

Office of Environmental Management – Grand Junction



October 2005 Water Sampling

**Validation Data Package for
Ground Water Interim Action
Configuration 2 Well Field
Monthly Sampling
Moab, Utah**

January 2006



**U.S. Department
of Energy**

Office of Environmental Management

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Data Package Contents

This data package includes the following information:

<u>Item No.</u>	<u>Description of Contents</u>
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2.	Sample Location Maps
3.	Data Assessment Summary
	Water Sampling Field Activities Verification Checklist
	Laboratory Performance Assessment
	Field Analyses/Activities
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Water Quality Data
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Attachment 2—Trip Report

Sampling Event Summary

Site: Moab, Utah

Sampling Period: October 18-21, 2005

The purpose of this sampling event was to collect data that can be used to evaluate the Configuration 2 injection system. This is the thirteenth round of sampling of the injection system since the baseline samples were collected just prior to starting injection on October 6, 2004.

According to the USGS Cisco Gaging Station, the mean daily Colorado River flows during the sampling event ranged from 4,200 to 4,870 cubic feet per second (cfs).

Sampling and analysis were conducted in accordance with the *Operations, Maintenance, and Performance Monitoring Plan for the Interim Action Ground Water Treatment System, February 2004*. Configuration 2 water samples were collected from 15 observation wells (0401, 0402, 0408, 0580 through 0589, 0600, and 0601), five piezometers (0590, 0605, 0613, 0615, and 0616), three surface waters (0236, 0239, and 0240), and one injection water sample (0550). Including one equipment blank and two duplicates, a total of 27 samples were collected.

Analysis and interpretation of some of the validated data presented in this package are presented as part of the *Performance of the Ground Water Interim Action Injection System at the Configuration 2 Well Field, October 2004–October 2005*. Additionally, for completeness in monitoring performance of the injection effort, time versus concentration graphs are included for certain key indicator wells and major contaminants of concern. Generally, contaminant concentrations continue to be suppressed by the injection of fresh water. One exception to this is well 0589; the graph shows uranium concentrations decreasing from September 2004 through January 2005. Thereafter, concentrations have increased to levels between 2 and 2.5 milligrams per liter (mg/L), which is greater than first measured, although this most recent event reported 1.8 mg/L. This deep zone well is screened from approximately 43 to 53 feet below ground surface (bgs). Ammonia concentrations in well 0408 (screened 13 to 18 feet bgs) have continued to be low (approximately 200 mg/L) since February 2005. The time versus concentration graphs for 0408 portray a different trend for ammonia and uranium in the past three months. Also, ammonia and uranium concentrations increased for well 0588 (screened 25 to 35 feet bgs) which had increased in the previous month, have decreased back to previous levels. These trends will continue to be evaluated in the successive monthly reports and a determination made if they are representative of the configuration area or just individual wells.

The data validation indicated the data meet the quality control criteria specified for this project. No significant discrepancies were noted regarding sample shipping/receiving, preservation and holding times, instrument calibration, method blanks, matrix spikes, etc., except as qualified.

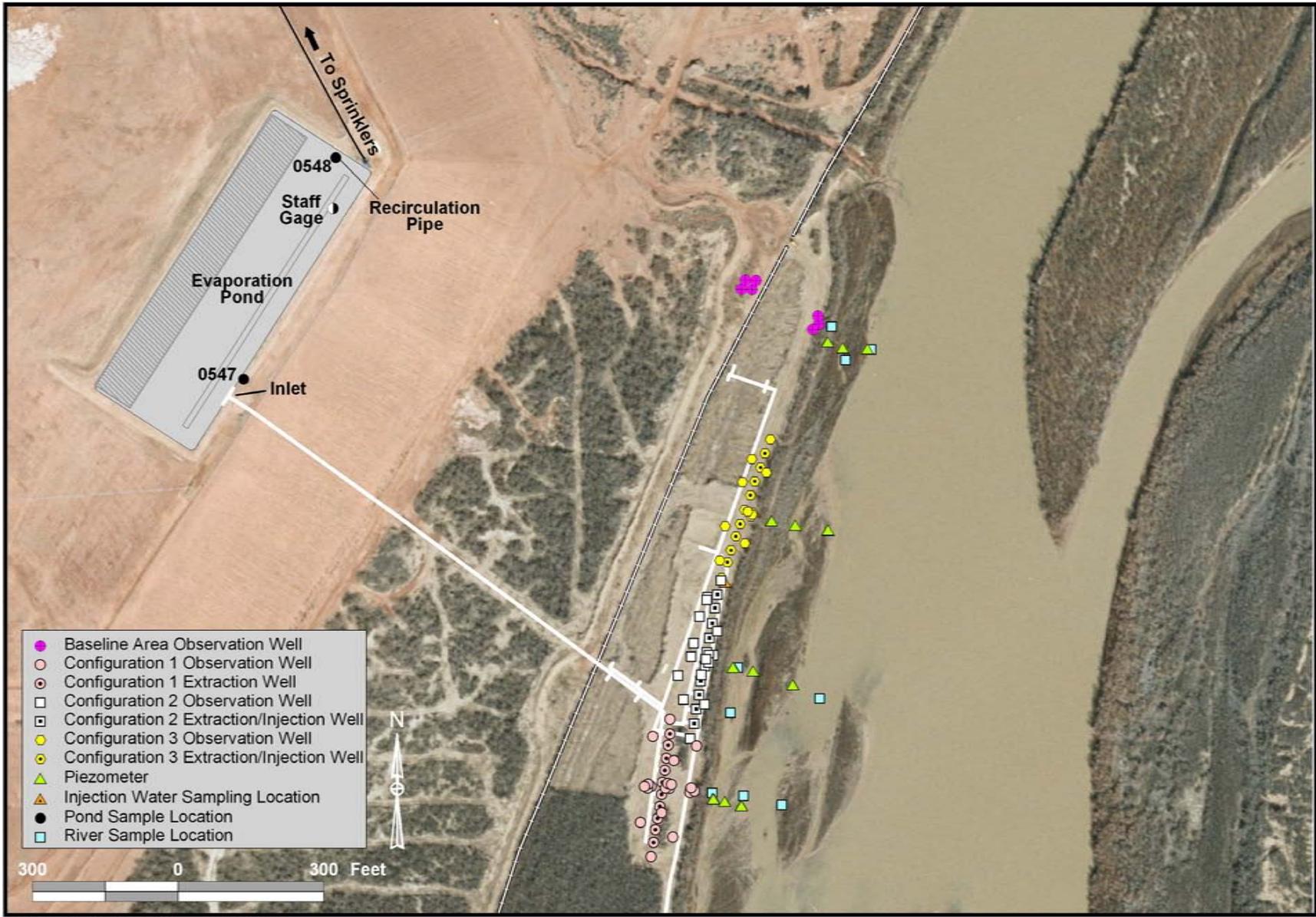


John R. Ford
Ground Water Lead



Date

Sample Location Maps



Sample Locations at the Interim Action Well Field and Baseline Area (may include locations not sampled)

Data Assessment Summary

Water Sampling Field Activities Verification Checklist

Project	<u>Moab, Utah</u>	Date(s) of Water Sampling	<u>October 18-21, 2005</u>
Date(s) of Verification	<u>December 19, 2005</u>	Name of Verifier	<u>Jeff Price</u>

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List other documents, SOP's, instructions.	<u>Yes</u> <u>NA</u>	
2. Were the sampling locations specified in the planning documents sampled?	<u>No</u>	<u>See trip report for explanation.</u>
3. Was a pre-trip calibration conducted as specified in the above named documents?	<u>Yes</u>	
4. Was an operational check of the field equipment conducted twice daily? Did the operational checks meet criteria?	<u>Yes</u> <u>Yes</u>	
5. Were the number and types (alkalinity, temperature, Ec, pH, turbidity, DO, ORP) of field measurements taken as specified?	<u>Yes</u>	
6. Was the Category of the well documented?	<u>Yes</u>	
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling? Did the water level stabilize prior to sampling? Did pH, specific conductance, and turbidity measurements stabilize prior to sampling? Was the flow rate less than 500 mL/min? If a portable pump was used, was there a 4 hour delay between pump installation and sampling?	<u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>NA</u>	

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	Yes	
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?	Yes	
Was the true identity of the samples recorded on the Quality Assurance Sample Log?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Requisition No. (RIN): 05100238
 Sample Event: October 18-20, 2005
 Site(s): Moab, Utah
 Laboratory: Paragon Analytics
 Work Order No.: 0510210
 Analysis: Metals and Inorganics
 Validator: Steve Donovan
 Review Date: December 8, 2005

This validation was performed according to the *Environmental Procedures Catalog (STO 6)*, “Standard Practice for Validation of Laboratory Data”, GT-9(P) (2004). All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 1.

Table 1. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Ammonia as N, NH ₃ -N	WCH-A-005	MCAWW 350.1	MCAWW 350.1
Bromide, Br	MIS-A-039	SW-846 9056	SW-846 9056
Chloride, Cl	MIS-A-039	SW-846 9056	SW-846 9056
Sulfate, SO ₄	MIS-A-044	SW-846 9056	SW-846 9056
Total Dissolved Solids, TDS	WCH-A-033	MCAWW 160.1	MCAWW 160.1
Uranium, U	GJO-01	SW-846 3005A	SW-846 6020A

Data Qualifier Summary

Analytical results were qualified as listed in Table 2. The total dissolved solids (TDS) result for sample 0510210-21 is qualified as “J” because the holding time was exceeded. The uranium result for sample 0510210-27 is qualified as “U” because the associated calibration blank result is greater than the method detection limit (MDL) and the sample result is less than 5 times the calibration blank result.

Table 2. Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
0510210-21	0401	TDS	J	Holding time exceeded
0510210-27	2237 (Equip Blank)	U	U	Less than 5 times the calibration blank

Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado, received 27 samples on October 21, 2005, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the samples were listed on the form with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents including the COC form and the sample tickets had no errors or omissions.

Preservation and Holding Times

The sample shipment was received cool and intact with the temperature within the coolers of 0.8 and 1.4 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times with the following exception. The TDS sample from location 0401 was analyzed outside of the holding time due to an analyst error. The laboratory issued Non-Conformance Report 007212 to document the error. The result from this analysis is qualified with a “J” flag (estimated).

Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods.

Method SW-846 6020A

Calibration for uranium was performed on November 16, 2005. The initial calibration was performed using six calibration standards resulting in a calibration curve with a correlation coefficient (r^2) value greater than 0.995. The absolute value of the curve intercept was less than 3 times the MDL. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification (CCV) checks were made at the required frequency resulting in nine CCVs. All calibration check results met the acceptance criteria. A reporting limit verification check was made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit. The check was within the acceptance criteria range. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries were stable and within acceptable ranges.

Method SW-846 9056

The initial calibrations for bromide, chloride, and sulfate were performed using five calibration standards each on October 25, 2005. The calibration curve r^2 values were greater than 0.995 and

intercepts were less than 3 times the MDL. Initial calibration and calibration check standards were prepared from independent sources. Initial and continuing calibration checks were made at the required frequency resulting in 13 CCVs. The calibration checks met the acceptance criteria.

Method MCAWW 350.1

The initial calibrations for ammonia as N was performed using six calibration standards on October 31, 2005 resulting in calibration curves with r^2 values greater than 0.995 and intercepts less than 3 times the MDL. Initial and continuing calibration checks were made at the required frequency resulting in seven CCVs. All calibration check results met the acceptance criteria.

Method MCAWW 160.1

There are no calibration requirements associated with the determination of TDS.

Method and Calibration Blanks

The uranium initial and continuing calibration blanks were below the practical quantitation limits but greater than the MDL. The uranium result for sample 0510210-27 was less than 5 times the concentration of the associated calibration blank and is qualified as “U”. The chloride, sulfate, ammonia as N, and TDS method blanks and calibration blanks were below the MDLs.

Inductively Coupled Plasma Interference Check Sample Analysis

Inductively coupled plasma interference check samples were analyzed at the required frequency to verify the instrumental interelement and background correction factors. All check sample results met the acceptance criteria.

Matrix Spike Analysis

Matrix spike and matrix spike duplicate pairs were analyzed for uranium, chloride, sulfate, and ammonia as N as a measure of method performance in the sample matrix. The spike recoveries were not evaluated for chloride or sulfate because the concentration of these analytes in the unspiked sample was greater than 4 times the spike concentration. The spike recoveries met the recovery and precision criteria for all analytes evaluated.

Laboratory Replicate Analysis

The relative percent difference (RPD) values for the laboratory replicate sample and matrix spike duplicate sample results for all analytes were less than 20 percent, indicating acceptable laboratory precision.

Laboratory Control Sample

Laboratory control samples were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. The results were acceptable for all analytes.

Metals Serial Dilution

Serial dilutions were performed during the uranium analysis to monitor physical or chemical interferences that may exist in the sample matrix. The results met the acceptance criteria.

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The samples were diluted prior to analysis of uranium to reduce interferences. The required detection limits were achieved for all analytes.

Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

Chromatography Peak Integration

The integration of analyte peaks was reviewed for all ion chromatography data. There were no manual integrations performed and all peak integrations were satisfactory.

Electronic Data Deliverable File

The electronic data deliverable (EDD) file arrived on December 2, 2005, and the data loaded into SeePro on December 8, 2005. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements. The module compares the contents of the file to the requested analyses to ensure all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package.

Field Analyses/Activities

The following information summarizes the field activities for this sampling event period.

Field Activities

All monitor well results were qualified with an “F” flag in the database, indicating the wells were purged and sampled using the low-flow sampling method. Duplicate samples were collected from wells 0584 and 0601. There are no established regulatory criteria for the evaluation of field duplicate samples; therefore, U.S. Environmental Protection Agency (EPA) guidance for laboratory duplicates (which is conservative for field duplicates) was used to assess the precision of the field duplicates. Duplicate sample results varied by less than +/-20 RPD and are considered acceptable. An equipment blank was collected and analyzed for the same constituents as the regular water samples. Concentrations measured in the equipment blank were below levels of concern; therefore, equipment blank results are considered acceptable.

Observation wells 0600 and 0601, which are screened from 20 to 30 ft bgs, were sampled from approximately 18 ft bgs rather than the customary 27 ft bgs. The data for these wells is not “flagged”, but the deviation from typical sampling depths is noted here.

Certification

Results were reported in correct units for all analytes requested, appropriate contract-required laboratory qualifiers and target analyte lists were used, and the required detection limits were met when possible, or an explanation of why they were not met was given in the laboratory case narrative. All analytical quality control criteria were met except as qualified on the Ground Water Quality Data by Parameter, Surface Water Quality by Parameter, or equipment/trip blank database printouts. The meaning of data qualifiers is defined on the database printouts or defined in the EPA Contract Laboratory Program Statement of Work for Inorganic Analysis, Multi-Media Multi-Concentration, Document Number ILMO2.0, 1991. All data in this package are considered validated and may be treated as final results.

Laboratory Validation Lead: Steve Donovan 1-18-06
Steve Donovan Date

Field Activities Validation Lead: J.E. Price 1/18/06
Jeff Price Date

Attachment 1

Data Presentation

Minimums and Maximums Report

Minimums and Maximums Report

The Minimums and Maximums Report is generated by a data validation application (DataVal) used to query the SEEPro database. The DataVal compares the new data set with historical data and lists all new data that fall outside the historical data range. Values listed in the report are further screened and the results are not considered anomalous if:

- (1) identified low concentrations are the result of low detection limits;
- (2) the concentration detected is within 50 percent of historical minimum or maximum values;
- (3) there were fewer than five historical samples for comparison.

There were no anomalous data identified from this sampling.

Water Quality Data

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY	
				DATE	ID			LAB	DATA	QA			
Alkalinity, Total (As CaCO3)	mg/L	0236	SL, RIV	10/18/2005	0001	0.50 - 0.50	144				#	-	-
	mg/L	0239	SL, RIV	10/18/2005	0001	0.67 - 0.67	166				#	-	-
	mg/L	0240	SL, RIV	10/19/2005	0001	0.50 - 0.50	232				#	-	-
	mg/L	0401	WL	10/20/2005	0001	18.00 - 18.00	326		F		#	-	-
	mg/L	0402	WL	10/19/2005	0001	17.00 - 17.00	338		F		#	-	-
	mg/L	0408	WL	10/20/2005	0001	26.00 - 26.00	430		F		#	-	-
	mg/L	0550	IS, IHYD	10/20/2005	0001	0.00 - 0.00	154				#	-	-
	mg/L	0580	WL	10/19/2005	0001	18.00 - 18.00	306		F		#	-	-
	mg/L	0581	WL	10/19/2005	0001	18.00 - 18.00	402		F		#	-	-
	mg/L	0582	WL	10/19/2005	0001	18.00 - 18.00	270		F		#	-	-
	mg/L	0583	WL	10/19/2005	0001	18.00 - 18.00	1512		F		#	-	-
	mg/L	0584	WL	10/19/2005	0001	18.00 - 18.00	388		F		#	-	-
	mg/L	0585	WL	10/19/2005	0001	18.00 - 18.00	310		F		#	-	-
	mg/L	0586	WL	10/20/2005	0001	18.00 - 18.00	196		F		#	-	-
	mg/L	0587	WL	10/19/2005	0001	18.00 - 18.00	314		F		#	-	-
	mg/L	0588	WL	10/19/2005	0001	34.00 - 34.00	288		F		#	-	-
	mg/L	0589	WL	10/19/2005	0001	52.00 - 52.00	560		F		#	-	-
	mg/L	0600	WL	10/19/2005	0001	18.00 - 18.00	814		F		#	-	-
mg/L	0601	WL	10/20/2005	0001	18.00 - 18.00	688		F		#	-	-	
Ammonia Total as N	mg/L	0236	SL, RIV	10/18/2005	0001	0.50 - 0.50	0.13				#	0.1	-
	mg/L	0239	SL, RIV	10/18/2005	0001	0.67 - 0.67	0.1	U			#	0.1	-
	mg/L	0240	SL, RIV	10/19/2005	0001	0.50 - 0.50	20				#	1	-
	mg/L	0401	WL	10/20/2005	0001	18.00 - 18.00	72		F		#	20	-
	mg/L	0402	WL	10/19/2005	0001	17.00 - 17.00	84		F		#	20	-
	mg/L	0408	WL	10/20/2005	0001	26.00 - 26.00	320		F		#	20	-
	mg/L	0550	IS, IHYD	10/20/2005	0001	0.00 - 0.00	0.12				#	0.1	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Ammonia Total as N	mg/L	0580	WL	10/19/2005	0001	18.00 - 18.00	24	F	#		1	-
	mg/L	0581	WL	10/19/2005	0001	18.00 - 18.00	110	F	#		20	-
	mg/L	0582	WL	10/19/2005	0001	18.00 - 18.00	63	F	#		2	-
	mg/L	0583	WL	10/19/2005	0001	18.00 - 18.00	340	F	#		20	-
	mg/L	0584	WL	10/19/2005	0001	18.00 - 18.00	280	F	#		20	-
	mg/L	0584	WL	10/19/2005	0002	18.00 - 18.00	270	F	#		20	-
	mg/L	0585	WL	10/19/2005	0001	18.00 - 18.00	120	F	#		20	-
	mg/L	0586	WL	10/20/2005	0001	18.00 - 18.00	21	F	#		1	-
	mg/L	0587	WL	10/19/2005	0001	18.00 - 18.00	38	F	#		1	-
	mg/L	0588	WL	10/19/2005	0001	34.00 - 34.00	77	F	#		20	-
	mg/L	0589	WL	10/19/2005	0001	52.00 - 52.00	700	F	#		20	-
	mg/L	0590	WL, PZ	10/19/2005	0001	1.50 - 1.50	66	FQ	#		20	-
	mg/L	0600	WL	10/19/2005	0001	18.00 - 18.00	430	F	#		20	-
	mg/L	0601	WL	10/20/2005	0001	18.00 - 18.00	520	F	#		20	-
	mg/L	0601	WL	10/20/2005	0002	18.00 - 18.00	520	F	#		20	-
	mg/L	0605	WL, PZ	10/19/2005	0001	9.90 - 9.90	190	FQ	#		20	-
	mg/L	0613	WL, PZ	10/19/2005	0001	1.70 - 1.70	330	FQ	#		20	-
	mg/L	0615	WL, PZ	10/19/2005	0001	1.90 - 1.90	2	FQ	#		0.1	-
mg/L	0616	WL, PZ	10/19/2005	0001	5.80 - 5.80	93	FQ	#		20	-	
Bromide	mg/L	0236	SL, RIV	10/18/2005	0001	0.50 - 0.50	0.2	U		#	0.2	-
	mg/L	0239	SL, RIV	10/18/2005	0001	0.67 - 0.67	0.2	U		#	0.2	-
	mg/L	0240	SL, RIV	10/19/2005	0001	0.50 - 0.50	1	U		#	1	-
	mg/L	0401	WL	10/20/2005	0001	18.00 - 18.00	2	U	F	#	2	-
	mg/L	0402	WL	10/19/2005	0001	17.00 - 17.00	2	U	F	#	2	-
	mg/L	0408	WL	10/20/2005	0001	26.00 - 26.00	4	U	F	#	4	-
	mg/L	0550	IS, IHYD	10/20/2005	0001	0.00 - 0.00	0.4	U		#	0.4	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Bromide	mg/L	0580	WL	10/19/2005	0001	18.00 - 18.00	1	U	F	#	1	-
	mg/L	0581	WL	10/19/2005	0001	18.00 - 18.00	2	U	F	#	2	-
	mg/L	0582	WL	10/19/2005	0001	18.00 - 18.00	1	U	F	#	1	-
	mg/L	0583	WL	10/19/2005	0001	18.00 - 18.00	4	U	F	#	4	-
	mg/L	0584	WL	10/19/2005	0001	18.00 - 18.00	2	U	F	#	2	-
	mg/L	0584	WL	10/19/2005	0002	18.00 - 18.00	2	U	F	#	2	-
	mg/L	0585	WL	10/19/2005	0001	18.00 - 18.00	2	U	F	#	2	-
	mg/L	0586	WL	10/20/2005	0001	18.00 - 18.00	0.4	U	F	#	0.4	-
	mg/L	0587	WL	10/19/2005	0001	18.00 - 18.00	1	U	F	#	1	-
	mg/L	0588	WL	10/19/2005	0001	34.00 - 34.00	2	U	F	#	2	-
	mg/L	0589	WL	10/19/2005	0001	52.00 - 52.00	20	U	F	#	20	-
	mg/L	0590	WL, PZ	10/19/2005	0001	1.50 - 1.50	1	U	FQ	#	1	-
	mg/L	0600	WL	10/19/2005	0001	18.00 - 18.00	4	U	F	#	4	-
	mg/L	0601	WL	10/20/2005	0001	18.00 - 18.00	4	U	F	#	4	-
	mg/L	0601	WL	10/20/2005	0002	18.00 - 18.00	4	U	F	#	4	-
	mg/L	0605	WL, PZ	10/19/2005	0001	9.90 - 9.90	2	U	FQ	#	2	-
	mg/L	0613	WL, PZ	10/19/2005	0001	1.70 - 1.70	4	U	FQ	#	4	-
	mg/L	0615	WL, PZ	10/19/2005	0001	1.90 - 1.90	0.4	U	FQ	#	0.4	-
mg/L	0616	WL, PZ	10/19/2005	0001	5.80 - 5.80	1	U	FQ	#	1	-	
Chloride	mg/L	0236	SL, RIV	10/18/2005	0001	0.50 - 0.50	100			#	2	-
	mg/L	0239	SL, RIV	10/18/2005	0001	0.67 - 0.67	93			#	2	-
	mg/L	0240	SL, RIV	10/19/2005	0001	0.50 - 0.50	310			#	10	-
	mg/L	0401	WL	10/20/2005	0001	18.00 - 18.00	610		F	#	20	-
	mg/L	0402	WL	10/19/2005	0001	17.00 - 17.00	550		F	#	20	-
	mg/L	0408	WL	10/20/2005	0001	26.00 - 26.00	1100		F	#	40	-
	mg/L	0550	IS, IHYD	10/20/2005	0001	0.00 - 0.00	95			#	4	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Chloride	mg/L	0580	WL	10/19/2005	0001	18.00 - 18.00	330	F	#	10	-	
	mg/L	0581	WL	10/19/2005	0001	18.00 - 18.00	850	F	#	20	-	
	mg/L	0582	WL	10/19/2005	0001	18.00 - 18.00	230	F	#	10	-	
	mg/L	0583	WL	10/19/2005	0001	18.00 - 18.00	1900	F	#	40	-	
	mg/L	0584	WL	10/19/2005	0001	18.00 - 18.00	1000	F	#	20	-	
	mg/L	0584	WL	10/19/2005	0002	18.00 - 18.00	1100	F	#	20	-	
	mg/L	0585	WL	10/19/2005	0001	18.00 - 18.00	830	F	#	20	-	
	mg/L	0586	WL	10/20/2005	0001	18.00 - 18.00	130	F	#	4	-	
	mg/L	0587	WL	10/19/2005	0001	18.00 - 18.00	420	F	#	10	-	
	mg/L	0588	WL	10/19/2005	0001	34.00 - 34.00	1300	F	#	20	-	
	mg/L	0589	WL	10/19/2005	0001	52.00 - 52.00	6700	F	#	200	-	
	mg/L	0590	WL, PZ	10/19/2005	0001	1.50 - 1.50	420	FQ	#	10	-	
	mg/L	0600	WL	10/19/2005	0001	18.00 - 18.00	2700	F	#	40	-	
	mg/L	0601	WL	10/20/2005	0001	18.00 - 18.00	1200	F	#	40	-	
	mg/L	0601	WL	10/20/2005	0002	18.00 - 18.00	1200	F	#	40	-	
	mg/L	0605	WL, PZ	10/19/2005	0001	9.90 - 9.90	500	FQ	#	20	-	
	mg/L	0613	WL, PZ	10/19/2005	0001	1.70 - 1.70	2400	FQ	#	40	-	
	mg/L	0615	WL, PZ	10/19/2005	0001	1.90 - 1.90	95	FQ	#	4	-	
	mg/L	0616	WL, PZ	10/19/2005	0001	5.80 - 5.80	170	FQ	#	10	-	
	Dissolved Oxygen	mg/L	0236	SL, RIV	10/18/2005	N001	0.50 - 0.50	8.81		#	-	-
mg/L		0239	SL, RIV	10/18/2005	N001	0.67 - 0.67	9.47		#	-	-	
mg/L		0240	SL, RIV	10/19/2005	N001	0.50 - 0.50	2.00		#	-	-	
mg/L		0401	WL	10/20/2005	N001	18.00 - 18.00	1.12	F	#	-	-	
mg/L		0402	WL	10/19/2005	N001	17.00 - 17.00	1.52	F	#	-	-	
mg/L		0408	WL	10/20/2005	N001	26.00 - 26.00	0.94	F	#	-	-	
mg/L		0550	IS, IHYD	10/20/2005	N001	0.00 - 0.00	8.31		#	-	-	

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Dissolved Oxygen	mg/L	0580	WL	10/19/2005	N001	18.00 - 18.00	0.81	F	#	-	-	
	mg/L	0581	WL	10/19/2005	N001	18.00 - 18.00	0.53	F	#	-	-	
	mg/L	0582	WL	10/19/2005	N001	18.00 - 18.00	0.47	F	#	-	-	
	mg/L	0583	WL	10/19/2005	N001	18.00 - 18.00	0.83	F	#	-	-	
	mg/L	0584	WL	10/19/2005	N001	18.00 - 18.00	0.65	F	#	-	-	
	mg/L	0585	WL	10/19/2005	N001	18.00 - 18.00	0.72	F	#	-	-	
	mg/L	0586	WL	10/20/2005	N001	18.00 - 18.00	1.01	F	#	-	-	
	mg/L	0587	WL	10/19/2005	N001	18.00 - 18.00	0.77	F	#	-	-	
	mg/L	0588	WL	10/19/2005	N001	34.00 - 34.00	0.49	F	#	-	-	
	mg/L	0589	WL	10/19/2005	N001	52.00 - 52.00	0.43	F	#	-	-	
	mg/L	0590	WL, PZ	10/19/2005	N001	1.50 - 1.50	3.25	FQ	#	-	-	
	mg/L	0600	WL	10/19/2005	N001	18.00 - 18.00	0.58	F	#	-	-	
	mg/L	0601	WL	10/20/2005	N001	18.00 - 18.00	1.86	F	#	-	-	
	mg/L	0605	WL, PZ	10/19/2005	N001	9.90 - 9.90	0.69	FQ	#	-	-	
	mg/L	0613	WL, PZ	10/19/2005	N001	1.70 - 1.70	4.61	FQ	#	-	-	
	mg/L	0615	WL, PZ	10/19/2005	N001	1.90 - 1.90	5.62	FQ	#	-	-	
	mg/L	0616	WL, PZ	10/19/2005	N001	5.80 - 5.80	2.19	FQ	#	-	-	
Oxidation Reduction Potent	mV	0236	SL, RIV	10/18/2005	N001	0.50 - 0.50	56.2		#	-	-	
	mV	0239	SL, RIV	10/18/2005	N001	0.67 - 0.67	69.4		#	-	-	
	mV	0240	SL, RIV	10/19/2005	N001	0.50 - 0.50	-3.0		#	-	-	
	mV	0401	WL	10/20/2005	N001	18.00 - 18.00	166.7	F	#	-	-	
	mV	0402	WL	10/19/2005	N001	17.00 - 17.00	103.8	F	#	-	-	
	mV	0408	WL	10/20/2005	N001	26.00 - 26.00	167.7	F	#	-	-	
	mV	0580	WL	10/19/2005	N001	18.00 - 18.00	47.6	F	#	-	-	
	mV	0581	WL	10/19/2005	N001	18.00 - 18.00	57.1	F	#	-	-	
	mV	0582	WL	10/19/2005	N001	18.00 - 18.00	61.5	F	#	-	-	

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site

REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Oxidation Reduction Potent	mV	0583	WL	10/19/2005	N001	18.00 - 18.00	219.7	F	#	-	-	
	mV	0584	WL	10/19/2005	N001	18.00 - 18.00	129.7	F	#	-	-	
	mV	0585	WL	10/19/2005	N001	18.00 - 18.00	159.0	F	#	-	-	
	mV	0586	WL	10/20/2005	N001	18.00 - 18.00	154.7	F	#	-	-	
	mV	0587	WL	10/19/2005	N001	18.00 - 18.00	81.7	F	#	-	-	
	mV	0588	WL	10/19/2005	N001	34.00 - 34.00	84.9	F	#	-	-	
	mV	0589	WL	10/19/2005	N001	52.00 - 52.00	36.3	F	#	-	-	
	mV	0590	WL, PZ	10/19/2005	N001	1.50 - 1.50	-111.9	FQ	#	-	-	
	mV	0600	WL	10/19/2005	N001	18.00 - 18.00	100.2	F	#	-	-	
	mV	0601	WL	10/20/2005	N001	18.00 - 18.00	152.8	F	#	-	-	
	mV	0605	WL, PZ	10/19/2005	N001	9.90 - 9.90	-265.2	FQ	#	-	-	
	mV	0613	WL, PZ	10/19/2005	N001	1.70 - 1.70	86.8	FQ	#	-	-	
	mV	0615	WL, PZ	10/19/2005	N001	1.90 - 1.90	51.2	FQ	#	-	-	
	mV	0616	WL, PZ	10/19/2005	N001	5.80 - 5.80	-266.5	FQ	#	-	-	
	pH	s.u.	0236	SL, RIV	10/18/2005	N001	0.50 - 0.50	8.47		#	-	-
s.u.		0239	SL, RIV	10/18/2005	N001	0.67 - 0.67	8.41		#	-	-	
s.u.		0240	SL, RIV	10/19/2005	N001	0.50 - 0.50	7.31		#	-	-	
s.u.		0401	WL	10/20/2005	N001	18.00 - 18.00	7.04	F	#	-	-	
s.u.		0402	WL	10/19/2005	N001	17.00 - 17.00	7.13	F	#	-	-	
s.u.		0408	WL	10/20/2005	N001	26.00 - 26.00	6.93	F	#	-	-	
s.u.		0550	IS, IHYD	10/20/2005	N001	0.00 - 0.00	8.00		#	-	-	
s.u.		0580	WL	10/19/2005	N001	18.00 - 18.00	7.03	F	#	-	-	
s.u.		0581	WL	10/19/2005	N001	18.00 - 18.00	6.96	F	#	-	-	
s.u.		0582	WL	10/19/2005	N001	18.00 - 18.00	7.40	F	#	-	-	
s.u.		0583	WL	10/19/2005	N001	18.00 - 18.00	6.88	F	#	-	-	
s.u.		0584	WL	10/19/2005	N001	18.00 - 18.00	6.86	F	#	-	-	

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
pH	s.u.	0585	WL	10/19/2005	N001	18.00 - 18.00	7.05	F	#	-	-	
	s.u.	0586	WL	10/20/2005	N001	18.00 - 18.00	7.49	F	#	-	-	
	s.u.	0587	WL	10/19/2005	N001	18.00 - 18.00	6.97	F	#	-	-	
	s.u.	0588	WL	10/19/2005	N001	34.00 - 34.00	7.81	F	#	-	-	
	s.u.	0589	WL	10/19/2005	N001	52.00 - 52.00	6.88	F	#	-	-	
	s.u.	0590	WL, PZ	10/19/2005	N001	1.50 - 1.50	8.00	FQ	#	-	-	
	s.u.	0600	WL	10/19/2005	N001	18.00 - 18.00	6.99	F	#	-	-	
	s.u.	0601	WL	10/20/2005	N001	18.00 - 18.00	6.97	F	#	-	-	
	s.u.	0605	WL, PZ	10/19/2005	N001	9.90 - 9.90	9.12	FQ	#	-	-	
	s.u.	0613	WL, PZ	10/19/2005	N001	1.70 - 1.70	8.33	FQ	#	-	-	
	s.u.	0615	WL, PZ	10/19/2005	N001	1.90 - 1.90	8.17	FQ	#	-	-	
	s.u.	0616	WL, PZ	10/19/2005	N001	5.80 - 5.80	8.94	FQ	#	-	-	
	Specific Conductance	umhos/cm	0236	SL, RIV	10/18/2005	N001	0.50 - 0.50	1240		#	-	-
umhos/cm		0239	SL, RIV	10/18/2005	N001	0.67 - 0.67	1164		#	-	-	
umhos/cm		0240	SL, RIV	10/19/2005	N001	0.50 - 0.50	3486		#	-	-	
umhos/cm		0401	WL	10/20/2005	N001	18.00 - 18.00	6245	F	#	-	-	
umhos/cm		0402	WL	10/19/2005	N001	17.00 - 17.00	5716	F	#	-	-	
umhos/cm		0408	WL	10/20/2005	N001	26.00 - 26.00	12234	F	#	-	-	
umhos/cm		0550	IS, IHYD	10/20/2005	N001	0.00 - 0.00	1201		#	-	-	
umhos/cm		0580	WL	10/19/2005	N001	18.00 - 18.00	4088	F	#	-	-	
umhos/cm		0581	WL	10/19/2005	N001	18.00 - 18.00	8196	F	#	-	-	
umhos/cm		0582	WL	10/19/2005	N001	18.00 - 18.00	2898	F	#	-	-	
umhos/cm		0583	WL	10/19/2005	N001	18.00 - 18.00	16091	F	#	-	-	
umhos/cm		0584	WL	10/19/2005	N001	18.00 - 18.00	10317	F	#	-	-	
umhos/cm		0585	WL	10/19/2005	N001	18.00 - 18.00	8082	F	#	-	-	
umhos/cm		0586	WL	10/20/2005	N001	18.00 - 18.00	1666	F	#	-	-	

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Specific Conductance	umhos/cm	0587	WL	10/19/2005	N001	18.00 - 18.00	5187	F	#	-	-	
	umhos/cm	0588	WL	10/19/2005	N001	34.00 - 34.00	6452	F	#	-	-	
	umhos/cm	0589	WL	10/19/2005	N001	52.00 - 52.00	79244	F	#	-	-	
	umhos/cm	0590	WL, PZ	10/19/2005	N001	1.50 - 1.50	3970	FQ	#	-	-	
	umhos/cm	0600	WL	10/19/2005	N001	18.00 - 18.00	20946	F	#	-	-	
	umhos/cm	0601	WL	10/20/2005	N001	18.00 - 18.00	13933	F	#	-	-	
	umhos/cm	0605	WL, PZ	10/19/2005	N001	9.90 - 9.90	5146	FQ	#	-	-	
	umhos/cm	0613	WL, PZ	10/19/2005	N001	1.70 - 1.70	2737	FQ	#	-	-	
	umhos/cm	0615	WL, PZ	10/19/2005	N001	1.90 - 1.90	1232	FQ	#	-	-	
	umhos/cm	0616	WL, PZ	10/19/2005	N001	5.80 - 5.80	3582	FQ	#	-	-	
Sulfate	mg/L	0236	SL, RIV	10/18/2005	0001	0.50 - 0.50	360		#	5	-	
	mg/L	0239	SL, RIV	10/18/2005	0001	0.67 - 0.67	320		#	5	-	
	mg/L	0240	SL, RIV	10/19/2005	0001	0.50 - 0.50	1100		#	25	-	
	mg/L	0401	WL	10/20/2005	0001	18.00 - 18.00	2300	F	#	50	-	
	mg/L	0402	WL	10/19/2005	0001	17.00 - 17.00	2300	F	#	50	-	
	mg/L	0408	WL	10/20/2005	0001	26.00 - 26.00	5700	F	#	100	-	
	mg/L	0550	IS, IHYD	10/20/2005	0001	0.00 - 0.00	330		#	10	-	
	mg/L	0580	WL	10/19/2005	0001	18.00 - 18.00	1500	F	#	25	-	
	mg/L	0581	WL	10/19/2005	0001	18.00 - 18.00	3400	F	#	50	-	
	mg/L	0582	WL	10/19/2005	0001	18.00 - 18.00	950	F	#	25	-	
	mg/L	0583	WL	10/19/2005	0001	18.00 - 18.00	7000	F	#	100	-	
	mg/L	0584	WL	10/19/2005	0001	18.00 - 18.00	4500	F	#	50	-	
	mg/L	0584	WL	10/19/2005	0002	18.00 - 18.00	4700	F	#	50	-	
	mg/L	0585	WL	10/19/2005	0001	18.00 - 18.00	3400	F	#	50	-	
	mg/L	0586	WL	10/20/2005	0001	18.00 - 18.00	470	F	#	10	-	
	mg/L	0587	WL	10/19/2005	0001	18.00 - 18.00	1800	F	#	25	-	

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Sulfate	mg/L	0588	WL	10/19/2005	0001	34.00 - 34.00	1100	F	#	50	-	
	mg/L	0589	WL	10/19/2005	0001	52.00 - 52.00	9500	F	#	500	-	
	mg/L	0590	WL, PZ	10/19/2005	0001	1.50 - 1.50	1500	FQ	#	25	-	
	mg/L	0600	WL	10/19/2005	0001	18.00 - 18.00	9800	F	#	100	-	
	mg/L	0601	WL	10/20/2005	0001	18.00 - 18.00	6600	F	#	100	-	
	mg/L	0601	WL	10/20/2005	0002	18.00 - 18.00	6600	F	#	100	-	
	mg/L	0605	WL, PZ	10/19/2005	0001	9.90 - 9.90	1600	FQ	#	50	-	
	mg/L	0613	WL, PZ	10/19/2005	0001	1.70 - 1.70	5000	FQ	#	100	-	
	mg/L	0615	WL, PZ	10/19/2005	0001	1.90 - 1.90	260	FQ	#	10	-	
	mg/L	0616	WL, PZ	10/19/2005	0001	5.80 - 5.80	610	FQ	#	25	-	
	Temperature	C	0236	SL, RIV	10/18/2005	N001	0.50 - 0.50	17.72		#	-	-
C		0239	SL, RIV	10/18/2005	N001	0.67 - 0.67	15.92		#	-	-	
C		0240	SL, RIV	10/19/2005	N001	0.50 - 0.50	12.07		#	-	-	
C		0401	WL	10/20/2005	N001	18.00 - 18.00	16.95	F	#	-	-	
C		0402	WL	10/19/2005	N001	17.00 - 17.00	18.28	F	#	-	-	
C		0408	WL	10/20/2005	N001	26.00 - 26.00	15.68	F	#	-	-	
C		0550	IS, IHYD	10/20/2005	N001	0.00 - 0.00	16.95		#	-	-	
C		0580	WL	10/19/2005	N001	18.00 - 18.00	16.70	F	#	-	-	
C		0581	WL	10/19/2005	N001	18.00 - 18.00	16.29	F	#	-	-	
C		0582	WL	10/19/2005	N001	18.00 - 18.00	16.43	F	#	-	-	
C		0583	WL	10/19/2005	N001	18.00 - 18.00	16.95	F	#	-	-	
C		0584	WL	10/19/2005	N001	18.00 - 18.00	16.19	F	#	-	-	
C		0585	WL	10/19/2005	N001	18.00 - 18.00	16.64	F	#	-	-	
C		0586	WL	10/20/2005	N001	18.00 - 18.00	17.95	F	#	-	-	
C		0587	WL	10/19/2005	N001	18.00 - 18.00	17.53	F	#	-	-	
C		0588	WL	10/19/2005	N001	34.00 - 34.00	16.57	F	#	-	-	

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Temperature	C	0589	WL	10/19/2005	N001	52.00 - 52.00	16.27	F	#	-	-	
	C	0590	WL, PZ	10/19/2005	N001	1.50 - 1.50	13.80	FQ	#	-	-	
	C	0600	WL	10/19/2005	N001	18.00 - 18.00	16.41	F	#	-	-	
	C	0601	WL	10/20/2005	N001	18.00 - 18.00	15.83	F	#	-	-	
	C	0605	WL, PZ	10/19/2005	N001	9.90 - 9.90	16.48	FQ	#	-	-	
	C	0613	WL, PZ	10/19/2005	N001	1.70 - 1.70	16.99	FQ	#	-	-	
	C	0615	WL, PZ	10/19/2005	N001	1.90 - 1.90	16.84	FQ	#	-	-	
	C	0616	WL, PZ	10/19/2005	N001	5.80 - 5.80	16.10	FQ	#	-	-	
Total Dissolved Solids	mg/L	0236	SL, RIV	10/18/2005	0001	0.50 - 0.50	830		#	20	-	
	mg/L	0239	SL, RIV	10/18/2005	0001	0.67 - 0.67	750		#	20	-	
	mg/L	0240	SL, RIV	10/19/2005	0001	0.50 - 0.50	2300		#	80	-	
	mg/L	0401	WL	10/20/2005	0001	18.00 - 18.00	4300	JF	#	200	-	
	mg/L	0402	WL	10/19/2005	0001	17.00 - 17.00	4400	F	#	200	-	
	mg/L	0408	WL	10/20/2005	0001	26.00 - 26.00	9400	F	#	400	-	
	mg/L	0550	IS, IHYD	10/20/2005	0001	0.00 - 0.00	800		#	40	-	
	mg/L	0580	WL	10/19/2005	0001	18.00 - 18.00	3100	F	#	80	-	
	mg/L	0581	WL	10/19/2005	0001	18.00 - 18.00	6100	F	#	200	-	
	mg/L	0582	WL	10/19/2005	0001	18.00 - 18.00	1800	F	#	80	-	
	mg/L	0583	WL	10/19/2005	0001	18.00 - 18.00	12000	F	#	400	-	
	mg/L	0584	WL	10/19/2005	0001	18.00 - 18.00	7600	F	#	200	-	
	mg/L	0584	WL	10/19/2005	0002	18.00 - 18.00	7800	F	#	200	-	
	mg/L	0585	WL	10/19/2005	0001	18.00 - 18.00	6300	F	#	200	-	
	mg/L	0586	WL	10/20/2005	0001	18.00 - 18.00	1000	F	#	40	-	
	mg/L	0587	WL	10/19/2005	0001	18.00 - 18.00	3600	F	#	200	-	
	mg/L	0588	WL	10/19/2005	0001	34.00 - 34.00	3700	F	#	200	-	
	mg/L	0589	WL	10/19/2005	0001	52.00 - 52.00	56000	F	#	2000	-	

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Total Dissolved Solids	mg/L	0590	WL, PZ	10/19/2005	0001	1.50 - 1.50	2800	FQ	#	80	-	
	mg/L	0600	WL	10/19/2005	0001	18.00 - 18.00	16000	F	#	400	-	
	mg/L	0601	WL	10/20/2005	0001	18.00 - 18.00	10000	F	#	400	-	
	mg/L	0601	WL	10/20/2005	0002	18.00 - 18.00	10000	F	#	400	-	
	mg/L	0605	WL, PZ	10/19/2005	0001	9.90 - 9.90	3400	FQ	#	200	-	
	mg/L	0613	WL, PZ	10/19/2005	0001	1.70 - 1.70	10000	FQ	#	400	-	
	mg/L	0615	WL, PZ	10/19/2005	0001	1.90 - 1.90	770	FQ	#	40	-	
	mg/L	0616	WL, PZ	10/19/2005	0001	5.80 - 5.80	1200	FQ	#	80	-	
Turbidity	NTU	0236	SL, RIV	10/18/2005	N001	0.50 - 0.50	119		#	-	-	
	NTU	0239	SL, RIV	10/18/2005	N001	0.67 - 0.67	970		#	-	-	
	NTU	0240	SL, RIV	10/19/2005	N001	0.50 - 0.50	73.5		#	-	-	
	NTU	0401	WL	10/20/2005	N001	18.00 - 18.00	5.93	F	#	-	-	
	NTU	0402	WL	10/19/2005	N001	17.00 - 17.00	3.65	F	#	-	-	
	NTU	0408	WL	10/20/2005	N001	26.00 - 26.00	9.06	F	#	-	-	
	NTU	0550	IS, IHYD	10/20/2005	N001	0.00 - 0.00	59.1		#	-	-	
	NTU	0580	WL	10/19/2005	N001	18.00 - 18.00	5.25	F	#	-	-	
	NTU	0581	WL	10/19/2005	N001	18.00 - 18.00	9.4	F	#	-	-	
	NTU	0582	WL	10/19/2005	N001	18.00 - 18.00	677	F	#	-	-	
	NTU	0583	WL	10/19/2005	N001	18.00 - 18.00	5.37	F	#	-	-	
	NTU	0584	WL	10/19/2005	N001	18.00 - 18.00	6.49	F	#	-	-	
	NTU	0585	WL	10/19/2005	N001	18.00 - 18.00	3.25	F	#	-	-	
	NTU	0586	WL	10/20/2005	N001	18.00 - 18.00	5.31	F	#	-	-	
	NTU	0587	WL	10/19/2005	N001	18.00 - 18.00	2.27	F	#	-	-	
	NTU	0588	WL	10/19/2005	N001	34.00 - 34.00	1.94	F	#	-	-	
	NTU	0589	WL	10/19/2005	N001	52.00 - 52.00	10.0	F	#	-	-	
	NTU	0600	WL	10/19/2005	N001	18.00 - 18.00	2.24	F	#	-	-	

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Turbidity	NTU	0601	WL	10/20/2005	N001	18.00 - 18.00	1.19	F	#	-	-	
	NTU	0613	WL, PZ	10/19/2005	N001	1.70 - 1.70	358	FQ	#	-	-	
	NTU	0615	WL, PZ	10/19/2005	N001	1.90 - 1.90	313	FQ	#	-	-	
	NTU	0616	WL, PZ	10/19/2005	N001	5.80 - 5.80	978	FQ	#	-	-	
Uranium	mg/L	0236	SL, RIV	10/18/2005	0001	0.50 - 0.50	0.015		#	4.8E-06	-	
	mg/L	0239	SL, RIV	10/18/2005	0001	0.67 - 0.67	0.0083		#	4.8E-06	-	
	mg/L	0240	SL, RIV	10/19/2005	0001	0.50 - 0.50	0.230		#	9.5E-05	-	
	mg/L	0401	WL	10/20/2005	0001	18.00 - 18.00	0.760	F	#	0.00024	-	
	mg/L	0402	WL	10/19/2005	0001	17.00 - 17.00	0.730	F	#	0.00024	-	
	mg/L	0408	WL	10/20/2005	0001	26.00 - 26.00	1.400	F	#	0.00048	-	
	mg/L	0550	IS, IHYD	10/20/2005	0001	0.00 - 0.00	0.0054		#	4.8E-06	-	
	mg/L	0580	WL	10/19/2005	0001	18.00 - 18.00	0.490	F	#	9.5E-05	-	
	mg/L	0581	WL	10/19/2005	0001	18.00 - 18.00	1.100	F	#	0.00024	-	
	mg/L	0582	WL	10/19/2005	0001	18.00 - 18.00	0.350	F	#	0.00024	-	
	mg/L	0583	WL	10/19/2005	0001	18.00 - 18.00	2.500	F	#	0.00048	-	
	mg/L	0584	WL	10/19/2005	0001	18.00 - 18.00	1.200	F	#	0.00024	-	
	mg/L	0584	WL	10/19/2005	0002	18.00 - 18.00	1.300	F	#	0.00048	-	
	mg/L	0585	WL	10/19/2005	0001	18.00 - 18.00	0.980	F	#	0.00024	-	
	mg/L	0586	WL	10/20/2005	0001	18.00 - 18.00	0.160	F	#	9.5E-05	-	
	mg/L	0587	WL	10/19/2005	0001	18.00 - 18.00	0.650	F	#	0.00024	-	
	mg/L	0588	WL	10/19/2005	0001	34.00 - 34.00	0.300	F	#	9.5E-05	-	
	mg/L	0589	WL	10/19/2005	0001	52.00 - 52.00	1.800	F	#	0.00048	-	
	mg/L	0600	WL	10/19/2005	0001	18.00 - 18.00	2.100	F	#	0.00048	-	
	mg/L	0601	WL	10/20/2005	0001	18.00 - 18.00	1.500	F	#	0.00048	-	
mg/L	0601	WL	10/20/2005	0002	18.00 - 18.00	1.400	F	#	0.00048	-		
mg/L	0605	WL, PZ	10/19/2005	0001	9.90 - 9.90	0.220	FQ	#	4.8E-05	-		

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Uranium	mg/L	0613	WL, PZ	10/19/2005	0001	1.70 - 1.70	1.000	FQ	#	0.00024	-	
	mg/L	0615	WL, PZ	10/19/2005	0001	1.90 - 1.90	0.010	FQ	#	4.8E-06	-	
	mg/L	0616	WL, PZ	10/19/2005	0001	5.80 - 5.80	0.010	FQ	#	4.8E-06	-	

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site

REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
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RECORDS: SELECTED FROM USEE200 WHERE site_code='MOA01' AND location_code in('0401','0402','0408','0580','0581','0582','0583','0584','0585','0586','0587','0588','0589','0600','0601','0590','0605','0613','0615','0616','0236','0239','0240','0550') AND quality_assurance = TRUE AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #10/18/2005# and #10/21/2005#

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LOCATION TYPES: IS INJECTION SYSTEM SL SURFACE LOCATION WL WELL

LOCATION SUBTYPES: IHYD Injection System Hydrant PZ Piezometer RIV River

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- + Correlation coefficient for MSA < 0.995.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- M GFAA duplicate injection precision not met.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
- S Result determined by method of standard addition (MSA).
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFIERS:

- | | | |
|--|--|--------------------|
| F Low flow sampling method used. | G Possible grout contamination, pH > 9. | J Estimated value. |
| L Less than 3 bore volumes purged prior to sampling. | Q Qualitative result due to sampling technique | R Unusable result. |
| U Parameter analyzed for but was not detected. | X Location is undefined. | |

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT		DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
			DATE	TIME			
0401	O	3969.60	10/20/2005	17:24	16.00	3953.60	
0402	O	3968.63	10/19/2005	11:27	15.40	3953.23	
0408	O	3969.17	10/20/2005	16:47	15.54	3953.63	
0580		3969.32	10/19/2005	09:37	16.63	3952.69	
0581		3969.02	10/19/2005	10:00	15.93	3953.09	
0582		3969.65	10/19/2005	10:38	16.44	3953.21	
0583		3969.64	10/19/2005	13:30	16.29	3953.35	
0584		3969.13	10/19/2005	15:25	15.64	3953.49	
0585		3969.36	10/19/2005	15:54	15.82	3953.54	
0586		3969.20	10/20/2005	17:49	15.56	3953.64	
0587		3968.89	10/19/2005	14:37	15.45	3953.44	
0588		3968.82	10/19/2005	15:00	15.33	3953.71	
0589		3968.87	10/19/2005	13:55	15.21	3953.66	
0590		3956.70	10/18/2005	09:11	3.03	3953.67	
0600		3968.77	10/19/2005	11:05	15.59	-15.59	
0601		3968.73	10/20/2005	16:22	15.23	-15.23	
0605		3956.10	10/18/2005	15:09	2.72	-	
0613		3957.11	10/18/2005	14:38	3.83	-	
0615		3957.10	10/18/2005	14:49	3.68	-	
0616		3955.26	10/18/2005	15:15	2.35	-	

RECORDS: SELECTED FROM USEE700 WHERE site_code='MOA01' AND location_code in('0401','0402','0408','0580','0581','0582','0583','0584','0585','0586','0587','0588','0589','0600','0601','0590','0605','0613','0615','0616','0236','0239','0240','0550') AND LOG_DATE between #10/18/2005# and #10/21/2005#

FLOW CODES: O ON-SITE

WATER LEVEL FLAGS:

Blanks

BLANKS REPORT (USEE810) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE DATE	SAMPLE ID	SAMPLE TYPE	RESULT	QUALIFIERS:			DETECTIO N	UN-CERTAINTY
							LAB	DATA	QA		
Ammonia Total as N	mg/L	0999	10/20/2005	0001	E	0.1	U		#	0.1	-
	mg/L	0999	10/20/2005	0002	E	0.1	U		#	0.1	-
Bromide	mg/L	0999	10/20/2005	0001	E	0.2	U		#	0.2	-
	mg/L	0999	10/20/2005	0002	E	0.2	U		#	0.2	-
Chloride	mg/L	0999	10/20/2005	0001	E	0.2	U		#	0.2	-
	mg/L	0999	10/20/2005	0002	E	0.2	U		#	0.2	-
Sulfate	mg/L	0999	10/20/2005	0001	E	0.5	U		#	0.5	-
	mg/L	0999	10/20/2005	0002	E	0.5	U		#	0.5	-
Total Dissolved Solids	mg/L	0999	10/20/2005	0001	E	20	U		#	20	-
	mg/L	0999	10/20/2005	0002	E	20	U		#	20	-
Uranium	mg/L	0999	10/20/2005	0001	E	0.00005	B	U	#	4.8E-06	-
	mg/L	0999	10/20/2005	0002	E	0.00004	B	U	#	4.8E-06	-

BLANKS REPORT (USEE810) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/9/2006 4:19 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE DATE	SAMPLE ID	SAMPLE TYPE	RESULT	QUALIFIERS:			DETECTIO N	UN- CERTAINTY
							LAB	DATA	QA		

RECORDS: SELECTED FROM USEE810 WHERE site_code='MOA01' AND quality_assurance = TRUE AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #10/18/2005# and #10/21/2005#

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

SAMPLE TYPES: E EQUIPMENT BLANK

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- + Correlation coefficient for MSA < 0.995.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- M GFAA duplicate injection precision not met.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
- S Result determined by method of standard addition (MSA).
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFIERS:

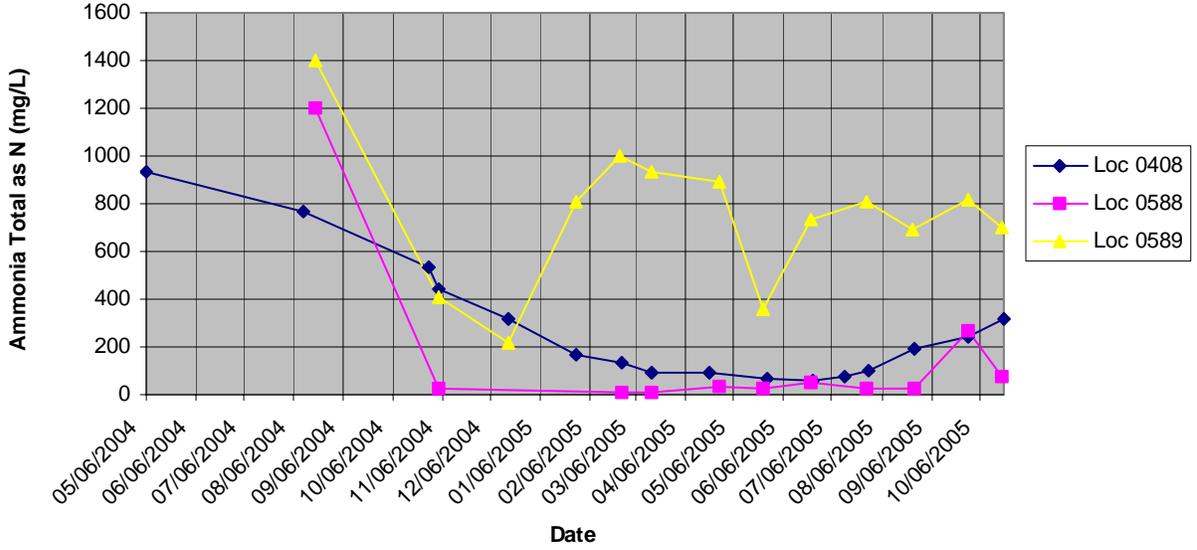
- F Low flow sampling method used.
- G Possible grout contamination, pH > 9.
- J Estimated value.
- L Less than 3 bore volumes purged prior to sampling.
- Q Qualitative result due to sampling technique
- R Unusable result.
- U Parameter analyzed for but was not detected.
- X Location is undefined.

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

Time Versus Concentration Graphs

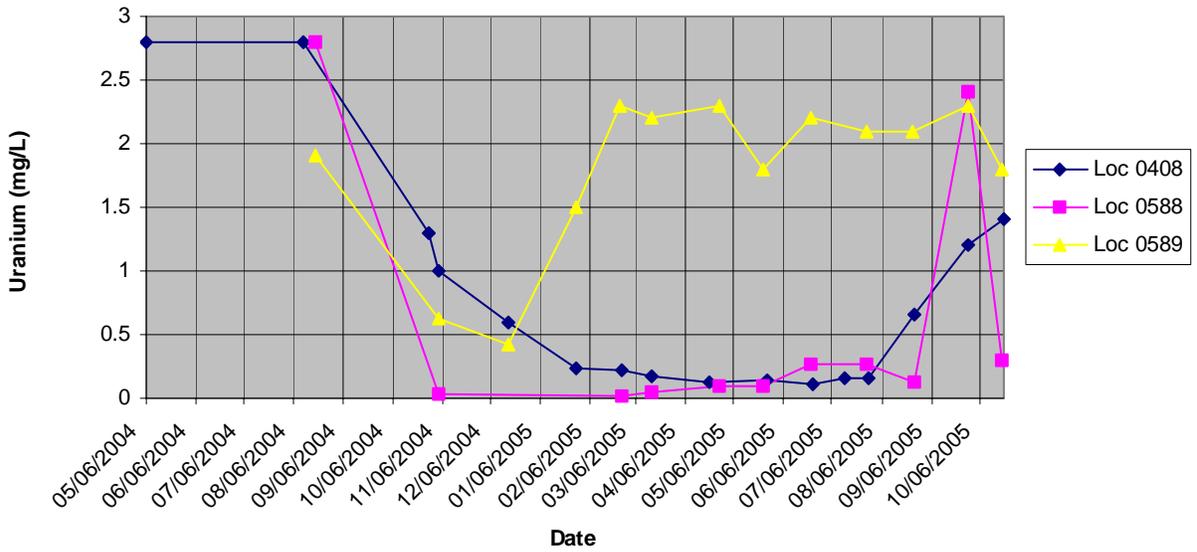
Moab Site (MOA01)

Ammonia Total as N Concentration



Moab Site (MOA01)

Uranium Concentration



Attachment 2

Trip Report

DATE: November 14, 2005

TO: John Ford

FROM: K. G. Pill

SUBJECT: Trip Report

Site: Moab – Interim Action Configuration 2 Injection Test Sampling – October 2005

Date of Sampling Event: October 18 through 21, 2005.

Team Members: Emile Bettez and Michelle Hershey

Number of Locations Sampled: 15 CF2 observation wells (0401, 0402, 0408, 0580 through 0589, 0600, and 0601), 5 piezometers (0590, 0605, 0613, 0615, and 0616), 3 surface waters (0236, 0239, and 0240), and 1 injection water sample (0550). Including one equipment blank and two duplicates, a total of 27 samples were collected.

Locations in Which Field Parameters Were Measured Only: None.

Locations Not Sampled/Reason: Observation wells 0588 (from 26 ft bgs), 0589 (from 44 ft bgs), and 0602 will be sampled as part of the microbial study sampling event the following week. Piezometers 0591, 0603, 0604, and 0614 also will be sampled during the microbial sampling event the following week.

Field Variance: Only a 125 ml sample was collected for uranium analysis as opposed to the standard 500 ml sample volume. No other metals are being sampled, and this volume is sufficient for the uranium analysis. Limited sample volume was available for analysis from locations 0590, 0605, 0613, and 0616. These samples were split and preserved as directed by the laboratory for proper analysis.

Quality Control Sample Cross Reference: Following are the false identifications assigned to the quality control samples:

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2237	NA	Equipment Blank – GW Equip	DI Water	NDV-063
2238	0584	Duplicate from 18 ft bgs	Ground Water	NDV-359
2239	0601	Duplicate from 18 ft bgs	Ground Water	NDV-060

RIN Number Assigned: All samples were assigned to RIN 05100238.

Sample Shipment: One half of the samples were shipped in one cooler overnight FEDEX to Paragon Analytics, Inc. from Moab, Utah, on October 20, 2005 (Airbill No. 8473 2967 6432). The remaining samples were shipped from Moab, Utah, on October 21, 2005 (Airbill No. 8527 5847 8550).

Location Specific Information – CF2 Observation Wells: All observation wells were sampled using micro-purge techniques with a peristaltic pump and downhole tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0401	10/20/05	17:24	16.00	18
0402	10/19/05	11:27	15.40	17
0408	10/20/05	16:47	15.54	26
0580	10/19/05	09:37	16.63	18
0581	10/19/05	10:00	15.93	18
0582	10/19/05	10:38	16.44	18
0583	10/19/05	13:30	16.29	18
0584	10/19/05	15:25	15.64	18
0585	10/19/05	15:54	15.82	18
0586	10/20/05	17:49	15.56	18
0587	10/19/05	14:37	15.45	18
0588	10/19/05	15:00	15.33	34
0589	10/19/05	13:55	15.21	52
0600	10/19/05	11:05	15.59	18
0601	10/20/05	16:22	15.23	18

This sampling event marks the first time locations 0600 and 0601 have been sampled.

Location Specific Information – Piezometer Sampling: All piezometers were purged on October 18, and sampled on October 19 and 21 (if necessary). The table below presents the water level, stick up height, and depth to the river surface for the piezometers prior to the initial purge.

PZ No.	Date	Time	Depth to Water (ft btoc)	Stick Up Height (ft)	Depth to River Surface (ft btoc)
0590	10/18/05	09:11	3.03	3.45	Dry at base
0605	10/18/05	15:09	2.72	2.07	Dry at base
0613	10/18/05	14:38	3.83	3.25	Dry at base
0615	10/18/05	14:49	3.68	3.10	Dry at base
0616	10/18/05	15:15	2.35	1.20	Dry at base

Limited sample volume was available for analysis from locations 0590, 0605, 0613, and 0616. These samples were split and preserved as directed by the laboratory for proper analysis. There was insufficient volume to submit a sample for uranium analysis from piezometer 0590.

Location Specific Information – Surface Water Sampling: Location 0236 was sampled from a depth of 6 inches below the water surface despite being isolated from the main river channel. Small fish were observed swimming in the water body. A sample from location 0239 was collected in the main river channel from a depth of 8 inches below the water surface off the

0605/0615/0616 piezometer cluster. A sample from location 0240 was collected at an unconnected water body from the main channel in the vicinity of the 0590/0591/0603 piezometer cluster from a depth of 6 inches below the water surface. Small fish were also observed swimming about this stagnant water body (photos attached).

Location Specific Information – Injection Water Sampling: The fresh water injection source was sampled from the hydrant (location 0550) located off the southern end of the CF2 well field.

Well Inspection Summary: A well inspection was not conducted.

Equipment: No issues to report.

Site Issues: The injection test had been running approximately 53 weeks (since October 6, 2004).

According to the USGS Cisco Gaging Station (Station No. 09180500), the mean daily Colorado River Flows during this sampling event are provided below:

Date	Daily Mean Flow (cfs)
10/17/2005	4,280
10/18/2005	4,200
10/19/2005	4,320
10/20/2005	4,630
10/21/2005	4,870
10/22/2005	4,810

Corrective Action Required/Taken: None.

(KGP/lcg)

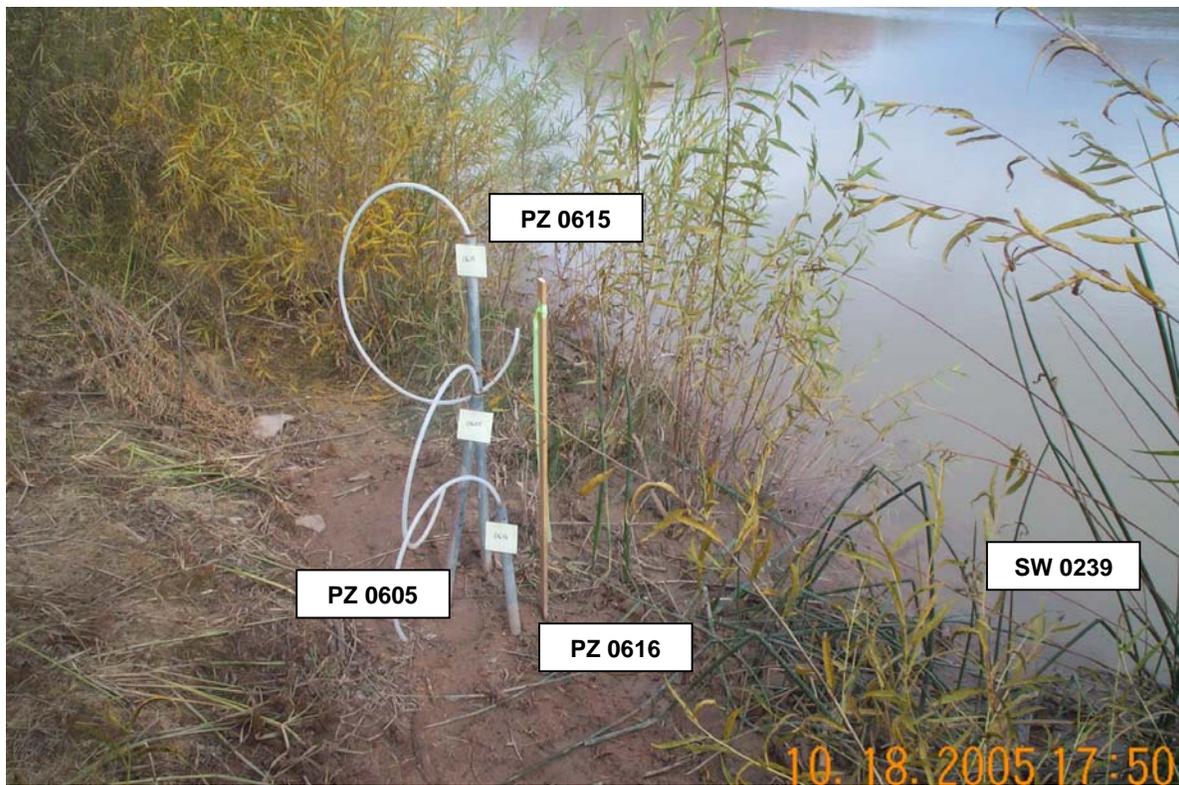
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D. R. Metzler, DOE-EM
C. I. Bahrke, Stoller (e)
L. E. Cummins, Stoller (e)
S. E. Donivan, Stoller (e)
L. M. Edwards, Stoller (e)
K. E. Karp, Stoller (e)
S. D. Lyon, Stoller (e)
K. E. Miller, Stoller
K. G. Pill, Stoller (e)
J. E. Price, Stoller (e)



Piezometer 0590 and Surface Water 0240



Piezometer 0613



Piezometers 0605, 0615, and 0616, and Surface Water Location 0239



Surface Water Location 0236