



WM-41

**U.S. Department of Energy**

Grand Junction Office  
2597 B<sup>3</sup>/<sub>4</sub> Road  
Grand Junction, CO 81503

JAN 14 2003

Rob Herbert  
State of Utah, Department of Environmental Quality  
Division of Radiation Control  
168 North 1950 West  
Salt Lake City, Utah 84114

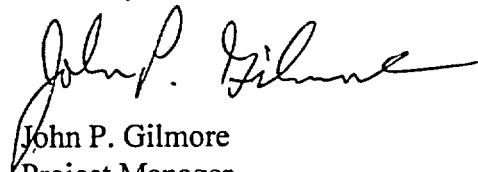
Subject: Data Validation Salt Lake City, Utah Processing Site

Dear Mr. Herbert:

Enclosed is a diskette and a Validated Data Package for the Salt Lake City, Utah Processing Site. The water-sampling event took place during the month of November 2002.

Please call me at (970) 248-6027 if you have any questions.

Sincerely,



John P. Gilmore  
Project Manager

Enclosure

cc w/enclosure:

M. Layton, NRC  
South Salt Lake Public Library

cc w/o enclosure:

Project File LSLC 6.7 (A. Temple)

gilmore/SLCDVP doc



**DATA VALIDATION  
SALT LAKE CITY, UTAH  
PROCESSING SITE  
LONG-TERM SURVEILLANCE AND  
MAINTENANCE PROGRAM**

**November 2002  
Water Sampling**

**U.S. Department of Energy  
Grand Junction, Colorado**

Prepared by the  
**U.S. Department of Energy  
Grand Junction Office**



**Salt Lake City, Utah**  
**Sampled November 2002**

**DATA PACKAGE CONTENTS**

This data package includes the following information:

- | <u>Item No.</u> | <u>Description of Contents</u>  |
|-----------------|---|
| 1.              | <b>Site Hydrologist Summary</b>   |
| 2.              | <b>Data Package Assessment, which includes the following:</b> <ul style="list-style-type: none"><li>a. Field procedures verification checklist</li><li>b. Confirmation that chain-of-custody was maintained.</li><li>c. Confirmation that holding time requirements were met.</li><li>d. Evaluation of the adequacy of the QC sample results.</li></ul>   |
| 3.              | <b>Data Assessment Summary, which describes problems identified in the data validation process and summarizes the validator's findings.</b>   |
| 4.              | <b>Suspected Anomalies Report (SAR)</b> is generated by the UMTRA ground water database system. This report compares the new data set with historical data and designates "suspected anomalies" based on the many criteria listed as footnotes on each page. In aggregate, these criteria cause the suspected anomaly program to be very conservative; many of the data shown in the tables are not, in the evaluator's judgement, truly anomalies, but merely natural variations in data or routine changes in laboratory detection limits. The designation "OK" affirms the judgement that the particular entry is not an anomaly, and therefore requires no further inquiry. |
| 5.              | <b>UMTRA Ground Water Database Printouts</b> of analytical data organized as follows: <ul style="list-style-type: none"><li>a. Ground water quality data (included on disk)</li><li>b. Surface water quality data (included on disk)</li><li>c. Equipment blank sample data (included on disk)</li><li>d. Static ground water level data</li><li>e. Time Versus Concentration Graphs</li></ul>  |
| 6.              | <b>Sampling and Analysis Work Order and Trip Report.</b>  |

## Site Hydrologist Summary

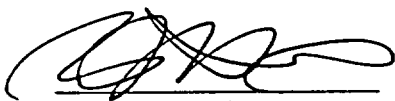
**Site:** Salt Lake City, Utah, Processing Site

**Sampling Period:** November 21, 2002

### SUMMARY

Results from this sampling event demonstrate continued improvement of ground water quality in the shallow unconfined aquifer beneath the Salt Lake City processing site. Molybdenum and uranium concentrations are below their respective U.S. Environmental Protection Agency (EPA) standards (40 CFR 192) and are generally lower than historical results as shown on the time versus concentration graphs for wells 134 and 144. Ground water elevations in the shallow unconfined aquifer are consistent at approximately 4225 feet above sea level (based on datalogger measurements) and observed water levels in the deeper confined aquifer are approximately 10 feet higher. This confirms that there continues to be an upward vertical hydraulic gradient.

As with the ground water, results from this sampling event demonstrate improvement of surface water quality in the ponds located on the site ( see time versus concentration graphs for locations 146,148, 149, 150, and 151). Improvement of surface water quality in the on-site ponds reflects the interconnection of the ponds with the shallow unconfined aquifer. Molybdenum and uranium concentrations remained the same in Mill Creek upstream of the site (location 181) and decreased downstream of the site (location 182) (see time versus concentration graphs). The concentrations are well below their respective standards.



Dick Heydenburg  
Site Hydrologist

27 Dec 02

Date

# DATA ASSESSMENT

**SALT LAKE CITY, UTAH  
NOVEMBER 2002 SAMPLING  
DATA ASSESSMENT SUMMARY**

Samples were analyzed and reported under requisition 18222 for the Long Term Surveillance and Maintenance (LTSM) Program.

**METALS/MAJOR CATIONS ANALYSIS**

Molybdenum results were obtained by inductively coupled plasma-atomic emission spectrometry (ICP-AES). Uranium was analyzed using inductively coupled plasma-mass spectrometry (ICP-MS).

**FIELD ANALYSIS / ACTIVITIES**

Equipment blank results were collected and analyzed for the same constituents and are considered acceptable.

Both wells were micro-purged and the associated data were flagged with an "F" flag in the data base.

Field duplicates were collected from surface location 148 and well 144. There are no established regulatory criteria for the evaluation of field duplicate samples; therefore, EPA guidance for *laboratory* duplicates (less than 20 % relative difference), which is conservative for field duplicates, was used to assess the precision of the field duplicate. All results met the laboratory duplicate criteria and are considered acceptable.

**SAR**

Data were considered valid if: (1) identified low concentrations were the result of low detection limits; (2) the concentration detected was within 50 percent historical minimum or maximum values; or (3) there were four or fewer historical results for comparison. There were no results identified as anomalous data.

**SUMMARY**

All analytical quality control criteria were met except as qualified on the Surface Water by Parameter or equipment blank printouts. The meaning of data qualifiers is as defined on the UMTRA ground water database printout or as defined in the USEPA 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 acceptable for use.

A disk copy of the Ground Water Quality Data by Parameter, Surface Water Quality Data by Parameter, and equipment blank database printouts with the qualifiers incorporated are included in this package.

J.E. Price 12/23/02  
Jeff Price Date  
Data Validation Lead

Dick Heydenburg 3/20/02  
Dick Heydenburg Date  
Site Hydrologist

## UGW Water Sampling Field Activities Verification Checklist

Project Salt Lake City - Processing Site  
 Date(s) of Verification 12/20/02

Date(s) of Water Sampling 11/21/02  
 Name of Verifier JEFF PRICE

Response Comments  
 (Yes, No, N/A)

1. Is the SAP the primary document directing field procedures?

YES

List other documents, SOP's, instructions

Work Order

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, ORI\*) 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?

Were two pump/tubing volumes purged prior to sampling?

YES

Did the water level stabilize prior to sampling?

YES

Was a turbidity of less than 10 NTUs obtained 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?

N/A

Dedicated peristaltic tubing.

8. Were the following conditions met when purging a Category II well?

N/A

Was the flow rate less than 100 mL/min?



## UGW Water Sampling Field Activities Verification Checklist (continued)

- |   |            |  |
|---|------------|--|
| Were two pump/tubing volumes removed prior to sampling?   | _____      | _____                                      |
| Were water levels documented during the purge?  | _____      | _____                                      |
| 9. Were duplicates taken at a frequency of one per 20 samples for ground water and surface water?                     | <u>YES</u> | _____                                      |
| 10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment? | <u>YES</u> | _____                                      |
| 11. Were trip blanks prepared and included with each shipment of VOC samples?   | <u>N/A</u> | _____                                      |
| 12. Were QC samples assigned a fictitious site identification number?   | <u>YES</u> | _____                                      |
| Was the true identity of the samples recorded on the Quality Assurance Sample Log?                                    | <u>YES</u> | _____                                      |
| 13. Were samples collected in the containers specified?   | <u>YES</u> | _____                                      |
| 14. Were samples filtered and preserved as specified?   | <u>YES</u> | _____                                      |
| 15. Were the number and types of samples collected as specified?  | <u>YES</u> | _____                                      |
| 16. Were chain of custody records completed and was sample custody maintained?  | <u>YES</u> | _____                                      |
| 17. Are field data sheets signed and dated by both team members?  | <u>YES</u> | _____                                      |
| 18. Was all other pertinent information documented on the field data sheets?  | <u>YES</u> | _____                                      |
| 19. Was the presence or absence of ice in the cooler documented at every sample location?                             | <u>YES</u> | <u>Metals sample only - no ice needed.</u> |
| 20. Were water levels measured at the locations specified in the planning documents?                                  | <u>YES</u> | _____                                      |

### DATA PACKAGE ASSESSMENT

REQUISITION NUMBERS: 18222 SITE: SLC 01 LABORATORY: GJO ANALYSIS DATES: 12/5 → 12/10/02

REVIEWER: JEFF PRICE J. E. Price December 20, 02  
NAME (print) SIGNATURE DATE

	<sup>U</sup> ICP-MS	<sup>M<sub>0</sub></sup> ICP-AES	GFAA	FAA	NaBH <sub>4</sub>	AS	LSc	PC	IC	Gravimetric	Colorimetric	Other
CHAIN OF CUSTODY	<u>OK</u>	<u>OK</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
HOLDING TIME	<u>OK</u>	<u>OK</u>										
CALIB. VERIFICATION (For AS, internal tracer)	<u>OK</u>	<u>OK</u>								<u>NA</u>		
PREP. BLANKS (Only if digestion)	<u>NA</u>	<u>NA</u>									<u>NA</u>	
INT/CONT CAL. BLANKS	<u>OK</u>	<u>OK</u>				<u>NA</u>	<u>NA</u>	<u>NA</u>		<u>NA</u>		
ICP SERIAL DILUTION	<u>OK</u>	<u>OK</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	
ICS (ICP only)	<u>NA</u>	<u>OK</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	
LAB. CONTROL SAMPLE	<u>NA</u>	<u>NA</u>										
DUPLICATES	<u>OK</u>	<u>OK</u>										
POSTDIGEST. SPKS. (Only if MS fails)	<u>NA</u>	<u>NA</u>				<u>NA</u>	<u>NA</u>	<u>NA</u>		<u>NA</u>	<u>NA</u>	
MATRIX SPKS.	<u>OK</u>	<u>OK</u>								<u>NA</u>		
OVERALL ASSESS.	<u>OK</u>	<u>OK</u>	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

DATA REQUIRING FLAGS: Only field flags: "F" flags on all groundwater data.

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**SAR**

SUSPECTED ANOMALIES REPORT  
 REPORT DATE 12/20/2002 TIME 2 41 33 PM

Site : SLC01 SALT LAKE CITY

Test Data Date Range : 11/1/2002 to 11/30/2002

Older Data Only Used for Baseline Data

68 Chemical Records

328 History Records

LOC ID.	ERR. TYPE FLAG	PARAM CODE UNITS	ANOMALOUS TEST DATA POINT			# OF SAMP. %NON DETE C	ALL TIME MINIMUMS		LOWER BOUND UPPER BOUND	3 MOST RECENT SAMPLING EVENTS								
			LOG DATE	SAMPLE VALUE	VALUE		ALL TIME MAXIMUMS	LOG DATE		SAMPLE VALUE	VALUE	LOG DATE	SAMPLE VALUE	VALUE				
			FLAGS	UNCERTAINTY	DETLIM		ALL TIME MAXIMUMS	FLAGS		UNCERTAINTY	DETLIM	FLAGS	UNCERTAINTY	DETLIM				
0134	5 OK	ORP mV	11/21/2002	N001	-98 0000	9	-177 000	-167.000	0 0000	12/11/2001	N001	-134 0000	12/20/2000	N001	-177 0000	10/27/1999	N001	-166 0000
	6 OK	TMP C	11/21/2002	N001	16 4000	12	10 800	13 600	12 3909	12/11/2001	N001	10 8000	12/20/2000	N001	15 7000	10/27/1999	N001	15 0000
	5 OK	TURBIDI NTU	11/21/2002	N001	2 4500	9	5 000	5 690	10 8696	12/11/2001	N001	22 0000	12/20/2000	N001	10 1000	10/27/1999	N001	7.7900
0144	6 OK	ALK mg/L	11/21/2002	0001	798 0000	5	607.000	610 000	374 2744	12/11/2001	0001	760 0000	12/20/2000	0001	610 0000	12/20/2000	N001	607 0000
	4 OK	ORP mV	11/21/2002	N001	129 0000	3	-187 000	-133 000	-93 5000	12/11/2001	N001	-133 0000	12/20/2000	N001	-60 0000	10/26/1999	N001	-187 0000
0146	5 OK	ALK mg/L	11/21/2002	0001	284 0000	5	165 000	178 000	279 9625	12/11/2001	0001	255 0000	12/20/2000	0001	208 0000	12/20/2000	N001	186 0000
	5 OK	Mo mg/L	11/21/2002	0001	0 0380	4	0 019	0 022	0 0546	12/11/2001	0001	0 0457	12/20/2000	0001	0 0261	4/26/2000	0001	0 0219
	3 OK	TURBIDI NTU	11/21/2002	N001	5 0500	1	15 500	15 500	7.7500	4/26/2000	N001	15 5000	4/26/2000	N001	15 5000	4/26/2000	N001	15 5000
	5 OK	U mg/L	11/21/2002	0001	0 0167	4	0 006	0 007	0 0229	12/11/2001	0001	0 0194	12/20/2000	0001	0 0085	4/26/2000	N001	0 0061
	5 OK	U mg/L	11/21/2002	0001	0 0001	0	0 009	0 019	0 0287	E	0 0001	0 0001	12/20/2000	0001	0 0001			
0149	6 OK	Mo mg/L	11/21/2002	0001	0 0083	4	0 008	0 032	0 0000	12/11/2001	0001	0 0078	12/20/2000	0001	0 0321	4/26/2000	N001	0 0909
	6 OK	U mg/L	11/21/2002	0001	0 0031	4	0 010	0 351	0 0000	12/11/2001	0001	0 0100	12/20/2000	0001	0 3510	4/26/2000	0001	0 3640
0181	5 OK	EC umhos/c	11/21/2002	N001	985 0000	4	733 000	908 000	1848 3201	12/11/2001	N001	2430 0000	12/20/2000	N001	1070 0000	4/26/2000	N001	908 0000
	6 OK	ORP mV	11/21/2002	N001	172 0000	4	104 000	141.000	59 2978	12/11/2001	N001	104 0000	12/20/2000	N001	141 0000	4/26/2000	N001	198 0000

Error Type Flags : 2 - All time high detection limit  
 3 - Too low (non-trend approach)  
 4 - Too high (non-trend approach)  
 5 - Too low (trend approach)  
 6 - Too high (trend approach)

Flags : I - Increased detection limit due to required dilution  
 L - Less than three bore volumes removed before sampling  
 J - Estimated value  
 H - Hold time expired, value suspect.

Approved by J. E. [Signature]  
 Hydrologist "Ok" indicates insignificant variation

Date 12/20/02

SUSPECTED ANOMALIES REPORT  
 REPORT DATE: 12/20/2002 TIME: 2 41 34 PM

Site : SLC01 SALT LAKE CITY

Test Data Date Range : 11/1/2002 to 11/30/2002

Older Data Only Used for Baseline Data

68 Chemical Records

328 History Records

LOC. ID	ERR. TYPE FLAG	PARAM CODE UNITS	ANOMALOUS TEST DATA POINT			# OF SAMP. %NON DETE C	ALL TIME MINIMUMS		LOWER BOUND UPPER BOUND	3 MOST RECENT SAMPLING EVENTS								
			LOG DATE	SAMPLE VALUE			ALL TIME MAXIMUMS	LOG DATE		SAMPLE VALUE	LOG DATE	SAMPLE VALUE	LOG DATE	SAMPLE VALUE				
			FLAGS	UNCERTAINTY	DETLIM			FLAGS		UNCERTAINTY	DETLIM	FLAGS	UNCERTAINTY	DETLIM	FLAGS	UNCERTAINTY	DETLIM	
0181	6 OK	TMP C	11/21/2002	N001	6 2000	4 0	5 000 15 300	5 900 15 300	0 0000 3 5749	12/11/2001	N001	5 0000	12/20/2000	N001	5 9000	4/26/2000	N001	11 8000
0182	5 OK 5 OK	EC	11/21/2002	N001	1281 0000	7 0	852 000 1390 000	1042 000 1928 000	1415 0396 2064 2687	12/11/2001	N001	1928 0000	12/20/2000	N001	1390 0000	4/26/2000	N001	1248 0000
		umhos/c																
		Mo	11/21/2002	0001	0 0062	12	0 008	0 008	0 0065	12/11/2001	0001	0 0108	12/20/2000	0001	0 0085	4/26/2000	N001	0 0083
		mg/L	B		0 0017	33 333	0 011	0 020	0 0121			0 0015	B		0 0007	B		

Error Type Flags :  
 2 - All time high detection limit  
 3 - Too low (non-trend approach)  
 4 - Too high (non-trend approach)  
 5 - Too low (trend approach)  
 6 - Too high (trend approach)

Flags :  
 I - Increased detection limit due to required dilution  
 L - Less than three bore volumes removed before sampling  
 J - Estimated value  
 H - Hold time expired, value suspect

Approved by \_\_\_\_\_  
 Hydrologist "Ok" indicates insignificant variation

Date \_\_\_\_\_

# WATER QUALITY DATA

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE SLC01, SALT LAKE CITY  
 REPORT DATE: 12/20/2002 3:28 pm

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	SAMPLE:		DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
				DATE	ID			LAB	DATA	QA		
Alkalinity, Total (As CaCO3)	mg/L	0134	WL	11/21/2002	0001	29.42 - 39.42	357	F	#	-	-	
	mg/L	0144	WL	11/21/2002	0001	29.70 - 39.70	798	F	#	-	-	
Molybdenum	mg/L	0134	WL	11/21/2002	0001	29.42 - 39.42	0.0021	B	F	#	0.0017	-
	mg/L	0144	WL	11/21/2002	0001	29.70 - 39.70	0.0255	F	#	0.0017	-	
	mg/L	0144	WL	11/21/2002	0002	29.70 - 39.70	0.0228	F	#	0.0017	-	
Oxidation Reduction Potent	mV	0134	WL	11/21/2002	N001	29.42 - 39.42	-98	F	#	-	-	
	mV	0144	WL	11/21/2002	N001	29.70 - 39.70	129	F	#	-	-	
pH	s u	0134	WL	11/21/2002	N001	29.42 - 39.42	7.76	F	#	-	-	
	s.u.	0144	WL	11/21/2002	N001	29.70 - 39.70	7.68	F	#	-	-	
Specific Conductance	umhos/cm	0134	WL	11/21/2002	N001	29.42 - 39.42	885	F	#	-	-	
	umhos/cm	0144	WL	11/21/2002	N001	29.70 - 39.70	12249	F	#	-	-	
Temperature	C	0134	WL	11/21/2002	N001	29.42 - 39.42	16.4	F	#	-	-	
	C	0144	WL	11/21/2002	N001	29.70 - 39.70	13.7	F	#	-	-	
Turbidity	NTU	0134	WL	11/21/2002	N001	29.42 - 39.42	2.45	F	#	-	-	
	NTU	0144	WL	11/21/2002	N001	29.70 - 39.70	7.79	F	#	-	-	
Uranium	mg/L	0134	WL	11/21/2002	0001	29.42 - 39.42	0.0001	U	F	#	0.0001	-
	mg/L	0144	WL	11/21/2002	0001	29.70 - 39.70	0.0088	F	#	0.0001	-	
	mg/L	0144	WL	11/21/2002	0002	29.70 - 39.70	0.0084	F	#	0.0001	-	

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE SLC01, SALT LAKE CITY  
 REPORT DATE: 12/20/2002 3:28 pm

PARAMETER	UNITS	LOCATION ID	LOCATION TYPE	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 #11/1/2002# and #11/30/2002#

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

LOCATION TYPES WL WELL

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.



SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SLC01, SALT LAKE CITY  
 REPORT DATE: 12/20/2002 3 29 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE:		RESULT	QUALIFIERS:			DETECTION LIMIT	UN- CERTAINTY
			DATE	ID		LAB	DATA	QA		
Alkalinity, Total (As CaCO3	mg/L	0146	11/21/2002	0001	264			#	-	-
	mg/L	0148	11/21/2002	0001	78			#	-	-
	mg/L	0149	11/21/2002	0001	133			#	-	-
	mg/L	0150	11/21/2002	0001	146			#	-	-
	mg/L	0151	11/21/2002	0001	161			#	-	-
	mg/L	0181	11/21/2002	0001	234			#	-	-
	mg/L	0182	11/21/2002	0001	172			#	-	-
Molybdenum	mg/L	0146	11/21/2002	0001	0.038			#	0 0017	-
	mg/L	0148	11/21/2002	0001	0.0079 B			#	0 0017	-
	mg/L	0148	11/21/2002	0002	0.009 B			#	0 0017	-
	mg/L	0149	11/21/2002	0001	0.0083 B			#	0.0017	-
	mg/L	0150	11/21/2002	0001	0.0086 B			#	0 0017	-
	mg/L	0151	11/21/2002	0001	0.0069 B			#	0 0017	-
	mg/L	0181	11/21/2002	0001	0.0017 U			#	0 0017	-
	mg/L	0182	11/21/2002	0001	0.0062 B			#	0 0017	-
Oxidation Reduction Potent	mV	0146	11/21/2002	N001	169.6			#	-	-
	mV	0148	11/21/2002	N001	172			#	-	-
	mV	0149	11/21/2002	N001	175			#	-	-
	mV	0150	11/21/2002	N001	194			#	-	-
	mV	0151	11/21/2002	N001	200			#	-	-
	mV	0181	11/21/2002	N001	172			#	-	-
	mV	0182	11/21/2002	N001	168			#	-	-
pH	s u	0146	11/21/2002	N001	7.84			#	-	-
	s u	0148	11/21/2002	N001	10.98			#	-	-
	s.u	0149	11/21/2002	N001	10.74			#	-	-
	s u	0150	11/21/2002	N001	10.31			#	-	-
	s u	0151	11/21/2002	N001	10.08			#	-	-
	s u	0181	11/21/2002	N001	7.7			#	-	-
	s u	0182	11/21/2002	N001	7.26			#	-	-
Specific Conductance	umhos/cm	0146	11/21/2002	N001	1227			#	-	-
	umhos/cm	0148	11/21/2002	N001	1310			#	-	-
	umhos/cm	0149	11/21/2002	N001	1227			#	-	-
	umhos/cm	0150	11/21/2002	N001	1232			#	-	-
	umhos/cm	0151	11/21/2002	N001	1244			#	-	-
	umhos/cm	0181	11/21/2002	N001	985			#	-	-
	umhos/cm	0182	11/21/2002	N001	1261			#	-	-
Temperature	C	0146	11/21/2002	N001	13			#	-	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SLC01, SALT LAKE CITY  
 REPORT DATE: 12/20/2002 3 29 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Temperature	C	0148	11/21/2002	N001	4.8	#	-	-
	C	0149	11/21/2002	N001	5.5	#	-	-
	C	0150	11/21/2002	N001	6.2	#	-	-
	C	0151	11/21/2002	N001	5.5	#	-	-
	C	0181	11/21/2002	N001	6.2	#	-	-
	C	0182	11/21/2002	N001	15.2	#	-	-
Turbidity	NTU	0146	11/21/2002	N001	5.05	#	-	-
	NTU	0148	11/21/2002	N001	65.7	#	-	-
	NTU	0149	11/21/2002	N001	36.6	#	-	-
	NTU	0150	11/21/2002	N001	27.7	#	-	-
	NTU	0151	11/21/2002	N001	33.1	#	-	-
	NTU	0181	11/21/2002	N001	10.8	#	-	-
	NTU	0182	11/21/2002	N001	7.27	#	-	-
Uranium	mg/L	0146	11/21/2002	0001	0.0167	#	0.0001	-
	mg/L	0148	11/21/2002	0001	0.0013	#	0.0001	-
	mg/L	0148	11/21/2002	0002	0.0013	#	0.0001	-
	mg/L	0149	11/21/2002	0001	0.0031	#	0.0001	-
	mg/L	0150	11/21/2002	0001	0.004	#	0.0001	-
	mg/L	0151	11/21/2002	0001	0.0042	#	0.0001	-
	mg/L	0181	11/21/2002	0001	0.0018	#	0.0001	-
	mg/L	0182	11/21/2002	0001	0.0028	#	0.0001	-

SURFACE WATER QUALITY DATA BY PARAMETER (USEE800) FOR SITE SLC01, SALT LAKE CITY  
 REPORT DATE 12/20/2002 3:29 pm

PARAMETER	UNITS	LOCATION ID	SAMPLE DATE	SAMPLE ID	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
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RECORDS SELECTED FROM USEE800 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 #11/1/2002# and #11/30/2002#

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
- > 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

BLANKS REPORT

LAB REQUISITION(S): 18222

REPORT DATE: 12/20/02 01.39 13. PM

PARAMETER	SITE CODE	LOCATION ID	SAMPLE		UNITS	RESULT	QUALIFIERS LAB DATA	DETECTION LIMIT	UNCERTAINTY	SAMPLE TYPE
			DATE	ID						
Molybdenum	SLC01	0999	11/21/2002	0001	mg/L	0 0017	U	0 0017		E
Uranium	SLC01	0999	11/21/2002	0001	mg/L	0 0001	U	0 0001		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 compound (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.

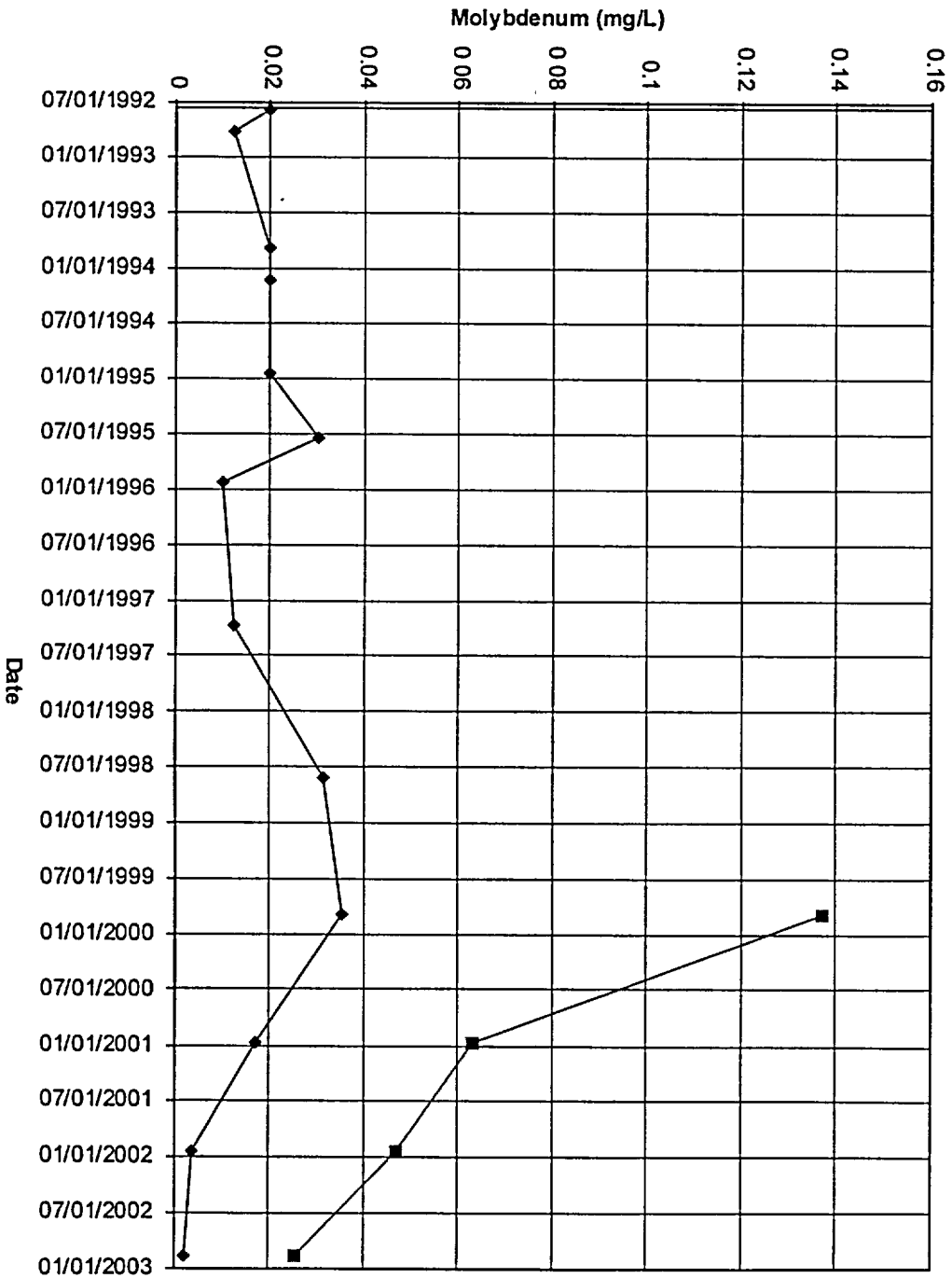
SAMPLE TYPES

- AK ANALYTICAL KNOWN
- F FIELD SAMPLE
- K KNOWN
- R REPLICATE
- XB EXTRACTION BLANK
- D DUPLICATE
- FB FIELD BLANK
- L LABORATORY
- TB TRIP BLANK
- E EQUIPMENT BLANK
- FR FIELD SAMPLE WITH REPLICATES
- N NOT KNOWN
- TK THEORETICAL KNOWN

**TIME VERSUS CONCENTRATION  
GRAPHS**

SALT LAKE CITY (SLC01)

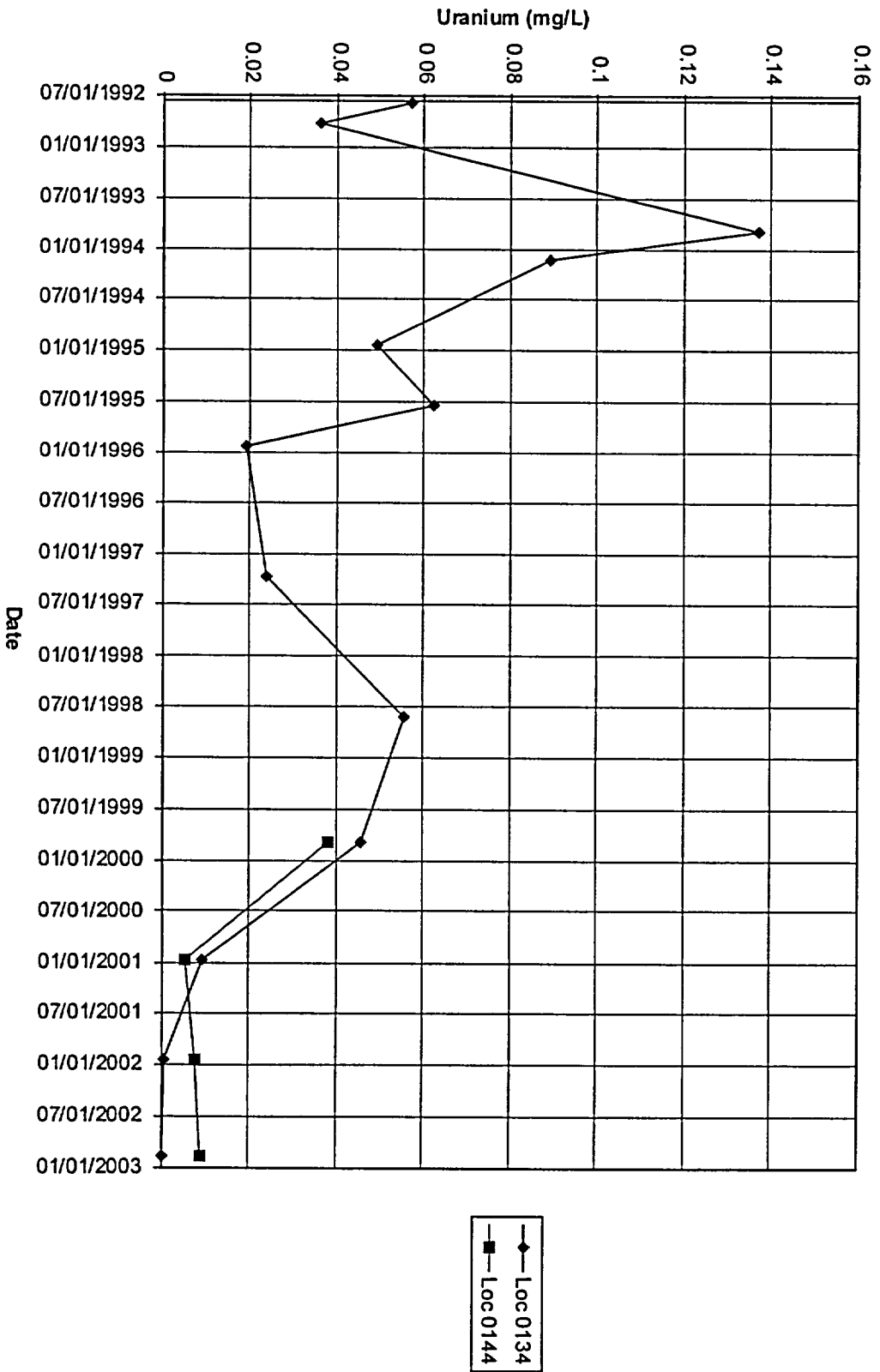
Molybdenum Concentration



◆ Loc 0134  
■ Loc 0144

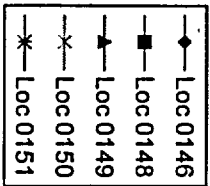
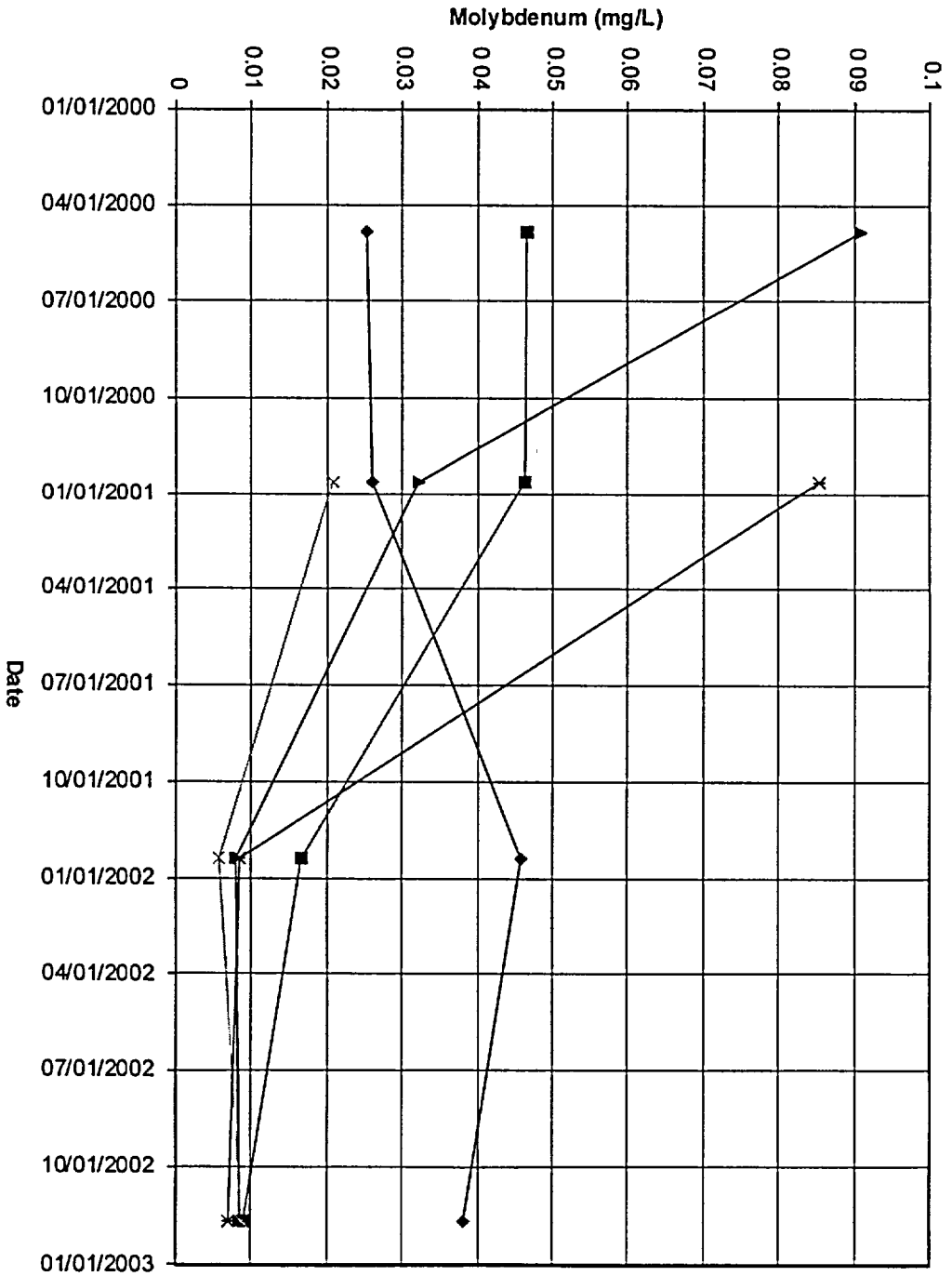
SALT LAKE CITY (SLC01)

Uranium Concentration

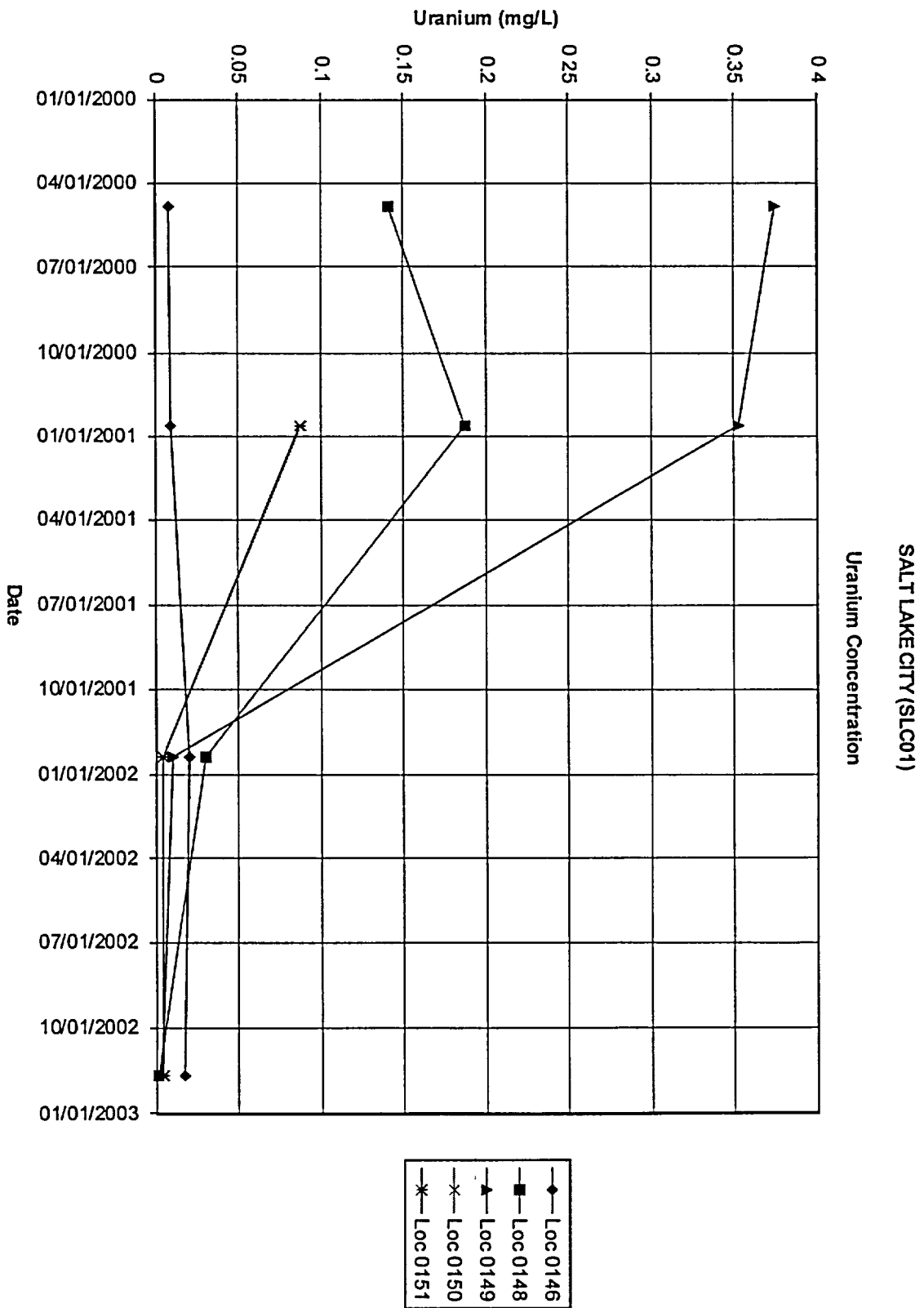


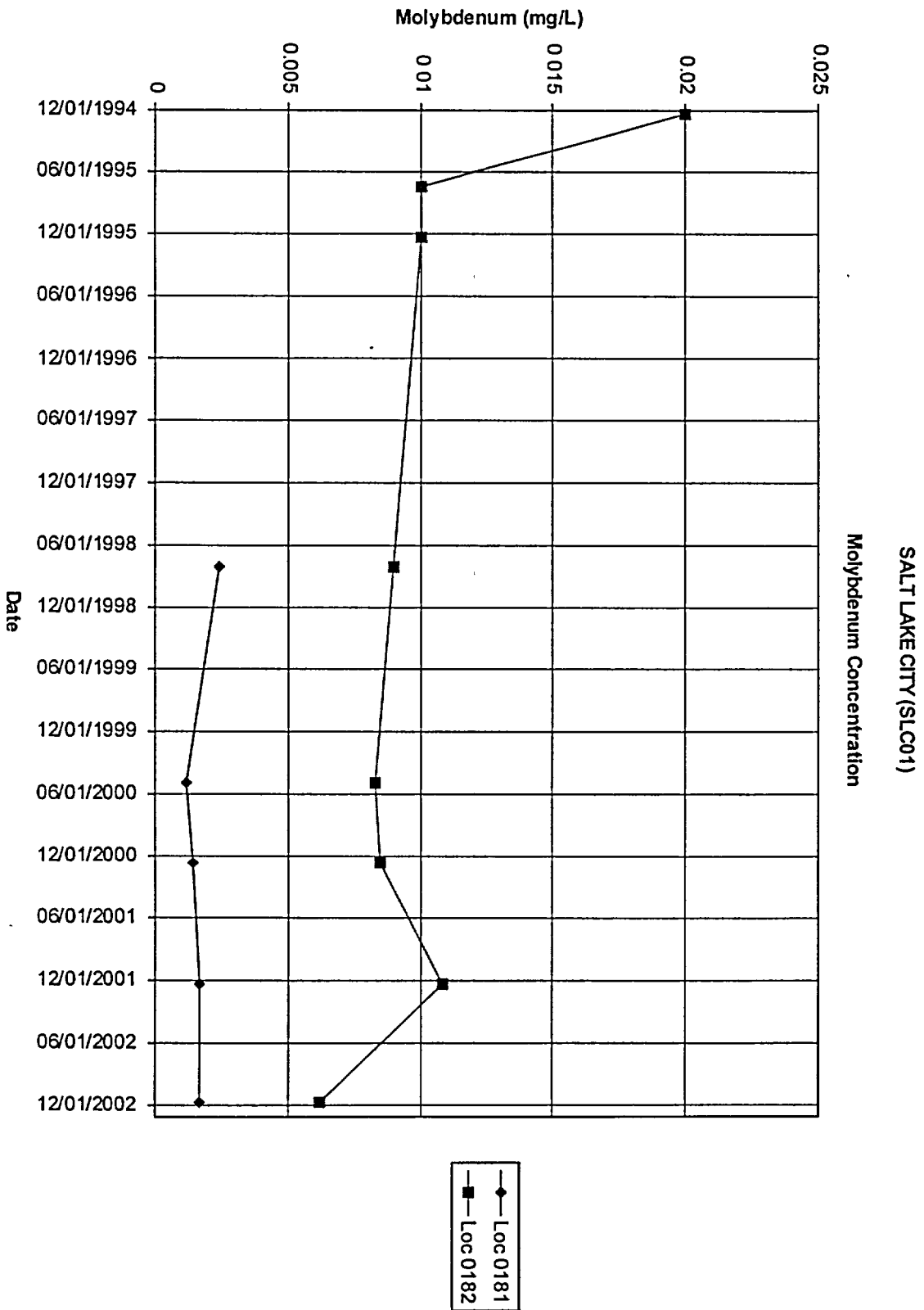
SALT LAKE CITY (SLC01)

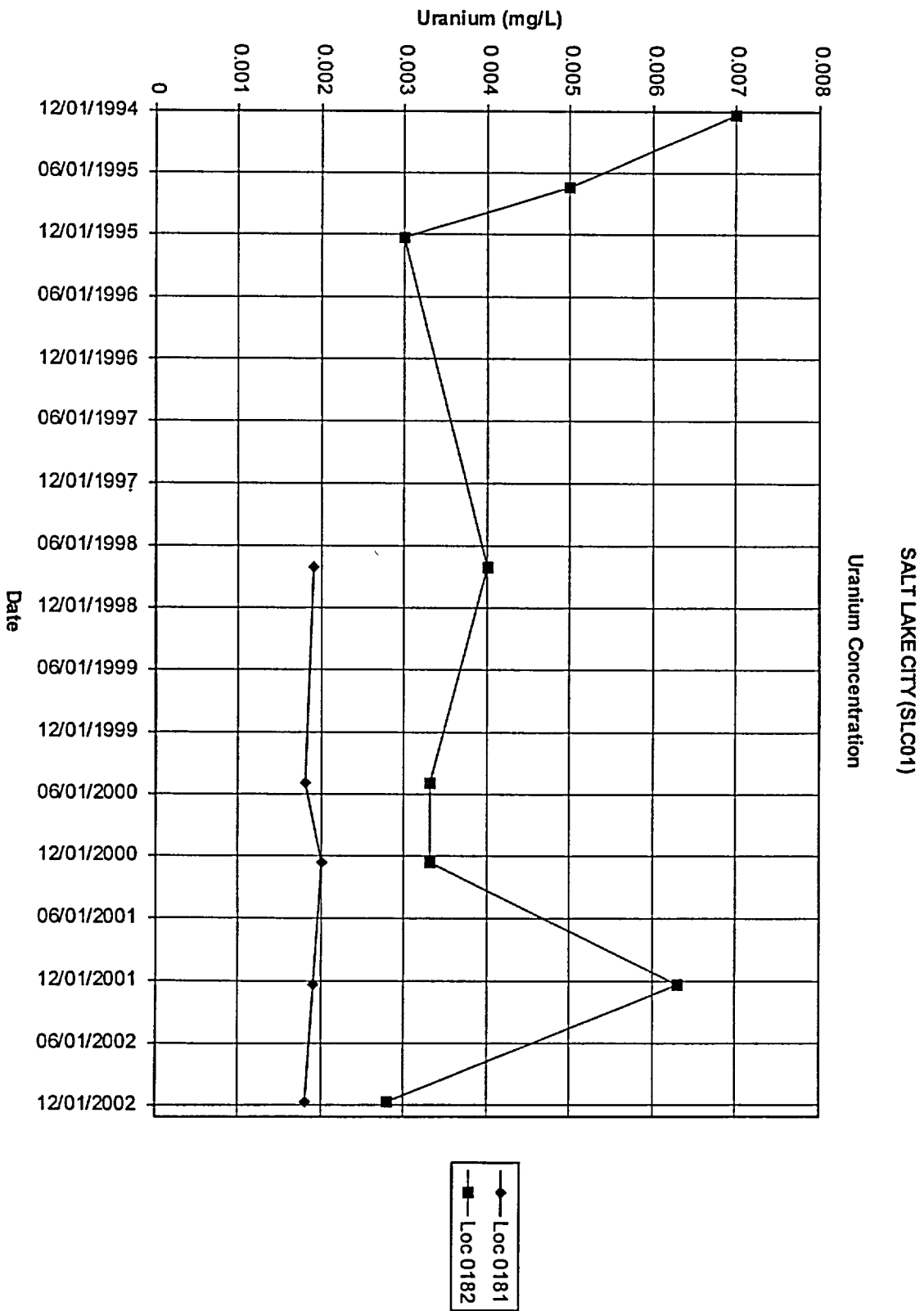
Molybdenum Concentration











# WATER LEVELS

STATIC GROUND WATER LEVELS (USEE700) FOR SITE SLC01, SALT LAKE CITY  
 REPORT DATE: 12/23/2002 1:10 pm

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT NGVD)	MEASUREMENT		DEPTH FROM TOP OF CASING (FT)	GROUND WATER ELEVATION (FT NGVD)	WATER LEVEL FLAG
			DATE	TIME			
0134	D	4239.50	11/21/2002	11.42	13.78	4225.72	
0143		-	11/21/2002		5.00	-5.00	
0144		-	11/21/2002	10.46	8.66	-8.66	
0145		-	11/21/2002			-	F

RECORDS SELECTED FROM USEE700 WHERE site\_code='SLC01' AND LOG\_DATE between #11/1/2002# and #11/30/2002#

FLOW CODES           D   DOWN GRADIENT

WATER LEVEL FLAGS

F   Flowing

**SAMPLING WORK ORDER AND  
TRIP REPORT**

## Memorandum

CONTRACT NO	DE-AC13-02GJ79491
TASK ORDER NO.	ST03-102
CONTROL NO	N/A

DATE: November 4, 2002  
TO: Carl Jacobson  
FROM: Lauren Goodknight  
SUBJECT: November 2002 LTSM Sampling at Salt Lake City, Utah

Ground water sampling for the LTSM Salt Lake City, Utah, site is scheduled to begin the week of November 18, 2002. The attached tables indicate which monitor wells will be sampled as well as which laboratory measurements will be performed.

Normally, for an UMTRA Ground Water Project site, a letter is sent to DOE one month in advance informing them of upcoming sampling events. However, since there are no UMTRA Ground Water Project samples to be collected, this will not be done for the Salt Lake City site.

If you have any additions or deletions to these lists please let me know as soon as possible.

Attachments (2)

LCG

cc: C. I. Bahrke, Stoller  
R. B. Chessmore, Stoller  
K. E. Miller, Stoller  
D. G. Traub, Stoller  
M. R. Widdop, Stoller  
Project File LSLC 6.07 (Thru A. Temple)

D:\UGW\SLC\0211slc mem doc

## Memorandum

Control Number N/A

DATE: December 5, 2002  
TO: Carl L. Jacobson  
FROM: Jeffrey E. Price  
SUBJECT: LTSM Sampling Trip Report – Salt Lake City, Utah

Site: Salt Lake City, Utah - Processing Site

Dates of Sampling Event: November 20 - 21, 2002

Team Members: Mike Widdop and Jeff Price.

Number of Locations Sampled: 2 wells, 7 surface water sites.

Locations Not Sampled/Reason: None.

Field Variance: None.

**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
103	144	Duplicate	Groundwater	NDS-897
101	148	Duplicate	Surface Water	NDS-892
102	102	Equipment Blank	NA	NDS-899

**Water Level Measurements:** Water level elevations were measured on sampled wells and wells 135 and 145. The water level in well 135 was 5.00 feet below top of PVC casing; well 145 was flowing.

**Well Inspection Summary:** All wells inspected were in satisfactory conditions.



**Requisition Number:** 18222.

**Equipment:** All equipment operated properly.

**Regulatory:** Rob Herbert, State of Utah Water Quality Division, was on site during the sampling event and collected split samples. John Gilmore also was on site during the sampling event.

**Site Issues:** Water level data loggers were downloaded from wells 134 and 144.

JEP/lcg

cc: D. R. Metzler, DOE-GJO  
R. J. Heydenburg, Stoller  
S. J. Marutzky, Stoller  
K. E. Miller, Stoller  
M. R. Widdop, Stoller  
Project File LSLC 6.07 (Thru A. Temple)

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