

**Data Validation Package for the  
Monument Valley, Arizona, Processing Site,  
December 2015**

The U.S. Department of Energy (DOE) has prepared a Data Validation Package containing the groundwater and surface water monitoring data generated from the December 2015 sampling event at the Monument Valley, Arizona, Processing Site. This package includes worksheets and reports that document the sampling activities and validation procedures conducted. **At your request, you are receiving a hard copy of the report.**

The report is also available for your review on the Internet at the DOE Office of Legacy Management (LM) website – <http://energy.gov/lm>. From the LM website home page, select the LM SITES MAP. Then select Monument Valley Site from the LM SITES list in the right column. The report will be available on the Monument Valley Site page under Site Documents and Links.



U.S. DEPARTMENT OF  
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Management



# Data Validation Package

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WM-60070

**December 2015  
Groundwater and Surface Water  
Sampling at the  
Monument Valley, Arizona,  
Processing Site**

**March 2016**



**U.S. DEPARTMENT OF  
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NMSS20

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## **Attachment 1—Assessment of Anomalous Data**

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# Sampling Event Summary

**Site:** Monument Valley, Arizona, Processing Site

**Sampling Period:** December 8–10, 2015

Fifty-two groundwater samples and one surface water sample were collected at the Monument Valley, Arizona, Processing Site to monitor groundwater contaminants for evaluating the effectiveness of the proposed compliance strategy as specified in the 1999 *Final Site Observational Work Plan for the UMTRA Project Site at Monument Valley, Arizona*. Sampling and analyses were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PRO/S04351, continually updated, <http://energy.gov/lm/downloads/sampling-and-analysis-plan-us-department-energy-office-legacy-management-sites>). Samples were collected for metals, anions, nitrate + nitrite as N, and ammonia as N analyses at all locations.

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

Table 1. Monument Valley Locations That Exceed Standards

Analyte	Standard <sup>a</sup> (mg/L)	Site Code	Location	Concentration (mg/L)
Nitrate + Nitrite as Nitrogen	10	MON01	0606	630
			0648	50
			0653	45
			0655	150
			0656	13
			0740	19
			0741	100
			0742	110
			0743	94
			0744	130
			0761	32
			0762	100
			0764	34
			0765	56
			0766	110
			0770	19
			0771	180
			0772	130

Table 1 (continued). Monument Valley Locations That Exceed Standards

Analyte	Standard <sup>a</sup> (mg/L)	Site Code	Location	Concentration (mg/L)
Uranium	0.044	MON01	0619	0.047
			0662	0.39
			0699	0.42
			0700	0.6
			0701	0.52
			0702	0.43
			0703	0.55
			0704	0.56
Uranium	0.044	MON01	0734	0.14
			0735	0.19
			0740	0.07
			0772	0.049

<sup>a</sup> Standards are listed in 40 CFR 192.02 Table 1 to Subpart A.  
mg/L = milligrams per liter.

The Navajo Nation's proposed cleanup standard for sulfate is 250 milligrams per liter (mg/L). The ratios of sulfate-to-chloride concentrations vary depending on whether the source of the sulfate is related to past millsite activities or if it is from natural sources. Tailings fluids were enriched in nitrate and sulfate but had relatively low chloride concentrations. A sulfate-to-chloride ratio greater than 10 usually is an 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-to-chloride ratio is less than 10. Table 2 lists sulfate concentrations and sulfate-to-chloride ratios.

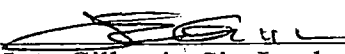
Table 2. Sulfate Results

Location	Sulfate Concentration (mg/L)	Sulfate/Chloride Ratio	Treatment Goal Achieved?
0402	13	1	Yes
0602	98	8	Yes
0603	110	8	Yes
0604	100	9	Yes
0605	400	8	Yes
0606	930	17	No
0618	16	3	Yes
0619	89	16	Yes
0623	32	3	Yes
0648	810	32	No
0650	680	24	No
0651	120	9	Yes
0652	69	4	Yes
0653	1000	36	No
0655	1400	15	No
0656	140	9	Yes
0657	50	7	Yes

Table 2 (continued). Sulfate Results

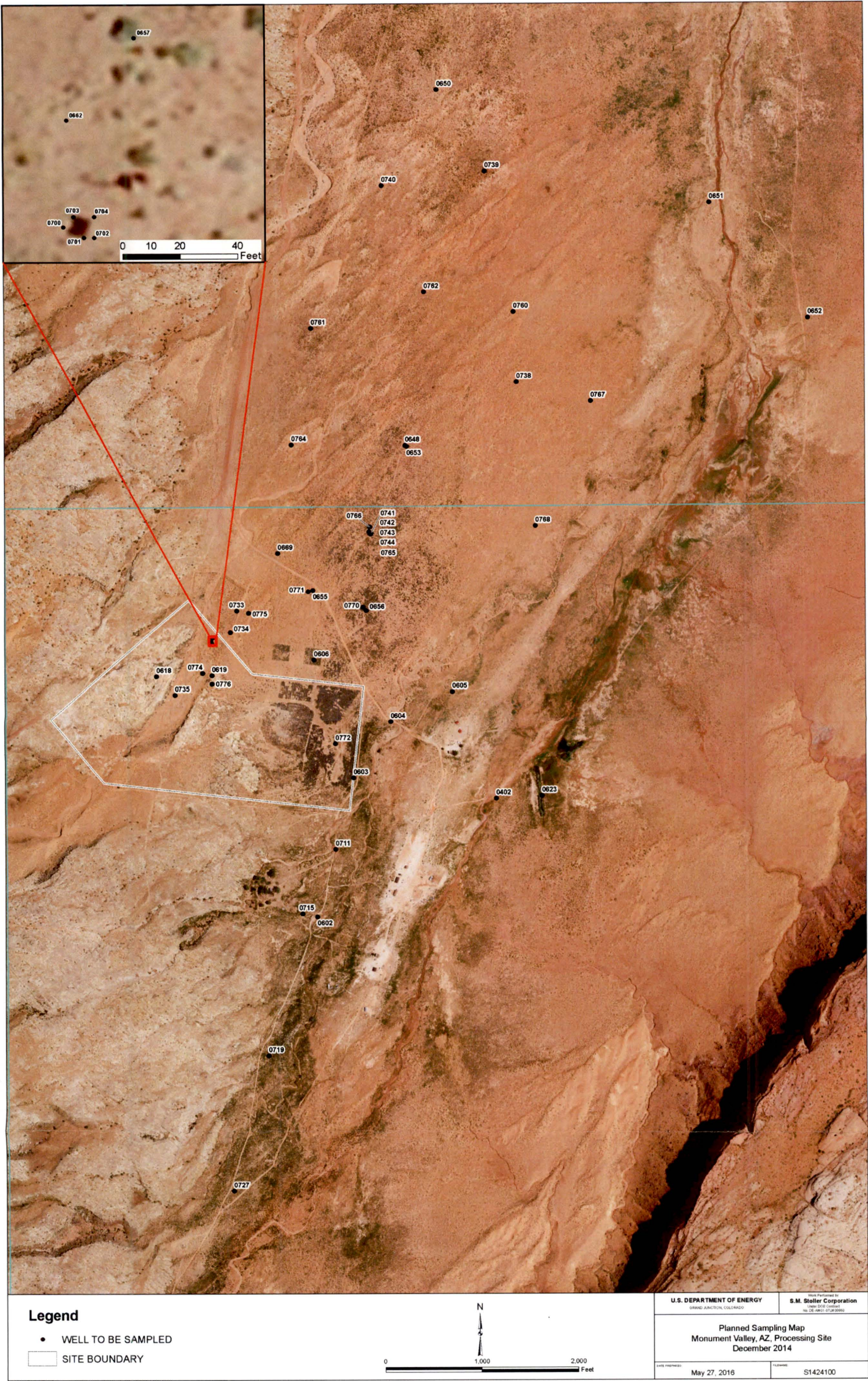
Location	Sulfate Concentration (mg/L)	Sulfate/Chloride Ratio	Treatment Goal Achieved?
0662	130	17	Yes
0669	92	11	Yes
0699	59	11	Yes
0700	73	12	Yes
0701	72	13	Yes
0702	45	9	Yes
0703	75	14	Yes
0704	70	12	Yes
0711	120	8	Yes
0715	74	7	Yes
0719	120	8	Yes
0727	87	8	Yes
0733	93	14	Yes
0734	70	12	Yes
0735	160	48	Yes
0738	160	11	Yes
0739	150	9	Yes
0740	1600	36	No
0741	490	15	No
0742	490	16	No
0743	500	17	No
0744	410	13	No
0760	90	8	Yes
0761	390	28	No
0762	1600	22	No
0764	200	18	Yes
0765	520	17	No
0766	360	15	No
0767	33	6	Yes
0768	180	5	Yes
0770	190	12	Yes
0771	1300	59	No
0772	930	11	No
0774	91	16	Yes
0775	25	4	Yes
0776	45	7	Yes

Time-concentration plots for ammonia as nitrogen, chloride, nitrate + nitrite as nitrogen, sulfate, uranium, and vanadium are included in Attachment 2.

  
 Joey Gillespie, Site Lead  
 Navarro Research and Engineering, Inc.

3-23-2016  
 Date





Monument Valley, Arizona, Disposal Site Sample Location Map



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## **Data Assessment Summary**

## Water Sampling Field Activities Verification Checklist

<b>Project</b>	<u>Monument Valley, Arizona</u>	<b>Date(s) of Water Sampling</b>	<u>December 8–10, 2015</u>
<b>Date(s) of Verification</b>	<u>February 26, 2016</u>	<b>Name of Verifier</b>	<u>Stephen Donovan</u>

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?  List any Program Directives or other documents, SOPs, instructions.	Yes	 Work Order letter dated November 5, 2015.
2. Were the sampling locations specified in the planning documents sampled?	Yes	Six additional locations (0699, 0700, 0701, 0702, 0703, and 0704) were sampled at the direction of the site lead.
3. Were field equipment calibrations conducted as specified in the above-named documents?	Yes	Calibrations were performed December 2–3, 2015.
4. Was an operational check of the field equipment conducted daily?  Did the operational checks meet criteria?	Yes Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Were wells categorized correctly?	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 meet criteria prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	No	Well 0651 was sampled at a flow rate of 955 mL/min because of a faulty pump.



## 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	Duplicate samples were collected from locations 0605, 0648, and 0740.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	NA	Dedicated equipment was used at all locations and an equipment blank was not required.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were the true identities of the QC samples documented?	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. Was all pertinent information documented on the field data sheets?	Yes	
18. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
19. Were water levels measured at the locations specified in the planning documents?	Yes	

## Laboratory Performance Assessment

### General Information

Report Numbers (RINs): 15117527  
Sample Event: December 8–10, 2015  
Site(s): Monument Valley, Arizona  
Laboratory: ALS Laboratory Group, Fort Collins, Colorado  
Work Order No.: 1512199  
Analysis: Metals and Wet Chemistry  
Validator: Stephen Donovan  
Review Date: February 24, 2016

This validation was performed according to the *Environmental Procedures Catalog*, (LMS/POL/S04325, continually updated) "Standard Practice for Validation of Environmental 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	EPA 350.1	EPA 350.1
Chloride, Sulfate	MIS-A-045	SW-856 9056	SW-856 9056
Nitrate + Nitrite as Nitrogen	WCH-A-022	EPA 353.2	EPA 353.2
Sulfide	WCH-A-038	EPA 376.1	EPA 376.1
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
1512199-2	0602	Vanadium	J	PQL check result
1512199-3	0603	Vanadium	U	Less than 5 times the method blank
1512199-4	0604	Vanadium	J	PQL check result
1512199-5	0605	Vanadium	U	Less than 5 times the method blank
1512199-6	0606	Vanadium	U	Less than 5 times the method blank
1512199-9	0623	Vanadium	J	PQL check result
1512199-13	0652	Ammonia-N	R	Laboratory error
1512199-26	0711	Vanadium	U	Less than 5 times the method blank
1512199-27	0715	Vanadium	U	Less than 5 times the method blank

Table 4 (continued). Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
1512199-33	0738	Vanadium	U	Less than 5 times the method blank
1512199-38	0743	Vanadium	U	Less than 5 times the method blank
1512199-41	0761	Vanadium	U	Less than 5 times the method blank
1512199-44	0765	Vanadium	U	Less than 5 times the method blank
1512199-45	0766	Vanadium	U	Less than 5 times the method blank
1512199-46	0767	Vanadium	U	Less than 5 times the method blank
1512199-47	0768	Vanadium	U	Less than 5 times the method blank
1512199-48	0770	Vanadium	U	Less than 5 times the method blank
1512199-52	0775	Vanadium	U	Less than 5 times the method blank
1512199-56	0605 Duplicate	Vanadium	U	Less than 5 times the method blank

## DATA QUALIFIERS:

J Estimated Value

R Unusable Result

U Parameter analyzed for but was not detected

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 56 water samples on December 11, 2015, accompanied by a Chain of Custody form. Copies of the air bills were included in the receiving documentation. The Chain of Custody 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 Chain of Custody was complete with no errors or omissions.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced coolers at 0.8 °C and 1.6 °C, with metals bottles in coolers at ambient temperature 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.

Detection and Quantitation Limits

The method detection limit (MDL) was reported for all analytes as required. The MDL, as defined in 40 CFR 136, is the minimum concentration of an analyte that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. The practical quantitation limit (PQL) for these analytes is the lowest concentration that can be reliably measured, and is defined as 5 times the MDL. The reported MDLs for all analytes demonstrate compliance with contractual requirements.

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 EPA 350.1, Ammonia as Nitrogen*

Calibrations were performed using six calibration standards on December 14–21, 2015. 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. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks meeting the acceptance criteria.

*Method EPA 353.2, Nitrate + Nitrite as Nitrogen*

Calibrations were performed using seven calibration standards on December 17, 2015. 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. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks meeting the acceptance criteria.

*Method EPA 376.1*

There are no initial or continuing calibration requirements associated with the sulfide method.

*Method SW-846 6020A, Uranium, Vanadium*

Calibrations were performed on December 16, 2015 using four 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. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks meeting the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range, with the following exception. The vanadium reporting limit verification check from December 17, 2015, did not meet the acceptance criteria, failing low. The associated sample results greater than the MDL but less than 5 times the PQL are qualified with a “J” flag as estimated values. 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, Sulfate*

Calibrations were performed using six calibration standards on November 20, 2015. 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. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks meeting 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, initial calibration, and continuing calibration blank (CCB)

results associated with the samples were below the practical quantitation limits for all analytes with the exception of CCB2 for nitrate/nitrite as N, and CCB8 and CCB9 for sulfate. The samples bracketed by these CCBs contained more than 10 times the blank concentration or were reanalyzed with acceptable CCBs.

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. In cases where a blank concentration is negative and the absolute value of it exceeds the MDL, the associated sample results are qualified with a "J" flag (not detected) when the sample result is less than 5 times the MDL or non-detect.

#### Inductively Coupled Plasma Interference Check Sample Analysis

Interference check samples 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. The spike recoveries met the acceptance criteria for all analytes evaluated. The chloride MSD recovery was below the laboratory acceptance limit but within the validation limits of 75–125 percent, not requiring qualification.

#### Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative percent difference for replicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than 5 times the PQL, the range should be no greater than the PQL. All replicate results met these criteria demonstrating 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. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 50 times the MDL. All evaluated serial dilution data were acceptable.

### Completeness

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

### Chromatography Peak Integration

The integration of analyte peaks was reviewed for all ion chromatography data. All peak integrations were satisfactory.

### Electronic Data Deliverable (EDD) File

The EDD file arrived on January 4, 2016. 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: 15117527 Lab Code: PAR Validator: Stephen Donovan Validation Date: 02/24/2016

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

# of Samples: 56 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

There are 0 holding time failures.

☒ Detection Limits

There are 0 detection limit failures.

☐ Field/Trip Blanks

☒ Field Duplicates

There were 3 duplicates evaluated.

# SAMPLE MANAGEMENT SYSTEM

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## Metals Data Validation Worksheet

RIN: 15117527

Lab Code: PAR

Date Due: 01/08/2016

Matrix: Water

Site Code: MON01

Date Completed: 12/30/2015

Analyte	Method Type	Date Analyzed	CALIBRATION				Method	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	CCV	CCB								
Uranium	ICP/MS	12/17/2015	0.0000	1.0000	OK	OK	OK	106.0	97.0	103.0	6.0	105.0	3.0	130.0
Uranium	ICP/MS	12/17/2015	0.0000	1.0000	OK	OK	OK	102.0			1.0			130.0
Uranium	ICP/MS	12/17/2015	0.0000	1.0000	OK	OK	OK	101.0	113.0	113.0	0.0			130.0
Vanadium	ICP/MS	12/17/2015	0.0000	1.0000	OK	OK	OK	104.0	97.0	103.0	6.0	100.0	4.0	45.0
Vanadium	ICP/MS	12/17/2015	0.0000	1.0000	OK	OK	OK	102.0	99.0	97.0	1.0			100.0
Vanadium	ICP/MS	12/17/2015	0.0000	1.0000	OK	OK	OK	100.0	111.0	109.0	2.0			71.0



# SAMPLE MANAGEMENT SYSTEM

## Wet Chemistry Data Validation Worksheet

RIN: 15117527

Lab Code: PAR

Date Due: 01/08/2016

Matrix: Water

Site Code: MON01

Date Completed: 12/30/2015

Analyte	Date Analyzed	CALIBRATION				Method	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	CCV	CCB						
AMMONIA AS N	12/14/2015	0.000	1.0000	OK	OK	OK	105	107	109	2	
AMMONIA AS N	12/17/2015	0.000	1.0000	OK	OK	OK	110	112	97	13	
AMMONIA AS N	12/18/2015	0.000	1.0000	OK	OK	OK	104	85	86	1	
CHLORIDE	12/16/2015	0.000	1.0000	OK	OK	OK	100	91	92	1	
CHLORIDE	12/16/2015					OK	97	91			
CHLORIDE	12/16/2015						97				
CHLORIDE	12/17/2015							94	84	3	
CHLORIDE	12/17/2015								98	2	
Nitrate+Nitrite as N	12/17/2015	0.000	1.0000	OK	OK	OK	100	103	104	1	
Nitrate+Nitrite as N	12/17/2015			OK	OK	OK	99	95	97	1	
Nitrate+Nitrite as N	12/17/2015					OK	99	103	102	1	
SULFATE	12/16/2015	0.000	1.0000	OK	OK	OK	99	106	106	0	
SULFATE	12/16/2015					OK	97	105			
SULFATE	12/16/2015					OK	97				
SULFATE	12/17/2015							98	92	3	
SULFATE	12/17/2015								104	2	

# SAMPLE MANAGEMENT SYSTEM Wet Chemistry Data Validation Worksheet

RIN: 15117527      Lab Code: PAR      Date Due: 01/08/2016  
 Matrix: Water      Site Code: MON01      Date Completed: 12/30/2015

Analyte	Date Analyzed	CALIBRATION				Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R <sup>2</sup>	CCV	CCB						
SULFIDE	12/17/2015						104				

## Sampling Quality Control Assessment

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

### Sampling Protocol

The surface water location, 0623, was collected using container immersion. All monitoring wells were sampled with a peristaltic pump and dedicated tubing or a dedicated bladder pump. Sample results from these 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, 0602, 0606, 0764, and 0771 were further qualified with a "Q" flag, indicating the data are qualitative because these wells were classified as Category II.

### 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. 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 5 times the PQL, the range should be no greater than the PQL. Duplicate samples were collected from locations 0605, 0648, and 0740. The duplicate results met the criteria, demonstrating acceptable overall precision.

# SAMPLE MANAGEMENT SYSTEM

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## Validation Report: Field Duplicates

RIN: 15117527    Lab Code: PAR    Project: Monument Valley    Validation Date: 02/24/2016

Duplicate: 2079

Sample: 0740

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
AMMONIAAS N	0.1	U		1	0.1	U		1			MG/L
CHLORIDE	44			20	42			20	4.65		MG/L
Nitrate+Nitrite as N	19			20	18			20	5.41		MG/L
SULFATE	1600			20	1500			20	6.45		MG/L
Uranium	63			10	70			10	10.53		UG/L
Vanadium	20			10	23			10	13.95		UG/L

Duplicate: 2251

Sample: 0648

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
AMMONIAAS N	19			25	11			10	NA		MG/L
CHLORIDE	25			10	26			10	3.92		MG/L
Nitrate+Nitrite as N	50			50	47			50	6.19		MG/L
SULFATE	810			10	840			10	3.64		MG/L
Uranium	9.1			10	10			10	9.42		UG/L
Vanadium	11			10	12			10	8.70		UG/L

Duplicate: 2711

Sample: 0605

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
AMMONIAAS N	0.73			1	0.45			1			MG/L
CHLORIDE	50			5	50			10	0		MG/L
Nitrate+Nitrite as N	0.01	U		1	0.01	U		1			MG/L
SULFATE	400			5	400			10	0		MG/L
Uranium	1.2			10	1.3			10	8.00		UG/L
Vanadium	0.27	J		10	1.1	J		10			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:

Stephen Donovan  
Stephen Donovan

3-16-2016  
Date

Data Validation Lead:

Stephen Donovan  
Stephen Donovan

3-16-2016  
Date

**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 can result from transcription errors, data-coding errors, or measurement system problems. However, outliers can also represent true extreme values of a distribution and can 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.** Do this by generating the Outliers Report using the Sample Management System from data in the environmental database. The application compares the new data set (in standard environmental database units) with historical data and lists the new data that fall outside the historical data range. A determination is also made as to whether the data are normally distributed using the Shapiro-Wilk Test.
2. **Apply the appropriate statistical test.** Dixon's Test for extreme values 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.** The review should include an evaluation of any notable trends in the data that may indicate the outliers represent true extreme values.

Twelve laboratory results were identified as potentially anomalous. All data associated with these results were reviewed in detail with the following error noted. The ammonia-N result for location 0652 was determined to be erroneous, due to a laboratory error. It was not possible to repeat the analysis because the holding time was expired. The erroneous result is qualified with an "R" flag as rejected.

The uranium result for the sample from location 0740 was potentially anomalous. This location was sampled in duplicate with good agreement between the sample and duplicate results, confirming the reported uranium result.

Other outlying values are a result of analyte concentrations trending downward or upward and resulting in more variability in the population than was expected. Notable are the results for locations 0772 and 0776 where concentrations increased for most analytes. The laboratory results for this RIN are acceptable as qualified.



**Data Validation Outliers Report - No Field Parameters**

**Comparison: All historical Data Beginning 01/01/2005**

Laboratory: ALS Laboratory Group

RIN: 15117527

Report Date: 02/26/2016

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
MON01	0602	N001	12/08/2015	Nitrate + Nitrite as Nitrogen	0.700		FQ	0.800		FQ	0.715		FQ	11	0	No
MON01	0602	N001	12/08/2015	Sulfate	98.0		FQ	110		F	100.0		F	11	0	NA
MON01	0603	N001	12/08/2015	Ammonia Total as N	0.450		F	0.370		F	0.140		F	12	0	No
MON01	0603	N001	12/08/2015	Nitrate + Nitrite as Nitrogen	0.330		F	0.420		F	0.340		F	12	0	No
MON01	0604	N001	12/08/2015	Uranium	0.00180		F	0.00261		F	0.00200		F	19	0	No
MON01	0606	N001	12/09/2015	Ammonia Total as N	65.0		FQ	140		F	69.0		FQ	18	0	No
MON01	0606	N001	12/09/2015	Nitrate + Nitrite as Nitrogen	630		FQ	350		FQ	160		F	18	0	Yes
MON01	0606	N001	12/09/2015	Sulfate	930		FQ	720		FQ	360		F	18	0	NA
MON01	0606	N001	12/09/2015	Uranium	0.0110		FQ	0.0103		FQ	0.00820		F	18	0	No
MON01	0618	N001	12/09/2015	Uranium	0.00330		F	0.0460			0.00350		F	9	0	No
MON01	0619	N001	12/08/2015	Nitrate + Nitrite as Nitrogen	0.710		F	3.60		F	0.782		F	24	0	NA
MON01	0619	N001	12/08/2015	Sulfate	89.0		F	77.0		F	27.0		F	24	0	NA
MON01	0623	N001	12/08/2015	Nitrate + Nitrite as Nitrogen	0.0710			0.0500	U		0.01000	U		13	7	NA
MON01	0648	N002	12/09/2015	Ammonia Total as N	11.0		F	9.20		F	0.1000	U	F	13	1	No
MON01	0648	N001	12/09/2015	Sulfate	810		F	1100		F	824		F	13	0	No
MON01	0648	N001	12/09/2015	Uranium	0.00910		F	0.0130		F	0.00970		F	13	0	No
MON01	0650	N001	12/08/2015	Chloride	28.0		F	23.0		F	9.00		F	15	0	No

**Data Validation Outliers Report - No Field Parameters**

**Comparison: All historical Data Beginning 01/01/2005**

Laboratory: ALS Laboratory Group

RIN: 15117527

Report Date: 02/26/2016

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
MON01	0650	N001	12/08/2015	Nitrate + Nitrite as Nitrogen	8.20		F	5.90		F	0.530		F	15	0	No
MON01	0650	N001	12/08/2015	Sulfate	680		F	430		F	41.0		F	15	0	No
MON01	0651	N001	12/08/2015	Nitrate + Nitrite as Nitrogen	0.220		F	0.170		F	0.110		F	12	0	Yes
MON01	0652	N001	12/08/2015	Ammonia Total as N	4.60		F	0.1000	U	F	0.0160	U	F	12	11	Yes
MON01	0652	N001	12/08/2015	Chloride	17.0		F	16.0		F	13.9		F	12	0	No
MON01	0662	N001	12/09/2015	Nitrate + Nitrite as Nitrogen	3.70		F	26.0		F	4.50		F	23	0	No
MON01	0669	N001	12/08/2015	Sulfate	92.0		F	130		F	96.0		F	21	0	No
MON01	0711	N001	12/08/2015	Chloride	16.0	N	F	15.0		F	14.0		F	12	0	NA
MON01	0711	N001	12/08/2015	Uranium	0.00430		F	0.00420		F	0.00360		F	12	0	No
MON01	0715	N001	12/08/2015	Chloride	11.0		F	10.00		F	8.73		F	11	0	No
MON01	0715	N001	12/08/2015	Sulfate	74.0		F	73.0		F	64.3		F	11	0	No
MON01	0719	N001	12/08/2015	Nitrate + Nitrite as Nitrogen	0.700		F	0.840		FQ	0.760		F	13	0	Yes
MON01	0727	N001	12/08/2015	Nitrate + Nitrite as Nitrogen	0.740		F	0.910		F	0.780		F	12	0	No
MON01	0733	0001	12/10/2015	Ammonia Total as N	0.110		F	0.1000	U	F	0.0160	U	FQ	8	8	NA
MON01	0734	0001	12/10/2015	Chloride	6.00		F	5.80		F	5.05		F	8	0	No
MON01	0734	0001	12/10/2015	Nitrate + Nitrite as Nitrogen	2.40		F	5.40		F	2.70		F	8	0	No
MON01	0735	0001	12/10/2015	Ammonia Total as N	0.360		F	0.1000	U	F	0.0160	U	F	7	7	NA



**Data Validation Outliers Report - No Field Parameters**

**Comparison: All historical Data Beginning 01/01/2005**

Laboratory: ALS Laboratory Group

RIN: 15117527

Report Date: 02/26/2016

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
MON01	0735	0001	12/10/2015	Nitrate + Nitrite as Nitrogen	4.70		F	16.0		FQ	4.80		FQ	7	0	No
MON01	0735	0001	12/10/2015	Sulfate	160		F	1400		FQ	180		FQ	7	0	No
MON01	0738	N001	12/08/2015	Uranium	0.00036		F	0.00035		F	0.00024		F	8	0	No
MON01	0739	N001	12/08/2015	Ammonia Total as N	0.920		F	0.830		F	0.102		UF	8	1	No
MON01	0739	N001	12/08/2015	Nitrate + Nitrite as Nitrogen	0.810		F	2.20		F	0.830		F	8	0	No
MON01	0740	N002	12/08/2015	Sulfate	1500		F	1400		F	973		F	9	0	No
MON01	0740	N001	12/08/2015	Sulfate	1600		F	1400		F	973		F	9	0	No
MON01	0740	N002	12/08/2015	Uranium	0.0700		F	0.0390		F	0.0124		F	9	0	Yes
MON01	0740	N001	12/08/2015	Uranium	0.0630		F	0.0390		F	0.0124		F	9	0	No
MON01	0740	N002	12/08/2015	Vanadium	0.0230		F	0.0220		F	0.0157		F	9	0	No
MON01	0741	0001	12/08/2015	Chloride	32.0		F	26.0		F	14.6		F	8	0	No
MON01	0742	N001	12/08/2015	Chloride	31.0		F	26.0		F	14.5		F	9	0	No
MON01	0743	N001	12/08/2015	Chloride	30.0		F	23.0		F	14.0		F	8	0	No
MON01	0743	N001	12/08/2015	Nitrate + Nitrite as Nitrogen	94.0		F	91.0		F	0.0120		F	8	0	No
MON01	0743	N001	12/08/2015	Uranium	0.00023		F	0.0520		F	0.00032		F	8	0	No
MON01	0744	0001	12/08/2015	Chloride	32.0		F	24.0		F	13.8		F	8	0	No
MON01	0744	0001	12/08/2015	Uranium	0.00840		F	0.0102		F	0.00860		F	8	0	No

**Data Validation Outliers Report - No Field Parameters**

**Comparison: All historical Data Beginning 01/01/2005**

Laboratory: ALS Laboratory Group

RIN: 15117527

Report Date: 02/26/2016

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
MON01	0760	0001	12/08/2015	Uranium	0.0130		F	0.00079		F	0.00021		F	19	2	NA
MON01	0761	N001	12/08/2015	Ammonia Total as N	0.230		F	0.1000	U	F	0.0160	U	F	19	18	NA
MON01	0761	N001	12/08/2015	Sulfate	390		F	530		F	393		F	19	0	No
MON01	0761	N001	12/08/2015	Uranium	0.0340		F	0.0310		F	0.0260		F	19	0	Yes
MON01	0764	0001	12/09/2015	Nitrate + Nitrite as Nitrogen	34.0		FQ	55.0		FQ	36.0		FQ	18	0	No
MON01	0764	0001	12/09/2015	Sulfate	200		FQ	350		FQ	220		FQ	17	0	No
MON01	0764	0001	12/09/2015	Vanadium	0.0210		FQ	0.0170		FQ	0.0120		FQ	18	0	Yes
MON01	0765	N001	12/08/2015	Ammonia Total as N	80.0		F	150		F	93.0		F	18	0	No
MON01	0765	N001	12/08/2015	Chloride	30.0		F	24.0		F	13.0		FQ	16	0	No
MON01	0767	N001	12/09/2015	Uranium	0.00071		F	0.00069		F	0.00049		F	19	0	NA
MON01	0768	N001	12/09/2015	Chloride	37.0		F	34.0		F	10.4		F	18	0	NA
MON01	0768	N001	12/09/2015	Uranium	0.00069		F	0.00061		F	0.000039	B	F	20	9	NA
MON01	0772	N001	12/08/2015	Chloride	83.0		F	19.0		F	13.0		F	20	0	NA
MON01	0772	N001	12/08/2015	Nitrate + Nitrite as Nitrogen	130		F	7.30		F	0.990		F	22	0	NA
MON01	0772	N001	12/08/2015	Sulfate	930		F	170		F	109		F	22	0	NA
MON01	0772	N001	12/08/2015	Uranium	0.0490		F	0.0130		F	0.00580		F	22	0	NA
MON01	0772	N001	12/08/2015	Vanadium	0.250		F	0.0480		F	0.00860		F	22	2	Yes



**Data Validation Outliers Report - No Field Parameters**

**Comparison: All historical Data Beginning 01/01/2005**

Laboratory: ALS Laboratory Group

RIN: 15117527

Report Date: 02/26/2016

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum	Qualifiers		Historical Minimum	Qualifiers		Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
MON01	0774	N001	12/08/2015	Sulfate	91.0		F	86.0		F	30.0		F	18	0	NA
MON01	0775	N001	12/09/2015	Nitrate + Nitrite as Nitrogen	0.530		F	0.630		F	0.560		F	11	0	Yes
MON01	0776	N001	12/08/2015	Ammonia Total as N	0.240		F	0.1000	U	F	0.0160	U	F	12	12	NA
MON01	0776	N001	12/08/2015	Nitrate + Nitrite as Nitrogen	1.30		F	0.880		F	0.740		F	12	0	Yes
MON01	0776	N001	12/08/2015	Sulfate	45.0		F	36.0		F	28.0		F	12	0	Yes
MON01	0776	N001	12/08/2015	Uranium	0.0140		F	0.00907		F	0.00660		F	12	0	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.

NA: Data are not normally or lognormally distributed.

**Attachment 2**

**Data Presentation**



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## **Groundwater Quality Data**

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Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0402 WELL Tribal Well No. 08-0643.

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	0001	5.17	-	9.63	0.1	U	FQ	#	0.1	
Chloride	mg/L	12/09/2015	0001	5.17	-	9.63	14		FQ	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	0001	5.17	-	9.63	0.094		FQ	#	0.01	
Oxidation Reduction Potential	mV	12/09/2015	N001	5.17	-	9.63	11.4		FQ	#		
pH	s.u.	12/09/2015	N001	5.17	-	9.63	8.48		FQ	#		
Specific Conductance	umhos /cm	12/09/2015	N001	5.17	-	9.63	554		FQ	#		
Sulfate	mg/L	12/09/2015	0001	5.17	-	9.63	13		FQ	#	0.5	
Temperature	C	12/09/2015	N001	5.17	-	9.63	12.68		FQ	#		
Turbidity	NTU	12/09/2015	N001	5.17	-	9.63	24.5		FQ	#		
Uranium	mg/L	12/09/2015	0001	5.17	-	9.63	0.000029	U	FQ	#	0.000029	
Vanadium	mg/L	12/09/2015	0001	5.17	-	9.63	0.00015	U	FQ	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0602 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	19.5 - 29.5	0.1	U	FQ	#	0.1	
Chloride	mg/L	12/08/2015	N001	19.5 - 29.5	13		FQ	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	19.5 - 29.5	0.7		FQ	#	0.01	
Oxidation Reduction Potential	mV	12/08/2015	N001	19.5 - 29.5	88.1		FQ	#		
pH	s.u.	12/08/2015	N001	19.5 - 29.5	7.79		FQ	#		
Specific Conductance	umhos /cm	12/08/2015	N001	19.5 - 29.5	627		FQ	#		
Sulfate	mg/L	12/08/2015	N001	19.5 - 29.5	98		FQ	#	1	
Temperature	C	12/08/2015	N001	19.5 - 29.5	13.93		FQ	#		
Turbidity	NTU	12/08/2015	N001	19.5 - 29.5	6.36		FQ	#		
Uranium	mg/L	12/08/2015	N001	19.5 - 29.5	0.0036		FQ	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	19.5 - 29.5	0.0014	J	FQJ	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0603 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	43	-	53	0.45		F	#	0.1	
Chloride	mg/L	12/08/2015	N001	43	-	53	13		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	43	-	53	0.33		F	#	0.01	
Oxidation Reduction Potential	mV	12/08/2015	N001	43	-	53	-5.1		F	#		
pH	s.u.	12/08/2015	N001	43	-	53	7.77		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	43	-	53	619		F	#		
Sulfate	mg/L	12/08/2015	N001	43	-	53	110		F	#	1	
Temperature	C	12/08/2015	N001	43	-	53	15.06		F	#		
Turbidity	NTU	12/08/2015	N001	43	-	53	5		F	#		
Uranium	mg/L	12/08/2015	N001	43	-	53	0.0031		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	43	-	53	0.00084	J	UF	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0604 WELL

Parameter	Units	Sample	ID	Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date		(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	12/08/2015	N001	13	-	28	0.1	U	F	#	0.1	
Chloride	mg/L	12/08/2015	N001	13	-	28	11		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	13	-	28	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	12/08/2015	N001	13	-	28	11.6		F	#		
pH	s.u.	12/08/2015	N001	13	-	28	8.1		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	13	-	28	598		F	#		
Sulfate	mg/L	12/08/2015	N001	13	-	28	100		F	#	1	
Temperature	C	12/08/2015	N001	13	-	28	15.03		F	#		
Turbidity	NTU	12/08/2015	N001	13	-	28	6.9		F	#		
Uranium	mg/L	12/08/2015	N001	13	-	28	0.0018		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	13	-	28	0.0024	J	FJ	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0605 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	N001	14	-	29	0.73		F	#	0.1	
Ammonia Total as N	mg/L	12/09/2015	N002	14	-	29	0.45		F	#	0.1	
Chloride	mg/L	12/09/2015	N001	14	-	29	50		F	#	1	
Chloride	mg/L	12/09/2015	N002	14	-	29	50		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N001	14	-	29	0.01	U	F	#	0.01	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N002	14	-	29	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	12/09/2015	N001	14	-	29	-198.2		F	#		
pH	s.u.	12/09/2015	N001	14	-	29	8.19		F	#		
Specific Conductance	umhos /cm	12/09/2015	N001	14	-	29	1258		F	#		
Sulfate	mg/L	12/09/2015	N001	14	-	29	400		F	#	2.5	
Sulfate	mg/L	12/09/2015	N002	14	-	29	400		F	#	5	
Temperature	C	12/09/2015	N001	14	-	29	15.77		F	#		
Turbidity	NTU	12/09/2015	N001	14	-	29	9.4		F	#		
Uranium	mg/L	12/09/2015	N001	14	-	29	0.0012		F	#	0.000029	
Uranium	mg/L	12/09/2015	N002	14	-	29	0.0013		F	#	0.000029	
Vanadium	mg/L	12/09/2015	N001	14	-	29	0.00027	J	UF	#	0.00015	
Vanadium	mg/L	12/09/2015	N002	14	-	29	0.0011	J	UF	#	0.00015	



Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0606 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	N001	32	-	42	65		FQ	#	20	
Chloride	mg/L	12/09/2015	N001	32	-	42	55		FQ	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N001	32	-	42	630		FQ	#	5	
Oxidation Reduction Potential	mV	12/09/2015	N001	32	-	42	90.7		FQ	#		
pH	s.u.	12/09/2015	N001	32	-	42	6.94		FQ	#		
Specific Conductance	umhos /cm	12/09/2015	N001	32	-	42	5754		FQ	#		
Sulfate	mg/L	12/09/2015	N001	32	-	42	930		FQ	#	5	
Temperature	C	12/09/2015	N001	32	-	42	15.21		FQ	#		
Uranium	mg/L	12/09/2015	N001	32	-	42	0.011		FQ	#	0.000029	
Vanadium	mg/L	12/09/2015	N001	32	-	42	0.00073	J	UFQ	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0618 WELL 12" DIA Steel CSG. Old Mill Well??

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	N001	-	0.1	U	F	#	0.1	
Chloride	mg/L	12/09/2015	N001	-	4.7		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N001	-	1.1		F	#	0.01	
Oxidation Reduction Potential	mV	12/09/2015	N001	-	-34		F	#		
pH	s.u.	12/09/2015	N001	-	7.93		F	#		
Specific Conductance	umhos /cm	12/09/2015	N001	-	322		F	#		
Sulfate	mg/L	12/09/2015	N001	-	16		F	#	0.5	
Temperature	C	12/09/2015	N001	-	14.08		F	#		
Turbidity	NTU	12/09/2015	N001	-	0.85		F	#		
Uranium	mg/L	12/09/2015	N001	-	0.0033		F	#	0.000029	
Vanadium	mg/L	12/09/2015	N001	-	0.059		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0619 WELL Water Use Permit No. 92-082.

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	103.9 - 153.9	0.1	U	F	#	0.1	
Chloride	mg/L	12/08/2015	N001	103.9 - 153.9	5.5		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	103.9 - 153.9	0.71		F	#	0.01	
Oxidation Reduction Potential	mV	12/08/2015	N001	103.9 - 153.9	75.8		F	#		
pH	s.u.	12/08/2015	N001	103.9 - 153.9	7.66		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	103.9 - 153.9	493		F	#		
Sulfate	mg/L	12/08/2015	N001	103.9 - 153.9	89		F	#	1	
Temperature	C	12/08/2015	N001	103.9 - 153.9	16.24		F	#		
Turbidity	NTU	12/08/2015	N001	103.9 - 153.9	0.57		F	#		
Uranium	mg/L	12/08/2015	N001	103.9 - 153.9	0.047		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	103.9 - 153.9	0.021		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0648 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	N001	38.5	- 88.5	19		F	#	2.5	
Ammonia Total as N	mg/L	12/09/2015	N002	38.5	- 88.5	11		F	#	1	
Chloride	mg/L	12/09/2015	N001	38.5	- 88.5	25		F	#	2	
Chloride	mg/L	12/09/2015	N002	38.5	- 88.5	26		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N001	38.5	- 88.5	50		F	#	0.5	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N002	38.5	- 88.5	47		F	#	0.5	
Oxidation Reduction Potential	mV	12/09/2015	N001	38.5	- 88.5	175.6		F	#		
pH	s.u.	12/09/2015	N001	38.5	- 88.5	7.64		F	#		
Specific Conductance	umhos /cm	12/09/2015	N001	38.5	- 88.5	2109		F	#		
Sulfate	mg/L	12/09/2015	N001	38.5	- 88.5	810		F	#	5	
Sulfate	mg/L	12/09/2015	N002	38.5	- 88.5	840		F	#	5	
Temperature	C	12/09/2015	N001	38.5	- 88.5	15.04		F	#		
Turbidity	NTU	12/09/2015	N001	38.5	- 88.5	0.96		F	#		
Uranium	mg/L	12/09/2015	N001	38.5	- 88.5	0.0091		F	#	0.000029	
Uranium	mg/L	12/09/2015	N002	38.5	- 88.5	0.01		F	#	0.000029	
Vanadium	mg/L	12/09/2015	N001	38.5	- 88.5	0.011		F	#	0.00015	
Vanadium	mg/L	12/09/2015	N002	38.5	- 88.5	0.012		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0650 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	77.5 - 97.5	0.1	U	F	#	0.1	
Chloride	mg/L	12/08/2015	N001	77.5 - 97.5	28		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	77.5 - 97.5	8.2		F	#	0.1	
Oxidation Reduction Potential	mV	12/08/2015	N001	77.5 - 97.5	72.2		F	#		
pH	s.u.	12/08/2015	N001	77.5 - 97.5	8.14		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	77.5 - 97.5	1538		F	#		
Sulfate	mg/L	12/08/2015	N001	77.5 - 97.5	680		F	#	5	
Temperature	C	12/08/2015	N001	77.5 - 97.5	15.34		F	#		
Turbidity	NTU	12/08/2015	N001	77.5 - 97.5	0.96		F	#		
Uranium	mg/L	12/08/2015	N001	77.5 - 97.5	0.0024		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	77.5 - 97.5	0.0034		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0651 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	12/08/2015	N001	20	-	80	0.1	U	F	#	0.1	
Chloride	mg/L	12/08/2015	N001	20	-	80	14		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	20	-	80	0.22		F	#	0.01	
Oxidation Reduction Potential	mV	12/08/2015	N001	20	-	80	64.2		F	#		
pH	s.u.	12/08/2015	N001	20	-	80	8.42		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	20	-	80	636		F	#		
Sulfate	mg/L	12/08/2015	N001	20	-	80	120		F	#	1	
Temperature	C	12/08/2015	N001	20	-	80	15.11		F	#		
Turbidity	NTU	12/08/2015	N001	20	-	80	2.28		F	#		
Uranium	mg/L	12/08/2015	N001	20	-	80	0.0022		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	20	-	80	0.012		F	#	0.00015	

## Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0652 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	12/08/2015	N001	34	-	54	4.6		F	#	2.5	
Chloride	mg/L	12/08/2015	N001	34	-	54	17		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	34	-	54	4.6		F	#	0.05	
Oxidation Reduction Potential	mV	12/08/2015	N001	34	-	54	89.4		F	#		
pH	s.u.	12/08/2015	N001	34	-	54	8.05		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	34	-	54	569		F	#		
Sulfate	mg/L	12/08/2015	N001	34	-	54	69		F	#	0.5	
Temperature	C	12/08/2015	N001	34	-	54	14.88		F	#		
Turbidity	NTU	12/08/2015	N001	34	-	54	1.48		F	#		
Uranium	mg/L	12/08/2015	N001	34	-	54	0.004		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	34	-	54	0.0092		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0653 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	N001	56	-	76	0.1	U	F	#	0.1	
Chloride	mg/L	12/09/2015	N001	56	-	76	28		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N001	56	-	76	45		F	#	0.5	
Oxidation Reduction Potential	mV	12/09/2015	N001	56	-	76	173.2		F	#		
pH	s.u.	12/09/2015	N001	56	-	76	7.6		F	#		
Specific Conductance	umhos /cm	12/09/2015	N001	56	-	76	2361		F	#		
Sulfate	mg/L	12/09/2015	N001	56	-	76	1000		F	#	10	
Temperature	C	12/09/2015	N001	56	-	76	14.66		F	#		
Turbidity	NTU	12/09/2015	N001	56	-	76	1.41		F	#		
Uranium	mg/L	12/09/2015	N001	56	-	76	0.01		F	#	0.000029	
Vanadium	mg/L	12/09/2015	N001	56	-	76	0.0089		F	#	0.00015	



Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0655 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	38	-	58	170		F	#	20	
Chloride	mg/L	12/08/2015	N001	38	-	58	96		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	38	-	58	150		F	#	2	
Oxidation Reduction Potential	mV	12/08/2015	N001	38	-	58	133.6		F	#		
pH	s.u.	12/08/2015	N001	38	-	58	7.2		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	38	-	58	4012		F	#		
Sulfate	mg/L	12/08/2015	N001	38	-	58	1400		F	#	10	
Temperature	C	12/08/2015	N001	38	-	58	16.38		F	#		
Turbidity	NTU	12/08/2015	N001	38	-	58	0.92		F	#		
Uranium	mg/L	12/08/2015	N001	38	-	58	0.014		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	38	-	58	0.0077		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0656 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	N001	38	-	58	44		F	#	2.5	
Chloride	mg/L	12/09/2015	N001	38	-	58	15		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N001	38	-	58	13		F	#	0.1	
Oxidation Reduction Potential	mV	12/09/2015	N001	38	-	58	97		F	#		
pH	s.u.	12/09/2015	N001	38	-	58	8.02		F	#		
Specific Conductance	umhos /cm	12/09/2015	N001	38	-	58	909		F	#		
Sulfate	mg/L	12/09/2015	N001	38	-	58	140		F	#	1	
Temperature	C	12/09/2015	N001	38	-	58	15.31		F	#		
Turbidity	NTU	12/09/2015	N001	38	-	58	0.75		F	#		
Uranium	mg/L	12/09/2015	N001	38	-	58	0.0053		F	#	0.000029	
Vanadium	mg/L	12/09/2015	N001	38	-	58	0.0012	J	F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0657 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers		Detection Limit	Uncertainty
									Data	QA		
Ammonia Total as N	mg/L	12/09/2015	N001	121	-	136	0.1	U	F	#	0.1	
Chloride	mg/L	12/09/2015	N001	121	-	136	7.1		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N001	121	-	136	3.2		F	#	0.05	
Oxidation Reduction Potential	mV	12/09/2015	N001	121	-	136	65.9		F	#		
pH	s.u.	12/09/2015	N001	121	-	136	7.72		F	#		
Specific Conductance	umhos /cm	12/09/2015	N001	121	-	136	425		F	#		
Sulfate	mg/L	12/09/2015	N001	121	-	136	50		F	#	0.5	
Temperature	C	12/09/2015	N001	121	-	136	15.55		F	#		
Turbidity	NTU	12/09/2015	N001	121	-	136	2.71		F	#		
Uranium	mg/L	12/09/2015	N001	121	-	136	0.019		F	#	0.000029	
Vanadium	mg/L	12/09/2015	N001	121	-	136	0.066		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0662 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	N001	37.5	-	67.5	0.1	U	F	#	0.1	
Chloride	mg/L	12/09/2015	N001	37.5	-	67.5	7.6		F	#	0.4	
Dissolved Oxygen	mg/L	12/09/2015	N001	37.5	-	67.5	5.09		F	#		
Field Ferrous Iron	mg/L	12/09/2015	N001	37.5	-	67.5	0.02		F	#		
Field Total Iron	mg/L	12/09/2015	N001	37.5	-	67.5	0.36		F	#		
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N001	37.5	-	67.5	3.7		F	#	0.05	
Oxidation Reduction Potential	mV	12/09/2015	N001	37.5	-	67.5	125.2		F	#		
pH	s.u.	12/09/2015	N001	37.5	-	67.5	7.49		F	#		
Specific Conductance	umhos /cm	12/09/2015	N001	37.5	-	67.5	632		F	#		
Sulfate	mg/L	12/09/2015	N001	37.5	-	67.5	130		F	#	1	
Sulfide	mg/L	12/09/2015	N001	37.5	-	67.5	2	U	F	#	2	
Temperature	C	12/09/2015	N001	37.5	-	67.5	15.38		F	#		
Turbidity	NTU	12/09/2015	N001	37.5	-	67.5	9.96		F	#		
Uranium	mg/L	12/09/2015	N001	37.5	-	67.5	0.39		F	#	0.000029	
Vanadium	mg/L	12/09/2015	N001	37.5	-	67.5	0.029		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0669 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	34	-	54	3.6		F	#	1	
Chloride	mg/L	12/08/2015	N001	34	-	54	8.4		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	34	-	54	6.4		F	#	0.2	
Oxidation Reduction Potential	mV	12/08/2015	N001	34	-	54	108.7		F	#		
pH	s.u.	12/08/2015	N001	34	-	54	7.53		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	34	-	54	609		F	#		
Sulfate	mg/L	12/08/2015	N001	34	-	54	92		F	#	1	
Temperature	C	12/08/2015	N001	34	-	54	16.77		F	#		
Turbidity	NTU	12/08/2015	N001	34	-	54	0.49		F	#		
Uranium	mg/L	12/08/2015	N001	34	-	54	0.006		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	34	-	54	0.056		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0699 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	0001	-	0.1	U	F	#	0.1	
Chloride	mg/L	12/09/2015	0001	-	5.2		F	#	0.2	
Dissolved Oxygen	mg/L	12/09/2015	N001	-	5.33		F	#		
Field Ferrous Iron	mg/L	12/09/2015	N001	-	0.02		F	#		
Field Total Iron	mg/L	12/09/2015	N001	-	0.09		F	#		
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	0001	-	1.4		F	#	0.05	
Oxidation Reduction Potential	mV	12/09/2015	N001	-	48.2		F	#		
pH	s.u.	12/09/2015	N001	-	7.53		F	#		
Specific Conductance	umhos /cm	12/09/2015	N001	-	472		F	#		
Sulfate	mg/L	12/09/2015	0001	-	59		F	#	0.5	
Sulfide	mg/L	12/09/2015	0001	-	2	U	F	#	2	
Temperature	C	12/09/2015	N001	-	13.9		F	#		
Turbidity	NTU	12/09/2015	N001	-	347		F	#		
Uranium	mg/L	12/09/2015	0001	-	0.42		F	#	0.000029	
Vanadium	mg/L	12/09/2015	0001	-	0.032		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0700 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	0001	-	0.2			#	0.1	
Chloride	mg/L	12/09/2015	0001	-	6			#	0.2	
Field Ferrous Iron	mg/L	12/09/2015	N001	-	0.03			#		
Field Total Iron	mg/L	12/09/2015	N001	-	0.07			#		
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	0001	-	1.9			#	0.05	
Oxidation Reduction Potential	mV	12/09/2015	N001	-	66.7			#		
pH	s.u.	12/09/2015	N001	-	7.64			#		
Specific Conductance	umhos/cm	12/09/2015	N001	-	506			#		
Sulfate	mg/L	12/09/2015	0001	-	73			#	0.5	
Sulfide	mg/L	12/09/2015	0001	-	2	U		#	2	
Temperature	C	12/09/2015	N001	-	11.85			#		
Turbidity	NTU	12/09/2015	N001	-	78.6			#		
Uranium	mg/L	12/09/2015	0001	-	0.6			#	0.000029	
Vanadium	mg/L	12/09/2015	0001	-	0.029			#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0701 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	0001	-	0.1	U		#	0.1	
Chloride	mg/L	12/09/2015	0001	-	5.4			#	0.4	
Field Ferrous Iron	mg/L	12/09/2015	N001	-	0.02			#		
Field Total Iron	mg/L	12/09/2015	N001	-	0.04			#		
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	0001	-	2			#	0.05	
Oxidation Reduction Potential	mV	12/09/2015	N001	-	35.2			#		
pH	s.u.	12/09/2015	N001	-	7.69			#		
Specific Conductance	umhos /cm	12/09/2015	N001	-	572			#		
Sulfate	mg/L	12/09/2015	0001	-	72			#	1	
Sulfide	mg/L	12/09/2015	0001	-	2	U		#	2	
Temperature	C	12/09/2015	N001	-	8.82			#		
Turbidity	NTU	12/09/2015	N001	-	78.6			#		
Uranium	mg/L	12/09/2015	0001	-	0.52			#	0.000029	
Vanadium	mg/L	12/09/2015	0001	-	0.02			#	0.00015	



Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0702 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	0001	-	0.1	U		#	0.1	
Chloride	mg/L	12/09/2015	0001	-	4.8			#	0.2	
Field Ferrous Iron	mg/L	12/09/2015	N001	-	0.06			#		
Field Total Iron	mg/L	12/09/2015	N001	-	0.15			#		
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	0001	-	0.025			#	0.01	
Oxidation Reduction Potential	mV	12/09/2015	N001	-	26			#		
pH	s.u.	12/09/2015	N001	-	7.79			#		
Specific Conductance	umhos /cm	12/09/2015	N001	-	698			#		
Sulfate	mg/L	12/09/2015	0001	-	45			#	0.5	
Sulfide	mg/L	12/09/2015	0001	-	2	U		#	2	
Temperature	C	12/09/2015	N001	-	10.06			#		
Turbidity	NTU	12/09/2015	N001	-	1000	>		#		
Uranium	mg/L	12/09/2015	0001	-	0.43			#	0.000029	
Vanadium	mg/L	12/09/2015	0001	-	0.0053			#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0703 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	0001	-	0.1	U	F	#	0.1	
Chloride	mg/L	12/09/2015	0001	-	5.5		F	#	0.2	
Dissolved Oxygen	mg/L	12/09/2015	N001	-	4.98		F	#		
Field Ferrous Iron	mg/L	12/09/2015	N001	-	0.06		F	#		
Field Total Iron	mg/L	12/09/2015	N001	-	0.07		F	#		
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	0001	-	2		F	#	0.05	
Oxidation Reduction Potential	mV	12/09/2015	N001	-	76.6		F	#		
pH	s.u.	12/09/2015	N001	-	7.48		F	#		
Specific Conductance	umhos /cm	12/09/2015	N001	-	514		F	#		
Sulfate	mg/L	12/09/2015	0001	-	75		F	#	0.5	
Sulfide	mg/L	12/09/2015	0001	-	2	U	F	#	2	
Temperature	C	12/09/2015	N001	-	13.48		F	#		
Turbidity	NTU	12/09/2015	N001	-	38.6		F	#		
Uranium	mg/L	12/09/2015	0001	-	0.55		F	#	0.000029	
Vanadium	mg/L	12/09/2015	0001	-	0.033		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0704 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	N001	-	0.1	U	F	#	0.1	
Chloride	mg/L	12/09/2015	N001	-	5.8		F	#	0.2	
Dissolved Oxygen	mg/L	12/09/2015	N001	-	4.07		F	#		
Field Ferrous Iron	mg/L	12/09/2015	N001	-	0.03		F	#		
Field Total Iron	mg/L	12/09/2015	N001	-	0.07		F	#		
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N001	-	1.5		F	#	0.05	
Oxidation Reduction Potential	mV	12/09/2015	N001	-	88.4		F	#		
pH	s.u.	12/09/2015	N001	-	7.43		F	#		
Specific Conductance	umhos /cm	12/09/2015	N001	-	503		F	#		
Sulfate	mg/L	12/09/2015	N001	-	70		F	#	0.5	
Sulfide	mg/L	12/09/2015	N001	-	2	U	F	#	2	
Temperature	C	12/09/2015	N001	-	13.62		F	#		
Turbidity	NTU	12/09/2015	N001	-	8.88		F	#		
Uranium	mg/L	12/09/2015	N001	-	0.56		F	#	0.000029	
Vanadium	mg/L	12/09/2015	N001	-	0.044		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0711 WELL

Parameter	Units	Sample	ID	Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date		(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	12/08/2015	N001	25.5	-	30.5	0.1	U	F	#	0.1	
Chloride	mg/L	12/08/2015	N001	25.5	-	30.5	16	N	F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	25.5	-	30.5	0.55		F	#	0.01	
Oxidation Reduction Potential	mV	12/08/2015	N001	25.5	-	30.5	5.9		F	#		
pH	s.u.	12/08/2015	N001	25.5	-	30.5	7.82		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	25.5	-	30.5	674		F	#		
Sulfate	mg/L	12/08/2015	N001	25.5	-	30.5	120		F	#	1	
Temperature	C	12/08/2015	N001	25.5	-	30.5	15.48		F	#		
Turbidity	NTU	12/08/2015	N001	25.5	-	30.5	4.9		F	#		
Uranium	mg/L	12/08/2015	N001	25.5	-	30.5	0.0043		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	25.5	-	30.5	0.0016	J	UF	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0715 WELL

Parameter	Units	Sample	ID	Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date		(Ft BLS)				Lab	Data	QA		
Ammonia Total as N	mg/L	12/08/2015	N001	16	-	21	0.1	U	F	#	0.1	
Chloride	mg/L	12/08/2015	N001	16	-	21	11		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	16	-	21	0.71		F	#	0.01	
Oxidation Reduction Potential	mV	12/08/2015	N001	16	-	21	84.8		F	#		
pH	s.u.	12/08/2015	N001	16	-	21	7.86		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	16	-	21	524		F	#		
Sulfate	mg/L	12/08/2015	N001	16	-	21	74		F	#	0.5	
Temperature	C	12/08/2015	N001	16	-	21	16.05		F	#		
Turbidity	NTU	12/08/2015	N001	16	-	21	2.93		F	#		
Uranium	mg/L	12/08/2015	N001	16	-	21	0.0028		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	16	-	21	0.0012	J	UF	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0719 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Data QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	19.35 - 24.35	0.1	U	F #	0.1	
Chloride	mg/L	12/08/2015	N001	19.35 - 24.35	16		F #	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	19.35 - 24.35	0.7		F #	0.01	
Oxidation Reduction Potential	mV	12/08/2015	N001	19.35 - 24.35	82.8		F #		
pH	s.u.	12/08/2015	N001	19.35 - 24.35	7.76		F #		
Specific Conductance	umhos /cm	12/08/2015	N001	19.35 - 24.35	690		F #		
Sulfate	mg/L	12/08/2015	N001	19.35 - 24.35	120		F #	1	
Temperature	C	12/08/2015	N001	19.35 - 24.35	15.3		F #		
Turbidity	NTU	12/08/2015	N001	19.35 - 24.35	5.94		F #		
Uranium	mg/L	12/08/2015	N001	19.35 - 24.35	0.0037		F #	0.000029	
Vanadium	mg/L	12/08/2015	N001	19.35 - 24.35	0.0049		F #	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0727 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	23.73 - 28.78	0.1	U	F	#	0.1	
Chloride	mg/L	12/08/2015	N001	23.73 - 28.78	11		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	23.73 - 28.78	0.74		F	#	0.01	
Oxidation Reduction Potential	mV	12/08/2015	N001	23.73 - 28.78	153.7		F	#		
pH	s.u.	12/08/2015	N001	23.73 - 28.78	7.83		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	23.73 - 28.78	554		F	#		
Sulfate	mg/L	12/08/2015	N001	23.73 - 28.78	87		F	#	1	
Temperature	C	12/08/2015	N001	23.73 - 28.78	15.24		F	#		
Turbidity	NTU	12/08/2015	N001	23.73 - 28.78	9.26		F	#		
Uranium	mg/L	12/08/2015	N001	23.73 - 28.78	0.002		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	23.73 - 28.78	0.0033		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0733 WELL

Parameter	Units	Sample	ID	Depth Range			Result	Lab	Qualifiers		Detection Limit	Uncertainty
		Date		(Ft BLS)					Data	QA		
Ammonia Total as N	mg/L	12/10/2015	0001	49	-	54	0.11		F	#	0.1	
Chloride	mg/L	12/10/2015	0001	49	-	54	6.7		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/10/2015	0001	49	-	54	4.4		F	#	0.05	
Oxidation Reduction Potential	mV	12/10/2015	N001	49	-	54	146.4		F	#		
pH	s.u.	12/10/2015	N001	49	-	54	7.78		F	#		
Specific Conductance	umhos /cm	12/10/2015	N001	49	-	54	559		F	#		
Sulfate	mg/L	12/10/2015	0001	49	-	54	93		F	#	1	
Temperature	C	12/10/2015	N001	49	-	54	13.92		F	#		
Turbidity	NTU	12/10/2015	N001	49	-	54	35.5		F	#		
Uranium	mg/L	12/10/2015	0001	49	-	54	0.0055		F	#	0.000029	
Vanadium	mg/L	12/10/2015	0001	49	-	54	0.051		F	#	0.00015	



Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0734 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/10/2015	0001	50	-	80	0.1	U	F	#	0.1	
Chloride	mg/L	12/10/2015	0001	50	-	80	6		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	12/10/2015	0001	50	-	80	2.4		F	#	0.05	
Oxidation Reduction Potential	mV	12/10/2015	N001	50	-	80	174.1		F	#		
pH	s.u.	12/10/2015	N001	50	-	80	7.86		F	#		
Specific Conductance	umhos /cm	12/10/2015	N001	50	-	80	484		F	#		
Sulfate	mg/L	12/10/2015	0001	50	-	80	70		F	#	0.5	
Temperature	C	12/10/2015	N001	50	-	80	13.71		F	#		
Turbidity	NTU	12/10/2015	N001	50	-	80	26.7		F	#		
Uranium	mg/L	12/10/2015	0001	50	-	80	0.14		F	#	0.000029	
Vanadium	mg/L	12/10/2015	0001	50	-	80	0.022		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0735 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/10/2015	0001	53.5 - 58.5	0.36		F	#	0.1	
Chloride	mg/L	12/10/2015	0001	53.5 - 58.5	3.3		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/10/2015	0001	53.5 - 58.5	4.7		F	#	0.1	
Oxidation Reduction Potential	mV	12/10/2015	N001	53.5 - 58.5	164.6		F	#		
pH	s.u.	12/10/2015	N001	53.5 - 58.5	7.61		F	#		
Specific Conductance	umhos /cm	12/10/2015	N001	53.5 - 58.5	616		F	#		
Sulfate	mg/L	12/10/2015	0001	53.5 - 58.5	160		F	#	1	
Temperature	C	12/10/2015	N001	53.5 - 58.5	14.91		F	#		
Turbidity	NTU	12/10/2015	N001	53.5 - 58.5	31.2		F	#		
Uranium	mg/L	12/10/2015	0001	53.5 - 58.5	0.19		F	#	0.000029	
Vanadium	mg/L	12/10/2015	0001	53.5 - 58.5	0.03		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0738 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	26	-	31	0.1	U	F	#	0.1	
Chloride	mg/L	12/08/2015	N001	26	-	31	15		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	26	-	31	0.012		F	#	0.01	
Oxidation Reduction Potential	mV	12/08/2015	N001	26	-	31	-76.7		F	#		
pH	s.u.	12/08/2015	N001	26	-	31	8.37		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	26	-	31	718		F	#		
Sulfate	mg/L	12/08/2015	N001	26	-	31	160		F	#	1	
Temperature	C	12/08/2015	N001	26	-	31	16.05		F	#		
Turbidity	NTU	12/08/2015	N001	26	-	31	9.96		F	#		
Uranium	mg/L	12/08/2015	N001	26	-	31	0.00036		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	26	-	31	0.00087	J	UF	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0739 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	33	-	38	0.92		F	#	0.1	
Chloride	mg/L	12/08/2015	N001	33	-	38	16		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	33	-	38	0.81		F	#	0.01	
Oxidation Reduction Potential	mV	12/08/2015	N001	33	-	38	-42.2		F	#		
pH	s.u.	12/08/2015	N001	33	-	38	8.19		F	#		
Specific Conductance	umhos/cm	12/08/2015	N001	33	-	38	742		F	#		
Sulfate	mg/L	12/08/2015	N001	33	-	38	150		F	#	1	
Temperature	C	12/08/2015	N001	33	-	38	15.83		F	#		
Turbidity	NTU	12/08/2015	N001	33	-	38	6.31		F	#		
Uranium	mg/L	12/08/2015	N001	33	-	38	0.0037		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	33	-	38	0.01		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0740 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	30	-	35	0.1	U	F	#	0.1	
Ammonia Total as N	mg/L	12/08/2015	N002	30	-	35	0.1	U	F	#	0.1	
Chloride	mg/L	12/08/2015	N001	30	-	35	44		F	#	4	
Chloride	mg/L	12/08/2015	N002	30	-	35	42		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	30	-	35	19		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N002	30	-	35	18		F	#	0.2	
Oxidation Reduction Potential	mV	12/08/2015	N001	30	-	35	97		F	#		
pH	s.u.	12/08/2015	N001	30	-	35	7.52		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	30	-	35	2919		F	#		
Sulfate	mg/L	12/08/2015	N001	30	-	35	1600		F	#	10	
Sulfate	mg/L	12/08/2015	N002	30	-	35	1500		F	#	10	
Temperature	C	12/08/2015	N001	30	-	35	16.08		F	#		
Turbidity	NTU	12/08/2015	N001	30	-	35	3.86		F	#		
Uranium	mg/L	12/08/2015	N001	30	-	35	0.063		F	#	0.000029	
Uranium	mg/L	12/08/2015	N002	30	-	35	0.07		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	30	-	35	0.02		F	#	0.00015	
Vanadium	mg/L	12/08/2015	N002	30	-	35	0.023		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0741 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	0001	50	-	80	110		F	#	20	
Chloride	mg/L	12/08/2015	0001	50	-	80	32		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	0001	50	-	80	100		F	#	1	
Oxidation Reduction Potential	mV	12/08/2015	N001	50	-	80	103.5		F	#		
pH	s.u.	12/08/2015	N001	50	-	80	7.41		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	50	-	80	2308		F	#		
Sulfate	mg/L	12/08/2015	0001	50	-	80	490		F	#	5	
Temperature	C	12/08/2015	N001	50	-	80	15.6		F	#		
Turbidity	NTU	12/08/2015	N001	50	-	80	1000	>	F	#		
Uranium	mg/L	12/08/2015	0001	50	-	80	0.011		F	#	0.000029	
Vanadium	mg/L	12/08/2015	0001	50	-	80	0.0072		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0742 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	50	-	80	110		F	#	20	
Chloride	mg/L	12/08/2015	N001	50	-	80	31		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	50	-	80	110		F	#	1	
Oxidation Reduction Potential	mV	12/08/2015	N001	50	-	80	113.5		F	#		
pH	s.u.	12/08/2015	N001	50	-	80	7.36		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	50	-	80	2347		F	#		
Sulfate	mg/L	12/08/2015	N001	50	-	80	490		F	#	5	
Temperature	C	12/08/2015	N001	50	-	80	15.87		F	#		
Turbidity	NTU	12/08/2015	N001	50	-	80	7.01		F	#		
Uranium	mg/L	12/08/2015	N001	50	-	80	0.0092		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	50	-	80	0.01		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0743 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	45	-	75	91		F	#	20	
Chloride	mg/L	12/08/2015	N001	45	-	75	30		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	45	-	75	94		F	#	1	
Oxidation Reduction Potential	mV	12/08/2015	N001	45	-	75	59.8		F	#		
pH	s.u.	12/08/2015	N001	45	-	75	7.46		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	45	-	75	2214		F	#		
Sulfate	mg/L	12/08/2015	N001	45	-	75	500		F	#	5	
Temperature	C	12/08/2015	N001	45	-	75	15.11		F	#		
Turbidity	NTU	12/08/2015	N001	45	-	75	6.17		F	#		
Uranium	mg/L	12/08/2015	N001	45	-	75	0.00023		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	45	-	75	0.00087	J	UF	#	0.00015	



Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0744 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	0001	31	-	61	110		F	#	20	
Chloride	mg/L	12/08/2015	0001	31	-	61	32		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	0001	31	-	61	130		F	#	1	
Oxidation Reduction Potential	mV	12/08/2015	N001	31	-	61	108.2		F	#		
pH	s.u.	12/08/2015	N001	31	-	61	7.32		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	31	-	61	2376		F	#		
Sulfate	mg/L	12/08/2015	0001	31	-	61	410		F	#	5	
Temperature	C	12/08/2015	N001	31	-	61	16.4		F	#		
Turbidity	NTU	12/08/2015	N001	31	-	61	86.1		F	#		
Uranium	mg/L	12/08/2015	0001	31	-	61	0.0084		F	#	0.000029	
Vanadium	mg/L	12/08/2015	0001	31	-	61	0.0074		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0760 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	0001	55	-	75	0.16		F	#	0.1	
Chloride	mg/L	12/08/2015	0001	55	-	75	11		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	0001	55	-	75	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	12/08/2015	N001	55	-	75	-139.5		F	#		
pH	s.u.	12/08/2015	N001	55	-	75	8.41		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	55	-	75	518		F	#		
Sulfate	mg/L	12/08/2015	0001	55	-	75	90		F	#	1	
Temperature	C	12/08/2015	N001	55	-	75	16.41		F	#		
Turbidity	NTU	12/08/2015	N001	55	-	75	33.3		F	#		
Uranium	mg/L	12/08/2015	0001	55	-	75	0.013		F	#	0.000029	
Vanadium	mg/L	12/08/2015	0001	55	-	75	0.0036		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0761 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	39	-	49	0.23		F	#	0.1	
Chloride	mg/L	12/08/2015	N001	39	-	49	14		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	39	-	49	32		F	#	0.5	
Oxidation Reduction Potential	mV	12/08/2015	N001	39	-	49	81.7		F	#		
pH	s.u.	12/08/2015	N001	39	-	49	7.48		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	39	-	49	1296		F	#		
Sulfate	mg/L	12/08/2015	N001	39	-	49	390		F	#	2.5	
Temperature	C	12/08/2015	N001	39	-	49	15.66		F	#		
Turbidity	NTU	12/08/2015	N001	39	-	49	2.28		F	#		
Uranium	mg/L	12/08/2015	N001	39	-	49	0.034		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	39	-	49	0.0022	J	UF	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0762 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data QA		Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	29	-	49	0.1	U	F	#	0.1	
Chloride	mg/L	12/08/2015	N001	29	-	49	74		F	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	29	-	49	100		F	#	1	
Oxidation Reduction Potential	mV	12/08/2015	N001	29	-	49	109.2		F	#		
pH	s.u.	12/08/2015	N001	29	-	49	7.63		F	#		
Specific Conductance	umhos/cm	12/08/2015	N001	29	-	49	3584		F	#		
Sulfate	mg/L	12/08/2015	N001	29	-	49	1600		F	#	10	
Temperature	C	12/08/2015	N001	29	-	49	15.47		F	#		
Turbidity	NTU	12/08/2015	N001	29	-	49	9.96		F	#		
Uranium	mg/L	12/08/2015	N001	29	-	49	0.013		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	29	-	49	0.0088		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0764 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	0001	47	-	52	0.1	U	FQ	#	0.1	
Chloride	mg/L	12/09/2015	0001	47	-	52	11		FQ	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	0001	47	-	52	34		FQ	#	2	
Oxidation Reduction Potential	mV	12/09/2015	N001	47	-	52	204		FQ	#		
pH	s.u.	12/09/2015	N001	47	-	52	7.89		FQ	#		
Specific Conductance	umhos /cm	12/09/2015	N001	47	-	52	997		FQ	#		
Sulfate	mg/L	12/09/2015	0001	47	-	52	200		FQ	#	2.5	
Temperature	C	12/09/2015	N001	47	-	52	11.51		FQ	#		
Turbidity	NTU	12/09/2015	N001	47	-	52	16.9		FQ	#		
Uranium	mg/L	12/09/2015	0001	47	-	52	0.01		FQ	#	0.000029	
Vanadium	mg/L	12/09/2015	0001	47	-	52	0.021		FQ	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0765 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	58.6	-	88.7	80		F	#	5	
Chloride	mg/L	12/08/2015	N001	58.6	-	88.7	30		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	58.6	-	88.7	56		F	#	0.5	
Oxidation Reduction Potential	mV	12/08/2015	N001	58.6	-	88.7	0.7		F	#		
pH	s.u.	12/08/2015	N001	58.6	-	88.7	7.27		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	58.6	-	88.7	2020		F	#		
Sulfate	mg/L	12/08/2015	N001	58.6	-	88.7	520		F	#	5	
Temperature	C	12/08/2015	N001	58.6	-	88.7	14.83		F	#		
Turbidity	NTU	12/08/2015	N001	58.6	-	88.7	2.99		F	#		
Uranium	mg/L	12/08/2015	N001	58.6	-	88.7	0.0098		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	58.6	-	88.7	0.0037		UF	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0766 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	47.2 - 57.2	120		F	#	20	
Chloride	mg/L	12/08/2015	N001	47.2 - 57.2	24		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	47.2 - 57.2	110		F	#	1	
Oxidation Reduction Potential	mV	12/08/2015	N001	47.2 - 57.2	106.2		F	#		
pH	s.u.	12/08/2015	N001	47.2 - 57.2	7.48		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	47.2 - 57.2	2195		F	#		
Sulfate	mg/L	12/08/2015	N001	47.2 - 57.2	360		F	#	2.5	
Temperature	C	12/08/2015	N001	47.2 - 57.2	15.76		F	#		
Turbidity	NTU	12/08/2015	N001	47.2 - 57.2	2.98		F	#		
Uranium	mg/L	12/08/2015	N001	47.2 - 57.2	0.0098		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	47.2 - 57.2	0.0058		UF	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0767 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	N001	43.5 - 63.5	0.21		F	#	0.1	
Chloride	mg/L	12/09/2015	N001	43.5 - 63.5	6		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N001	43.5 - 63.5	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	12/09/2015	N001	43.5 - 63.5	-118		F	#		
pH	s.u.	12/09/2015	N001	43.5 - 63.5	8.14		F	#		
Specific Conductance	umhos /cm	12/09/2015	N001	43.5 - 63.5	404		F	#		
Sulfate	mg/L	12/09/2015	N001	43.5 - 63.5	33		F	#	0.5	
Temperature	C	12/09/2015	N001	43.5 - 63.5	15.55		F	#		
Turbidity	NTU	12/09/2015	N001	43.5 - 63.5	1.6		F	#		
Uranium	mg/L	12/09/2015	N001	43.5 - 63.5	0.00071		F	#	0.000029	
Vanadium	mg/L	12/09/2015	N001	43.5 - 63.5	0.001	J	UF	#	0.00015	



Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0768 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	N001	24.4	-	44.4	0.62		F	#	0.1	
Chloride	mg/L	12/09/2015	N001	24.4	-	44.4	37		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N001	24.4	-	44.4	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	12/09/2015	N001	24.4	-	44.4	-267.9		F	#		
pH	s.u.	12/09/2015	N001	24.4	-	44.4	8.31		F	#		
Specific Conductance	umhos /cm	12/09/2015	N001	24.4	-	44.4	730		F	#		
Sulfate	mg/L	12/09/2015	N001	24.4	-	44.4	180		F	#	2.5	
Temperature	C	12/09/2015	N001	24.4	-	44.4	14.82		F	#		
Turbidity	NTU	12/09/2015	N001	24.4	-	44.4	8.84		F	#		
Uranium	mg/L	12/09/2015	N001	24.4	-	44.4	0.00069		F	#	0.000029	
Vanadium	mg/L	12/09/2015	N001	24.4	-	44.4	0.0014	J	UF	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0770 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	N001	54.9 - 64.9	31		F	#	2.5	
Chloride	mg/L	12/09/2015	N001	54.9 - 64.9	16		F	#	1	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N001	54.9 - 64.9	19		F	#	0.2	
Oxidation Reduction Potential	mV	12/09/2015	N001	54.9 - 64.9	103.6		F	#		
pH	s.u.	12/09/2015	N001	54.9 - 64.9	7.7		F	#		
Specific Conductance	umhos/cm	12/09/2015	N001	54.9 - 64.9	987		F	#		
Sulfate	mg/L	12/09/2015	N001	54.9 - 64.9	190		F	#	2.5	
Temperature	C	12/09/2015	N001	54.9 - 64.9	15.21		F	#		
Turbidity	NTU	12/09/2015	N001	54.9 - 64.9	3		F	#		
Uranium	mg/L	12/09/2015	N001	54.9 - 64.9	0.0057		F	#	0.000029	
Vanadium	mg/L	12/09/2015	N001	54.9 - 64.9	0.0015	J	UF	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0771 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	57.4	-	77.4	210		FQ	#	20	
Chloride	mg/L	12/08/2015	N001	57.4	-	77.4	22		FQ	#	4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	57.4	-	77.4	180		FQ	#	2	
Oxidation Reduction Potential	mV	12/08/2015	N001	57.4	-	77.4	128.4		FQ	#		
pH	s.u.	12/08/2015	N001	57.4	-	77.4	7.22		FQ	#		
Specific Conductance	umhos /cm	12/08/2015	N001	57.4	-	77.4	4005		FQ	#		
Sulfate	mg/L	12/08/2015	N001	57.4	-	77.4	1300		FQ	#	10	
Temperature	C	12/08/2015	N001	57.4	-	77.4	16.34		FQ	#		
Turbidity	NTU	12/08/2015	N001	57.4	-	77.4	2.37		FQ	#		
Uranium	mg/L	12/08/2015	N001	57.4	-	77.4	0.015		FQ	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	57.4	-	77.4	0.0088		FQ	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0772 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	7.4	-	27.4	1.6		F	#	0.1	
Chloride	mg/L	12/08/2015	N001	7.4	-	27.4	83		F	#	2	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	7.4	-	27.4	130		F	#	1	
Oxidation Reduction Potential	mV	12/08/2015	N001	7.4	-	27.4	61.4		F	#		
pH	s.u.	12/08/2015	N001	7.4	-	27.4	7.45		F	#		
Specific Conductance	umhos/cm	12/08/2015	N001	7.4	-	27.4	3313		F	#		
Sulfate	mg/L	12/08/2015	N001	7.4	-	27.4	930		F	#	5	
Temperature	C	12/08/2015	N001	7.4	-	27.4	15.68		F	#		
Turbidity	NTU	12/08/2015	N001	7.4	-	27.4	1.81		F	#		
Uranium	mg/L	12/08/2015	N001	7.4	-	27.4	0.049		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	7.4	-	27.4	0.25		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0774 WELL-

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	45	-	55	0.21		F	#	0.1	
Chloride	mg/L	12/08/2015	N001	45	-	55	5.7		F	#	0.4	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	45	-	55	3.4		F	#	0.1	
Oxidation Reduction Potential	mV	12/08/2015	N001	45	-	55	75.2		F	#		
pH	s.u.	12/08/2015	N001	45	-	55	7.64		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	45	-	55	495		F	#		
Sulfate	mg/L	12/08/2015	N001	45	-	55	91		F	#	1	
Temperature	C	12/08/2015	N001	45	-	55	16.2		F	#		
Turbidity	NTU	12/08/2015	N001	45	-	55	1.44		F	#		
Uranium	mg/L	12/08/2015	N001	45	-	55	0.046		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	45	-	55	0.021		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0775 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/09/2015	N001	142 - 167	0.1	U	F	#	0.1	
Chloride	mg/L	12/09/2015	N001	142 - 167	6		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	12/09/2015	N001	142 - 167	0.53		F	#	0.01	
Oxidation Reduction Potential	mV	12/09/2015	N001	142 - 167	66.6		F	#		
pH	s.u.	12/09/2015	N001	142 - 167	7.98		F	#		
Specific Conductance	umhos /cm	12/09/2015	N001	142 - 167	388		F	#		
Sulfate	mg/L	12/09/2015	N001	142 - 167	25		F	#	0.5	
Temperature	C	12/09/2015	N001	142 - 167	14.84		F	#		
Turbidity	NTU	12/09/2015	N001	142 - 167	5		F	#		
Uranium	mg/L	12/09/2015	N001	142 - 167	0.0034		F	#	0.000029	
Vanadium	mg/L	12/09/2015	N001	142 - 167	0.0014	J	UF	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0776 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/08/2015	N001	99.5 - 149.5	0.24		F	#	0.1	
Chloride	mg/L	12/08/2015	N001	99.5 - 149.5	6.1		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	99.5 - 149.5	1.3		F	#	0.01	
Oxidation Reduction Potential	mV	12/08/2015	N001	99.5 - 149.5	67.3		F	#		
pH	s.u.	12/08/2015	N001	99.5 - 149.5	7.8		F	#		
Specific Conductance	umhos /cm	12/08/2015	N001	99.5 - 149.5	414		F	#		
Sulfate	mg/L	12/08/2015	N001	99.5 - 149.5	45		F	#	0.5	
Temperature	C	12/08/2015	N001	99.5 - 149.5	16.37		F	#		
Turbidity	NTU	12/08/2015	N001	99.5 - 149.5	0.82		F	#		
Uranium	mg/L	12/08/2015	N001	99.5 - 149.5	0.014		F	#	0.000029	
Vanadium	mg/L	12/08/2015	N001	99.5 - 149.5	0.017		F	#	0.00015	

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.



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## **Surface Water Quality Data**

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Surface Water Quality Data by Location (USEE102) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 02/26/2016

Location: 0623 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Ammonia Total as N	mg/L	12/08/2015	N001	0.1	U		#	0.1	
Chloride	mg/L	12/08/2015	N001	11			#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2015	N001	0.071			#	0.01	
Oxidation Reduction Potential	mV	12/08/2015	N001	95.8			#		
pH	s.u.	12/08/2015	N001	8.7			#		
Specific Conductance	umhos/cm	12/08/2015	N001	525			#		
Sulfate	mg/L	12/08/2015	N001	32			#	0.5	
Temperature	C	12/08/2015	N001	2.12			#		
Turbidity	NTU	12/08/2015	N001	9.65			#		
Uranium	mg/L	12/08/2015	N001	0.0011			#	0.000029	
Vanadium	mg/L	12/08/2015	N001	0.0021	J	J	#	0.00015	

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**

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STATIC WATER LEVELS (USEE700) FOR SITE MON01, Monument Valley Processing Site  
REPORT DATE: 02/26/2016

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0402	U	4840.3	12/09/2015	13:57:32	4.6	4835.7	
0602	U	4864.43	12/08/2015	09:50:03	9.29	4855.14	
0603	U	4849.41	12/08/2015	11:00:54	10.61	4838.8	
0604	C	4840.42	12/08/2015	11:15:09	8.7	4831.72	
0605	C	4835.07	12/09/2015	11:10:36	10.52	4824.55	
0606	D	4864.73	12/09/2015	15:45:58	35.52	4829.21	
0618	O	4924.81	12/09/2015	16:28:50	91.44	4833.37	
0619	O	4888.63	12/08/2015	13:55:06	56.29	4832.34	
0648	N	4835.14	12/09/2015	09:10:11	34.56	4800.58	
0650	D	4794.28	12/08/2015	10:35:56	19.97	4774.31	
0651	C	4787.88	12/08/2015	10:05:11	8.86	4779.02	
0652	C	4808.93	12/08/2015	09:40:37	19.14	4789.79	
0653	D	4837.08	12/09/2015	09:30:18	36.4	4800.68	
0655	D	4862.06	12/08/2015	14:25:14	39.93	4822.13	
0656	D	4856.33	12/09/2015	10:10:20	36.74	4819.59	
0657	O	4878.99	12/09/2015	17:15:34	49	4829.99	
0662	D	4878.56	12/09/2015	10:00:14	48.25	4830.31	
0669	D	4867.19	12/08/2015	15:00:39	49.61	4817.58	
0699	O	4876.09	12/09/2015	11:45:04	45.95	4830.14	
0700	O	4875.21	12/09/2015	16:45:44	45.1	4830.11	
0701	O	4875.45	12/09/2015	16:30:17	45.38	4830.07	
0702	O	4875.95	12/09/2015	16:00:47	45.85	4830.1	
0703	O	4875.85	12/09/2015	15:30:47	45.72	4830.13	
0704	O	4875.93	12/09/2015	13:40:08	45.56	4830.37	
0733	D	4875.16	12/10/2015	09:05:10	47.92	4827.24	
0734	D	4877.97	12/10/2015	08:25:28	49.37	4828.6	
0735	O	4881.85	12/10/2015	08:20:08	49.05	4832.8	
0738	D	4810.86	12/08/2015	15:40:24	16.49	4794.37	
0739	D	4823.58	12/08/2015	11:05:14	22.7	4800.88	



**STATIC WATER LEVELS (USEE700) FOR SITE MON01, Monument Valley Processing Site**  
**REPORT DATE: 02/26/2016**

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0740	D	4810.28	12/08/2015	11:30:01	27.03	4783.25	
0741	D	4846.98	12/08/2015	16:30:38	36.03	4810.95	
0742	D	4847.02	12/08/2015	15:55:33	36.23	4810.79	
0743	D	4846.92	12/08/2015	16:45:29	35.95	4810.97	
0744	D	4847.19	12/08/2015	15:30:10	36.15	4811.04	
0760	D	4814.8	12/08/2015	15:05:35	25.93	4788.87	
0761	D	4835.02	12/08/2015	16:15:39	43.51	4791.51	
0762	D	4820.74	12/08/2015	14:25:33	32.7	4788.04	
0764	D	4851.53	12/09/2015	08:25:36	49.97	4801.56	
0765	D	4848.45	12/08/2015	17:05:28	35.81	4812.64	
0766	D	4847.97	12/08/2015	16:15:31	36.41	4811.56	
0767	D	4808.25	12/09/2015	12:55:12	7.08	4801.17	
0768	D	4820.73	12/09/2015	12:30:53	14.7	4806.03	
0770	D	4857.26	12/09/2015	09:55:49	33.15	4824.11	
0771	D	4863.26	12/08/2015	14:40:24	41.68	4821.58	
0772	O	4847.6	12/08/2015	11:45:03	11.35	4836.25	
0774	O	4880.14	12/08/2015	12:25:22	48	4832.14	
0775	D	4879.68	12/09/2015	15:15:26	48.31	4831.37	
0776	O	4883.33	12/08/2015	13:30:05	51.91	4831.42	

FLOW CODES: B BACKGROUND  
N UNKNOWN

C CROSS GRADIENT  
O ONSITE

D DOWNGRADIENT  
U UPGRADIENT

F OFFSITE

WATER LEVEL FLAGS: D Dry

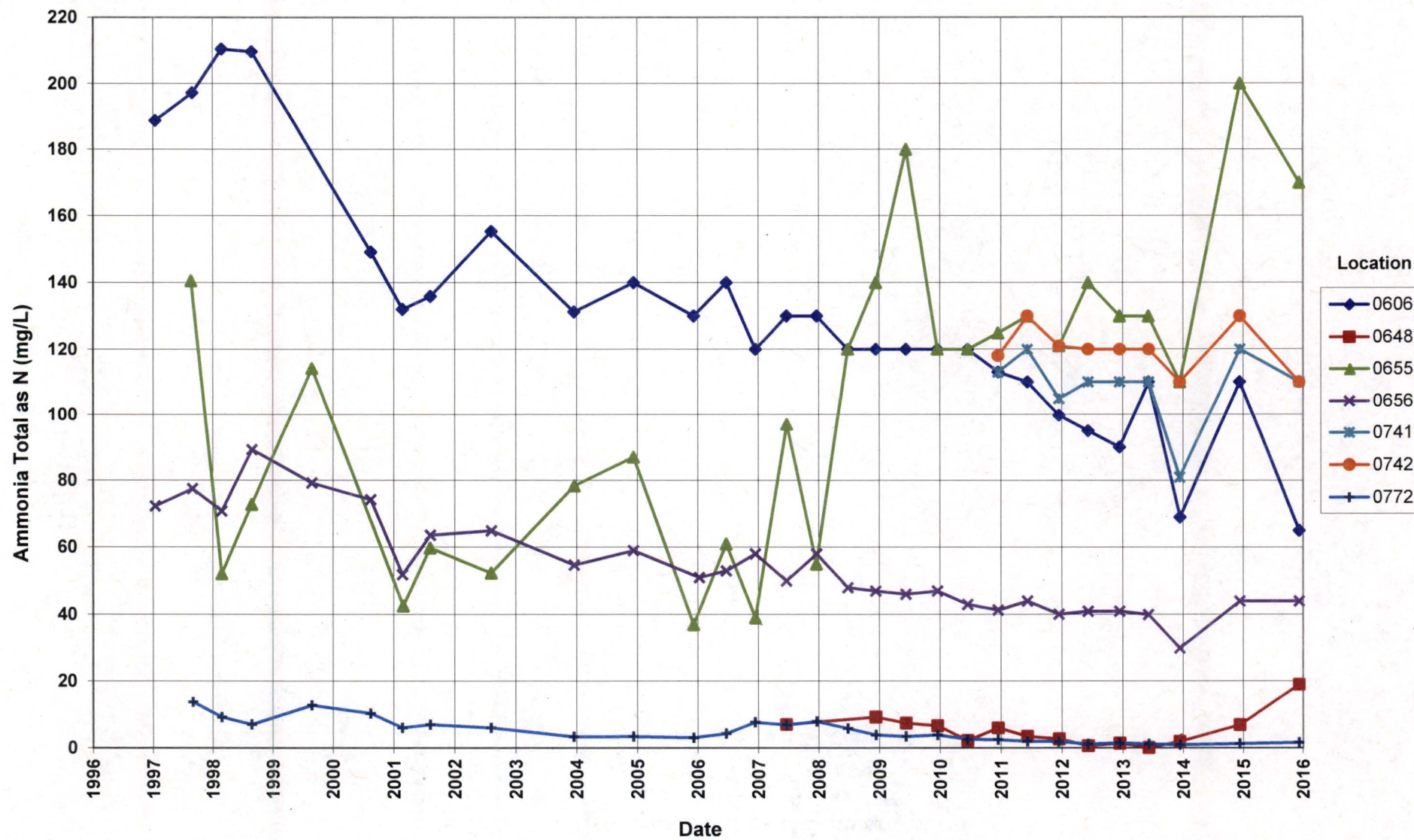
F Flowing

B Below top of pump

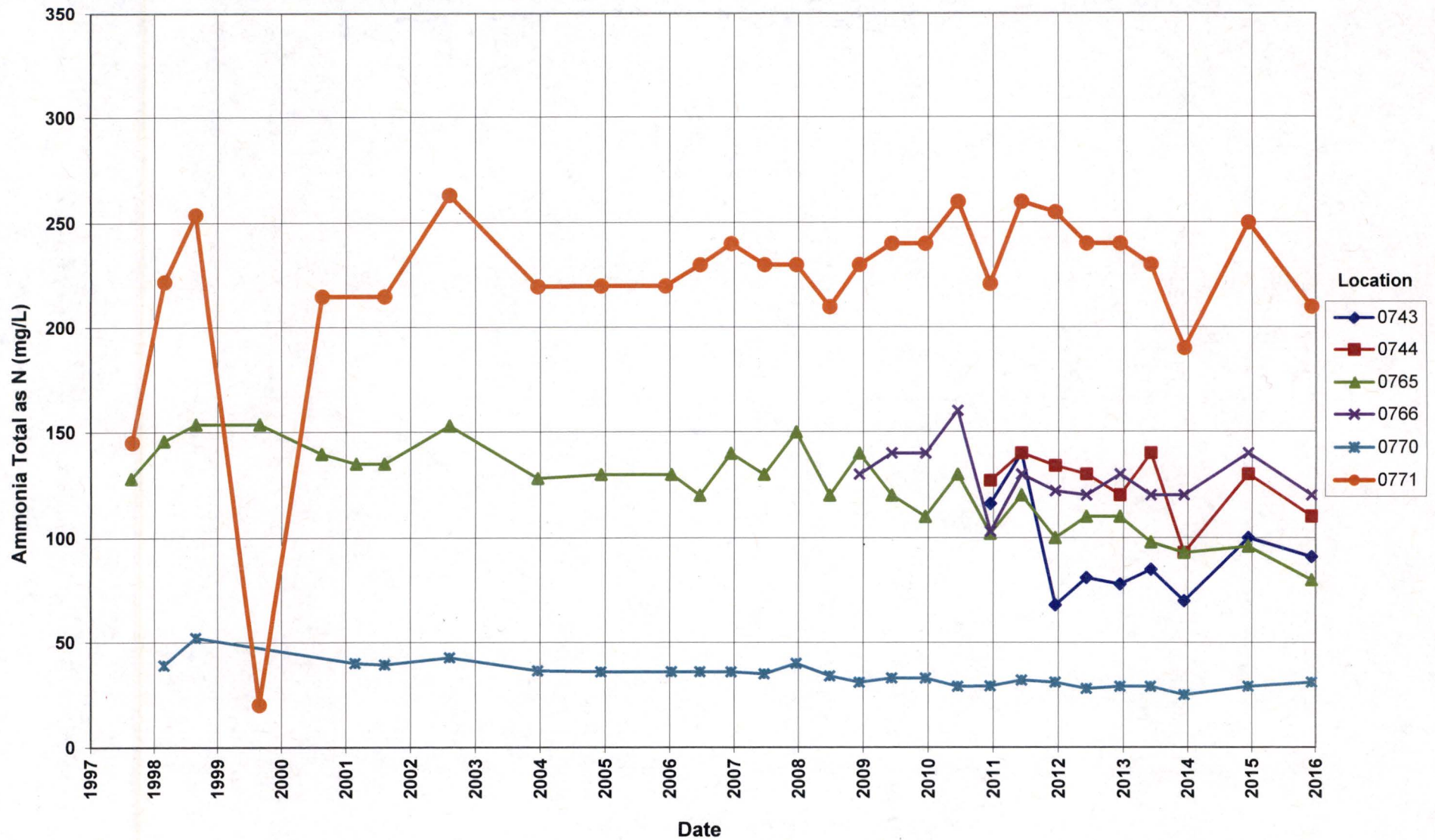
## **Time-Concentration Graphs**

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# Monument Valley Processing Site Ammonia Total as N Concentration

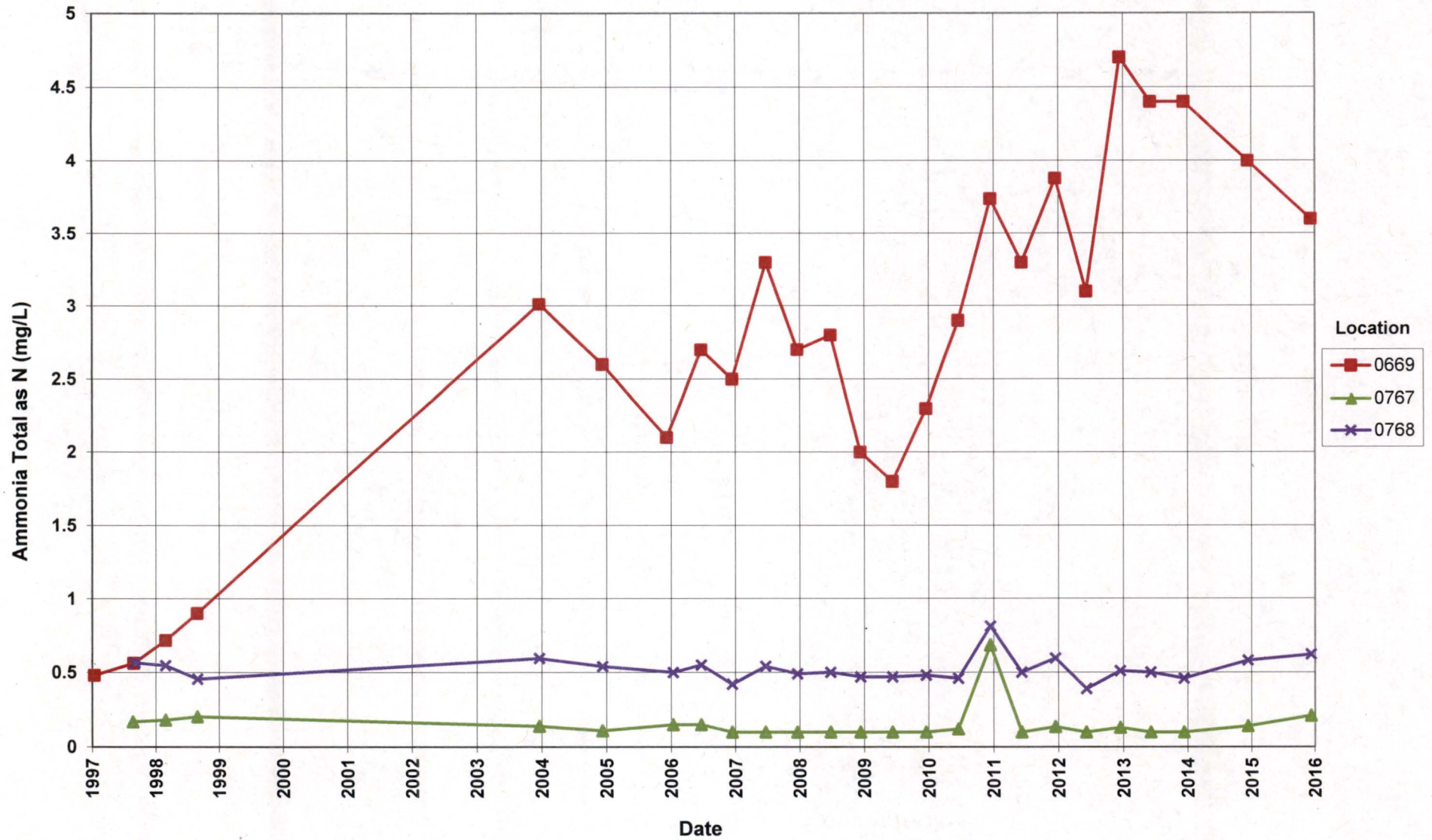


Monument Valley Processing Site  
Ammonia Total as N Concentration

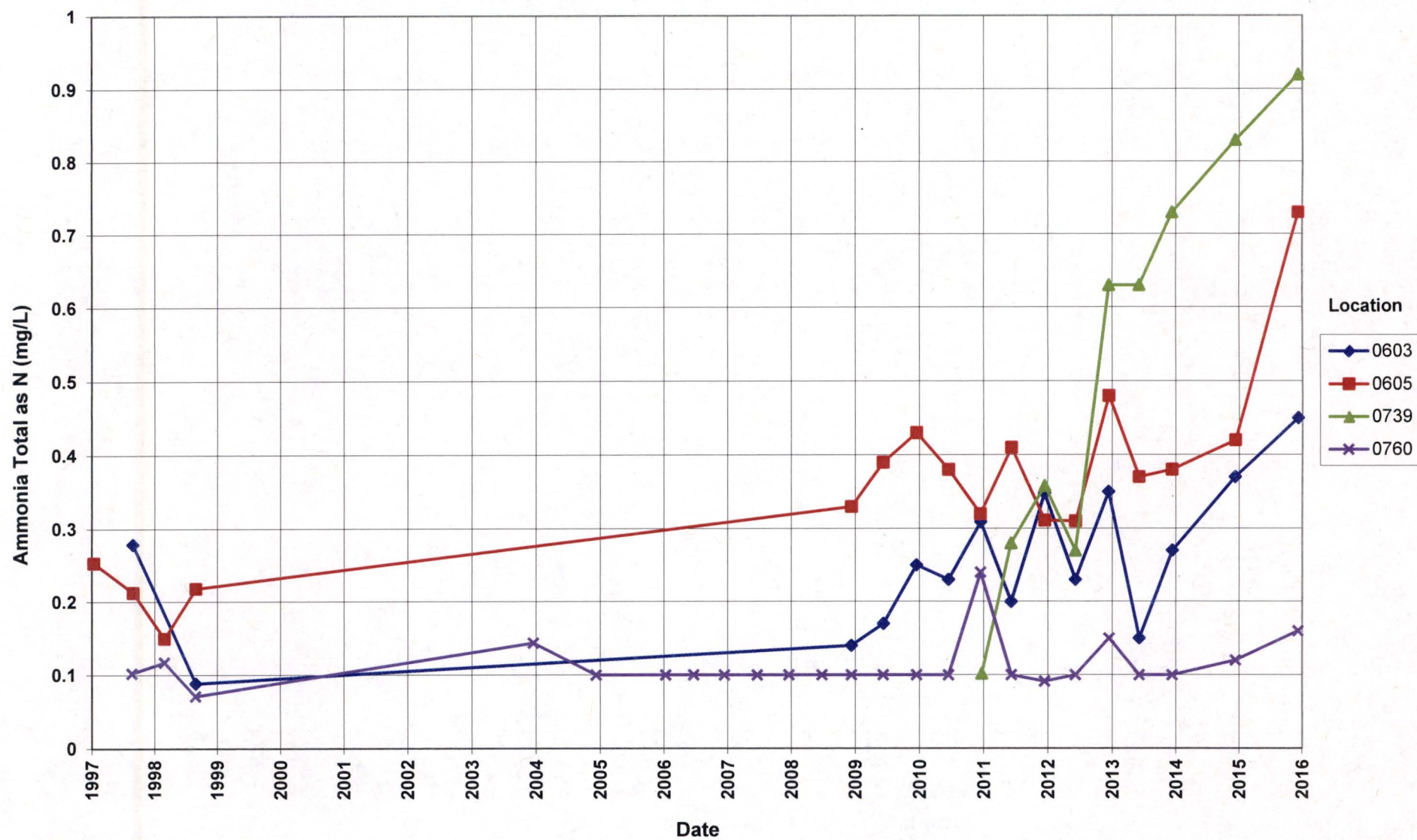




Monument Valley Processing Site  
Ammonia Total as N Concentration

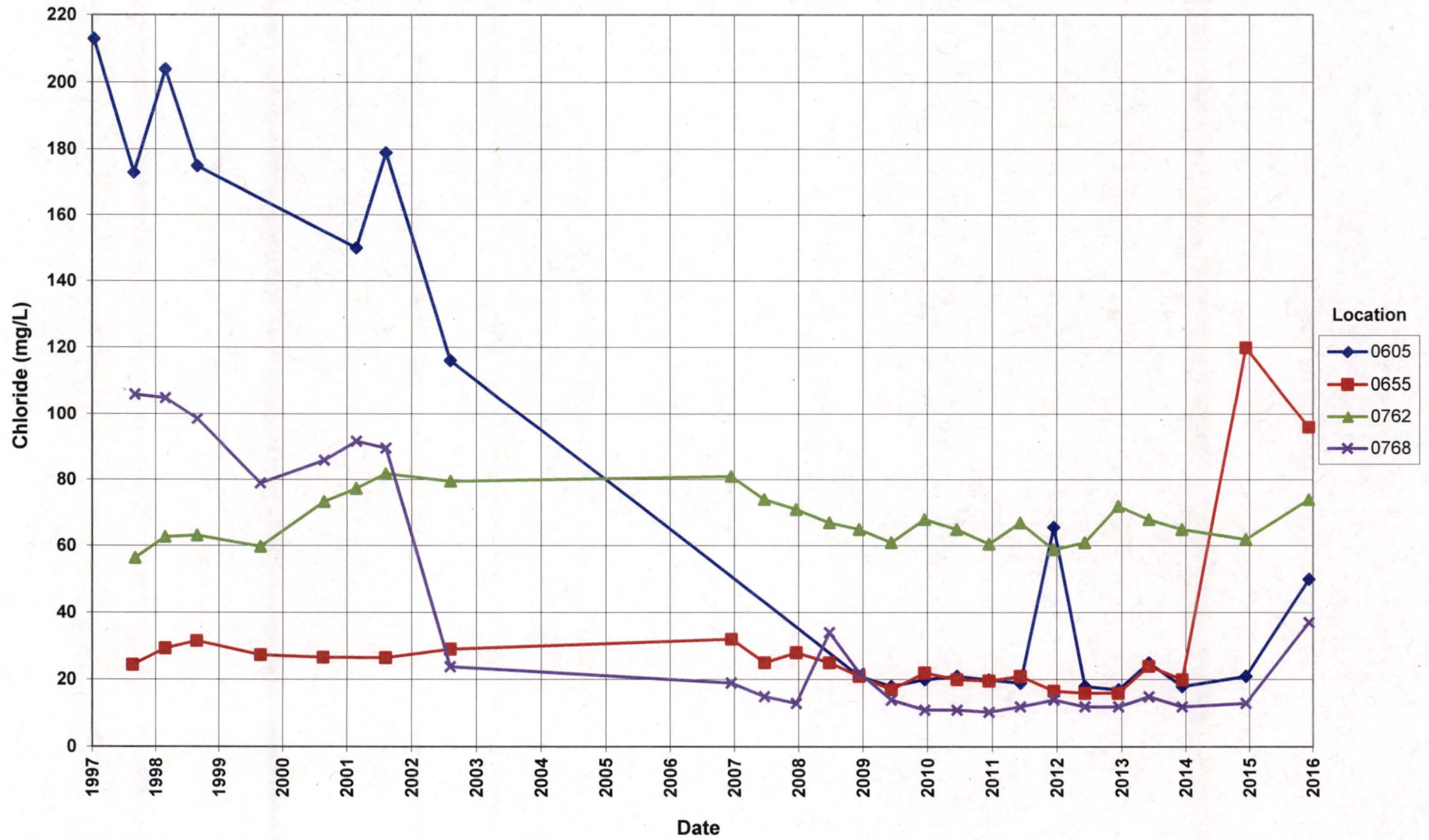


Monument Valley Processing Site  
Ammonia Total as N Concentration



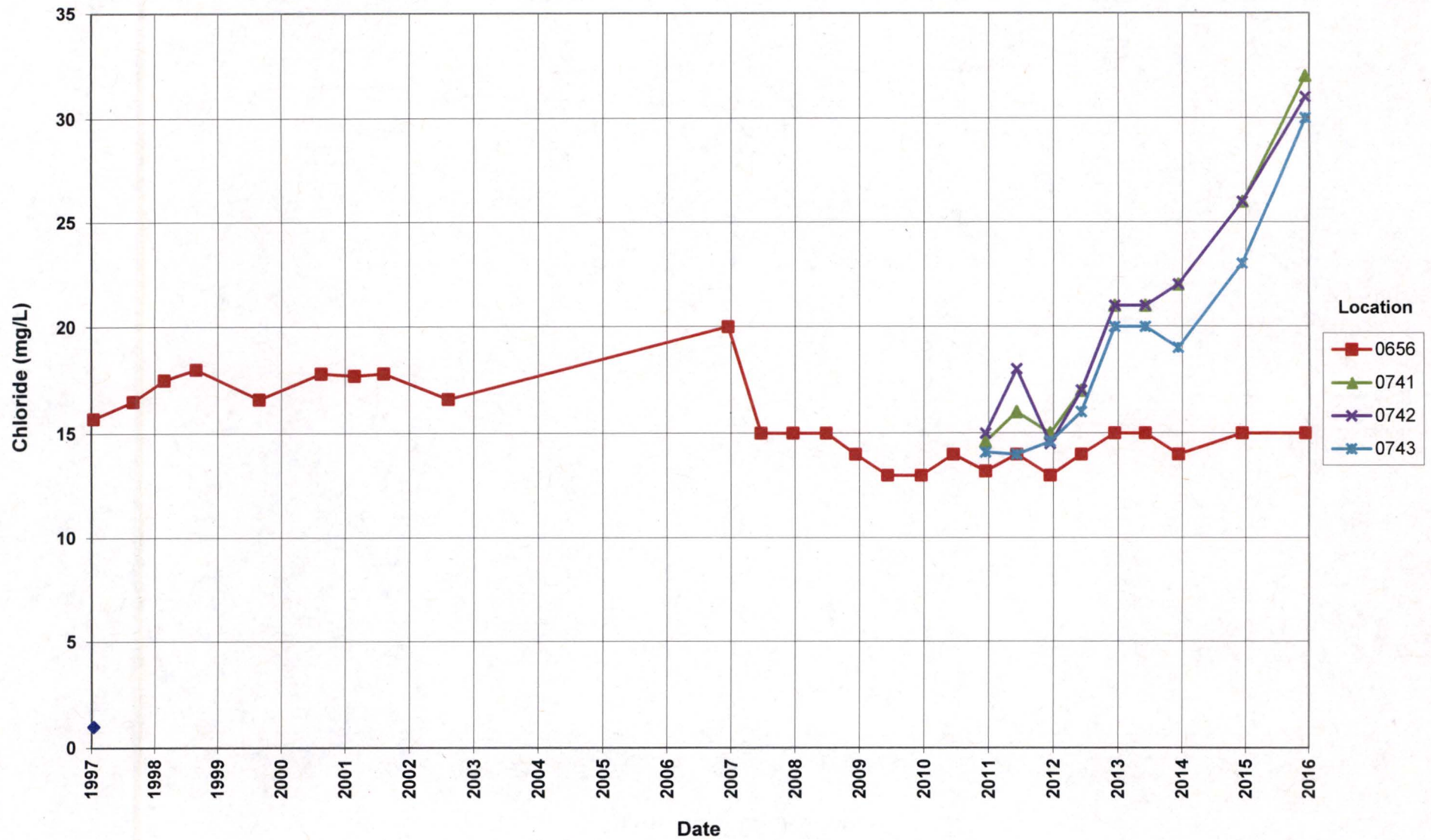


# Monument Valley Processing Site Chloride Concentration

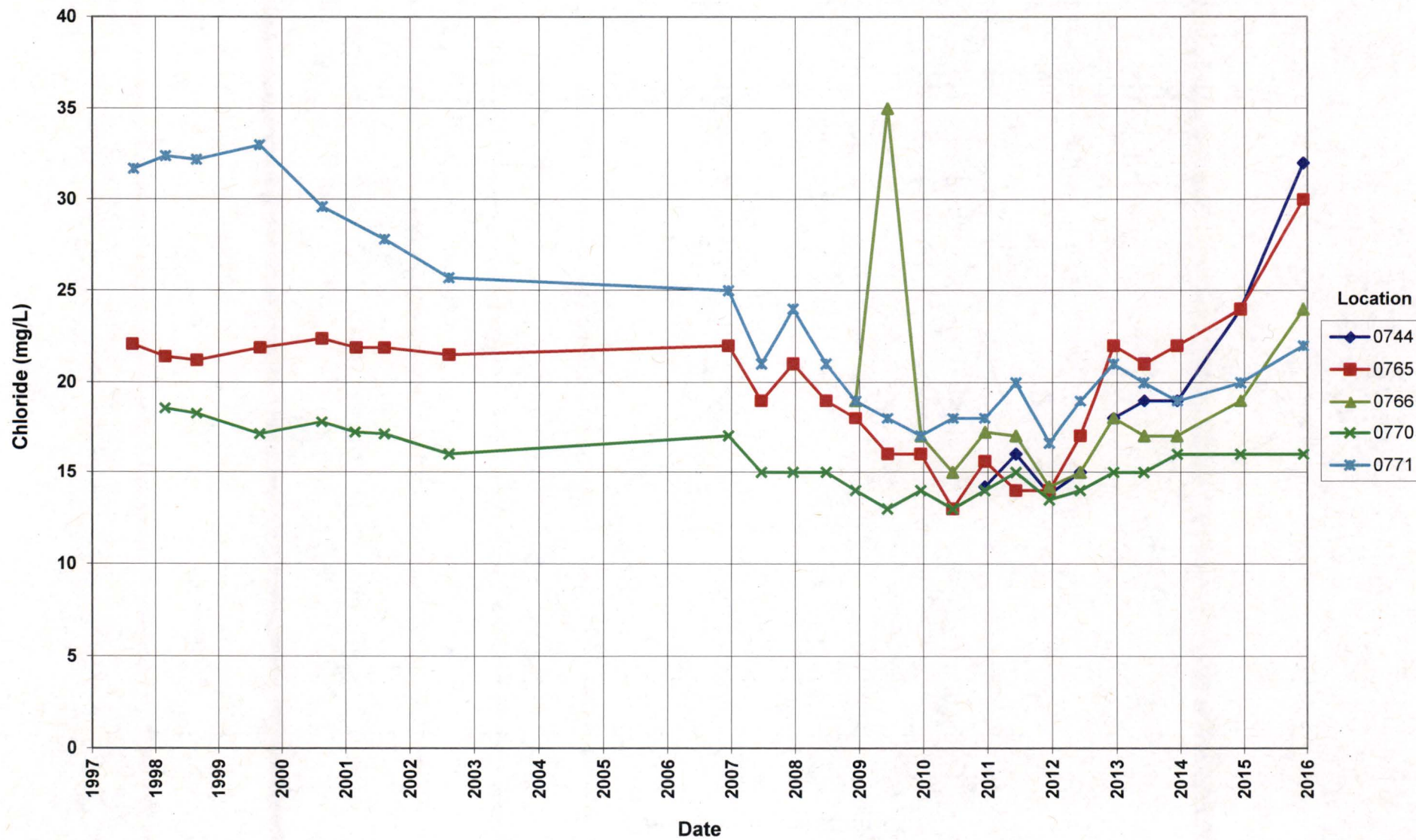




# Monument Valley Processing Site Chloride Concentration

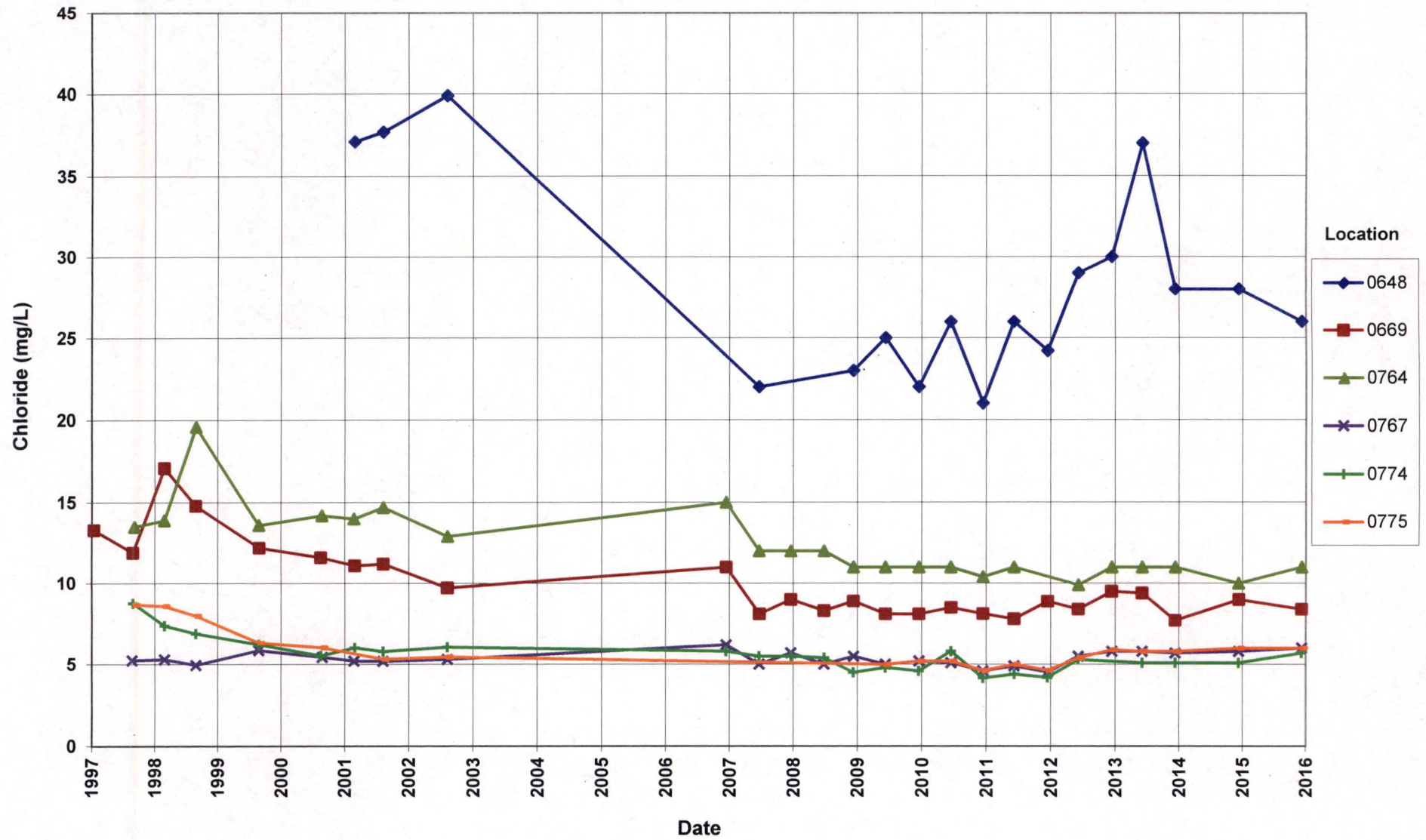


# Monument Valley Processing Site Chloride Concentration

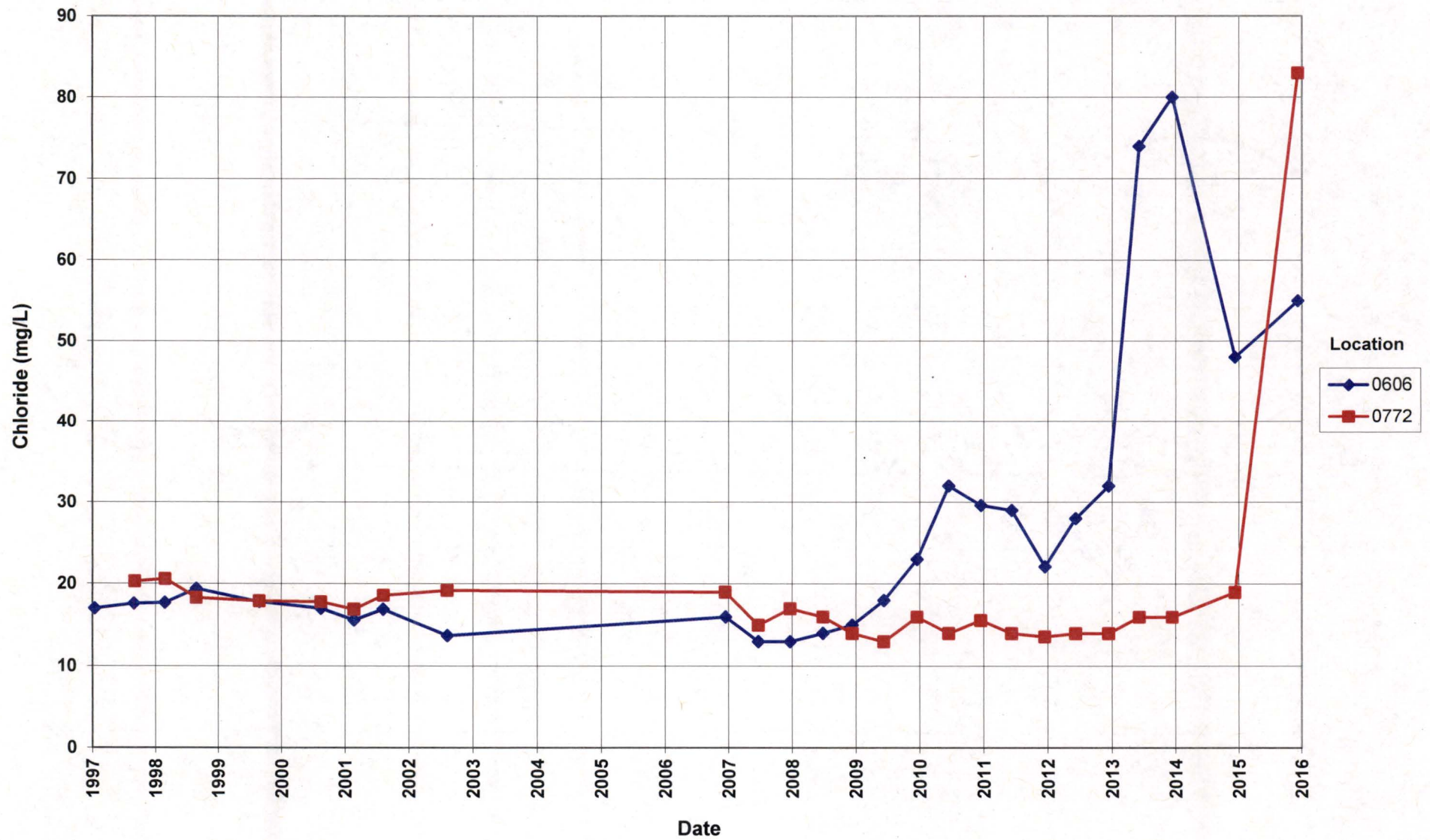




# Monument Valley Processing Site Chloride Concentration

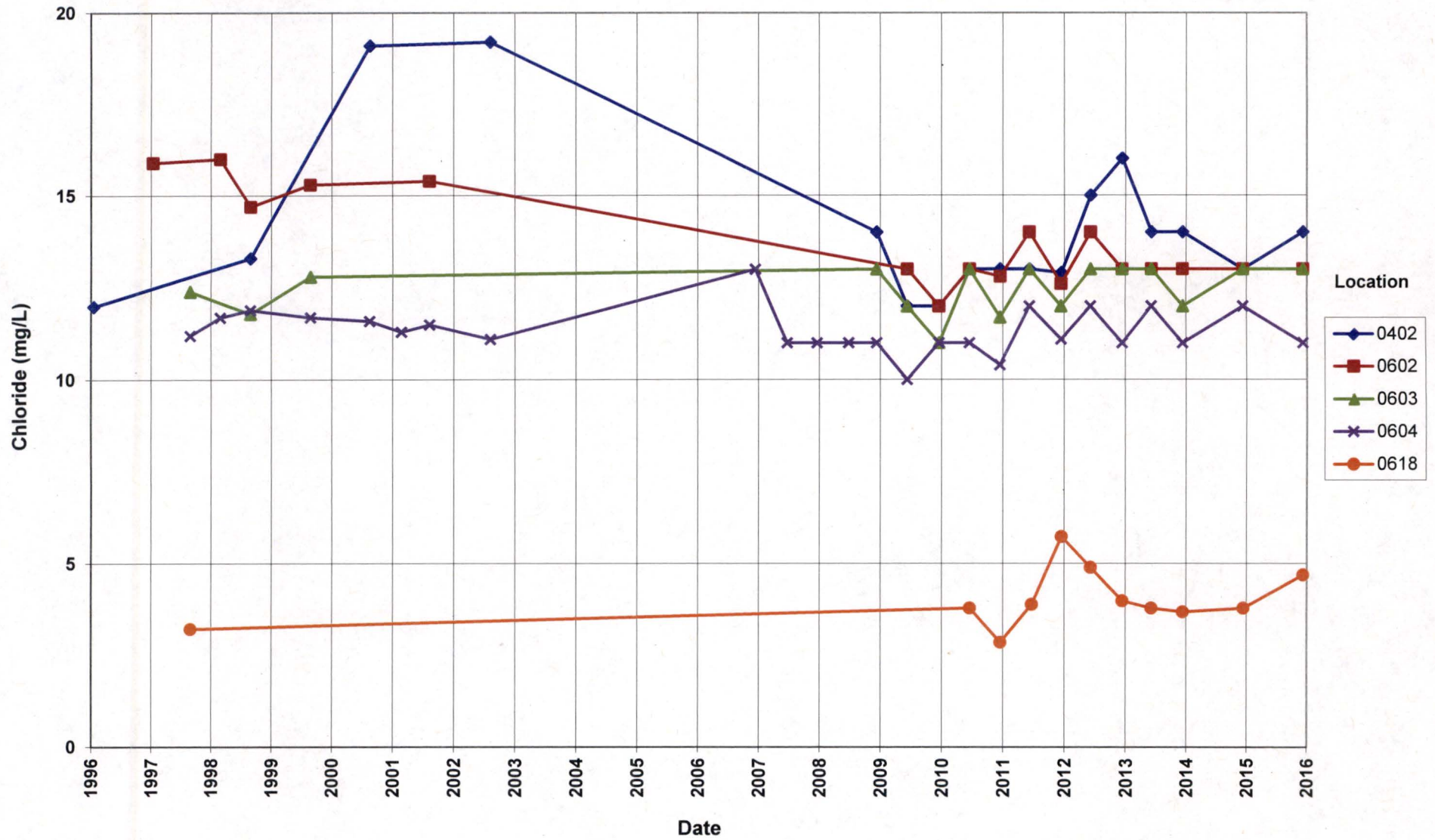


# Monument Valley Processing Site Chloride Concentration

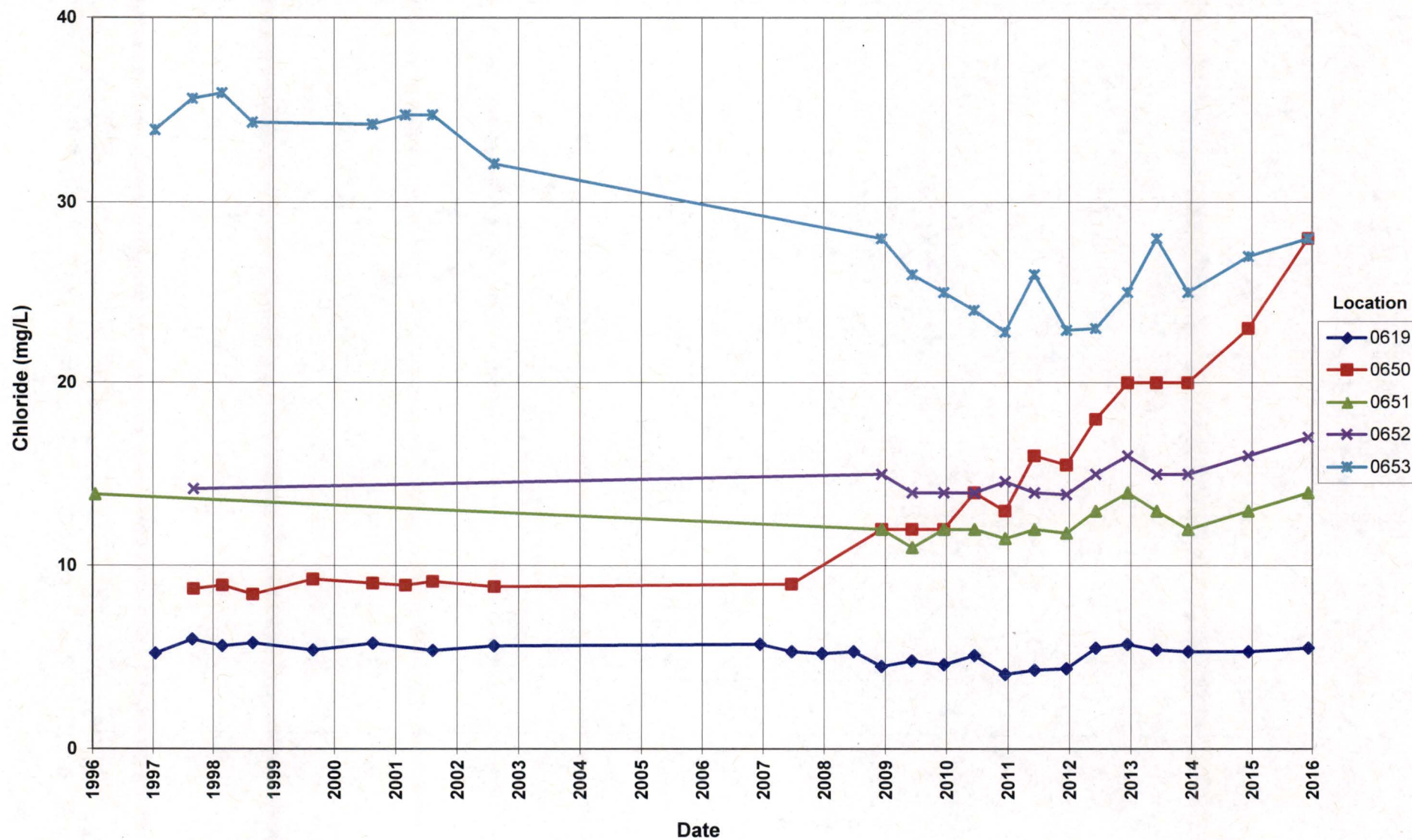




# Monument Valley Processing Site Chloride Concentration

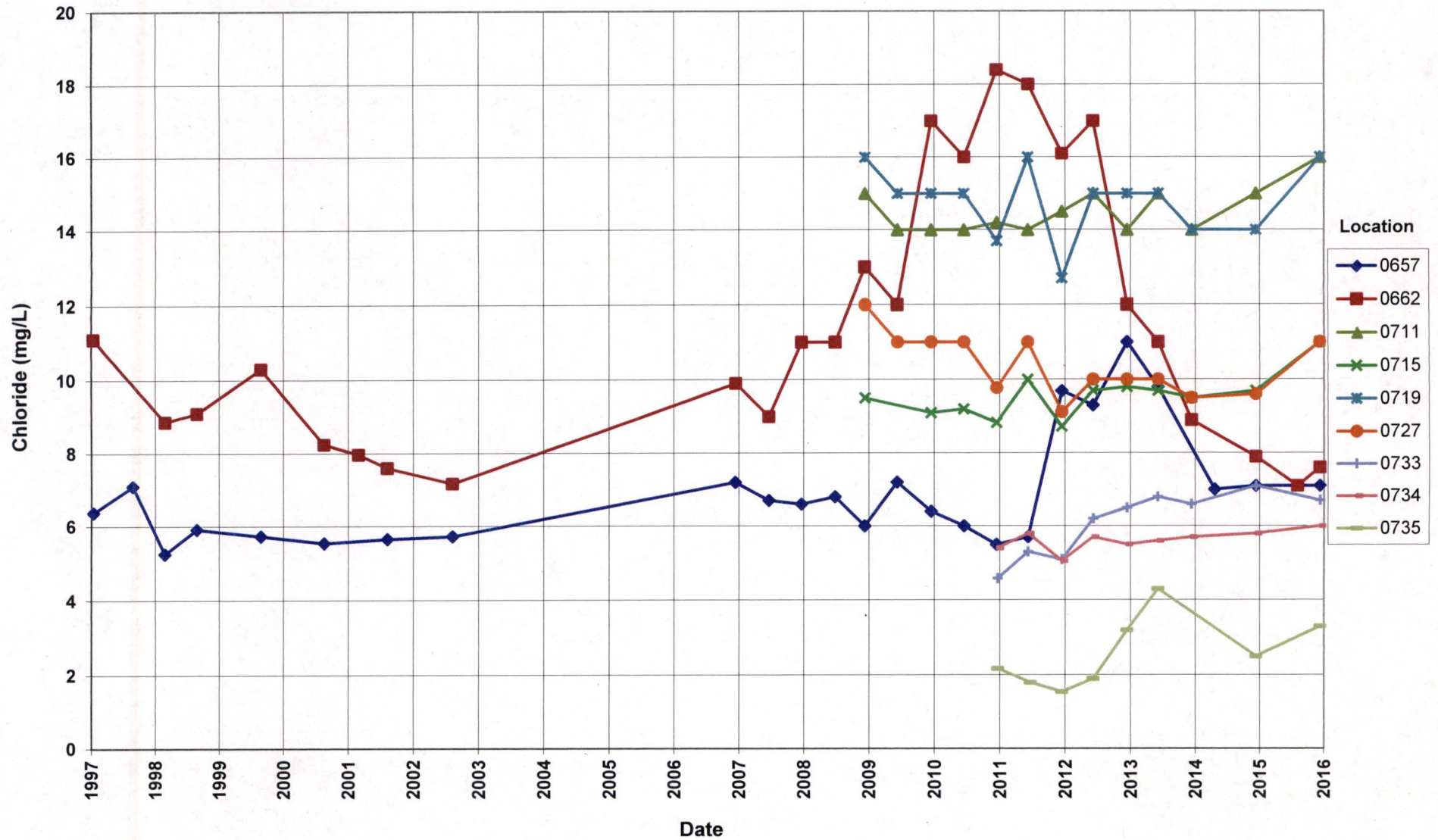


# Monument Valley Processing Site Chloride Concentration

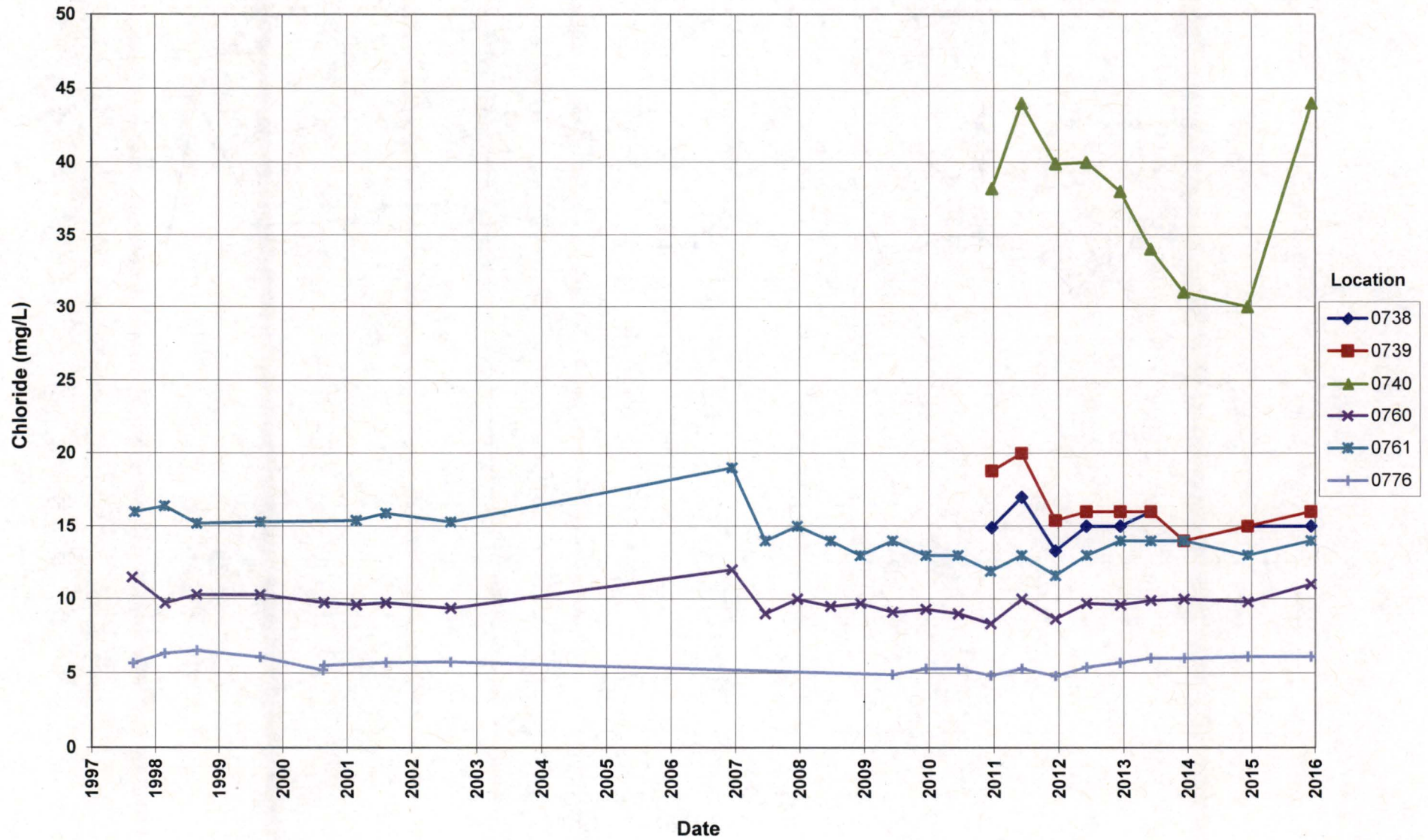




# Monument Valley Processing Site Chloride Concentration

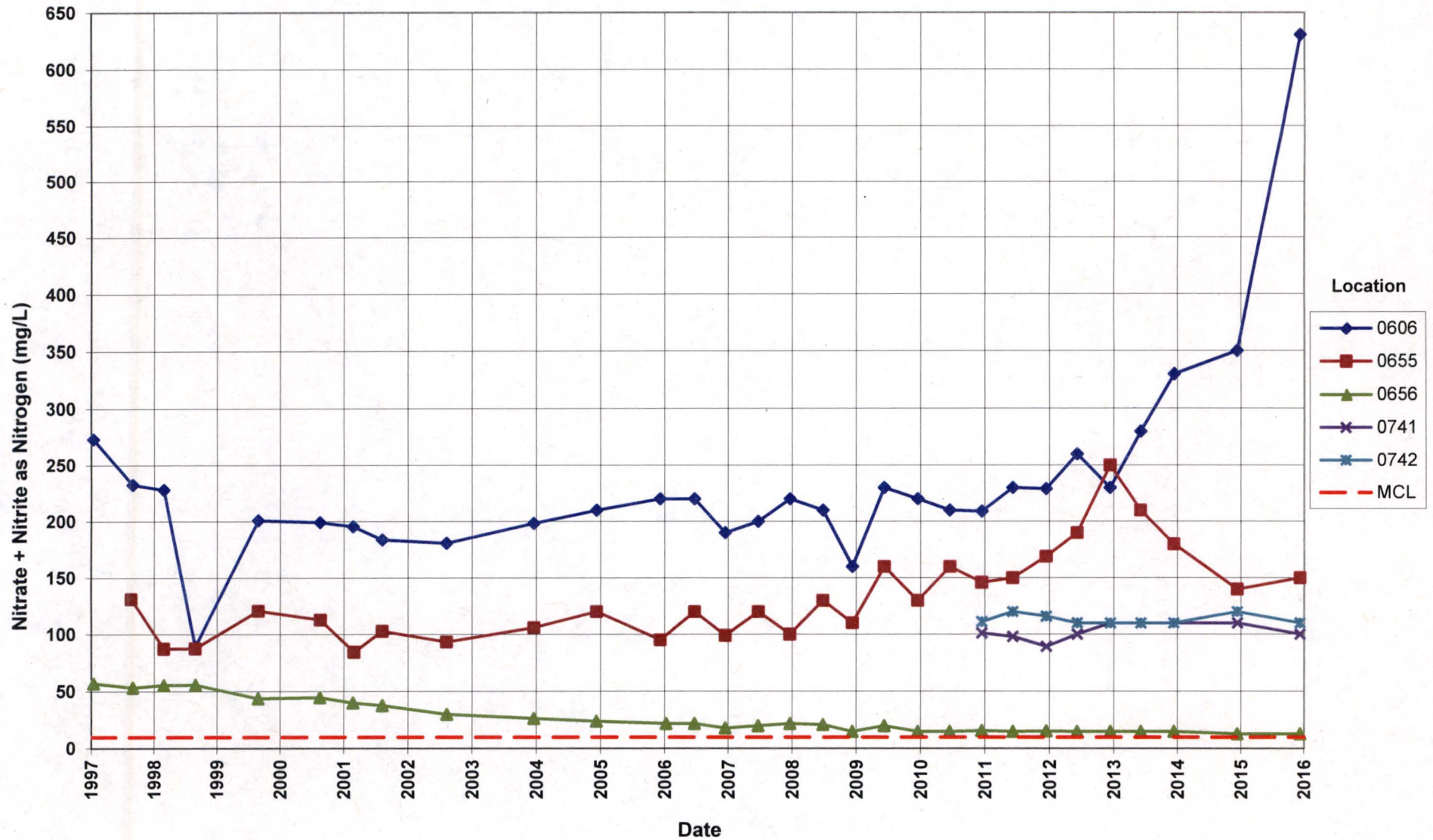


# Monument Valley Processing Site Chloride Concentration

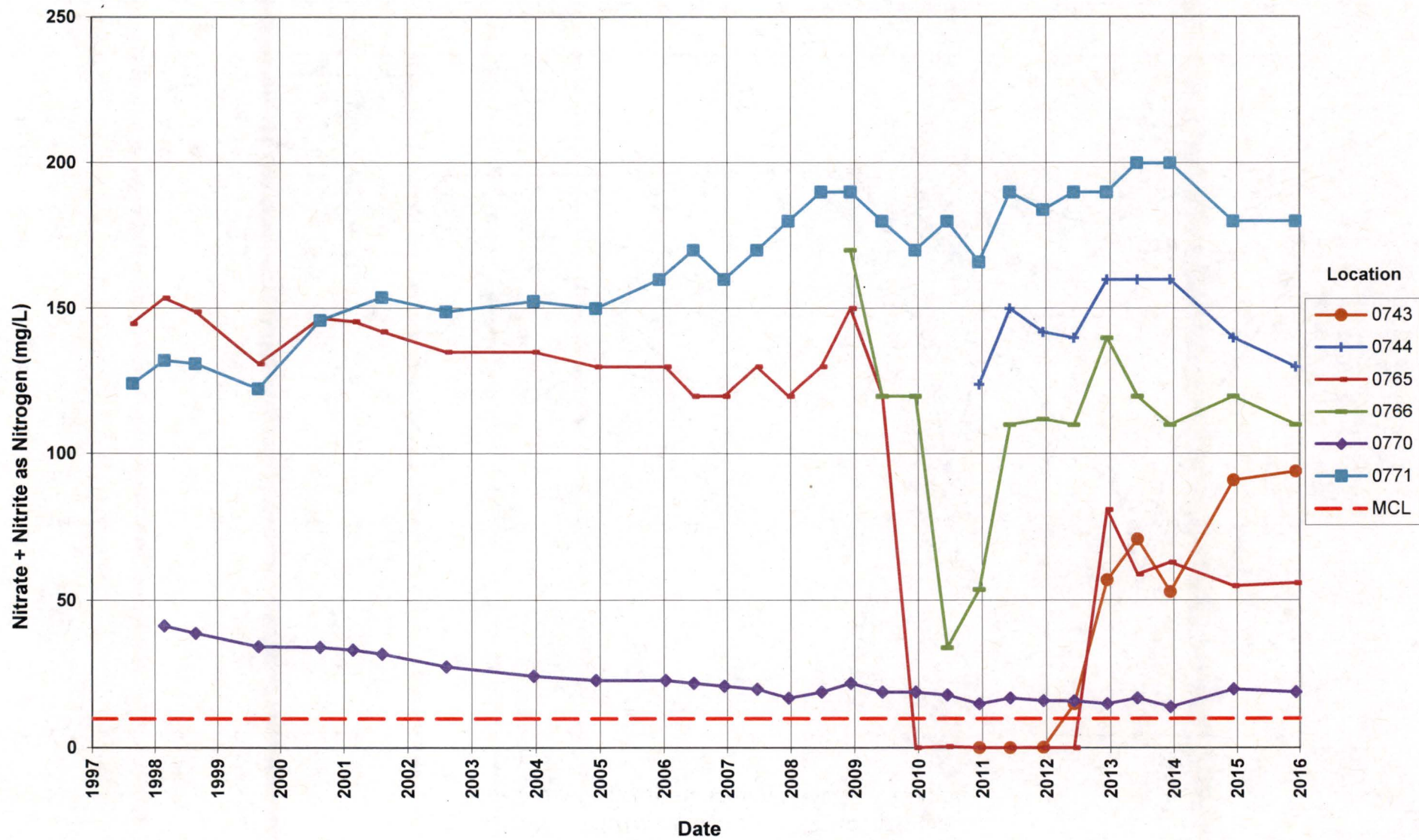




**Monument Valley Processing Site**  
**Nitrate + Nitrite as Nitrogen Concentration**  
Maximum Concentration Limit (MCL) = 10 mg/L

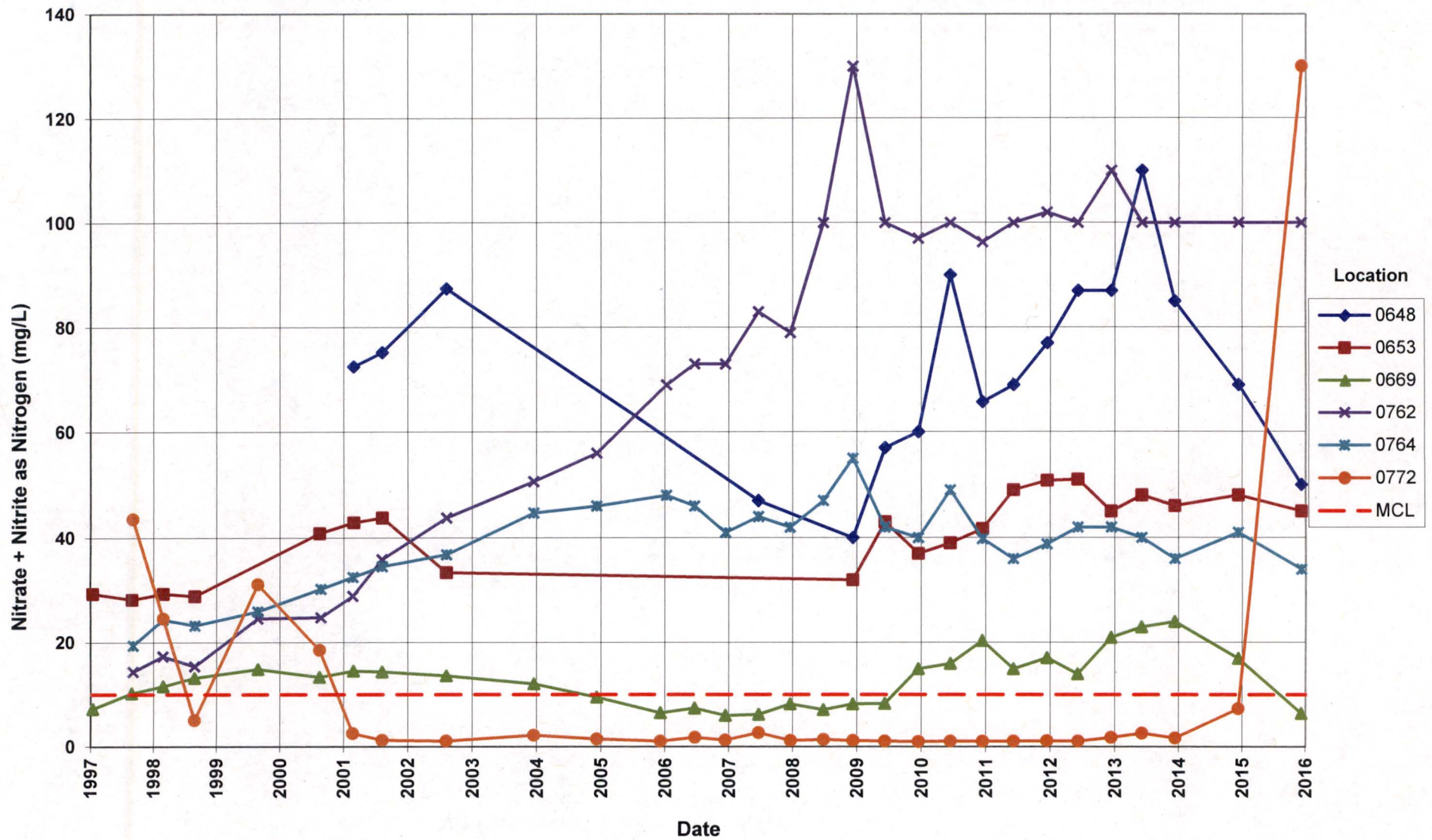


**Monument Valley Processing Site**  
**Nitrate + Nitrite as Nitrogen Concentration**  
 Maximum Concentration Limit (MCL) = 10 mg/L

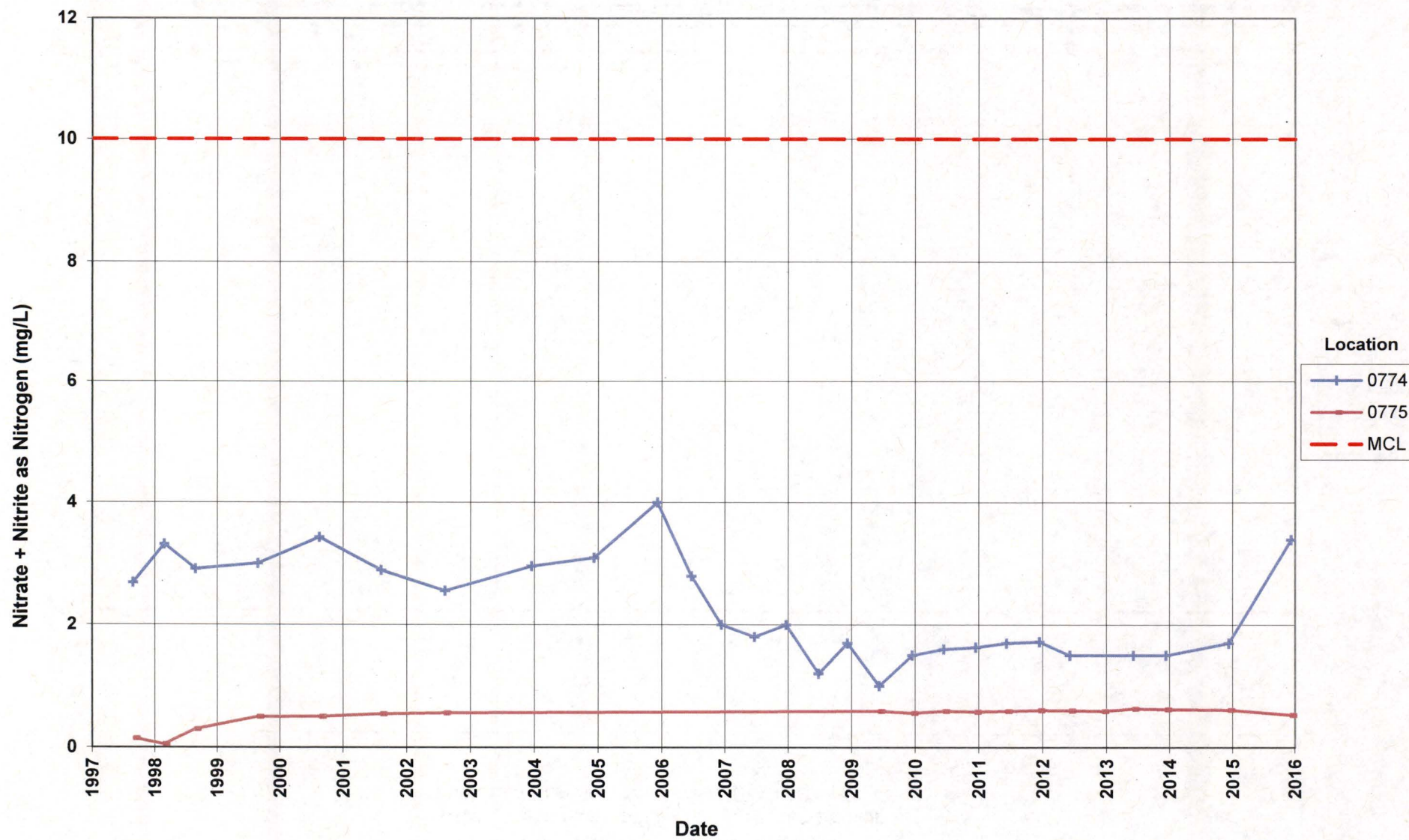




**Monument Valley Processing Site**  
**Nitrate + Nitrite as Nitrogen Concentration**  
Maximum Concentration Limit (MCL) = 10 mg/L

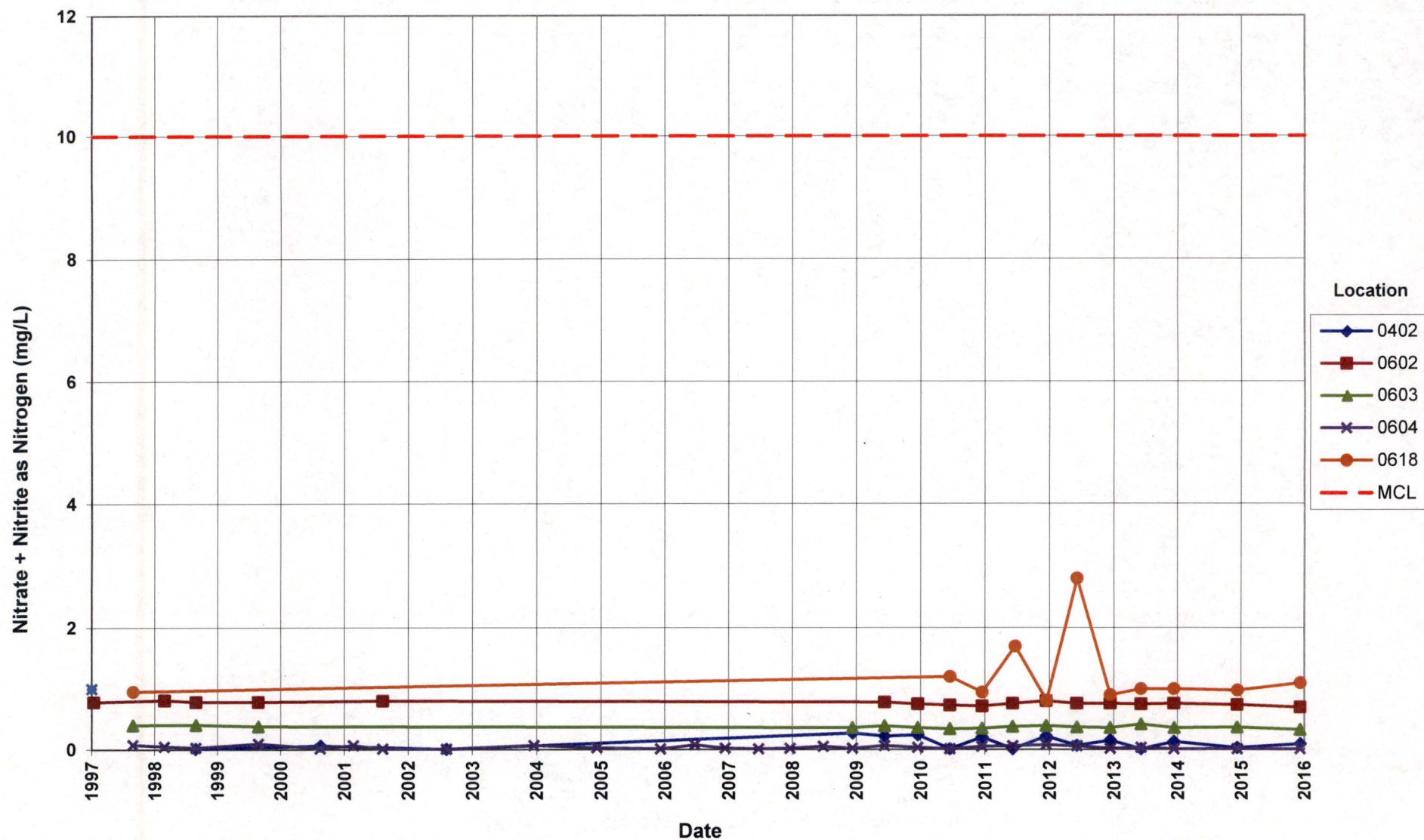


**Monument Valley Processing Site**  
**Nitrate + Nitrite as Nitrogen Concentration**  
Maximum Concentration Limit (MCL) = 10 mg/L

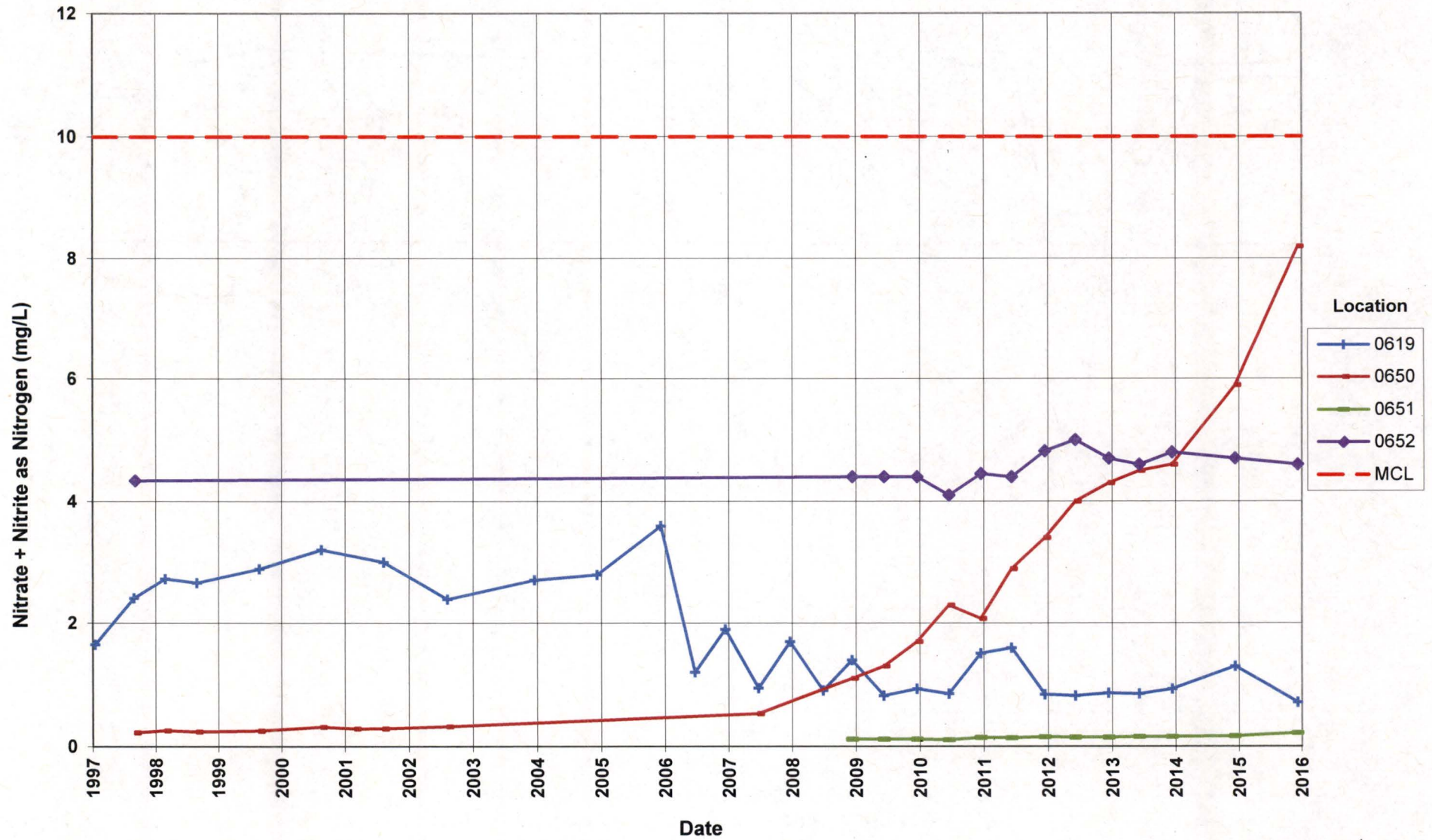




**Monument Valley Processing Site**  
**Nitrate + Nitrite as Nitrogen Concentration**  
Maximum Concentration Limit (MCL) = 10 mg/L

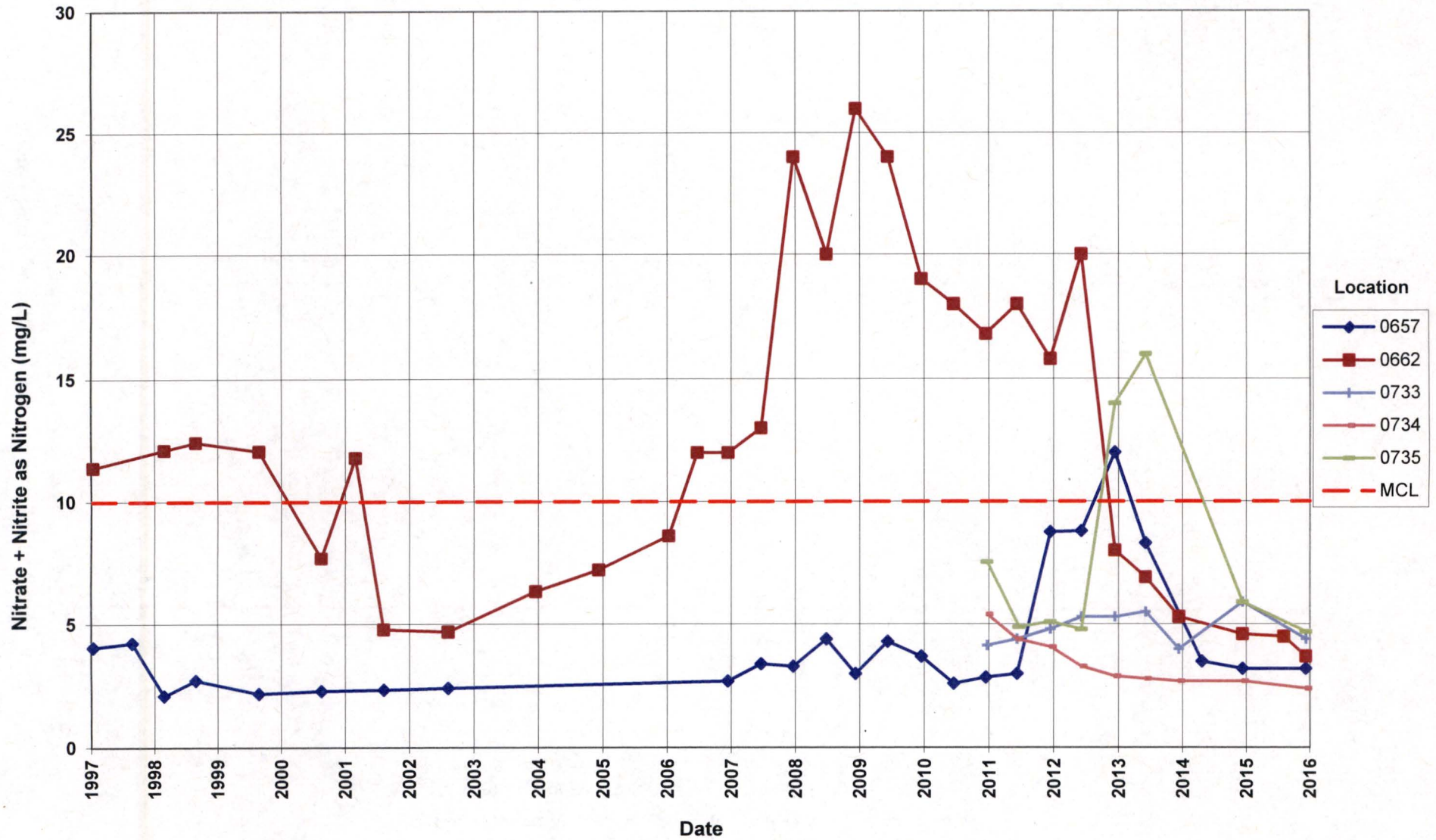


**Monument Valley Processing Site**  
**Nitrate + Nitrite as Nitrogen Concentration**  
Maximum Concentration Limit (MCL) = 10 mg/L

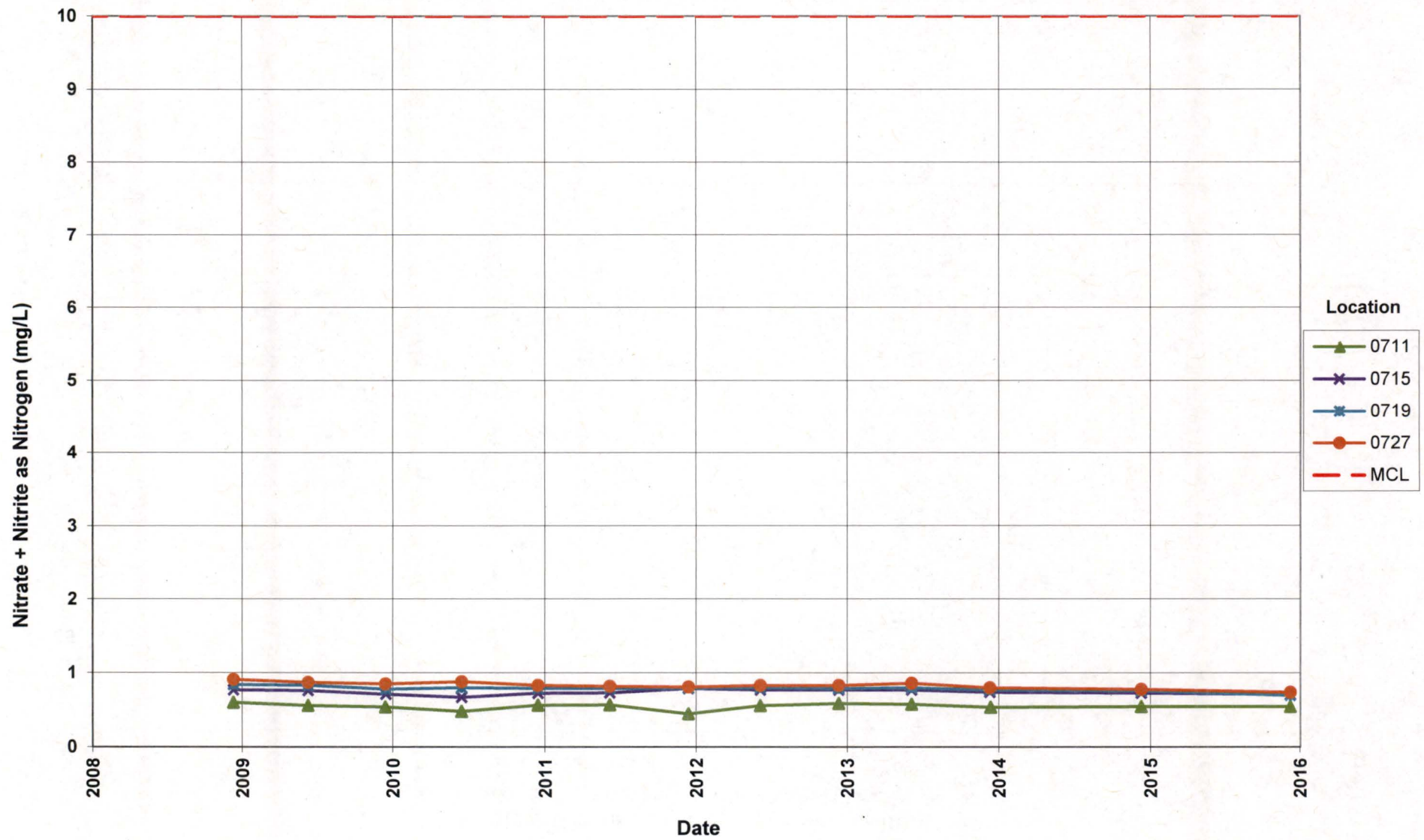




**Monument Valley Processing Site**  
**Nitrate + Nitrite as Nitrogen Concentration**  
Maximum Concentration Limit (MCL) = 10 mg/L

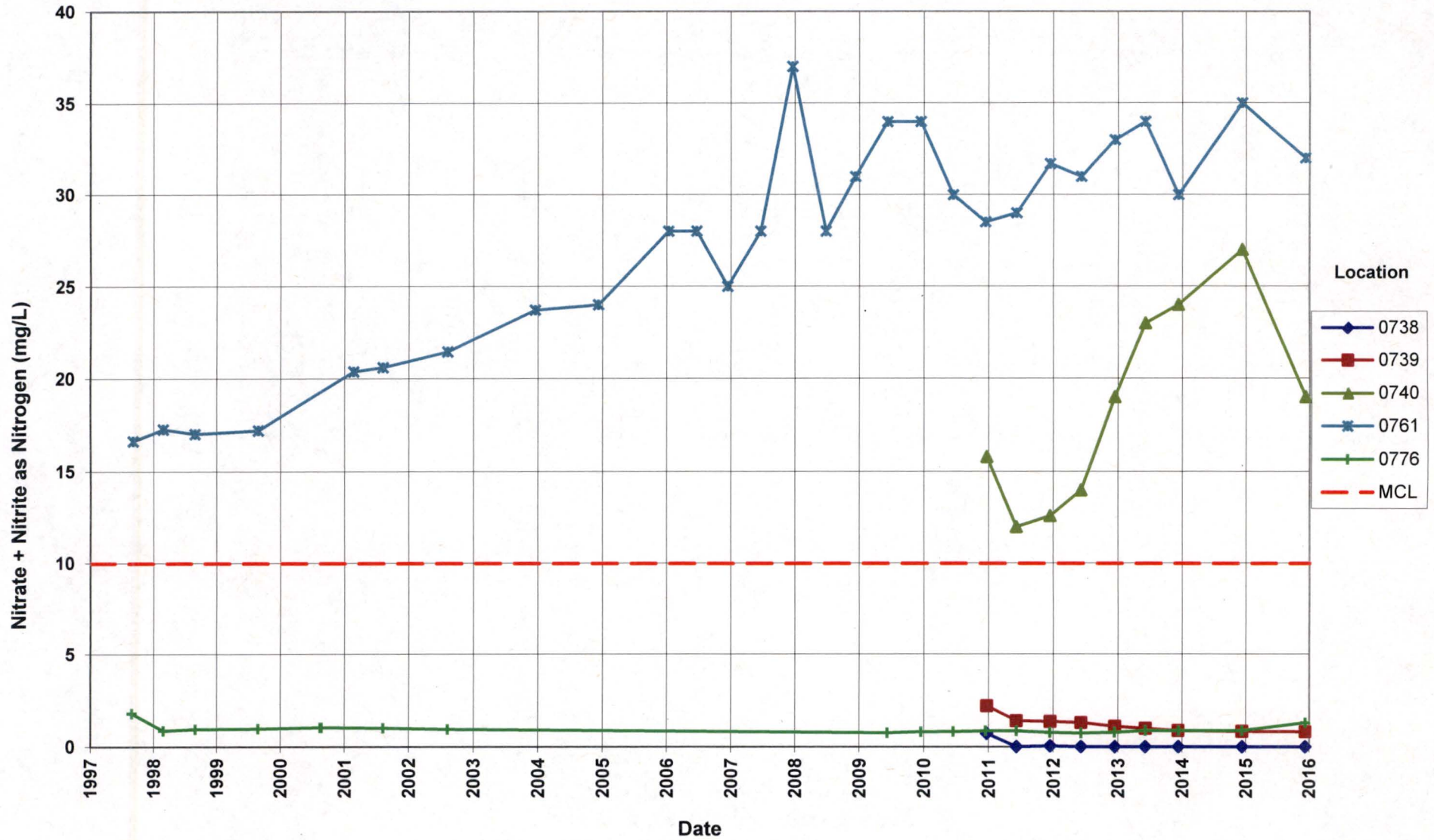


**Monument Valley Processing Site**  
**Nitrate + Nitrite as Nitrogen Concentration**  
Maximum Concentration Limit (MCL) = 10 mg/L

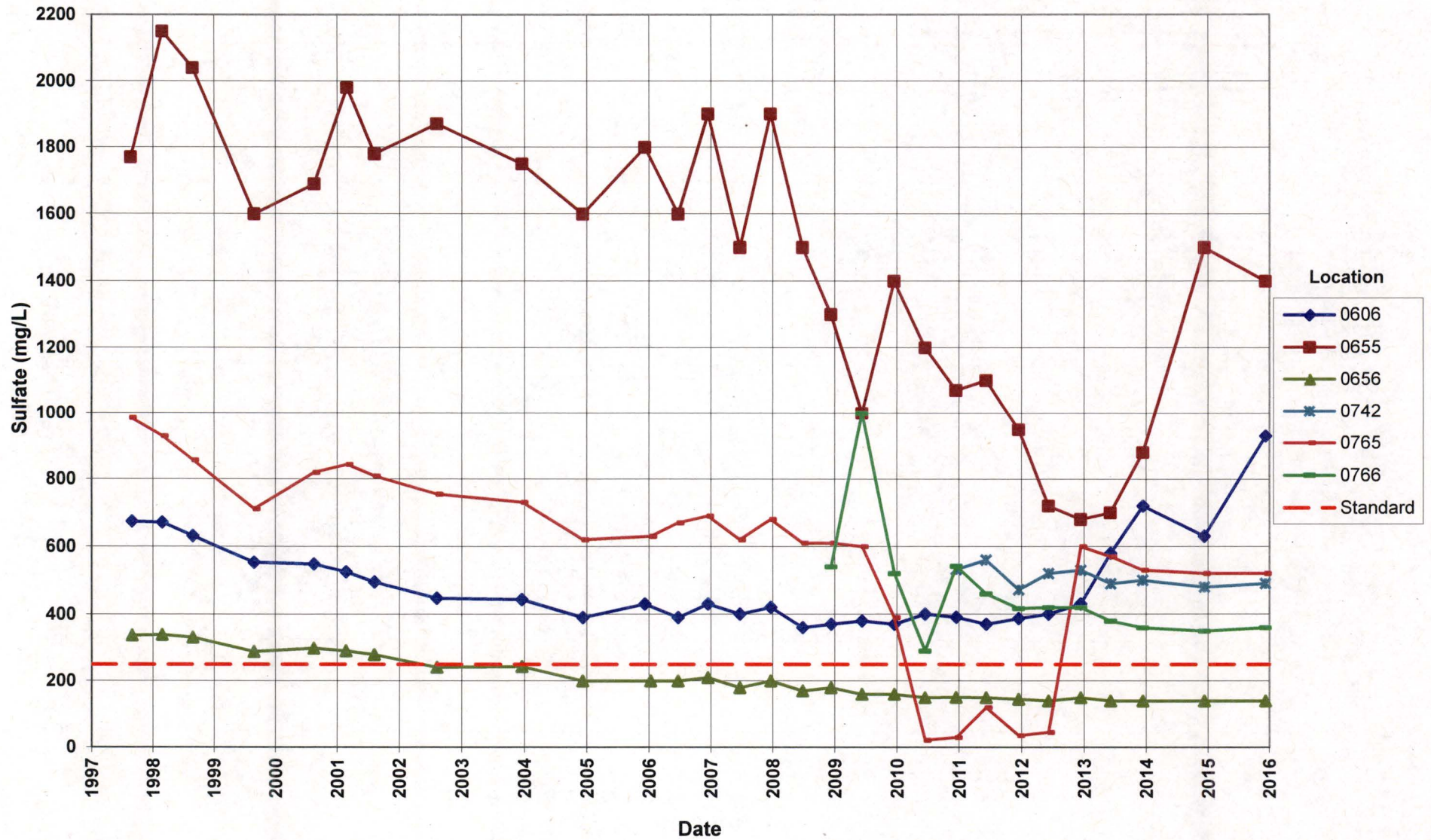




**Monument Valley Processing Site**  
**Nitrate + Nitrite as Nitrogen Concentration**  
Maximum Concentration Limit (MCL) = 10 mg/L

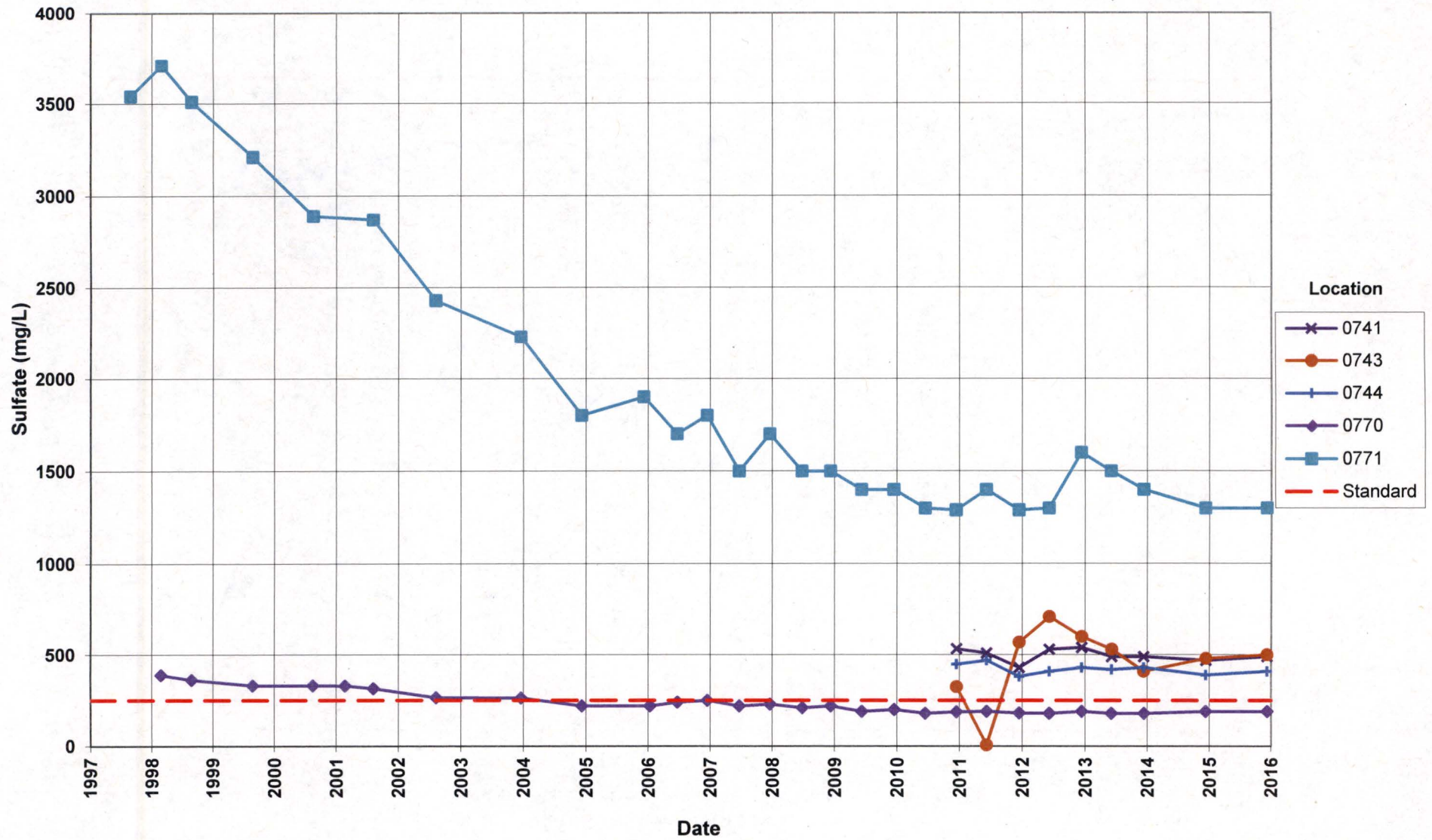


**Monument Valley Processing Site**  
**Sulfate Concentration**  
Proposed Cleanup Standard = 250 mg/L



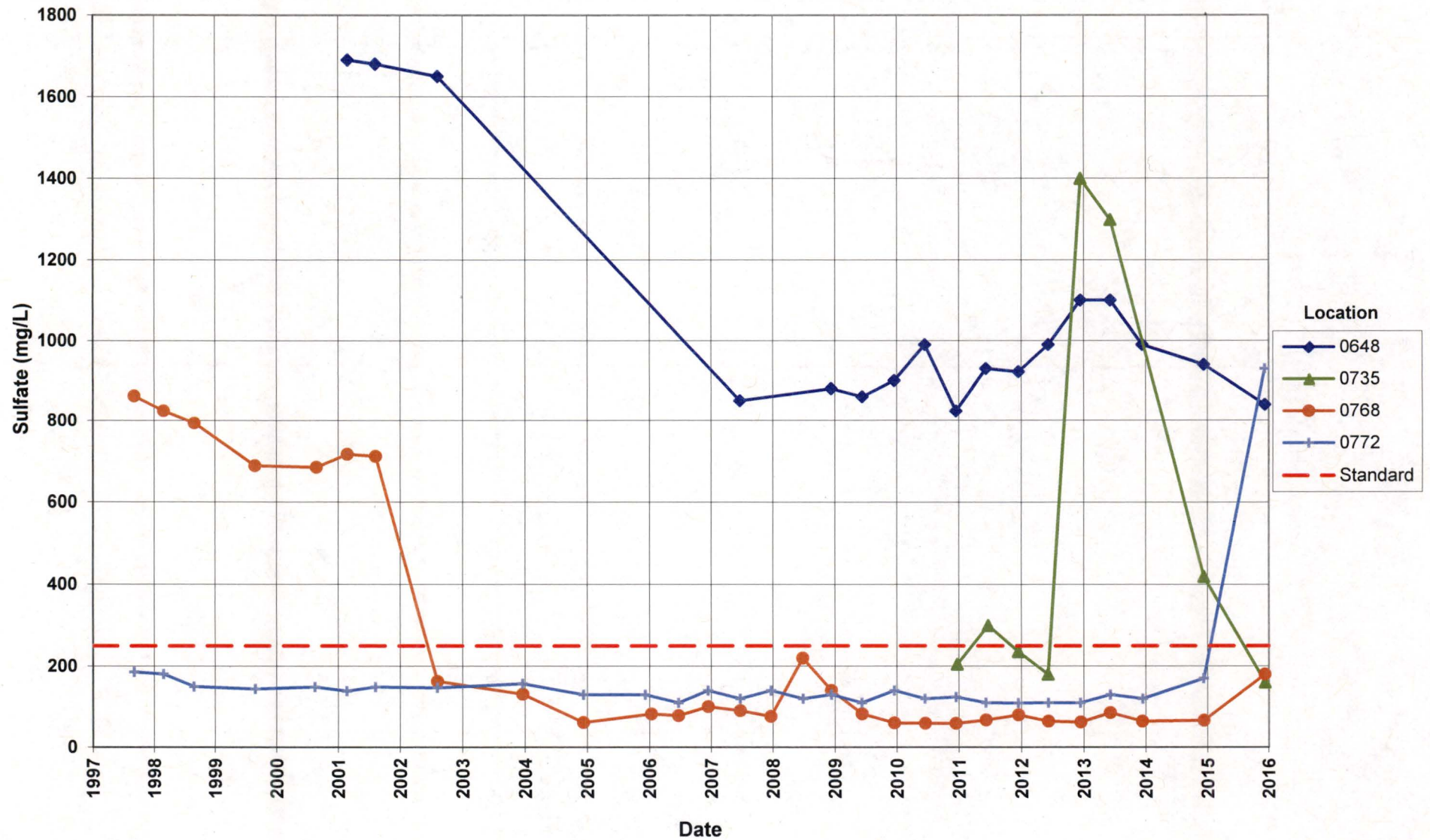


**Monument Valley Processing Site**  
**Sulfate Concentration**  
Proposed Cleanup Standard = 250 mg/L



# Monument Valley Processing Site Sulfate Concentration

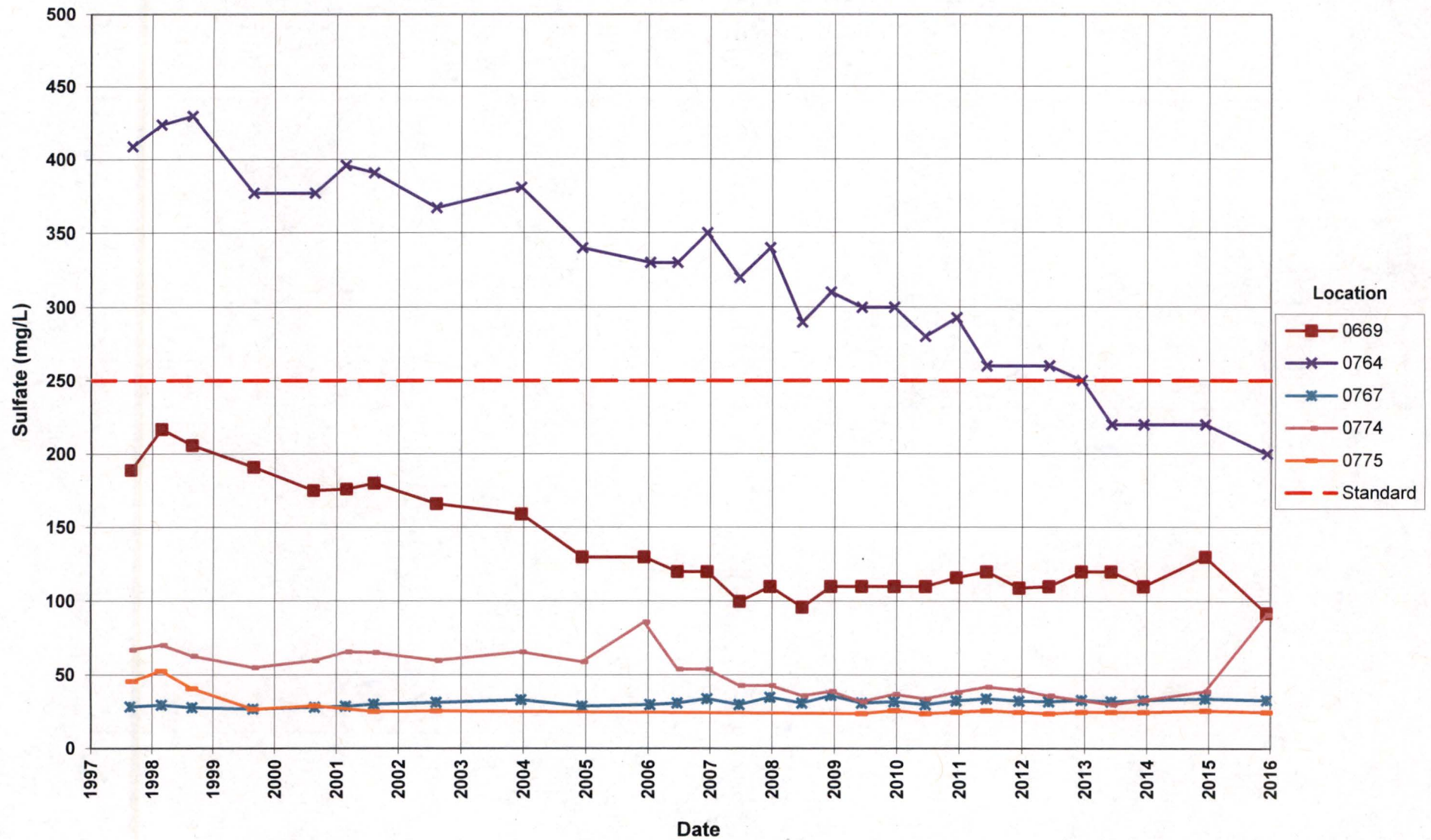
Proposed Cleanup Standard = 250 mg/L



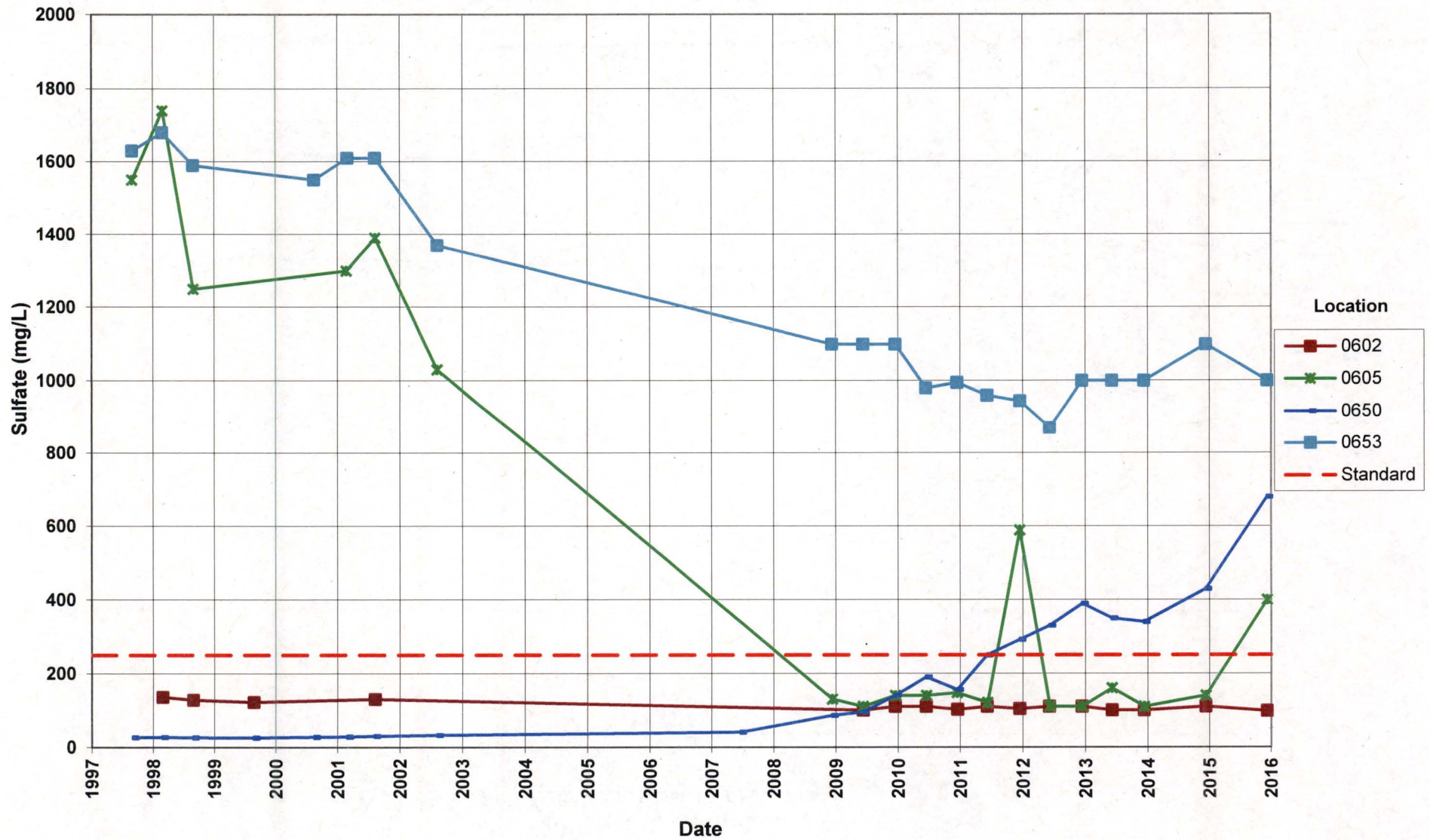


# Monument Valley Processing Site Sulfate Concentration

Proposed Cleanup Standard = 250 mg/L



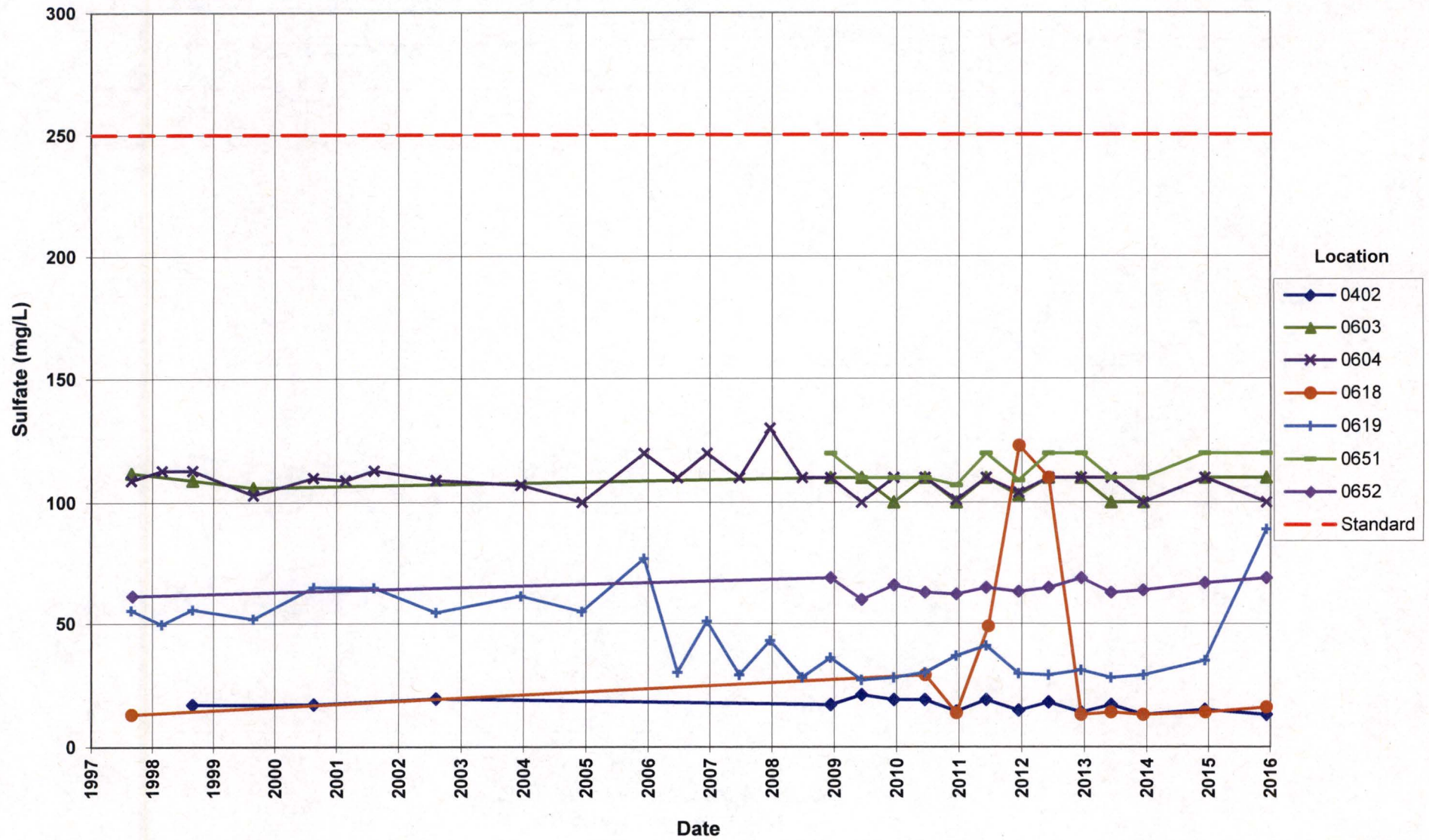
**Monument Valley Processing Site**  
**Sulfate Concentration**  
Proposed Cleanup Standard = 250 mg/L





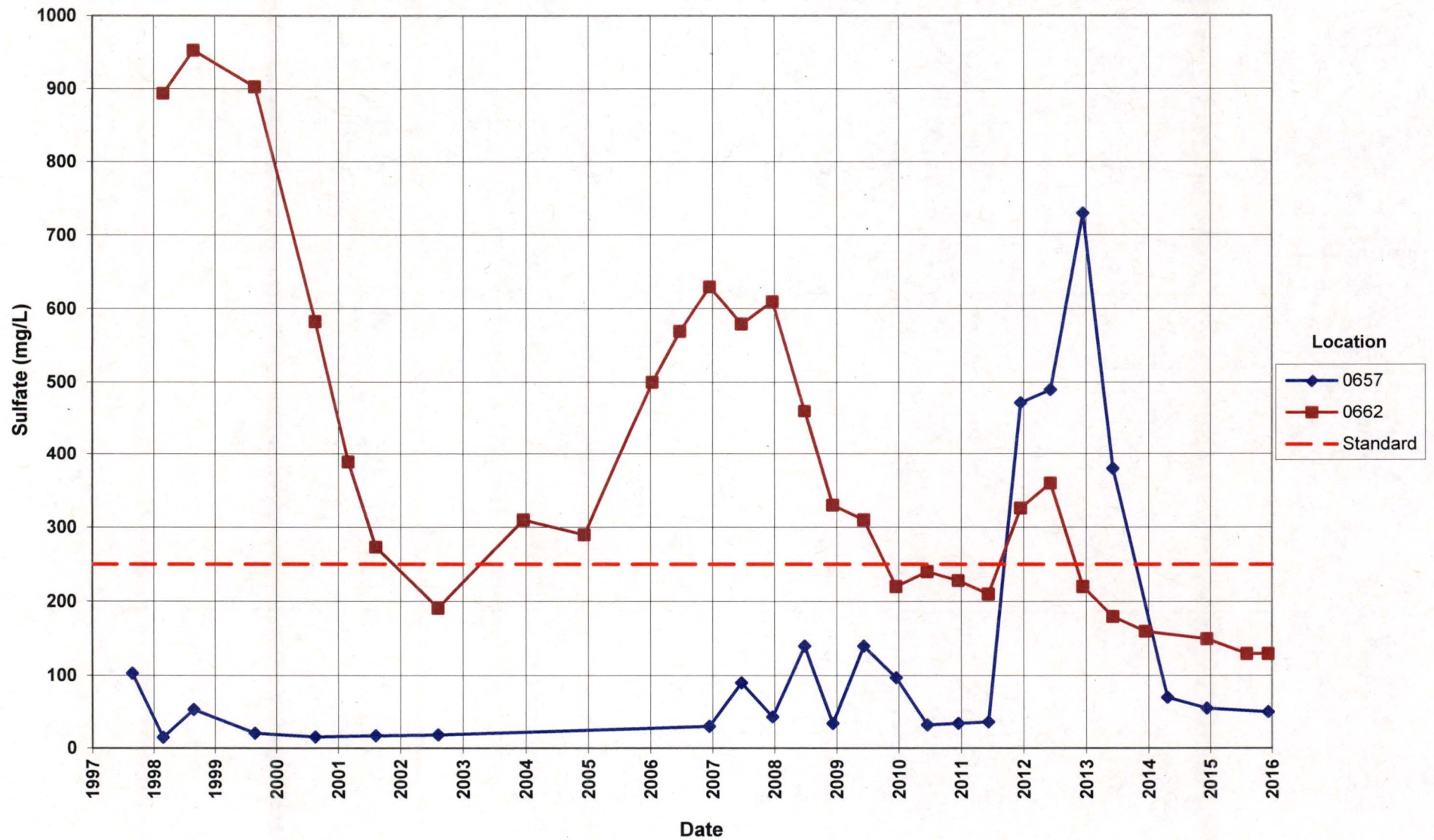
# Monument Valley Processing Site Sulfate Concentration

Proposed Cleanup Standard = 250 mg/L



# Monument Valley Processing Site Sulfate Concentration

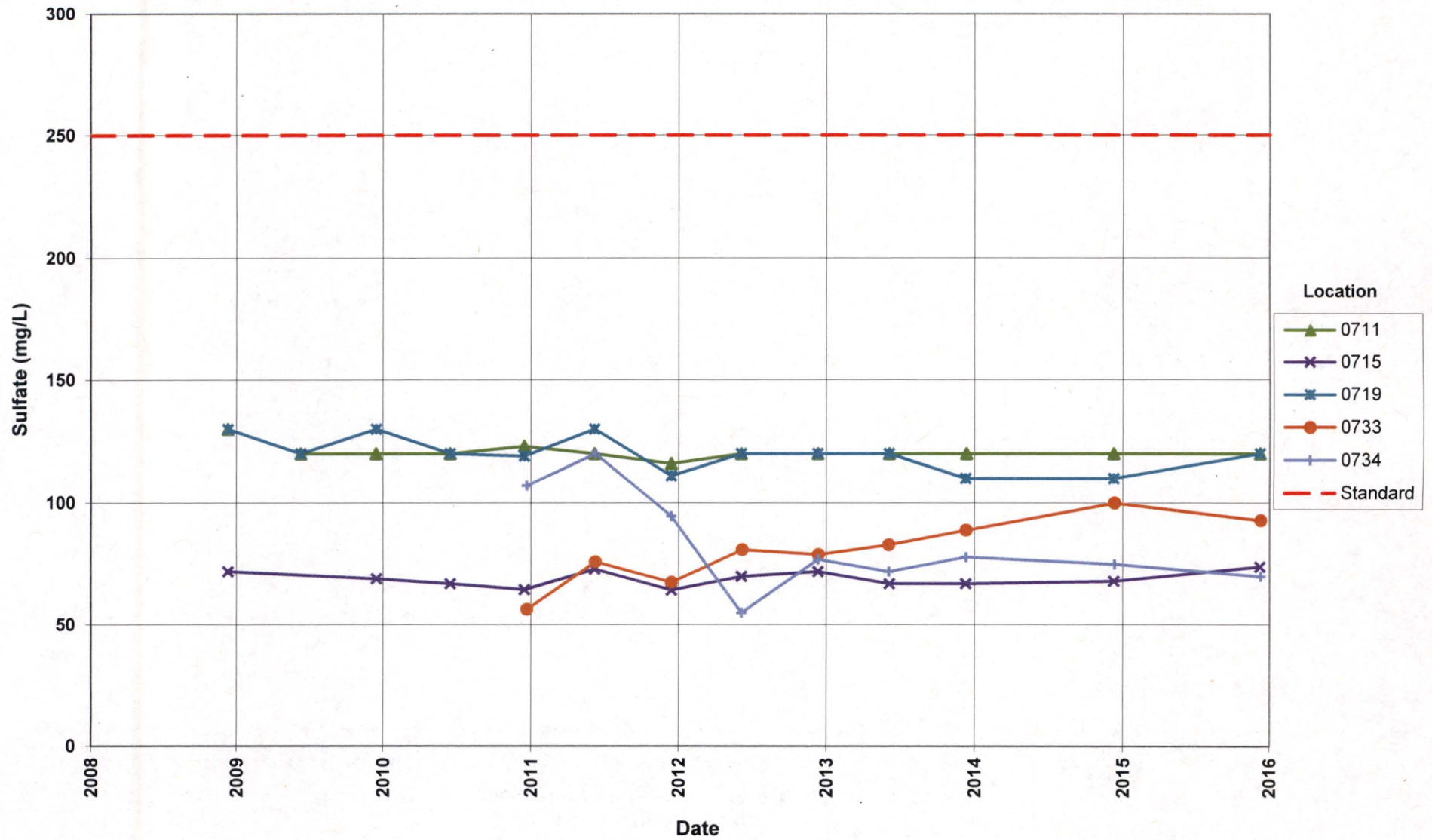
Proposed Cleanup Standard = 250 mg/L



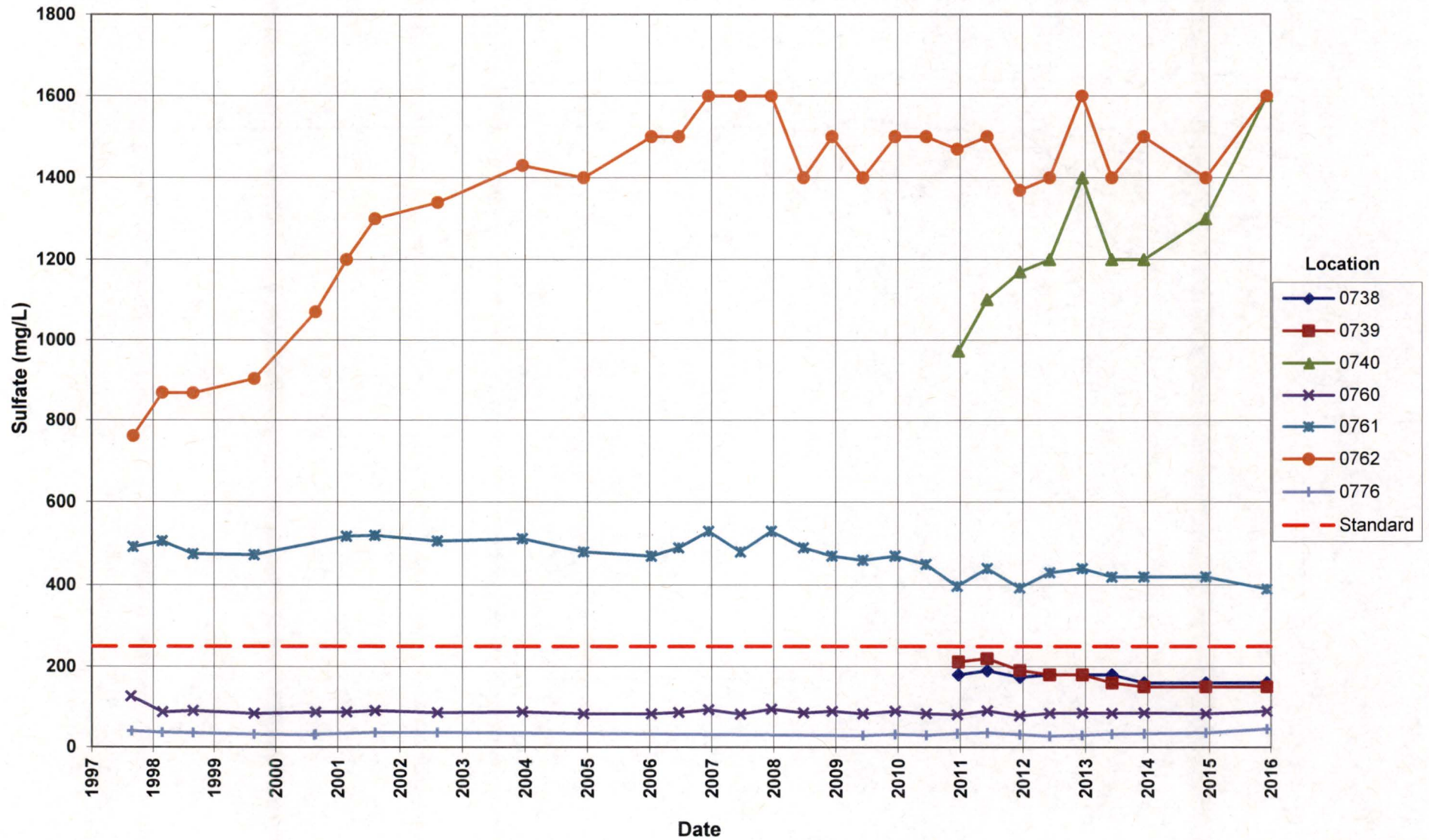


# Monument Valley Processing Site Sulfate Concentration

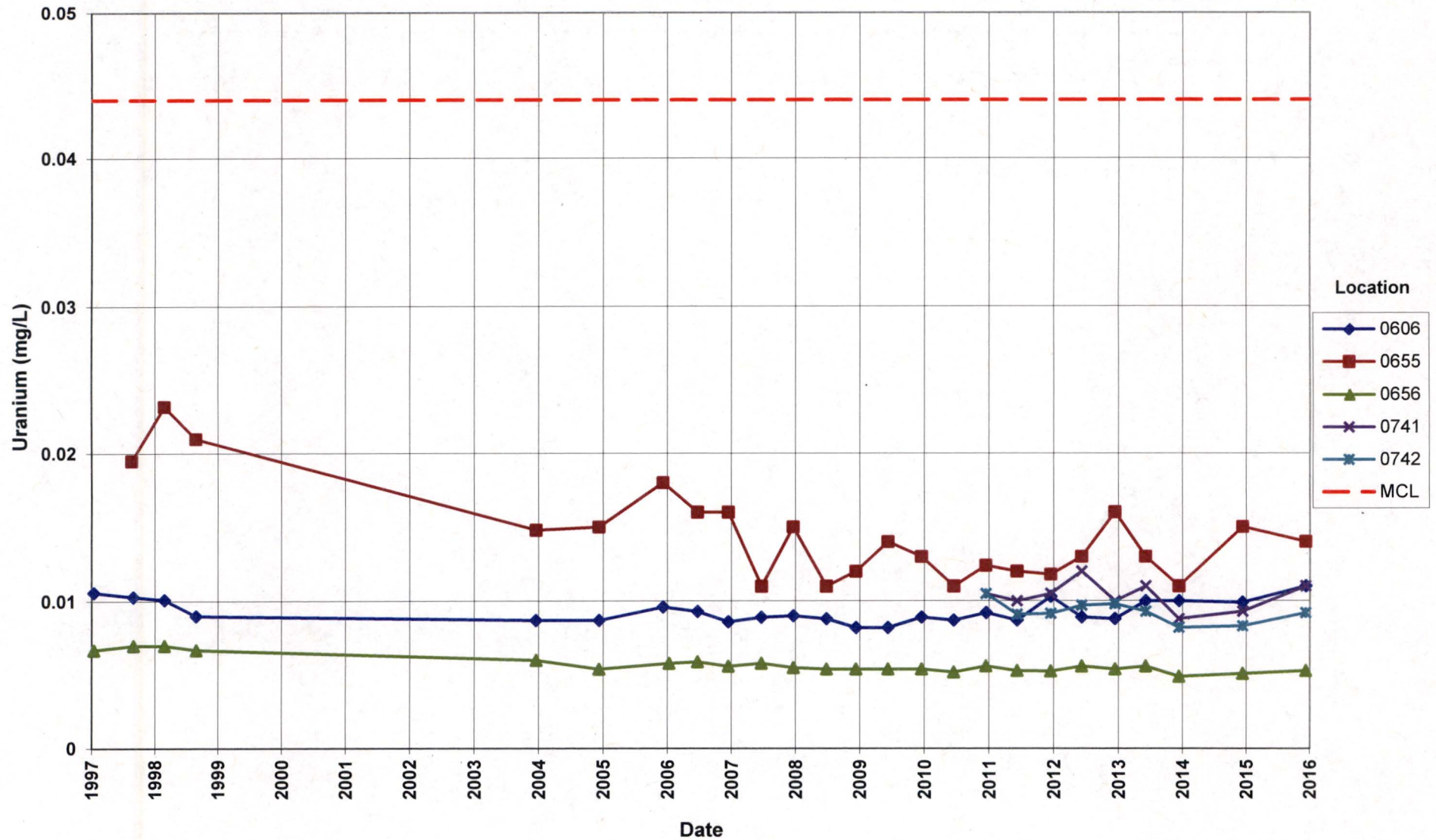
Proposed Cleanup Standard = 250 mg/L



# **Monument Valley Processing Site** **Sulfate Concentration** Proposed Cleanup Standard = 250 mg/L

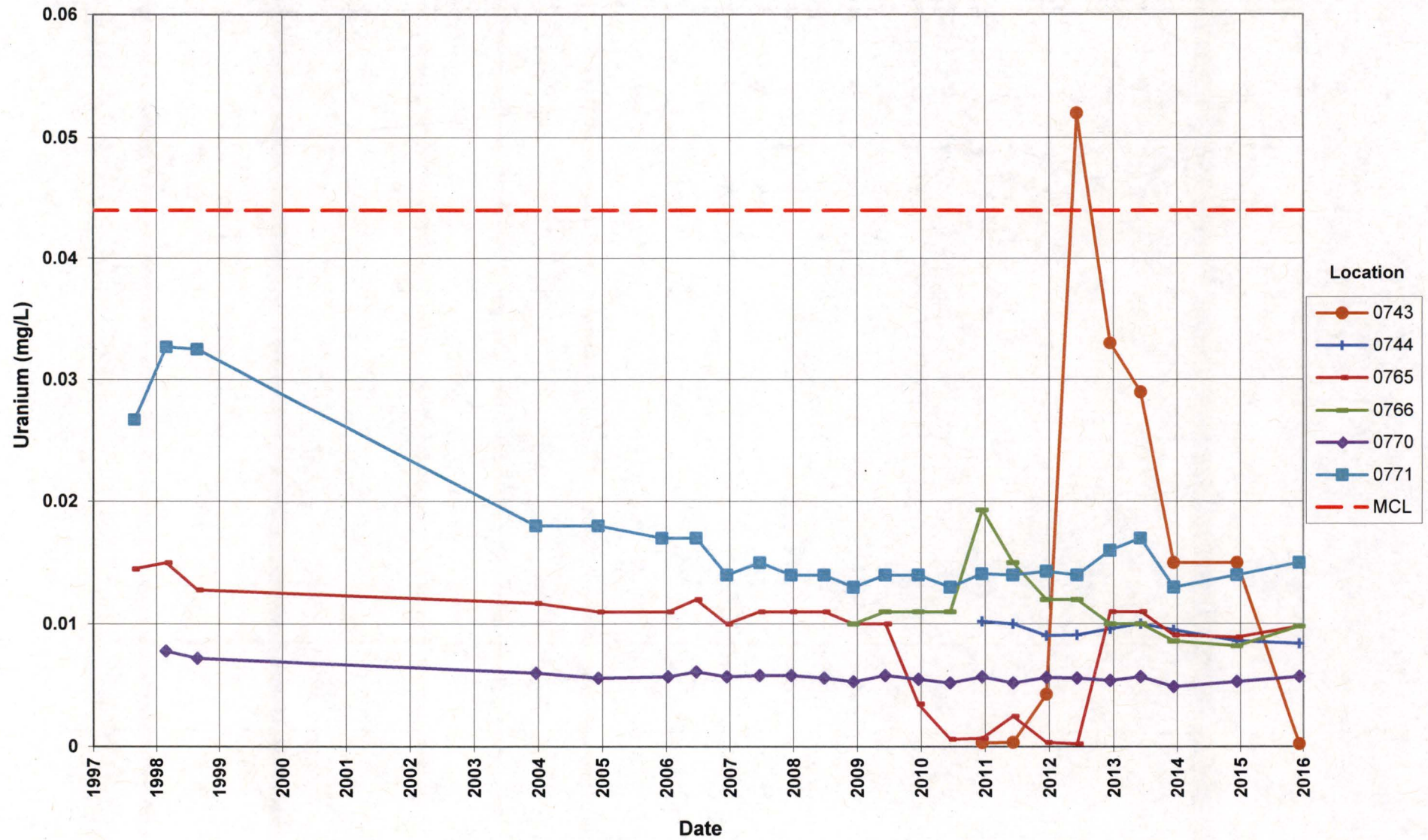


**Monument Valley Processing Site**  
**Uranium Concentration**  
Maximum Concentration Limit (MCL) = 0.044 mg/L

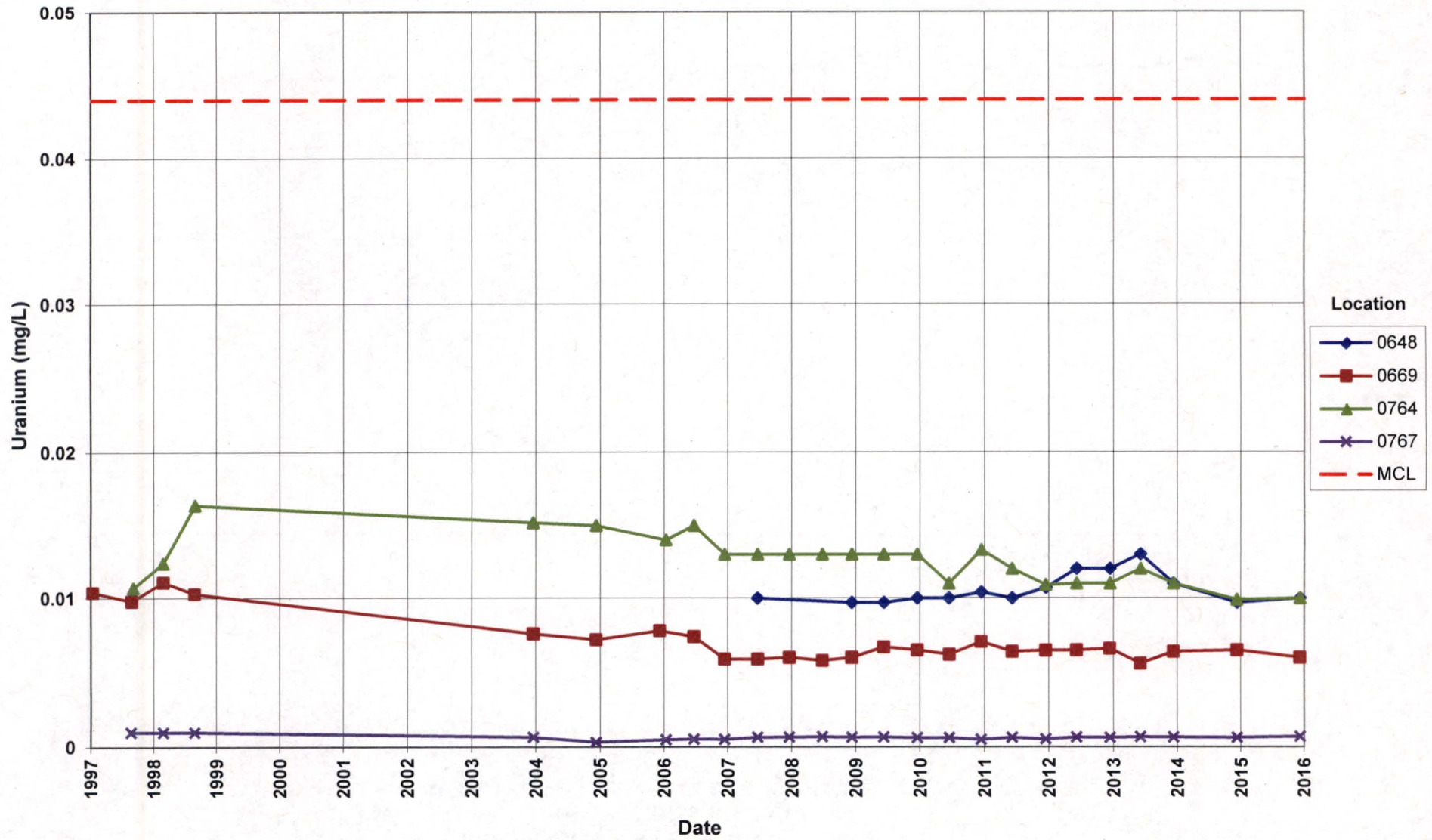




**Monument Valley Processing Site**  
**Uranium Concentration**  
Maximum Concentration Limit (MCL) = 0.044 mg/L

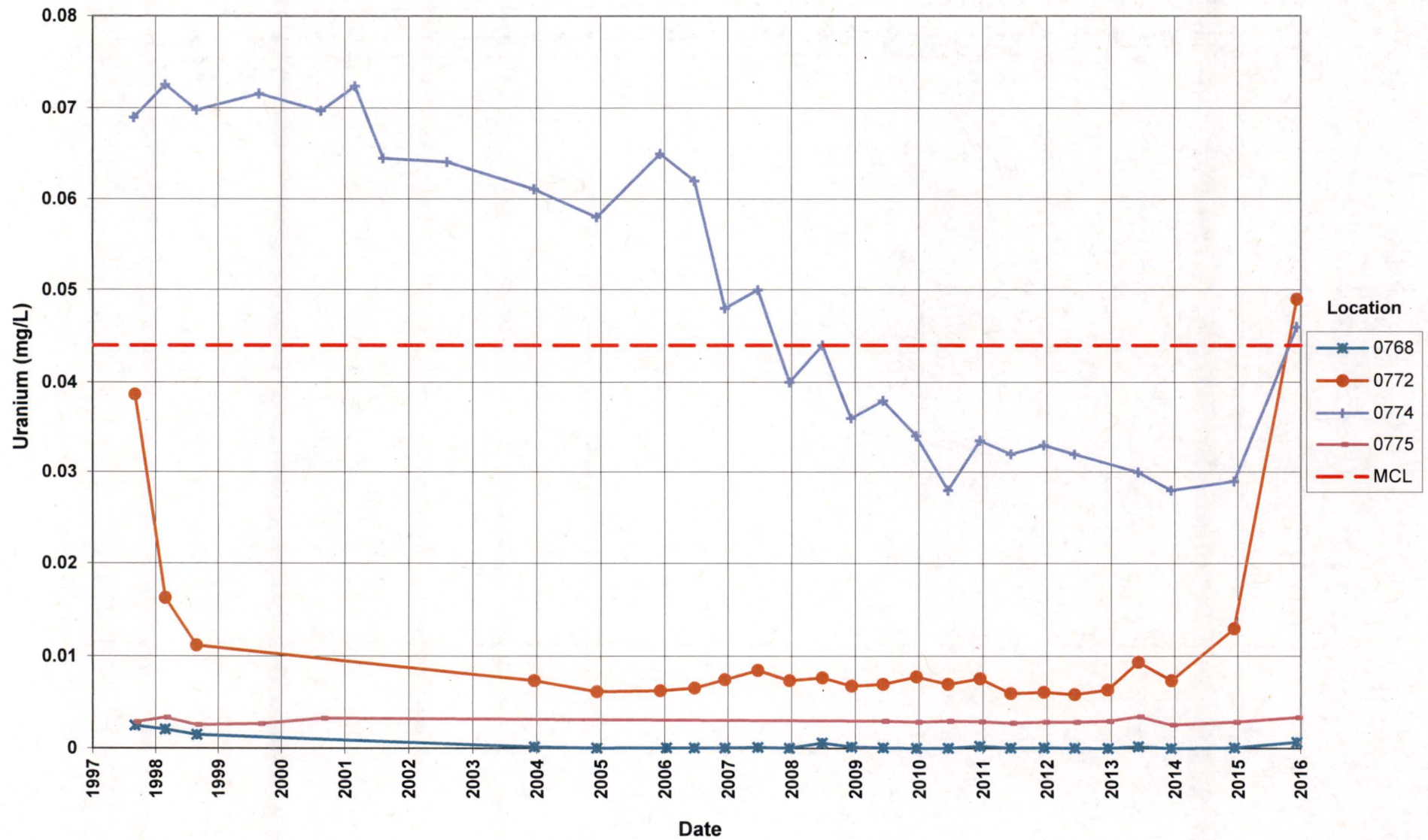


**Monument Valley Processing Site**  
**Uranium Concentration**  
Maximum Concentration Limit (MCL) = 0.044 mg/L

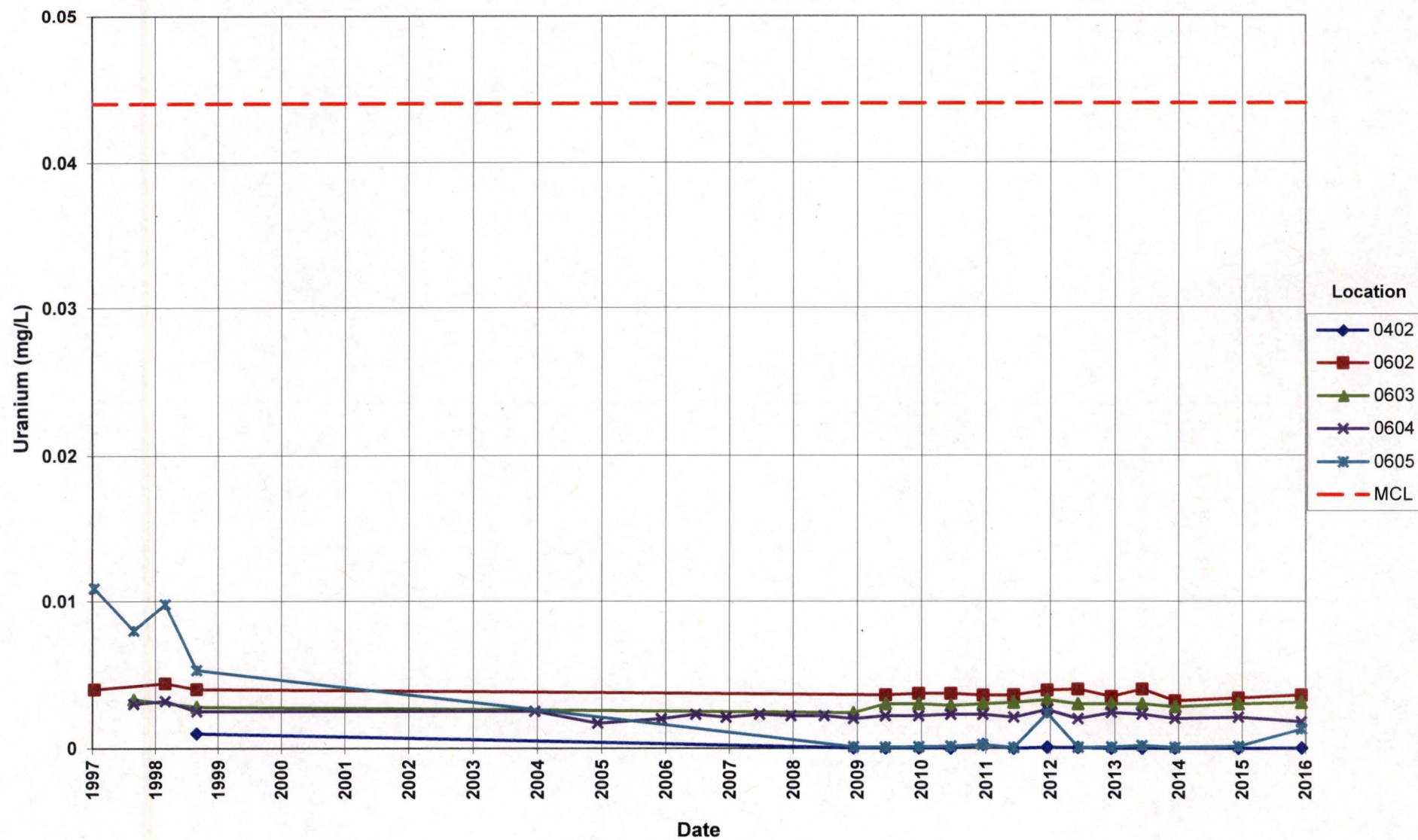




**Monument Valley Processing Site**  
**Uranium Concentration**  
Maximum Concentration Limit (MCL) = 0.044 mg/L

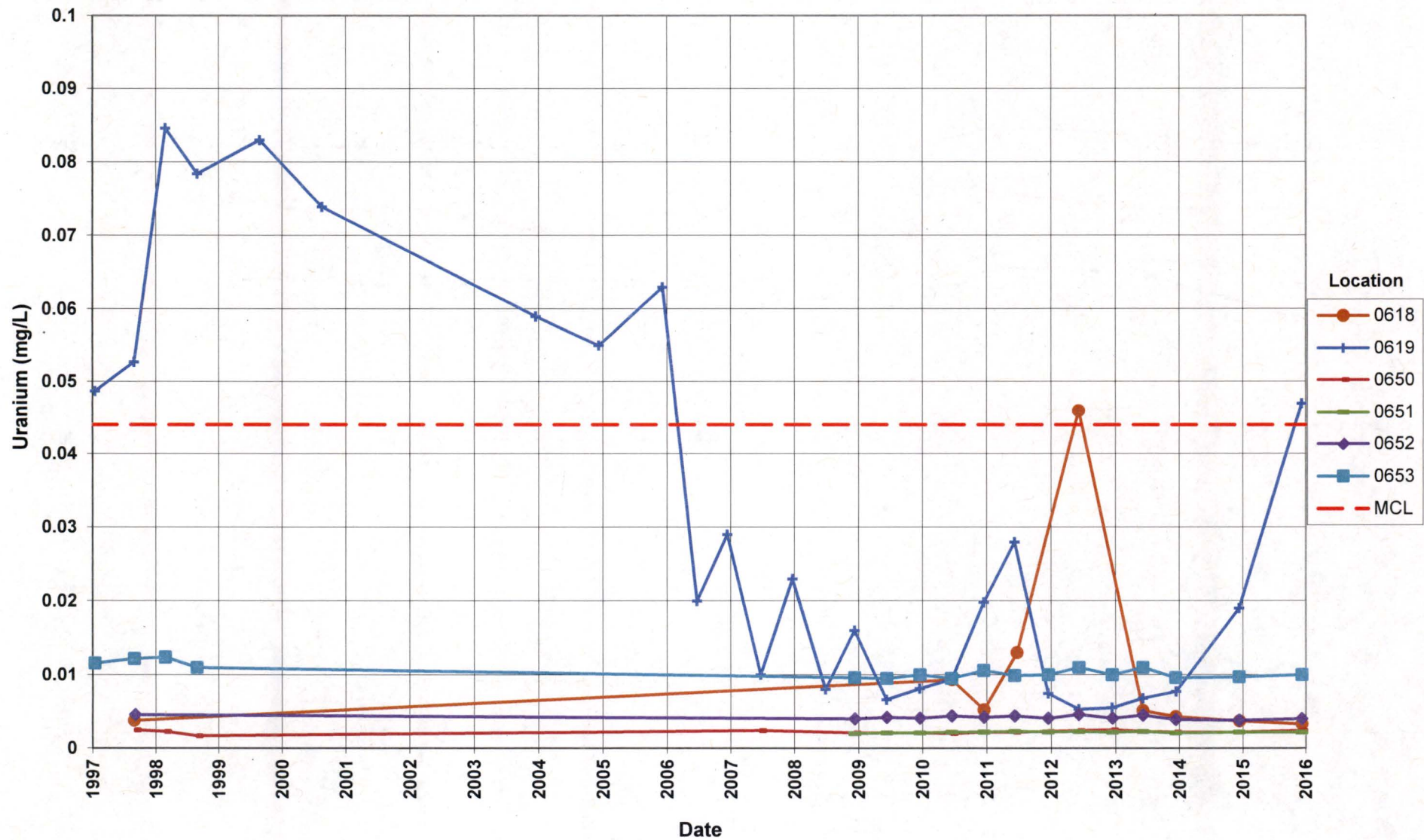


**Monument Valley Processing Site**  
**Uranium Concentration**  
Maximum Concentration Limit (MCL) = 0.044 mg/L

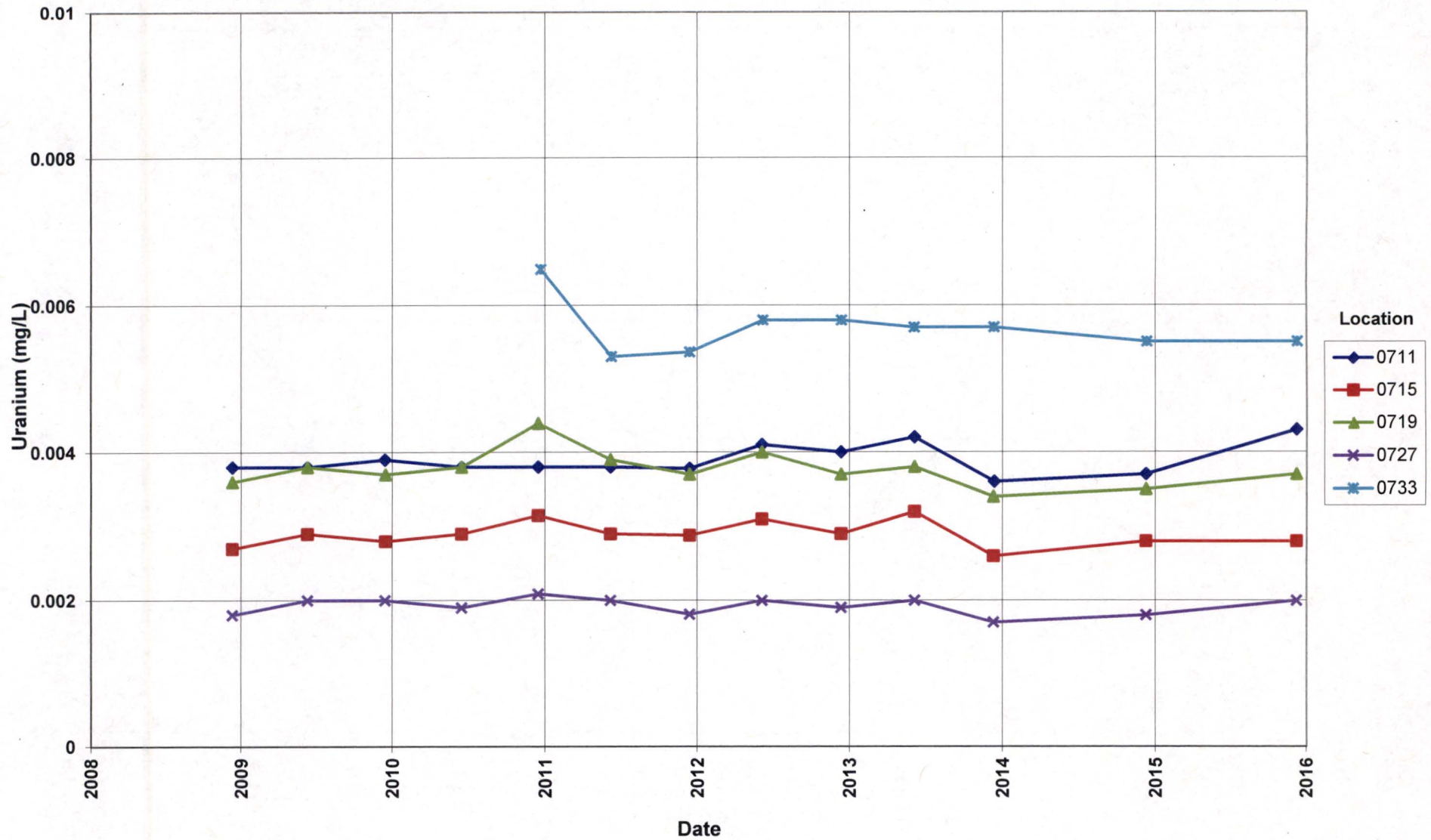




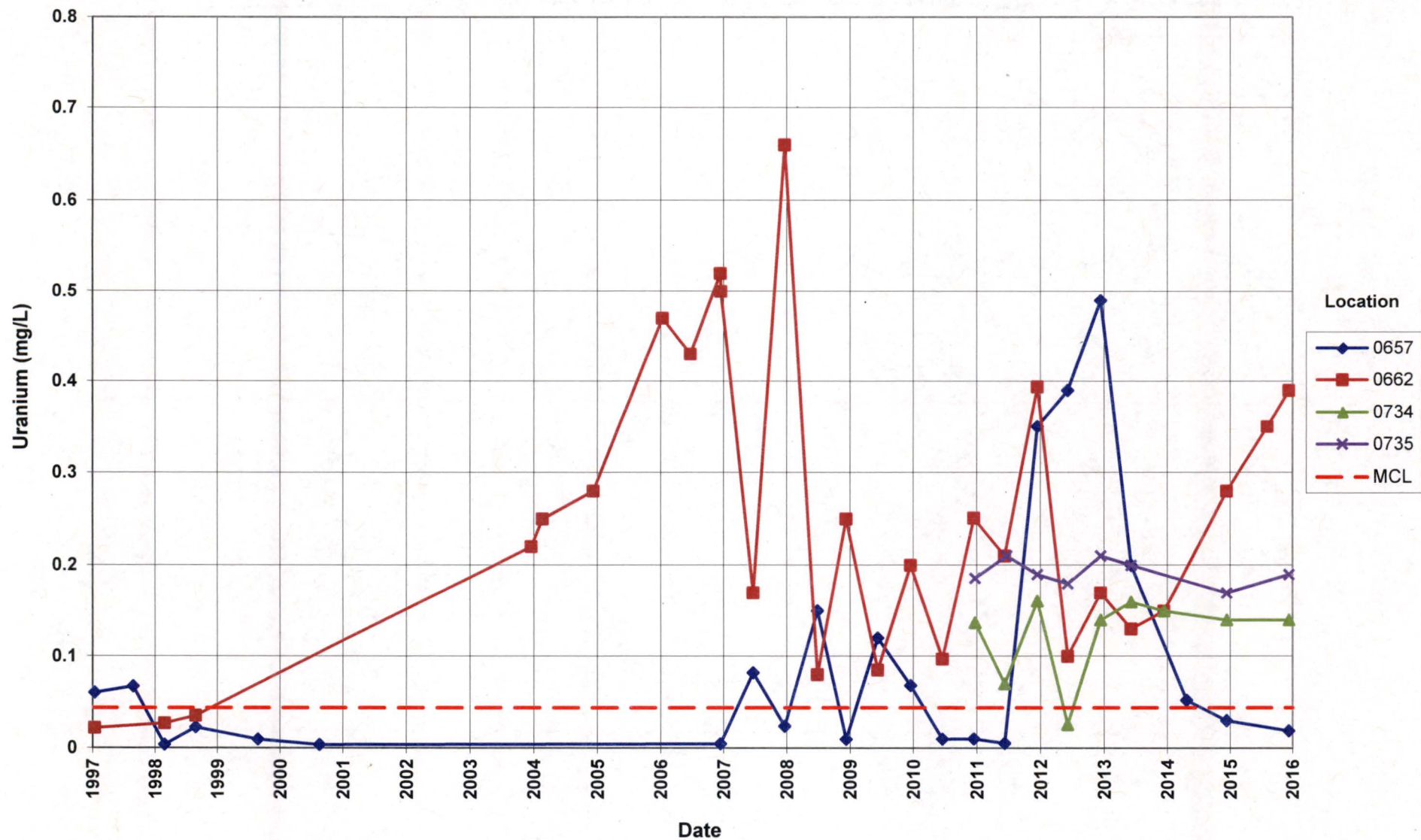
**Monument Valley Processing Site**  
**Uranium Concentration**  
Maximum Concentration Limit (MCL) = 0.044 mg/L



**Monument Valley Processing Site**  
**Uranium Concentration**  
Maximum Concentration Limit (MCL) = 0.044 mg/L

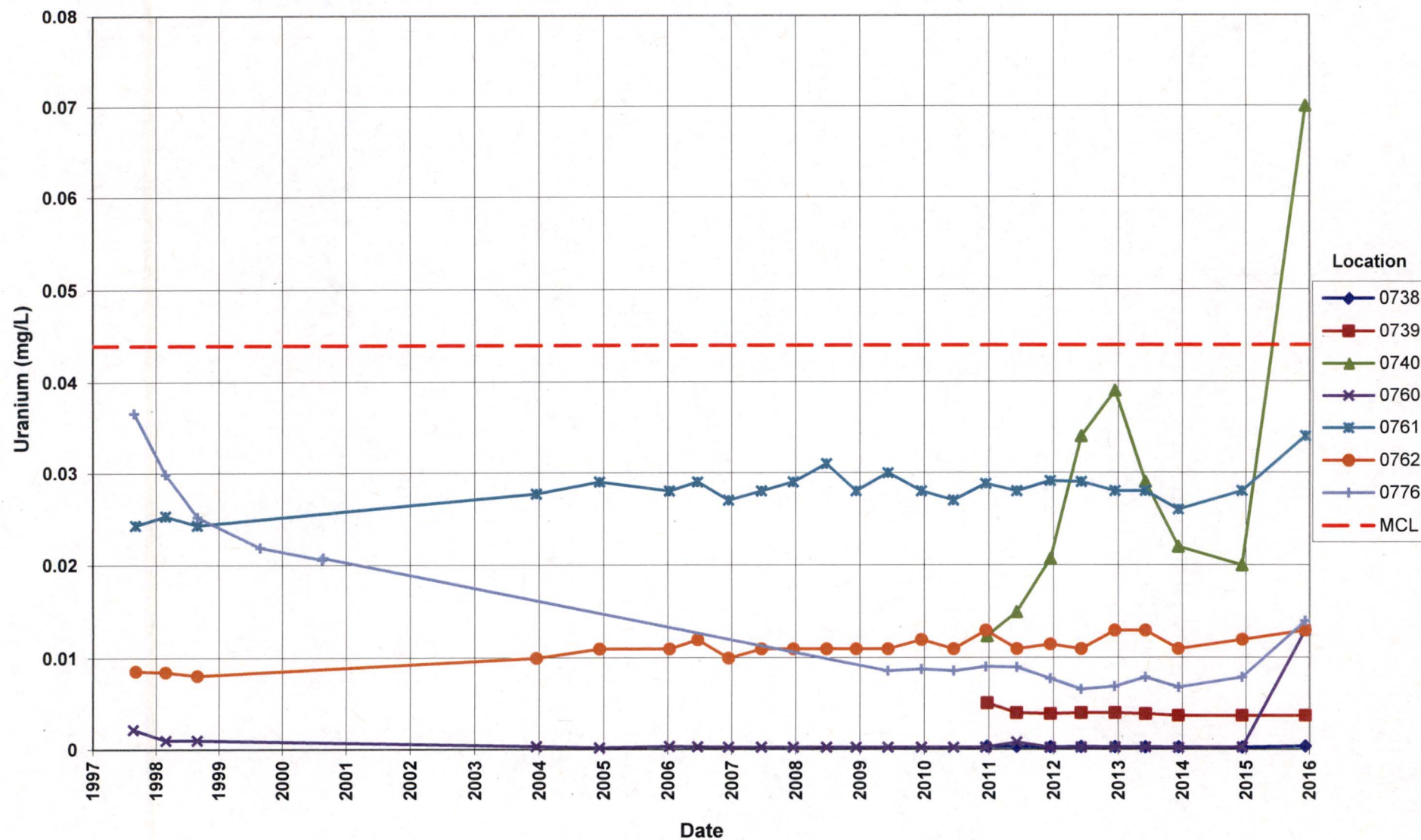


**Monument Valley Processing Site**  
**Uranium Concentration**  
Maximum Concentration Limit (MCL) = 0.044 mg/L

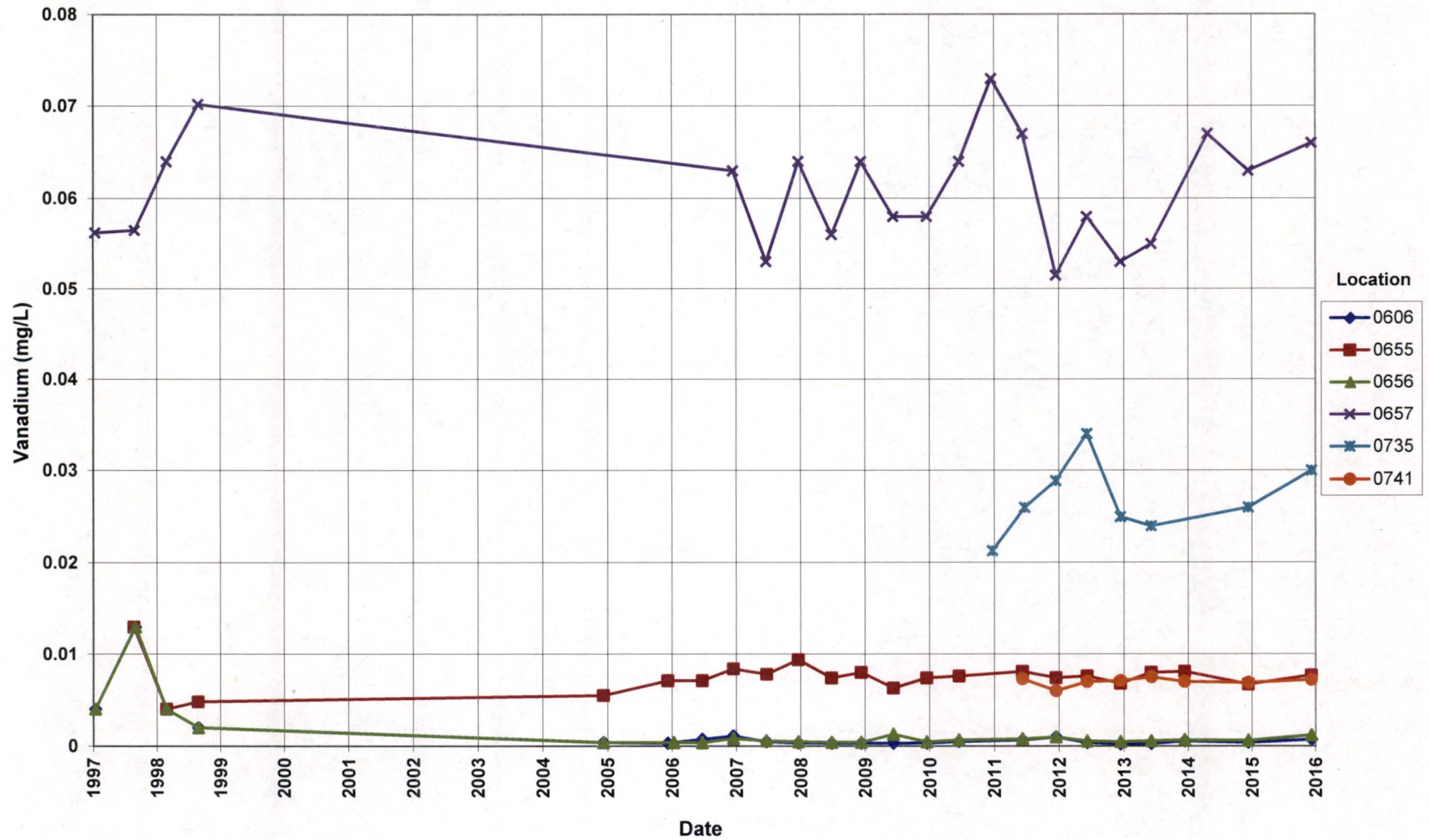




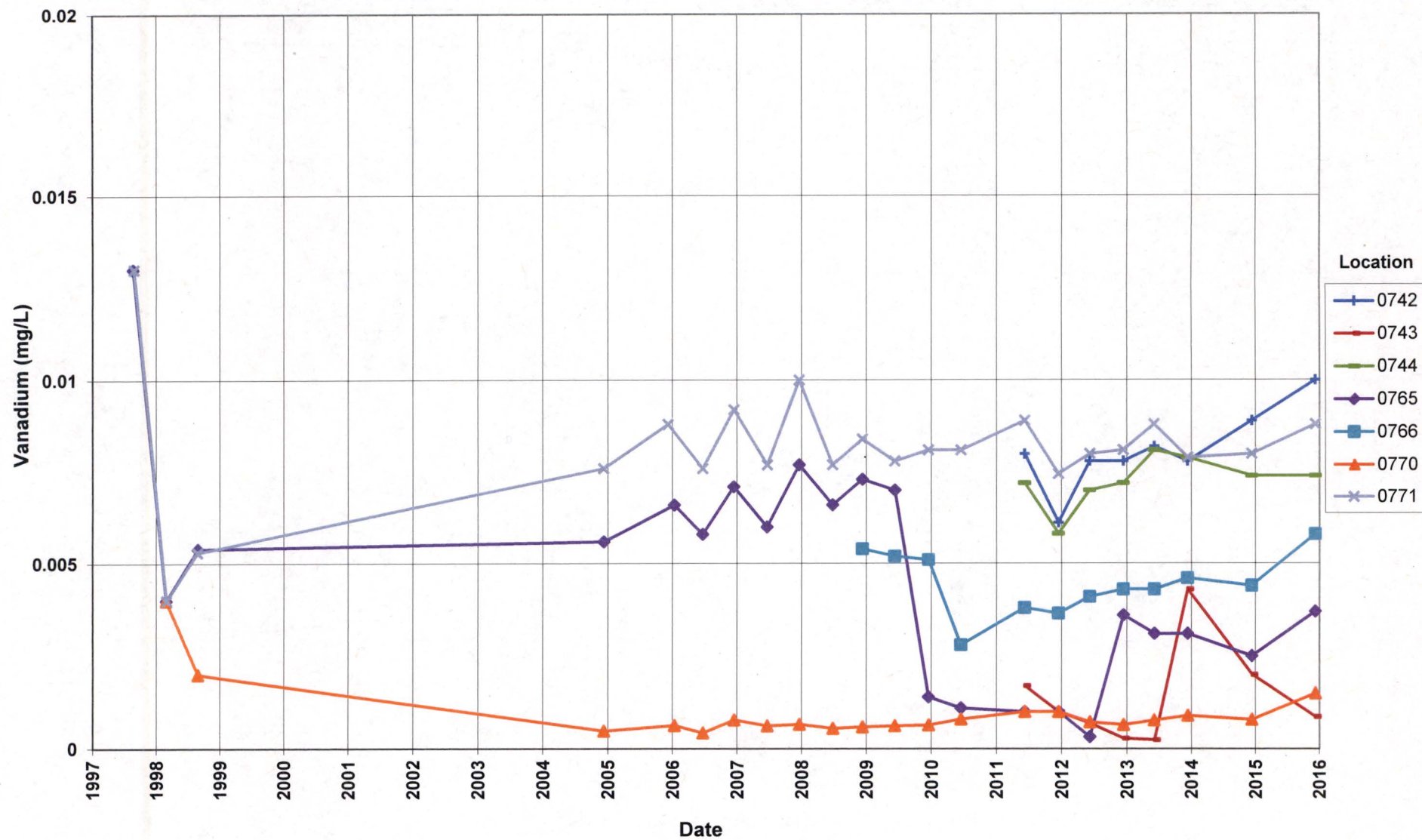
**Monument Valley Processing Site**  
**Uranium Concentration**  
Maximum Concentration Limit (MCL) = 0.044 mg/L



# Monument Valley Processing Site Vanadium Concentration

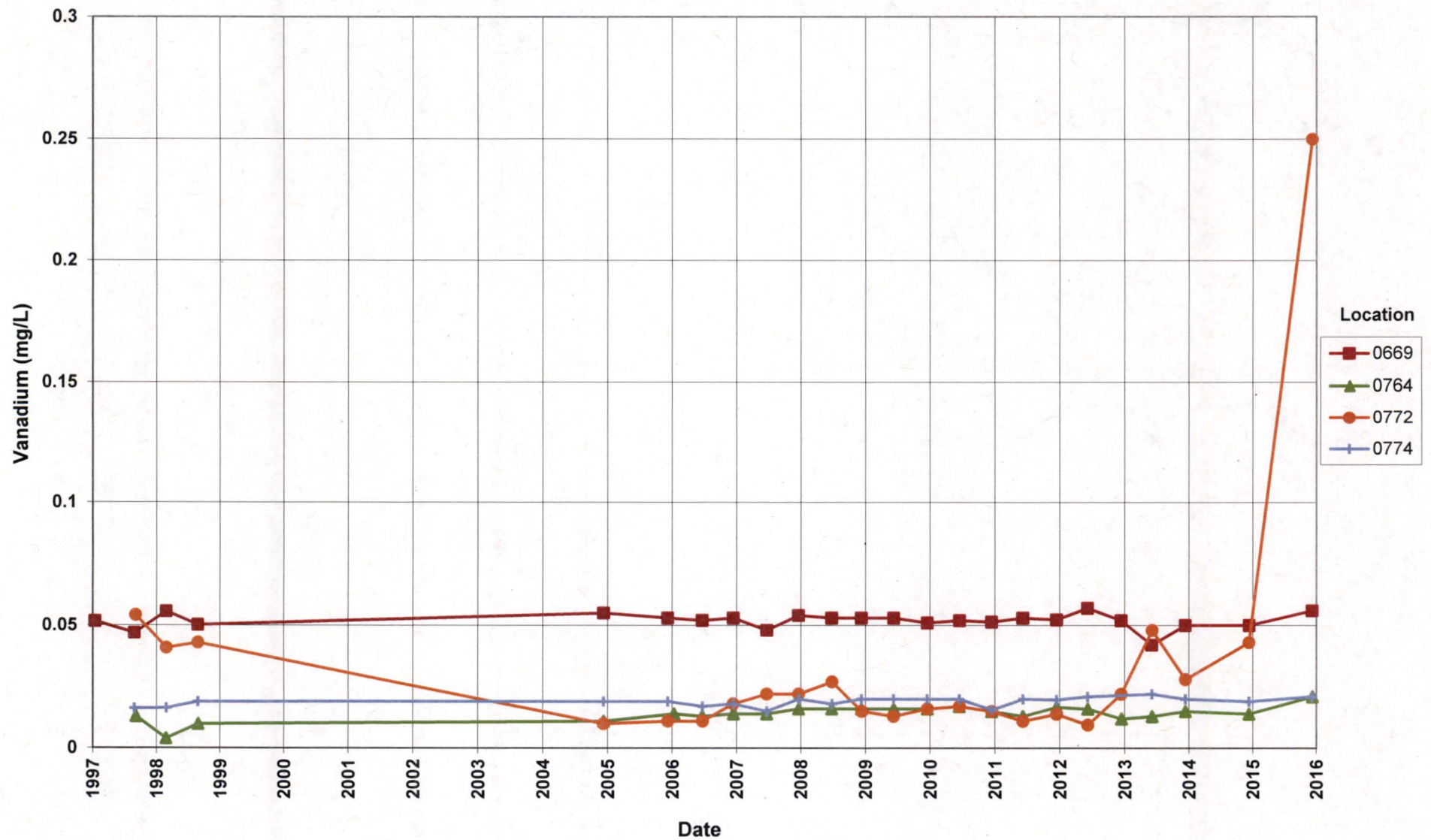


# Monument Valley Processing Site Vanadium Concentration

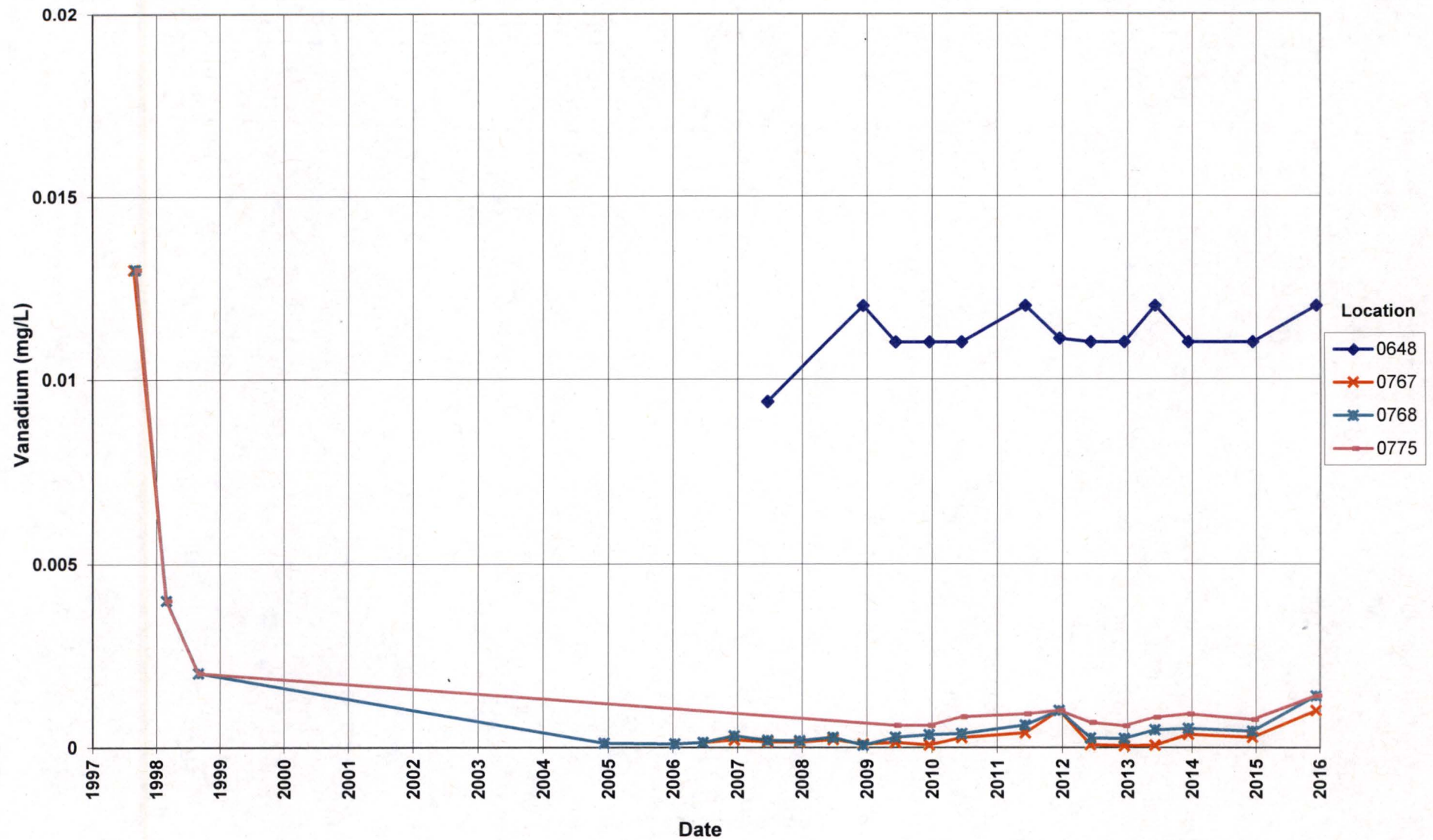




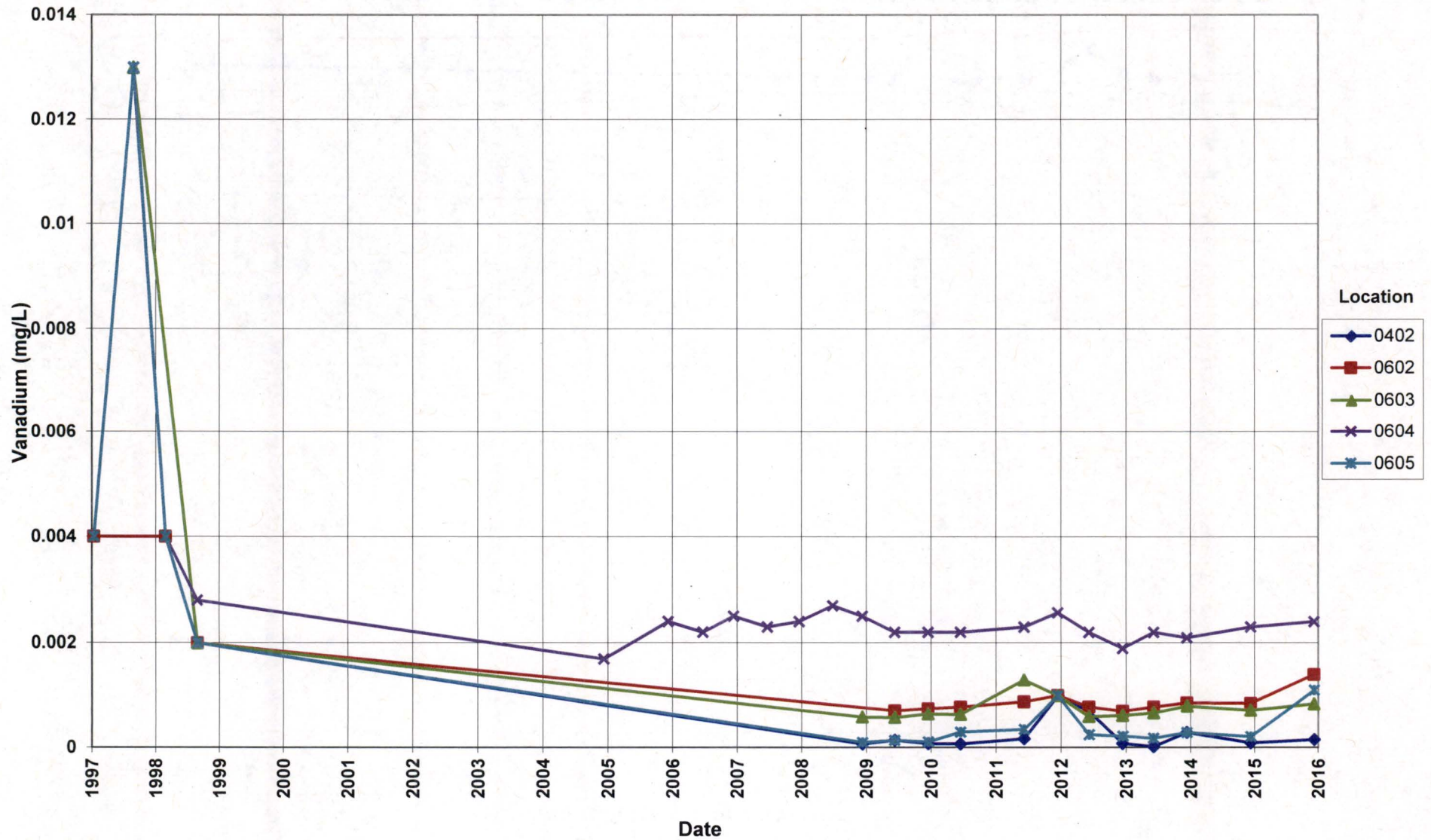
# Monument Valley Processing Site Vanadium Concentration



# Monument Valley Processing Site Vanadium Concentration

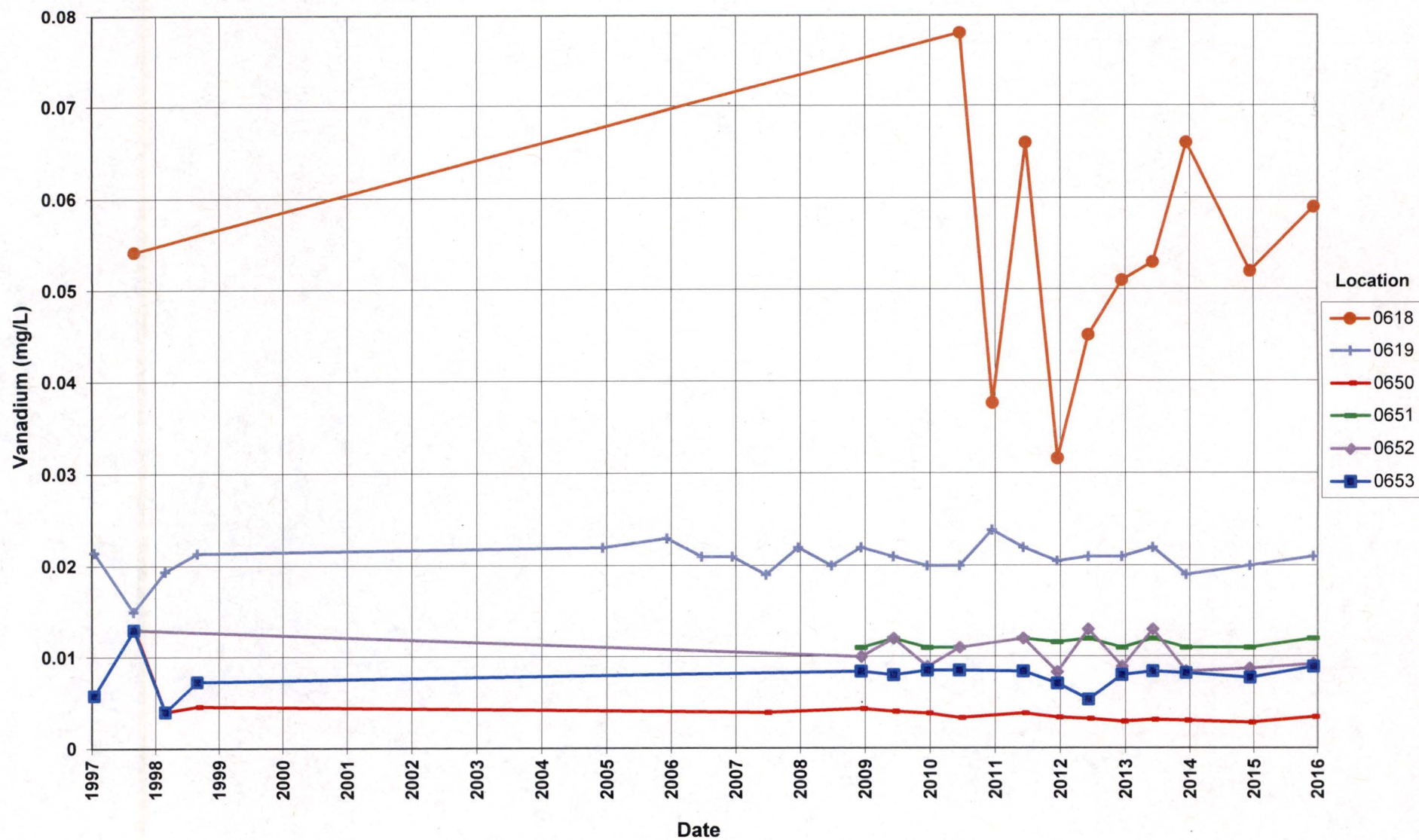


# Monument Valley Processing Site Vanadium Concentration

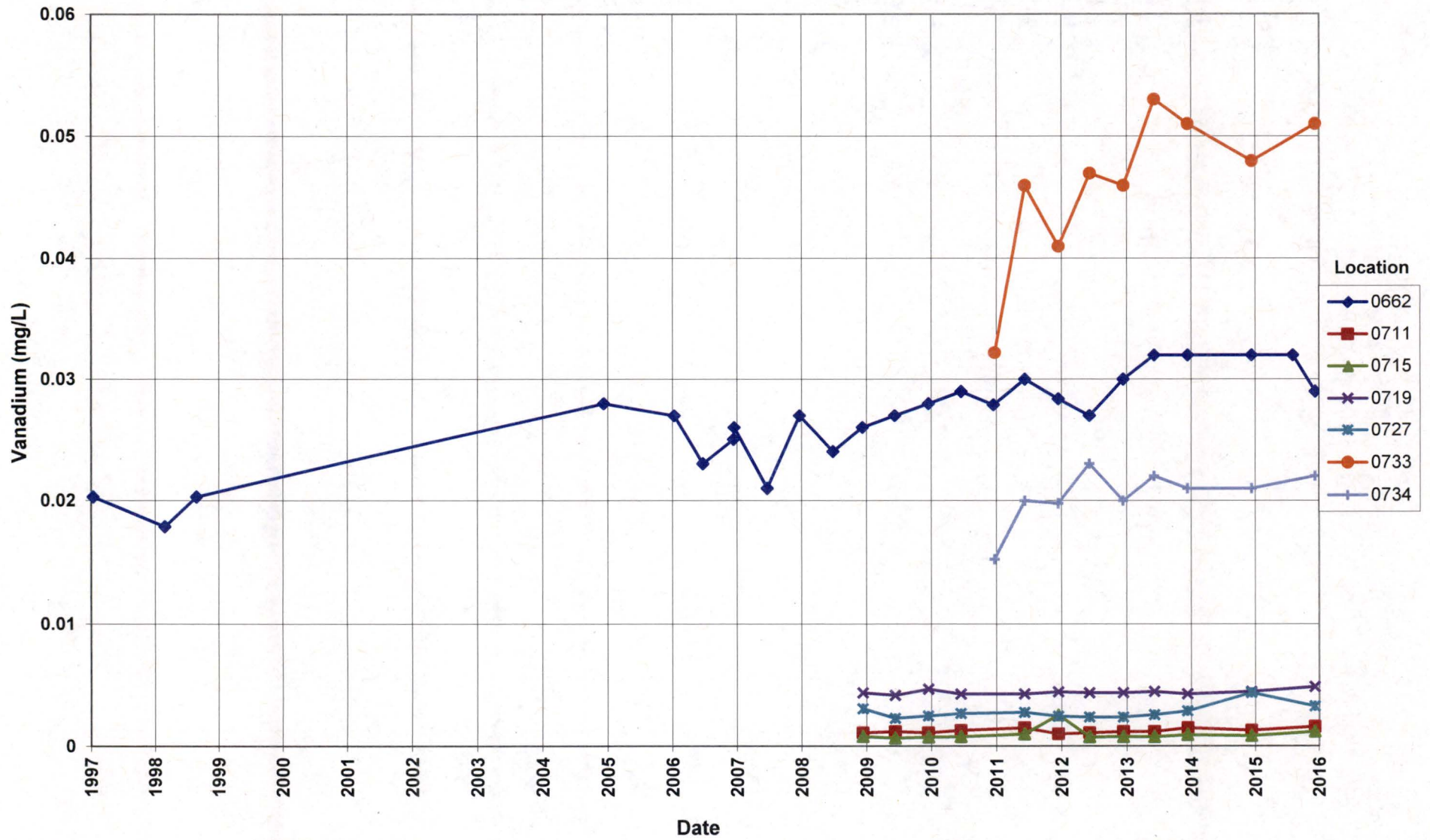




# Monument Valley Processing Site Vanadium Concentration

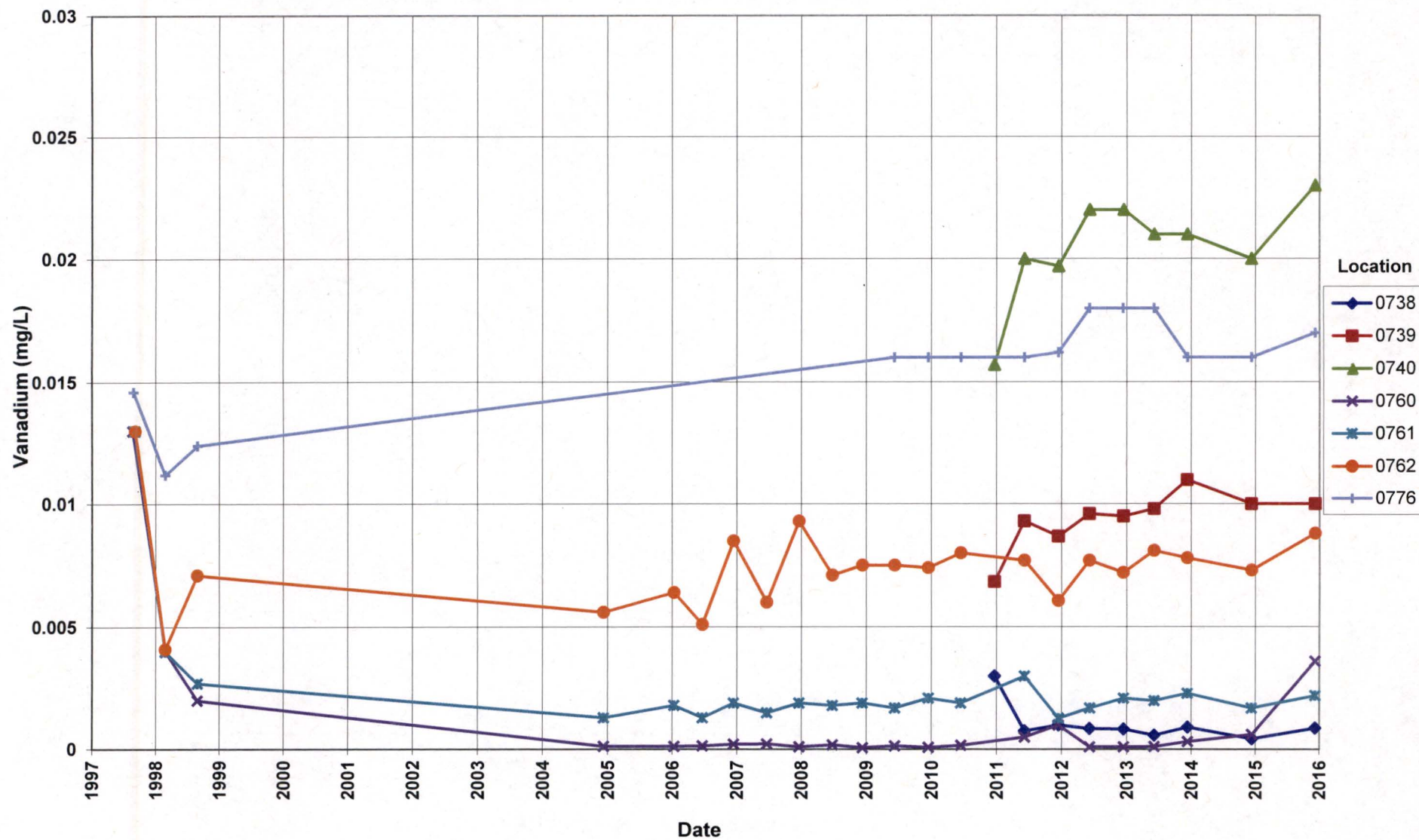


# Monument Valley Processing Site Vanadium Concentration





# Monument Valley Processing Site Vanadium Concentration





## **Attachment 3**

# **Sampling and Analysis Work Order**

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November 5, 2015

Task Assignment 103  
Control Number 16-0085

U.S. Department of Energy  
Office of Legacy Management  
ATTN: Angelita Denny  
Site Manager  
2597 Legacy Way  
Grand Junction, CO 81503

SUBJECT: Contract No. DE-LM0000421, Navarro Research & Engineering, Inc. (Navarro)  
Task Assignment 103 LTS&M-UMTRCA TI & TII Sites, D&D Sites, Other  
Sites and Other  
December 2015 Environmental Sampling at the Monument Valley, Arizona,  
Processing Site

REFERENCE: Task Assignment 103, 1-103-1-02-114; Monument Valley, Arizona, Processing  
Site

Dear Ms. Denny:

The purpose of this letter is to inform you of the upcoming sampling event at the Monument Valley, Arizona, processing site. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Monument Valley site. Water quality data will be collected from this site as part of the routine environmental sampling currently scheduled to begin the week of December 7, 2015.

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

**Monitoring Wells\***

402 Al	648 Al	662 Al	735 Al	760 Al	768 Al
602 Al	650 Al	669 Al	738 Al	761 Al	770 Al
603 Al	651 Al	711 Nr	739 Al	762 Al	771 Al
604 Al	652 Al	715 Nr	740 Al	764 Al	772 Al
605 Al	653 Al	719 Nr	741 Al	765 Al	774 Al
606 Al	655 Al	727 Nr	742 Al	766 Al	775 Dc
618 Al	656 Al	733 Al	743 Al	767 Al	776 Dc
619 Dc	657 Dc	734 Al	744 Al		

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

**Surface Location**

Angelita Denny  
Control Number 16-0085  
Page 2

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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/bkb

Enclosures (3)

cc: (electronic)

Christina Pennal, DOE  
Jeff Carman, Navarro  
Beverly Cook, Navarro  
Steve Donovan, Navarro  
Lauren Goodknight, Navarro  
David Miller, Navarro  
EDD Delivery  
rc-grand.junction  
File: MON 400.02

**Sampling Frequencies for Locations at  
Monument Valley, Arizona**

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
<b>Monitoring Wells</b>						
402		X				
602		X				
603		X				
604		X				
605		X				
606		X				
618		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				
733		X				
734		X				
735		X				
738		X				
739		X				
740		X				
741		X				
742		X				
743		X				
744		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				
<b>Surface Locations</b>						
623		X				

Sampling conducted in December and June

### Constituent Sampling Breakdown

Site	Monument Valley		Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Analyte	Groundwater	Surface Water			
Approx. No. Samples/yr	68	1			
<i>Field Measurements</i>					
Alkalinity					
Dissolved Oxygen					
Redox Potential	X				
pH	X				
Specific Conductance	X				
Turbidity	X				
Temperature	X				
<i>Laboratory Measurements</i>					
Aluminum					
Ammonia as N (NH <sub>3</sub> -N)	X	X	0.1	EPA 350.1	WCH-A-005
Arsenic			0.0001	SW-846 6020	LMM-02
Calcium					
Chloride	X	X	0.5	SW-846 9056	MIS-A_039
Chromium					
Gross Beta					
Iron			0.05	SW-846 6020	LMM-02
Lead					
Magnesium			5	SW-846 6010	LMM-01
Manganese			0.005	SW-846 6010	LMM-01
Molybdenum			0.003	SW-846 6020	LMM-02
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO <sub>3</sub> +NO <sub>2</sub> )-N	X	X	0.05	EPA 353.1	WCH-A-022
Potassium			1	SW-846 6010	LMM-01
Selenium					
Silica					
Sodium			1	SW-846 6010	LMM-01
Strontium					
Sulfate	X	X	0.5	SW-846 9056	MIS-A-044
Sulfide					
Total Dissolved Solids					
Total Organic Carbon					
Uranium	X	X	0.0001	SW-846 6020	LMM-02
Vanadium	X	X	0.0003	SW-846 6020	IMM-02
Zinc					
Total No. of Analytes	6	6			

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

DATE: December 22, 2015

TO: David Miller

FROM: Samantha Tigar

SUBJECT: Trip Report

Site: Monument Valley, Arizona, Processing Site

Dates of Sampling Event: December 7 – 10, 2015

Team Members: Jennifer Graham, Rob Rice, Dan Sellers, and Samantha Tigar. David Miller was present December 9, 2015.

Number of Locations Sampled: Samples were collected from all 46 of the locations identified on the sampling notification letter and from six new locations (0699, 0700, 0701, 0702, 0703, and 0704) as requested by Ray Johnson.

### Location Specific Information:

Location IDs	Comments
0662, 0699, 0700, 0701, 0702, 0703, 0704	In addition to the regular bottle set, a sulfide sample and field measurements for dissolved oxygen, ferrous iron, and total iron were to be collected at these locations.
0727	3/8" tubing was replaced with 3/16" tubing.
0618	Extensive beehive in well (See photo 1).
0735	Listed as a Category II well but met stability criteria and was sampled as a Category I well.
0699, 0703, 0704	Installed 3/16" ID dedicated tubing attached to 20mL volume bladder pumps.
0700, 0701	Wells were set up with 3/16" ID dedicated tubing for use with a hand crank.
0702	Well was set up with 1/4" ID dedicated tubing for use with a peristaltic pump. Tubing must be re-inserted several times during sample collection.
0606	Listed as a Category II well, but did not draw down at 233 mL/min.

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

False ID	Ticket Number	True ID	Sample Type	Associated Matrix
2079	NMR 040	0740	Duplicate	Groundwater
2251	NMR 060	0648	Duplicate	Groundwater
2711	NMR 031	0605	Duplicate	Groundwater

**Requisition Index Number (RIN) Assigned:** Samples were assigned to RIN 15117527. Field data sheets can be found in \\crow\RAApps\SMS\15117527\FieldData.

**Sample Shipment:** Samples were shipped overnight via FedEx from Moab, UT, to ALS Laboratory Group in Fort Collins, CO, on December 10, 2015.

**Water Level Measurements:** Water levels were measured in all sampled wells.

**Well Inspection Summary:** See Future Actions Required or Suggested section below.

**Sampling Method:** Samples were collected according to the *Sampling and Analysis Plan (SAP)* for the U. S. Department of Energy Office of Legacy Management Sites (LMS/PRO/S04351, continually updated).

**Field Variance:** The following are deviations from the SAP.

Location IDs	Field Variance
0606	Turbidity was not recorded.
0618	Water level stability could not be verified at this Category I well due to debris from a large beehive falling into the well (see photo 1).
0623	Surface water sample was taken slightly downstream due to water being frozen.
0651	Could not establish flow rate below 500mL/min at this Category I well.
0700, 0701, 0702	Could not verify stabilization criteria, turbidity requirements were not met, and dissolved oxygen levels could not be measured.
0699, 0703, 0733, 0734, 0735, 0741, 0744, 0760	Turbidity requirements could not be met at these Category I wells, samples were filtered.

**Equipment:** All equipment functioned properly.

**Stakeholder/Regulatory/DOE:** Angelita Denny (DOE) and Joni Nofchissey (Navajo UMTRA/AML) observed sampling on December 9, 2015.

**Institutional Controls:**

**Fences, Gates, and Locks:** All gates were locked and in good condition.

**Signs:** No issues were observed.

**Trespassing/Site Disturbances:** None observed.

**Disposal Cell/Drainage Structure Integrity:** N/A

**Safety Issues:** None.

**Access Issues:** None.

**General Information:** Nothing to note.

**Immediate Actions Taken:** Beehive removed from well 0618.

**Future Actions Required or Suggested:** Numerous well maintenance issues were identified that require action. Wells 0605, 0733, 0734, 0735, 0741, 0744, and 0760 need to be redeveloped.

David Miller  
December 22, 2015  
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The screen at 0741 is likely broken based on excessive turbidity readings ( $>1000\text{NTU}$ ). At locations 0733 and 0734, the sand underneath the well pads has been eroded. The bladder pump at location 0651 appears to have a faulty check valve and location 0768 needs to have its inner tubing and pump head tubing replaced.



*Photo 1. Beehive in well 0618*

ST/lcg

cc: (electronic)  
Angelita Denny, DOE  
Steve Donovan, Navarro  
David Miller, Navarro  
EDD Delivery

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