

Data Validation Package

January 2011
Groundwater and Surface Water
Sampling at the Grand Junction,
Colorado, Processing Site

March 2011



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

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Sampling Event Summary

Site: Grand Junction, Colorado, Processing Site

Sampling Period: January 7, 2011

The groundwater compliance strategy for the Grand Junction Processing Site is no remediation and the application of supplemental standards based limited-use of the groundwater. Supplemental standards are typically applied at locations where groundwater is classified as limited use (not a current or potential source of drinking water) because of widespread ambient contamination not related to milling activities. A limited groundwater monitoring program is conducted at the site with samples collected once every 5 years. Sampling at 5-year intervals will continue until all analytes are below their respective maximum concentration limits, within the range of background values, or until the monitoring program is modified.

Four monitoring wells were sampled at the Grand Junction, Colorado, Processing Site to monitor groundwater contaminants as specified in the 1999 *Final Site Observational Work Plan for the UMTRA Project Site at Grand Junction, Colorado*. Two nearby surface water locations were also sampled. Sampling and analysis were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PLN/S04351, continually updated). One duplicate sample was collected from location 1001. Water levels were measured at each sampled well.

Results from this sampling event are consistent with historical results and do not indicate any unusual change in contaminant concentration. Concentrations of ammonia (as nitrogen), molybdenum, and uranium are shown in the time-concentration plots that are included in the data presentation section.

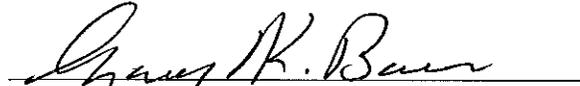
Wells with analyte concentrations that exceeded U.S. Environmental Protection Agency groundwater standards are listed in Table 1.

Table 1. Grand Junction Processing Site Locations that Exceed Standards

Analyte	Standard ^a	Site Code	Location	Concentration
Molybdenum	0.1	GRJ01	1001	0.17
			1036	0.15
Uranium	0.044	GRJ01	0590	0.078
			0748	0.049
			1001	0.38
			1036	2.3

^a Standards are listed in 40 CFR 192.02 Table 1 to Subpart A; units are in milligrams per liter (mg/L).

The results from surface water location 0427, which is downstream from the site on the Colorado River, were compared to the results from location 0423, which is upstream from the site. The nearly identical results for the two locations indicate negligible impact to Colorado River water quality.



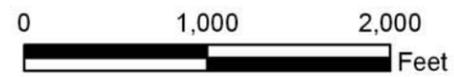
Gary K. Baur
Site Lead, S.M. Stoller Corporation

MARCH 24, 2011
Date



Legend

- WELL TO BE SAMPLED
- SURFACE LOCATION TO BE SAMPLED
- EXISTING WELL



U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO	Work Performed by S.M. Stoller Corporation Under DOE Contract No. DE-AM01-07LM00090
Planned Sampling Map Grand Junction, CO, Processing Site January 2011	
DATE PREPARED December 6, 2010	FILENAME S0723100

M:\LTS\111\0001\16\000\IS07231\IS0723100-11x17.mxd smithw 12/6/2010 11:00:06 AM

Grand Junction, Colorado, Processing Site, Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	<u>Grand Junction, Colorado</u>	Date(s) of Water Sampling	<u>January 7, 2011</u>
Date(s) of Verification	<u>February 10, 2011</u>	Name of Verifier	<u>Steve Donovan</u>

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List other documents, SOPs, instructions.	<u>Yes</u>	<u>Work Order Letter dated December 6, 2010.</u>
2. Were the sampling locations specified in the planning documents sampled?	<u>Yes</u>	
3. Was a pre-trip calibration conducted as specified in the above-named documents?	<u>Yes</u>	<u>Pre-trip calibration was performed on January 6, 2011.</u>
4. Was an operational check of the field equipment conducted daily? Did the operational checks meet criteria?	<u>Yes</u>	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	<u>Yes</u>	
6. Was the category of the well documented?	<u>Yes</u>	
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling? Did the water level stabilize prior to sampling? Did pH, specific conductance, and turbidity measurements stabilize prior to sampling? Was the flow rate less than 500 mL/min? If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	<u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>NA</u>	

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well: Was the flow rate less than 500 mL/min?	NA	All wells were Category I.
Was one pump/tubing volume removed prior to sampling?	NA	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	A duplicate sample was collected from location 1001.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	Yes	One equipment blank was collected.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number? Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?	Yes	Location IDs 2114 and 2865 were used for the QC samples.
	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members (hardcopies) or are dates present for the "Date Signed" fields (FDCS)?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN): 10123525
Sample Event: January 7, 2011
Site(s): Grand Junction, Colorado, Processing Site
Laboratory: TestAmerica Denver
Work Order No.: 280-11472
Analysis: Metals and Wet Chemistry
Validator: Steve Donovan
Review Date: February 10, 2011

This validation was performed according to the *Environmental Procedures Catalog* (LMS/PRO/S04325, continually updated), “*Standard Practice for Validation of Laboratory Data.*” The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation on the data review and validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 2.

Table 2. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Metals: Molybdenum and Uranium	LMM-02	SW-846 3020A	SW-846 6020
Ammonia as N	WCH-A-005	MCAWW 350.1	MCAWW 350.1
Total Dissolved Solids	WCH-A-033	SM 2540C	SM 2540C

Data Qualifier Summary

Analytical results were qualified as listed in Table 3. Refer to the sections below for an explanation of the data qualifiers applied.

Table 3. Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
280-11472-1	0423	Ammonia as N	U	Less than 5 times the method blank
280-11472-1	0423	Uranium	J	Less than 5 times the equipment blank
280-11472-2	0427	Ammonia as N	U	Less than 5 times the method blank
280-11472-2	0427	Uranium	J	Less than 5 times the equipment blank
280-11472-7	Equipment blank	Ammonia as N	U	Less than 5 times the method blank

Sample Shipping/Receiving

TestAmerica in Denver, Colorado, received 8 water samples on January 8, 2011, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the

samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The COC form was complete with no errors or omissions. The receiving documentation included a copy of the shipping air waybill labels.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 0.4 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods. All calibration and laboratory spike standards were prepared from independent sources.

Method SM 2540C

There are no calibration requirements associated with the determination of total dissolved solids.

Method MCAWW 350.1

Calibrations for ammonia as N were performed using six calibration standards on January 20, 2011. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the method detection limit. Initial and continuing calibration verification checks were made at the required frequency resulting in 10 verification checks. All calibration check results were within the acceptance criteria.

Method SW-846 6020

Calibration for molybdenum and uranium were performed on January 11, 2011, using single point calibration. Initial and continuing calibration verification checks were made at the required frequency resulting in 6 verification checks. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit (PQL) and all results were within the acceptance range. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. All method blank and calibration blank results associated with the samples were below the PQLs for all analytes.

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

ICP interference check samples ICSA and ICSAB were analyzed at the required frequency to verify the instrumental interelement and background correction factors. All check sample results met the acceptance criteria.

Matrix Spike Analysis

Matrix spike and matrix spike duplicate (MS/MSD) samples are used to measure method performance in the sample matrix. The MS/MSD data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike concentration. The spikes met the recovery and precision criteria for all analytes evaluated.

Laboratory Replicate Analysis

Laboratory replicate sample results demonstrate acceptable laboratory precision. The relative percent difference values for the sample replicates, laboratory control sample replicates, and matrix spike replicates were less than 20 percent for results that were greater than 5 times the PQL, indicating acceptable precision.

Laboratory Control Sample

Laboratory control samples were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. All control sample results were acceptable.

Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. ICP-MS serial dilution data are evaluated when the concentration of the undiluted sample is greater than 100 times the PQL. All evaluated serial dilution data were acceptable.

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The samples were diluted prior to analysis of molybdenum, uranium, and vanadium to reduce interferences. The required detection limits were met for all analytes.

Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

Electronic Data Deliverable (EDD) File

The EDD file arrived on January 28, 2011. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements. The module compares the contents of the file to the requested analyses to ensure all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package.

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 10123525 Lab Code: STD Validator: Steve Donovan Validation Date: 2/10/2011
Project: Grand Junction Disp/Proc Sites Analysis Type: Metals General Chem Rad Organics
of Samples: 8 Matrix: WATER Requested Analysis Completed: Yes

Chain of Custody

Present: OK Signed: OK Dated: OK

Sample

Integrity: OK Preservation: OK Temperature: OK

Select Quality Parameters

- Holding Times
- Detection Limits
- Field/Trip Blanks
- Field Duplicates

All analyses were completed within the applicable holding times.

The reported detection limits are equal to or below contract requirements.

There was 1 trip/equipment blank evaluated.

There was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 10123525

Lab Code: STD

Date Due: 2/5/2011

Matrix: Water

Site Code: GRJ03

Date Completed: 1/31/2011

Analyte	Date Analyzed	CALIBRATION						Method	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
		Int.	R^2	ICV	CCV	ICB	CCB								
Molybdenum	01/12/2011			OK	OK	OK	OK	OK	101.0	97.0		1.0	105.0	7.0	97.0
Uranium	01/12/2011			OK	OK	OK	OK	OK	103.0	117.0		1.0	108.0	2.0	99.0

SAMPLE MANAGEMENT SYSTEM
Wet Chemistry Data Validation Worksheet

RIN: 10123525 **Lab Code:** STD **Date Due:** 2/5/2011
Matrix: Water **Site Code:** GRJ03 **Date Completed:** 1/31/2011

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
Ammonia as N	01/20/2011	0.000	1.0000	OK	OK	OK	OK	102	96	96	0		
Ammonia as N	01/20/2011							103			1		
Total Dissolved Solids	01/11/2011						OK	95			2		
Total Dissolved Solids	01/11/2011							95					
Total Dissolved Solids	01/11/2011							96			0		

Sampling Quality Control Assessment

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

Sampling Protocol

All wells met the Category I criteria. Sample results are qualified with an “F” flag in the database, indicating the wells were purged and sampled using the low-flow sampling method.

Equipment Blank Assessment

Equipment blanks are prepared and analyzed to document contamination attributable to the sample collection process. One equipment blank was submitted with these samples. Molybdenum and uranium were detected in this blank. The associated sample results that are greater than the method detection limit but less than 5 times the blank concentration are qualified with a “J” flag as estimated values.

Field Duplicate Analysis

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates, which measure only laboratory performance. The relative percent difference for duplicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than the PQL, the range should be no greater than the PQL. A duplicate sample was collected from location 1001. The duplicate results met these criteria, demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Equipment/Trip Blanks

RIN: 10123525 Lab Code: STD Project: Grand Junction Disp/Proc Sites Validation Date: 2/10/2011

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	280-11472-7	6020	Molybdenum	0.18	J	0.14	ug/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
280-11472-1	INT 726	0423	6.2	1		
280-11472-2	INT 727	0427	5.4	1		

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	280-11472-7	6020	Uranium	0.99	B	0.020	ug/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
280-11472-1	INT 726	0423	4.3	1	B	J
280-11472-2	INT 727	0427	3.6	1	B	J

SAMPLE MANAGEMENT SYSTEM
Validation Report: Field Duplicates

RIN: 10123525 Lab Code: STD Project: Grand Junction Disp/Proc Sites Validation Date: 2/10/2011

Duplicate: 2865

Sample: 1001

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Ammonia as N	69	B		20	70	B		20	1.44		mg/L
Molybdenum	170			1	170			1	0		ug/L
Total Dissolved Solids	6100			1	6400			1	4.80		mg/L
Uranium	380	B		1	380	B		1	0		ug/L

Certification

All laboratory analytical quality control criteria were met except as qualified in this report. The data qualifiers listed on the SEEPro database reports are defined on the last page of each report. All data in this package are considered validated and available for use.

Laboratory Coordinator: Steve Donovan 3-16-2011
Steve Donovan Date

Data Validation Lead: Steve Donovan 3-16-2011
Steve Donovan Date

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Attachment 1
Assessment of Anomalous Data

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Potential Outliers Report

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Potential Outliers Report

Potential outliers are measurements that are extremely large or small relative to the rest of the data and, therefore, are suspected of misrepresenting the population from which they were collected. Potential outliers may result from transcription errors, data-coding errors, or measurement system problems. However, outliers may also represent true extreme values of a distribution and indicate more variability in the population than was expected.

Statistical outlier tests give probabilistic evidence that an extreme value does not "fit" with the distribution of the remainder of the data and is therefore a statistical outlier. These tests should only be used to identify data points that require further investigation. The tests alone cannot determine whether a statistical outlier should be discarded or corrected within a data set.

There are three steps involved in identifying extreme values or outliers:

1. Identify extreme values that may be potential outliers by generating the Outliers Report using the Sample Management System from data in the SEEPro database. The application compares the new data set with historical data and lists the new data that fall outside the historical data range. A determination is also made if the data are normally distributed using the Shapiro-Wilk Test.
2. Apply the appropriate statistical test. Dixon's Extreme Value test is used to test for statistical outliers when the sample size is less than or equal to 25. This test considers both extreme values that are much smaller than the rest of the data (case 1) and extreme values that are much larger than the rest of the data (case 2). This test is valid only if the data without the suspected outlier are normally distributed. Rosner's Test is a parametric test that is used to detect outliers for sample sizes of 25 or more. This test also assumes that the data without the suspected outliers are normally distributed.
3. Scientifically review statistical outliers and decide on their disposition.

There were no potential outliers identified, and the data for this event are acceptable as qualified.

Data Validation Outliers Report - No Field Parameters

Comparison: All Historical Data

Laboratory: TestAmerica Denver

RIN: 10123525

Report Date: 2/23/2011

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current			Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
					Result	Qualifiers Lab Data		Result	Qualifiers Lab Data		Result	Qualifiers Lab Data		N	N Below Detect	
GRJ01	0590	N001	01/07/2011	Ammonia Total as N	8.6	B	F	5.7		F	3.4		F	5	0	No
GRJ01	0590	N001	01/07/2011	Uranium	0.078	B	F	0.229			0.112			32	0	No
GRJ01	1001	N001	01/07/2011	Total Dissolved Solids	6100		F	7210		F	6150			19	0	No

Data Validation Outliers Report - Field Parameters Only

Comparison: All Historical Data

Laboratory: Field Measurements

RIN: 10123525

Report Date: 2/23/2011

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current			Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
					Result	Qualifiers Lab Data		Result	Qualifiers Lab Data		Result	Qualifiers Lab Data		N	N Below Detect	
GRJ01	0423	N001	01/07/2011	Alkalinity, Total (As CaCO3)	173			166			49			17	0	No
GRJ01	0423	N001	01/07/2011	Specific Conductance	1528			1397			399			16	0	No
GRJ01	0427	N001	01/07/2011	Alkalinity, Total (As CaCO3)	206			173			49			19	0	No
GRJ01	0427	N001	01/07/2011	Oxidation Reduction Potential	14.7			255			79			14	0	No
GRJ01	0427	N001	01/07/2011	Specific Conductance	1609			1474			418			15	0	No
GRJ01	1001	N001	01/07/2011	Specific Conductance	8360		F	8310			358			17	0	No

STATISTICAL TESTS:

The distribution of the data is tested for normality or lognormality using the Shapiro-Wilk Test

Outliers are identified using Dixon's Test when there are 25 or fewer data points.

Outliers are identified using Rosner's Test when there are 26 or more data points.

See Data Quality Assessment: Statistical Methods for Practitioners, EPA QC/G-9S, February 2006.

Attachment 2

Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE GRJ01, Grand Junction Processing Site

REPORT DATE: 2/23/2011

Location: 0590 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	01/07/2011	N001	7.2	- 15.5	410		F	#		
Ammonia Total as N	mg/L	01/07/2011	N001	7.2	- 15.5	8.6	B	F	#	0.022	
Molybdenum	mg/L	01/07/2011	N001	7.2	- 15.5	0.039		F	#	0.00014	
Oxidation Reduction Potential	mV	01/07/2011	N001	7.2	- 15.5	108		F	#		
pH	s.u.	01/07/2011	N001	7.2	- 15.5	6.75		F	#		
Specific Conductance	umhos/cm	01/07/2011	N001	7.2	- 15.5	7004		F	#		
Temperature	C	01/07/2011	N001	7.2	- 15.5	12.52		F	#		
Total Dissolved Solids	mg/L	01/07/2011	N001	7.2	- 15.5	5600		F	#	19	
Turbidity	NTU	01/07/2011	N001	7.2	- 15.5	2.49		F	#		
Uranium	mg/L	01/07/2011	N001	7.2	- 15.5	0.078	B	F	#	0.00002	

Groundwater Quality Data by Location (USEE100) FOR SITE GRJ01, Grand Junction Processing Site

REPORT DATE: 2/23/2011

Location: 0748 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	01/07/2011	N001	9.05	- 13.55	14	B	F	#	0.044	
Molybdenum	mg/L	01/07/2011	N001	9.05	- 13.55	0.042		F	#	0.00014	
Oxidation Reduction Potential	mV	01/07/2011	N001	9.05	- 13.55	17		F	#		
pH	s.u.	01/07/2011	N001	9.05	- 13.55	6.78		F	#		
Specific Conductance	umhos /cm	01/07/2011	N001	9.05	- 13.55	6484		F	#		
Temperature	C	01/07/2011	N001	9.05	- 13.55	12.57		F	#		
Total Dissolved Solids	mg/L	01/07/2011	N001	9.05	- 13.55	5500		F	#	19	
Turbidity	NTU	01/07/2011	N001	9.05	- 13.55	8.47		F	#		
Uranium	mg/L	01/07/2011	N001	9.05	- 13.55	0.049	B	F	#	0.00002	

Groundwater Quality Data by Location (USEE100) FOR SITE GRJ01, Grand Junction Processing Site

REPORT DATE: 2/23/2011

Location: 1001 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	01/07/2011	N001	6.6	- 11.6	457		F	#		
Ammonia Total as N	mg/L	01/07/2011	N001	6.6	- 11.6	69	B	F	#	0.44	
Ammonia Total as N	mg/L	01/07/2011	N002	6.6	- 11.6	70	B	F	#	0.44	
Molybdenum	mg/L	01/07/2011	N001	6.6	- 11.6	0.17		F	#	0.00014	
Molybdenum	mg/L	01/07/2011	N002	6.6	- 11.6	0.17		F	#	0.00014	
Oxidation Reduction Potential	mV	01/07/2011	N001	6.6	- 11.6	93.8		F	#		
pH	s.u.	01/07/2011	N001	6.6	- 11.6	6.81		F	#		
Specific Conductance	umhos/cm	01/07/2011	N001	6.6	- 11.6	8360		F	#		
Temperature	C	01/07/2011	N001	6.6	- 11.6	11.91		F	#		
Total Dissolved Solids	mg/L	01/07/2011	N001	6.6	- 11.6	6100		F	#	47	
Total Dissolved Solids	mg/L	01/07/2011	N002	6.6	- 11.6	6400		F	#	47	
Turbidity	NTU	01/07/2011	N001	6.6	- 11.6	8.19		F	#		
Uranium	mg/L	01/07/2011	N001	6.6	- 11.6	0.38	B	F	#	0.00002	
Uranium	mg/L	01/07/2011	N002	6.6	- 11.6	0.38	B	F	#	0.00002	

Groundwater Quality Data by Location (USEE100) FOR SITE GRJ01, Grand Junction Processing Site

REPORT DATE: 2/23/2011

Location: 1036 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	01/07/2011	N001	8.85 - 13.35	538		F #		
Ammonia Total as N	mg/L	01/07/2011	N001	8.85 - 13.35	74	B	F #	0.44	
Molybdenum	mg/L	01/07/2011	N001	8.85 - 13.35	0.15		F #	0.00014	
pH	s.u.	01/07/2011	N001	8.85 - 13.35	7.12		F #		
Specific Conductance	umhos/cm	01/07/2011	N001	8.85 - 13.35	8016		F #		
Temperature	C	01/07/2011	N001	8.85 - 13.35	11.68		F #		
Total Dissolved Solids	mg/L	01/07/2011	N001	8.85 - 13.35	6100		F #	47	
Turbidity	NTU	01/07/2011	N001	8.85 - 13.35	8.14		F #		
Uranium	mg/L	01/07/2011	N001	8.85 - 13.35	2.3	B	F #	0.00002	

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

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- > 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
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined 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

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Surface Water Quality Data by Location (USEE102) FOR SITE GRJ01, Grand Junction Processing Site

REPORT DATE: 2/23/2011

Location: 0423 SURFACE LOCATION SURFACE WATER & SEDIMENT Originally State_Plane_East:1138690 State_Plane_North:458550
Changed 12/3/96

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Ammonia Total as N	mg/L	01/07/2011	0001	0.12	B	U	#	0.022	
Molybdenum	mg/L	01/07/2011	0001	0.0062			#	0.00014	
Total Dissolved Solids	mg/L	01/07/2011	0001	820			#	6.3	
Uranium	mg/L	01/07/2011	0001	0.0043	B	J	#	0.00002	
Alkalinity, Total (As CaCO3)	mg/L	01/07/2011	N001	173			#		
Oxidation Reduction Potential	mV	01/07/2011	N001	117.4			#		
pH	s.u.	01/07/2011	N001	7.34			#		
Specific Conductance	umhos/cm	01/07/2011	N001	1528			#		
Temperature	C	01/07/2011	N001	1.04			#		
Turbidity	NTU	01/07/2011	N001	24.3			#		

Surface Water Quality Data by Location (USEE102) FOR SITE GRJ01, Grand Junction Processing Site

REPORT DATE: 2/23/2011

Location: 0427 SURFACE LOCATION SURFACE WATER & SEDIMENT Originally State_Plane_East:1129215 State_Plane_North:459210
 Changed 12/3/96

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Ammonia Total as N	mg/L	01/07/2011	0001	0.077	JB	U	#	0.022	
Molybdenum	mg/L	01/07/2011	0001	0.0054			#	0.00014	
Total Dissolved Solids	mg/L	01/07/2011	0001	780			#	19	
Uranium	mg/L	01/07/2011	0001	0.0036	B	J	#	0.00002	
Alkalinity, Total (As CaCO3)	mg/L	01/07/2011	N001	206			#		
Oxidation Reduction Potential	mV	01/07/2011	N001	14.7			#		
pH	s.u.	01/07/2011	N001	8.13			#		
Specific Conductance	umhos/cm	01/07/2011	N001	1609			#		
Temperature	C	01/07/2011	N001	0.69			#		
Turbidity	NTU	01/07/2011	N001	87.1			#		

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

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- > 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
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

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

QA QUALIFIER:

- # Validated according to quality assurance guidelines.

Equipment Blank Data

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BLANKS REPORT

LAB: TestAmerica /SEVERN TRENT LABORATORY (Denver, CO)

RIN: 10123525

Report Date: 2/23/2011

Parameter	Site Code	Location ID	Sample Date	Sample ID	Units	Result	Qualifiers Lab	Data	Detection Limit	Uncertainty	Sample Type
Ammonia Total as N	GRJ01	0999	01/07/2011	N001	mg/L	0.064	JB	U	0.022		E
Molybdenum	GRJ01	0999	01/07/2011	N001	mg/L	0.00018	J		0.00014		E
Total Dissolved Solids	GRJ01	0999	01/07/2011	N001	mg/L	6.3	U		6.3		E
Uranium	GRJ01	0999	01/07/2011	N001	mg/L	0.00099	B		0.00002		E

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

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- > 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
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

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

SAMPLE TYPES:

- E Equipment Blank.

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Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE GRJ01, Grand Junction Processing Site
REPORT DATE: 2/23/2011

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0590	D	4566.69	01/07/2011	10:42:12	9.92	4556.77
0748		4582.49	01/07/2011	12:19:07	10.89	4571.6
1001	O	4569.69	01/07/2011	11:07:23	8.79	4560.9
1036		4570.64	01/07/2011	11:49:38	7.79	4562.85

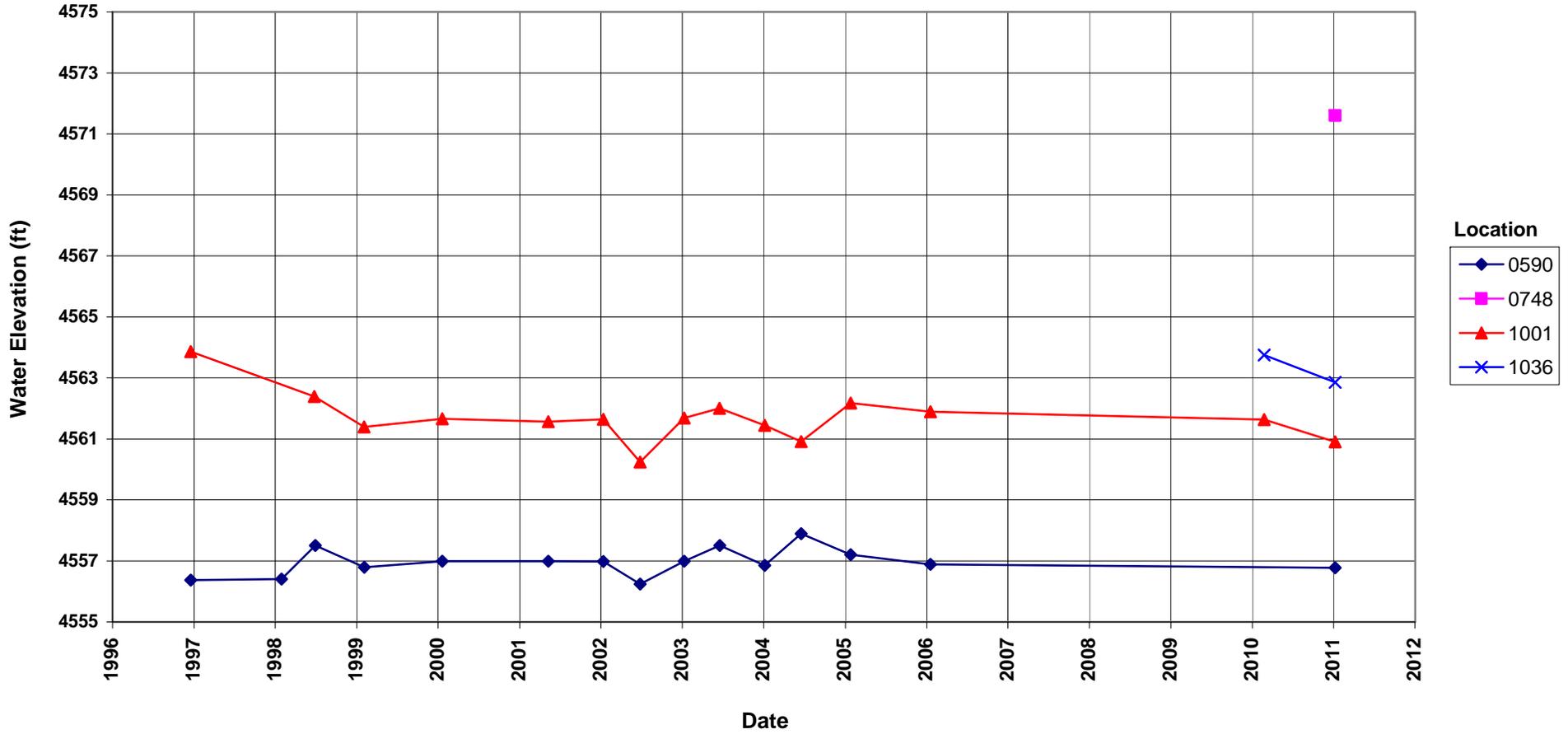
FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT F OFF SITE
 N UNKNOWN O ON SITE U UPGRADIENT

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Hydrograph

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Grand Junction Processing Site Hydrograph

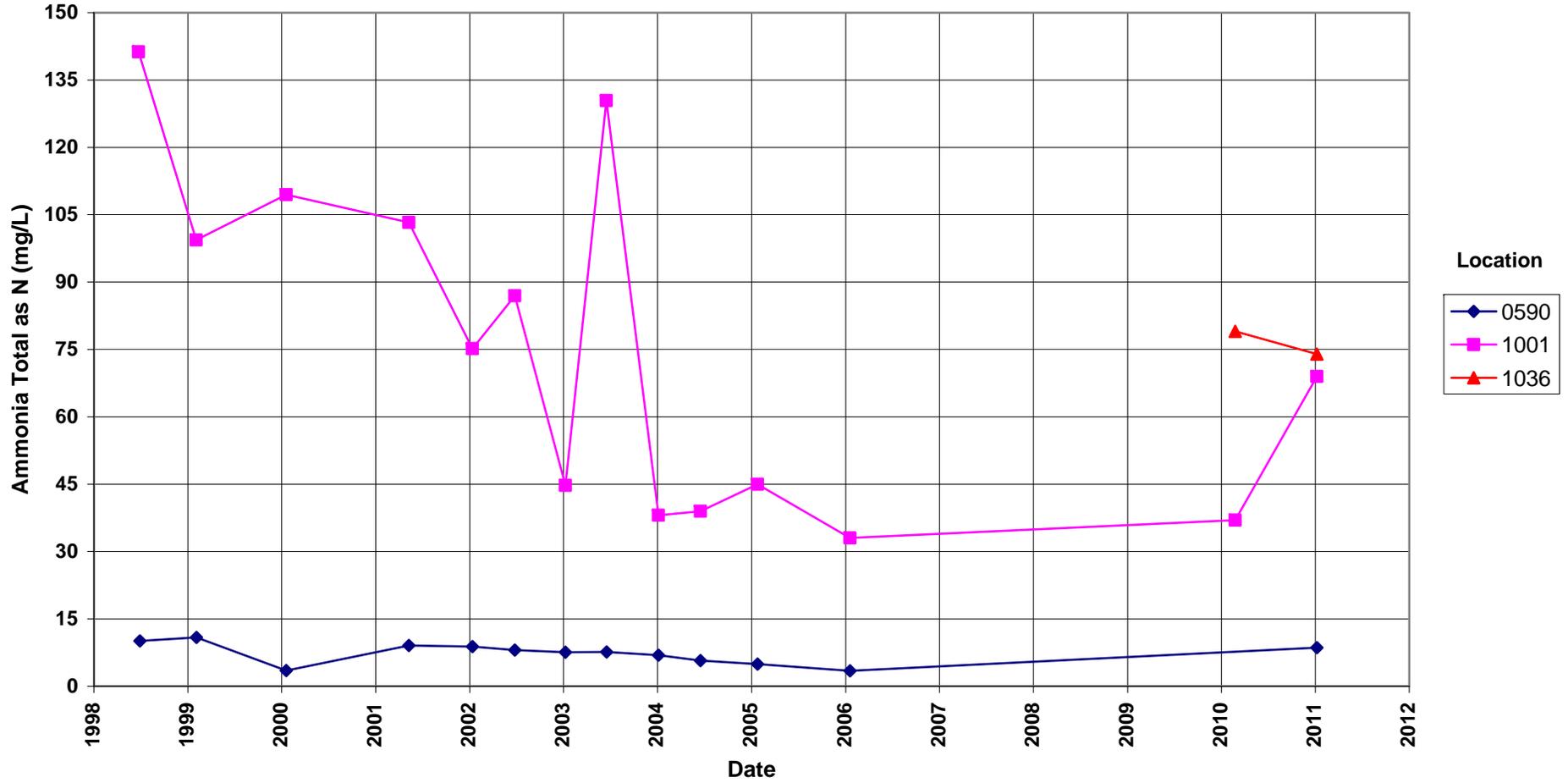


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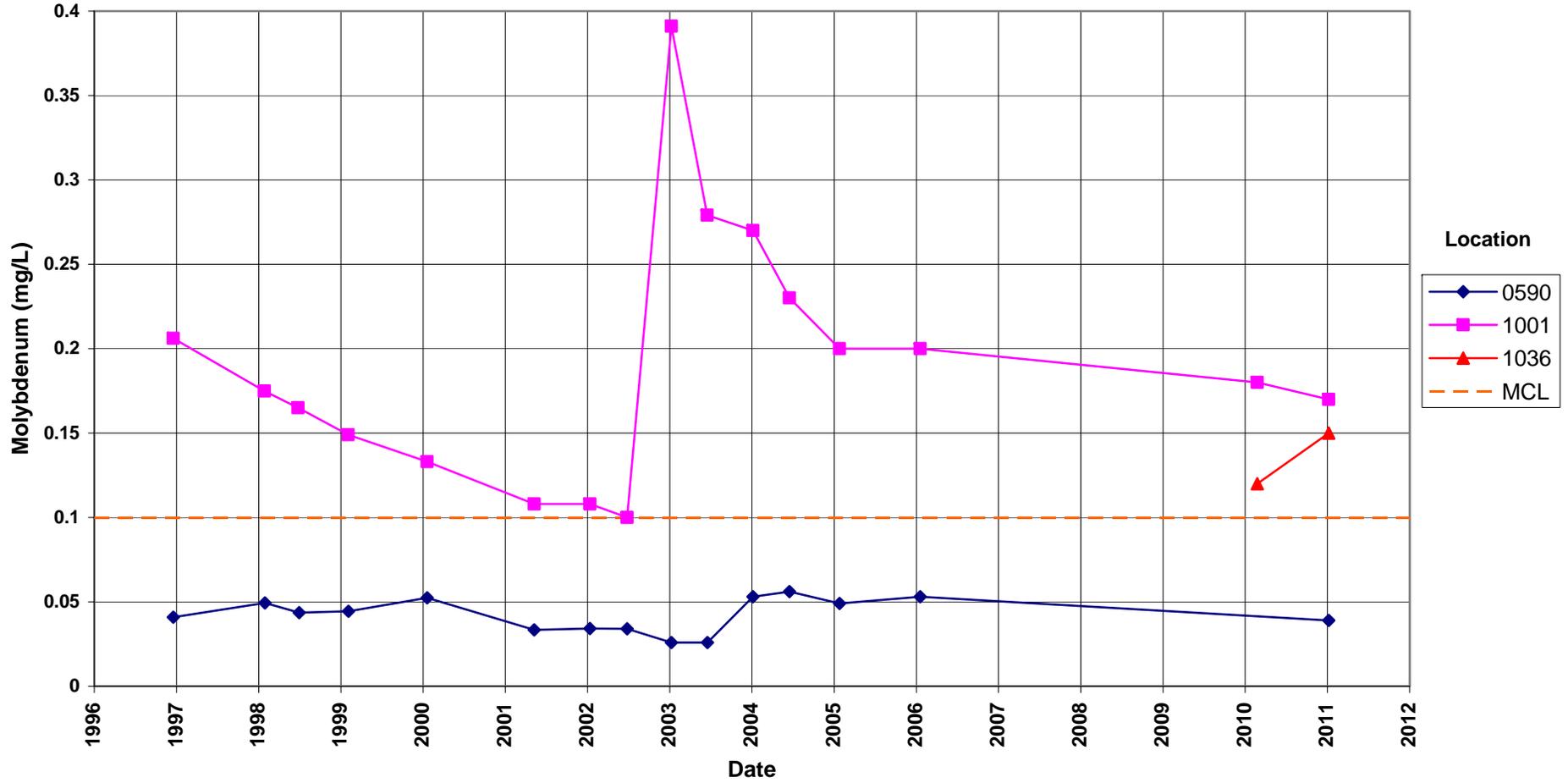
Time-Concentration Graphs

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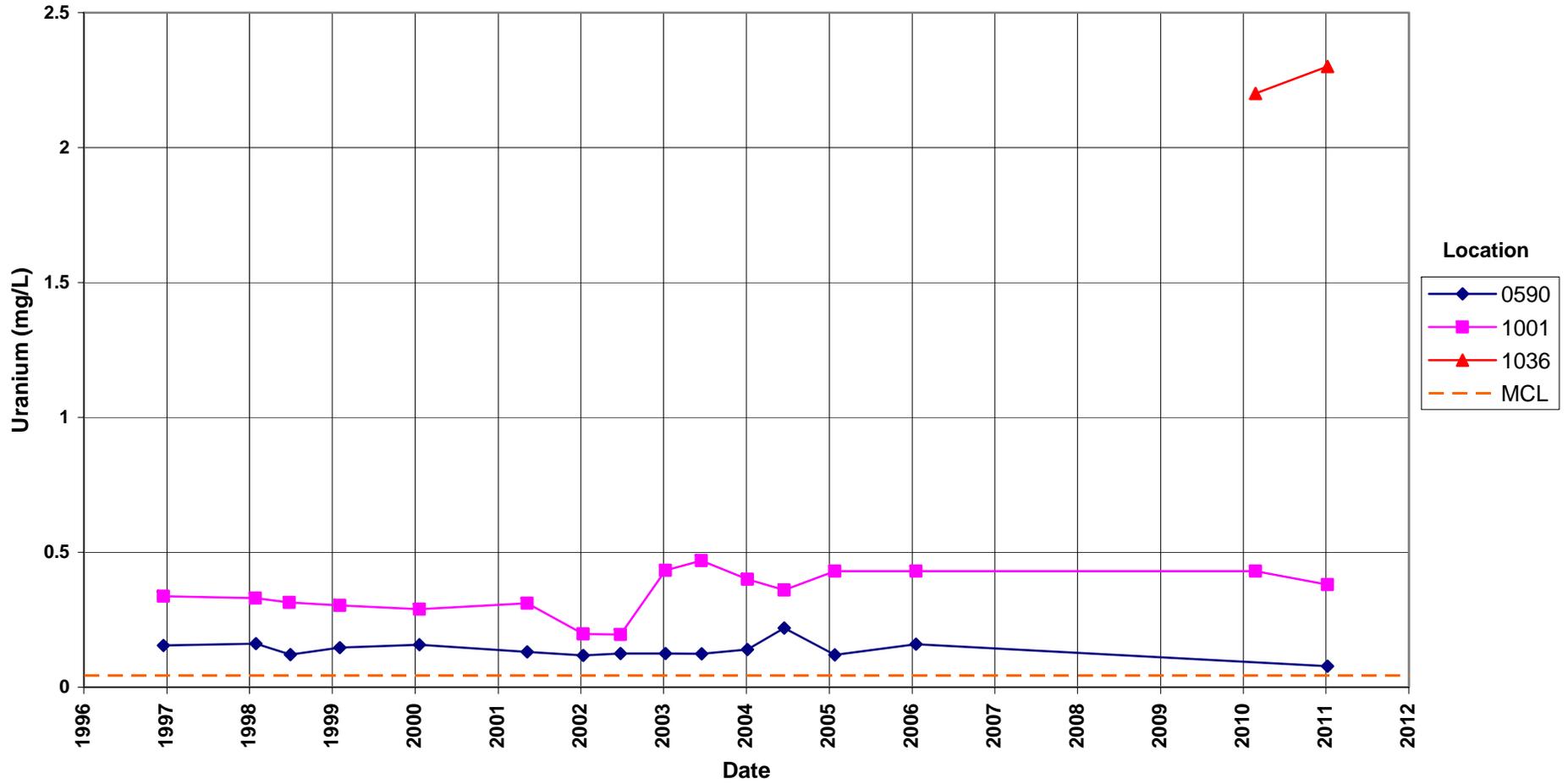
Grand Junction Processing Site Ammonia Total as N Concentration



**Grand Junction Processing Site
Molybdenum Concentration**
Maximum Contaminant Level (MCL) = 0.1 mg/L



Grand Junction Processing Site
Uranium Concentration
Maximum Contaminant Level (MCL) = 0.044 mg/L



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Attachment 3
Sampling and Analysis Work Order

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established 1959

Task Order LM00-501
Control Number 11-0146

December 6, 2010

U.S. Department of Energy
Office of Legacy Management
ATTN: Joseph Desormeau
Site Manager
2597 B ¾ Road
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
January 2011 Environmental Sampling at the Grand Junction, Colorado,
Processing Site

REFERENCE: Task Order LM00-501-02-106-402, Grand Junction, CO, Processing Site

Dear Mr. Desormeau:

The purpose of this letter is to inform you of the upcoming sampling event at the Grand Junction, CO, Processing Site. Enclosed are the map and tables specifying sample locations and analytes for routine monitoring. Water quality data will be collected from this site as part of the environmental sampling currently scheduled to begin the week of January 3, 2011.

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

Monitoring Wells*

590 Al 748 Al 1001 Al 1036 Al

*NOTE: Al = Alluvium

Surface locations

423 427

Please note that monitoring well 1014, sampled during previous events, will not be included in this event due to its unsafe location in the bike lane on Riverside Parkway. New monitoring well 1036, located in a safer area off the Parkway, immediately south of monitoring well 1014, will be sampled instead.

Joseph Desormeau
Control Number 11-0146
Page 2

All samples will be collected as directed in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. Access agreements are being reviewed and are expected to be complete by the beginning of fieldwork.

Please call me at (970) 248-6391 if you have any questions.

Sincerely,



Gary K. Baur
Site Lead

GB/lcg/lb

Enclosures (3)

cc: (electronic)

Cheri Bahrke, Stoller
Gary Baur, Stoller
Steve Donovan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
EDD Delivery
re-grand.junction
File: GJP 410.02(A)

Sampling Frequencies for Locations at Grand Junction Processing Site

Location ID	Quarterly	Semiannually	Annually	Every 5 Years	Not Sampled	Notes
Monitoring Wells						
590				X		Download data logger; next sampling in 1/2011
748				X		
1001				X		Download data logger; next sampling in 1/2011
1036				X		Next sampling in 1/2011
Surface Locations						
423				X		Next sampling in 1/2011
427				X		Next sampling in 1/2011

Sampling conducted in January

Constituent Sampling Breakdown

Site	Grand Junction Processing Site		Required Detection Limit (mg/L)	Analytical Method	Line Item Code
	Groundwater	Surface Water			
Analyte					
Approx. No. Samples/yr	6	2			
Field Measurements					
Alkalinity	X	X			
Dissolved Oxygen					
Redox Potential	X	X			
pH	X	X			
Specific Conductance	X	X			
Turbidity	X				
Temperature	X	X			
Laboratory Measurements					
Aluminum					
Ammonia as N (NH ₃ -N)	X	X	0.1	EPA 350.1	WCH-A-005
Calcium					
Chloride					
Chromium					
Gross Alpha					
Gross Beta					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum	X	X	0.003	SW-846 6020	LMM-02
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO ₃ +NO ₂)-N					
Potassium					
Radium-226					
Radium-228					
Selenium					
Silica					
Sodium					
Strontium					
Sulfate					
Sulfide					
Total Dissolved Solids	X	X	10	SM2540 C	WCH-A-033
Total Organic Carbon					
Uranium	X	X	0.0001	SW-846 6020	LMM-02
Vanadium					
Zinc					
Total No. of Analytes	4	4			

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

Attachment 4 Trip Report

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Memorandum

Control Number N/A

DATE: January 13, 2011

TO: Gary Baur

FROM: Jeff Walters

SUBJECT: Trip Report

Site: Grand Junction Processing Site

Date of Sampling Event: January 7, 2011

Team Members: Joe Trevino, Jason Kaufman, and Jeff Walters

Number of Locations Sampled: 4 monitoring wells, 2 surface water locations, with 1 equipment blank, and 1 duplicate sample.

Locations Not Sampled/Reason: None

Location Specific Information:

Date	Sample Time	Ticket Number	Sample Location	Notes	Water Levels
1/7/2011	1007	INT 726	0423	Surface Water	-----
1/7/2011	1239	INT 727	0427	Surface Water	-----
1/7/2011	1042	INT 724	0590	Groundwater	9.92
1/7/2011	1219	INT 725	0748	Groundwater	10.89
1/7/2011	1107	INT 722	1001	Groundwater	8.79
1/7/2011	1149	INT 721	1036	Groundwater	7.79

All samples were shipped from Grand Junction via Fed-Ex to TestAmerica Denver on January 7, 2011.

Field Variance: None.

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

Date	Time	False ID	True ID	Sample Type	Ticket Number
1/7/2011	1200	2865	1001	Duplicate	INT 723
1/7/2011	0920	2114	NA	Equipment Blank	JVC 259

Requisition Numbers Assigned: All samples were assigned to report identification number (RIN) 10123525.

Water Level Measurements: Water levels were measured at all sampled monitoring wells. See table above.

Well Inspection Summary: All wells were in good condition. Sand has been added between the well and protective casing at monitoring well 1001.

Equipment: All wells are equipped with dedicated tubing and all were sampled with a peristaltic pump. The surface water locations were sampled using a peristaltic pump and lanyard with tubing and a stainless steel weight.

Regulatory: N/A

Institutional Controls

Fences, Gates, Locks: N/A

Signs: N/A

Trespassing/Site Disturbances: N/A

Site Issues: None Observed

Disposal Cell/Drainage Structure Integrity: N/A

Vegetation/Noxious Weed Concerns: N/A

Maintenance Requirements: None.

Access Issues: None.

Corrective Action Required/Taken: Monitoring well 0590 needs to have the shrubs trimmed back some.

cc: (electronic)
Joe Desormeau, DOE
Steve Donivan, Stoller
EDD Delivery