WM-41

Department of Energy
Office of Legacy Management

APR 6 - 2005

Mr. Brian Hamos
State of Utah, Department of Environmental Quality
Division of Radiation Control
168 North 1950 West
Salt Lake City, UT 84114

Subject: Data Validation for Salt Lake City, Utah, Processing Site

Dear Mr. Hamos:

Enclosed is a Data Validation Package for the Salt Lake City, Utah, processing site. The water-sampling event took place during the month of December 2004.

Ground water sampling was performed at two monitoring wells completed in the shallow unconfined aquifer. Ground water level measurements were obtained from both the shallow aquifer and the deeper confined aquifer. Surface water sampling was performed at seven locations.

Ground water elevations in the shallow unconfined aquifer are consistent; however, water levels in the deeper confined aquifer are approximately 10 feet higher. This elevation difference indicates that there continues to be an upward vertical hydraulic gradient. Therefore, water in the shallow unconfined aquifer that contains widespread ambient arsenic contamination is unable to migrate into the deeper confined aquifer.

Molybdenum and uranium concentrations in ground water are below their respective maximum concentration limits. The molybdenum concentration in well 0144 had increased to a value of 0.215 mg/L in December 2003, but now has decreased to a concentration of 0.0747 mg/L, which is back below the MCL as it had been since 2001. Surface water quality in the open ditch, the ponds, and in Mill Creek, continues to be well below the MCLs.

Please call me at (970)248-6004 if you have any questions.

Sincerely,

Michael K Tucker

Michael Tucker
Site Manager

Enclosure

19901 Germantown Road, Germantown, MD 20874 • 2597 B 3/4 Road, Grand Junction, CO 81503
3610 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507 • 626 Cochrans Mill Road, P.O. Box 10940, Pittsburgh, PA 15236
1000 Independence Ave., S.W., Washington, DC 20585 •
REPLY TO: Grand Junction Office

cc w/enclosure:
J. Lusher, NRC
South Salt Lake Public Library

cc w/o enclosure:
Project File SLC 410.02 (D. Roberts)
R. Johnson, Stoller

mkt/SLC/VDP for 12-14-04.doc

DOE–LM/GJ794–2005

Data Validation Package

December 2004 Water Sampling at the Salt Lake City, Utah, Processing Site

March 2005

U.S. Department of Energy
Office of Legacy Management

Work Performed by the S.M. Stoller Corporation under DOE Contract No. DE–AC01–02GJ79491
for the U.S. Department of Energy Office of Legacy Management.
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Contents

Sampling Event Summary

Site: Salt Lake City, Utah, Processing Site

Sampling Period: December 14, 2004

Ground water sampling was performed at two monitoring wells (0134 and 0144) completed in the shallow unconfined aquifer. Ground water level measurements were obtained from both the shallow aquifer (locations 0134 and 0144) and the deeper confined aquifer (locations 0143 and 0145). Surface water sampling was performed at seven locations (0146, 0148, 0149, 0150, 0151, 0181, and 0182). Monitoring locations are shown on the Sample Location Map.

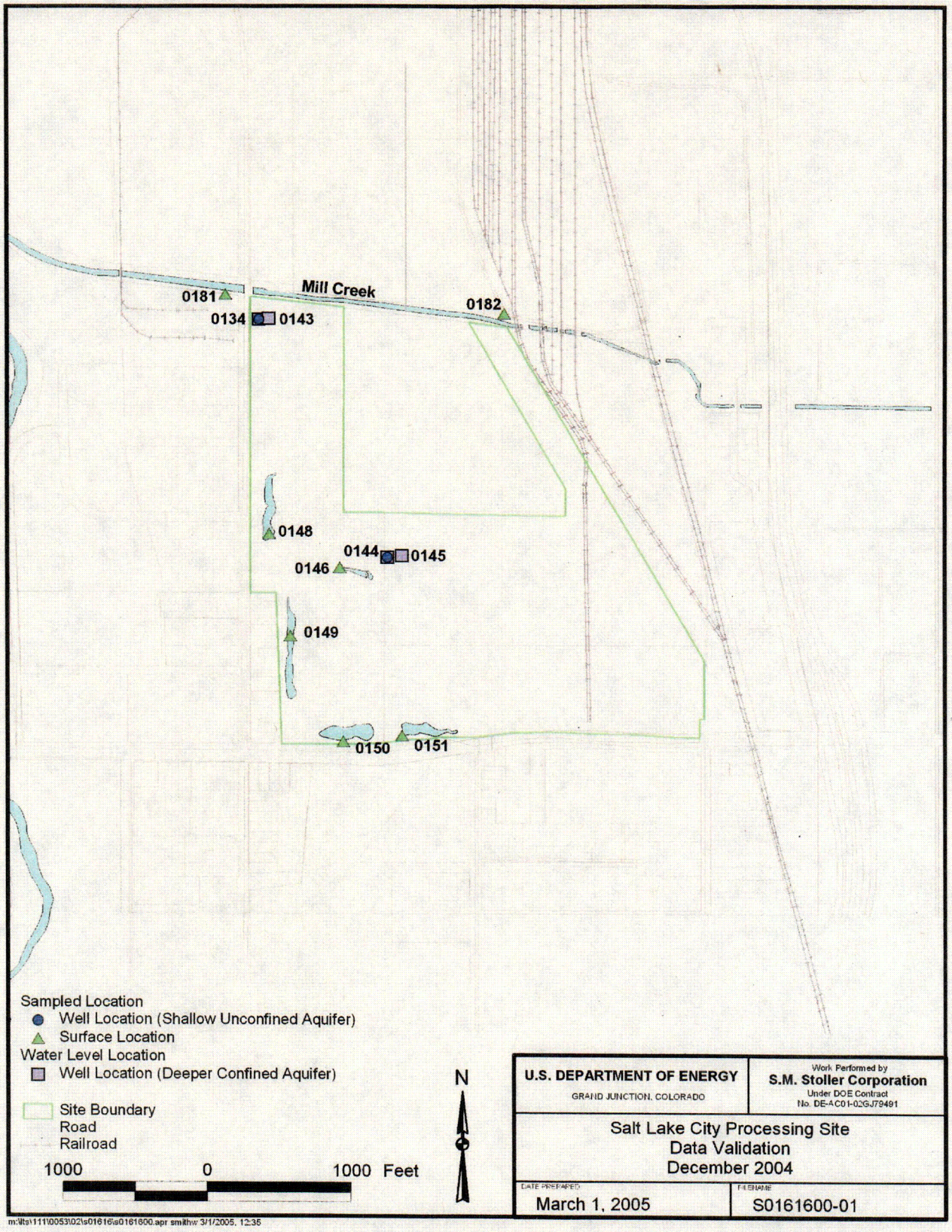
Molybdenum and uranium concentrations in ground water are below their respective maximum concentration limits (MCL) of 0.1 milligram per liter (mg/L) and 0.044 mg/L; U.S. Environmental Protection Agency (EPA) standards (40 CFR 192). The molybdenum concentration in well 0144 had increased to a value of 0.215 mg/L in December 2003, but now has decreased to a concentration of 0.0747 mg/L which is back below the MCL as it had been since 2001.

Ground water elevations in the shallow unconfined aquifer are consistent at approximately 4,226 feet above sea level (based on datalogger measurements). Observed water levels in the deeper confined aquifer are approximately 10 feet higher. This elevation difference indicates that there continues to be an upward vertical hydraulic gradient. Therefore, water in the shallow unconfined aquifer that contains widespread ambient arsenic contamination (unrelated to the site) is unable to migrate into the deeper confined aquifer (see the ground water level hydrograph in Attachment 2).

Surface water quality in the onsite open ditch (location 0146); the onsite ponds (locations 0148, 0149, 0150, and 0151); and in Mill Creek, both upstream (location 0181) and downstream of the site (location 0182), continues to be well below the MCLs. See Attachment 2 "Time Versus Concentration Graphs" for surface and ground water data.

Steve Hall
Site Lead

3/1/05
Date



Sample Location Map

C01

Data Assessment Summary

Water Sampling Field Activities Verification Checklist

Project	Salt Lake City, Utah, Processing Site	**Date(s) of Water Sampling**	December 14, 2004
Date(s) of Verification	January 19, 2005	**Name of Verifier**	Jeff Price

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

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?	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	
11. Were trip blanks prepared and included with each shipment of VOC samples?	Yes	
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.:	04120143
Sample Event:	December 14, 2005
Site(s):	Salt Lake City, Utah, Processing Site
Laboratory:	Severn Trent St. Louis
Work Order No.:	F4L170402
Analysis:	Metals
Validator:	S. Donivan/Jeff Price
Review Date:	January 18, 2005

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
Molybdenum, Mo	GJO-15	SW-846 3005A	SW-846 6020

Sample Shipping/Receiving

Severn Trent in St. Louis, Missouri, received 11 samples on December 17, 2004, accompanied by a Chain of Custody (COC) form. The COC was checked to confirm that the samples listed on the form were the correct number and type with consistent identification as that indicated on the sample label and ticket, and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents including the Chain of Custody Form and the Sample Submittal Form had no errors or omissions.

Preservation and Holding Times

The sample shipment was received intact and at ambient temperature. All samples had been preserved correctly for the requested analyses and all samples were analyzed within the applicable holding times.

Data Qualifier Summary

Two molybdenum results were qualified as "U" (not detected) as listed in Table 2.

Table 2. Qualified Results

Sample Number	Location	Analyte	Flag	Reason
F4L170402001	0134	Mo	U	Less than 5 times the blank
F4L170402006	0181	Mo	U	Less than 5 times the blank

Laboratory Instrument Calibration

All laboratory instrument calibrations were performed correctly in accordance with the cited methods.

Calibrations for molybdenum and uranium were performed on December 27, 2004. The initial calibrations were performed using three calibration standards resulting in correlation coefficient (r^2) values greater than 0.995. The absolute value of the intercepts 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 seven CCVs. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit. The reporting limit verification check results were within the acceptance criteria, the mass calibration and resolution was checked at the beginning of each analytical run, and the internal standard recoveries were stable and within acceptance ranges.

Method and Calibration Blanks

The molybdenum and uranium method blanks and initial and continuing calibration blanks were below the practical quantitation 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 met the acceptance criteria.

Matrix Spike Analysis

Matrix spike and matrix spike duplicate (MS/MSD) pairs were analyzed for molybdenum and uranium with acceptable results.

Laboratory Replicate Analysis

The relative percent difference (RPD) values for the matrix spike duplicate and laboratory duplicate sample results for both analytes 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

A serial dilution was prepared and analyzed to monitor chemical or physical interferences in the sample matrix. The serial dilution data could not be evaluated because the analyte concentration in the undiluted sample was less than one hundred times the practical quantitation limit.

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. 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.

Electronic Data Deliverable (EDD) File

An error free EDD file arrived on January 12, 2005.

Sampling Quality Control Assessment

The following information summarizes and assesses quality control for this sampling event.

Sampling Protocol

All monitor well data were given an "F" flag, which indicates that samples were collected using the micro-purge method.

Equipment Blank Assessment

An equipment blank was collected and analyzed for the same constituents as the other samples. Equipment blank concentrations were below their respective instrument detection limit or contract required detection limit (CRDL); therefore, equipment blank results are considered acceptable.

Field Duplicate Assessment

A duplicate was collected from location 0144. 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. All duplicate sample results met the laboratory duplicate criteria (20 percent relative difference) and thus are considered acceptable.

Certification

All laboratory analytical quality control criteria were met except as qualified on the SEEPro database reports. The meaning of data qualifiers is as defined on the SEEPro database report or as 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 available for use.

Laboratory Coordinator: Steve Donivan — Steve Donivan — 3-1-05 — Date

Data Validation Lead: Sam Campbell For — Jeff Price — 3-1-05 — Date

Attachment 1
Assessment of Anomalous Data

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 data validation application compares the new data set with historical data and lists in the Minimums and Maximums Report all new data that fall outside the historical data range. Values listed in the report are further screened using the following criteria. Results are considered valid if (1) identified low concentrations are the result of low detection limits; (2) the concentration detected is within 50 percent historical minimum or maximum values; (3) there were fewer than 5 historical samples for comparison.

At this time, all data from this sampling event may be treated as final results.

SAMPLING DATA VALIDATION MINIMUMS AND MAXIMUMS REPORT -- No Field Parameters
LAB CODE: STS, SEVERN TRENT ST. LOUIS (Earth City, MO)
LAB REQUISITION(S): 04120143
HISTORY BEGIN DATE: comparing to all historical data
REPORT DATE: 01/19/05 11:40:04: AM

				CURRENT			HISTORICAL MAXIMUM			HISTORICAL MINIMUM			COUNT	
SITE CODE	LOCATION CODE	SAMPLE DATE	ANALYTE	RESULT	QUALIFIERS LAB	DATA	RESULT	QUALIFIERS LAB	DATA	RESULT	QUALIFIERS LAB	DATA	N	N BELOW DETECT
SLC01	0146	12/14/2004	Molybdenum	0.0541			0.046			0.019			9	0

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

LAB QUALIFIERS:

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

DATA QUALIFIERS:

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

Attachment 2
Data Presentation

General Water Quality Data

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE SLC01, Salt Lake City Processing Site
REPORT DATE: 1/19/2005 11:41 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	0134	WL	12/14/2004	0001	29.42 - 39.42	343		F	#	-	-
	mg/L	0144	WL	12/14/2004	0001	29.70 - 39.70	708		F	#	-	-
	mg/L	0146	SL, DTCH	12/14/2004	0001	0.00 - 0.00	232			#	-	-
	mg/L	0148	SL, POND	12/14/2004	0001	0.00 - 0.00	145			#	-	-
	mg/L	0149	SL, POND	12/14/2004	0001	0.00 - 0.00	179			#	-	-
	mg/L	0150	SL, POND	12/14/2004	0001	0.00 - 0.00	177			#	-	-
	mg/L	0151	SL, POND	12/14/2004	0001	0.00 - 0.00	187			#	-	-
	mg/L	0181	SL	12/14/2004	0001	0.00 - 0.00	228			#	-	-
	mg/L	0182	SL	12/14/2004	0001	0.00 - 0.00	189			#	-	-
Molybdenum	mg/L	0134	WL	12/14/2004	0001	29.42 - 39.42	0.0014	B	UF	#	0.00025	-
	mg/L	0144	WL	12/14/2004	0001	29.70 - 39.70	0.0722		F	#	0.00025	-
	mg/L	0144	WL	12/14/2004	0002	29.70 - 39.70	0.0747		F	#	0.00025	-
	mg/L	0146	SL, DTCH	12/14/2004	0001	0.00 - 0.00	0.0541			#	0.00025	-
	mg/L	0148	SL, POND	12/14/2004	0001	0.00 - 0.00	0.0111			#	0.00025	-
	mg/L	0149	SL, POND	12/14/2004	0001	0.00 - 0.00	0.0092	B		#	0.00025	-
	mg/L	0150	SL, POND	12/14/2004	0001	0.00 - 0.00	0.0093	B		#	0.00025	-
	mg/L	0151	SL, POND	12/14/2004	0001	0.00 - 0.00	0.0047	B		#	0.00013	-
	mg/L	0181	SL	12/14/2004	0001	0.00 - 0.00	0.0013	B	U	#	0.00025	-
	mg/L	0182	SL	12/14/2004	0001	0.00 - 0.00	0.0102			#	0.00025	-
Oxidation Reduction Potent	mV	0134	WL	12/14/2004	N001	29.42 - 39.42	-173		F	#	-	-
	mV	0144	WL	12/14/2004	N001	29.70 - 39.70	-99		F	#	-	-
	mV	0146	SL, DTCH	12/14/2004	N001	0.00 - 0.00	64.6			#	-	-
	mV	0148	SL, POND	12/14/2004	N001	0.00 - 0.00	59			#	-	-
	mV	0149	SL, POND	12/14/2004	N001	0.00 - 0.00	51.8			#	-	-
	mV	0150	SL, POND	12/14/2004	N001	0.00 - 0.00	33.6			#	-	-
	mV	0151	SL, POND	12/14/2004	N001	0.00 - 0.00	53.4			#	-	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE SLC01, Salt Lake City Processing Site
REPORT DATE: 1/19/2005 11:41 am

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potent	mV	0181	SL	12/14/2004	N001	0.00 - 0.00	39.8			#	-	-
	mV	0182	SL	12/14/2004	N001	0.00 - 0.00	82.7			#	-	-
pH	s.u.	0134	WL	12/14/2004	N001	29.42 - 39.42	8.03		F	#	-	-
	s.u.	0144	WL	12/14/2004	N001	29.70 - 39.70	7.85		F	#	-	-
	s.u.	0146	SL, DTCH	12/14/2004	N001	0.00 - 0.00	8.21			#	-	-
	s.u.	0148	SL, POND	12/14/2004	N001	0.00 - 0.00	9.54			#	-	-
	s.u.	0149	SL, POND	12/14/2004	N001	0.00 - 0.00	9.55			#	-	-
	s.u.	0150	SL, POND	12/14/2004	N001	0.00 - 0.00	9.55			#	-	-
	s.u.	0151	SL, POND	12/14/2004	N001	0.00 - 0.00	9.19			#	-	-
	s.u.	0181	SL	12/14/2004	N001	0.00 - 0.00	8.31			#	-	-
	s.u.	0182	SL	12/14/2004	N001	0.00 - 0.00	7.56			#	-	-
Specific Conductance	umhos/cm	0134	WL	12/14/2004	N001	29.42 - 39.42	743		F	#	-	-
	umhos/cm	0144	WL	12/14/2004	N001	29.70 - 39.70	8829		F	#	-	-
	umhos/cm	0146	SL, DTCH	12/14/2004	N001	0.00 - 0.00	1198			#	-	-
	umhos/cm	0148	SL, POND	12/14/2004	N001	0.00 - 0.00	1243			#	-	-
	umhos/cm	0149	SL, POND	12/14/2004	N001	0.00 - 0.00	1305			#	-	-
	umhos/cm	0150	SL, POND	12/14/2004	N001	0.00 - 0.00	1286			#	-	-
	umhos/cm	0151	SL, POND	12/14/2004	N001	0.00 - 0.00	1375			#	-	-
	umhos/cm	0181	SL	12/14/2004	N001	0.00 - 0.00	1043			#	-	-
	umhos/cm	0182	SL	12/14/2004	N001	0.00 - 0.00	1355			#	-	-
Temperature	C	0134	WL	12/14/2004	N001	29.42 - 39.42	13.28		F	#	-	-
	C	0144	WL	12/14/2004	N001	29.70 - 39.70	12.87		F	#	-	-
	C	0146	SL, DTCH	12/14/2004	N001	0.00 - 0.00	12.30			#	-	-
	C	0148	SL, POND	12/14/2004	N001	0.00 - 0.00	5.77			#	-	-
	C	0149	SL, POND	12/14/2004	N001	0.00 - 0.00	6.14			#	-	-
	C	0150	SL, POND	12/14/2004	N001	0.00 - 0.00	6.65			#	-	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE SLC01, Salt Lake City Processing Site
REPORT DATE: 1/19/2005 11:41 am

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Temperature	C	0151	SL, POND	12/14/2004	N001	0.00 - 0.00	7.64			#	-	-
	C	0181	SL	12/14/2004	N001	0.00 - 0.00	8.22			#	-	-
	C	0182	SL	12/14/2004	N001	0.00 - 0.00	13.23			#	-	-
Turbidity	NTU	0134	WL	12/14/2004	N001	29.42 - 39.42	1.80		F	#	-	-
	NTU	0144	WL	12/14/2004	N001	29.70 - 39.70	2.61		F	#	-	-
Uranium	mg/L	0134	WL	12/14/2004	0001	29.42 - 39.42	0.00025 U		F	#	0.00025	-
	mg/L	0144	WL	12/14/2004	0001	29.70 - 39.70	0.0058		F	#	0.00025	-
	mg/L	0144	WL	12/14/2004	0002	29.70 - 39.70	0.0060		F	#	0.00025	-
	mg/L	0146	SL, DTCH	12/14/2004	0001	0.00 - 0.00	0.0186			#	0.00025	-
	mg/L	0148	SL, POND	12/14/2004	0001	0.00 - 0.00	0.0060			#	0.00025	-
	mg/L	0149	SL, POND	12/14/2004	0001	0.00 - 0.00	0.0041			#	0.00025	-
	mg/L	0150	SL, POND	12/14/2004	0001	0.00 - 0.00	0.0043			#	0.00025	-
	mg/L	0151	SL, POND	12/14/2004	0001	0.00 - 0.00	0.0022			#	0.00013	-
	mg/L	0181	SL	12/14/2004	0001	0.00 - 0.00	0.0017			#	0.00025	-
	mg/L	0182	SL	12/14/2004	0001	0.00 - 0.00	0.0042			#	0.00025	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE SLC01, Salt Lake City Processing Site
REPORT DATE: 1/19/2005 11:41 am

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY

RECORDS: SELECTED FROM USEE200 WHERE site_code='SLC01' 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 #12/1/2004# and #12/30/2004#

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

LOCATION TYPES: SL SURFACE LOCATION WL WELL

LOCATION SUBTYPES: DTCH Ditch POND Pond/Lake

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 compund (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.

Equipment Blank Data

BLANKS REPORT
LAB CODE: STS, SEVERN TRENT ST. LOUIS (Earth City, MO)
LAB REQUISITION(S): 04120143
REPORT DATE: 01/19/05 11:39:35: AM

PARAMETER	SITE CODE	LOCATION ID	SAMPLE DATE	SAMPLE ID	UNITS	RESULT	QUALIFIERS LAB	QUALIFIERS DATA	DETECTION LIMIT	UNCERTAINTY	SAMPLE TYPE
Molybdenum	SLC01	0999	12/14/2004	0001	mg/L	0.00025	U		0.00025		E
Uranium	SLC01	0999	12/14/2004	0001	mg/L	0.00025	U		0.00025		E

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

LAB QUALIFIERS:

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

DATA QUALIFIERS:

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

SAMPLE TYPES:

- E EQUIPMENT BLANK

Static Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE SLC01, Salt Lake City Processing Site
REPORT DATE: 1/20/2005 3:54 pm

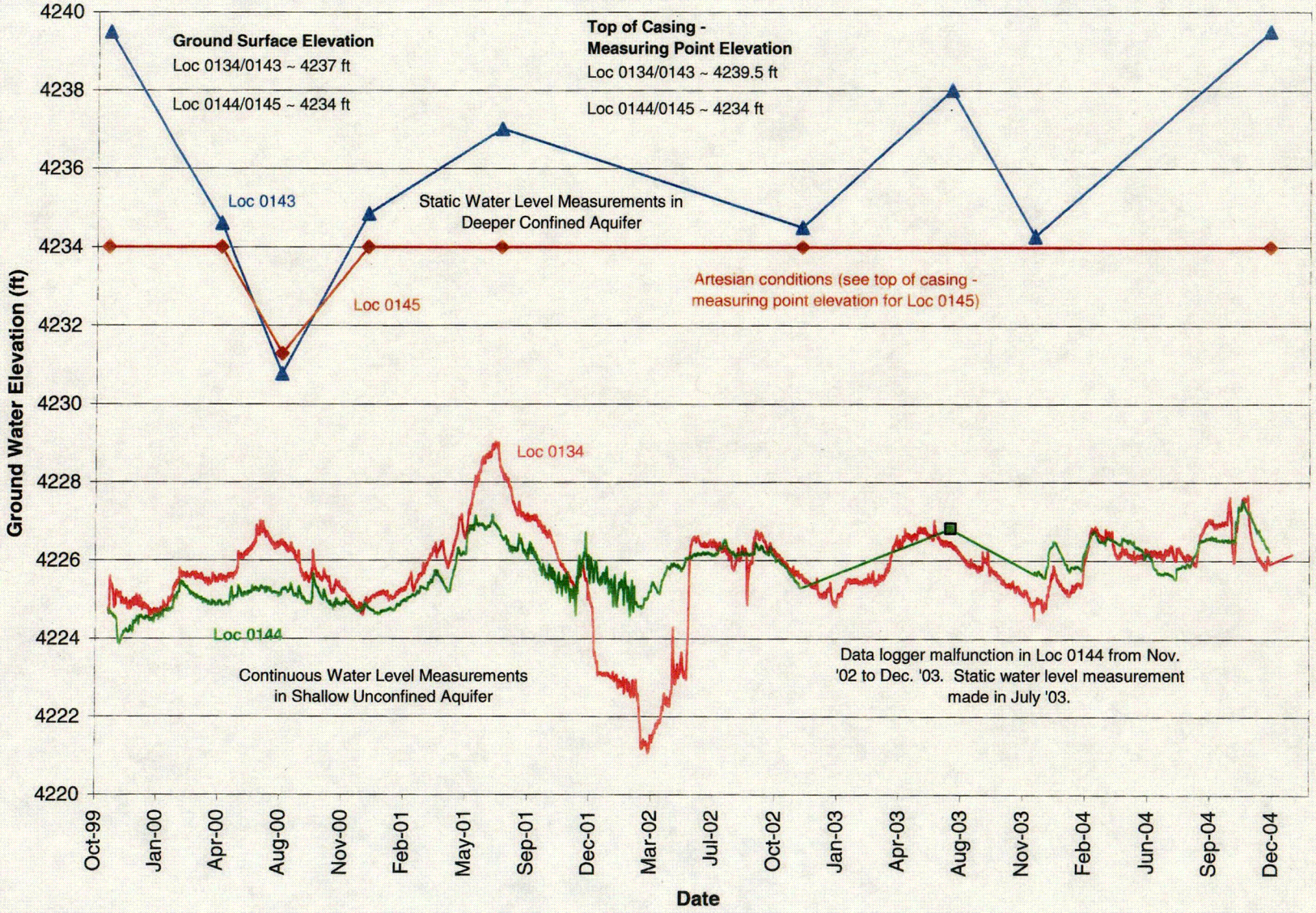
LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT		DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
			DATE	TIME			
0134	D	4239.50	12/14/2004	09:00	13.60	4225.90	
0143		4239.50	12/14/2004			-	F
0144		4234.00	12/14/2004	10:20	7.74	4226.26	
0145		4234.00	12/14/2004			-	F

RECORDS: SELECTED FROM USEE700 WHERE site_code='SLC01' AND LOG_DATE between #12/1/2004# and #12/30/2004#

FLOW CODES: D DOWN GRADIENT

WATER LEVEL FLAGS:
F Flowing

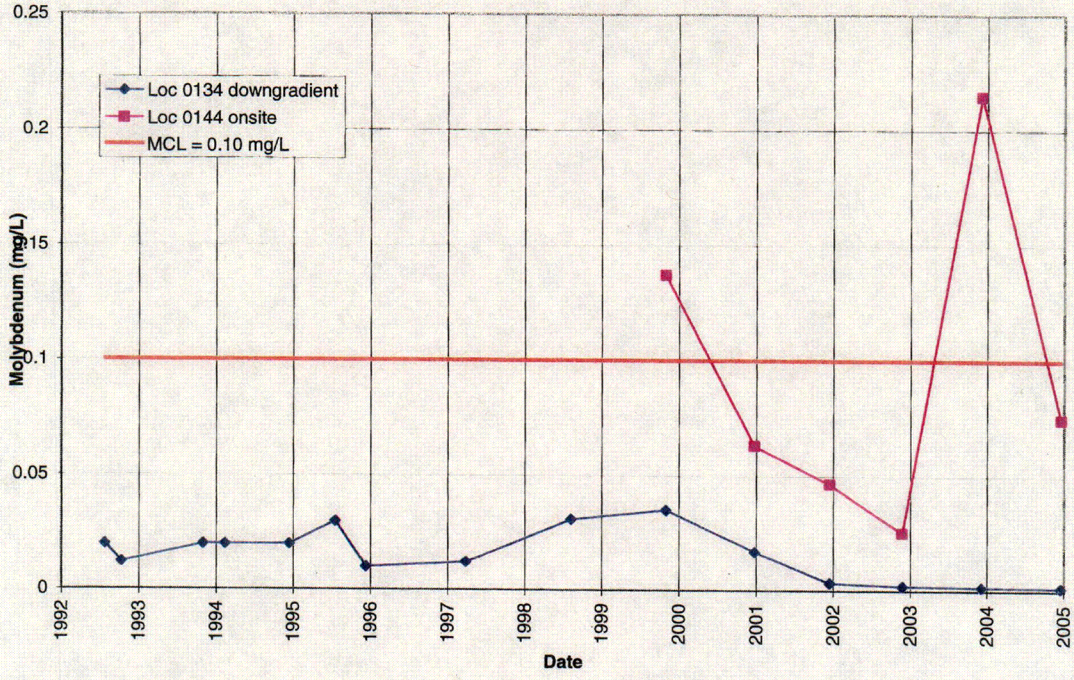
Ground Water Level Hydrograph


Ground Surface Elevation
Loc 0134/0143 ~ 4237 ft
Loc 0144/0145 ~ 4234 ft
Top of Casing -
Measuring Point Elevation
Loc 0134/0143 ~ 4239.5 ft
Loc 0144/0145 ~ 4234 ft
Loc 0143
Static Water Level Measurements in
Deeper Confined Aquifer
Loc 0145
Artesian conditions (see top of casing -
measuring point elevation for Loc 0145)
Loc 0134
Loc 0144
Continuous Water Level Measurements
in Shallow Unconfined Aquifer
Data logger malfunction in Loc 0144 from Nov.
'02 to Dec. '03. Static water level measurement
made in July '03.
Ground Water Elevation (ft)
4240
4238
4236
4234
4232
4230
4228
4226
4224
4222
4220
Oct-99
Jan-00
Apr-00
Aug-00
Nov-00
Feb-01
May-01
Sep-01
Dec-01
Mar-02
Jul-02
Oct-02
Jan-03
Apr-03
Aug-03
Nov-03
Feb-04
Jun-04
Sep-04
Dec-04
Date

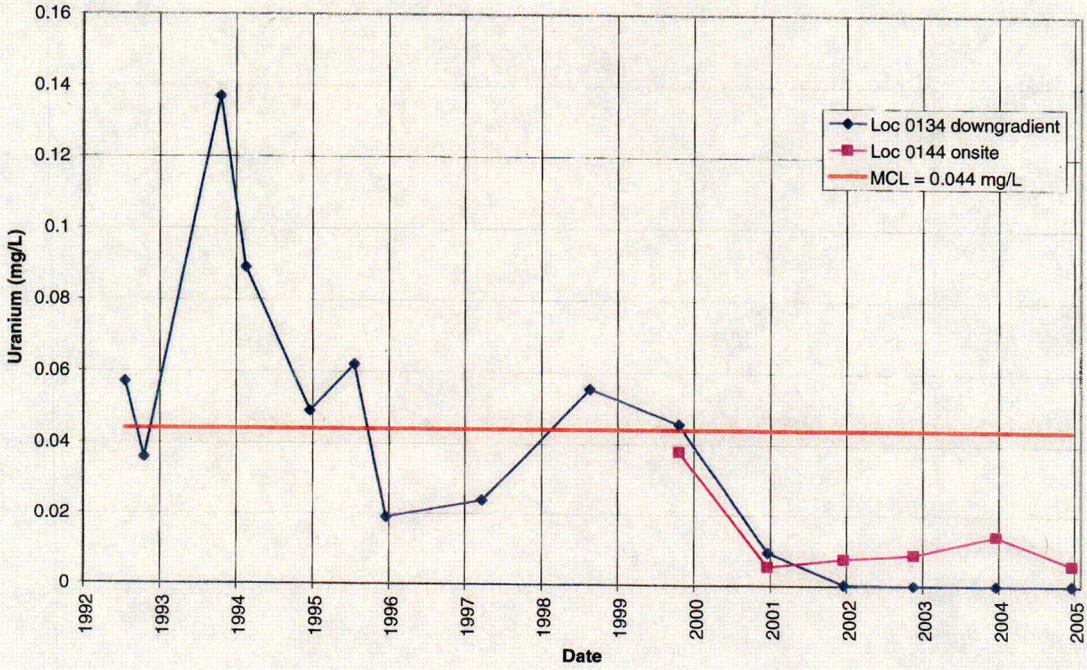
C02

Time Versus Concentration Graphs

Salt Lake City Processing Site (SLC01)
Shallow Unconfined Aquifer
Molybdenum Concentration

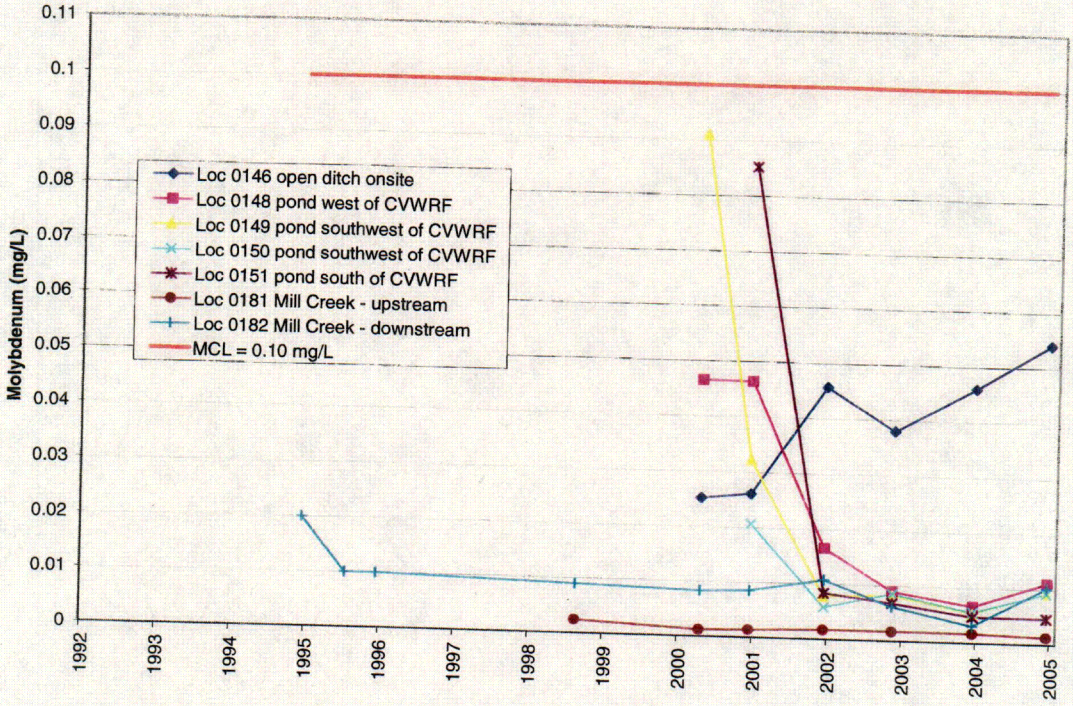


Salt Lake City Processing Site (SLC01)
Shallow Unconfined Aquifer
Uranium Concentration

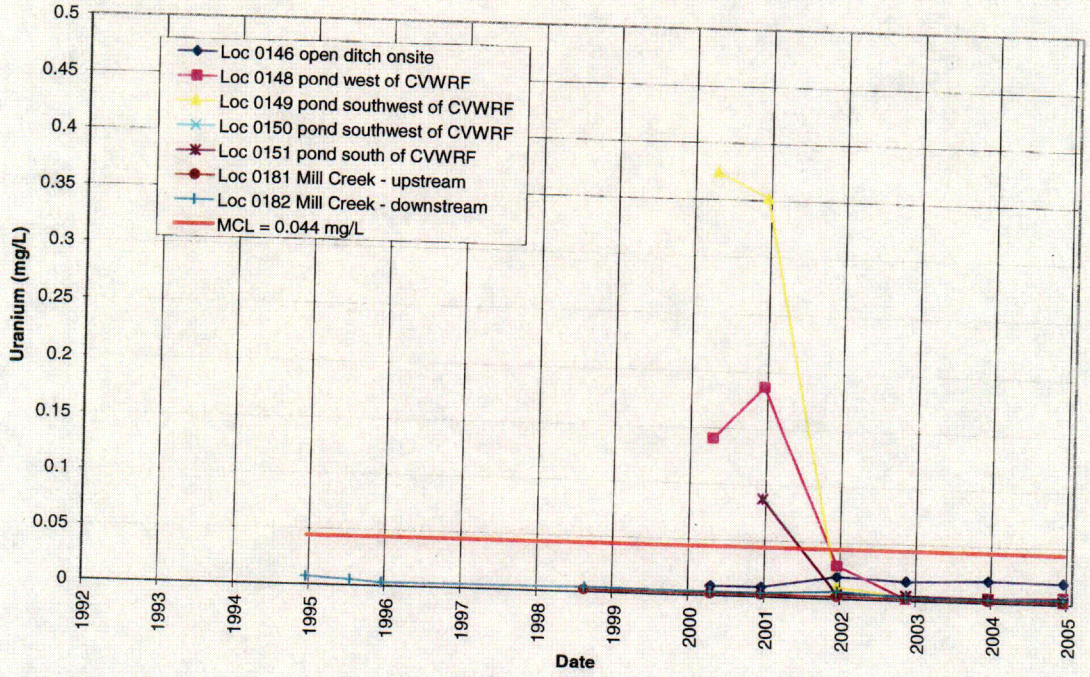


C03

Salt Lake City Processing Site (SLC01)
Surface Water
Molybdenum Concentration



Salt Lake City Processing Site (SLC01)
Surface Water
Uranium Concentration



Attachment 3
Sampling and Analysis Work Order

Stoller

established 1959

Task Order ST05-102
Control Number 1000-T05-0318

November 23, 2004

Michael Tucker
Program Manager
U.S. Department of Energy
Office of Legacy Management
2597 B ¾ Road
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AC01-02GJ79491, Stoller
December 2004 Environmental Sampling at Salt Lake City, Utah

Reference: FY 2005 LM Task Order No. ST05-102-21

Dear Mr. Tucker:

The purpose of this letter is to inform you of the upcoming sampling event at Salt Lake City, Utah. Enclosed are the map and tables specifying sample locations and analytes for routine monitoring. Water quality data will be collected from this site as part of the environmental sampling currently scheduled to begin the week of December 13, 2004.

The following list shows the wells (with zone of completion) and surface locations scheduled to be sampled during this event.

Monitor Wells (filtered)*
134 Lu 144 Lu

*NOTE: Lu = Lacustrine unconfined.

Surface locations (filtered)
146 148 149 150 151 181 182

QA/QC samples will be collected as directed in the *Sampling and Analysis Plan for GJO Projects*. Access agreements are being reviewed and are expected to be complete by the beginning of fieldwork.

If you have any questions, please call me at extension 6588 or Dick Johnson at extension 6022.

Sincerely,

Signature on Original

Clay Carpenter
Project Manager

CC/lcg/lad
Enclosures (3)

cc: C. I. Bahrke, Stoller
S. E. Donivan, Stoller (e)
R. K. Johnson, Stoller (e)
K. E. Miller, Stoller
D. G. Traub, Stoller (e)
Working File – SLC

cc w/o enclosures:
Correspondence Control File (Thru V. Creagar)

Attachment 4
Trip Report

Stoller

established 1959

Memorandum

DATE: December 28, 2004

TO: Richard K. Johnson

FROM: David G. Traub

SUBJECT: Trip Report

Site: Salt Lake City, Utah, Processing Site

Date of Sampling Event: December 13 - 14, 2004

Team Members: Dave Traub

Number of Locations Sampled: 2 monitor wells and 7 surface water locations were sampled. 1 duplicate sample, and 1 equipment blank also were collected for a total of 11 samples.

Locations Not Sampled/Reason: None.

Field Variance: None.

Quality Control Sample Cross Reference: The following are the false identifications assigned to the quality control samples.

TICKET NUMBER	FALSE ID	TRUE ID	SAMPLE TYPE	ASSOCIATED MATRIX
NDU 241	2735	Well 0144	Sample Duplicate	Water
NDU 248	2736	NA	Equipment Blank	DI Water

RIN Number Assigned: All samples were assigned to RIN 04120143.

Sample Shipment: Samples were shipped FedEx to Severn Trent St. Louis from Grand Junction on December 16, 2004.

Water Level Measurements: Water levels were collected from wells 0134, 0143, 0144, and 0145. Wells 0143 and 0145 were both under artesian conditions and began to flow as soon as the J-plug was released from the well casing. Both wells flowed such that there was about ½" of water above the well casings. Well 0143 has apparently leaked in the past or is leaking past the concrete seal as there is some evidence such as stained concrete, rusted steel casing, and some upwelling of grout inside the protective casing. I do not remember this from when we were at the

well last summer. The J-plug seal was not leaking at the time of this event and was under slight pressure.

Well Inspection Summary: Well inspections were conducted at all wells; all sampled wells were in good condition.

Equipment: All wells and surface water locations were sampled using a peristaltic pump using low flow procedures.

Location Specific Information:

Ticket Number	Sample Date	Location	Comments
NDU 238	12/14/2004	0134	Well
NDU 239	12/14/2004	0144	Well
NDU 240	12/14/2004	0146	Surface Water; very good flow in creek/ditch.
NDU 241	12/14/2004	2735	QA, Duplicate
NDU 242	12/14/2004	0148	Surface Water; sample collected off concrete drain structure. Intake is 8" deep.
NDU 243	12/14/2004	0181	Surface Water; sample collected from bottom of Mill Creek; ~30' W of stop sign, ~3' from edge, 6" deep
NDU 244	12/14/2004	0182	Surface Water; just W of bridge. Very good flow in creek.
NDU 245	12/14/2004	0149	Surface Water
NDU 246	12/14/2004	0150	Surface Water
NDU 247	12/14/2004	0151	Surface Water
NDU 248	12/14/2004	2736	QA, Equipt. Blank

Regulatory: Dean Henderson of the Utah Department of Environmental Quality, Division of Radiation Control, was at the site to observe the sampling. He was there all day and stated he saw no problems. He did not take splits of the samples.

Site Issues: There was no evidence of excavations or subsurface activity at the site. We were not able to speak to Reed Fisher, the site manager, but instead spoke to the site engineer.

Corrective Action Required/Taken: None. We may want to consider abandoning the two artesian wells if there is enough data collected to satisfy the regulators of the ground water gradient. There is beginning to be some evidence these wells could leak and as we usually only go to this site once per year it could be some time before a problem was repaired.

cc: M. K. Tucker, LM-50 (e)
S. E. Donivan, Stoller (e)
K. E. Miller, Stoller
Working file SLP

M:\SMO\04120143\RIN04120143_DVP.doc