

**October 2004 Water Sampling**

**Validation Data Package  
Configuration 2 Interim Action  
Extraction Test Shutdown and  
Injection Test Startup Sampling  
Moab, Utah**

January 2005

# Moab, Utah

October 5 & 6, 2004

## Data Package Contents

This data package includes the following information:

<u>Item No.</u>	<u>Description of Contents</u>
1.	<b>Sampling Event Summary</b>
2.	<b>Sample Location Map</b>
3.	<b>Data Assessment Summary</b>
	Field Activities Verification Checklist
	Laboratory Performance Assessment
	Field Analysis/Activities
	Certification

### **Attachment 1—Data Presentation**

Water Quality Data  
Water Level Data

### **Attachment 2—Trip Report**

## **Sampling Event Summary**

**Site:** Moab, Utah

**Sampling Period:** October 5 and 6, 2004

The purpose of this sampling was to collect data that can be used to evaluate the performance of the Configuration 2 extraction and injection system. Samples for laboratory analyses were collected from the extraction wells approximately 2-hours prior to shutting off the pumps on October 5, 2004. The system was allowed to recover overnight prior to starting the injection system on October 6, 2004. Field parameters were measured in ground water samples collected from the injection wells and selected observation wells just prior to starting the injection system. A sample for laboratory analysis of the fresh water injectate was also collected.

Sampling and analysis was conducted in accordance with the *Operations, Maintenance, and Performance Monitoring Plan for the Interim Action Ground Water Treatment System, February 2004*. Ground water samples were collected from 10 extraction wells (0570 through 0579), one observation well (0580) and from the fresh water injectate (0549). Including one duplicate a total of 13 samples were collected for laboratory analyses.

Analysis and interpretation of the validated data presented in this package will be reported as part of a performance evaluation report on the injection system scheduled in 2005.

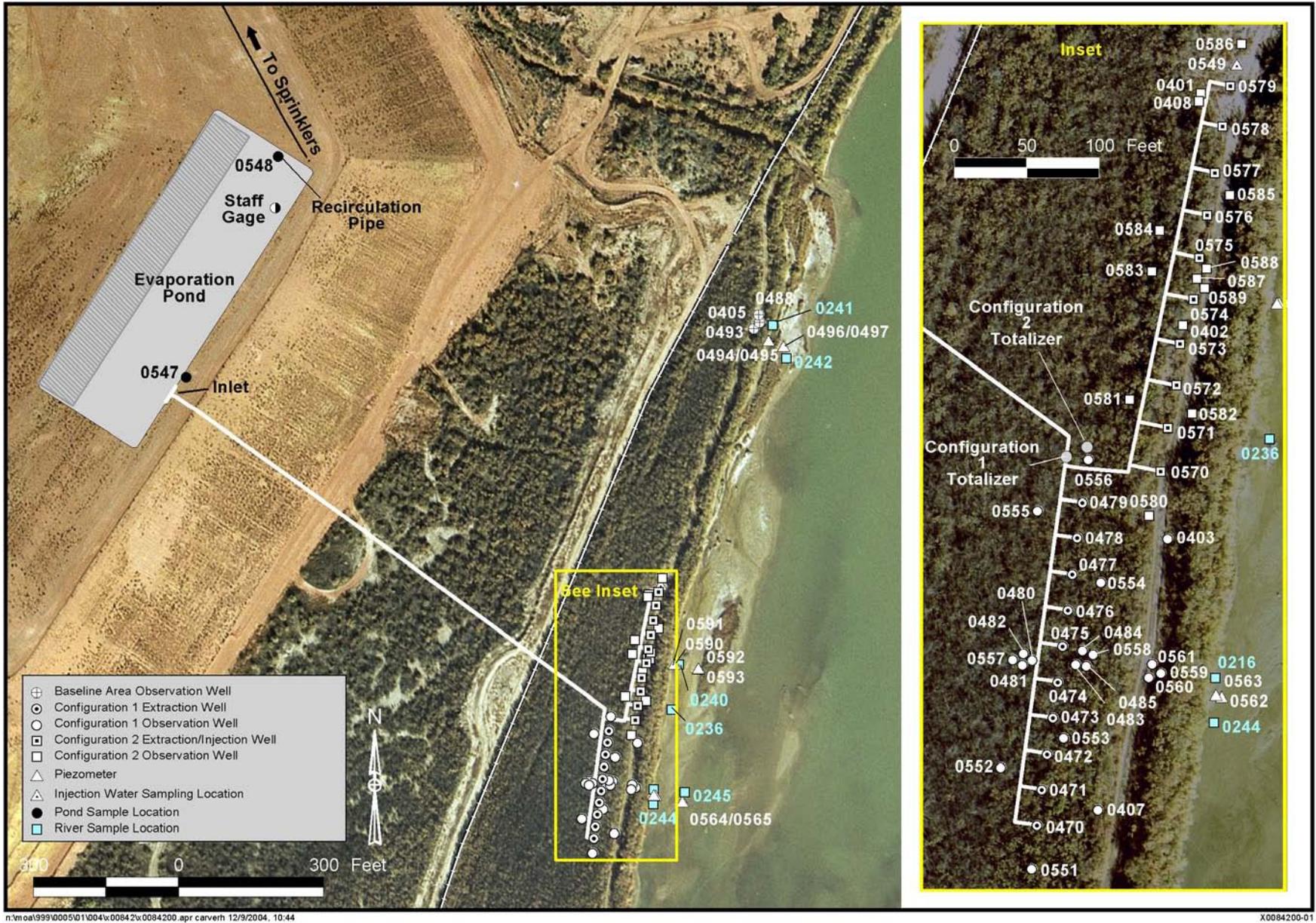


Kenneth E. Karp  
Site Lead

1-20-05

Date

# **Sample Location Map**



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

<b>Project</b>	<u>Moab, Utah</u>	<b>Date(s) of Water Sampling</b>	<u>October 5 and 6, 2004</u>
<b>Date(s) of Verification</b>	<u>11/24/04</u>	<b>Name of Verifier</b>	<u>Jeff Price</u>

	<b>Response (Yes, No, NA)</b>	<b>Comments</b>
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>Yes</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?	<u>Yes</u>	
Did the water level stabilize prior to sampling?	<u>Yes</u>	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	<u>Yes</u>	
Was the flow rate less than 500 mL/min?	<u>Yes</u>	
If a portable pump was used, was there a 4 hour delay between pump installation and sampling?	<u>NA</u>	

## Water Sampling Field Activities Verification Checklist

	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?	NA	
Was one pump/tubing volume removed prior to sampling?	NA	
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?	NA	All samples were collected with dedicated equipment.
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?	No	
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.: 04080116  
Sample Event: Water Sampling  
Site(s): Moab Processing Site  
Laboratory: Paragon Analytics  
Work Order No.: 0410068  
Analysis: Metals and inorganics  
Validator: Jeff Price/Steve Donovan  
Review Date: 11/24/04

This validation was performed according to *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
Uranium, U	GJO-01	SW-846 3005A	SW-846 6020
Chloride, Cl	MIS-A-039	SW-846 9056	SW-846 9056
Sulfate, SO4	MIS-A-044	SW-846 9056	SW-846 9056
Ammonia as N, NH3-N	WCH-A-005	MCAWW 350.1	MCAWW 350.1
Total Dissolved Solids, TDS	WCH-A-033	MCAWW 160.1	MCAWW 160.1

### Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado received thirteen samples on October 8, 2004, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the samples are listed on the form and that signatures and dates are present indicating sample relinquishment and receipt. The sample submittal documents including the Chain of Custody Form, the Sample Submittal Form, and the samples tickets had no errors or omissions.

### Preservation and Holding Times

The sample shipment was received cool and intact with temperature within the cooler of 3.2 degrees centigrade (°C), which is in compliance with requirements. All samples had been preserved correctly for the requested analyses and all samples were analyzed within the applicable holding times.

### Data Qualifier Summary

None of the sample results required qualification.

## Laboratory Instrument Calibration

Calibrations for uranium were performed on October 19, 2004. The initial calibration was performed using 4 calibration standards resulting in correlation coefficient ( $r^2$ ) values greater than 0.995. The absolute value of the intercept was less than 3 times the method detection limit (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 4 CCVs. All calibration checks 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 reporting limit verification result was within the acceptance criteria. The mass calibration and resolution was checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries were stable and within acceptance ranges.

Calibrations were performed for chloride and sulfate using 5 calibration standards on October 12, 2004. The  $r^2$  values were greater than 0.995 and intercepts 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 3 CCVs that met the acceptance criteria.

The initial calibration for NH<sub>3</sub>-N was performed using 6 calibration standards on October 18, 2004, resulting in an  $r^2$  value greater than 0.995. Initial and continuing calibration checks were made at the required frequency, resulting in 4 CCVs. All initial and continuing calibration verifications were within the acceptance criteria.

There is no initial or continuing calibration requirement associated with the determination of total dissolved solids.

## Method and Calibration Blanks

The uranium initial and continuing calibration blanks were below the practical quantitation limits. The chloride, sulfate, NH<sub>3</sub>-N, and TDS method blanks and initial and continuing calibration blanks were below the method detection limits.

## Inductively Coupled Plasma (ICP) Interference Check Sample (ICS) Analysis

ICP interference check samples ICSA and ICSAB were analyzed at the required frequency and all results meet the acceptance criteria.

## Matrix Spike Analysis

A matrix spike and matrix spike duplicate (MS/MSD) pair for uranium from this RIN was not analyzed. Two pairs of laboratory control samples (LCS/LCSD) were analyzed for uranium with acceptable recovery and precision. MS/MSD pairs were analyzed for chloride and sulfate with acceptable results.

### Laboratory Replicate Analysis

The relative percent difference (RPD) values for the LCS/LCSD results for uranium were less than 20 percent. The RPD values for the matrix spike duplicate and laboratory duplicate sample results for chloride, sulfate, NH<sub>3</sub>-N, and TDS were less than 20 percent.

### Laboratory Control Sample

Laboratory control samples were analyzed at the correct frequency with acceptable results for all analysis categories.

### Metals Serial Dilution

Serial dilutions were performed during the uranium analysis with acceptable results.

### 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 whenever possible.

### Completeness

Results were reported, in correct units, for all analytes requested. Appropriate contract-required laboratory qualifiers were used, appropriate target analyte lists (TALs) 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. The analytical report did not include the initial calibration data for chloride or sulfate. The laboratory was requested to provide these data on November 2, 2004. The missing data were received on November 9, 2004.

### Chromatography Peak Integration

The integration of analytes peaks was reviewed for all ion chromatography data. The manual integrations that were performed were acceptable and all peak integrations were satisfactory.

### Electronic Data Deliverable (EDD) File

An EDD file arrived on October 29, 2004. The EDD validation application identified no problems with the EDD file.

## **Field Analyses/Activities**

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

All monitoring well results were qualified with an “F” flag in the database indicating the wells were purged and sampled using the low-flow sampling method. Extraction wells are not sampled using the low-flow sampling method.

One duplicate sample was collected from well 0573. There are no established regulatory criteria for the evaluation of field duplicate samples; therefore, EPA guidance for laboratory duplicates (which is conservative for field duplicates) was used to assess the precision of the field duplicates. Duplicate results met the laboratory duplicate criteria of +/- 20 relative percent difference and are considered acceptable.

## Certification

Results were reported in correct units for all analytes requested, appropriate contract-required laboratory qualifiers and target analyte lists (TALs) 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 U.S., Environmental Protection Agency 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 1-19-05  
Steve Donovan Date

Field Activities Validation Lead: J. E. Price Jan 19 05  
Jeff Price Date

**Attachment 1**  
**Data Presentation**

# **Water Quality Data**

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 1/19/2005 10:02 am

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity, Total (As CaCO3	mg/L	0549	IS, IHYD	10/06/2004	0001	0.00 - 0.00	179		#	-
	mg/L	0570	WL, I&E	10/05/2004	0001	15.00 - 30.00	495		#	-
	mg/L	0571	WL, I&E	10/05/2004	0001	25.00 - 40.00	456		#	-
	mg/L	0572	WL, I&E	10/05/2004	0001	15.00 - 30.00	591		#	-
	mg/L	0573	WL, I&E	10/05/2004	0001	25.00 - 40.00	574		#	-
	mg/L	0574	WL, I&E	10/05/2004	0001	15.00 - 30.00	710		#	-
	mg/L	0575	WL, I&E	10/05/2004	0001	25.00 - 40.00	693		#	-
	mg/L	0576	WL, I&E	10/05/2004	0001	15.00 - 30.00	806		#	-
	mg/L	0577	WL, I&E	10/05/2004	0001	25.00 - 40.00	732		#	-
	mg/L	0578	WL, I&E	10/05/2004	0001	15.00 - 30.00	802		#	-
	mg/L	0579	WL, I&E	10/05/2004	0001	25.00 - 40.00	701		#	-
	mg/L	0580	WL	10/05/2004	0001	18.00 - 18.00	318	F	#	-
Ammonia Total as N	mg/L	0549	IS, IHYD	10/06/2004	0001	0.00 - 0.00	0.1	U	#	0.1
	mg/L	0570	WL, I&E	10/05/2004	0001	15.00 - 30.00	1400		#	50
	mg/L	0571	WL, I&E	10/05/2004	0001	25.00 - 40.00	1400		#	50
	mg/L	0572	WL, I&E	10/05/2004	0001	15.00 - 30.00	1100		#	50
	mg/L	0573	WL, I&E	10/05/2004	0001	25.00 - 40.00	1200		#	50
	mg/L	0573	WL, I&E	10/05/2004	0002	25.00 - 40.00	1200		#	50
	mg/L	0574	WL, I&E	10/05/2004	0001	15.00 - 30.00	930		#	20
	mg/L	0575	WL, I&E	10/05/2004	0001	25.00 - 40.00	1100		#	50
	mg/L	0576	WL, I&E	10/05/2004	0001	15.00 - 30.00	880		#	20
	mg/L	0577	WL, I&E	10/05/2004	0001	25.00 - 40.00	1000		#	20
	mg/L	0578	WL, I&E	10/05/2004	0001	15.00 - 30.00	680		#	20
	mg/L	0579	WL, I&E	10/05/2004	0001	25.00 - 40.00	760		#	20
	mg/L	0580	WL	10/05/2004	0001	18.00 - 18.00	110	F	#	20
	Chloride	mg/L	0549	IS, IHYD	10/06/2004	0001	0.00 - 0.00	88		#

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 1/19/2005 10:02 am

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Chloride	mg/L	0570	WL, I&E	10/05/2004	0001	15.00 - 30.00	21000		# 400	-
	mg/L	0571	WL, I&E	10/05/2004	0001	25.00 - 40.00	31000		# 400	-
	mg/L	0572	WL, I&E	10/05/2004	0001	15.00 - 30.00	20000		# 200	-
	mg/L	0573	WL, I&E	10/05/2004	0001	25.00 - 40.00	25000		# 400	-
	mg/L	0573	WL, I&E	10/05/2004	0002	25.00 - 40.00	26000		# 400	-
	mg/L	0574	WL, I&E	10/05/2004	0001	15.00 - 30.00	14000		# 200	-
	mg/L	0575	WL, I&E	10/05/2004	0001	25.00 - 40.00	20000		# 200	-
	mg/L	0576	WL, I&E	10/05/2004	0001	15.00 - 30.00	9600		# 100	-
	mg/L	0577	WL, I&E	10/05/2004	0001	25.00 - 40.00	23000		# 400	-
	mg/L	0578	WL, I&E	10/05/2004	0001	15.00 - 30.00	4800		# 100	-
	mg/L	0579	WL, I&E	10/05/2004	0001	25.00 - 40.00	15000		# 200	-
	mg/L	0580	WL	10/05/2004	0001	18.00 - 18.00	640	F	# 20	-
	Oxidation Reduction Potent	mV	0549	IS, IHYD	10/06/2004	N001	0.00 - 0.00	76.7		# -
mV		0570	WL, I&E	10/05/2004	N001	15.00 - 30.00	165.1		# -	-
mV		0571	WL, I&E	10/05/2004	N001	25.00 - 40.00	174.9		# -	-
mV		0572	WL, I&E	10/05/2004	N001	15.00 - 30.00	156.0		# -	-
mV		0573	WL, I&E	10/05/2004	N001	25.00 - 40.00	150.7		# -	-
mV		0574	WL, I&E	10/05/2004	N001	15.00 - 30.00	127.6		# -	-
mV		0575	WL, I&E	10/05/2004	N001	25.00 - 40.00	162.8		# -	-
mV		0576	WL, I&E	10/05/2004	N001	15.00 - 30.00	142.7		# -	-
mV		0577	WL, I&E	10/05/2004	N001	25.00 - 40.00	179.7		# -	-
mV		0578	WL, I&E	10/05/2004	N001	15.00 - 30.00	127.4		# -	-
mV		0579	WL, I&E	10/05/2004	N001	25.00 - 40.00	169.3		# -	-
mV		0580	WL	10/05/2004	N001	18.00 - 18.00	134	F	# -	-
pH		s.u.	0549	IS, IHYD	10/06/2004	N001	0.00 - 0.00	8.10		# -
	s.u.	0570	WL, I&E	10/05/2004	N001	15.00 - 30.00	6.68		# -	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 1/19/2005 10:02 am

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
pH	s.u.	0571	WL, I&E	10/05/2004	N001	25.00 - 40.00	6.68		#	-
	s.u.	0572	WL, I&E	10/05/2004	N001	15.00 - 30.00	6.68		#	-
	s.u.	0573	WL, I&E	10/05/2004	N001	25.00 - 40.00	6.76		#	-
	s.u.	0574	WL, I&E	10/05/2004	N001	15.00 - 30.00	7.11		#	-
	s.u.	0575	WL, I&E	10/05/2004	N001	25.00 - 40.00	6.75		#	-
	s.u.	0576	WL, I&E	10/05/2004	N001	15.00 - 30.00	6.77		#	-
	s.u.	0577	WL, I&E	10/05/2004	N001	25.00 - 40.00	6.72		#	-
	s.u.	0578	WL, I&E	10/05/2004	N001	15.00 - 30.00	6.78		#	-
	s.u.	0579	WL, I&E	10/05/2004	N001	25.00 - 40.00	6.73		#	-
	s.u.	0580	WL	10/05/2004	N001	18.00 - 18.00	6.97	F	#	-
Specific Conductance	umhos/cm	0549	IS, IHYD	10/06/2004	N001	0.00 - 0.00	1284		#	-
	umhos/cm	0570	WL, I&E	10/05/2004	N001	15.00 - 30.00	44305		#	-
	umhos/cm	0571	WL, I&E	10/05/2004	N001	25.00 - 40.00	79710		#	-
	umhos/cm	0572	WL, I&E	10/05/2004	N001	15.00 - 30.00	50174		#	-
	umhos/cm	0573	WL, I&E	10/05/2004	N001	25.00 - 40.00	69401		#	-
	umhos/cm	0574	WL, I&E	10/05/2004	N001	15.00 - 30.00	47515		#	-
	umhos/cm	0575	WL, I&E	10/05/2004	N001	25.00 - 40.00	59650		#	-
	umhos/cm	0576	WL, I&E	10/05/2004	N001	15.00 - 30.00	36521		#	-
	umhos/cm	0577	WL, I&E	10/05/2004	N001	25.00 - 40.00	63827		#	-
	umhos/cm	0578	WL, I&E	10/05/2004	N001	15.00 - 30.00	26050		#	-
	umhos/cm	0579	WL, I&E	10/05/2004	N001	25.00 - 40.00	47975		#	-
	umhos/cm	0580	WL	10/05/2004	N001	18.00 - 18.00	6340	F	#	-
Sulfate	mg/L	0549	IS, IHYD	10/06/2004	0001	0.00 - 0.00	350		#	10
	mg/L	0570	WL, I&E	10/05/2004	0001	15.00 - 30.00	8200		#	1000
	mg/L	0571	WL, I&E	10/05/2004	0001	25.00 - 40.00	7900		#	1000
	mg/L	0572	WL, I&E	10/05/2004	0001	15.00 - 30.00	8600		#	500

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 1/19/2005 10:02 am

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Sulfate	mg/L	0573	WL, I&E	10/05/2004	0001	25.00 - 40.00	8700		# 1000	-
	mg/L	0573	WL, I&E	10/05/2004	0002	25.00 - 40.00	8600		# 1000	-
	mg/L	0574	WL, I&E	10/05/2004	0001	15.00 - 30.00	12000		# 500	-
	mg/L	0575	WL, I&E	10/05/2004	0001	25.00 - 40.00	9500		# 1000	-
	mg/L	0576	WL, I&E	10/05/2004	0001	15.00 - 30.00	10000		# 250	-
	mg/L	0577	WL, I&E	10/05/2004	0001	25.00 - 40.00	9400		# 1000	-
	mg/L	0578	WL, I&E	10/05/2004	0001	15.00 - 30.00	8900		# 250	-
	mg/L	0579	WL, I&E	10/05/2004	0001	25.00 - 40.00	9000		# 500	-
	mg/L	0580	WL	10/05/2004	0001	18.00 - 18.00	2000	F	# 50	-
Temperature	C	0549	IS, IHYD	10/06/2004	N001	0.00 - 0.00	19.01		# -	-
	C	0570	WL, I&E	10/05/2004	N001	15.00 - 30.00	16.57		# -	-
	C	0571	WL, I&E	10/05/2004	N001	25.00 - 40.00	16.61		# -	-
	C	0572	WL, I&E	10/05/2004	N001	15.00 - 30.00	17.67		# -	-
	C	0573	WL, I&E	10/05/2004	N001	25.00 - 40.00	16.86		# -	-
	C	0574	WL, I&E	10/05/2004	N001	15.00 - 30.00	18.21		# -	-
	C	0575	WL, I&E	10/05/2004	N001	25.00 - 40.00	17.33		# -	-
	C	0576	WL, I&E	10/05/2004	N001	15.00 - 30.00	18.74		# -	-
	C	0577	WL, I&E	10/05/2004	N001	25.00 - 40.00	15.52		# -	-
	C	0578	WL, I&E	10/05/2004	N001	15.00 - 30.00	18.82		# -	-
	C	0579	WL, I&E	10/05/2004	N001	25.00 - 40.00	15.61		# -	-
	C	0580	WL	10/05/2004	N001	18.00 - 18.00	19.98	F	# -	-
Total Dissolved Solids	mg/L	0549	IS, IHYD	10/06/2004	0001	0.00 - 0.00	830		# 20	-
	mg/L	0570	WL, I&E	10/05/2004	0001	15.00 - 30.00	41000		# 1000	-
	mg/L	0571	WL, I&E	10/05/2004	0001	25.00 - 40.00	59000		# 2000	-
	mg/L	0572	WL, I&E	10/05/2004	0001	15.00 - 30.00	40000		# 1000	-
	mg/L	0573	WL, I&E	10/05/2004	0001	25.00 - 40.00	49000		# 1000	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 1/19/2005 10:02 am

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Total Dissolved Solids	mg/L	0573	WL, I&E	10/05/2004	0002	25.00 - 40.00	49000		# 1000	-
	mg/L	0574	WL, I&E	10/05/2004	0001	15.00 - 30.00	34000		# 1000	-
	mg/L	0575	WL, I&E	10/05/2004	0001	25.00 - 40.00	42000		# 1000	-
	mg/L	0576	WL, I&E	10/05/2004	0001	15.00 - 30.00	27000		# 1000	-
	mg/L	0577	WL, I&E	10/05/2004	0001	25.00 - 40.00	46000		# 1000	-
	mg/L	0578	WL, I&E	10/05/2004	0001	15.00 - 30.00	20000		# 400	-
	mg/L	0579	WL, I&E	10/05/2004	0001	25.00 - 40.00	35000		# 1000	-
	mg/L	0580	WL	10/05/2004	0001	18.00 - 18.00	4400	F	# 200	-
Turbidity	NTU	0549	IS, IHYD	10/06/2004	N001	0.00 - 0.00	234		# -	-
	NTU	0570	WL, I&E	10/05/2004	N001	15.00 - 30.00	3.28		# -	-
	NTU	0571	WL, I&E	10/05/2004	N001	25.00 - 40.00	0.97		# -	-
	NTU	0572	WL, I&E	10/05/2004	N001	15.00 - 30.00	2.30		# -	-
	NTU	0573	WL, I&E	10/05/2004	N001	25.00 - 40.00	0.96		# -	-
	NTU	0574	WL, I&E	10/05/2004	N001	15.00 - 30.00	3.08		# -	-
	NTU	0575	WL, I&E	10/05/2004	N001	25.00 - 40.00	2.11		# -	-
	NTU	0576	WL, I&E	10/05/2004	N001	15.00 - 30.00	4.23		# -	-
	NTU	0577	WL, I&E	10/05/2004	N001	25.00 - 40.00	1.17		# -	-
	NTU	0578	WL, I&E	10/05/2004	N001	15.00 - 30.00	2.30		# -	-
	NTU	0579	WL, I&E	10/05/2004	N001	25.00 - 40.00	2.27		# -	-
	NTU	0580	WL	10/05/2004	N001	18.00 - 18.00	3.63	F	# -	-
Uranium	mg/L	0549	IS, IHYD	10/06/2004	0001	0.00 - 0.00	0.0095		# 8.3E-06	-
	mg/L	0570	WL, I&E	10/05/2004	0001	15.00 - 30.00	1.800		# 0.00083	-
	mg/L	0571	WL, I&E	10/05/2004	0001	25.00 - 40.00	1.600		# 0.00083	-
	mg/L	0572	WL, I&E	10/05/2004	0001	15.00 - 30.00	2.000		# 0.00083	-
	mg/L	0573	WL, I&E	10/05/2004	0001	25.00 - 40.00	2.000		# 0.00083	-
	mg/L	0573	WL, I&E	10/05/2004	0002	25.00 - 40.00	2.000		# 0.00083	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 1/19/2005 10:02 am

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Uranium	mg/L	0574	WL, I&E	10/05/2004	0001	15.00 - 30.00	2.400	#	0.00083	-
	mg/L	0575	WL, I&E	10/05/2004	0001	25.00 - 40.00	2.300	#	0.00083	-
	mg/L	0576	WL, I&E	10/05/2004	0001	15.00 - 30.00	2.500	#	0.00083	-
	mg/L	0577	WL, I&E	10/05/2004	0001	25.00 - 40.00	2.100	#	0.00083	-
	mg/L	0578	WL, I&E	10/05/2004	0001	15.00 - 30.00	2.300	#	0.00083	-
	mg/L	0579	WL, I&E	10/05/2004	0001	25.00 - 40.00	2.200	#	0.00083	-
	mg/L	0580	WL	10/05/2004	0001	18.00 - 18.00	0.530	F #	8.3E-05	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Site  
 REPORT DATE: 1/19/2005 10:02 am

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 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 #10/5/2004# and #10/6/2004#

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

LOCATION TYPES: IS INJECTION SYSTEM WL WELL

LOCATION SUBTYPES: I&E Dual Purpose Injection and Ex IHYD Injection System Hydrant

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: 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: 1/20/2005 3:50 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			
0570		3965.22	10/05/2004	14:20	26.92	3938.30	
0571		3964.89	10/05/2004	14:30	34.18	3930.71	
0572		3965.14	10/05/2004	14:43	25.47	3939.67	
0573		3965.15	10/05/2004	14:50	36.75	3928.40	
0574		3965.12	10/05/2004	15:13	26.75	3938.37	
0575		3965.01	10/05/2004	15:22	31.39	3933.62	
0576		3965.15	10/05/2004	15:28	24.97	3940.18	
0577		3965.10	10/05/2004	15:38	36.65	3928.45	
0578		3965.08	10/05/2004	15:45	27.85	3937.23	
0579		3965.11	10/05/2004	15:53	24.55	3940.56	
0580		3969.32	10/05/2004	13:40	17.46	3951.86	

RECORDS: SELECTED FROM USEE700 WHERE site\_code='MOA01' AND LOG\_DATE between #10/5/2004# and #10/5/2004#

FLOW CODES:

WATER LEVEL FLAGS:

**Attachment 2**  
**Trip Report**

DATE: January 18, 2005

TO: Ken Karp

FROM: Ken Pill

SUBJECT: Trip Report

**Site:** Moab Project Interim Action Configuration II Full Scale Extraction Test Shutdown, Injection Test Startup – REVISED

**Date of Sampling Event:** October 5 and 6, 2004.

**Team Members:** Ken Pill and Steve Hall

**Number of Locations Sampled:** Ten CF II extraction wells (0570 through 0579) and one observation well (0580) were sampled as part of the full scale extraction well test shutdown. A sample of the injection water (0549) was also collected as part of the injection test startup. Including one duplicate, a total of 13 samples were collected.

**Locations in Which Field Parameters Were Measured Only:** On October 6, 2004, prior to the beginning of the injection test, field parameters were measured from observation wells 0580 through 0589, 0401, 0402, and 0408. With the exception of the sample collected from location 0580 on October 5, 2004, samples were not submitted to Paragon for laboratory analysis from the observation wells.

**Locations in Which Water Levels Were Measured Only:** Water levels were measured in piezometers 0590 through 0593. Samples were not collected from these locations for laboratory analysis.

**Locations Not Sampled/Reason:** None.

**Field Variance:** Only a 125 ml sample was collected for uranium analysis as opposed to the standard 500 ml sample volume.

**Quality Control Sample Cross Reference:** Following is the false identification assigned to the quality control sample:

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2529	573	Duplicate	Ground water	NDX-968

**RIN Number Assigned:** All samples were assigned to RIN 04090116.

**Sample Shipment:** All samples were shipped (in one cooler) overnight FEDEX to Paragon Analytics, Inc. from GJO on October 7, 2004, Airbill No. 847329676660.

**Location Specific Information - Extraction Well Sampling:** The ten extraction wells (0570 through 0579) were sampled using dedicated submersible pumps. Each well was sampled within the last two hours of the 292 hour-long test. The table below provides the depth to water measurements and pumping rate from each location during the full scale test just prior to sampling:

Well No.	Date	Time	Depth to Water (ft btoc)	Pumping Rate (gpm)
0570	10/5/04	14:22	26.92	1.44
0571	10/5/04	14:29	34.18	2.01
0572	10/5/04	14:39	25.47	1.53
0573	10/5/04	14:52	36.75	1.82
0574	10/5/04	15:12	26.75	0.82
0575	10/5/04	15:19	31.39	1.67
0576	10/5/04	15:26	24.97	0.95
0577	10/5/04	15:35	36.65	5.22
0578	10/5/04	15:43	27.85	1.12
0579	10/5/04	15:51	24.55	8.79

**Location Specific Information – Observation Wells:** During the full scale test, only observation well 0580 was sampled using the micro-purge technique with a peristaltic pump and downhole tubing from a depth of 18 ft bgs.

As part of the injection test startup, field parameters were measured from each observation well associated with CF II well (0580 through 0589, 0401, 0402, and 0408) using the micro-purge technique with a peristaltic pump and downhole tubing. The table below provides the field parameter data collected along with the sample depths:

Well No.	Date	Time	Sample Depth (ft bgs)	Depth to Water (ft btoc)	Field Parameters			
					Temp (°C)	Spec Cond (µS/cm)	pH	ORP
0580	10/6/04	9:44	18	17.28	16.87	6,635	7.18	128
0581	10/6/04	9:52	18	16.69	16.51	19,345	6.97	140
0582	10/6/04	10:00	18	17.18	16.18	20,348	6.92	136
0583	10/6/04	10:45	18	17.02	16.73	18,169	6.88	137
0584	10/6/04	10:56	18	16.42	16.71	18,750	6.89	136
0585	10/6/04	11:05	18	16.51	16.62	17,893	6.88	137
0586	10/6/04	11:35	18	15.73	16.83	18,077	6.91	138
0587	10/6/04	10:15	18	16.17	16.94	17,520	6.89	137
0588	10/6/04	10:25	26	16.25	18.91	42,795	7.02	138
0589	10/6/04	10:35	44	16.33	16.73	106,500	6.86	172
0401	10/6/04	11:25	18	16.56	17.48	17,331	6.87	138
0402	10/6/04	10:08	18	16.22	16.82	18,607	6.90	135
0408	10/6/04	11:15	28	16.06	16.90	19,041	6.90	136

**Location Specific Information - Piezometers:** Water levels (only) were measured in piezometers 0590 through 0593, photographs are attached to this report. These locations were not sampled. These data are provided below:

Well No.	Date	Time	Depth to Water (ft btoc)
0590	10/6/04	14:40	3.98
0591	10/6/04	14:38	1.13
0592	10/6/04	14:41	3.53
0593	10/6/04	14:42	1.80

**Well Inspection Summary:** No inspection was conducted.

**Site Issues:** According to the USGS Cisco Gaging Station (Station No. 09180500), the mean daily Colorado River Flow on October 5, 2004 was 4,750 cubic feet per second (cfs), and on October 6, 2004 the flow was 4,810 cfs.

**Corrective Action Required/Taken:** None.

(KGP/lcg)

cc: J. D. Berwick, DOE-EM (e)  
D. R. Metzler, DOE-EM  
C. I. Bahrke, Stoller (e)  
L. E. Cummins, Stoller (e)  
S. E. Donovan, Stoller (e)  
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S. D. Lyon, Stoller (e)  
K. E. Miller, Stoller  
K. G. Pill, Stoller (e)  
J. E. Price, Stoller (e)  
L. M. Wright, Stoller (e)  
Working File MOA



Piezometers 0590/0591



Piezometers 0592/0593