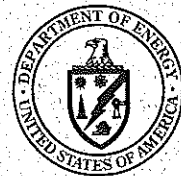




**DATA VALIDATION
SHIPROCK, NEW MEXICO
UMTRA SITE**

**May 2001
Water Sampling**

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



RECORD COPY

SHIPROCK, NEW MEXICO

May 2001

DATA PACKAGE CONTENTS

This data package includes the following information:

<u>Item No.</u>	<u>Description of Contents</u>
1.	Site Hydrologist Summary
2.	Data Package Assessment, which includes the following: <ul style="list-style-type: none">a. Field procedures verification checklistb. 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 validator's findings.
4.	UMTRA Database Printouts of analytical data organized as follows: <ul style="list-style-type: none">a. Ground Water Quality Data (included on disk)b. Equipment Blank Data (included on disk)c. Static Ground Water Level Measurement Data
5.	Sampling and Analysis Work Order and Trip Reports.

Site Hydrologist Summary

Site: Shiprock

Sampling Period: May 1 to May 3, 2001

SUMMARY CRITERIA

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

Domestic wells were not sampled during this event.

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

There are no point-of-compliance wells established at the Shiprock site because of preexisting ground water contamination (from milling operations) at the repository site.

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

Wells sampled during this event were installed with a backhoe in March of 2001 and were sampled for the first time during this event; therefore, a comparison to historical data from these locations was not possible. Results from this event, however, are consistent with the results from adjacent previously existing alluvial wells on the floodplain and unexpected ground water movement is not indicated. Wells with sample concentrations that exceeded UMTRA standards are listed in Table 1.

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

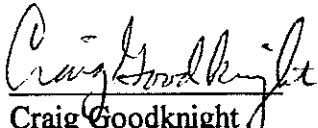
Surface water was not sampled during this event.

Site Hydrologist Summary (continued)

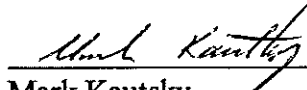
Table 1. Shiprock Wells Exceeding UMTRA standards in May 2001.

ANALYTE	STANDARD ¹	SITE	WELLS EXCEEDING STANDARDS (CONCENTRATION) ¹
Nitrate	44.27	SHP01	792 (133), 793 (759), 794 (657), 795 (59.2), 798 (899)
Selenium	0.01	SHP01	792 (0.384), 793 (0.505), 794 (0.228), 795 (0.106), 798 (0.873)
Uranium	0.044	SHP01	792 (1.49), 793 (1.29), 794 (0.674), 795 (0.570), 798 (2.78)

¹Units are in mg/L.


Craig Goodknight
Project Lead

9/14/01
Date


Mark Kautsky
Site Hydrologist

9-24-01
Date

DATA ASSESSMENT

UGW Water Sampling Field Activities Verification Checklist

Project UGW-Shiprock

Date(s) of Ground Water Sampling _____

Date(s) of Verification 7/30/01

Name of Verifier DAVID Miller

	Response (Yes, No, N/A)	Comments
1. Is the SAP the primary document directing field procedures? List other documents, SOPs, Instructions.	<u>Yes</u>	<u>Written direction from site lead.</u>
2. Were the sampling locations specified in the planning documents sampled?	<u>Yes</u>	
3. Was field equipment calibrated as specified in the above named documents? Were the number and types (alkalinity, temperature, conductivity pH, turbidity, DO, Eh) of field measurements taken as specified? Were the standard solutions used for the calibration and operational checks of the field instruments brought to within 10°C of the temperature of the water to be sampled? Was the calibration information recorded on the field data sheets?	<u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u>	
4. Was a duplicate alkalinity measurement conducted on a frequency of one duplicate per 20 samples?	<u>NA</u>	
5. Was depth to water measured before purging? Was this information used to calculate the purge volume?	<u>Yes</u> <u>Yes</u>	
6. 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?	<u>Yes</u>	
7. If low-flow purging was used, was the purge rate less than 0.125 gal/min, and was the drawdown less than 0.3 feet?	<u>NA</u>	

8. Were duplicates taken at a frequency of one per 20 samples?

Yes

9. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?

Yes

10. Were trip blanks prepared and included with each shipment of VOC samples?

NA

11. Were QC samples assigned a fictitious site identification number?

Yes

Was the true identity of the samples recorded in the field notes?

Yes

12. Were samples collected in the containers specified?

Yes

Were certified pre-cleaned containers used for the sampling?

Yes

13. Were samples filtered and preserved as specified?

Yes

14. Were the number and types of samples collected as specified?

Yes

15. Were chain of custody records completed and was sample custody maintained?

Yes

16. Were sample ticket book numbers recorded on field data forms and on the chain of custody?

Yes

17. Are field data sheets signed and dated by the field team leader?

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

DATA PACKAGE ASSESSMENT

REQUISITION NUMBERS: 17427 SITE: Shiprock LABORATORY: GJO ANALYSIS DATES: 5-7-01 to 5-31-01

REVIEWER: Sam Campbell Sam Campbell 7-25-01
NAME (print) SIGNATURE DATE

	ICP-MS	ICP-AES	GFAA	FAA	NaBH ₄	AS	LSc	PC	IC	Gravimetric	Colorimetric	Other	
CHAIN OF CUSTODY	<u>OK</u>	<u>OK</u>	<u>NA</u>	<u>NA</u>	<u>OK</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>OK</u>	<u>OK</u>	<u>OK</u>	<u>NA</u>	<u>NA</u>
HOLDING TIME	<u>OK</u>	<u>OK</u>			<u>OK</u>				<u>OK</u>	<u>OK</u>	<u>OK</u>		
CALIB. VERIFICATION (For AS, internal tracer)	<u>OK</u>	<u>OK</u>			<u>OK</u>				<u>OK</u>	NA	<u>OK</u>		
PREP. BLANKS (Only if digestion)	<u>NA</u>	<u>NA</u>			<u>NA</u>	↓	↓	↓	<u>NA</u>	NA	<u>NA</u>		
INT/CONT CAL. BLANKS	<u>OK</u>	<u>①</u>	↓	↓	<u>OK</u>	NA	NA	NA	<u>②</u>	NA	<u>OK</u>		
ICP SERIAL DILUTION	<u>OK</u>	<u>OK</u>	NA	NA	NA	NA	NA	NA	NA	NA	NA		
ICS (ICP only)	<u>OK</u>	<u>OK</u>	NA	NA	NA	NA	NA	NA	NA	NA	NA		
LAB. CONTROL SAMPLE	<u>NA</u>	<u>NA</u>			<u>NA</u>				<u>NA</u>	<u>OK</u>	<u>NA</u>		
DUPLICATES	<u>OK</u>	<u>OK</u>			<u>OK</u>	↓	↓	↓	<u>OK</u>	<u>OK</u>	<u>OK</u>		
POSTDIGEST. SPKS. (Only if MS fails)	<u>NA</u>	<u>NA</u>			<u>NA</u>	NA	NA	NA	<u>NA</u>	NA	NA		
MATRIX SPKS.	<u>OK</u>	<u>OK</u>			<u>OK</u>				<u>OK</u>	NA	<u>OK</u>		
OVERALL ASSESS.	<u>OK</u>	<u>OK</u>	↓	↓	<u>OK</u>	↓	↓	↓	<u>OK</u>	<u>OK</u>	<u>OK</u>	↓	↓

REVIEWER COMMENTS: ① Na detected in one CCB - no samples affected. ② Cl and SO₄ detected in CCBs - no samples affected.

ITEMS REQUIRING ATTENTION: ① U flag the Ca, Mg, Mn, K, and Sr results from sample 276037 (equipment blank) because of CCB contamination.

**SHIPROCK, NEW MEXICO
MAY 2001 SAMPLING
DATA ASSESSMENT SUMMARY**

The DOE-GJO Analytical Laboratory analyzed samples and reported results for this sampling event under requisition number 17427 for the UMTRA Ground Water Project.

METALS/MAJOR CATIONS ANALYSES

The determination of calcium, magnesium, manganese, potassium, sodium, and strontium was performed by inductively coupled plasma-atomic emission spectrometry (ICP-AES). Uranium was analyzed using inductively coupled-mass spectrometry (ICP-MS). Selenium was determined by hydride generation (NaBH_4) atomic absorption spectroscopy.

The calcium magnesium, manganese, potassium, and strontium result from sample 276037 (equipment blank) was qualified with a "U" flag in the database because of continuing calibration blank (CCB) contamination.

INORGANIC ANALYSES

Chloride, nitrate, and sulfate were determined by ion chromatography (IC), and ammonium was determined by spectrophotometry (or colorimetry). TDS was determined gravimetrically.

All data validation criteria were met for these analyses and data validation flags were not required.

FIELD ANALYSES/ACTIVITIES

Results from wells 797 were qualified with an "L" flag in the database indicating that less than three casing volumes were removed prior to sampling.

One equipment blank was collected for the 7 locations where samples were collected using non-dedicated equipment. The equipment blanks were analyzed for the same constituents as the Shiprock environmental samples. Equipment blank concentrations of UMTRA related contaminants were less than the contract required detection limit (CRDL); therefore, equipment blank results are considered acceptable.

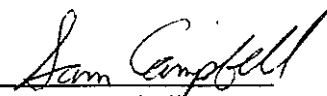
One field duplicate sample was collected during this event. The duplicate sample was collected at well 794. There are no established regulatory criteria for the evaluation of field duplicate samples; therefore, EPA guidance for laboratory duplicates (which is conservative for field duplicates) was used to assess duplicate precision. With the exception of the ammonium result (36 relative percent difference [RPD]), duplicate results met the laboratory duplicate criteria (20 RPD); therefore, duplicate results and are considered acceptable.

Wells sampled during this event were installed in March 2001 and were sampled for the first time; therefore, a Suspected Anomalies Report (SAR) was not generated and a comparison to historical data was not possible. However, results from the new wells were compared to results from previously existing alluvial wells located in the vicinity of the new wells. This comparison indicated that results are consistent with concentrations that would be expected in that portion of the aquifer. Therefore, the results from this sampling event are considered acceptable with no further action required.

SUMMARY

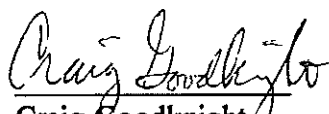
All analytical quality control criteria were met except as qualified on the Ground Water Quality Data by Parameter and equipment blank/trip blank database printouts. The meaning of data qualifiers is as defined on the UMTRA database printout or as defined in the USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, Multi-Media Multi-Concentration, Document Number ILMO2.0, 1991. All data in this package are considered validated and may be treated as final results.

An electronic copy (disk) of the ground water and equipment blank database printouts with the qualifiers incorporated is included in this package.



Sam Campbell
Data Validation Lead

9/14/01
Date



Craig Goodknight
Project Lead

9/14/01
Date

WATER QUALITY DATA

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE SHP01, SHIPROCK
 REPORT DATE: 9/14/2001 1:03 p

PARAMETER	UNITS	LOCATION ID	SAMPLE:		ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS:			DETECTION LIMIT	UN-CERTAINTY
			DATE	ID				LAB	DATA	QA		
Alkalinity as CaCO3	mg/L	0792	05/02/2001	0001	AL		1109			#	-	-
	mg/L	0792	05/02/2001	N001	AL		1117			#	-	-
	mg/L	0793	05/02/2001	N001	AL		400			#	-	-
	mg/L	0794	05/03/2001	0001	AL		309			#	-	-
	mg/L	0794	05/03/2001	N001	AL		310			#	-	-
	mg/L	0795	05/02/2001	0001	AL		324			#	-	-
	mg/L	0795	05/02/2001	N001	AL		320			#	-	-
	mg/L	0797	05/02/2001	0001	AL		310		L	#	-	-
	mg/L	0797	05/02/2001	N001	AL		316		L	#	-	-
	mg/L	0798	05/02/2001	N001	AL		1078			#	-	-
	mg/L	0799	05/01/2001	0001	AL		300			#	-	-
	mg/L	0799	05/01/2001	N001	AL		307			#	-	-
Ammonium	mg/L	0792	05/02/2001	0001	AL		2.200			#	0.0062	-
	mg/L	0793	05/02/2001	0001	AL		11.600			#	0.0062	-
	mg/L	0794	05/03/2001	0001	AL		6.790			#	0.0062	-
	mg/L	0794	05/03/2001	0002	AL		9.800			#	0.0062	-
	mg/L	0795	05/02/2001	0001	AL		6.170			#	0.0062	-
	mg/L	0797	05/02/2001	0001	AL		0.0321	B	L	#	0.0062	-
	mg/L	0798	05/02/2001	0001	AL		28.700			#	0.0062	-
	mg/L	0799	05/01/2001	0001	AL		0.200			#	0.0062	-
Calcium	mg/L	0792	05/02/2001	0001	AL		416.000			#	0.0642	-
	mg/L	0793	05/02/2001	0001	AL		485.000			#	0.0642	-
	mg/L	0794	05/03/2001	0001	AL		503.000			#	0.0642	-
	mg/L	0794	05/03/2001	0002	AL		503.000			#	0.0642	-
	mg/L	0795	05/02/2001	0001	AL		505.000			#	0.0642	-
	mg/L	0797	05/02/2001	0001	AL		75.200		L	#	0.0642	-
	mg/L	0798	05/02/2001	0001	AL		446.000			#	0.0642	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE SHP01, SHIPROCK
 REPORT DATE: 9/14/2001 1:03 p

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Calcium	mg/L	0799	05/01/2001	0001	AL		176.000	#	0.0642	-
Chloride	mg/L	0792	05/02/2001	0001	AL		669.000	#	0.149	-
	mg/L	0793	05/02/2001	0001	AL		233.000	#	0.0745	-
	mg/L	0794	05/03/2001	0001	AL		147.000	#	0.0745	-
	mg/L	0794	05/03/2001	0002	AL		148.000	#	0.0745	-
	mg/L	0795	05/02/2001	0001	AL		89.100	#	0.0745	-
	mg/L	0797	05/02/2001	0001	AL		30.900	L #	0.0149	-
	mg/L	0798	05/02/2001	0001	AL		908.000	#	0.149	-
	mg/L	0799	05/01/2001	0001	AL		108.000	#	0.0298	-
Dissolved Oxygen	mg/L	0792	05/02/2001	N001	AL		0.302	#	-	-
	mg/L	0793	05/02/2001	N001	AL		0.689	#	-	-
	mg/L	0794	05/03/2001	N001	AL		0.856	#	-	-
	mg/L	0795	05/02/2001	N001	AL		0.989	#	-	-
	mg/L	0797	05/02/2001	N001	AL		4.9	L #	-	-
	mg/L	0798	05/02/2001	N001	AL		0.793	#	-	-
	mg/L	0799	05/01/2001	N001	AL		0.2	#	-	-
Magnesium	mg/L	0792	05/02/2001	0001	AL		1520.000	#	0.031	-
	mg/L	0793	05/02/2001	0001	AL		758.000	#	0.031	-
	mg/L	0794	05/03/2001	0001	AL		514.000	#	0.031	-
	mg/L	0794	05/03/2001	0002	AL		514.000	#	0.031	-
	mg/L	0795	05/02/2001	0001	AL		247.000	#	0.0031	-
	mg/L	0797	05/02/2001	0001	AL		16.700	L #	0.0031	-
	mg/L	0798	05/02/2001	0001	AL		2130.000	#	0.031	-
	mg/L	0799	05/01/2001	0001	AL		23.400	#	0.0031	-
Manganese	mg/L	0792	05/02/2001	0001	AL		2.490	#	0.0001	-
	mg/L	0793	05/02/2001	0001	AL		1.300	#	0.0001	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE SHP01, SHIPROCK
 REPORT DATE: 9/14/2001 1:03 p

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Manganese	mg/L	0794	05/03/2001	0001	AL		0.105	#	0.0001	-
	mg/L	0794	05/03/2001	0002	AL		0.105	#	0.0001	-
	mg/L	0795	05/02/2001	0001	AL		0.0404	#	0.0001	-
	mg/L	0797	05/02/2001	0001	AL		0.294	L #	0.0001	-
	mg/L	0798	05/02/2001	0001	AL		5.810	#	0.0001	-
	mg/L	0799	05/01/2001	0001	AL		0.403	#	0.0001	-
Nitrate as NO3	mg/L	0792	05/02/2001	0001	AL		133.000	#	0.0342	-
	mg/L	0793	05/02/2001	0001	AL		759.000	#	0.171	-
	mg/L	0794	05/03/2001	0001	AL		657.000	#	0.171	-
	mg/L	0794	05/03/2001	0002	AL		648.000	#	0.171	-
	mg/L	0795	05/02/2001	0001	AL		59.200	#	0.0171	-
	mg/L	0797	05/02/2001	0001	AL		0.172	B L #	0.0171	-
	mg/L	0798	05/02/2001	0001	AL		899.000	#	0.171	-
	mg/L	0799	05/01/2001	0001	AL		0.0171	U #	0.0171	-
ORP of Zobell Solution	mV	0792	05/02/2001	N001	AL		223	#	-	-
	mV	0793	05/02/2001	N001	AL		223	#	-	-
	mV	0794	05/03/2001	N001	AL		213	#	-	-
	mV	0795	05/02/2001	N001	AL		221	#	-	-
	mV	0797	05/02/2001	N001	AL		202	L #	-	-
	mV	0798	05/02/2001	N001	AL		222	#	-	-
	mV	0799	05/01/2001	N001	AL		201	#	-	-
Oxidation Reduction Potenti	mV	0792	05/02/2001	N001	AL		145	#	-	-
	mV	0793	05/02/2001	N001	AL		140	#	-	-
	mV	0794	05/03/2001	N001	AL		136	#	-	-
	mV	0795	05/02/2001	N001	AL		129	#	-	-
	mV	0797	05/02/2001	N001	AL		75	L #	-	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE SHP01, SHIPROCK
 REPORT DATE: 9/14/2001 1:03 p

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potenti	mV	0798	05/02/2001	N001	AL		139	#	-	-
	mV	0799	05/01/2001	N001	AL		80	#	-	-
pH	s.u.	0792	05/02/2001	N001	AL		7.55	#	-	-
	s.u.	0793	05/02/2001	N001	AL		7.74	#	-	-
	s.u.	0794	05/03/2001	N001	AL		7.18	#	-	-
	s.u.	0795	05/02/2001	N001	AL		7.49	#	-	-
	s.u.	0797	05/02/2001	N001	AL		8.01	L #	-	-
	s.u.	0798	05/02/2001	N001	AL		7.2	#	-	-
	s.u.	0799	05/01/2001	N001	AL		7.39	#	-	-
Potassium	mg/L	0792	05/02/2001	0001	AL		95.200	#	0.0091	-
	mg/L	0793	05/02/2001	0001	AL		66.500	#	0.0091	-
	mg/L	0794	05/03/2001	0001	AL		38.000	#	0.0091	-
	mg/L	0794	05/03/2001	0002	AL		37.300	#	0.0091	-
	mg/L	0795	05/02/2001	0001	AL		26.400	#	0.0091	-
	mg/L	0797	05/02/2001	0001	AL		2.480	L #	0.0091	-
	mg/L	0798	05/02/2001	0001	AL		133.000	#	0.0091	-
	mg/L	0799	05/01/2001	0001	AL		5.870	#	0.0091	-
Selenium	mg/L	0792	05/02/2001	0001	AL		0.384	#	0.012	-
	mg/L	0793	05/02/2001	0001	AL		0.505	#	0.012	-
	mg/L	0794	05/03/2001	0001	AL		0.228	#	0.012	-
	mg/L	0794	05/03/2001	0002	AL		0.217	#	0.012	-
	mg/L	0795	05/02/2001	0001	AL		0.106	#	0.006	-
	mg/L	0797	05/02/2001	0001	AL		0.0003	U L #	0.0003	-
	mg/L	0798	05/02/2001	0001	AL		0.873	#	0.015	-
	mg/L	0799	05/01/2001	0001	AL		0.0003	U #	0.0003	-
Sodium	mg/L	0792	05/02/2001	0001	AL		2960.000	#	0.052	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE SHP01, SHIPROCK
 REPORT DATE: 9/14/2001 1:03 p

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Sodium	mg/L	0793	05/02/2001	0001	AL		1010.000	#	0.052	-
	mg/L	0794	05/03/2001	0001	AL		591.000	#	0.052	-
	mg/L	0794	05/03/2001	0002	AL		594.000	#	0.052	-
	mg/L	0795	05/02/2001	0001	AL		416.000	#	0.052	-
	mg/L	0797	05/02/2001	0001	AL		387.000	L #	0.052	-
	mg/L	0798	05/02/2001	0001	AL		3810.000	#	0.13	-
	mg/L	0799	05/01/2001	0001	AL		488.000	#	0.052	-
Specific Conductance	umhos/cm	0792	05/02/2001	N001	AL		14820	#	-	-
	umhos/cm	0793	05/02/2001	N001	AL		8320	#	-	-
	umhos/cm	0794	05/03/2001	N001	AL		6430	#	-	-
	umhos/cm	0795	05/02/2001	N001	AL		4470	#	-	-
	umhos/cm	0797	05/02/2001	N001	AL		3100	L #	-	-
	umhos/cm	0798	05/02/2001	N001	AL		18820	#	-	-
	umhos/cm	0799	05/01/2001	N001	AL		2850	#	-	-
Strontium	mg/L	0792	05/02/2001	0001	AL		10.300	#	0.001	-
	mg/L	0793	05/02/2001	0001	AL		6.830	#	0.0001	-
	mg/L	0794	05/03/2001	0001	AL		5.570	#	0.0001	-
	mg/L	0794	05/03/2001	0002	AL		5.590	#	0.0001	-
	mg/L	0795	05/02/2001	0001	AL		4.160	#	0.0001	-
	mg/L	0797	05/02/2001	0001	AL		1.330	L #	0.0001	-
	mg/L	0798	05/02/2001	0001	AL		13.000	#	0.001	-
	mg/L	0799	05/01/2001	0001	AL		2.510	#	0.0001	-
Sulfate	mg/L	0792	05/02/2001	0001	AL		6810.000	#	0.506	-
	mg/L	0793	05/02/2001	0001	AL		2460.000	#	0.253	-
	mg/L	0794	05/03/2001	0001	AL		2090.000	#	0.253	-
	mg/L	0794	05/03/2001	0002	AL		2100.000	#	0.253	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE SHP01, SHIPROCK
 REPORT DATE: 9/14/2001 1:03 p

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Sulfate	mg/L	0795	05/02/2001	0001	AL		1870.000	#	0.253	-
	mg/L	0797	05/02/2001	0001	AL		427.000	L #	0.0253	-
	mg/L	0798	05/02/2001	0001	AL		10500.000	#	1.265	-
	mg/L	0799	05/01/2001	0001	AL		879.000	#	0.1265	-
Temperature	C	0792	05/02/2001	N001	AL		14	#	-	-
	C	0793	05/02/2001	N001	AL		15.1	#	-	-
	C	0794	05/03/2001	N001	AL		15.2	#	-	-
	C	0795	05/02/2001	N001	AL		15.8	#	-	-
	C	0797	05/02/2001	N001	AL		16.3	L #	-	-
	C	0798	05/02/2001	N001	AL		13.9	#	-	-
	C	0799	05/01/2001	N001	AL		14.5	#	-	-
Temperature of Zobell Soluti	C	0792	05/02/2001	N001	AL		8.8	#	-	-
	C	0793	05/02/2001	N001	AL		8.8	#	-	-
	C	0794	05/03/2001	N001	AL		11.2	#	-	-
	C	0795	05/02/2001	N001	AL		8.9	#	-	-
	C	0797	05/02/2001	N001	AL		20.8	L #	-	-
	C	0798	05/02/2001	N001	AL		10.2	#	-	-
	C	0799	05/01/2001	N001	AL		21.1	#	-	-
Total Dissolved Solids	mg/L	0792	05/02/2001	0001	AL		21100	#	10	-
	mg/L	0793	05/02/2001	0001	AL		9800	#	10	-
	mg/L	0794	05/03/2001	0001	AL		6890	#	10	-
	mg/L	0794	05/03/2001	0002	AL		6760	#	10	-
	mg/L	0795	05/02/2001	0001	AL		4820	#	10	-
	mg/L	0797	05/02/2001	0001	AL		1530	L #	10	-
	mg/L	0798	05/02/2001	0001	AL		28600	#	10	-
	mg/L	0799	05/01/2001	0001	AL		2240	#	10	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE SHP01, SHIPROCK
 REPORT DATE: 9/14/2001 1:03 p

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Turbidity	NTU	0792	05/02/2001	N001	AL		7.81	#	-	-
	NTU	0793	05/02/2001	N001	AL		9.33	#	-	-
	NTU	0794	05/03/2001	N001	AL		3.2	#	-	-
	NTU	0795	05/02/2001	N001	AL		8.44	#	-	-
	NTU	0797	05/02/2001	N001	AL		1000	> L #	-	-
	NTU	0798	05/02/2001	N001	AL		9.8	#	-	-
	NTU	0799	05/01/2001	N001	AL		2.53	#	-	-
Uranium	mg/L	0792	05/02/2001	0001	AL		1.490	#	0.001	-
	mg/L	0793	05/02/2001	0001	AL		1.290	#	0.001	-
	mg/L	0794	05/03/2001	0001	AL		0.674	#	0.0001	-
	mg/L	0794	05/03/2001	0002	AL		0.680	#	0.0001	-
	mg/L	0795	05/02/2001	0001	AL		0.570	#	0.0001	-
	mg/L	0797	05/02/2001	0001	AL		0.0162	L #	0.0001	-
	mg/L	0798	05/02/2001	0001	AL		2.780	#	0.001	-
	mg/L	0799	05/01/2001	0001	AL		0.010	#	0.0001	-

GROUND WATER QUALITY DATA BY PARAMETER (USEE200) FOR SITE SHP01, SHIPROCK
 REPORT DATE: 9/14/2001 1:03 p

PARAMETER	UNITS	LOCATION ID	SAMPLE: DATE	ZONE ID	FLOW COMPL	REL	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
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RECORDS: SELECTED FROM USEE200 WHERE site_code='SHP01' 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 #5/1/2001# and #5/5/2001#

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 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.
- G Possible grout contamination, pH > 9.
- X Location is undefined.

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	SHP01	0999	05/03/2001	0001	mg/L	0.0062	U		0.0062		E
Calcium	SHP01	0999	05/03/2001	0001	mg/L	0.153	B	U	0.0642		E
Chloride	SHP01	0999	05/03/2001	0001	mg/L	0.162	B		0.0149		E
Magnesium	SHP01	0999	05/03/2001	0001	mg/L	0.0439	B	U	0.0031		E
Manganese	SHP01	0999	05/03/2001	0001	mg/L	0.00043	B	U	0.0001		E
Nitrate as NO3	SHP01	0999	05/03/2001	0001	mg/L	0.0546	B		0.0171		E
Potassium	SHP01	0999	05/03/2001	0001	mg/L	0.0635	B	U	0.0091		E
Selenium	SHP01	0999	05/03/2001	0001	mg/L	0.0003	U		0.0003		E
Sodium	SHP01	0999	05/03/2001	0001	mg/L	0.0331	B		0.0052		E
Strontium	SHP01	0999	05/03/2001	0001	mg/L	0.00034	B	U	0.0001		E
Sulfate	SHP01	0999	05/03/2001	0001	mg/L	0.755	B		0.0253		E
Total Dissolved Solids	SHP01	0999	05/03/2001	0001	mg/L	10	U		10		E
Uranium	SHP01	0999	05/03/2001	0001	mg/L	0.0001	U		0.0001		E

WATER LEVELS

STATIC GROUND WATER LEVELS (USEE700) FOR SITE SHP01, SHIPROCK
 REPORT DATE: 9/14/2001 10:44 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			
0792		4891.52	05/02/2001	14:59	4898.11	-6.59	
0793		4891.05	05/02/2001	14:02	4896.94	-5.89	
0794		4892.93	05/03/2001	11:56	4900.62	-7.69	
0795		4892.56	05/02/2001	12:14	4899.81	-7.25	
0797		4908.04	05/02/2001	09:26	4915.94	-7.90	
0798		4891.55	05/02/2001	15:54	4898.77	-7.22	
0799		4918.95	05/01/2001	16:23	4928.55	-9.60	

RECORDS: SELECTED FROM USEE700 WHERE site_code='SHP01' AND LOG_DATE between #5/1/2001# and #5/5/2001#

FLOW CODES:

WATER LEVEL FLAGS:

**SAMPLING AND ANALYSIS
WORK ORDER
AND TRIP REPORT**

April 12, 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—Special Sampling at Shiprock, New Mexico

Dear Mr. Metzler:

Attached are a map and tables specifying sampling locations and analytes for a special sampling event at the Shiprock, New Mexico, UMTRA site. Water quality data will be collected from monitor wells at this site the week of April 30, 2001.

NABIR personnel from Battelle, PNNL, plan to be on site during sampling. They have additional sampling needs for most of the locations and will provide equipment and bottles necessary for their sampling.

The following list shows the Ground Water Project monitor wells and that will be sampled during this sampling event.

Ground Water Project Monitor Wells (filtered)*

SHP01

792 AI	794 AI	797 AI	799 AI	1009 AI	1010 AI	1013 AI
793 AI	795 AI	798 AI	1008 AI			

*NOTE: AI = Alluvium

At the request of Navajo UMTRA, the following two new surface locations will be sampled. Ray Russell will accompany the samplers to indicate where the samples are to be collected.

- Head of Cudei Ditch downstream from Shiprock about 5 miles. This is the inlet on the river for the ditch.
- Return flow of Helium Lateral Canal as it empties into the San Juan River, about 1 mile upstream from the Cudei Ditch intake.

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 filtered and unfiltered. Access agreements are being reviewed and are expected to be completed by the beginning of fieldwork.

RECORD COPY

GW Shp 14.06

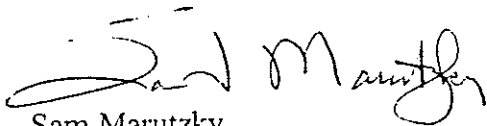
2597 B 3/4 ROAD
GRAND JUNCTION, COLORADO 81503
PHONE) 970 248-6000 (FAX) 970 248-6040

Donald Metzler
April 12, 2001
Page 2
Control No.: 3100-T01-0521

In addition to sampled wells, water levels will be collected on SHP02 wells 800, 801, 802, 803, and 810.

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/o att: K. Miller
D. Traub
Contract File (J. Dearborn)
cc w/att: C. Bahrke
C. Goodknight
R. Chessmore
Project Record File GWSHP'14.06 thru P. Taylor

**Sampling Frequencies for Locations at
Shiprock, New Mexico**

Location	Quarterly	Semi-annually	Annually	Biennially	Not Sampled	Notes
Ground Water Project Monitor Wells						
SHP01						
792		X				Added by C. Goodknight 4/10/01
793		X				Added by C. Goodknight 4/10/01
794		X				Added by C. Goodknight 4/10/01
795		X				Added by C. Goodknight 4/10/01
797		X				Added by C. Goodknight 4/10/01
798		X				Added by C. Goodknight 4/10/01
799		X				Added by C. Goodknight 4/10/01
1008		X				New well 4/00
1009		X				New well 4/00
1010		X				New well 4/00
1013		X				New well 4/00
SHP02						
800					X	Water levels only
801					X	Water levels only
802					X	Water levels only
803					X	Water levels only
810					X	Water levels only
Surface Water/Sediment Locations						
SHP01						
NEW		X				Head of Cudei ditch
NEW		X				Helium Lateral return flow

**Constituent Sampling Breakdown
For Individual UMTRA Sites**

Site	Shiprock	
	Ground Water	Surface Water
Approx. No. Samples/yr	160	88
<i>Field Measurements</i>	<i>UGW</i>	<i>UGW</i>
Alkalinity	X	X
Dissolved Oxygen	X	X
Redox Potential	X	X
pH	X	X
Specific Conductance	X	X
Turbidity	X	
Temperature	X	X
<i>Laboratory Measurements</i>	<i>UGW</i>	<i>UGW</i>
Aluminum		
Ammonium	X	X
Antimony		
Arsenic		
Beryllium		
Bromide		
Cadmium		
Calcium	X	X
Chloride	X	X
Chromium		
Cobalt		
Copper		
Fluoride		
Gamma Spec		
Gross Alpha		
Gross Beta		
Iron		
Lead		
Lead-210		
Magnesium	X	X
Manganese	X	X
Molybdenum		

**Constituent Sampling Breakdown
For Individual UMTRA Sites**

Site	Shiprock	
	Ground Water	Surface Water
<i>Laboratory Measurements (Continued)</i>	<i>UGW</i>	<i>UGW</i>
Nickel		
Nickel-63		
Nitrate	X	X
Polonium-210		
Potassium	X	X
Radium-226		
Radium-228		
Radon-222		
Selenium	X	X
Silica		
Sodium	X	X
Strontium	X	X
Sulfate	X	X
Sulfide		
Thallium		
Thorium-230		
Thorium-232		
Tin		
Total Dissolved Solids	X	X
Total Organic Carbon		
Tritium		
Uranium	X	X
Uranium-234, -238		
Vanadium		
VOCs		
Zinc		
Total Analytes	13	13

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.



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

MEMO TO: Sam Marutzky
FROM: T. Franzone *for*
DATE: May 21, 2001
SUBJECT: UGW Ground Water Trip Report

Site: Shiprock, NM

Dates of Sampling Event: May 1 through May 4, 2001

Team Members: Tony Franzone and Tom Maveal

Number of Locations Sampled: 7 ground water monitoring wells

Locations Not Sampled/Reason: None; all locations were sampled.

Field Variance: Well 0797 went dry at 3 gallons. Allowed to recover overnight and sampled.

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

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
1100	N/A	Equipment Blank-Peristaltic	Ground Water	NDK-865
1101	0794	Duplicate	Ground Water	NDK-866

Requisition Numbers Assigned: The UGW requisition number is 17427.

Water Level Measurements: Water level measurements were taken on all sampled wells. Water levels were also taken at wells 0800, 0801, 0802, and 0803, all of which were dry. Well 0810 was found to have 0.2 ft. of water in the bottom.

Well Inspection Summary: Well inspections were conducted on all wells that were sampled. Sampled wells were in good condition.

Data Logger Download: None

RECORD COPY

GPS: Sample location 591, on the downstream end of the Helium Lateral Canal, was staked and GPSd but could not be sampled because irrigation water had not been released into the canal. Location 592, at the head of Cudei Ditch where its water comes out of the San Juan River, could not be sampled because a locked gate prevented access to the sample location. When location 592 is accessed it needs to be staked and GPSd.

Corrective Action: None

Equipment: None.

Regulatory: None.

Site Issues: Additional samples were taken at the request of NABIR at the following wells: 0792, 0793, 0794, 0795, 0797, 0798, and 0799. The sampling analytes are: tritium, iron speciation, sulfide, anion, carbon, and uranium. Samples were collected in NABIR supplied containers, preserved, and handled per instructions. Samples were shipped out of Cortez, CO Fed Ex, on May 3, 2001, to addresses specified in the NABIR instructions.

Additional Action Required/Taken: None.

TF/lcg

Distribution:

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