/3/2013	1,2-Dibromoethane	1312087	0.52	0.45086	1	1	ug/L	J+
CRT0001	REG	12/3/2013	2-Methylnaphthalene	1312087	3.3	0.38802	4	1	ug/L	J+
CRT0005	REG	12/3/2013	1,2-Dibromoethane	1312124	0.81	0.45086	1	1	ug/L	J+
CRT0007	REG	12/4/2013	1,2-Dibromoethane	1312126	0.99	0.45086	1	1	ug/L	J+
CRT0011	REG	12/4/2013	1,2-Dibromoethane	1312179	0.93	0.45086	1	1	ug/L	J+
CRT0011	REG	12/4/2013	n-Butylbenzene	1312179	2.9	0.40981	3	1	ug/L	J+
CRT0013	REG	12/5/2013	1,2-Dibromoethane	1312193	0.93	0.45086	1	1	ug/L	J+
CRT0017	REG	12/5/2013	1,2-Dibromoethane	1312233	0.93	0.45086	1	1	ug/L	J+
CRT0025	REG	12/7/2013	1,2-Dibromoethane	1312280	0.91	0.45086	1	1	ug/L	J+
CRT0029	REG	12/7/2013	2-Methylnaphthalene	1312281	3.7	0.38802	4	1	ug/L	J+
CRT0031	REG	12/8/2013	1,2-Dibromoethane	1312282	0.99	0.45086	1	1	ug/L	J+
CRT0031	REG	12/8/2013	2-Methylnaphthalene	1312282	3.5	0.38802	4	1	ug/L	J+
CRT0035	REG	12/8/2013	1,2-Dibromoethane	1312292	0.96	0.45086	1	1	ug/L	J+
CRT0035	REG	12/8/2013	2-Methylnaphthalene	1312292	3.5	0.38802	4	1	ug/L	J+

Appendix D - Table 3
Qualified Data Summary
Fourth Quarter CY 2013 Aquifer Testing Results
Kirtland Air Force Base

Sample ID	Sample Type	Sample Date	Analyte	SDG	Result	DL	LOQ	Dilution	Units	Qualifier
Constant Rate - Environmental Samples										
Reason Code STr		**Method SW8260B**								
CRT0037	REG	12/9/2013	1,2-Dibromoethane	1312297	0.95	0.45086	1	1	ug/L	J+
CRT0037	REG	12/9/2013	2-Methylnaphthalene	1312297	3.2	0.38802	4	1	ug/L	J+
Constant Rate - Field QC Samples										
Reason Code C		**Method SW8260B**								
CRT8001	TB	12/3/2013	Acetone	1312087	ND	1.72049	10	1	ug/L	UJ
CRT8002	TB	12/3/2013	2-Butanone	1312124	ND	0.99961	10	1	ug/L	UJ
CRT8002	TB	12/3/2013	Acetone	1312124	ND	1.72049	10	1	ug/L	UJ
CRT8003	TB	12/4/2013	2-Butanone	1312126	ND	0.99961	10	1	ug/L	UJ
CRT8003	TB	12/4/2013	Acetone	1312126	ND	1.72049	10	1	ug/L	UJ
CRT8004	TB	12/4/2013	Acetone	1312179	ND	1.72049	10	1	ug/L	UJ
CRT8005	TB	12/5/2013	1-Methyl naphthalene	1312193	ND	0.41112	4	1	ug/L	UJ
CRT8005	TB	12/5/2013	2-Butanone	1312193	ND	0.99961	10	1	ug/L	UJ
CRT8005	TB	12/5/2013	2-Methylnaphthalene	1312193	ND	0.38802	4	1	ug/L	UJ
CRT8005	TB	12/5/2013	Acetone	1312193	ND	1.72049	10	1	ug/L	UJ
CRT8006	TB	12/5/2013	2-Methylnaphthalene	1312233	ND	0.38802	4	1	ug/L	UJ
CRT8006	TB	12/5/2013	Acetone	1312233	ND	1.72049	10	1	ug/L	UJ
CRT8007	TB	12/6/2013	Acetone	1312261	ND	1.72049	10	1	ug/L	UJ
CRT8008	TB	12/6/2013	1-Methyl naphthalene	1312279	ND	0.41112	4	1	ug/L	UJ
CRT8008	TB	12/6/2013	2-Butanone	1312279	ND	0.99961	10	1	ug/L	UJ
CRT8008	TB	12/6/2013	2-Methylnaphthalene	1312279	ND	0.38802	4	1	ug/L	UJ
CRT8008	TB	12/6/2013	Acetone	1312279	ND	1.72049	10	1	ug/L	UJ
Reason Code STr		**Method SW8260B**								
CRT8001	TB	12/3/2013	Methylene chloride	1312087	0.58	0.3503	3	1	ug/L	J+

Notes: See Appendix C - Table 2 for definitions of Qualifiers and Reason Codes.

DL Detection limit
LOQ Limit of quantitation
ND Not detected at the LOQ (chemistry data) or not detected at the DL (bacteria data)
REG Normal sample sent to the lab
SDG Sample delivery group
TB Trip blank sent to the lab
µg/L Micrograms per liter
mg/L Milligrams per liter

Appendix D - Table 4
Detected Trip Blank Results and Associated Sample Results
Fourth Quarter CY 2013 Aquifer Testing Results
Kirtland Air Force Base

Field Sample ID	Sample Type	Sample Date	Method	Analyte	Result	DL	LOQ	Units	Qualifier	Reason Code
CRT8001	**TB**	**12/3/2013**	**SW8260B**	**Methylene chloride**	**0.58**	**0.3503**	**3**	**ug/L**	**J+**	**STr**
CRT0001	REG	12/3/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0002	REG	12/3/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0003	REG	12/3/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0004	REG	12/3/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT8002	**TB**	**12/3/2013**	**SW8260B**	**Methylene chloride**	**0.58**	**0.3503**	**3**	**ug/L**	**J**	**Tr**
CRT0005	REG	12/3/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0006	REG	12/3/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT8003	**TB**	**12/4/2013**	**SW8260B**	**Methylene chloride**	**0.66**	**0.3503**	**3**	**ug/L**	**J**	**Tr**
CRT0007	REG	12/4/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0008	REG	12/4/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0009	REG	12/4/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0010	REG	12/4/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT8004	**TB**	**12/4/2013**	**SW8260B**	**Chloromethane**	**0.39**	**0.3681**	**3**	**ug/L**	**J**	**Tr**
CRT0011	REG	12/4/2013	SW8260B	Chloromethane	ND	0.36814	3	ug/L		
CRT0012	REG	12/4/2013	SW8260B	Chloromethane	31	0.36814	3	ug/L	J	P
CRT8004	**TB**	**12/4/2013**	**SW8260B**	**Methylene chloride**	**0.56**	**0.3503**	**3**	**ug/L**	**J**	**Tr**
CRT0011	REG	12/4/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0012	REG	12/4/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT8005	**TB**	**12/5/2013**	**SW8260B**	**Methylene chloride**	**0.56**	**0.3503**	**3**	**ug/L**	**J**	**Tr**
CRT0013	REG	12/5/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0014	REG	12/5/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0015	REG	12/5/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0016	REG	12/5/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT8006	**TB**	**12/5/2013**	**SW8260B**	**Methylene chloride**	**0.54**	**0.3503**	**3**	**ug/L**	**J**	**Tr**
CRT0017	REG	12/5/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0018	REG	12/5/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT8007	**TB**	**12/6/2013**	**SW8260B**	**Methylene chloride**	**0.55**	**0.3503**	**3**	**ug/L**	**J**	**Tr**
CRT0019	REG	12/6/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0020	REG	12/6/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0021	REG	12/6/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0022	REG	12/6/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT8008	**TB**	**12/6/2013**	**SW8260B**	**Methylene chloride**	**0.57**	**0.3503**	**3**	**ug/L**	**J**	**Tr**
CRT0023	REG	12/6/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0024	REG	12/6/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		

Appendix D - Table 4
Detected Trip Blank Results and Associated Sample Results
Fourth Quarter CY 2013 Aquifer Testing Results
Kirtland Air Force Base

Field Sample ID	Sample Type	Sample Date	Method	Analyte	Result	DL	LOQ	Units	Qualifier	Reason Code
CRT8009	**TB**	**12/7/2013**	**SW8260B**	**Methylene chloride**	**0.63**	**0.3503**	**3**	**ug/L**	**J**	**Tr**
CRT0025	REG	12/7/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0026	REG	12/7/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0027	REG	12/7/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0028	REG	12/7/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT8010	**TB**	**12/7/2013**	**SW8260B**	**Methylene chloride**	**0.71**	**0.3503**	**3**	**ug/L**	**J**	**Tr**
CRT0029	REG	12/7/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0030	REG	12/7/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT8011	**TB**	**12/8/2013**	**SW8260B**	**Methylene chloride**	**0.65**	**0.3503**	**3**	**ug/L**	**J**	**Tr**
CRT0031	REG	12/8/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0032	REG	12/8/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0033	REG	12/8/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0034	REG	12/8/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT8012	**TB**	**12/8/2013**	**SW8260B**	**Methylene chloride**	**0.6**	**0.3503**	**3**	**ug/L**	**J**	**Tr**
CRT0035	REG	12/8/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0036	REG	12/8/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT8013	**TB**	**12/9/2013**	**SW8260B**	**Methylene chloride**	**0.58**	**0.3503**	**3**	**ug/L**	**J**	**Tr**
CRT0037	REG	12/9/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0038	REG	12/9/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0039	REG	12/9/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT0040	REG	12/9/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		
CRT8014	**TB**	**12/9/2013**	**SW8260B**	**Methylene chloride**	**0.59**	**0.3503**	**3**	**ug/L**	**J**	**Tr**
CRT0041	REG	12/9/2013	SW8260B	Methylene chloride	ND	0.3503	3	ug/L		

Notes: See Appendix C - Table 2 for definitions of Qualifiers and Reason Codes.

DL Detection limit
LOQ Limit of quantitation
ND Not detected at the LOQ
REG Normal sample sent to the lab
TB Trip blank
µg/L Micrograms per liter

Appendix D - Table 5
Technical Completeness
Fourth Quarter CY 2013 Aquifer Testing Results
Kirtland Air Force Base

Analytical Method	Number of Analytes	Number of Samples	Number of Results	Number of Useable Results	Technical Completeness [Goal = 95 percent] (percent)
Step Testing - Environmental Samples					
E300.0	2	4	8	8	100.0
E353.2	1	4	4	4	100.0
SM2320B	2	4	8	8	100.0
SM4500NH3BG	1	4	4	4	100.0
SM4500S2CF	1	4	4	4	100.0
SW6010B	7	4	28	28	100.0
SW8011	1	4	4	4	100.0
SW8015B - Diesel	1	4	4	4	100.0
SW8015B - Gasoline	1	4	4	4	100.0
SW8260B	64	4	256	256	100.0
SW8270D	69	4	276	276	100.0
Step Testing - Field QC Samples					
SW8260B	64	1	64	64	100.0
Constant Rate - Environmental Samples					
E150.1	1	14	14	14	100.0
E300	3	27	81	81	100.0
E504.1	1	41	41	41	100.0
M4500-NH3	1	27	27	27	100.0
SM2320B	3	27	81	81	100.0
SM4500S2F	1	27	27	26	96.3
SW1010	1	14	14	14	100.0
SW6010B	13	27	302	302	100.0

Appendix D - Table 5
Technical Completeness
Fourth Quarter CY 2013 Aquifer Testing Results
Kirtland Air Force Base

Analytical Method	Number of Analytes	Number of Samples	Number of Results	Number of Useable Results	Technical Completeness [Goal = 95 percent] (percent)
Constant Rate - Environmental Samples					
SW7.3.4.2	2	14	28	27	96.4
SW7470	1	20	20	20	100.0
SW8015	2	41	82	82	100.0
SW8260B	66	41	2706	2706	100.0
SW8270C	67	27	1809	1809	100.0
Constant Rate - Field QC Samples					
SW8260B	66	14	924	924	100.0