LMS/MON/S01209

Data Validation Package

December 2009
Water Sampling at the Monument Valley, Arizona, Site

February 2010

U.S. DEPARTMENT OF ENERGY

Legacy Management

Contents

Sampling Event Summary 1
Monument Valley, Arizona, Processing Site Sample Locations 4
Data Assessment Summary 5
Water Sampling Field Activities Verification Checklist 7
Laboratory Performance Assessment 9
Sampling Quality Control Assessment 16
Certification 18

Attachment 1—Assessment of Anomalous Data

Potential Outliers Report

Attachment 2—Data Presentation

Groundwater Quality Data
Surface Water Quality Data
Static Water Level Data
Time-Concentration Graphs

Attachment 3—Sampling and Analysis Work Order

Attachment 4—Trip Report

This page intentionally left blank

Sampling Event Summary

Site: Monument Valley, Arizona, Processing Site

Sampling Period: December 14-16, 2009

Thirty-five groundwater samples and one surface water sample were collected at the Monument Valley, Arizona, Processing Site to monitor groundwater contaminants as specified in the 1999 *Final Site Observational Work Plan for the UMTRA Project Site at Monument Valley, Arizona.* Sampling and analysis was 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). Water levels were measured at each sampled well. Duplicate samples were collected from locations 0719 and 0774.

Time-concentration plots for ammonia as nitrogen, chloride, nitrate + nitrite as nitrogen, sulfate, uranium, and vanadium are included with the results data. The data from this sampling event are consistent with values previously obtained. Widely fluctuating uranium concentrations in wells 0657 and 0662 have been previously noted and this trend continues with the data from this sampling event. Ongoing erosion of a former uranium mine located upgradient from the site may be affecting the uranium concentrations at these locations. Nitrate + nitrite as nitrogen concentrations in wells 0662, 0761, 0762, 0764, and 0771 had been increasing through 2008, which was consistent with downgradient movement of the contaminant plume. Results from this event, however, demonstrate that nitrate + nitrite as nitrogen concentrations are leveling off or decreasing in these wells. In well 0655, nitrate + nitrite as nitrogen continues to fluctuate seasonally and may show an upward trend. A de-nitrification treatment of well 0765 in September 2009 by the University of Arizona has decreased concentrations for most analytes at this location, most notably nitrate + nitrite as nitrogen.

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

Table 1. Monument Valley Locations That Exceed Standards

Analyte	Standard[a] (mg/L)	Site Code	Location	Concentration (mg/L)
Nitrate + Nitrite as Nitrogen	10	MON01	0606	220
			0648	60
			0653	37
			0655	130
			0656	15
			0662	19
			0669	15
			0761	34
			0762	97
			0764	40
			0766	120
			0770	19
			0771	170
Uranium	0.044	MON01	0657	0.068
			0662	0.2

[a]Standards are listed in 40 CFR 192.02 Table 1 to Subpart A.

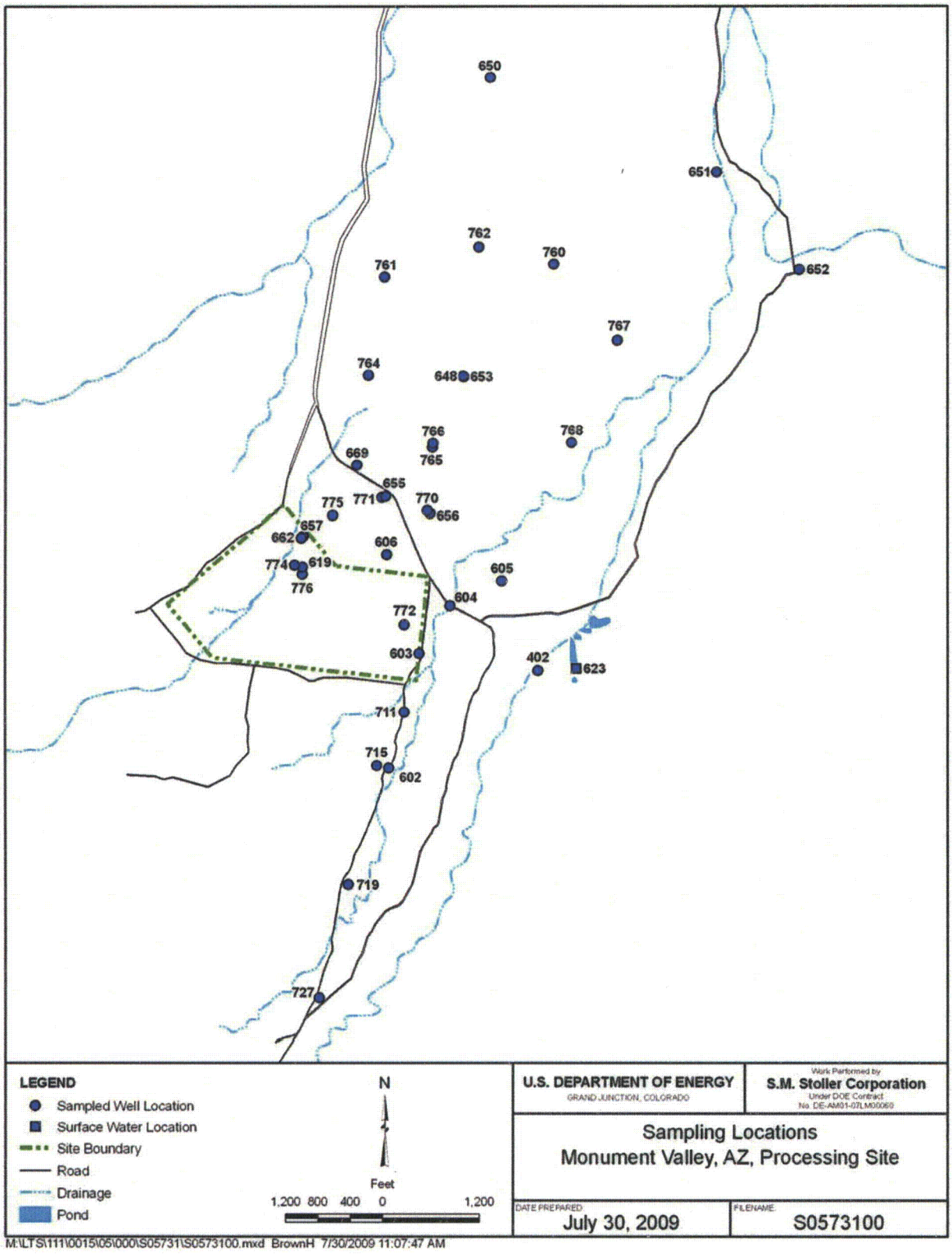
The Navajo Nation's proposed cleanup standard for sulfate is 250 milligrams per liter (mg/L). The ratios of sulfate:chloride concentrations vary depending on whether the source is related to past millsite activities or if it occurs naturally. Tailings fluids were enriched in nitrate and sulfate but had relatively low chloride concentrations. A sulfate:chloride ratio greater than 10 is a good indication of groundwater contamination resulting from milling activities. The proposed sulfate treatment goal for Monument Valley will incorporate both criteria. The treatment goal will be achieved when the sulfate concentration is less than 250 mg/L *or* the sulfate:chloride ratio is less than 10. Table 2 lists sulfate concentrations and sulfate:chloride ratios.

Table 2. Sulfate Results

Location	Sulfate Concentration (mg/L)	Sulfate : Chloride	Treatment Goal Achieved?
0402	19	2	Yes
0602	110	9	Yes
0603	100	9	Yes
0604	110	10	Yes
0605	140	7	Yes
0606	370	16	No
0619	28	6	Yes
0648	900	41	No
0650	140	12	Yes
0651	110	9	Yes
0652	66	5	Yes
0653	1100	44	No
0655	1400	64	No
0656	160	12	Yes
0657	97	15	Yes
0662	220	13	Yes
0669	110	14	Yes
0711	120	9	Yes
0715	69	8	Yes
0719	130	9	Yes
0727	93	8	Yes
0760	90	10	Yes
0761	470	36	No
0762	1500	22	No
0764	300	27	No
0765	390	24	No
0766	520	31	No
0767	32	6	Yes
0768	60	5	Yes
0770	200	14	Yes
0771	1400	82	No
0772	140	9	Yes
0774	37	8	Yes
0775	26	5	Yes
0776	32	6	Yes

David Miller
Site Lead, S.M. Stoller

2/15/10
Date



Monument Valley, Arizona, Processing Site Sample Locations

Data Assessment Summary

This page intentionally left blank

Water Sampling Field Activities Verification Checklist

Project	Monument Valley, Arizona	**Date(s) of Water Sampling**	December 14-16, 2009
Date(s) of Verification	January 26, 2010	**Name of Verifier**	Gretchen Baer

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List other documents, SOPs, instructions.		Work order letter dated November 9, 2009.
2. Were the sampling locations specified in the planning documents sampled?	No	Private location 0617 and monitor well 0777 were deleted from the sampling list at the direction of the site lead.
3. Was a pre-trip calibration conducted as specified in the above-named documents?	Yes	
4. Was an operational check of the field equipment conducted daily?	Yes	
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Was the category of the well documented?	Yes	
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	No	Turbidity was >10 NTU @ location 0760, 0765, & 0766. Data are qualified as "Q."
Was the flow rate less than 500 mL/min?	Yes	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	NA	

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Duplicates were collected @ 0719 and 0774.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?	Yes	QC samples are also listed in trip report.
Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	Samples with turbidity >10 were filtered.
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?	NA	

Laboratory Performance Assessment

General Information

Report Number (RIN):	09122747
Sample Event:	December 14-16, 2009
Site(s):	Monument Valley, Arizona
Laboratory:	ALS Laboratory Group, Fort Collins, Colorado
Work Order No.:	0912169
Analysis:	Metals and Wet Chemistry
Validator:	Gretchen Baer
Review Date:	January 26, 2010

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. 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 3.

Table 3. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Ammonia as Nitrogen	WCH-A-005	MCAWW 350.1	MCAWW 350.1
Chloride	MIS-A-039	SW-856 9056	SW-856 9056
Nitrite + Nitrate as Nitrogen	WCH-A-022	MCAWW 353.2	MCAWW 353.2
Sulfate	MIS-A-044	SW-856 9056	SW-856 9056
Uranium, Vanadium	LMM-02	SW-846 3005A	SW-846 6020A

Data Qualifier Summary

Analytical results were qualified as listed in Table 4. Refer to the sections below for an explanation of the data qualifiers applied.

Table 4. Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
0912169-1	0402	Uranium	U	Less than 5 times the calibration blank
0912169-5	0605	Uranium	U	Less than 5 times the calibration blank
0912169-30	0768	Uranium	U	Less than 5 times the calibration blank

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 38 water samples on December 19, 2009, accompanied by a Chain of Custody (COC) form. Copies of the two air bills were included in the receiving documentation. 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 with one exception. The sample time for location 0765 differed from the time written on the bottle labels by two hours; the laboratory used the time on the COC for log in.

Preservation and Holding Times

The sample shipments were received intact with the temperature inside the iced cooler at 1.8 °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.

Method MCAWW 350.1, Ammonia as Nitrogen

Calibrations were performed using six calibration standards on December 30, 2009. 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 (MDL). Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in eight verification checks. All calibration checks met the acceptance criteria.

Method MCAWW 353.2, Nitrite + Nitrate as Nitrogen

Calibrations were performed using seven calibration standards on January 4, 2010. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in six verification checks. All calibration checks met the acceptance criteria.

Method SW-846 6020A, Uranium and Vanadium

Calibrations were performed for uranium and vanadium on December 29, 2009, using seven standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in 12 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 SW-846 9056, Chloride and Sulfate

Calibrations were performed using five calibration standards on November 19, 2009. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in ten verification checks. All calibration checks met the acceptance criteria.

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 were below the PQLs for all analytes. In cases where a blank concentration exceeds the MDL, the associated sample results are qualified with a "U" flag (not detected) when the sample result is greater than the MDL but less than 5 times the blank concentration.

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 and matrix spike replicates were less than 20 percent for results that are greater than 5 times the PQLs, 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 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 with one exception. The nitrate + nitrite as nitrogen result for sample 2856 (field duplicate of 0719) was not included in the data package. This result was reported in the revised electronic data deliverable (EDD) file.

Chromatography Peak Integration

The integration of analyte peaks was reviewed for all ion chromatography data. There were no manual integrations performed and all peak integrations were satisfactory.

EDD File

A revised EDD file arrived on January 12, 2010, that included a result for nitrate + nitrite as nitrogen that was missing in the original EDD. 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 that 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: 09122747 **Lab Code:** PAR **Validator:** Gretchen Baer **Validation Date:** 1/25/2010

Project: Monument Valley **Analysis Type:** ☑ Metals ☑ General Chem ☐ Rad ☐ Organics

# of Samples: 38 **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	All analyses were completed within the applicable holding times.
☑ Detection Limits	The reported detection limits are equal to or below contract requirements.
☐ Field/Trip Blanks	
☑ Field Duplicates	There were 2 duplicates evaluated.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 09122747 **Lab Code:** PAR **Date Due:** 1/16/2010

Matrix: Water **Site Code:** MON **Date Completed:** 1/7/2010

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
		Int.	R^2	ICV	CCV	ICB	CCB								
URANIUM	12/29/2009							OK	100.0	101.0	100.0	0.0		4.0	
URANIUM	12/29/2009	0.0010	1.0000	OK	OK	OK	OK	OK	98.0	102.0	100.0	2.0	106.0	6.0	114.0
URANIUM	12/29/2009											2.0			
URANIUM	12/29/2009											2.0			
VANADIUM	12/29/2009							OK	102.0	107.0	102.0	3.0		5.0	
VANADIUM	12/29/2009	0.0060	1.0000	OK	OK	OK	OK	OK	98.0	102.0	103.0	1.0	99.0		95.0
VANADIUM	12/29/2009											1.0			

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 09122747 **Lab Code:** PAR **Date Due:** 1/16/2010

Matrix: Water **Site Code:** MON **Date Completed:** 1/7/2010

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	12/30/2009	-0.034	0.9990	OK	OK	OK	OK	OK	100.00	78.0	81.0	4.00	
AMMONIA AS N	12/30/2009	-0.042	0.9999	OK	OK	OK	OK	OK	97.00	80.0	83.0	5.00	
CHLORIDE	11/19/2009	0.022	1.0000										
CHLORIDE	12/21/2009			OK	OK	OK	OK	OK	98.00	104.0	101.0	2.00	
CHLORIDE	12/21/2009									103.0			
CHLORIDE	12/22/2009			OK	OK	OK	OK	OK	96.00	100.0	102.0	1.00	
CHLORIDE	12/22/2009									103.0			
NITRATE/NITRITE AS N	01/04/2010	0.000	0.9997	OK	OK	OK	OK	OK	106.00	107.0	113.0	3.00	
NITRATE/NITRITE AS N	01/04/2010	0.000	0.9994	OK	OK	OK	OK	OK	96.00	100.0	100.0	0	
SULFATE	11/19/2009	0.316	0.9999										
SULFATE	12/21/2009			OK	OK	OK	OK	OK	101.00	101.0	98.0	3.00	
SULFATE	12/21/2009									106.0			
SULFATE	12/22/2009			OK	OK	OK	OK	OK	99.00	104.0	107.0	1.00	
SULFATE	12/22/2009									106.0			

Sampling Quality Control Assessment

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

Sampling Protocol

Monitor wells were sampled using either a peristaltic pump and dedicated tubing or a dedicated bladder pump. The surface water location was sampled by pumping directly from the pond with dedicated tubing. Sample results for monitor wells were qualified with an "F" flag in the database, indicating the wells were purged and sampled using the low-flow sampling method. Wells 0402 and 0764 were qualified with a "Q" flag, indicating the data are qualitative because these wells were classified as Category II. Wells 0760, 0765, and 0766 were qualified with a "Q" flag because the turbidity criterion was not met during purging.

Equipment Blank Assessment

No equipment blanks were taken because all samples were collected using dedicated equipment.

Field Duplicate Assessment

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. Duplicate samples were collected from locations 0719 and 0774. The duplicate results were acceptable, meeting the EPA recommended laboratory duplicate criteria of less than 20 percent relative difference for results that are greater than 5 times the PQL.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 09122747 **Lab Code:** PAR **Project:** Monument Valley **Validation Date:** 1/25/2010

Duplicate: 2711 **Sample:** 0774

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
AMMONIA AS N	0.1	U		1	0.1	U		1			MG/L
CHLORIDE	4.6			2	4.4			2	4.44		MG/L
NITRATE/NITRITE AS N	1.5			1	1.5			1	0		MG/L
SULFATE	37			2	35			2	5.56		MG/L
URANIUM	34			10	33			10	2.99		UG/L
VANADIUM	20			3	20			3	0		UG/L

Duplicate: 2856 **Sample:** 0719

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
AMMONIA AS N	0.1	U		1	0.1	U		1			MG/L
CHLORIDE	15			5	14			5	6.90		MG/L
NITRATE/NITRITE AS N	0.78			1	0.77			1	1.29		MG/L
SULFATE	130			5	120			5	8.00		MG/L
URANIUM	3.7			10	3.7			10	0		UG/L
VANADIUM	4.7			3	4.7			3	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 Donivan — Date: 2-9-2010

Data Validation Lead: Gretchen Baer — Date: 2/9/10

Attachment 1
Assessment of Anomalous Data

This page intentionally left blank

Potential Outliers Report

This page intentionally left blank

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.

Four laboratory results were identified as potentially anomalous. The results for chloride at well 0602 and nitrate + nitrite as nitrogen at well 0669 were identified as potential outliers because of the low variability of the historical data. The sulfate result for location 0650 had a concentration higher than previously observed. Recent results for sulfate indicate upward trending at this location. Multiple laboratory and field measurement results from location 0765 were lower than previously observed as a result of the de-nitrification treatment of this well in September 2009. The field measurement for specific conductance at location 0656 was identified as a low outlier. Recent results for specific conductance indicate downward trending at this location. The results from this sampling event are acceptable as qualified.

The statistical tests identify outliers when there are at least five data points to examine. These tests do not apply to the results from well 0715, for which there are only three or four data points for each analyte. Examination of the concentration versus time graphs at this location, however, demonstrates that the chloride and sulfate results in June 2009 are anomalous and may indicate a laboratory dilution factor error. Figure 1 shows the ten-fold increase in chloride and sulfate concentrations in June 2009 and that there was no similar increase in specific conductance. Specific conductance is an indication of ionic concentrations in the water and a noticeable increase should have been observed if the chloride and sulfate concentrations were

measured accurately. Chloride and sulfate—which were measured simultaneously by the laboratory—were the only analytes that increased ten-fold in concentration in June 2009; all other analytes (including ammonia as nitrogen, nitrate + nitrite as nitrogen, uranium, and vanadium) have demonstrated stable concentrations at this location for all sampling events, as shown in their respective time-concentration plots. The results for chloride and sulfate at location 0715 from June 2009 (93 mg/L and 710 mg/L respectively) are qualified with an "R" flag as rejected.

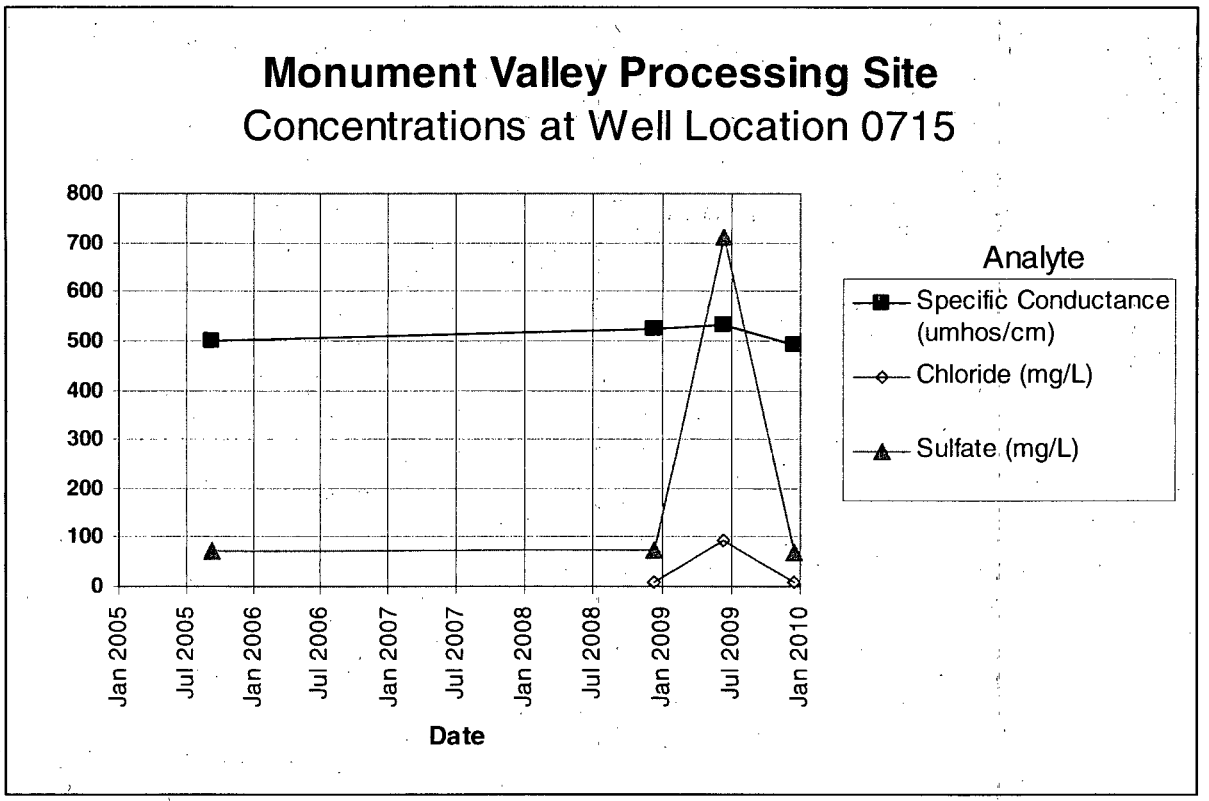


Figure 1

Data Validation Outliers Report - No Field Parameters
Laboratory: ALS Laboratory Group
RIN: 09122747
Comparison: All Historical Data
Report Date: 2/1/2010

Site Code	Location Code	Sample Date	Analyte (filtered)	Current Result	Current Qualifiers Lab	Current Qualifiers Data	Historical Maximum Result	Historical Maximum Qualifiers Lab	Historical Maximum Qualifiers Data	Historical Minimum Result	Historical Minimum Qualifiers Lab	Historical Minimum Qualifiers Data	Number of Data Points N	Number of Data Points N Below Detect	Normally Distributed	Statistical Outlier
MON01	0602	12/15/2009	Chloride (n)	12		F	17			13		F	15	0	Yes	Yes
MON01	0650	12/15/2009	Sulfate (n)	140		F	95		F	25.5		F	19	0	No	Yes
MON01	0650	12/15/2009	Vanadium (n)	0.0038		F	0.33		F	0.0039		F	14	7	No	No
MON01	0652	12/16/2009	Vanadium (n)	0.0089		F	0.51			0.01	U	F	15	3	No	No
MON01	0669	12/16/2009	Nitrate + Nitrite as Nitrogen (n)	15		F	9.5		F	5.5		F	11	0	Yes	Yes
MON01	0764	12/16/2009	Nitrate + Nitrite as Nitrogen (n)	40		FQ	55		FQ	41		FQ	9	0	Yes	No
MON01	0765	12/15/2009	Ammonia Total as N (y)	110		FQ	150		F	120		F	9	0	Yes	No
MON01	0765	12/15/2009	Nitrate + Nitrite as Nitrogen (y)	0.045		FQ	150		F	120		F	9	0	No	Yes
MON01	0765	12/15/2009	Sulfate (y)	390		FQ	986			600		F	19	0	Yes	Yes
MON01	0765	12/15/2009	Uranium (y)	0.0035		FQ	0.015			0.01		F	13	0	No	Yes
MON01	0765	12/15/2009	Vanadium (y)	0.0014		FQ	0.013	U		0.004	U		12	2	Yes (log)	Yes
MON01	0767	12/16/2009	Vanadium (n)	0.000075	U	F	0.013	U		0.0001	B	F	12	10	No	No
MON01	0768	12/16/2009	Chloride (n)	11		F	106			13		F	16	0	No	No
MON01	0768	12/16/2009	Sulfate (n)	60		F	862			61		F	20	0	No	No
MON01	0771	12/15/2009	Chloride (n)	17		F	33		L	18		F	14	0	Yes	No
MON01	0772	12/16/2009	Nitrate + Nitrite as Nitrogen (n)	0.99		F	2.7		F	1.1		F	10	0	No	No
MON01	0774	12/15/2009	Chloride (n)	4.4		F	8.77			4.5		F	14	0	Yes	No
MON01	0774	12/15/2009	Uranium (n)	0.033		F	0.0726			0.036		F	18	0	No	No
MON01	0774	12/15/2009	Uranium (n)	0.034		F	0.0726			0.036		F	18	0	No	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.

Data Validation Outliers Report - Field Parameters Only
Laboratory: Field Measurements
RIN: 09122747
Comparison: All Historical Data
Report Date: 2/1/2010

Site Code	Location Code	Sample Date	Analyte (filtered)	Current Result	Current Qualifiers Lab	Current Qualifiers Data	Historical Maximum Result	Historical Maximum Qualifiers Lab	Historical Maximum Qualifiers Data	Historical Minimum Result	Historical Minimum Qualifiers Lab	Historical Minimum Qualifiers Data	Number of Data Points N	Number of Data Points N Below Detect	Normally Distributed	Statistical Outlier
MON01	0656	12/16/2009	Specific Conductance (n)	915		F	2100		F	1020		F	25	0	Yes (log)	Yes
MON01	0765	12/15/2009	Oxidation Reduction Potential (n)	-166.9		FQ	218		F	-18.3		F	18	0	Yes	Yes
MON01	0765	12/15/2009	pH (n)	6.53		FQ	7.49		F	7.15			18	0	Yes	Yes
MON01	0765	12/15/2009	Specific Conductance (n)	1869		FQ	3530			2548		F	18	0	Yes	Yes

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

This page intentionally left blank

Groundwater Quality Data

This page intentionally left blank

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0402 WELL Tribal Well No. 08-0643.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	0001	5.17	-	9.63	0.1	U	FQ	#	0.1	
Chloride	mg/L	12/16/2009	0001	5.17	-	9.63	12		FQ	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	0001	5.17	-	9.63	0.24		FQ	#	0.01	
Oxidation Reduction Potential	mV	12/16/2009	N001	5.17	-	9.63	85.8		FQ	#		
pH	s.u.	12/16/2009	N001	5.17	-	9.63	8.6		FQ	#		
Specific Conductance	umhos /cm	12/16/2009	N001	5.17	-	9.63	529		FQ	#		
Sulfate	mg/L	12/16/2009	0001	5.17	-	9.63	19		FQ	#	2.5	
Temperature	C	12/16/2009	N001	5.17	-	9.63	9.43		FQ	#		
Turbidity	NTU	12/16/2009	N001	5.17	-	9.63	19		FQ	#		
Uranium	mg/L	12/16/2009	0001	5.17	-	9.63	0.000026	B	UFQ	#	0.0000024	
Vanadium	mg/L	12/16/2009	0001	5.17	-	9.63	0.000075	U	FQ	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0602 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	19.5	-	29.5	0.1	U	F	#	0.1	
Chloride	mg/L	12/15/2009	N001	19.5	-	29.5	12		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	19.5	-	29.5	0.75		F	#	0.01	
Oxidation Reduction Potential	mV	12/15/2009	N001	19.5	-	29.5	129		F	#		
pH	s.u.	12/15/2009	N001	19.5	-	29.5	7.93		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	19.5	-	29.5	613		F	#		
Sulfate	mg/L	12/15/2009	N001	19.5	-	29.5	110		F	#	2.5	
Temperature	C	12/15/2009	N001	19.5	-	29.5	13.39		F	#		
Turbidity	NTU	12/15/2009	N001	19.5	-	29.5	3.79		F	#		
Uranium	mg/L	12/15/2009	N001	19.5	-	29.5	0.0037		F	#	0.0000024	
Vanadium	mg/L	12/15/2009	N001	19.5	-	29.5	0.00075		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0603 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	43	-	53	0.25		F	#	0.1	
Chloride	mg/L	12/15/2009	N001	43	-	53	11		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	43	-	53	0.36		F	#	0.01	
Oxidation Reduction Potential	mV	12/15/2009	N001	43	-	53	90.3		F	#		
pH	s.u.	12/15/2009	N001	43	-	53	7.98		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	43	-	53	573		F	#		
Sulfate	mg/L	12/15/2009	N001	43	-	53	100		F	#	2.5	
Temperature	C	12/15/2009	N001	43	-	53	14.56		F	#		
Turbidity	NTU	12/15/2009	N001	43	-	53	5.46		F	#		
Uranium	mg/L	12/15/2009	N001	43	-	53	0.003		F	#	0.0000024	
Vanadium	mg/L	12/15/2009	N001	43	-	53	0.00065		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0604 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	13	-	28	0.1	U	F	#	0.1	
Chloride	mg/L	12/15/2009	N001	13	-	28	11		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	13	-	28	0.034		F	#	0.01	
Oxidation Reduction Potential	mV	12/15/2009	N001	13	-	28	79.7		F	#		
pH	s.u.	12/15/2009	N001	13	-	28	8.31		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	13	-	28	553		F	#		
Sulfate	mg/L	12/15/2009	N001	13	-	28	110		F	#	2.5	
Temperature	C	12/15/2009	N001	13	-	28	15.09		F	#		
Turbidity	NTU	12/15/2009	N001	13	-	28	6.12		F	#		
Uranium	mg/L	12/15/2009	N001	13	-	28	0.0022		F	#	0.0000024	
Vanadium	mg/L	12/15/2009	N001	13	-	28	0.0022		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0605 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	N001	14	-	29	0.43		F	#	0.1	
Chloride	mg/L	12/16/2009	N001	14	-	29	20		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	N001	14	-	29	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	12/16/2009	N001	14	-	29	-6.5		F	#		
pH	s.u.	12/16/2009	N001	14	-	29	8.45		F	#		
Specific Conductance	umhos /cm	12/16/2009	N001	14	-	29	579		F	#		
Sulfate	mg/L	12/16/2009	N001	14	-	29	140		F	#	2.5	
Temperature	C	12/16/2009	N001	14	-	29	15.07		F	#		
Turbidity	NTU	12/16/2009	N001	14	-	29	5.9		F	#		
Uranium	mg/L	12/16/2009	N001	14	-	29	0.00011		UF	#	0.0000024	
Vanadium	mg/L	12/16/2009	N001	14	-	29	0.00011	B	F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0606 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	N001	32	-	42	120		F	#	10	
Chloride	mg/L	12/16/2009	N001	32	-	42	23		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	N001	32	-	42	220		F	#	2	
Oxidation Reduction Potential	mV	12/16/2009	N001	32	-	42	113.2		F	#		
pH	s.u.	12/16/2009	N001	32	-	42	7.24		F	#		
Specific Conductance	umhos /cm	12/16/2009	N001	32	-	42	2542		F	#		
Sulfate	mg/L	12/16/2009	N001	32	-	42	370		F	#	10	
Temperature	C	12/16/2009	N001	32	-	42	15.7		F	#		
Turbidity	NTU	12/16/2009	N001	32	-	42	0.72		F	#		
Uranium	mg/L	12/16/2009	N001	32	-	42	0.0089		F	#	0.0000024	
Vanadium	mg/L	12/16/2009	N001	32	-	42	0.00035		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0619 WELL Water Use Permit No. 92-082.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	103.9	-	153.9	0.1	U	F	#	0.1	
Chloride	mg/L	12/15/2009	N001	103.9	-	153.9	4.6		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	103.9	-	153.9	0.93		F	#	0.01	
Oxidation Reduction Potential	mV	12/15/2009	N001	103.9	-	153.9	144.8		F	#		
pH	s.u.	12/15/2009	N001	103.9	-	153.9	8		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	103.9	-	153.9	358		F	#		
Sulfate	mg/L	12/15/2009	N001	103.9	-	153.9	28		F	#	1	
Temperature	C	12/15/2009	N001	103.9	-	153.9	15.26		F	#		
Turbidity	NTU	12/15/2009	N001	103.9	-	153.9	0.96		F	#		
Uranium	mg/L	12/15/2009	N001	103.9	-	153.9	0.0081		F	#	0.0000024	
Vanadium	mg/L	12/15/2009	N001	103.9	-	153.9	0.02		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0648 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	N001	38.5	-	88.5	6.6		F	#	0.2	
Chloride	mg/L	12/16/2009	N001	38.5	-	88.5	22		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	N001	38.5	-	88.5	60		F	#	0.5	
Oxidation Reduction Potential	mV	12/16/2009	N001	38.5	-	88.5	57		F	#		
pH	s.u.	12/16/2009	N001	38.5	-	88.5	7.56		F	#		
Specific Conductance	umhos /cm	12/16/2009	N001	38.5	-	88.5	2218		F	#		
Sulfate	mg/L	12/16/2009	N001	38.5	-	88.5	900		F	#	10	
Temperature	C	12/16/2009	N001	38.5	-	88.5	15.37		F	#		
Turbidity	NTU	12/16/2009	N001	38.5	-	88.5	0.8		F	#		
Uranium	mg/L	12/16/2009	N001	38.5	-	88.5	0.01		F	#	0.0000024	
Vanadium	mg/L	12/16/2009	N001	38.5	-	88.5	0.011		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0650 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	77.5	-	97.5	0.1	U	F	#	0.1	
Chloride	mg/L	12/15/2009	N001	77.5	-	97.5	12		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	77.5	-	97.5	1.7		F	#	0.01	
Oxidation Reduction Potential	mV	12/15/2009	N001	77.5	-	97.5	60.5		F	#		
pH	s.u.	12/15/2009	N001	77.5	-	97.5	8.32		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	77.5	-	97.5	675		F	#		
Sulfate	mg/L	12/15/2009	N001	77.5	-	97.5	140		F	#	2.5	
Temperature	C	12/15/2009	N001	77.5	-	97.5	15.58		F	#		
Turbidity	NTU	12/15/2009	N001	77.5	-	97.5	1.67		F	#		
Uranium	mg/L	12/15/2009	N001	77.5	-	97.5	0.0021		F	#	0.0000024	
Vanadium	mg/L	12/15/2009	N001	77.5	-	97.5	0.0038		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0651 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	N001	20	-	80	0.1	U	F	#	0.1	
Chloride	mg/L	12/16/2009	N001	20	-	80	12		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	N001	20	-	80	0.12		F	#	0.01	
Oxidation Reduction Potential	mV	12/16/2009	N001	20	-	80	127.9		F	#		
pH	s.u.	12/16/2009	N001	20	-	80	8.35		F	#		
Specific Conductance	umhos /cm	12/16/2009	N001	20	-	80	622		F	#		
Sulfate	mg/L	12/16/2009	N001	20	-	80	110		F	#	2.5	
Temperature	C	12/16/2009	N001	20	-	80	15.23		F	#		
Turbidity	NTU	12/16/2009	N001	20	-	80	3.08		F	#		
Uranium	mg/L	12/16/2009	N001	20	-	80	0.0021		F	#	0.0000024	
Vanadium	mg/L	12/16/2009	N001	20	-	80	0.011		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0652 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	N001	34	-	54	0.1	U	F	#	0.1	
Chloride	mg/L	12/16/2009	N001	34	-	54	14		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	N001	34	-	54	4.4		F	#	0.05	
Oxidation Reduction Potential	mV	12/16/2009	N001	34	-	54	140		F	#		
pH	s.u.	12/16/2009	N001	34	-	54	8.12		F	#		
Specific Conductance	umhos /cm	12/16/2009	N001	34	-	54	575		F	#		
Sulfate	mg/L	12/16/2009	N001	34	-	54	66		F	#	2.5	
Temperature	C	12/16/2009	N001	34	-	54	13.91		F	#		
Turbidity	NTU	12/16/2009	N001	34	-	54	0.94		F	#		
Uranium	mg/L	12/16/2009	N001	34	-	54	0.0041		F	#	0.0000024	
Vanadium	mg/L	12/16/2009	N001	34	-	54	0.0089		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0653 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	N001	56	-	76	0.1	U	F	#	0.1	
Chloride	mg/L	12/16/2009	N001	56	-	76	25		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	N001	56	-	76	37		F	#	0.5	
Oxidation Reduction Potential	mV	12/16/2009	N001	56	-	76	25.4		F	#		
pH	s.u.	12/16/2009	N001	56	-	76	7.55		F	#		
Specific Conductance	umhos /cm	12/16/2009	N001	56	-	76	2393		F	#		
Sulfate	mg/L	12/16/2009	N001	56	-	76	1100		F	#	10	
Temperature	C	12/16/2009	N001	56	-	76	15.12		F	#		
Turbidity	NTU	12/16/2009	N001	56	-	76	1.95		F	#		
Uranium	mg/L	12/16/2009	N001	56	-	76	0.01		F	#	0.0000024	
Vanadium	mg/L	12/16/2009	N001	56	-	76	0.0085		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0655 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	38	-	58	120		F	#	10	
Chloride	mg/L	12/15/2009	N001	38	-	58	22		F	#	10	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	38	-	58	130		F	#	1	
Oxidation Reduction Potential	mV	12/15/2009	N001	38	-	58	137.3		F	#		
pH	s.u.	12/15/2009	N001	38	-	58	7.3		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	38	-	58	3244		F	#		
Sulfate	mg/L	12/15/2009	N001	38	-	58	1400		F	#	25	
Temperature	C	12/15/2009	N001	38	-	58	15.06		F	#		
Turbidity	NTU	12/15/2009	N001	38	-	58	3.88		F	#		
Uranium	mg/L	12/15/2009	N001	38	-	58	0.013		F	#	0.0000024	
Vanadium	mg/L	12/15/2009	N001	38	-	58	0.0074		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0656 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	N001	38	-	58	47		F	#	10	
Chloride	mg/L	12/16/2009	N001	38	-	58	13		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	N001	38	-	58	15		F	#	0.2	
Oxidation Reduction Potential	mV	12/16/2009	N001	38	-	58	46.7		F	#		
pH	s.u.	12/16/2009	N001	38	-	58	7.97		F	#		
Specific Conductance	umhos /cm	12/16/2009	N001	38	-	58	915		F	#		
Sulfate	mg/L	12/16/2009	N001	38	-	58	160		F	#	5	
Temperature	C	12/16/2009	N001	38	-	58	14.96		F	#		
Turbidity	NTU	12/16/2009	N001	38	-	58	0.79		F	#		
Uranium	mg/L	12/16/2009	N001	38	-	58	0.0054		F	#	0.0000024	
Vanadium	mg/L	12/16/2009	N001	38	-	58	0.00048		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0657 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	121	-	136	0.1	U	F	#	0.1	
Chloride	mg/L	12/15/2009	N001	121	-	136	6.4		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	121	-	136	3.7		F	#	0.05	
Oxidation Reduction Potential	mV	12/15/2009	N001	121	-	136	188.8		F	#		
pH	s.u.	12/15/2009	N001	121	-	136	7.66		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	121	-	136	535		F	#		
Sulfate	mg/L	12/15/2009	N001	121	-	136	97		F	#	2.5	
Temperature	C	12/15/2009	N001	121	-	136	15.33		F	#		
Turbidity	NTU	12/15/2009	N001	121	-	136	1.25		F	#		
Uranium	mg/L	12/15/2009	N001	121	-	136	0.068		F	#	0.0000024	
Vanadium	mg/L	12/15/2009	N001	121	-	136	0.058		F	#	0.00025	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0662 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	37.5	-	67.5	0.1	U	F	#	0.1	
Chloride	mg/L	12/15/2009	N001	37.5	-	67.5	17		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	37.5	-	67.5	19		F	#	0.1	
Oxidation Reduction Potential	mV	12/15/2009	N001	37.5	-	67.5	180		F	#		
pH	s.u.	12/15/2009	N001	37.5	-	67.5	7.34		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	37.5	-	67.5	928		F	#		
Sulfate	mg/L	12/15/2009	N001	37.5	-	67.5	220		F	#	5	
Temperature	C	12/15/2009	N001	37.5	-	67.5	15.55		F	#		
Turbidity	NTU	12/15/2009	N001	37.5	-	67.5	1.09		F	#		
Uranium	mg/L	12/15/2009	N001	37.5	-	67.5	0.2		F	#	0.000012	
Vanadium	mg/L	12/15/2009	N001	37.5	-	67.5	0.028		F	#	0.00025	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0669 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	N001	34	-	54	2.3		F	#	0.1	
Chloride	mg/L	12/16/2009	N001	34	-	54	8.1		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	N001	34	-	54	15		F	#	0.1	
Oxidation Reduction Potential	mV	12/16/2009	N001	34	-	54	92.7		F	#		
pH	s.u.	12/16/2009	N001	34	-	54	7.71		F	#		
Specific Conductance	umhos /cm	12/16/2009	N001	34	-	54	665		F	#		
Sulfate	mg/L	12/16/2009	N001	34	-	54	110		F	#	2.5	
Temperature	C	12/16/2009	N001	34	-	54	15.74		F	#		
Turbidity	NTU	12/16/2009	N001	34	-	54	1.02		F	#		
Uranium	mg/L	12/16/2009	N001	34	-	54	0.0065		F	#	0.0000024	
Vanadium	mg/L	12/16/2009	N001	34	-	54	0.051		F	#	0.00025	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0711 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/14/2009	N001	25.5	-	30.5	0.1	U	F	#	0.1	
Chloride	mg/L	12/14/2009	N001	25.5	-	30.5	14		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/14/2009	N001	25.5	-	30.5	0.54		F	#	0.01	
Oxidation Reduction Potential	mV	12/14/2009	N001	25.5	-	30.5	209.8		F	#		
pH	s.u.	12/14/2009	N001	25.5	-	30.5	7.76		F	#		
Specific Conductance	umhos /cm	12/14/2009	N001	25.5	-	30.5	671		F	#		
Sulfate	mg/L	12/14/2009	N001	25.5	-	30.5	120		F	#	2.5	
Temperature	C	12/14/2009	N001	25.5	-	30.5	14.92		F	#		
Turbidity	NTU	12/14/2009	N001	25.5	-	30.5	2.1		F	#		
Uranium	mg/L	12/14/2009	N001	25.5	-	30.5	0.0039		F	#	0.0000024	
Vanadium	mg/L	12/14/2009	N001	25.5	-	30.5	0.0011		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0715 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	16	-	21	0.1	U	F	#	0.1	
Chloride	mg/L	12/15/2009	N001	16	-	21	9.1		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	16	-	21	0.71		F	#	0.01	
Oxidation Reduction Potential	mV	12/15/2009	N001	16	-	21	113.7		F	#		
pH	s.u.	12/15/2009	N001	16	-	21	8.01		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	16	-	21	493		F	#		
Sulfate	mg/L	12/15/2009	N001	16	-	21	69		F	#	2.5	
Temperature	C	12/15/2009	N001	16	-	21	15.11		F	#		
Turbidity	NTU	12/15/2009	N001	16	-	21	5.11		F	#		
Uranium	mg/L	12/15/2009	N001	16	-	21	0.0028		F	#	0.0000024	
Vanadium	mg/L	12/15/2009	N001	16	-	21	0.00074		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0719 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	19.35	-	24.35	0.1	U	F	#	0.1	
Ammonia Total as N	mg/L	12/15/2009	N002	19.35	-	24.35	0.1	U	F	#	0.1	
Chloride	mg/L	12/15/2009	N001	19.35	-	24.35	15		F	#	1	
Chloride	mg/L	12/15/2009	N002	19.35	-	24.35	14		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	19.35	-	24.35	0.78		F	#	0.01	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N002	19.35	-	24.35	0.77		F	#	0.01	
Oxidation Reduction Potential	mV	12/15/2009	N001	19.35	-	24.35	154.2		F	#		
pH	s.u.	12/15/2009	N001	19.35	-	24.35	7.81		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	19.35	-	24.35	704		F	#		
Sulfate	mg/L	12/15/2009	N001	19.35	-	24.35	130		F	#	2.5	
Sulfate	mg/L	12/15/2009	N002	19.35	-	24.35	120		F	#	2.5	
Temperature	C	12/15/2009	N001	19.35	-	24.35	14.36		F	#		
Turbidity	NTU	12/15/2009	N001	19.35	-	24.35	4.12		F	#		
Uranium	mg/L	12/15/2009	N001	19.35	-	24.35	0.0037		F	#	0.0000024	
Uranium	mg/L	12/15/2009	N002	19.35	-	24.35	0.0037		F	#	0.0000024	
Vanadium	mg/L	12/15/2009	N001	19.35	-	24.35	0.0047		F	#	0.000075	
Vanadium	mg/L	12/15/2009	N002	19.35	-	24.35	0.0047		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0727 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/14/2009	N001	23.73	-	28.78	0.1	U	F	#	0.1	
Chloride	mg/L	12/14/2009	N001	23.73	-	28.78	11		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/14/2009	N001	23.73	-	28.78	0.85		F	#	0.01	
Oxidation Reduction Potential	mV	12/14/2009	N001	23.73	-	28.78	158.7		F	#		
pH	s.u.	12/14/2009	N001	23.73	-	28.78	7.87		F	#		
Specific Conductance	umhos /cm	12/14/2009	N001	23.73	-	28.78	578		F	#		
Sulfate	mg/L	12/14/2009	N001	23.73	-	28.78	93		F	#	2.5	
Temperature	C	12/14/2009	N001	23.73	-	28.78	16.16		F	#		
Turbidity	NTU	12/14/2009	N001	23.73	-	28.78	7.21		F	#		
Uranium	mg/L	12/14/2009	N001	23.73	-	28.78	0.002		F	#	0.0000024	
Vanadium	mg/L	12/14/2009	N001	23.73	-	28.78	0.0025		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0760 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	0001	55	-	75	0.1	U	FQ	#	0.1	
Chloride	mg/L	12/15/2009	0001	55	-	75	9.3		FQ	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	0001	55	-	75	0.01	U	FQ	#	0.01	
Oxidation Reduction Potential	mV	12/15/2009	N001	55	-	75	-63.2		FQ	#		
pH	s.u.	12/15/2009	N001	55	-	75	8.27		FQ	#		
Specific Conductance	umhos /cm	12/15/2009	N001	55	-	75	516		FQ	#		
Sulfate	mg/L	12/15/2009	0001	55	-	75	90		FQ	#	2.5	
Temperature	C	12/15/2009	N001	55	-	75	15.88		FQ	#		
Turbidity	NTU	12/15/2009	N001	55	-	75	36.9		FQ	#		
Uranium	mg/L	12/15/2009	0001	55	-	75	0.00024		FQ	#	0.0000024	
Vanadium	mg/L	12/15/2009	0001	55	-	75	0.000075	U	FQ	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0761 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	39	-	49	0.1	U	F	#	0.1	
Chloride	mg/L	12/15/2009	N001	39	-	49	13		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	39	-	49	34		F	#	0.2	
Oxidation Reduction Potential	mV	12/15/2009	N001	39	-	49	64		F	#		
pH	s.u.	12/15/2009	N001	39	-	49	7.43		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	39	-	49	1353		F	#		
Sulfate	mg/L	12/15/2009	N001	39	-	49	470		F	#	5	
Temperature	C	12/15/2009	N001	39	-	49	15.34		F	#		
Turbidity	NTU	12/15/2009	N001	39	-	49	9.88		F	#		
Uranium	mg/L	12/15/2009	N001	39	-	49	0.028		F	#	0.0000024	
Vanadium	mg/L	12/15/2009	N001	39	-	49	0.0021		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0762 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	29	-	49	0.1	U	F	#	0.1	
Chloride	mg/L	12/15/2009	N001	29	-	49	68		F	#	10	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	29	-	49	97		F	#	1	
Oxidation Reduction Potential	mV	12/15/2009	N001	29	-	49	56.6		F	#		
pH	s.u.	12/15/2009	N001	29	-	49	7.54		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	29	-	49	3688		F	#		
Sulfate	mg/L	12/15/2009	N001	29	-	49	1500		F	#	25	
Temperature	C	12/15/2009	N001	29	-	49	16.02		F	#		
Turbidity	NTU	12/15/2009	N001	29	-	49	6.04		F	#		
Uranium	mg/L	12/15/2009	N001	29	-	49	0.012		F	#	0.0000024	
Vanadium	mg/L	12/15/2009	N001	29	-	49	0.0074		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0764 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	N001	47	-	52	0.1	U	FQ	#	0.1	
Chloride	mg/L	12/16/2009	N001	47	-	52	11		FQ	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	N001	47	-	52	40		FQ	#	0.5	
Oxidation Reduction Potential	mV	12/16/2009	N001	47	-	52	37.2		FQ	#		
pH	s.u.	12/16/2009	N001	47	-	52	7.79		FQ	#		
Specific Conductance	umhos /cm	12/16/2009	N001	47	-	52	1181		FQ	#		
Sulfate	mg/L	12/16/2009	N001	47	-	52	300		FQ	#	5	
Temperature	C	12/16/2009	N001	47	-	52	14.95		FQ	#		
Turbidity	NTU	12/16/2009	N001	47	-	52	4.24		FQ	#		
Uranium	mg/L	12/16/2009	N001	47	-	52	0.013		FQ	#	0.0000024	
Vanadium	mg/L	12/16/2009	N001	47	-	52	0.016		FQ	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0765 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	0001	58.6	-	88.7	110		FQ	#	10	
Chloride	mg/L	12/15/2009	0001	58.6	-	88.7	16		FQ	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	0001	58.6	-	88.7	0.045		FQ	#	0.01	
Oxidation Reduction Potential	mV	12/15/2009	N001	58.6	-	88.7	-166.9		FQ	#		
pH	s.u.	12/15/2009	N001	58.6	-	88.7	6.53		FQ	#		
Specific Conductance	umhos /cm	12/15/2009	N001	58.6	-	88.7	1869		FQ	#		
Sulfate	mg/L	12/15/2009	0001	58.6	-	88.7	390		FQ	#	5	
Temperature	C	12/15/2009	N001	58.6	-	88.7	13.47		FQ	#		
Turbidity	NTU	12/15/2009	N001	58.6	-	88.7	24.1		FQ	#		
Uranium	mg/L	12/15/2009	0001	58.6	-	88.7	0.0035		FQ	#	0.0000024	
Vanadium	mg/L	12/15/2009	0001	58.6	-	88.7	0.0014		FQ	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0766 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	0001	47.2	-	57.2	140		FQ	#	10	
Chloride	mg/L	12/16/2009	0001	47.2	-	57.2	17		FQ	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	0001	47.2	-	57.2	120		FQ	#	1	
Oxidation Reduction Potential	mV	12/16/2009	N001	47.2	-	57.2	99.1		FQ	#		
pH	s.u.	12/16/2009	N001	47.2	-	57.2	7.56		FQ	#		
Specific Conductance	umhos /cm	12/16/2009	N001	47.2	-	57.2	2292		FQ	#		
Sulfate	mg/L	12/16/2009	0001	47.2	-	57.2	520		FQ	#	10	
Temperature	C	12/16/2009	N001	47.2	-	57.2	15.68		FQ	#		
Turbidity	NTU	12/16/2009	N001	47.2	-	57.2	16		FQ	#		
Uranium	mg/L	12/16/2009	0001	47.2	-	57.2	0.011		FQ	#	0.0000024	
Vanadium	mg/L	12/16/2009	0001	47.2	-	57.2	0.0051		FQ	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0767 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	N001	43.5	-	63.5	0.1	U	F	#	0.1	
Chloride	mg/L	12/16/2009	N001	43.5	-	63.5	5.2		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	N001	43.5	-	63.5	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	12/16/2009	N001	43.5	-	63.5	-101.2		F	#		
pH	s.u.	12/16/2009	N001	43.5	-	63.5	8.05		F	#		
Specific Conductance	umhos /cm	12/16/2009	N001	43.5	-	63.5	397		F	#		
Sulfate	mg/L	12/16/2009	N001	43.5	-	63.5	32		F	#	1	
Temperature	C	12/16/2009	N001	43.5	-	63.5	15.27		F	#		
Turbidity	NTU	12/16/2009	N001	43.5	-	63.5	1.82		F	#		
Uranium	mg/L	12/16/2009	N001	43.5	-	63.5	0.00062		F	#	0.0000024	
Vanadium	mg/L	12/16/2009	N001	43.5	-	63.5	0.000075	U	F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0768 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	N001	24.4	-	44.4	0.48		F	#	0.1	
Chloride	mg/L	12/16/2009	N001	24.4	-	44.4	11		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	N001	24.4	-	44.4	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	12/16/2009	N001	24.4	-	44.4	-144		F	#		
pH	s.u.	12/16/2009	N001	24.4	-	44.4	8.31		F	#		
Specific Conductance	umhos /cm	12/16/2009	N001	24.4	-	44.4	461		F	#		
Sulfate	mg/L	12/16/2009	N001	24.4	-	44.4	60		F	#	2.5	
Temperature	C	12/16/2009	N001	24.4	-	44.4	14.99		F	#		
Turbidity	NTU	12/16/2009	N001	24.4	-	44.4	8.94		F	#		
Uranium	mg/L	12/16/2009	N001	24.4	-	44.4	0.000039	B	UF	#	0.0000024	
Vanadium	mg/L	12/16/2009	N001	24.4	-	44.4	0.00035		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0770 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	N001	54.9	-	64.9	33		F	#	2	
Chloride	mg/L	12/16/2009	N001	54.9	-	64.9	14		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	N001	54.9	-	64.9	19		F	#	0.1	
Oxidation Reduction Potential	mV	12/16/2009	N001	54.9	-	64.9	60.3		F	#		
pH	s.u.	12/16/2009	N001	54.9	-	64.9	7.75		F	#		
Specific Conductance	umhos /cm	12/16/2009	N001	54.9	-	64.9	934		F	#		
Sulfate	mg/L	12/16/2009	N001	54.9	-	64.9	200		F	#	5	
Temperature	C	12/16/2009	N001	54.9	-	64.9	15.41		F	#		
Turbidity	NTU	12/16/2009	N001	54.9	-	64.9	2		F	#		
Uranium	mg/L	12/16/2009	N001	54.9	-	64.9	0.0055		F	#	0.0000024	
Vanadium	mg/L	12/16/2009	N001	54.9	-	64.9	0.00064		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0771 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	57.4	-	77.4	240		F	#	10	
Chloride	mg/L	12/15/2009	N001	57.4	-	77.4	17		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	57.4	-	77.4	170		F	#	1	
Oxidation Reduction Potential	mV	12/15/2009	N001	57.4	-	77.4	148.5		F	#		
pH	s.u.	12/15/2009	N001	57.4	-	77.4	7.36		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	57.4	-	77.4	3949		F	#		
Sulfate	mg/L	12/15/2009	N001	57.4	-	77.4	1400		F	#	10	
Temperature	C	12/15/2009	N001	57.4	-	77.4	13.57		F	#		
Turbidity	NTU	12/15/2009	N001	57.4	-	77.4	0.99		F	#		
Uranium	mg/L	12/15/2009	N001	57.4	-	77.4	0.014		F	#	0.0000024	
Vanadium	mg/L	12/15/2009	N001	57.4	-	77.4	0.0081		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0772 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	N001	7.4	-	27.4	3.9		F	#	0.1	
Chloride	mg/L	12/16/2009	N001	7.4	-	27.4	16		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	N001	7.4	-	27.4	0.99		F	#	0.05	
Oxidation Reduction Potential	mV	12/16/2009	N001	7.4	-	27.4	72.1		F	#		
pH	s.u.	12/16/2009	N001	7.4	-	27.4	7.86		F	#		
Specific Conductance	umhos /cm	12/16/2009	N001	7.4	-	27.4	708		F	#		
Sulfate	mg/L	12/16/2009	N001	7.4	-	27.4	140		F	#	1	
Temperature	C	12/16/2009	N001	7.4	-	27.4	14.64		F	#		
Turbidity	NTU	12/16/2009	N001	7.4	-	27.4	4.31		F	#		
Uranium	mg/L	12/16/2009	N001	7.4	-	27.4	0.0078		F	#	0.0000024	
Vanadium	mg/L	12/16/2009	N001	7.4	-	27.4	0.016		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0774 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	45	-	55	0.1	U	F	#	0.1	
Ammonia Total as N	mg/L	12/15/2009	N002	45	-	55	0.1	U	F	#	0.1	
Chloride	mg/L	12/15/2009	N001	45	-	55	4.6		F	#	0.4	
Chloride	mg/L	12/15/2009	N002	45	-	55	4.4		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	45	-	55	1.5		F	#	0.01	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N002	45	-	55	1.5		F	#	0.01	
Oxidation Reduction Potential	mV	12/15/2009	N001	45	-	55	201		F	#		
pH	s.u.	12/15/2009	N001	45	-	55	7.74		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	45	-	55	384		F	#		
Sulfate	mg/L	12/15/2009	N001	45	-	55	37		F	#	1	
Sulfate	mg/L	12/15/2009	N002	45	-	55	35		F	#	1	
Temperature	C	12/15/2009	N001	45	-	55	14.56		F	#		
Turbidity	NTU	12/15/2009	N001	45	-	55	1.47		F	#		
Uranium	mg/L	12/15/2009	N001	45	-	55	0.034		F	#	0.0000024	
Uranium	mg/L	12/15/2009	N002	45	-	55	0.033		F	#	0.0000024	
Vanadium	mg/L	12/15/2009	N001	45	-	55	0.02		F	#	0.000075	
Vanadium	mg/L	12/15/2009	N002	45	-	55	0.02		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0775 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	N001	142	-	167	0.1	U	F	#	0.1	
Chloride	mg/L	12/16/2009	N001	142	-	167	5.2		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	N001	142	-	167	0.56		F	#	0.01	
Oxidation Reduction Potential	mV	12/16/2009	N001	142	-	167	38		F	#		
pH	s.u.	12/16/2009	N001	142	-	167	7.97		F	#		
Specific Conductance	umhos /cm	12/16/2009	N001	142	-	167	380		F	#		
Sulfate	mg/L	12/16/2009	N001	142	-	167	26		F	#	1	
Temperature	C	12/16/2009	N001	142	-	167	15.69		F	#		
Turbidity	NTU	12/16/2009	N001	142	-	167	1.56		F	#		
Uranium	mg/L	12/16/2009	N001	142	-	167	0.0029		F	#	0.0000024	
Vanadium	mg/L	12/16/2009	N001	142	-	167	0.0006		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0776 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/15/2009	N001	99.5	-	149.5	0.1	U	F	#	0.1	
Chloride	mg/L	12/15/2009	N001	99.5	-	149.5	5.3		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/15/2009	N001	99.5	-	149.5	0.81		F	#	0.01	
Oxidation Reduction Potential	mV	12/15/2009	N001	99.5	-	149.5	128.2		F	#		
pH	s.u.	12/15/2009	N001	99.5	-	149.5	8		F	#		
Specific Conductance	umhos /cm	12/15/2009	N001	99.5	-	149.5	387		F	#		
Sulfate	mg/L	12/15/2009	N001	99.5	-	149.5	32		F	#	1	
Temperature	C	12/15/2009	N001	99.5	-	149.5	16.42		F	#		
Turbidity	NTU	12/15/2009	N001	99.5	-	149.5	0.77		F	#		
Uranium	mg/L	12/15/2009	N001	99.5	-	149.5	0.0088		F	#	0.0000024	
Vanadium	mg/L	12/15/2009	N001	99.5	-	149.5	0.016		F	#	0.000075	

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.

Surface Water Quality Data

This page intentionally left blank

Surface Water Quality Data by Location (USEE102) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010
Location: 0623 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/16/2009	0001	0.1	U		#	0.1	
Chloride	mg/L	12/16/2009	0001	15			#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/16/2009	0001	0.01	U		#	0.01	
Oxidation Reduction Potential	mV	12/16/2009	N001	87.3			#		
pH	s.u.	12/16/2009	N001	7.81			#		
Specific Conductance	umhos/cm	12/16/2009	N001	616			#		
Sulfate	mg/L	12/16/2009	0001	51			#	2.5	
Temperature	C	12/16/2009	N001	1.56			#		
Turbidity	NTU	12/16/2009	N001	14.4			#		
Uranium	mg/L	12/16/2009	0001	0.0026			#	0.0000024	
Vanadium	mg/L	12/16/2009	0001	0.0012			#	0.000075	

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.

Static Water Level Data

This page intentionally left blank

STATIC WATER LEVELS (USEE700) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0402	U	4840.3	12/16/2009	10:40:02	4.81	4835.49	
0602	U	4864.43	12/15/2009	11:00:13	10.01	4854.42	
0603	U	4849.41	12/15/2009	12:05:34	11.96	4837.45	
0604	C	4840.42	12/15/2009	12:40:13	10.04	4830.38	
0605	C	4835.07	12/16/2009	11:25:17	11.65	4823.42	
0606	D	4864.73	12/16/2009	14:50:19	37.43	4827.3	
0619	O	4888.63	12/15/2009	15:30:51	60	4828.63	
0648	N	4835.14	12/16/2009	14:30:40	35	4800.14	
0650	D	4794.28	12/15/2009	16:30:00	20.56	4773.72	
0651	C	4787.88	12/16/2009	11:35:54	9.03	4778.85	
0652	C	4808.93	12/16/2009	09:40:32	19.26	4789.67	
0653	D	4837.08	12/16/2009	14:10:36	36.83	4800.25	
0655	D	4862.06	12/15/2009	13:25:39	41.49	4820.57	
0656	D	4856.33	12/16/2009	12:10:45	38.16	4818.17	
0657	O	4878.99	12/15/2009	11:55:33	52.65	4826.34	
0662	D	4878.56	12/15/2009	12:20:21	52.1	4826.46	
0669	D	4867.19	12/16/2009	15:15:23	51.5	4815.69	
0711			12/14/2009	17:04:42	12.1		
0715			12/15/2009	11:30:41	11.35		
0719			12/15/2009	10:10:09	12.69		
0727			12/14/2009	16:13:41	14.69		
0760	D	4814.8	12/15/2009	14:25:14	26.15	4788.65	
0761	D	4835.02	12/15/2009	15:45:11	43.93	4791.09	
0762	D	4820.74	12/15/2009	15:00:09	33.03	4787.71	
0764	D	4851.53	12/16/2009	14:55:24	50.59	4800.94	
0765	D	4848.45	12/15/2009	16:20:21	36.62	4811.83	
0766	D	4847.97	12/16/2009	13:25:31	37.36	4810.61	
0767	D	4808.25	12/16/2009	12:05:05	7.41	4800.84	

STATIC WATER LEVELS (USEE700) FOR SITE MON01, Monument Valley Processing Site
REPORT DATE: 2/1/2010

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0768	D	4820.73	12/16/2009	12:30:15	15.19	4805.54	
0770	D	4857.26	12/16/2009	12:30:31	34.52	4822.74	
0771	D	4863.26	12/15/2009	14:15:47	43.53	4819.73	
0772	O	4847.6	12/16/2009	14:10:25	12.9	4834.7	
0774	O	4880.14	12/15/2009	10:42:30	51.84	4828.3	
0775	D	4879.68	12/16/2009	15:35:12	52.16	4827.52	
0776	O	4883.33	12/15/2009	14:55:21	55.71	4827.62	

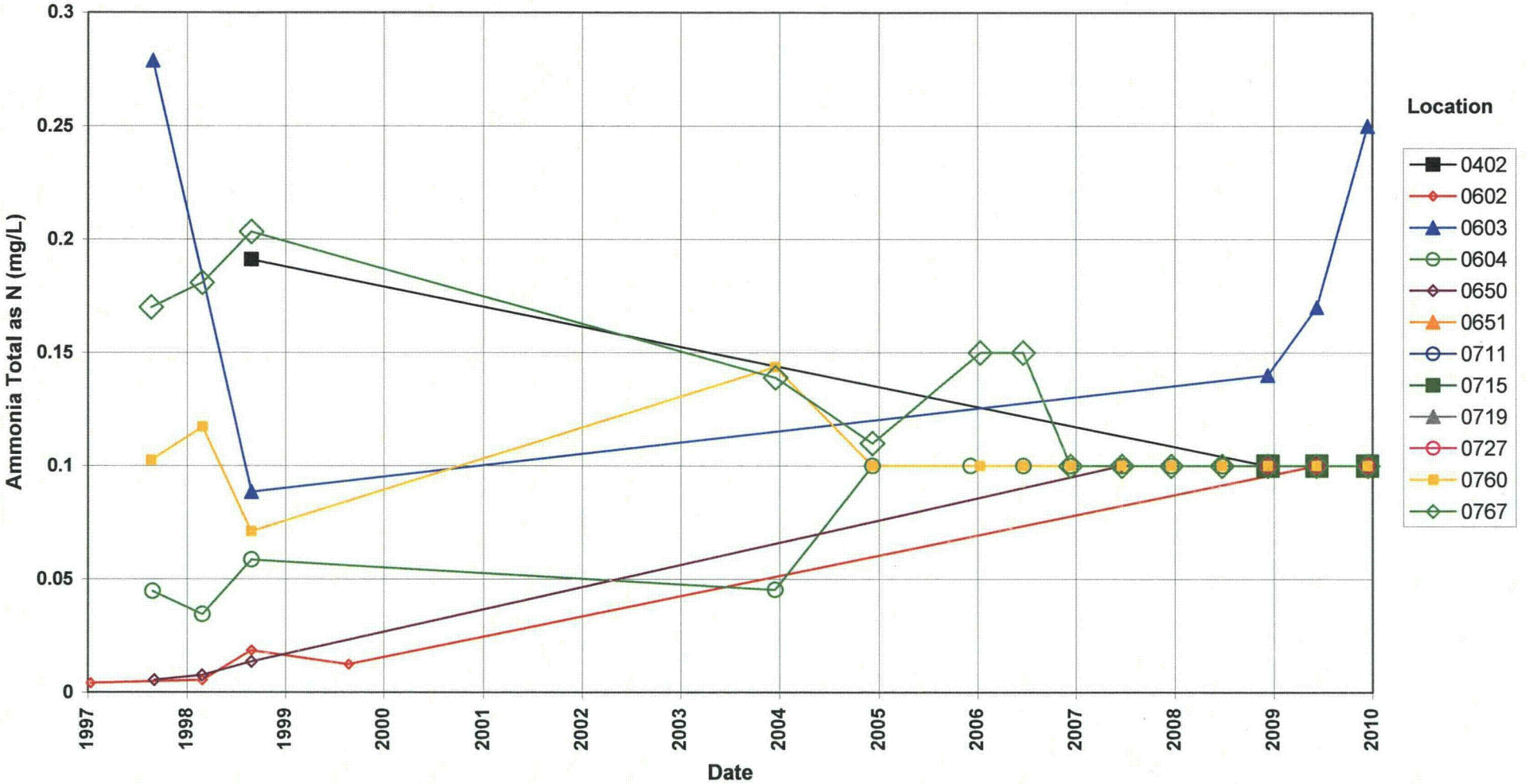
FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT F OFF SITE
N UNKNOWN O ON SITE U UPGRADIENT

WATER LEVEL FLAGS: D Dry F FLOWING

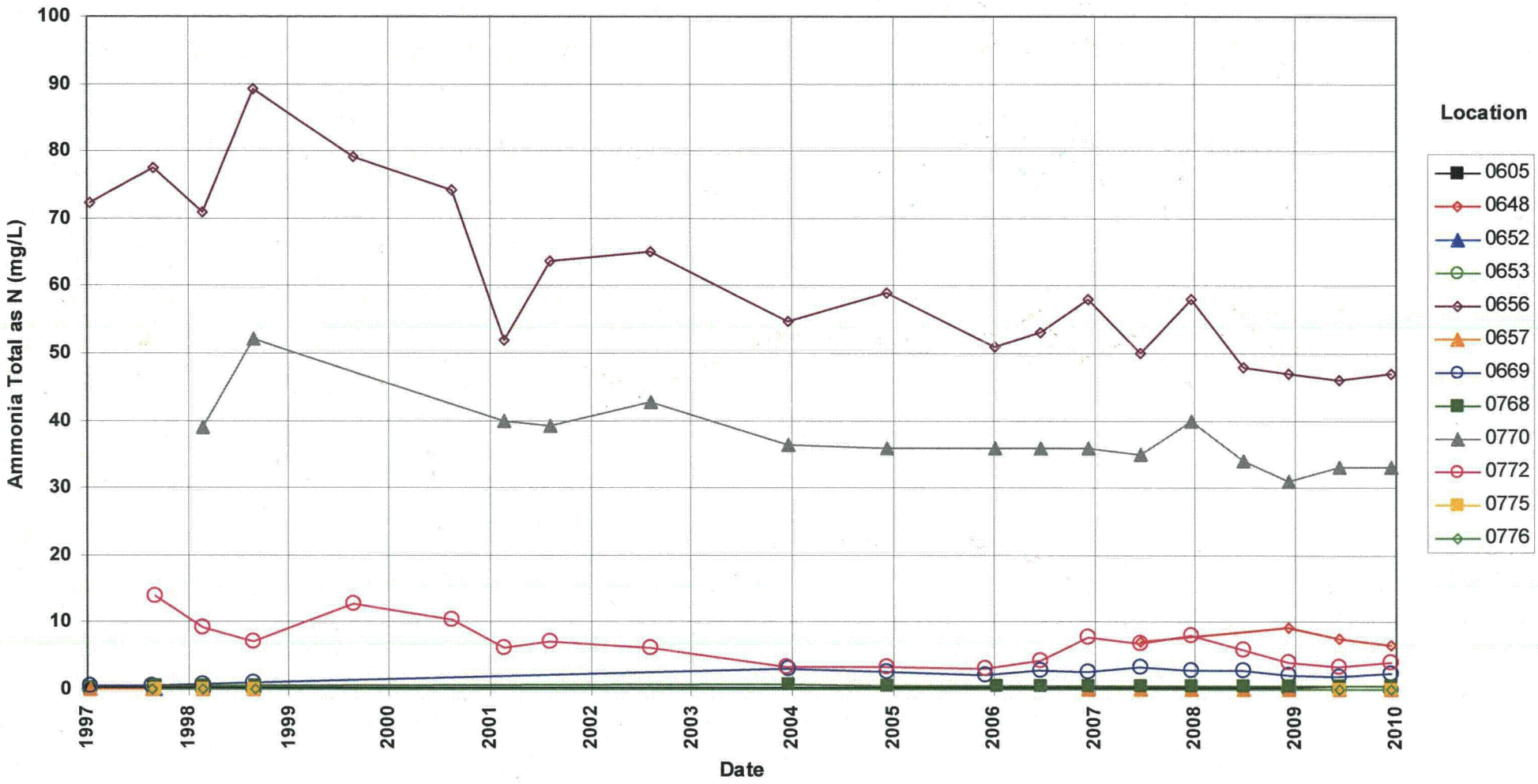
Time-Concentration Graphs

This page intentionally left blank

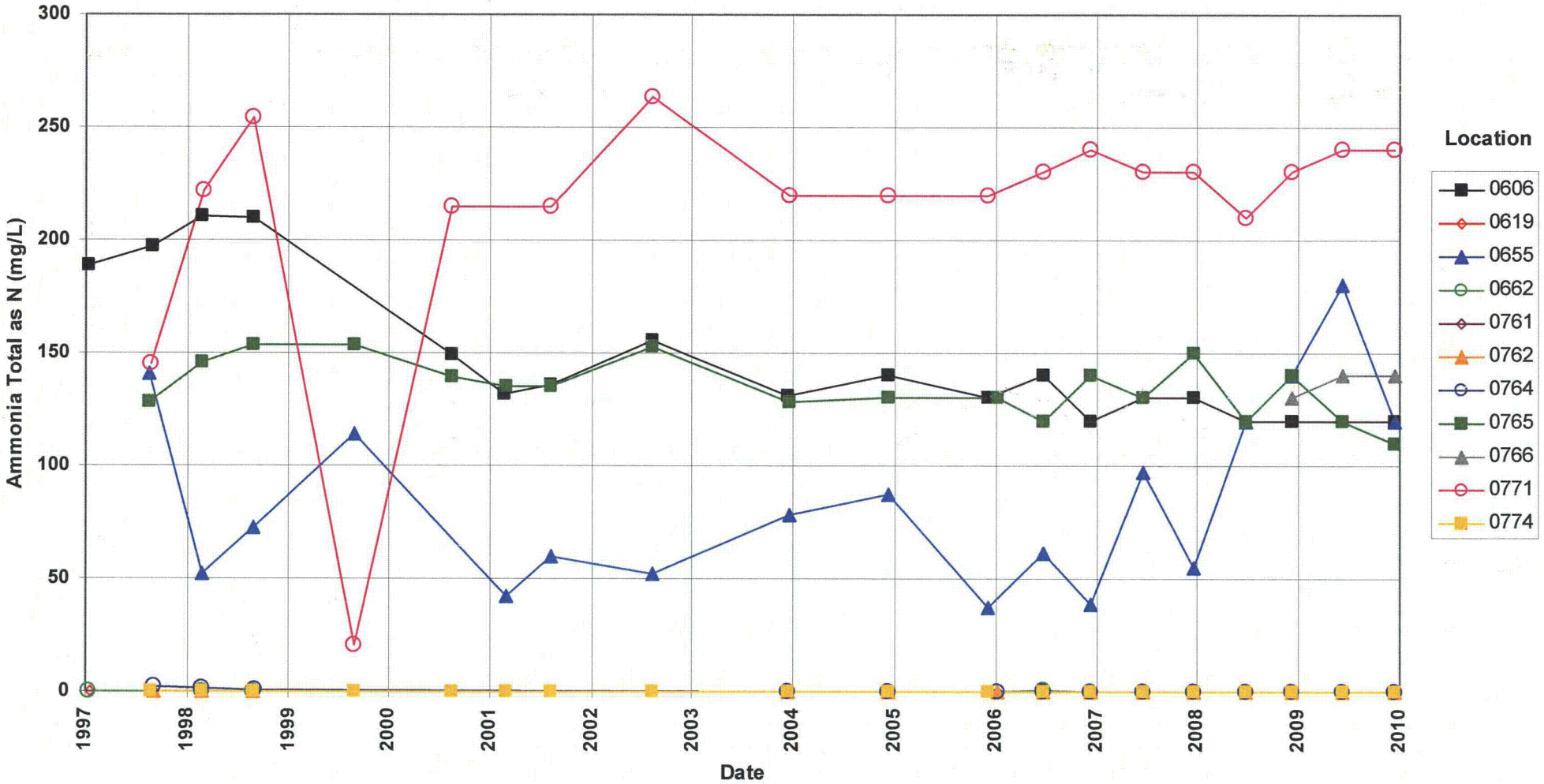
Monument Valley Processing Site
Ammonia Total as N Concentration



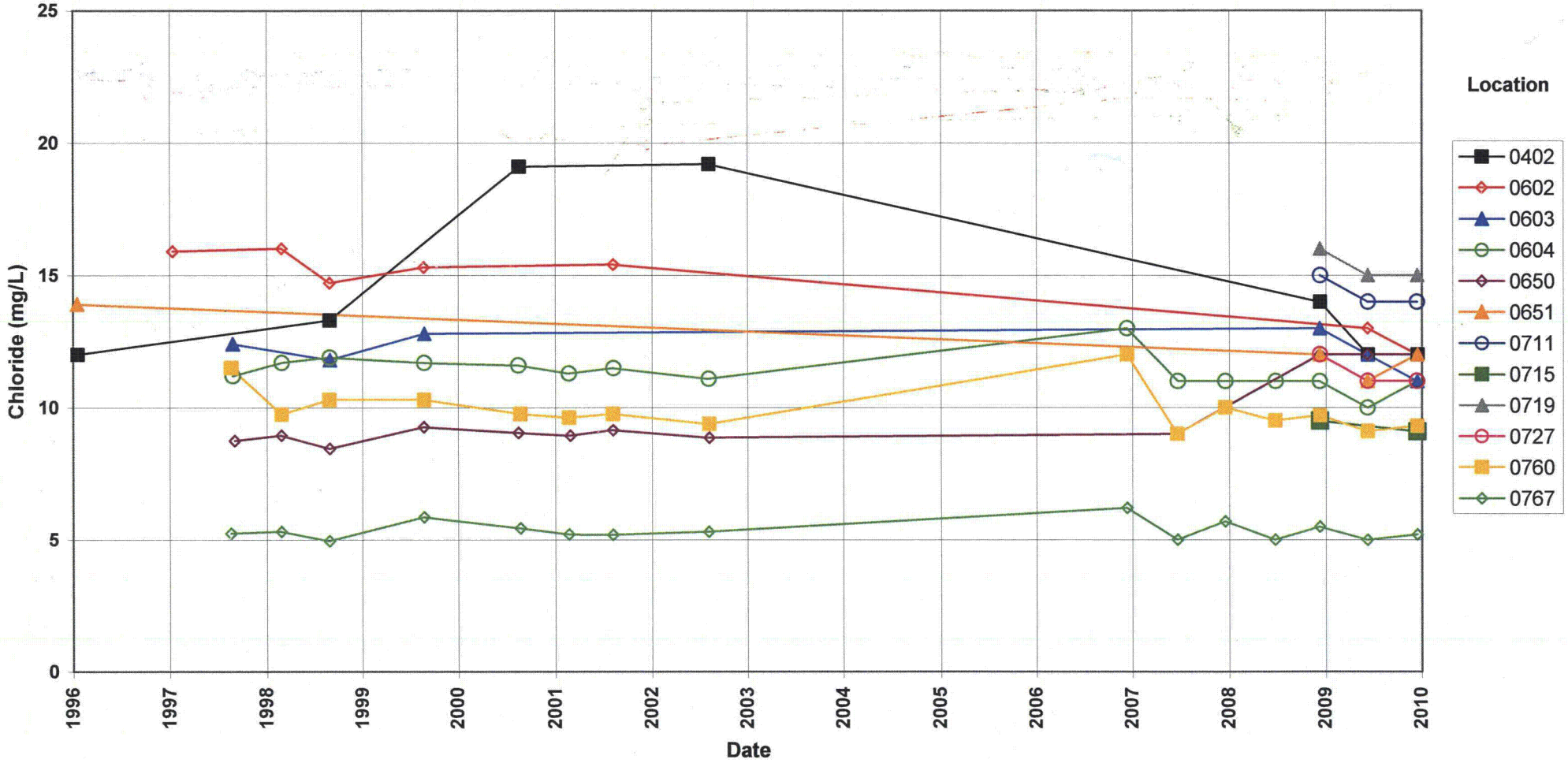
Monument Valley Processing Site
Ammonia Total as N Concentration

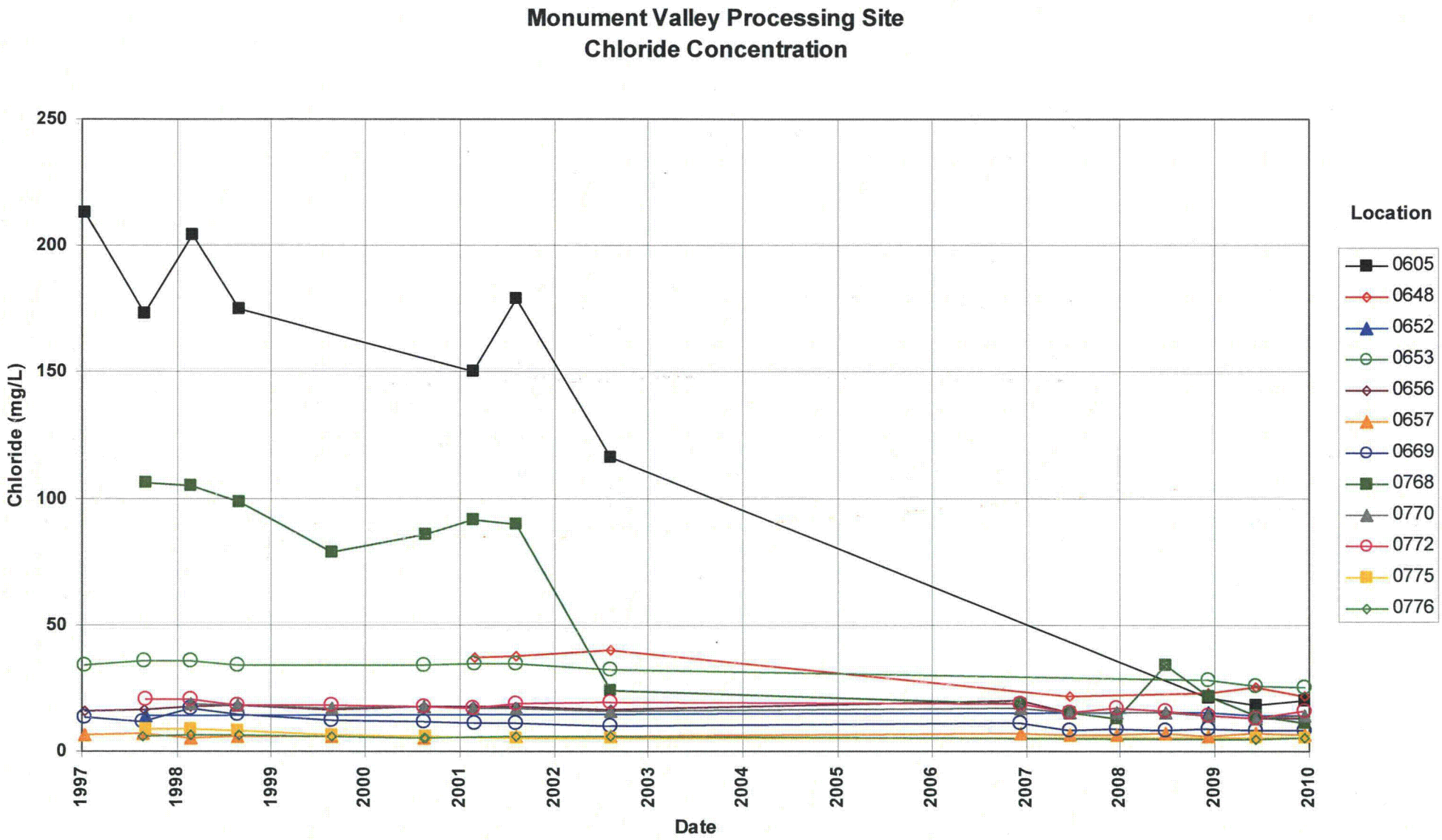


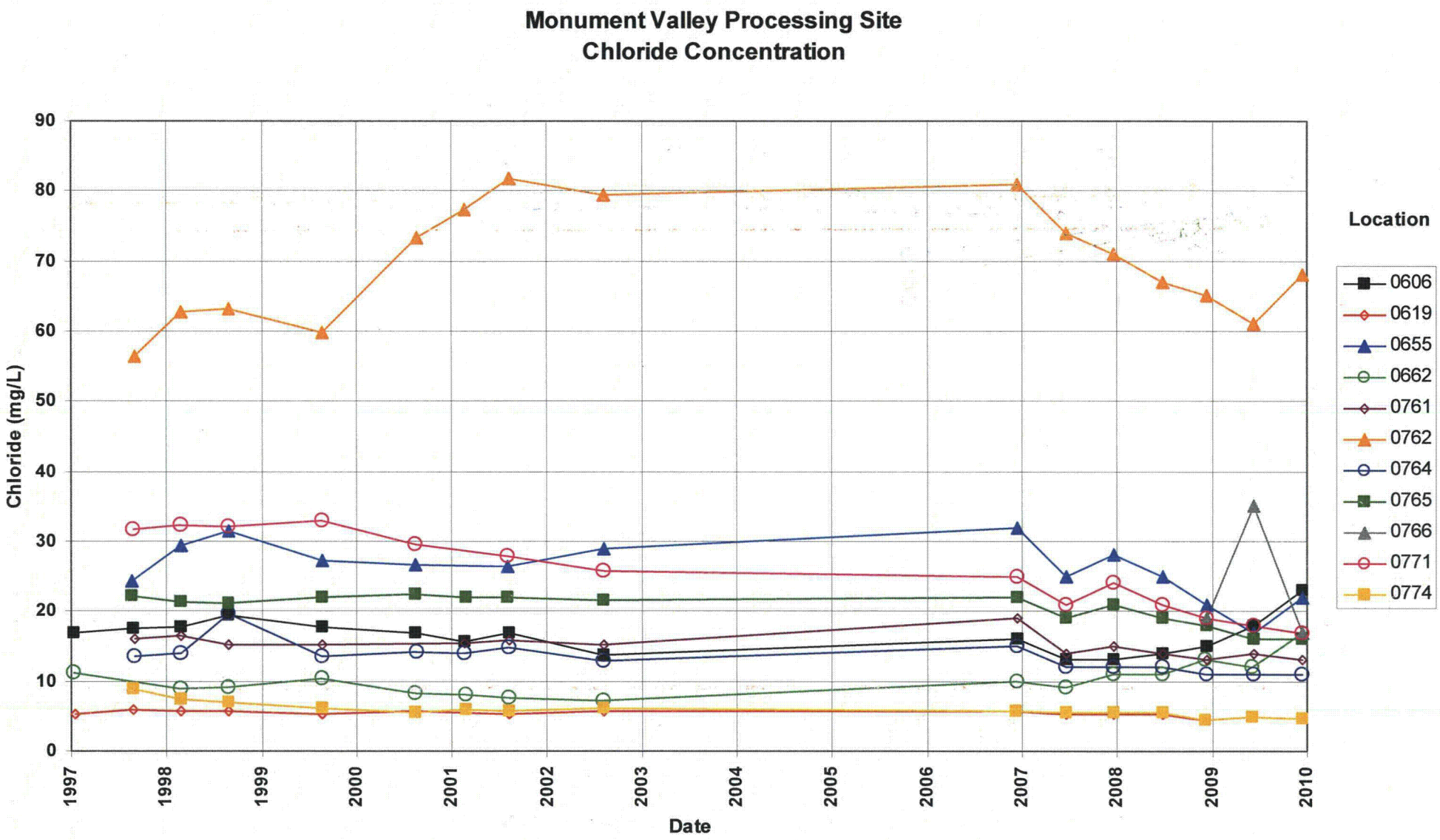
Monument Valley Processing Site
Ammonia Total as N Concentration

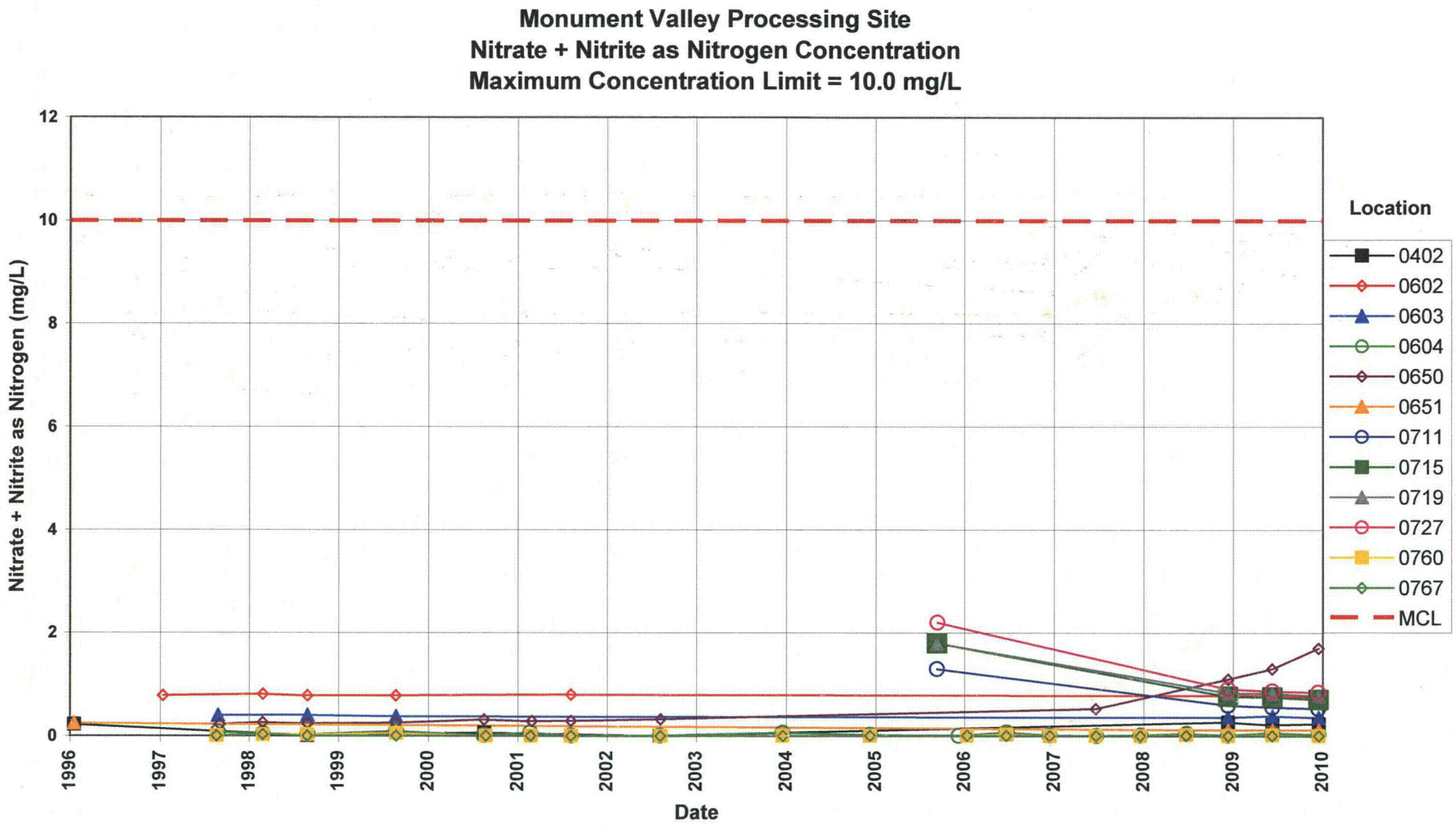


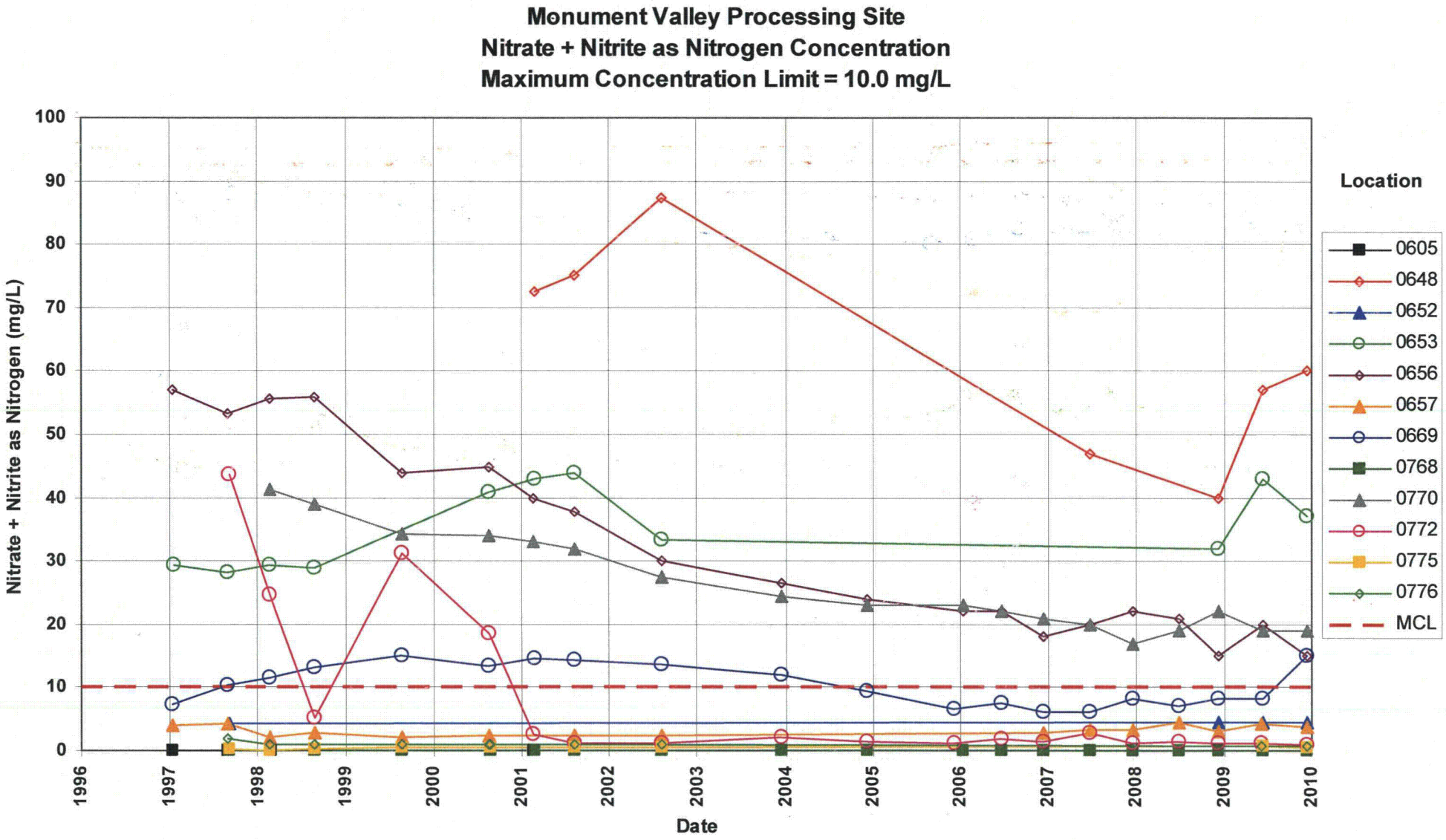
Monument Valley Processing Site
Chloride Concentration

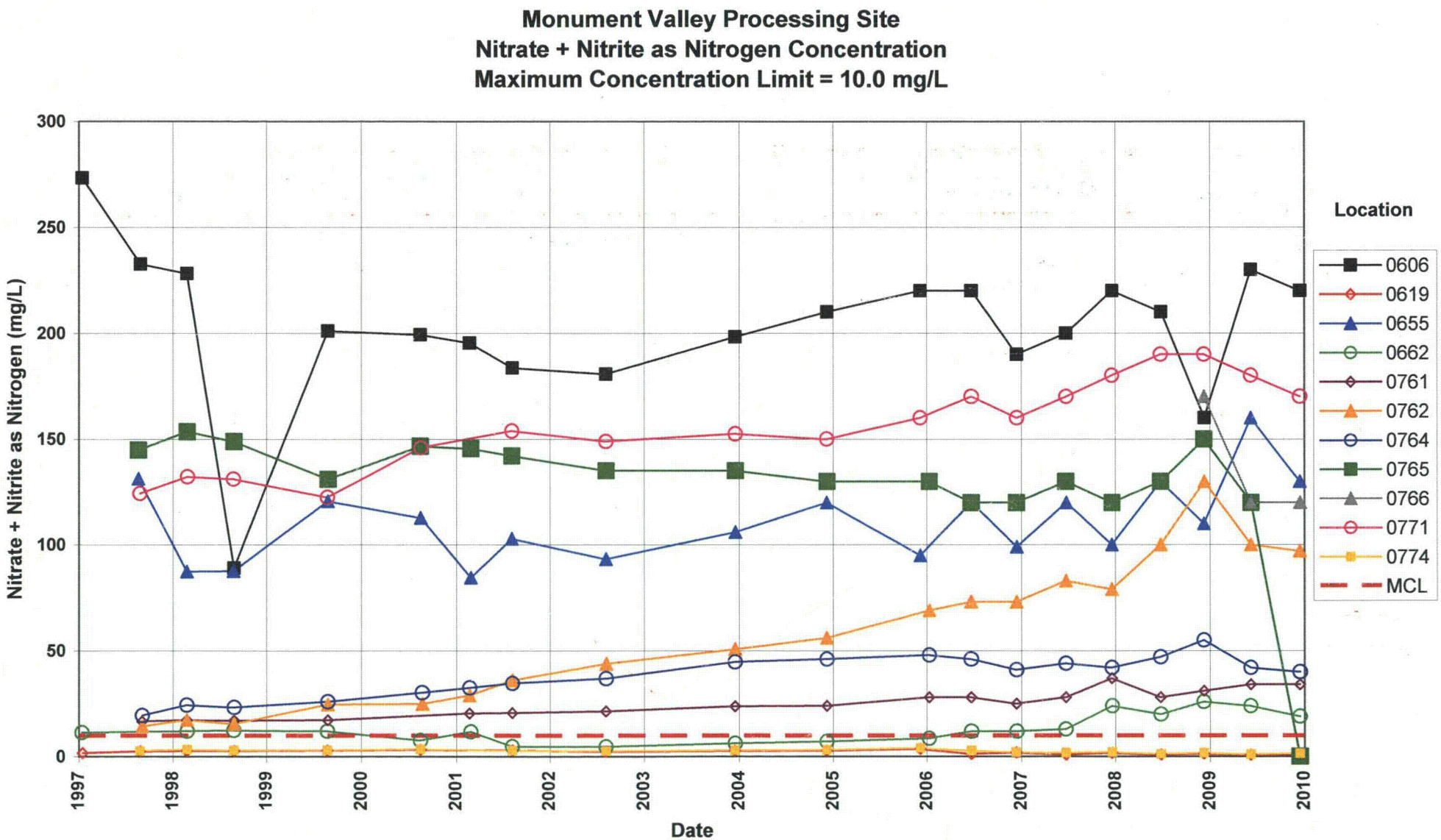


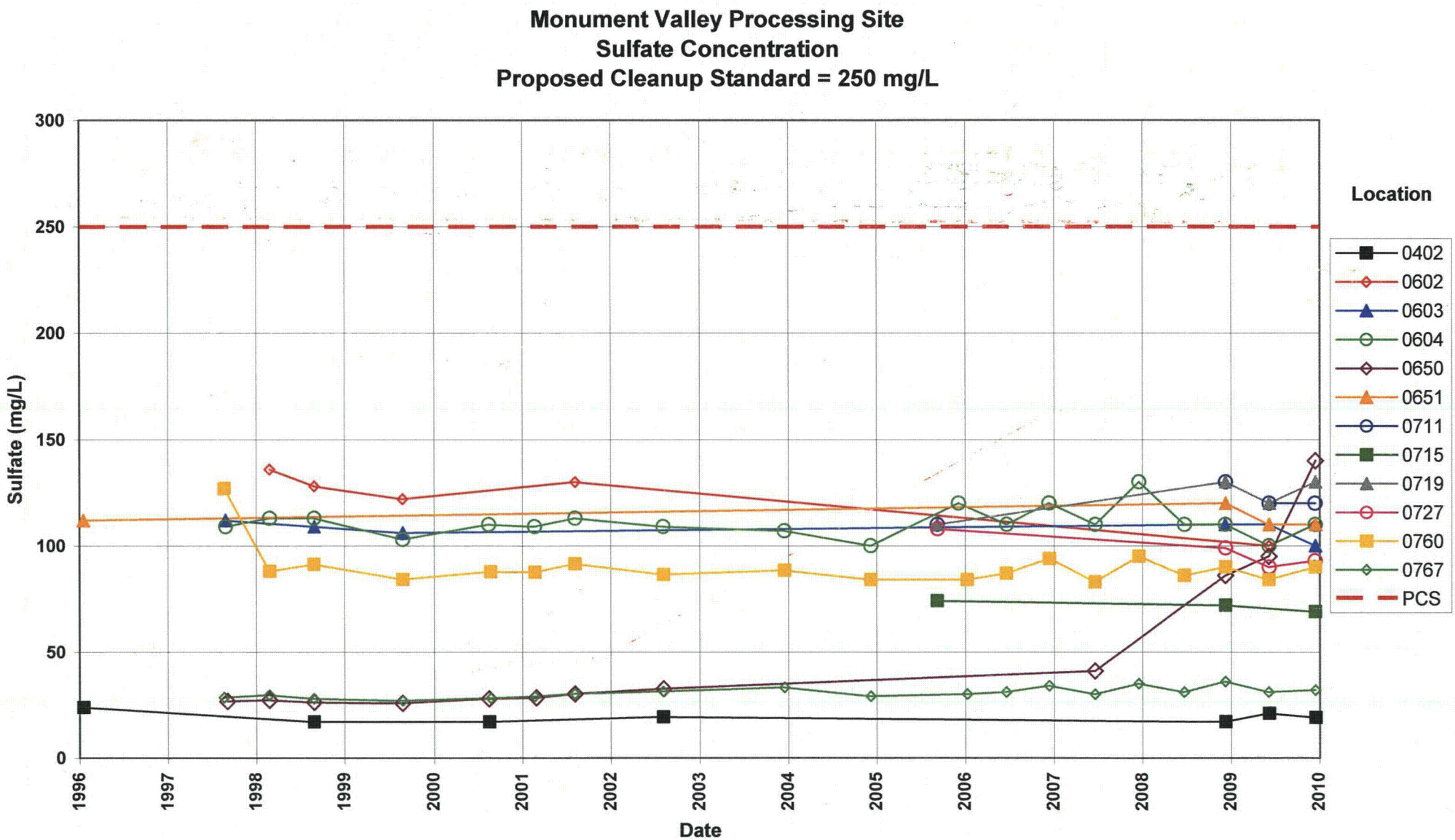

Monument Valley Processing Site
Chloride Concentration
Chloride (mg/L)
250
200
150
100
50
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Date
Location
0605
0648
0652
0653
0656
0657
0669
0768
0770
0772
0775
0776

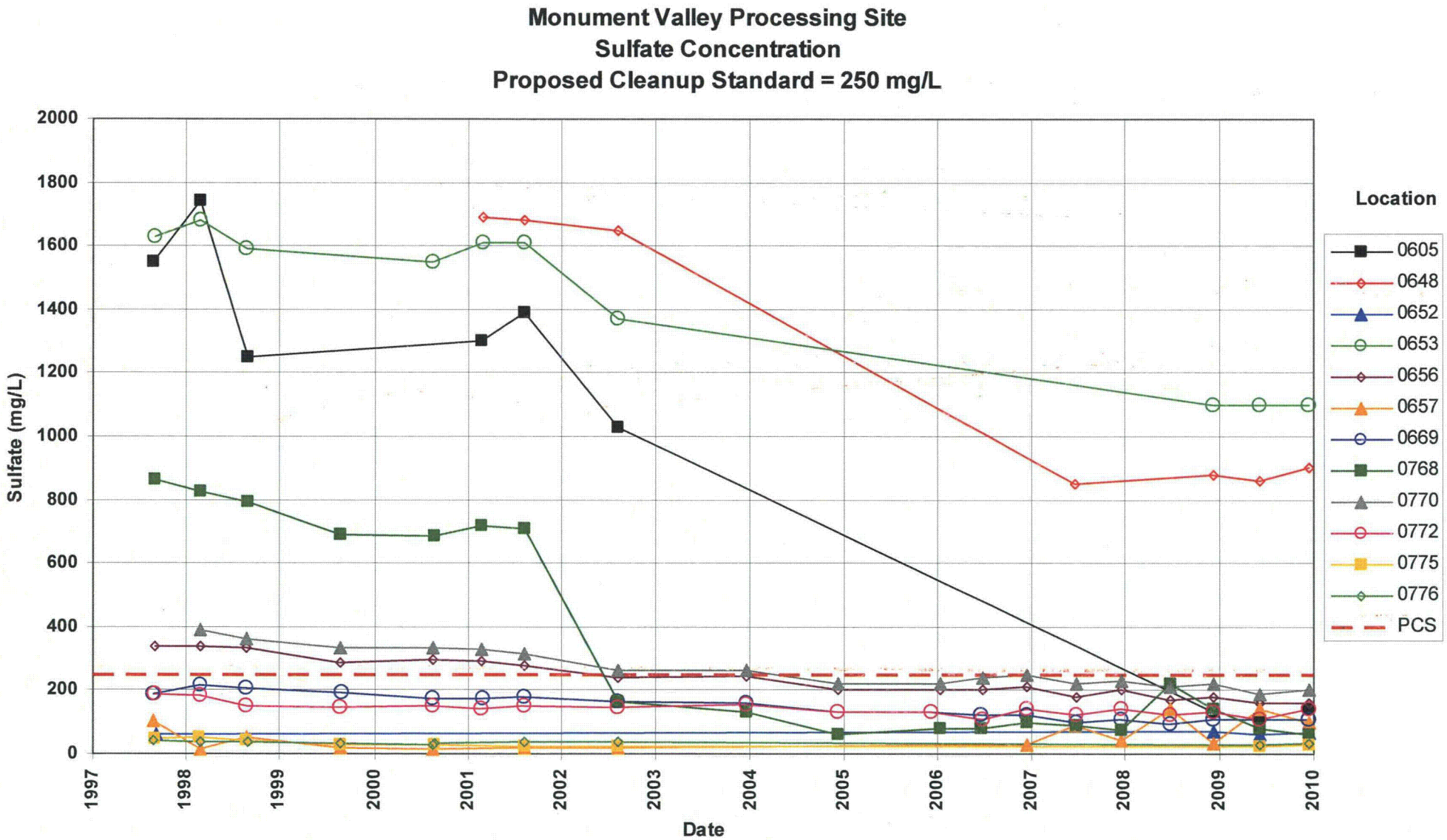

Monument Valley Processing Site
Chloride Concentration
Chloride (mg/L)
90
80
70
60
50
40
30
20
10
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Date
Location
0606
0619
0655
0662
0761
0762
0764
0765
0766
0771
0774

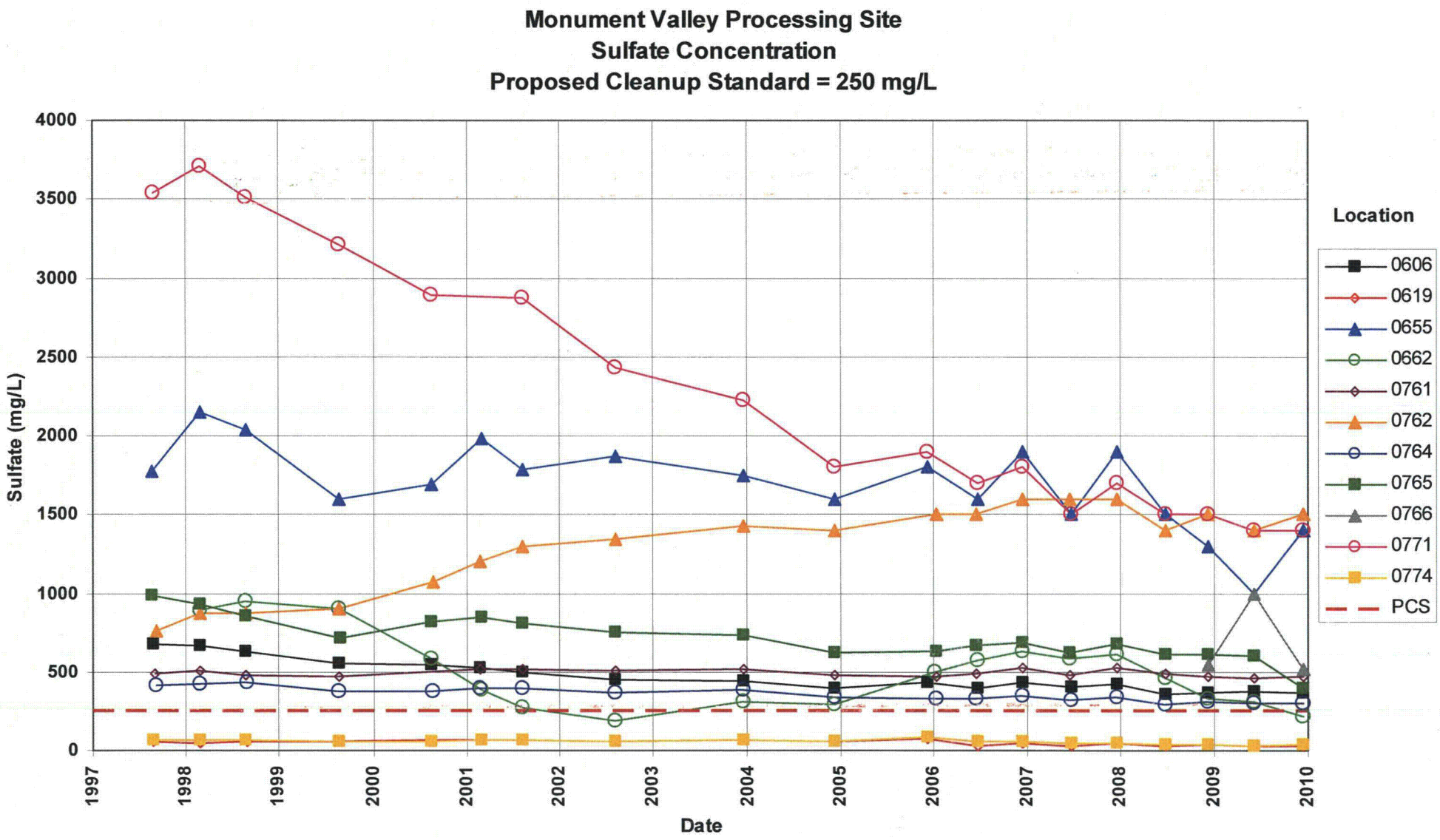

Monument Valley Processing Site
Nitrate + Nitrite as Nitrogen Concentration
Maximum Concentration Limit = 10.0 mg/L
Nitrate + Nitrite as Nitrogen (mg/L)
12
10
8
6
4
2
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Date
Location
0402
0602
0603
0604
0650
0651
0711
0715
0719
0727
0760
0767
MCL

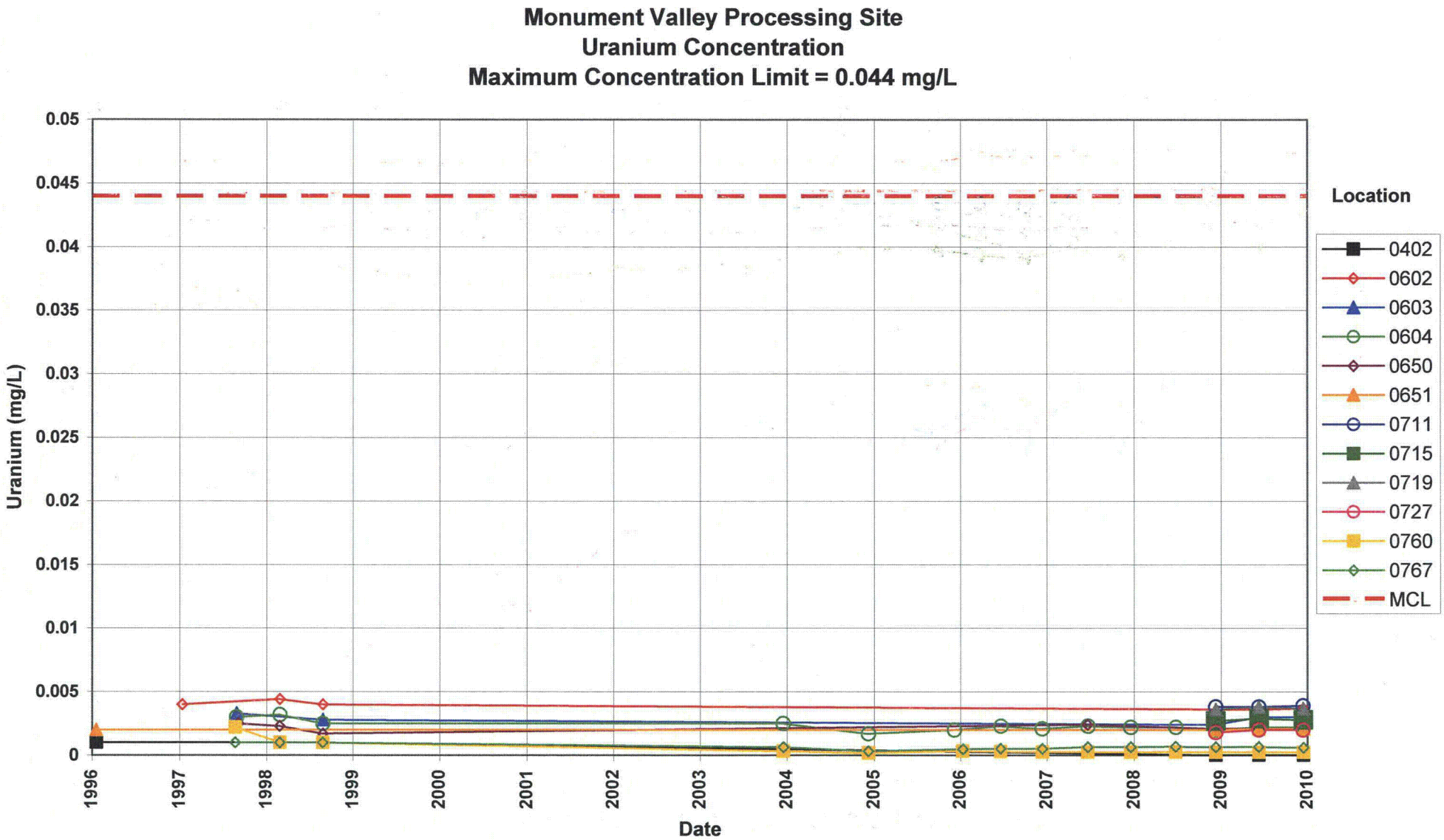

Monument Valley Processing Site
Nitrate + Nitrite as Nitrogen Concentration
Maximum Concentration Limit = 10.0 mg/L
Nitrate + Nitrite as Nitrogen (mg/L)
100
90
80
70
60
50
40
30
20
10
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Date
Location
0605
0648
0652
0653
0656
0657
0669
0768
0770
0772
0775
0776
MCL

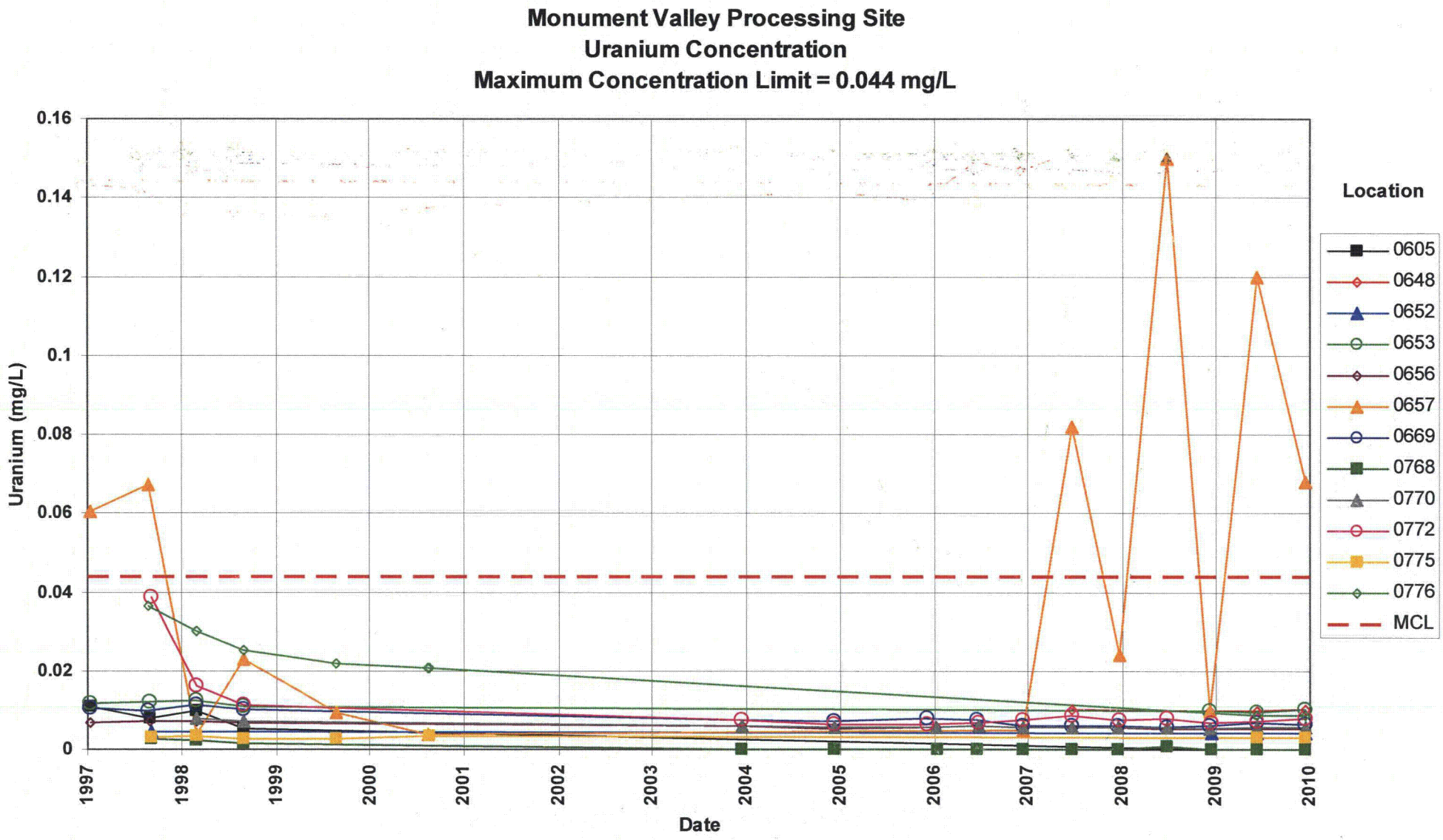

Monument Valley Processing Site
Nitrate + Nitrite as Nitrogen Concentration
Maximum Concentration Limit = 10.0 mg/L
Nitrate + Nitrite as Nitrogen (mg/L)
300
250
200
150
100
50
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Date
Location
0606
0619
0655
0662
0761
0762
0764
0765
0766
0771
0774
MCL

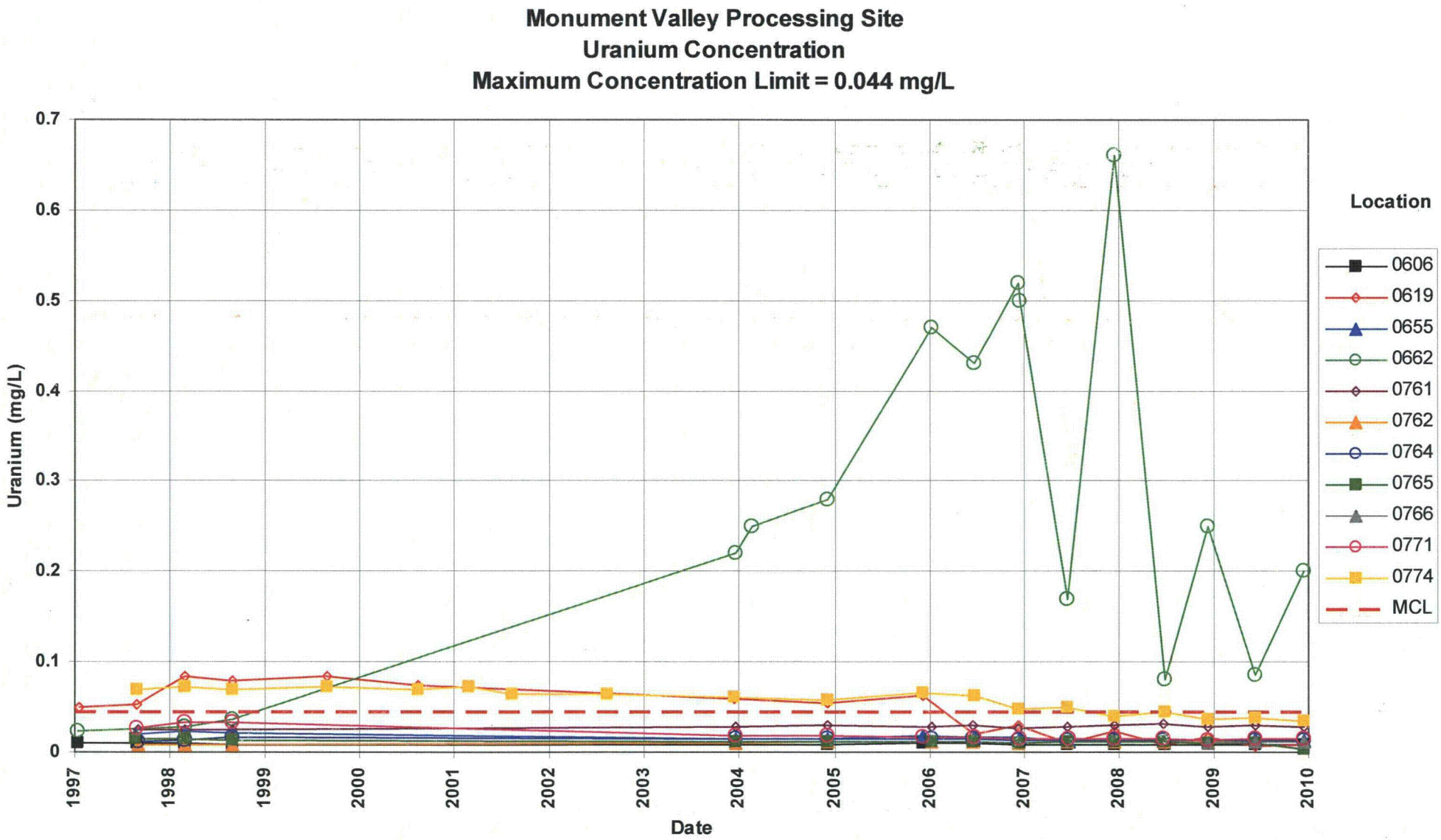

Monument Valley Processing Site
Sulfate Concentration
Proposed Cleanup Standard = 250 mg/L
Sulfate (mg/L)
300
250
200
150
100
50
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Date
Location
0402
0602
0603
0604
0650
0651
0711
0715
0719
0727
0760
0767
PCS


Monument Valley Processing Site
Sulfate Concentration
Proposed Cleanup Standard = 250 mg/L
Sulfate (mg/L)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Date
Location
0605
0648
0652
0653
0656
0657
0669
0768
0770
0772
0775
0776
PCS

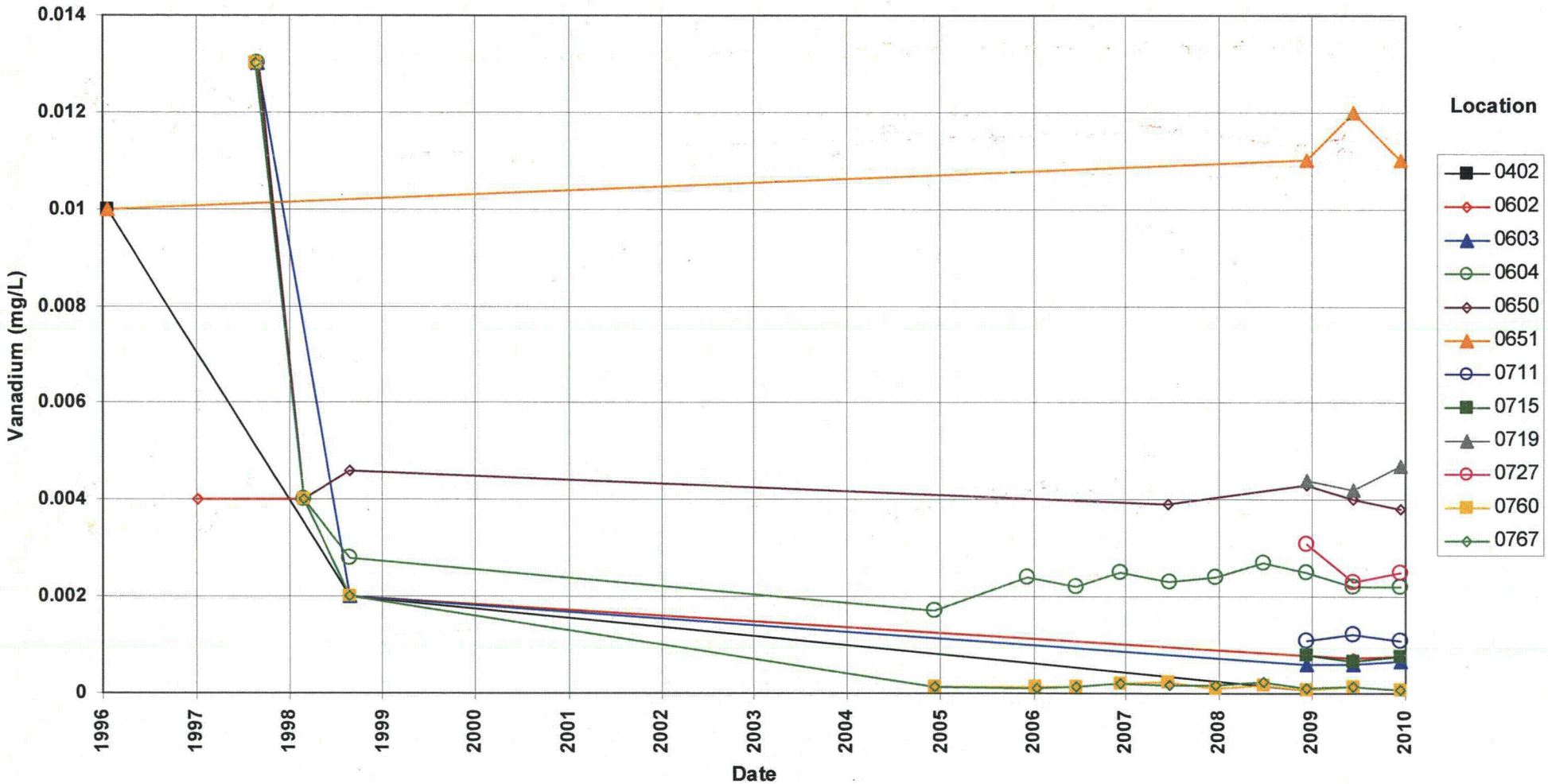

Monument Valley Processing Site
Sulfate Concentration
Proposed Cleanup Standard = 250 mg/L
Sulfate (mg/L)
4000
3500
3000
2500
2000
1500
1000
500
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Date
Location
0606
0619
0655
0662
0761
0762
0764
0765
0766
0771
0774
PCS


Monument Valley Processing Site
Uranium Concentration
Maximum Concentration Limit = 0.044 mg/L
Uranium (mg/L)
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Date
Location
0402
0602
0603
0604
0650
0651
0711
0715
0719
0727
0760
0767
MCL

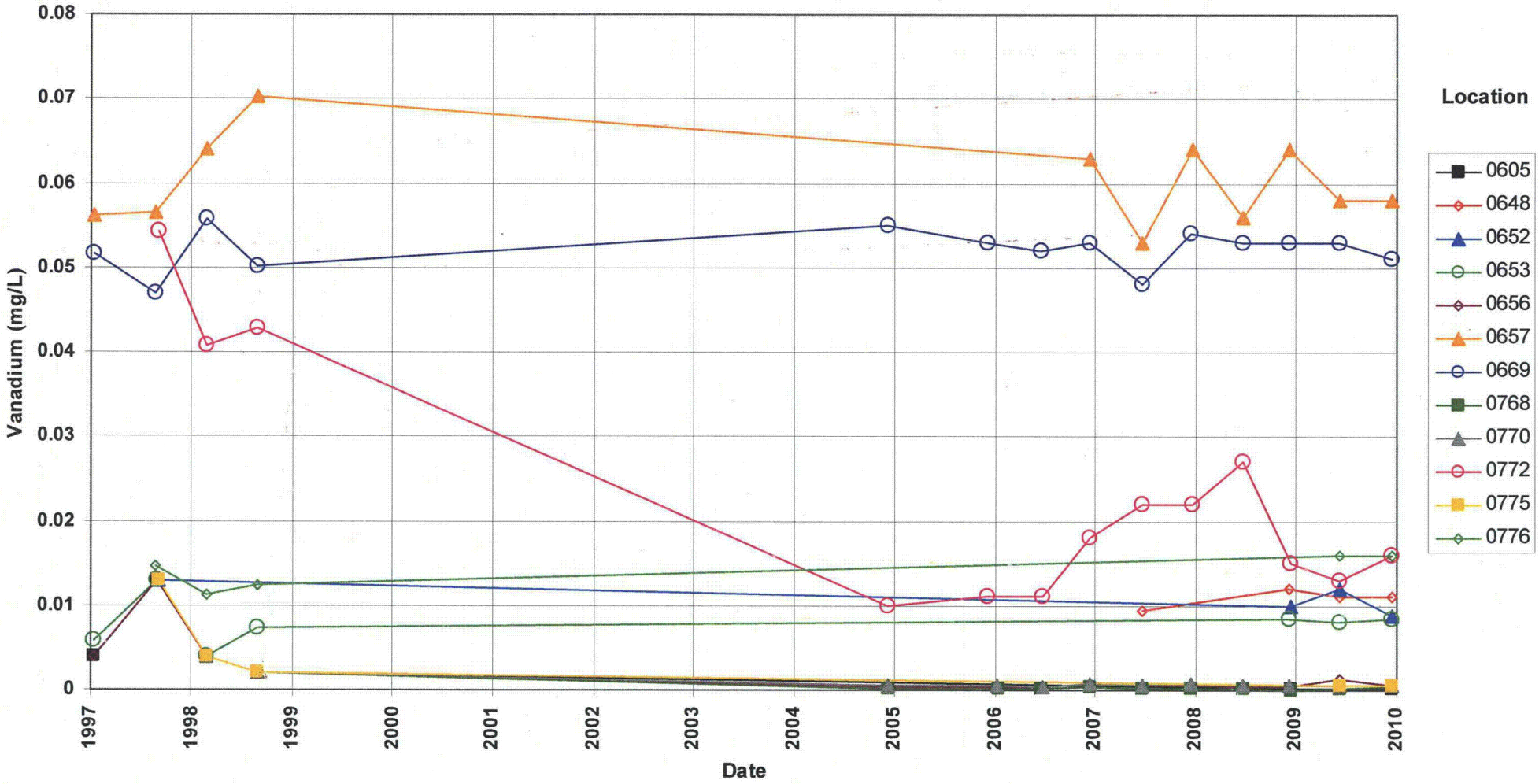

Monument Valley Processing Site
Uranium Concentration
Maximum Concentration Limit = 0.044 mg/L
Uranium (mg/L)
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Date
Location
0605
0648
0652
0653
0656
0657
0669
0768
0770
0772
0775
0776
MCL


Monument Valley Processing Site
Uranium Concentration
Maximum Concentration Limit = 0.044 mg/L
Uranium (mg/L)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Date
Location
0606
0619
0655
0662
0761
0762
0764
0765
0766
0771
0774
MCL

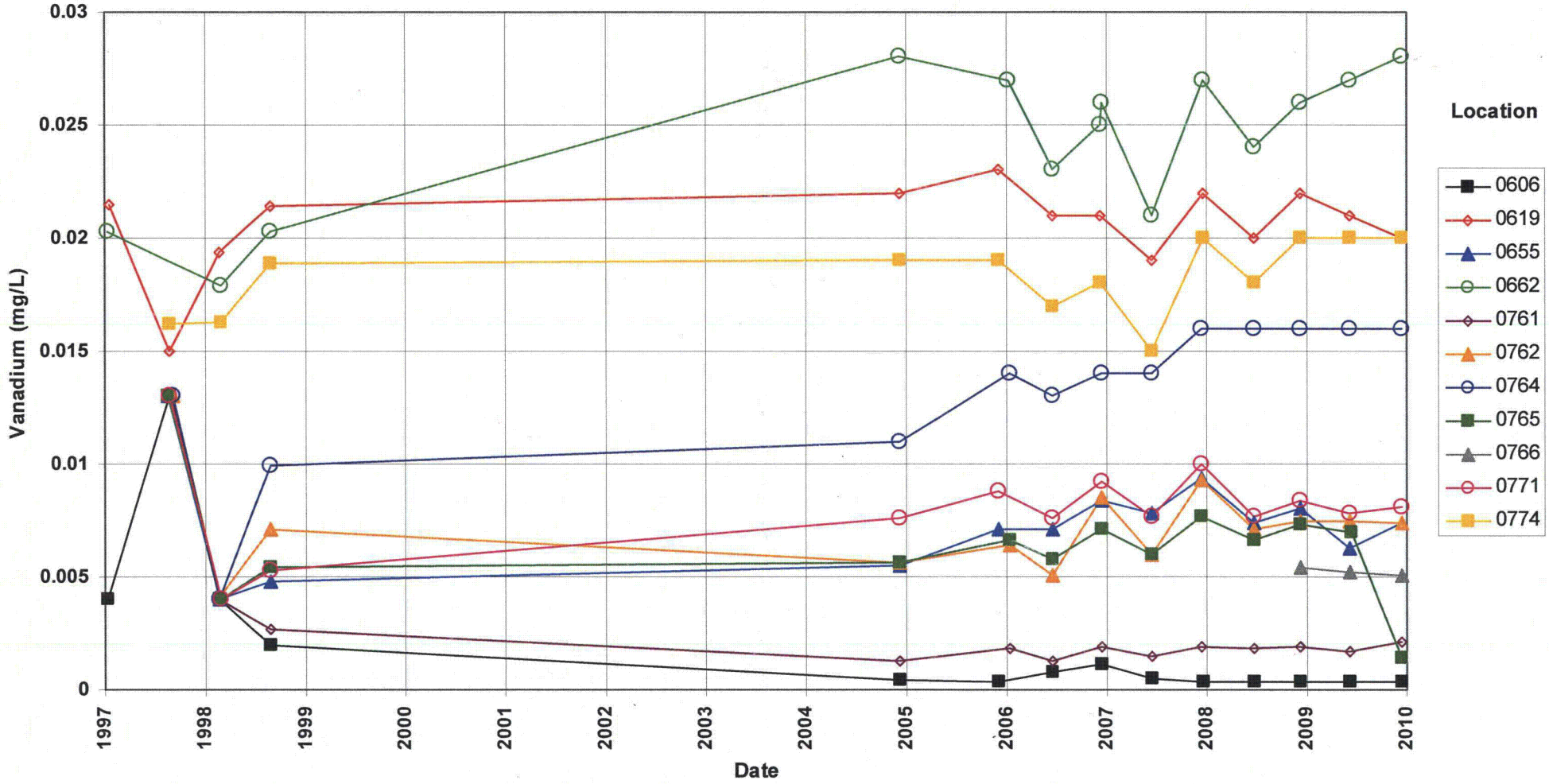
Monument Valley Processing Site
Vanadium Concentration



Monument Valley Processing Site
Vanadium Concentration



Monument Valley Processing Site
Vanadium Concentration



Attachment 3
Sampling and Analysis Work Order

This page intentionally left blank

Stoller

established 1959

Task Order LM00-501
Control Number 10-0092

November 9, 2009

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

SUBJECT: Contract No. DE-AM01-07LM00060, Stoller
December 2009 Environmental Sampling at the Monument Valley, Arizona, Processing Site

REFERENCE: Task Order LM-501-02-114-402, Monument Valley, AZ, Site

Dear Mr. Bush:

The purpose of this letter is to inform you of the upcoming sampling event at Monument Valley, Arizona. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Monument Valley processing site. Water quality data will be collected at this site as part of the routine environmental sampling currently scheduled to begin the week of December 7, 2009.

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

Monitor Wells*

402 Al	617 Al	653 Al	669 Al	760 Al	766 Al	772 Al
602 Al	619 Dc	655 Al	711 Nr	761 Al	767 Al	774 Al
603 Al	648 Al	656 Al	715 Nr	762 Al	768 Al	775 Dc
604 Al	650 Al	657 Dc	719 Nr	764 Al	770 Al	776 Dc
605 Al	651 Al	662 Al	727 Nr	765 Al	771 Al	777 Al
606 Al	652 Al					

*NOTE: Al = Alluvium; Dc = Dechelley Member of the Cutler Formation; Nr = no recovery of data for classifying

Surface Location
623

The S.M. Stoller Corporation 2597 B ¾ Road Grand Junction, CO 81503 (970) 248-6000 Fax: (970) 248-6040

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 covered under the cooperative agreement.

Please contact me at (970) 248-6652 if you have any questions.

Sincerely,

David Miller
Site Lead

DM/lcg/lb

Enclosures (3)

cc: (electronic)
Steve Donivan, Stoller
Lauren Goodknight, Stoller
Dave Miller, Stoller
EDD Delivery
rc-grand.junction

Constituent Sampling Breakdown

Site	Monument Valley				
Analyte	Groundwater	Surface Water	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Approx. No. Samples/yr	68	1			
Field Measurements					
Alkalinity					
Dissolved Oxygen					
Redox Potential	X				
pH	X				
Specific Conductance	X				
Turbidity	X				
Temperature	X				
Laboratory Measurements					
Aluminum					
Ammonia as N (NH3-N)	X		0.1	EPA 350.1	WCH-A-005
Calcium					
Chloride	X		0.5	SW-846 9056	MIS-A_039
Chromium					
Gross Beta					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO3+NO2)-N	X		0.05	EPA 353.1	WCH-A-022
Potassium					
Selenium					
Silica					
Sodium					
Strontium					
Sulfate	X		0.5	SW-846 9056	MIS-A-044
Sulfide					
Total Dissolved Solids					
Total Organic Carbon					
Uranium	X		0.0001	SW-846 6020	LMM-02
Vanadium	X		0.0003	SW-846 6020	LMM-02
Zinc					
Total No. of Analytes	6	0			

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

Sampling Frequencies for Locations at Monument Valley, Arizona

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitor Wells						
402		X				
602		X				
603		X				
604		X				
605		X				
606		X				
617		X				
619		X				
648		X				
650		X				
651		X				
652		X				
653		X				
655		X				
656		X				
657		X				
662		X				
669		X				
711		X				
715		X				
719		X				
727		X				
760		X				
761		X				
762		X				
764		X				
765		X				
766		X				
767		X				
768		X				
770		X				
771		X				
772		X				
774		X				
775		X				
776		X				
777		X				
Surface Locations						
623		X				
Private Wells						
200					X	
201					X	IHS water supply well
625					X	
640					X	

Sampling conducted in December and June

Attachment 4
Trip Report

This page intentionally left blank

Stoller
Grand Junction Office
established 1959

Memorandum

DATE: December 29, 2009

TO: David Miller

FROM: David Atkinson

SUBJECT: Trip Report

Site: Monument Valley, Processing Site.

Dates of Sampling Event: December 14-17, 2009

Team Members: David Atkinson, Gretchen Baer, Sam Campbell and Dan Sellers.

Number of Locations Sampled: Water samples for metals, anions, nitrate + nitrite as N, and ammonia as N, were collected from 35 monitor wells and one surface location for a total of 36 locations.

Locations Not Sampled/Reason: Private location 0617 and monitoring well 0777 were not sampled as per direction of project manager.

Location Specific Information:

Location ID	Comments
0602	Well lock replaced.
0605	Well pad is cracked and breaking apart.
0623	Surface location; collected directly from pond using peristaltic pump/dedicated pump head tubing so no equipment blank required. Filtration required.
0764	Wind has blown away sand under well pad.
0765	Flow cell and probes blackened by purge water. Filtration required.

All sample times were recorded in Mountain Standard Time.

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

False ID	Ticket Number	True ID	Type	Associated Matrix
2856	HNZ 745	0719	Duplicate	Groundwater
2711	HNZ 253	0774	Duplicate	Groundwater

RIN Number Assigned: All samples were assigned to RIN 09122747.

Sample Shipment: Samples were shipped overnight via FedEx to ALS Laboratory Group, Fort Collins, CO, from Grand Junction, CO, on December 18, 2009.

Water Level Measurements: Water levels were measured at all sampled wells.

Well Inspection Summary: Wind has removed sand from beneath the well pads at several locations, most notably at 0764. Well lock was inoperable at location 0602.

Field Variance: The following well locations failed to make turbidity less than 10 NTUs during purge, and had to be filtered: 0402, 0760, 0765, and 0766.

Equipment: Wells were sampled with a peristaltic pump and dedicated tubing or a dedicated bladder pump. The surface water location was sampled using a peristaltic pump and dedicated tubing. Because all equipment was dedicated or disposable, equipment blanks were not required. A bladder-pump regulator box was discovered to be leaking air during the sampling event. Operation of the pump(s) remained unaffected; however, the compressed gas providing power was quickly wasted by the leaking regulator box. The box was replaced with a spare regulator box kept in the onsite storage shed. Because the leaking regulator is operational when used with an air compressor instead of a compressed gas tank, it was determined to leave it in the storage shed and replace it when convenient.

Institutional Controls

Fences, Gates, Locks: Fences and gates were in good condition, several well locks were deteriorating and difficult to open, the lock at location 0602 could not be opened and had to be cut off and replaced.
Signs: Not applicable.
Trespassing/Site Disturbances: None observed.

Site Issues:

Disposal Cell/Drainage Structure Integrity: Not applicable.
Vegetation/Noxious Weed Concerns: None observed.
Maintenance Requirements: Well pad(s) and locks mentioned above.
Access Issues: None.
Safety Issues: None.

Corrective Action Taken: Well lock replaced.

cc: (electronic)
Rich Bush, DOE
Steve Donivan, Stoller
EDD Delivery