UMTRA
Ground Water Project

DATA VALIDATION FOR THE MONUMENT VALLEY, AZ. UMTRA SITE

February 2001
Water Sampling

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

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MONUMENT VALLEY
Sampled February 2001
DATA PACKAGE CONTENTS

This data package includes the following information:

Item No.	Description of Contents
1.	**Site Hydrologist Summary**
2.	**Data Package Assessment,** which includes the following:
	a. Field procedures verification checklist
	b. Confirmation that chain-of-custody was maintained.
	c. Confirmation that holding time requirements were met.
	d. Evaluation of the adequacy of the QC sample results.
3.	**Data Assessment Summary,** which describes problems identified in the data validation process and summarizes the validators findings.
4.	**Suspected Anomalies Reports** generated by the UMTRA 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 evaluators judgment, truly anomalies, but merely natural variations in data or routine changes in laboratory detection limits. The designation "OK" affirms the judgment that the particular entry is not an anomaly and, therefore, requires no further inquiry.
5.	**Anomalous Data Review Checksheets** which list the subset of data from sampling event that merits explanation or follow-up action. The "disposition" column of this report describes the evaluators judgments on the listed anomalies.
6.	**UMTRA Database Printouts**
	a. Ground-Water Quality Data (included on disk)
	b. Equipment Blank Data (included on disk)
	c. Time Versus Concentration Graphs
	d. Water Level Data
7.	**Sampling and Analysis Work Order and Trip Report.**

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Site Hydrologist Summary

Site: Monument Valley

Sampling Period: February 21 to February 27, 2001

SUMMARY CRITERIA

1. **Did concentrations in water from any domestic wells sampled exceed a ground water standard, primary drinking water standard, or health advisory?**

   Domestic location 201 (IHS water supply well) was the only domestic location sampled during this event. Concentrations did not exceed any standards at this location.

2. **Were standards exceeded at any point-of-compliance wells?**

   There are no point-of-compliance wells established at the Monument Valley Site.

3. **As a result of this sampling round, is there any indication of unexpected contaminated groundwater movement?**

   There is no indication of unexpected contaminated ground water movement. Time versus concentration graphs for nitrate and uranium from selected wells are provided with the analytical data. Wells with sample concentrations that exceeded UMTRA ground water standards are listed in Table 1.

4. **Is there statistical evidence that UMTRA Project related contaminants were detected in a surface water body in greater concentrations than upstream ambient water quality?**

   There were no surface water locations sampled during this event.

Table 1. Monument Valley Wells with Samples that Exceeded UMTRA Standards in February

2001.

Analyte	Standard[1]	Wells Exceeding Standards (Concentration[1])
Nitrate	44.27	770 (147), 656 (177), 606 (865), 762 (128), 761 (90.2), 648 (321), 649 (885), 778 (625), 655 (374), 653 (190), 662 (52.2), 765 (644), 764 (144), 777 (809),
Uranium	0.044	774 (0.0724)

[1]Units are in mg/L

Kenneth Karp 6/23/01

Ken Karp
Site Hydrologist

Date

DATA ASSESSMENT

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DATA PACKAGE ASSESSMENT

REQUISITION NUMBERS: 17327 SITE: Monument Valley LABORATORY: GJO ANALYSIS DATES: 2/26/01 thru 4/5/01

REVIEWER: DAVID MILLER (NAME (print)) D Miller (SIGNATURE) 5/9/01 (DATE)

	ICP-MS	ICP-AES	GFAA	FAA	$NaBH_4$	AS	LSc	PC	IC	Gravimetric	Colorimetric (spectrophotometry)	Other	
CHAIN OF CUSTODY	OK	OK	NA	NA	OK	NA	OK	OK	OK	OK	OK		
HOLDING TIME	OK	OK	↓	↓	OK	↓	OK	OK	OK	OK	OK		
CALIB. VERIFICATION (For AS, internal tracer)	OK	OK	↓	↓	OK	↓	OK	OK	OK	NA	OK		
PREP. BLANKS (Only if digestion)	NA	NA	↓	↓	NA	↓	OK	OK	NA	NA	NA		
INT/CONT CAL. BLANKS	(1)	OK	↓	↓	OK	NA	NA	NA	OK	NA	OK		
ICP SERIAL DILUTION	OK	OK	NA	NA	NA	NA	NA	NA	NA	NA	NA		
ICS (ICP only)	OK	OK	NA	NA	NA	NA	NA	NA	NA	NA	NA		
LAB. CONTROL SAMPLE	NA	NA	NA	NA	NA	NA	OK	OK	OK	OK	NA		
DUPLICATES	OK	OK	↓	↓	OK	NA	OK	OK	OK	OK	OK		
POSTDIGEST. SPKS. (Only if MS fails)	NA	NA	↓	↓	NA	NA	NA	NA	NA	NA	NA		
MATRIX SPKS.	OK	OK	↓	↓	OK	↓	NA	(2)	OK	NA	OK		
OVERALL ASSESS.	OK	OK	↓	↓	OK	↓	OK	OK	OK	~~NA~~ Dan OK	OK		

REVIEWER COMMENTS: (1) Blank contamination; U Flag Cadmium results 274292(201) and 274293(201 Duplicate). (2) Matrix spike outside control limits; J Flag all Gross alpha results.

ITEMS REQUIRING ATTENTION:

UGW Water Sampling Field Activities Verification Checklist

Project UGW - Monument Valley
Date(s) of Verification 5/9/01

Date(s) of Water Sampling 2/21/01 thru 2/27/01
Name of Verifier DAVID MILLER

	Response (Yes, No, N/A)	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	except: Well 771, which the sampling team mistakenly Forgot.
3. Was field equipment calibrated as specified in the above named documents?	YES	
Were the number and types (alkalinity, temperature, Ec, pH, turbidity, DO, ORP) of field measurements taken as specified?	YES	
Were the standard solutions used for the calibration and operational checks of the field instruments brought to within 10 degrees C of the temperature of the water to be sampled?	YES	
Was the calibration information recorded on the field data sheets?	YES	
4. Was depth to water measured before purging?	YES	
Was this information used to calculate purge volume?	YES	
5. If conventional purging was used, were the wells purged until parameters stabilized and 3 casing volumes were removed, until the well was purged dry, or until 10 casing volumes were removed?	YES	
6. If low-flow purging was used, was the purge rate less than 0.125 gal/min, and was the drawdown less than 0.3 ft?	NA	

7. Were duplicates taken at a frequency of one per 20 samples?	YES	
8. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	YES	
9. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
10. Were QC samples assigned a fictitious site identification number?	YES	
Was the true identity of the samples recorded in the field notes?	YES	
11. Were samples collected in the containers specified?	YES	
Were certified pre-cleaned containers used for the sampling?	YES	
12. Were samples filtered and preserved as specified?	YES	
13. Were the number and types of samples collected as specified?	YES	
14. Were chain of custody records completed and was sample custody maintained?	YES	
15. Were sample ticket book numbers recorded on field data forms and on the chain of custody?	YES	
16. Are field data sheets signed and dated by the team leader?	YES	
17. Was all other pertinent information documented on the field data sheets?	YES	
18. Was the presence or absence of ice in the cooler documented at every sample location?	YES	
19. Were water levels measured at the locations specified in the planning documents?	YES	

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MONUMENT VALLEY, AZ
FEBRUARY 2001 SAMPLING EVENT
DATA ASSESSMENT SUMMARY

The DOE-GJO Analytical Laboratory analyzed samples and reported results for this sampling event under requisition number 17327 for the UMTRA ground water project.

METALS/MAJOR CATIONS ANALYSES

The determinations of calcium, magnesium, potassium, sodium, strontium, and vanadium were done using inductively coupled plasma-atomic emission spectrometry (ICP-AES). The determinations of cadmium and uranium were analyzed by inductively coupled plasma-mass spectrometry (ICP-MS). Arsenic and selenium were determined by hydride generation atomic absorption spectroscopy. Except as noted, all quality control requirements were met during the course of these analyses.

The cadmium results for 274292 (201), and 274293 (201 duplicate) were qualified with a "U" flag because of CCB contamination.

INORGANIC ANALYSES

Chloride, nitrate, and sulfate were determined by ion chromatography (IC), and ammonium was determined by spectrophotometry (Colorimetry). TDS was determined gravimetrically. All quality control requirements were met during the course of these analyses.

RADIOCHEMICAL ANALYSES

The determination of gross alpha activity was done by gas proportional counting. Although not requested, gross beta results are included because gross beta activity is determined concurrently with gross alpha activity. The determinations of radium-226, radium-228, and lead-210 were done by liquid scintillation spectrometry. The chemical recoveries for lead-210 were determined by flame atomic absorption spectroscopy. Except as noted, all quality control requirements were met during the course of these analyses.

FIELD ANALYSES/ACTIVITIES

Low-flow purging was not used during this sampling event and therefore, F flags were not required. There were no wells with a measured pH greater than 9; therefore G flags indicating potential grout contamination were not required. Wells purged dry prior to removal of three casing volumes included 606, 655, and 764; therefore, results from these wells will be qualified with a L flag in the database indicating less than three casing volumes were removed prior to sampling.

Two equipment blanks were collected for the 19 locations where samples were collected using non-dedicated equipment. The equipment blanks were analyzed for the same constituents as the Monument Valley environmental samples. There were no UMTRA related contaminants detected in the equipment blank in concentrations above the contract required detection limit (CRDL); therefore, equipment blank results are considered acceptable.

Three field duplicates were collected for the 24 sampled locations. Duplicate samples were collected from wells 765, 772, and 201. There is 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 relative percent difference); and therefore, duplicate results are considered acceptable.

SAR

The SAR reflects samples collected in February 2001. Values listed in the SAR were considered valid if: (1) identified low concentrations were the results of low detection limits; or (2) the concentrations detected were within 50 percent of the historical minimum or maximum observed values. Results that did not meet this criteria are listed on the Anomalous Data Review Checksheet.

SUMMARY

All analytical quality control criteria were met except as qualified on the Ground Water Quality Data by Parameter, or Equipment Blank database printouts. The meaning of data qualifiers is defined on the UMTRA data base printouts or 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 meet the validation criteria and may be treated as final results.

An electronic copy of the analytical data on a disk is included with this data validation package.

D Miller 5/9/01

David Miller
Data Validation Lead

Date

SAR

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SUSPECTED ANOMALIES REPORT

REPORT DATE: 5/10/2001 TIME: 10:01:40 AM

Site : MON01 MONUMENT VALLE Test Data Date Range : 2/1/2001 to 3/1/2001 Older Data Only Used for Baseline Data 123 Chemical Records 821 History Records

LOC. ID.	ERR. TYPE FLAG	PARAM CODE / UNITS	ANOMALOUS TEST DATA POINT: LOG DATE / SAMPLE / VALUE / FLAGS / UNCERTAINTY / DETLIM	# OF SAMP. / %NON DETEC	ALL TIME MINIMUMS / ALL TIME MAXIMUMS	LOWER BOUND / UPPER BOUND	3 MOST RECENT SAMPLING EVENTS: LOG DATE / SAMPLE / VALUE / FLAGS / UNCERTAINTY / DETLIM	LOG DATE / SAMPLE / VALUE / FLAGS / UNCERTAINTY / DETLIM	LOG DATE / SAMPLE / VALUE / FLAGS / UNCERTAINTY / DET LIM
0604	5	ORP	2/21/2001 N001 -99.0000	7	-153.000 -76.000	0.0000	8/15/2000 N001 110.0000	8/25/1999 N001 1.0000	8/28/1998 N001 -153.0000
	OK	mV		0	453.100 453.100	131.3367			
	3	Zobell T	2/21/2001 N001 9.9000	1	20.400 20.400	10.2000	8/15/2000 N001 20.4000	8/15/2000 N001 20.4000	8/15/2000 N001 20.4000
	OK	C		0	20.400 20.400	40.8000			
0605	5	Chloride	2/21/2001 0001 150.0000	15	83.000 110.000	154.8364	8/28/1998 0001 175.0000	2/26/1998 0001 204.0000	8/28/1997 0001 173.0000
	OK	mg/L	0.096	0	248.000 259.000	245.5616			
	6	ORP	2/21/2001 N001 -71.0000	6	-166.000 -129.000	0.0000	8/28/1998 N001 -166.0000	2/26/1998 N001 -129.0000	8/28/1997 N001 11.0000
	OK	mV		0	441.500 441.500	-290.8307			
0606	5	NH4	2/21/2001 0001 170.0000	22	2.200 192.000	170.9507	8/15/2000 0001 192.0000	8/26/1998 0001 270.0000	2/24/1998 0001 271.0000
	OK	mg/L	0.0047	0	361.000 370.000	286.1744			
	6	ORP	2/21/2001 N001 190.0000	9	118.000 142.000	0.0000	8/15/2000 N001 142.0000	8/26/1999 N001 118.0000	8/26/1998 N001 174.0000
	OK	mV		0	481.700 481.700	141.4703			
	3	Zobell T	2/21/2001 N001 14.5000	1	30.800 30.800	15.4000	8/15/2000 N001 30.8000	8/15/2000 N001 30.8000	8/15/2000 N001 30.8000
	OK	C		0	30.800 30.800	61.6000			
0650	6	ORP	2/27/2001 N001 151.0000	8	-25.000 21.000	0.0000	8/16/2000 N001 74.0000	8/24/1999 N001 21.0000	8/28/1998 N001 73.0000
	OK	mV		0	376.000 376.000	83.2500			
0653	6	NO3	2/27/2001 0001 190.0000	21	5.000 12.000	157.3114	8/15/2000 0001 181.0000	8/27/1998 0001 124.0000	2/25/1998 0001 130.0000
	OK	mg/L	0.1256	0	130.000 181.000	180.4478			
	6	ORP	2/27/2001 N001 161.0000	11	22.000 35.000	0.0000	8/15/2000 N001 73.0000	8/27/1998 N001 94.0000	2/25/1998 N001 22.0000
	OK	mV		0	443.100 443.100	118.5547			
	3	Zobell T	2/27/2001 N001 8.0000	1	24.200 24.200	12.1000	8/15/2000 N001 24.2000	8/15/2000 N001 24.2000	8/15/2000 N001 24.2000
	OK	C		0	24.200 24.200	48.4000			
0655	5	Chloride	2/26/2001 0001 4.7500	18	24.400 25.800	23.1526	8/17/2000 0001 26.6000	8/26/1999 0001 27.3000	8/25/1998 0001 31.5000
	*	mg/L	0.096	0	36.000 38.000	30.1909			
	6	SO4	2/26/2001 0001 1980.0000	20	1600.000 1690.000	1328.2829	8/17/2000 0001 1690.0000	8/26/1999 0001 1600.0000	8/25/1998 0001 2040.0000
	OK	mg/L	0.2356	0	3130.000 3540.000	1905.9551			

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 _____ Date 5/10/01

Hydrologist "Ok" indicates insignificant variation

Site : MON01 MONUMENT VALLE Test Data Date Range : 2/1/2001 to 3/1/2001 Older Data Only Used for Baseline Data 123 Chemical Records 821 History Records

LOC. ID.	ERR. TYPE FLAG	PARAM CODE / UNITS	ANOMALOUS TEST DATA POINT: LOG DATE	SAMPLE	VALUE	FLAGS	UNCERTAINTY	DETLIM	# OF SAMP. / %NON DETEC	ALL TIME MINIMUMS / ALL TIME MAXIMUMS		BOUND	3 MOST RECENT SAMPLING EVENTS: LOG DATE	SAMPLE	VALUE	FLAGS	UNCERTAINTY	DETLIM	LOG DATE	SAMPLE	VALUE	FLAGS	UNCERTAINTY	DET LIM
0656	5	NH4	2/21/2001	0001	66.8000				11	91.000	91.200	82.1009	8/15/2000	0001	95.6000				8/26/1999	0001	102.0000			
	OK	mg/L			0.0047				0	150.000	150.000	109.8797												
0662	6	ORP	2/27/2001	N001	147.0000				8	28.000	70.000	0.0000	8/16/2000	N001	70.0000				8/25/1999	N001	132.0000	8/26/1998	N001	100.0000
	OK	mV							0	431.000	431.000	124.5443												
	5	SO4	2/27/2001	0001	389.0000				15	329.000	335.000	851.9333	8/16/2000	0001	583.0000				8/25/1999	0001	903.0000	8/26/1998	0001	953.0000
	OK	mg/L			0.0589				0	903.000	953.000	1118.9795												
0669	6	ORP	2/26/2001	N001	160.0000				7	8.000	50.000	0.0000	8/15/2000	N001	109.0000				8/27/1999	N001	121.0000	8/26/1998	N001	8.0000
	OK	mV							0	410.000	410.000	144.3637												
0760	5	ORP	2/22/2001	N001	-231.0000				5	-279.000	-214.000	0.0000	8/23/2000	N001	-104.0000				8/25/1999	N001	-279.0000	8/27/1998	N001	-214.0000
	OK	mV							0	3.000	3.000	-62.7089												
	3	Zobell T	2/22/2001	N001	8.8000				1	20.800	20.800	10.4000	8/23/2000	N001	20.8000				8/23/2000	N001	20.8000	8/23/2000	N001	20.8000
	OK	C							0	20.800	20.800	41.6000												
0761	6	Chloride	2/21/2001	0001	15.4000				4	15.200	15.300	13.7433	8/26/1999	0001	15.3000				8/27/1998	0001	15.2000	2/24/1998	0001	16.4000
	OK	mg/L			0.024				0	16.000	16.400	15.2293												
	6	NO3	2/21/2001	0001	90.2000				4	73.700	75.400	75.8561	8/26/1999	0001	76.2000				8/27/1998	0001	75.4000	2/24/1998	0001	76.5000
	OK	mg/L			0.0314				0	76.200	76.500	79.3698												
	5	ORP	2/21/2001	N001	155.0000				4	-17.000	66.000	241.2684	8/26/1999	N001	205.0000				8/27/1998	N001	109.0000	2/24/1998	N001	-17.0000
	OK	mV							0	109.000	205.000	427.2299												
	6	SO4	2/21/2001	0001	518.0000				4	473.000	475.000	432.0671	8/26/1999	0001	473.0000				8/27/1998	0001	475.0000	2/24/1998	0001	506.0000
	OK	mg/L			0.0589				0	492.000	506.000	470.7449												
0762	6	SO4	2/21/2001	0001	1200.0000				5	761.000	869.000	1030.5937	8/23/2000	0001	1070.0000				8/26/1999	0001	904.0000	8/27/1998	0001	869.0000
	OK	mg/L			0.2356				0	904.000	1070.000	1142.6543												
0764	6	SO4	2/22/2001	0001	396.0000				5	377.000	409.000	343.5608	8/23/2000	0001	377.0000				8/26/1999	0001	377.0000	8/28/1998	0001	430.0000
	OK	mg/L			0.0589				0	424.000	430.000	387.7481												
	3	Zobell T	2/22/2001	N001	8.5000				1	21.000	21.000	10.5000	8/23/2000	N001	21.0000				8/23/2000	N001	21.0000	8/23/2000	N001	21.0000
	OK	C							0	21.000	21.000	42.0000												

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 _____ Date 5/10/01
Hydrologist "Ok" indicates insignificant variation

Site : MON01 MONUMENT VALLE Test Data Date Range : 2/1/2001 to 3/1/2001 Older Data Only Used for Baseline Data 123 Chemical Records 821 History Records

LOC. ID.	ERR. TYPE FLAG	PARAM CODE / UNITS	ANOMALOUS TEST DATA POINT: LOG DATE	SAMPLE	VALUE	FLAGS	UNCERTAINTY	DETLIM	# OF SAMP. / %NON DETEC	ALL TIME MINIMUMS / ALL TIME MAXIMUMS		LOWER BOUND / UPPER BOUND	3 MOST RECENT SAMPLING EVENTS: LOG DATE	SAMPLE	VALUE	FLAGS	UNCERTAINTY	DETLIM	LOG DATE	SAMPLE	VALUE	FLAGS	UNCERTAINTY	DETLIM	LOG DATE	SAMPLE	VALUE	FLAGS	UNCERTAINTY	DET LIM
0765	5	NH4	2/27/2001	0001	171.0000			0.0047	5	165.000	180.000	173.2577	8/15/2000	0001	180.0000				8/27/1999	0001	198.0000				8/27/1998	0001	198.0000			
	OK	mg/L							0	188.000	198.000	210.1866																		
	5	ORP	2/27/2001	N001	166.0000				5	82.000	115.000	187.1914	8/15/2000	N001	208.0000				8/27/1999	N001	168.0000				8/27/1998	N001	115.0000			
	OK	mV							0	168.000	208.000	254.4714																		
	6	SO4	2/27/2001	0001	843.0000			0.2356	5	711.000	819.000	615.3849	8/15/2000	0001	819.0000				8/27/1999	0001	711.0000				8/27/1998	0001	856.0000			
	OK	mg/L							0	986.000	986.000	816.4030																		
0767	5	Chloride	2/22/2001	0001	5.2100			0.024	5	4.950	5.240	5.2448	8/24/2000	0001	5.4400				8/25/1999	0001	5.8600				8/27/1998	0001	4.9500			
	OK	mg/L							0	5.440	5.860	6.0947																		
	5	ORP	2/22/2001	N001	-200.0000				5	-191.000	-165.000	0.0000	8/24/2000	N001	-165.0000				8/25/1999	N001	-103.0000				8/27/1998	N001	-78.0000			
	OK	mV							0	25.000	25.000	-80.8696																		
	6	SO4	2/22/2001	0001	28.9000			0.0589	5	26.900	27.900	26.1393	8/24/2000	0001	28.2000				8/25/1999	0001	26.9000				8/27/1998	0001	27.9000			
	OK	mg/L							0	28.500	29.600	28.6030																		
0768	6	Chloride	2/22/2001	0001	91.6000			0.024	5	78.900	85.200	66.6976	8/24/2000	0001	85.2000				8/25/1999	0001	78.9000				8/28/1998	0001	98.6000			
	OK	mg/L							0	106.000	106.000	84.3314																		
	5	ORP	2/22/2001	N001	-222.0000				5	-230.000	-197.000	0.0000	8/24/2000	N001	-183.0000				8/25/1999	N001	-160.0000				8/28/1998	N001	-197.0000			
	OK	mV							0	-86.000	-86.000	-122.0966																		
	6	SO4	2/22/2001	0001	716.0000			0.0589	5	680.000	688.000	593.8459	8/24/2000	0001	680.0000				8/25/1999	0001	688.0000				8/28/1998	0001	794.0000			
	OK	mg/L							0	862.000	862.000	659.4511																		
0770	6	SO4	2/21/2001	0001	330.0000			0.0589	4	331.000	362.000	295.3881	8/15/2000	0001	331.0000				8/25/1999	0001	331.0000				8/26/1998	0001	362.0000			
	OK	mg/L							0	389.000	389.000	326.0962																		
0772	5	NH4	2/21/2001	0001	7.6100			0.0047	5	9.070	11.900	8.8068	8/15/2000	0001	13.3000				8/26/1999	0001	16.4000				8/26/1998	0001	9.0700			
	OK	mg/L							0	17.700	17.700	18.4493																		
	3	Zobell T	2/21/2001	N001	10.1000				1	20.400	20.400	10.2000	8/15/2000	N001	20.4000				8/15/2000	N001	20.4000				8/15/2000	N001	20.4000			
	OK	C							0	20.400	20.400	40.8000																		
0774	6	Chloride	2/27/2001	0001	6.0200			0.024	5	5.530	6.220	4.3341	8/16/2000	0001	5.5300				8/25/1999	0001	6.2200				8/26/1998	0001	6.8900			
	OK	mg/L							0	8.770	8.770	5.3783																		

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 _____ Date 5/10/01

Hydrologist "OK" indicates insignificant variation

SUSPECTED ANOMALIES REPORT

REPORT DATE: 5/10/2001 TIME: 10:01:44 AM

Site : MON01 MONUMENT VALLE Test Data Date Range : 2/1/2001 to 3/1/2001 Older Data Only Used for Baseline Data 123 Chemical Records 821 History Records

LOC. ID.	ERR. TYPE FLAG	PARAM CODE / UNITS	ANOMALOUS TEST DATA POINT: LOG DATE	SAMPLE	VALUE	FLAGS	UNCERTAINTY	DETLIM	# OF SAMP. / %NON DETEC	ALL TIME MINIMUMS / ALL TIME MAXIMUMS		LOWER BOUND / UPPER BOUND	3 MOST RECENT SAMPLING EVENTS: LOG DATE	SAMPLE	VALUE	FLAGS	UNCERTAINTY	DETLIM	LOG DATE	SAMPLE	VALUE	FLAGS	UNCERTAINTY	DETLIM	LOG DATE	SAMPLE	VALUE	FLAGS	UNCERTAINTY	DET LIM
0774	6	NO3	2/27/2001	0001	29.5000				5	11.900	12.900	13.6827	8/16/2000	0001	15.2000				8/25/1999	0001	13.3000				8/26/1998	0001	12.9000			
	*	mg/L			0.1256				0	14.700	15.200	16.5937																		
	6	SO4	2/27/2001	0001	65.7000				5	55.000	59.600	48.9266	8/16/2000	0001	59.6000				8/25/1999	0001	55.0000				8/26/1998	0001	62.8000			
	OK	mg/L			0.0589				0	67.000	70.100	60.0525																		
0777	6	NH4	2/22/2001	0001	436.0000				4	208.000	229.000	232.2446	8/15/2000	0001	241.0000				8/27/1999	0001	292.0000				8/27/1998	0001	229.0000			
	OK	mg/L			0.0047				0	241.000	292.000	314.8314																		
	5	ORP	2/22/2001	N001	168.0000				4	-15.000	44.000	199.1757	8/15/2000	N001	207.0000				8/27/1999	N001	199.0000				8/27/1998	N001	-15.0000			
	OK	mV							0	199.000	207.000	348.8212																		
	6	SO4	2/22/2001	0001	1010.0000				4	947.000	950.000	841.6512	8/15/2000	0001	950.0000				8/27/1999	0001	947.0000				8/27/1998	0001	1110.0000			
	OK	mg/L			0.2356				0	1030.000	1110.000	976.7129																		
	3	Zobell T	2/22/2001	N001	11.0000				1	23.400	23.400	11.7000	8/15/2000	N001	23.4000				8/15/2000	N001	23.4000				8/15/2000	N001	23.4000			
	OK	C							0	23.400	23.400	46.8000																		

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 _____ Date 5/10/01

Hydrologist "Ok" indicates insignificant variation

DATA REVIEW CHECKSHEET

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ANOMALOUS DATA REVIEW CHECKSHEET

SITE: Monument Valley SAMPLING DATA: Groundwater

REVIEWER(s): DAVID Miller (NAME (print)) (SIGNATURE) 5/10/01 (DATE)

SITE HYDROLOGIST: Ken Kamp (NAME (print)) (SIGNATURE) 6/25/01 (DATE)

DATE OF REVIEW: 5/10/01

LOC. NO.	ANALYTE	TYPE OF ANOMALY	DISPOSITION
655	Chloride	Low	Compare to next round
774	NO_3	High	Compare to next round

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ANALYTICAL LABORATORY RESULTS

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GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:27 a

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity as CaCO3	mg/L	0201	02/27/2001	0001			208			#	-	-
	mg/L	0201	02/27/2001	N001			209			#	-	-
	mg/L	0604	02/21/2001	0001	AL	C	186			#	-	-
	mg/L	0604	02/21/2001	N001	AL	C	171			#	-	-
	mg/L	0605	02/21/2001	0001	AL	C	217			#	-	-
	mg/L	0605	02/21/2001	N001	AL	C	218			#	-	-
	mg/L	0606	02/21/2001	0001	AL	D	286		L	#	-	-
	mg/L	0606	02/21/2001	N001	AL	D	230		L	#	-	-
	mg/L	0648	02/26/2001	0001	AL	N	246			#	-	-
	mg/L	0648	02/26/2001	N001	AL	N	272			#	-	-
	mg/L	0649	02/26/2001	0001	AL	N	248			#	-	-
	mg/L	0649	02/26/2001	N001	AL	N	242			#	-	-
	mg/L	0650	02/27/2001	0001	AL	D	191			#	-	-
	mg/L	0650	02/27/2001	N001	AL	D	200			#	-	-
	mg/L	0653	02/27/2001	0001	AL	D	197			#	-	-
	mg/L	0653	02/27/2001	N001	AL	D	200			#	-	-
	mg/L	0655	02/26/2001	0001	AL	D	267		L	#	-	-
	mg/L	0655	02/26/2001	N001	AL	D	255		L	#	-	-
	mg/L	0656	02/21/2001	0001	AL	D	227			#	-	-
	mg/L	0656	02/21/2001	N001	AL	D	239			#	-	-
	mg/L	0662	02/27/2001	0001	AL	D	211			#	-	-
	mg/L	0662	02/27/2001	N001	AL	D	213			#	-	-
	mg/L	0669	02/26/2001	0001	AL	D	190			#	-	-
	mg/L	0669	02/26/2001	N001	AL	D	196			#	-	-
	mg/L	0760	02/22/2001	0001	AL	D	161			#	-	-
	mg/L	0760	02/22/2001	N001	AL	D	160			#	-	-
	mg/L	0761	02/21/2001	0001	AL	D	170			#	-	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:27 a

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity as CaCO3	mg/L	0761	02/21/2001	N001	AL	D	173			#	-	-
	mg/L	0762	02/21/2001	0001	AL	D	210			#	-	-
	mg/L	0762	02/21/2001	N001	AL	D	216			#	-	-
	mg/L	0764	02/22/2001	0001	AL	D	210		L	#	-	-
	mg/L	0764	02/22/2001	N001	AL	D	212		L	#	-	-
	mg/L	0765	02/27/2001	0001	AL	D	247			#	-	-
	mg/L	0765	02/27/2001	N001	AL	D	249			#	-	-
	mg/L	0767	02/22/2001	0001	AL	D	178			#	-	-
	mg/L	0767	02/22/2001	N001	AL	D	165			#	-	-
	mg/L	0768	02/22/2001	0001	AL	D	180			#	-	-
	mg/L	0768	02/22/2001	N001	AL	D	175			#	-	-
	mg/L	0770	02/21/2001	0001	AL	D	224			#	-	-
	mg/L	0770	02/21/2001	N001	AL	D	222			#	-	-
	mg/L	0772	02/21/2001	0001	AL	O	254			#	-	-
	mg/L	0772	02/21/2001	N001	AL	O	245			#	-	-
	mg/L	0774	02/27/2001	0001	AL	O	163			#	-	-
	mg/L	0774	02/27/2001	N001	AL	O	168			#	-	-
	mg/L	0777	02/22/2001	0001	AL	D	277			#	-	-
	mg/L	0777	02/22/2001	N001	AL	D	313			#	-	-
	mg/L	0778	02/27/2001	0001	AL	N	271			#	-	-
	mg/L	0778	02/27/2001	N001	AL	N	275			#	-	-
Ammonium	mg/L	0201	02/27/2001	0001			0.0262	B		#	0.0047	-
	mg/L	0201	02/27/2001	0002			0.0226	B		#	0.0047	-
	mg/L	0606	02/21/2001	0001	AL	D	170.000		L	#	0.0047	-
	mg/L	0655	02/26/2001	0001	AL	D	54.800		L	#	0.0047	-
	mg/L	0656	02/21/2001	0001	AL	D	66.800			#	0.0047	-
	mg/L	0765	02/27/2001	0001	AL	D	171.000			#	0.0047	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:27 a

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonium	mg/L	0765	02/27/2001	0002	AL	D	174.000			#	0.0047	-
	mg/L	0770	02/21/2001	0001	AL	D	51.500			#	0.0047	-
	mg/L	0772	02/21/2001	0001	AL	O	7.610			#	0.0047	-
	mg/L	0772	02/21/2001	0002	AL	O	7.790			#	0.0047	-
	mg/L	0774	02/27/2001	0001	AL	O	0.0047	U		#	0.0047	-
	mg/L	0777	02/22/2001	0001	AL	D	436.000			#	0.0047	-
Arsenic	mg/L	0201	02/27/2001	0001			0.0038	B		#	0.0002	-
	mg/L	0201	02/27/2001	0002			0.0038	B		#	0.0002	-
Cadmium	mg/L	0201	02/27/2001	0001			0.00081	B	U	#	0.0003	-
	mg/L	0201	02/27/2001	0002			0.00082	B	U	#	0.0003	-
Calcium	mg/L	0201	02/27/2001	0001			24.000			#	0.0757	-
	mg/L	0201	02/27/2001	0002			23.600			#	0.0757	-
Chloride	mg/L	0201	02/27/2001	0001			21.700			#	0.024	-
	mg/L	0201	02/27/2001	0002			21.300			#	0.024	-
	mg/L	0604	02/21/2001	0001	AL	C	11.300			#	0.024	-
	mg/L	0605	02/21/2001	0001	AL	C	150.000			#	0.096	-
	mg/L	0606	02/21/2001	0001	AL	D	15.600		L	#	0.096	-
	mg/L	0648	02/26/2001	0001	AL	N	37.100			#	0.096	-
	mg/L	0649	02/26/2001	0001	AL	N	19.200			#	0.6	-
	mg/L	0650	02/27/2001	0001	AL	D	8.940			#	0.024	-
	mg/L	0653	02/27/2001	0001	AL	D	34.700			#	0.096	-
	mg/L	0655	02/26/2001	0001	AL	D	4.750		L	#	0.096	-
	mg/L	0656	02/21/2001	0001	AL	D	17.700			#	0.024	-
	mg/L	0662	02/27/2001	0001	AL	D	7.970			#	0.024	-
	mg/L	0669	02/26/2001	0001	AL	D	11.100			#	0.024	-
	mg/L	0760	02/22/2001	0001	AL	D	9.620			#	0.024	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:27 a

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Chloride	mg/L	0761	02/21/2001	0001	AL	D	15.400			#	0.024	-
	mg/L	0762	02/21/2001	0001	AL	D	77.300			#	0.096	-
	mg/L	0764	02/22/2001	0001	AL	D	14.000		L	#	0.024	-
	mg/L	0765	02/27/2001	0001	AL	D	21.900			#	0.096	-
	mg/L	0765	02/27/2001	0002	AL	D	21.900			#	0.096	-
	mg/L	0767	02/22/2001	0001	AL	D	5.210			#	0.024	-
	mg/L	0768	02/22/2001	0001	AL	D	91.600			#	0.024	-
	mg/L	0770	02/21/2001	0001	AL	D	17.200			#	0.024	-
	mg/L	0772	02/21/2001	0001	AL	O	16.900			#	0.024	-
	mg/L	0772	02/21/2001	0002	AL	O	16.800			#	0.024	-
	mg/L	0774	02/27/2001	0001	AL	O	6.020			#	0.024	-
	mg/L	0777	02/22/2001	0001	AL	D	22.200			#	0.096	-
	mg/L	0778	02/27/2001	0001	AL	N	3.140			#	0.096	-
Gross Alpha	pCi/L	0201	02/27/2001	0001			4.0	U		#	4.03	± 2.49
	pCi/L	0201	02/27/2001	0002			4.01	U		#	4.01	± 2.57
Gross Beta	pCi/L	0201	02/27/2001	0001			4.32			#	3.99	± 2.50
	pCi/L	0201	02/27/2001	0002			3.9	U		#	3.99	± 2.36
Lead-210	pCi/L	0201	02/27/2001	0001			1.22	U		#	1.22	± 0.72
	pCi/L	0201	02/27/2001	0002			1.25	U		#	1.25	± 0.74
Magnesium	mg/L	0201	02/27/2001	0001			15.200			#	0.0052	-
	mg/L	0201	02/27/2001	0002			14.900			#	0.0052	-
Nitrate	mg/L	0201	02/27/2001	0001			4.890			#	0.0314	-
	mg/L	0201	02/27/2001	0002			5.010			#	0.0314	-
	mg/L	0604	02/21/2001	0001	AL	C	0.304	B		#	0.0314	-
	mg/L	0605	02/21/2001	0001	AL	C	0.0314	U		#	0.0314	-
	mg/L	0606	02/21/2001	0001	AL	D	865.000		L	#	3.14	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:27 a

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Nitrate	mg/L	0648	02/26/2001	0001	AL	N	321.000			#	0.785	-
	mg/L	0649	02/26/2001	0001	AL	N	885.000			#	3.14	-
	mg/L	0650	02/27/2001	0001	AL	D	1.270			#	0.0314	-
	mg/L	0653	02/27/2001	0001	AL	D	190.000			#	0.1256	-
	mg/L	0655	02/26/2001	0001	AL	D	374.000		L	#	0.785	-
	mg/L	0656	02/21/2001	0001	AL	D	177.000			#	0.1256	-
	mg/L	0662	02/27/2001	0001	AL	D	52.200			#	0.1256	-
	mg/L	0669	02/26/2001	0001	AL	D	64.400			#	0.0314	-
	mg/L	0760	02/22/2001	0001	AL	D	0.0314	U		#	0.0314	-
	mg/L	0761	02/21/2001	0001	AL	D	90.200			#	0.0314	-
	mg/L	0762	02/21/2001	0001	AL	D	128.000			#	0.1256	-
	mg/L	0764	02/22/2001	0001	AL	D	144.000		L	#	0.1256	-
	mg/L	0765	02/27/2001	0001	AL	D	644.000			#	3.14	-
	mg/L	0765	02/27/2001	0002	AL	D	644.000			#	3.14	-
	mg/L	0767	02/22/2001	0001	AL	D	0.0314	U		#	0.0314	-
	mg/L	0768	02/22/2001	0001	AL	D	0.0314	U		#	0.0314	-
	mg/L	0770	02/21/2001	0001	AL	D	147.000			#	0.1256	-
	mg/L	0772	02/21/2001	0001	AL	O	11.000			#	0.0314	-
	mg/L	0772	02/21/2001	0002	AL	O	11.400			#	0.0314	-
	mg/L	0774	02/27/2001	0001	AL	O	29.500			#	0.1256	-
	mg/L	0777	02/22/2001	0001	AL	D	809.000			#	3.14	-
	mg/L	0778	02/27/2001	0001	AL	N	625.000			#	3.14	-
ORP of Zobell Solution	mV	0201	02/27/2001	N001			256			#	-	-
	mV	0604	02/21/2001	N001	AL	C	234			#	-	-
	mV	0605	02/21/2001	N001	AL	C	234			#	-	-
	mV	0606	02/21/2001	N001	AL	D	226		L	#	-	-
	mV	0648	02/26/2001	N001	AL	N	259			#	-	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:27 a

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
ORP of Zobell Solution	mV	0649	02/26/2001	N001	AL	N	259			#	-	-
	mV	0650	02/27/2001	N001	AL	D	223			#	-	-
	mV	0653	02/27/2001	N001	AL	D	224			#	-	-
	mV	0655	02/26/2001	N001	AL	D	219		L	#	-	-
	mV	0656	02/21/2001	N001	AL	D	229			#	-	-
	mV	0662	02/27/2001	N001	AL	D	213			#	-	-
	mV	0669	02/26/2001	N001	AL	D	226			#	-	-
	mV	0760	02/22/2001	N001	AL	D	235			#	-	-
	mV	0761	02/21/2001	N001	AL	D	224			#	-	-
	mV	0762	02/21/2001	N001	AL	D	226			#	-	-
	mV	0764	02/22/2001	N001	AL	D	250		L	#	-	-
	mV	0765	02/27/2001	N001	AL	D	221			#	-	-
	mV	0767	02/22/2001	N001	AL	D	235			#	-	-
	mV	0768	02/22/2001	N001	AL	D	235			#	-	-
	mV	0770	02/21/2001	N001	AL	D	229			#	-	-
	mV	0772	02/21/2001	N001	AL	O	232			#	-	-
	mV	0774	02/27/2001	N001	AL	O	219			#	-	-
	mV	0777	02/22/2001	N001	AL	D	231			#	-	-
	mV	0778	02/27/2001	N001	AL	N	254			#	-	-
Oxidation Reduction Potenti	mV	0201	02/27/2001	N001			-3			#	-	-
	mV	0604	02/21/2001	N001	AL	C	-99			#	-	-
	mV	0605	02/21/2001	N001	AL	C	-71			#	-	-
	mV	0606	02/21/2001	N001	AL	D	190		L	#	-	-
	mV	0648	02/26/2001	N001	AL	N	201			#	-	-
	mV	0649	02/26/2001	N001	AL	N	166			#	-	-
	mV	0650	02/27/2001	N001	AL	D	151			#	-	-
	mV	0653	02/27/2001	N001	AL	D	161			#	-	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:27 a

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potenti	mV	0655	02/26/2001	N001	AL	D	151		L	#	-	-
	mV	0656	02/21/2001	N001	AL	D	119			#	-	-
	mV	0662	02/27/2001	N001	AL	D	147			#	-	-
	mV	0669	02/26/2001	N001	AL	D	160			#	-	-
	mV	0760	02/22/2001	N001	AL	D	-231			#	-	-
	mV	0761	02/21/2001	N001	AL	D	155			#	-	-
	mV	0762	02/21/2001	N001	AL	D	138			#	-	-
	mV	0764	02/22/2001	N001	AL	D	227		L	#	-	-
	mV	0765	02/27/2001	N001	AL	D	166			#	-	-
	mV	0767	02/22/2001	N001	AL	D	-200			#	-	-
	mV	0768	02/22/2001	N001	AL	D	-222			#	-	-
	mV	0770	02/21/2001	N001	AL	D	157			#	-	-
	mV	0772	02/21/2001	N001	AL	O	122			#	-	-
	mV	0774	02/27/2001	N001	AL	O	166			#	-	-
	mV	0777	02/22/2001	N001	AL	D	168			#	-	-
	mV	0778	02/27/2001	N001	AL	N	77			#	-	-
pH	s.u.	0201	02/27/2001	N001			8.61			#	-	-
	s.u.	0604	02/21/2001	N001	AL	C	8.29			#	-	-
	s.u.	0605	02/21/2001	N001	AL	C	7.88			#	-	-
	s.u.	0606	02/21/2001	N001	AL	D	7.1		L	#	-	-
	s.u.	0648	02/26/2001	N001	AL	N	7.52			#	-	-
	s.u.	0649	02/26/2001	N001	AL	N	7.13			#	-	-
	s.u.	0650	02/27/2001	N001	AL	D	8.41			#	-	-
	s.u.	0653	02/27/2001	N001	AL	D	7.48			#	-	-
	s.u.	0655	02/26/2001	N001	AL	D	7.23		L	#	-	-
	s.u.	0656	02/21/2001	N001	AL	D	7.75			#	-	-
	s.u.	0662	02/27/2001	N001	AL	D	7.31			#	-	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:27 a

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
pH	s.u.	0669	02/26/2001	N001	AL	D	7.68			#	-	-
	s.u.	0760	02/22/2001	N001	AL	D	8.44			#	-	-
	s.u.	0761	02/21/2001	N001	AL	D	7.41			#	-	-
	s.u.	0762	02/21/2001	N001	AL	D	7.74			#	-	-
	s.u.	0764	02/22/2001	N001	AL	D	8.83		L	#	-	-
	s.u.	0765	02/27/2001	N001	AL	D	7.4			#	-	-
	s.u.	0767	02/22/2001	N001	AL	D	8.36			#	-	-
	s.u.	0768	02/22/2001	N001	AL	D	8.02			#	-	-
	s.u.	0770	02/21/2001	N001	AL	D	7.6			#	-	-
	s.u.	0772	02/21/2001	N001	AL	O	8.26			#	-	-
	s.u.	0774	02/27/2001	N001	AL	O	7.75			#	-	-
	s.u.	0777	02/22/2001	N001	AL	D	7.37			#	-	-
	s.u.	0778	02/27/2001	N001	AL	N	7.29			#	-	-
Potassium	mg/L	0201	02/27/2001	0001			3.020			#	0.0091	-
	mg/L	0201	02/27/2001	0002			3.020			#	0.0091	-
Radium-226	pCi/L	0201	02/27/2001	0001			0.16	U		#	0.16	± 0.09
	pCi/L	0201	02/27/2001	0002			0.17	U		#	0.17	± 0.10
Radium-228	pCi/L	0201	02/27/2001	0001			0.84	U		#	0.84	± 0.49
	pCi/L	0201	02/27/2001	0002			0.89	U		#	0.89	± 0.52
Selenium	mg/L	0201	02/27/2001	0001			0.004	B		#	0.0001	-
	mg/L	0201	02/27/2001	0002			0.004	B		#	0.0001	-
Sodium	mg/L	0201	02/27/2001	0001			106.000			#	0.0183	-
	mg/L	0201	02/27/2001	0002			105.000			#	0.0183	-
Specific Conductance	umhos/cm	0201	02/27/2001	N001			708			#	-	-
	umhos/cm	0604	02/21/2001	N001	AL	C	618			#	-	-
	umhos/cm	0605	02/21/2001	N001	AL	C	2840			#	-	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:27 a

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Specific Conductance	umhos/cm	0606	02/21/2001	N001	AL	D	2650		L	#	-	-
	umhos/cm	0648	02/26/2001	N001	AL	N	3330			#	-	-
	umhos/cm	0649	02/26/2001	N001	AL	N	4820			#	-	-
	umhos/cm	0650	02/27/2001	N001	AL	D	490			#	-	-
	umhos/cm	0653	02/27/2001	N001	AL	D	3070			#	-	-
	umhos/cm	0655	02/26/2001	N001	AL	D	3720		L	#	-	-
	umhos/cm	0656	02/21/2001	N001	AL	D	1453			#	-	-
	umhos/cm	0662	02/27/2001	N001	AL	D	1100			#	-	-
	umhos/cm	0669	02/26/2001	N001	AL	D	840			#	-	-
	umhos/cm	0760	02/22/2001	N001	AL	D	524			#	-	-
	umhos/cm	0761	02/21/2001	N001	AL	D	1163			#	-	-
	umhos/cm	0762	02/21/2001	N001	AL	D	2710			#	-	-
	umhos/cm	0764	02/22/2001	N001	AL	D	1277		L	#	-	-
	umhos/cm	0765	02/27/2001	N001	AL	D	3100			#	-	-
	umhos/cm	0767	02/22/2001	N001	AL	D	407			#	-	-
	umhos/cm	0768	02/22/2001	N001	AL	D	1833			#	-	-
	umhos/cm	0770	02/21/2001	N001	AL	D	1396			#	-	-
	umhos/cm	0772	02/21/2001	N001	AL	O	866			#	-	-
	umhos/cm	0774	02/27/2001	N001	AL	O	372			#	-	-
	umhos/cm	0777	02/22/2001	N001	AL	D	3650			#	-	-
	umhos/cm	0778	02/27/2001	N001	AL	N	3130			#	-	-
Strontium	mg/L	0201	02/27/2001	0001			0.272			#	0.0001	-
	mg/L	0201	02/27/2001	0002			0.272			#	0.0001	-
Sulfate	mg/L	0201	02/27/2001	0001			126.000			#	0.0589	-
	mg/L	0201	02/27/2001	0002			124.000			#	0.0589	-
	mg/L	0604	02/21/2001	0001	AL	C	109.000			#	0.0589	-
	mg/L	0605	02/21/2001	0001	AL	C	1300.000			#	0.2356	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:27 a

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Sulfate	mg/L	0606	02/21/2001	0001	AL	D	525.000		L	#	0.2356	-
	mg/L	0648	02/26/2001	0001	AL	N	1690.000			#	0.2356	-
	mg/L	0649	02/26/2001	0001	AL	N	1710.000			#	1.4725	-
	mg/L	0650	02/27/2001	0001	AL	D	28.400			#	0.0589	-
	mg/L	0653	02/27/2001	0001	AL	D	1610.000			#	0.2356	-
	mg/L	0655	02/26/2001	0001	AL	D	1980.000		L	#	0.2356	-
	mg/L	0656	02/21/2001	0001	AL	D	290.000			#	0.0589	-
	mg/L	0662	02/27/2001	0001	AL	D	389.000			#	0.0589	-
	mg/L	0669	02/26/2001	0001	AL	D	176.000			#	0.0589	-
	mg/L	0760	02/22/2001	0001	AL	D	87.600			#	0.0589	-
	mg/L	0761	02/21/2001	0001	AL	D	518.000			#	0.0589	-
	mg/L	0762	02/21/2001	0001	AL	D	1200.000			#	0.2356	-
	mg/L	0764	02/22/2001	0001	AL	D	396.000		L	#	0.0589	-
	mg/L	0765	02/27/2001	0001	AL	D	843.000			#	0.2356	-
	mg/L	0765	02/27/2001	0002	AL	D	833.000			#	0.2356	-
	mg/L	0767	02/22/2001	0001	AL	D	28.900			#	0.0589	-
	mg/L	0768	02/22/2001	0001	AL	D	716.000			#	0.0589	-
	mg/L	0770	02/21/2001	0001	AL	D	330.000			#	0.0589	-
	mg/L	0772	02/21/2001	0001	AL	O	139.000			#	0.0589	-
	mg/L	0772	02/21/2001	0002	AL	O	138.000			#	0.0589	-
	mg/L	0774	02/27/2001	0001	AL	O	65.700			#	0.0589	-
	mg/L	0777	02/22/2001	0001	AL	D	1010.000			#	0.2356	-
	mg/L	0778	02/27/2001	0001	AL	N	846.000			#	0.2356	-
Temperature	C	0201	02/27/2001	N001			17			#	-	-
	C	0604	02/21/2001	N001	AL	C	15.4			#	-	-
	C	0605	02/21/2001	N001	AL	C	14.3			#	-	-
	C	0606	02/21/2001	N001	AL	D	16.6		L	#	-	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:27 a

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Temperature	C	0648	02/26/2001	N001	AL	N	16			#	-	-
	C	0649	02/26/2001	N001	AL	N	16.7			#	-	-
	C	0650	02/27/2001	N001	AL	D	16.8			#	-	-
	C	0653	02/27/2001	N001	AL	D	16.5			#	-	-
	C	0655	02/26/2001	N001	AL	D	16.8		L	#	-	-
	C	0656	02/21/2001	N001	AL	D	16.4			#	-	-
	C	0662	02/27/2001	N001	AL	D	17			#	-	-
	C	0669	02/26/2001	N001	AL	D	16.5			#	-	-
	C	0760	02/22/2001	N001	AL	D	16.3			#	-	-
	C	0761	02/21/2001	N001	AL	D	16.5			#	-	-
	C	0762	02/21/2001	N001	AL	D	16.5			#	-	-
	C	0764	02/22/2001	N001	AL	D	15		L	#	-	-
	C	0765	02/27/2001	N001	AL	D	16.7			#	-	-
	C	0767	02/22/2001	N001	AL	D	15.6			#	-	-
	C	0768	02/22/2001	N001	AL	D	15.9			#	-	-
	C	0770	02/21/2001	N001	AL	D	16			#	-	-
	C	0772	02/21/2001	N001	AL	O	14.5			#	-	-
	C	0774	02/27/2001	N001	AL	O	17.4			#	-	-
	C	0777	02/22/2001	N001	AL	D	16.5			#	-	-
	C	0778	02/27/2001	N001	AL	N	16.3			#	-	-
Temperature of Zobell Soluti	C	0201	02/27/2001	N001			5.2			#	-	-
	C	0604	02/21/2001	N001	AL	C	9.9			#	-	-
	C	0605	02/21/2001	N001	AL	C	9.9			#	-	-
	C	0606	02/21/2001	N001	AL	D	14.5		L	#	-	-
	C	0648	02/26/2001	N001	AL	N	4.3			#	-	-
	C	0649	02/26/2001	N001	AL	N	4.3			#	-	-
	C	0650	02/27/2001	N001	AL	D	15.2			#	-	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:27 a

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Temperature of Zobell Soluti	C	0653	02/27/2001	N001	AL	D	8			#	-	-
	C	0655	02/26/2001	N001	AL	D	14.2		L	#	-	-
	C	0656	02/21/2001	N001	AL	D	11.9			#	-	-
	C	0662	02/27/2001	N001	AL	D	22			#	-	-
	C	0669	02/26/2001	N001	AL	D	13.1			#	-	-
	C	0760	02/22/2001	N001	AL	D	8.8			#	-	-
	C	0761	02/21/2001	N001	AL	D	16			#	-	-
	C	0762	02/21/2001	N001	AL	D	14.5			#	-	-
	C	0764	02/22/2001	N001	AL	D	8.5		L	#	-	-
	C	0765	02/27/2001	N001	AL	D	16.5			#	-	-
	C	0767	02/22/2001	N001	AL	D	8.7			#	-	-
	C	0768	02/22/2001	N001	AL	D	8.8			#	-	-
	C	0770	02/21/2001	N001	AL	D	11.9			#	-	-
	C	0772	02/21/2001	N001	AL	O	10.1			#	-	-
	C	0774	02/27/2001	N001	AL	O	18			#	-	-
	C	0777	02/22/2001	N001	AL	D	11			#	-	-
	C	0778	02/27/2001	N001	AL	N	8.9			#	-	-
Total Dissolved Solids	mg/L	0201	02/27/2001	0001			395			#	10	-
	mg/L	0201	02/27/2001	0002			415			#	10	-
Turbidity	NTU	0201	02/27/2001	N001			1.98			#	-	-
	NTU	0604	02/21/2001	N001	AL	C	7.24			#	-	-
	NTU	0605	02/21/2001	N001	AL	C	8.76			#	-	-
	NTU	0606	02/21/2001	N001	AL	D	30.6		L	#	-	-
	NTU	0648	02/26/2001	N001	AL	N	0.84			#	-	-
	NTU	0649	02/26/2001	N001	AL	N	1.25			#	-	-
	NTU	0650	02/27/2001	N001	AL	D	0.32			#	-	-
	NTU	0653	02/27/2001	N001	AL	D	0.31			#	-	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:27 a

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Turbidity	NTU	0655	02/26/2001	N001	AL	D	42.8		L	#	-	-
	NTU	0656	02/21/2001	N001	AL	D	5.03			#	-	-
	NTU	0662	02/27/2001	N001	AL	D	7.1			#	-	-
	NTU	0669	02/26/2001	N001	AL	D	0.39			#	-	-
	NTU	0760	02/22/2001	N001	AL	D	0.4			#	-	-
	NTU	0761	02/21/2001	N001	AL	D	4.98			#	-	-
	NTU	0762	02/21/2001	N001	AL	D	8.4			#	-	-
	NTU	0764	02/22/2001	N001	AL	D	153		L	#	-	-
	NTU	0765	02/27/2001	N001	AL	D	0.35			#	-	-
	NTU	0767	02/22/2001	N001	AL	D	0.21			#	-	-
	NTU	0768	02/22/2001	N001	AL	D	8.46			#	-	-
	NTU	0770	02/21/2001	N001	AL	D	3.8			#	-	-
	NTU	0772	02/21/2001	N001	AL	O	9.04			#	-	-
	NTU	0774	02/27/2001	N001	AL	O	8.85			#	-	-
	NTU	0777	02/22/2001	N001	AL	D	24.6			#	-	-
	NTU	0778	02/27/2001	N001	AL	N	1.8			#	-	-
Uranium	mg/L	0201	02/27/2001	0001			0.0027			#	0.0001	-
	mg/L	0201	02/27/2001	0002			0.0027			#	0.0001	-
	mg/L	0774	02/27/2001	0001	AL	O	0.0724			#	0.0001	-
Vanadium	mg/L	0201	02/27/2001	0001			0.0034	B		#	0.0003	-
	mg/L	0201	02/27/2001	0002			0.0035	B		#	0.0003	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:27 a

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY

RECORDS: SELECTED FROM USEE200 WHERE site_code='MON01' AND quality_assurance = TRUE AND (NOT (data_validation_qualifiers LIKE "R" OR data_validation_qualifiers LIKE "X") OR IsNull(data_validation_qualifiers)) AND DATE_SAMPLED between #2/1/2001# and #3/1/2001#

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.				

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

ANALYTE	SITE_CODE	LOCATION_CODE	DATE	SAMPLE_ID	UNIT	RESULT	LAB_QUAL	DATA_VAL_QUAL	DETECT_LIMIT	UNCERTAINTY	SAMPLE_TYPE
Ammonium	MON01	0999	02/21/2001	0001	mg/L	0.0047	U		0.0047		E
Ammonium	MON01	0999	02/28/2001	0001	mg/L	0.0047	U		0.0047		E
Chloride	MON01	0999	02/21/2001	0001	mg/L	0.0357	B		0.024		E
Chloride	MON01	0999	02/28/2001	0001	mg/L	0.024	U		0.024		E
Nitrate	MON01	0999	02/21/2001	0001	mg/L	0.0314	U		0.0314		E
Nitrate	MON01	0999	02/28/2001	0001	mg/L	0.0314	U		0.0314		E
Sulfate	MON01	0999	02/21/2001	0001	mg/L	0.0651	B		0.0589		E
Sulfate	MON01	0999	02/28/2001	0001	mg/L	0.0589	U		0.0589		E

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TIME/CONCENTRATION PLOTS

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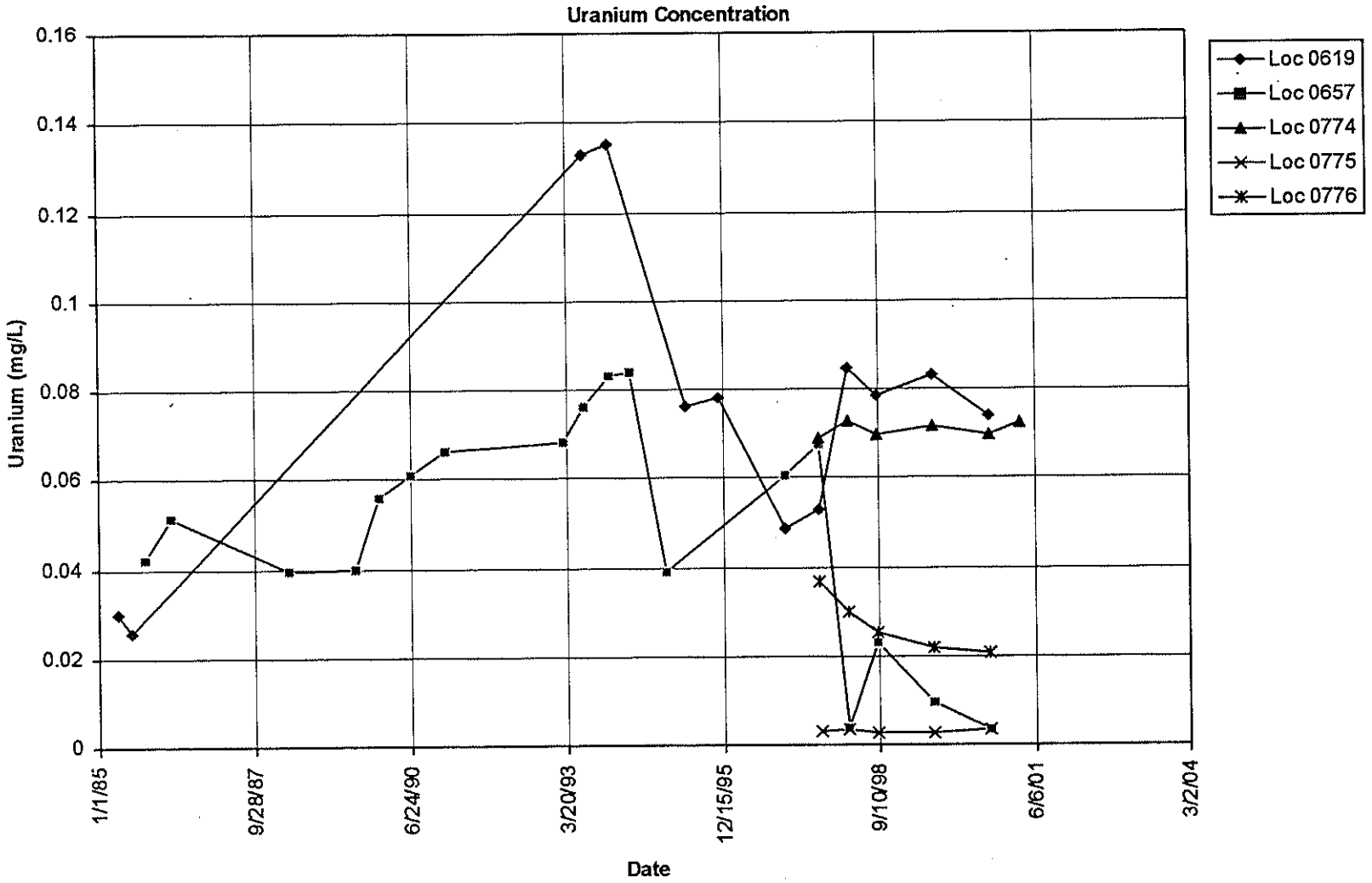
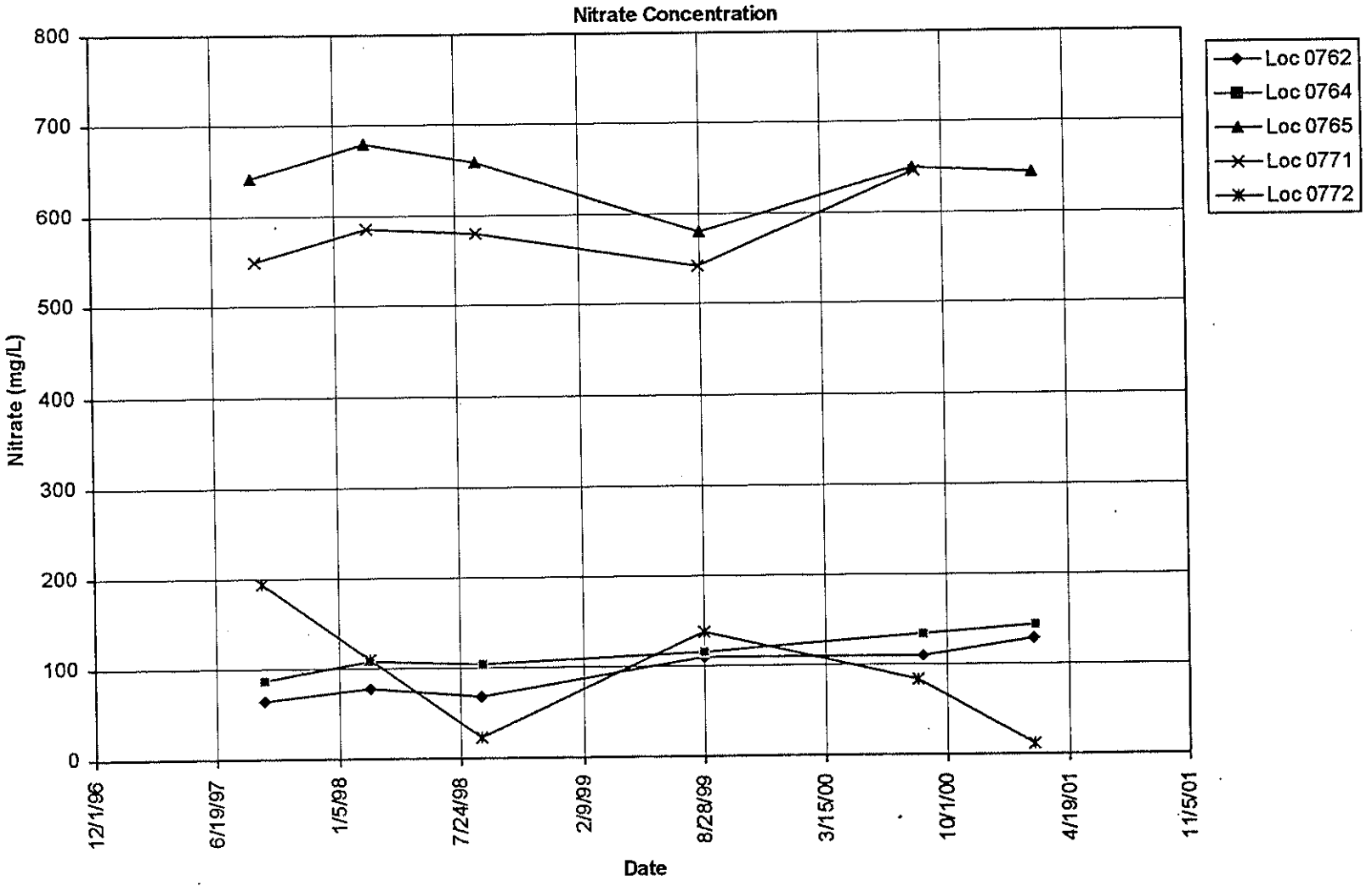
MONUMENT VALLEY (MON01)



6/19/2001 10:23 am

MONUMENT VALLEY (MON01)



6/19/2001 10:20 am

WATER LEVELS

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STATIC GROUND WATER LEVELS (USEE700) FOR SITE MON01, MONUMENT VALLEY
REPORT DATE: 6/19/2001 10:26 am

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			
0201		-	02/27/2001	08:51	27.41	-27.41	
0604	C	4840.42	02/21/2001	09:59	8.43	4831.99	
0605	C	4835.07	02/21/2001	09:22	9.96	4825.11	
0606	D	4864.73	02/21/2001	14:40	35.41	4829.32	
0648	N	4835.14	02/26/2001	15:40	33.64	4801.50	
0649	N	4861.64	02/26/2001	16:32	39.12	4822.52	
0650	D	4794.28	02/27/2001	14:52	19.56	4774.72	
0653	D	4837.08	02/27/2001	08:57	35.43	4801.65	
0655	D	4862.06	02/26/2001	15:24	39.21	4822.85	
0656	D	4856.33	02/21/2001	12:16	35.84	4820.49	
0662	D	4878.56	02/27/2001	10:15	48.71	4829.85	
0669	D	4867.19	02/26/2001	16:41	49.37	4817.82	
0760	D	4814.80	02/22/2001	11:37	25.17	4789.63	
0761	D	4835.02	02/21/2001	15:58	42.71	4792.31	
0762	D	4820.74	02/21/2001	15:15	32.00	4788.74	
0764	D	4851.53	02/22/2001	10:03	49.37	4802.16	
0765	D	4848.45	02/27/2001	12:33	34.90	4813.55	
0767	D	4808.25	02/22/2001	09:45	6.55	4801.70	
0768	D	4820.73	02/22/2001	10:54	13.70	4807.03	
0770	D	4857.26	02/21/2001	11:44	32.48	4824.78	
0772	O	4847.60	02/21/2001	10:36	11.61	4835.99	
0774	O	4880.14	02/27/2001	11:27	48.39	4831.75	
0777	D	4848.24	02/22/2001	13:56	33.62	4814.62	
0778	N	4846.07	02/27/2001	14:20	33.24	4812.83	

RECORDS: SELECTED FROM USEE700 WHERE site_code='MON01' AND LOG_DATE between #2/1/2001# and #3/1/2001#

FLOW CODES:
C CROSS GRADIENT D DOWN GRADIENT N UNKNOWN
O ON-SITE

WATER LEVEL FLAGS:

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TRIP REPORT/WORK ORDER

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MACTEC ENVIRONMENTAL RESTORATION SERVICES, LLC

CONTRACT NO.: DE-AC13-96GJ87335
TASK ORDER NO.: MAC01-05
CONTROL NO.: 3100-N/A

MEMO TO: Sam Marutzky

FROM: Tony Franzone TF

DATE: March 20, 2001

SUBJECT: UMTRA Ground Water Trip Report

Site: Monument Valley, AZ

Dates of Sampling Event: February 21 through February 28, 2001

Team Members: Tony Franzone, Robert Lucero, Dave Miller, Tom Nett, and Dan Sellers

Number of Locations Sampled: 24 ground water monitoring wells. One of these wells is a private well.

Locations Not Sampled/Reason: Well 771 was not sampled because of sampling team oversight.

Well Specific Information: Wells 606, 655, and 764 were purged dry prior to removing 3 casing volumes. The water levels in the wells were allowed to recover, and then sampled. The pump rate at well 662 was lowered to achieve turbidity. Well 777 was purged 10 bore volumes prior to sampling.

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
1100	0765	Duplicate	Ground Water	NDM-648
1101	N/A	Eqpt. Blank-Grundfos	Ground Water	NDM-650
1000	0772	Duplicate	Ground Water	NDM-629
1001	N/A	Eqpt. Blank-whale	Ground Water	NDM-630
0202	0201	Duplicate	Ground Water	NDN-629

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Requisition Numbers Assigned: UGW requisition number is 17327.

Water Level Measurements: Water level measurements were taken on all sampled wells.

Well Inspection Summary: Well inspections were conducted on all sampled wells. Sampled wells were in good condition. Some concrete well pads are being undermined by the wind in Monument Valley, however no wells seemed to be damaged or in danger of being damaged at the time of the visit. Well 653 was bent and a pump could not be inserted. The well was repaired, however the top of the casing elevation is now incorrect, as approximately 1.2 ft. of casing was removed from the top. Additionally, the total depth may also be incorrect because a small amount of well annulus gravel fell down the well during repairs.

Data Logger Download: None.

GPS: None.

Equipment: None.

Regulatory: None.

Site Issues: None.

Additional Action Required/Taken: Well 653 requires new GPS coordinates for the top of casing and database correction to reflect the new measurement. The site lead was notified.

TF/lcg

Distribution:

cc: C. Bahrke
K. Karp
D. Metzler
K. Miller
Project Record File GWMON 14.12 thru P. Taylor

mactec-ers
MACTEC ENVIRONMENTAL RESTORATION SERVICES, LLC

CONTRACT NO.: DE-AC13-96GJ87335
TASK ORDER NO.: MAC01-05
CONTROL NO.: 3100-T01-0326

January 24, 2001

UMTRA Ground Water Project Manager
Department of Energy
Grand Junction Office
2597 B3/4 Road
Grand Junction, CO 81503
ATTN: Donald Metzler

SUBJECT: Contract No. DE-AC13-96GJ87335---February 2001 UMTRA Ground Water Sampling at Monument Valley, AZ

Dear Mr. Metzler:

Attached are the map and tables specifying the sampling locations and analytes for routine monitoring at the Monument Valley, Arizona, UMTRA site. Water quality data will be collected from monitoring wells at this site as part of the routine UMTRA Ground Water sampling that is scheduled to begin the week of February 20, 2001.

The following list shows the well locations (with the associated zone of completion) that will be sampled during this monitoring event.

Ground Water Project Monitor Well (filtered)*

604 Al	649 Al	656 Al	761 Al	765 Al	770 Al	774 Al
605 Al	650 Al	662 Al	762 Al	767 Al	771 Al	777 Al
606 Al	653 Al	669 Al	764 Al	768 Al	772 Al	778 Al
648 Al	655 Al	760 Al	IHS water supply well			

*NOTE: Al = Alluvium

QA/QC samples will be collected as directed in the *Sampling and Analysis Plan for the UMTRA Ground Water Project*. Samples collected for alkalinity will be both filtered and unfiltered. Access for the Monument Valley site is covered under the cooperative agreement. Water level information will be collected from sampled wells, all alluvial wells, and the stakes in the frog ponds at the Monument Valley site. Monitor well inspections will be conducted and documented to confirm the status of all existing wells.

RECORD COPY

2597 B 3/4 R
GRAND JUNCTION, COLORADO
PHONE: 970 248-6000 FAX: 970 248-6

If you have any questions, please call me at extension 6059 or Dave Traub at extension 6557.

Sincerely,

Sam Marutzky
Project Manager

SM/lcg/ld
Attachments

cc w/att: R. Chessmore
K. Karp
K. Miller
D. Traub
Contract File (J. Dearborn)
Project Record File GWMON 14.06 thru P. Taylor

Sampling Frequencies for Locations at Monument Valley, Arizona

Wells	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Ground Water Project Monitor Wells						
604		X				
605		X				Added by K. Karp 1/22/01
606		X				
648		X				
649		X				Added by K. Karp 1/22/01
650		X				
653		X				
655		X				
656		X				
662		X				
669		X				
760		X				
761		X				
762		X				
764		X				
765		X				
767		X				
768		X				
770		X				
771		X				
772		X				
774		X				
777		X				
778		X				
780		X				
781		X				
782		X				
786		X				
Private Wells (unfiltered)						
IHS water supply well			X			Added by D. Metzler 1/23/01

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Constituent Sampling Breakdown For Individual UMTRA Sites

Site	Monument Valley	
Analyte	Ground Water	Surface Water
Approx. No. Samples/yr	26	0
Field Measurements	*UGW*	*UGW*
Alkalinity	X	
Dissolved Oxygen		
Redox Potential	X	
pH	X	
Specific Conductance	X	
Turbidity	X	
Temperature	X	
Laboratory Measurements	*UGW*	*UGW*
Aluminum	770, 771, 772, 774, 777, 780, 781, 782, IHS	
Ammonium		
Antimony		
Arsenic		
Barium		
Boron		
Bromide		
Cadmium	IHS only	
Calcium	IHS only	
Chloride	X	
Chromium		
Cobalt		
Copper		
Fluoride		
Gamma Spec		
Gross Alpha	IHS only	
Gross Beta		
Iron		
Lead		
Lead-210	IHS only	
Magnesium	IHS only	
Manganese		
Molybdenum		

Constituent Sampling Breakdown For Individual UMTRA Sites

Site	Monument Valley	
Analyte	Ground Water	Surface Water
Laboratory Measurements (Continued)	*UGW*	*UGW*
Nickel		
Nickel-63		
Nitrate	X	
Nitrite		
PCBs		
Phosphate		
Polonium-210		
Potassium	IHS only	
Radium-226	IHS only	
Radium-228	IHS only	
Selenium	IHS only	
Silica		
Sodium	IHS only	
Strontium	IHS only	
Sulfate	X	
Sulfide		
Thallium		
Thorium-230		
Tin		
Total Dissolved Solids	IHS only	
Total Hardness		
Total Suspended Solids		
Uranium	619, 625, 657, 774, 775, 776, IHS	
Vanadium	IHS only	
Zinc		
Total Analytes	5	0

Note: All samples are considered filtered unless stated otherwise. All private well samples are to be unfiltered. The total number of analytes does not include field parameters.

* The left number represents Ground Water Project samples and the right number represents LTSM Project samples.