



# 2017 Annual Groundwater Monitoring and Corrective Action Report

*CCR Annual Monitoring Report*

*Ash Disposal Area*

*Big Stone Plant*

*Big Stone City, South Dakota*

Prepared for  
Otter Tail Power Company

January 2018

# 2017 CCR Annual Groundwater Monitoring and Corrective Action Report

## Ash Disposal Area

### Big Stone Plant Big Stone City, South Dakota

January 2018

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## Acronyms

<b>Acronym</b>	<b>Description</b>
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
OTP	Otter Tail Power Company
SSI	Statistically Significant Increase

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## 1.0 Introduction

Otter Tail Power Company (OTP) operates Big Stone Plant, a coal-fired generation unit near Big Stone City, South Dakota (Figure 1). Coal combustion residuals (CCR) from plant operations are placed in an on-site landfill, referred to as the Ash Disposal Area. The Ash Disposal Area is required to comply with the provisions of the US Environmental Protection Agency (EPA) CCR Rule (40 CFR Parts 257 and 261 Disposal of Coal Combustion Residuals From Electric Utilities) for existing CCR landfills. The location of the CCR unit (Ash Disposal Area) is shown on Figure 1.

This 2017 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) describes the monitoring program and results for the Ash Disposal Area at Big Stone Plant (Site).

### 1.1 Purpose

As stated in Section §257.90(e), the purpose of the Annual Report is to:

- Document the status of monitoring and corrective action program for the CCR unit
- Summarize key actions completed
- Describe any problems encountered
- Discuss actions to resolve the problems
- Highlight key activities for the upcoming year

### 1.2 Status of the Groundwater Monitoring and Corrective Action Program

Baseline monitoring was completed prior to October 17, 2017. The evaluation of groundwater monitoring data for statistically significant increases over background levels for the constituents listed in Appendix III from the CCR Rule began on October 17, 2017.

### 1.3 CCR Rule Requirements

This Annual Report has been prepared in accordance with the requirements of §257.90(e) of the CCR Rule, as outlined in the following Table 1.

Table 1 CCR Rule Requirements

CCR Rule Reference	Content Required in Report	Location
§257.90(e)(1)	Map showing the CCR unit and all monitoring wells that are part of the groundwater monitoring system	Section 2.1.1 Documentation - see Figure 1
§257.90(e)(2)	Discuss any new or decommissioned monitoring wells	Section 2.1.2 Changes to Monitoring System
§257.90(e)(3)	Provide the number and date groundwater samples were collected, and the monitoring (i.e., detection or assessment)	Section 2.2 Monitoring and Analytical Results
§257.90(e)(4)	Discuss any transition between monitoring programs	Section 2.4 Key Activities for Upcoming Year
§257.90(e)(5)	Other information specified in §257.90 through §257.98	Other information not required in this report.

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## 2.0 Groundwater Monitoring and Corrective Action Program

This section documents the status of the groundwater monitoring and corrective action program for the CCR unit for the period starting with the effective date of the Rule through the end of 2017. The groundwater monitoring system is described in Section 2.1, the monitoring and analytical results are described in Section 2.2, key actions completed and problems encountered are described in Section 2.3, and key activities planned for 2018 are described in Section 2.4.

### 2.1 Groundwater Monitoring System

#### 2.1.1 Documentation

Figure 1 shows an aerial image of the CCR unit and all background (or upgradient) and downgradient monitoring wells, including the well identification numbers, that are part of the groundwater monitoring program, as required by §257.90(e)(1). Further details on the monitoring system and the CCR unit monitoring wells are included in the Groundwater Monitoring System Report, Big Stone Plant Ash Disposal Area (Barr, 2016).

#### 2.1.2 Changes to Monitoring System

The groundwater monitoring system was unchanged in 2017.

### 2.2 Monitoring and Analytical Results

CCR Rule provisions §257.90(e)(3) and §257.94(b) require collection of eight independent samples to establish background water quality for the detection monitoring program. A total of 48 (six monitoring wells for eight sampling events) groundwater samples were collected and analyzed for the constituents listed in Appendices III and IV (Part 257) before October 17, 2017. Dates of sampling are reported on the field data sheets and analytical laboratory reports in Appendix A.

### 2.3 Key Actions Completed/Problems Encountered

The following key actions were completed for the groundwater monitoring program through 2017:

- Baseline groundwater samples were collected and analyzed for the constituents listed in Appendices III and IV from the CCR Rule.
- A statistical method was selected for evaluating groundwater monitoring data by a qualified professional engineer in 2017.

There was insufficient recharge at monitoring well H4OX to sample Appendices III and IV (Part 257) constituents during the September 7, 2016 sampling event. Monitoring well H4OX was later resampled and no problems were reported.

---

## 2.4 Key Activities for Upcoming Year

The following key groundwater monitoring program activities are planned for 2018:

- Evaluate analytical results from the 2018 semiannual detection monitoring events for statistically significant increases (SSIs) according to the CCR Groundwater Sampling and Analysis Plan (Carlson McCain, 2017).
- Continue the groundwater monitoring program in accordance with the CCR rule.



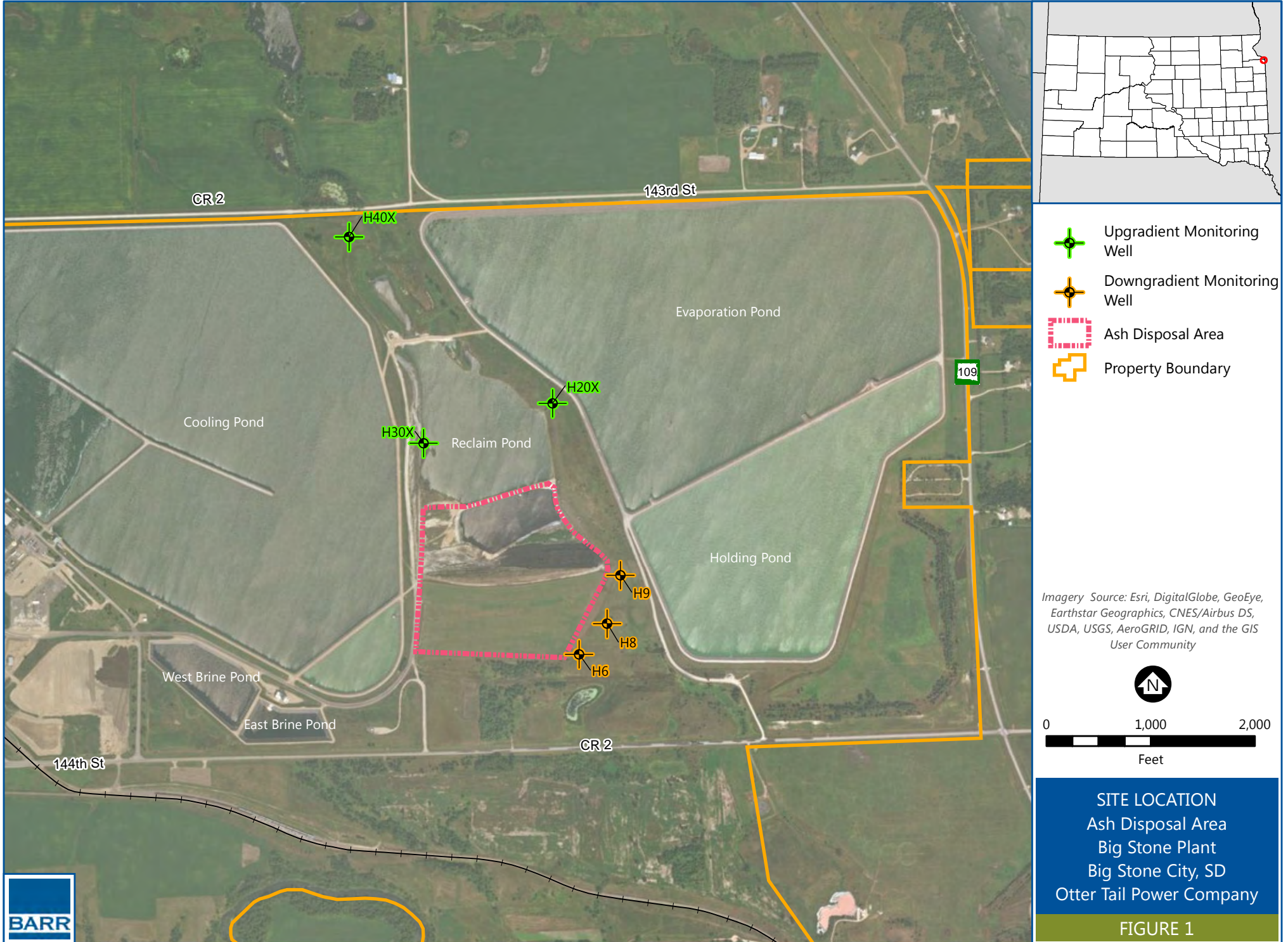
---

## 3.0 References

Barr, 2016, Groundwater Monitoring System Report, Big Stone Plant Ash Disposal Area. Prepared for Otter Tail Power Company. December 2016.

Carlson McCain, 2017. CCR Groundwater Sampling and Analysis Plan (Including Statistical Method Selection and Certification), Big Stone Plant Ash Disposal Area. Prepared for Otter Tail Power Company. October 2017.

## Figures



Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**SITE LOCATION**  
Ash Disposal Area  
Big Stone Plant  
Big Stone City, SD  
Otter Tail Power Company

FIGURE 1



## Appendices

## Appendix A

### Laboratory Reports and Field Sheets



**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890  
2 North German St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890  
2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724  
1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
www.mvtl.com



FINAL REPORT COMPLETION DATE: 11 Oct 16 A/L

Date Reported: 5 Oct 2016

PAUL VUKONICH  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Work Order #: 31-0455  
Account #: 006106  
PO #: 48680

Project Name: BIG STONE PLANT CCR

T. J. [Signature] 6 Oct 16  
Field Service Manager/Date Reviewed  
[Signature] 05 Oct 2016  
Chemistry Lab Manager/Date Reviewed  
Margaret Baumgart 5 October 2016  
Quality Assurance Director/Date Reviewed

- RL = Reporting Limits
- NQ = Not Present, Qualitative Only
- PQ = Present, Qualitative Only
- ND = Not Determined

All data for this report has been approved by MVTL Laboratory Management.

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com



PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
Lab Number: 16-A46025
Work Order #: 31-0455
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 7 Sep 2016 12:30
Sampled By: MVTL FIELD PERSONNEL
Date Received: 8 Sep 2016 10:55
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H2OX

Temp at Receipt: 3.0C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include MS Water Digestions, Water Digestions, Appearance, Field, Temperature - Field, Specific Conductance, Fld, pH, Field, Radium 226, Radium 228, Sulfate, Chloride, Mercury, Solids, Total Dissolved, Calcium, Lithium, Barium, Beryllium, Chromium, Cobalt, Molybdenum, Boron, Antimony, Arsenic, Cadmium, Lead, Selenium, Thallium, Fluoride.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WR/DW # R-040



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Report Date: 5 Oct 2016
Lab Number: 16-A46025
Work Order #: 31-0455
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 7 Sep 2016 12:30
Sampled By: MVTl FIELD PERSONNEL
Date Received: 8 Sep 2016 10:55
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H2OX

Temp at Receipt: 3.0C

As Received Method Method Date
Result RL Reference Analyzed Analyst

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TWI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
# = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

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PAUL VUKONICH
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FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
Lab Number: 16-A46026
Work Order #: 31-0455
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 7 Sep 2016 13:16
Sampled By: MVTL FIELD PERSONNEL
Date Received: 8 Sep 2016 10:55
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H3OX

Temp at Receipt: 3.0C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include MS Water Digestions, Water Digestions, Appearance, Field, Water Elevation, Temperature - Field, Specific Conductance, Fld, pH, Field, pH, Radium 226, Radium 228, Sulfate, Chloride, Mercury, Solids, Total Dissolved, Calcium, Lithium, Barium, Beryllium, Chromium, Cobalt, Molybdenum, Boron, Antimony, Arsenic, Cadmium, Lead, Selenium, Thallium, Fluoride.

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

OL = Analysis performed by an Outside Laboratory.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TWI standards.
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@ = Due to sample matrix # = Due to concentration of other analytes
j = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1011-M ND WW/DW # R-040







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PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016  
 Lab Number: 16-A46028  
 Work Order #: 31-0455  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 7 Sep 2016 15:12  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 8 Sep 2016 10:55  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H8

Temp at Receipt: 3.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					9 Sep 16	TWB
Water Digestions					9 Sep 16	TWB
Appearance, Field	CLEAR		NA	SM 2110	7 Sep 16 15:12	DGF
Water Elevation	1073.00		NA	NA	7 Sep 16 15:12	DGF
Temperature - Field	11.05 deg. C		NA	170.1	7 Sep 16 15:12	DGF
Specific Conductance, Fld	1414 umhos/cm		1	120.1	7 Sep 16 15:12	DGF
pH, Field	7.12 units		1.00	I-1586-85	7 Sep 16 15:12	DGF
pH	* 7.2 units		1.0	SM 4500 H+B-96	8 Sep 16 15:44	JFG
Radium 226	See Attached					OL
Radium 228	See Attached			EPA M9320		OL
Sulfate	329 mg/L		4.0	ASTM D516-02	15 Sep 16 8:59	KCJ
Chloride	3.7 mg/L		3.0	SM 4500 Cl E	15 Sep 16 7:52	AKF
Mercury	< 0.005 ug/L		0.005	EPA 245.7	16 Sep 16 11:40	TWB
Solids, Total Dissolved	925 mg/L		10	SM 2540 C-97	9 Sep 16 9:15	RC
Calcium	127.0 mg/L		0.500	SW6010C	13 Sep 16 14:07	RMB
	See Narrative					
Lithium	0.043 mg/L		0.005	SW6010C	14 Sep 16 13:07	RMB
Barium	0.035 mg/L		0.005	SW6010C	13 Sep 16 14:07	RMB
Beryllium	< 0.005 mg/L		0.005	SW6010C	13 Sep 16 14:07	RMB
Chromium	< 0.01 mg/L		0.01	SW6010C	13 Sep 16 14:07	RMB
Cobalt	< 0.005 mg/L		0.005	SW6010C	13 Sep 16 14:07	RMB
	See Narrative					
Molybdenum	0.016 mg/L		0.015	SW6010C	13 Sep 16 14:07	RMB
Boron	4.200 mg/L		0.100	SW6010C	13 Sep 16 14:07	RMB
Antimony	< 2.5 @ ug/L		0.5	SW6020A	14 Sep 16 15:23	RMV
Arsenic	< 1 ug/L		0.5	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative					
Cadmium	< 0.2 ug/L		0.1	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative					
Lead	< 1 ug/L		0.5	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative					
Selenium	8.26 @ ug/L		0.50	SW6020A	14 Sep 16 15:23	RMV
Thallium	< 0.2 ug/L		0.1	SW6020A	13 Sep 16 18:36	RMV
	@See Narrative					
Fluoride	0.550 mg/L		0.020	EPA 300.0	12 Sep 16 12:58	RMB

**RL = Reporting Limit**

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.  
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes  
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WQ/DW # R-040







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PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
Lab Number: 16-A46029
Work Order #: 31-0455
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 7 Sep 2016 16:12
Sampled By: MVTL FIELD PERSONNEL
Date Received: 8 Sep 2016 10:55
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H9

Temp at Receipt: 3.0C

As Received Method Method Date
Result RL Reference Analyzed Analyst

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

OL = Analysis performed by an Outside Laboratory.

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! = Due to sample quantity \* = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040



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PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 5 Oct 2016
Lab Number: 16-A46039
Work Order #: 31-0455
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 7 Sep 2016 13:40
Sampled By: MVTl FIELD PERSONNEL
Date Received: 8 Sep 2016 10:55
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H40X

Temp at Receipt: 3.0C

Table with 6 columns: Misc Comment, As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Well Depth, Water Level Before Purge, and Static Elevation.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity † = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447580 ND MICRO # 1013-M ND HW/DW # R-040

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Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 9/30/2016
Report ID S1609153001

ProjectName: 31-0455
Lab ID: S1609153-001
ClientSample ID: A46025 H2OX
COC:

WorkOrder: S1609153
CollectionDate: 9/7/2016 12:30:00 PM
DateReceived: 9/9/2016 11:50:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

- C Calculated Value
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 9/30/2016
Report ID S1609153001

ProjectName: 31-0455
Lab ID: S1609153-002
ClientSample ID: A46026 H3OX
COC:

WorkOrder: S1609153
CollectionDate: 9/7/2016 1:16:00 PM
DateReceived: 9/9/2016 11:50:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

- C Calculated Value
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Inc  
1126 N Front St  
New Ulm, MN 56073

**Date Reported** 9/30/2016  
**Report ID** S1609153001

**ProjectName:** 31-0455  
**Lab ID:** S1609153-003  
**ClientSample ID:** A46027 H6  
**COC:**

**WorkOrder:** S1609153  
**CollectionDate:** 9/7/2016 2:18:00 PM  
**DateReceived:** 9/9/2016 11:50:00 AM  
**FieldSampler:**  
**Matrix:** Water

**Comments**

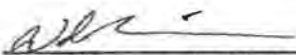
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
<b>Radionuclides - Total</b>						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	09/20/2016 1422 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/20/2016 1422 MB
Radium 228	4.5	pCi/L		2	Ga-Tech	09/24/2016 1053 MB
Radium 228 Precision (±)	3.1	pCi/L			Ga-Tech	09/24/2016 1053 MB

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - E Value above quantitation range
  - J Analyte detected below quantitation limits
  - M Value exceeds Monthly Ave or MCL or is less than LCL
  - O Outside the Range of Dilutions
  - X Matrix Effect

- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Reviewed by:   
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Inc  
1126 N Front St  
New Ulm, MN 56073

**Date Reported:** 9/30/2016  
**Report ID:** S1609153001

**ProjectName:** 31-0455  
**Lab ID:** S1609153-004  
**ClientSample ID:** A46028 H8  
**COC:**

**WorkOrder:** S1609153  
**CollectionDate:** 9/7/2016 3:12:00 PM  
**DateReceived:** 9/9/2016 11:50:00 AM  
**FieldSampler:**  
**Matrix:** Water

**Comments**

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	09/20/2016 1422	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	09/20/2016 1422	MB
Radium 228	ND	pCi/L		2	Ga-Tech	09/24/2016 1354	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	09/24/2016 1354	MB

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - E Value above quantitation range
  - J Analyte detected below quantitation limits
  - M Value exceeds Monthly Ave or MCL or is less than LCL
  - O Outside the Range of Dilutions
  - X Matrix Effect

- C Calculated Value
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 9/30/2016
Report ID S1609153001

ProjectName: 31-0455
Lab ID: S1609153-005
ClientSample ID: A46029 H9
COC:

WorkOrder: S1609153
CollectionDate: 9/7/2016 4:12:00 PM
DateReceived: 9/9/2016 11:50:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

- C Calculated Value
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager

# Minnesota Valley Testing Laboratories, Inc.

New Uim, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Dusty Fecsyo

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 7 Sep 16

Unique Station ID: —

Sample ID: Well H2OX (Middle)

### Well Condition

Well Locked?  Yes No  
 Well Labeled?  Yes No  
 Casing Straight?  Yes No

Protective Posts? Yes  No  
 State ID Tag? Yes  No  
 Grout Seal Intact?  Yes No

Repairs Necessary:

### Well Information

Well Depth: 32.83  
 Constructed Depth: 32.20  
 Casing Diameter: 2"  
 Water Level Before Purge: 8.66  
 Well Volume: 3.94 Gallons

Well Casing Elevation: 1103.91  
 Static Water Elevation: 1095.25  
 Previous Static: 1096.98  
 Water Level After Sample: Below Pump  
 Measurement Method: elec. WLP Steel Tape

### Sampling Information

Weather Conditions: Temp: 65 Wind: L+V Sky: Cloudy  
 Sampling Method: Grundfos  Bladder ~~SSP~~ Disp. Baller Whale Grab Other:  
 Dedicated Equipment:  Yes No Pumping Rate: 0.25 gpm  
 Well Purged Dry?  Yes No Time Pump Began: 1209 am /  pm  
 Time Purged Dry: 1225 Time of Sampling: 1230 am /  pm  
 Duplicate Sample? Yes  No ID: — Sample EH: 234.0  
 Sample Appearance: General: Clear Color: None Phase: None Odor: None

(16) Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1225	6.75	4072	10.83	NA	NA	4	1	
							2	
							3	
							4	
1230	6.80	4115	11.35			4	5	Recharge

Stabilized? Yes  No Amount Water Removed: 4 Gallons

Comments:

- very slow recharge!

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Dusty Faresyn

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 7 Sep 16

Unique Station ID: —

Sample ID: Well H3OX (Middle)

### Well Condition

Well Locked?  Yes No  
 Well Labeled?  Yes No  
 Casing Straight?  Yes No  
 Repairs Necessary:                     

Protective Posts? Yes  No  
 State ID Tag? Yes  No  
 Grout Seal Intact? Yes  No

### Well Information

Well Depth: 22.68  
 Constructed Depth: 22.55  
 Casing Diameter: 2"  
 Water Level Before Purge: 5.12  
 Well Volume: 2.86 Gallons

Well Casing Elevation: 1095.19  
 Static Water Elevation: 1090.07  
 Previous Static: 1090.58  
 Water Level After Sampl: Below Pump  
 Measurement Method: Elec. WLT Steel Tape

### Sampling Information

Weather Conditions: Temp: 68 Wind: L+V Sky: Fog  
 Sampling Method: Grundfos Gradder SS Disp. Bailer Whale Grab Other:  
 Dedicated Equipment:  Yes No Pumping Rate: 0.25 gpm  
 Well Purged Dry?  Yes No Time Pump Began: 1259 am /  PM  
 Time Purged Dry? 1311 Time of Sampling: 1316 am /  PM  
 Duplicate Sample? Yes  No ID: — Sample EH: 189.0  
 Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time (12)	pH	Specific	Temp	D. O.	Turbidity	Gallons	SEQ	Comments:
1311	6.79	4215	13.60	NA	NA	3	1	
							2	
							3	
							4	
1316	6.80	4233	13.59			3	5	Recharge

Stabilized? Yes  No Amount Water Remover 3 Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Dusty Forsyth

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 7 Sep 16

Unique Station ID: —

Sample ID: Well H6

## Well Condition

Well Locked?  Yes No

Well Labeled?  Yes No

Casing Straight?  Yes No

Repairs Necessary:

Protective Posts?  Yes No

State ID Tag? Yes  No

Grout Seal Intact? Yes  No

## Well Information

Well Depth: 17.92

Constructed Depth: 17.70

Casing Diameter: 2"

Water Level Before Purge: 14.16

Well Volume: 0.61 Gallons

Well Casing Elevation: NA

Static Water Elevation: I

Previous Static: I

Water Level After Sample: Below Pump

Measurement Method: Elec. W/L Steel Tape

## Sampling Information

Weather Conditions: Temp: 69 Wind: L+V Sky: Cloudy

Sampling Method: Grundfos Bladder SSP Disp. Baller Whale Grab Other:

Dedicated Equipment:  Yes No Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes No Time Pump Began: 1410 am  pm

Time Purged Dry? 1413 Time of Sampling: 1418 am  pm

Duplicate Sample? Yes  No ID: — Sample EH: 221.0

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time	pH	Specific	Temp	D. O.	Turbidity	Gallons	SEQ	Comments:
1413	7.37	985	13.78	NA	NA	0.75	1	
							2	
							3	
							4	
1418	7.28	965	12.05			0.75	5	Recharge

Stabiliz Yes  Amount Water Removed: 0.75 Gallons

Comments:

Exceptions to Protocol:



# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Dusty Erasya

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 7 Sept 16

Unique Station ID: —

Sample ID: Well H8

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary: —

Protective Posts?  Yes  No

State ID Tag?  Yes  No

Grout Seal Intact?  Yes  No

## Well Information

Well Depth: 22.33

Constructed Depth: 22.05

Casing Diameter: 2"

Water Level Before Purge: 8.23

Well Volume: 2.30 Gallons

Well Casing Elevation: 1081.23

Static Water Elevation: 1073.00

Previous Static: —

Water Level After Sample: 9.25

Measurement Method:  Elec. W/L  Steel Tape

## Sampling Information

Weather Conditions: Temp: 69 Wind: L+V Sky: Cloudy

Sampling Method: Grundfos  Bladder SSA  Disp. Baller  Whale  Grab  Other:

Dedicated Equipment:  Yes  No Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes  No Time Pump Began: 1442 am /  pm

Time Purged Dry? — Time of Sampling: 1512 am /  pm

Duplicate Sample?  Yes  No ID: — Sample EH: 114.5

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time (M)	pH	Specific	Temp	D. O.	Turbidity	Gallons	SEQ	Comments:
1452	7.18	1409	11.10	NA	NA	2.5	1	
1502	7.12	1408	10.94			5	2	
1512	7.12	1414	11.05			7.5	3	
							4	
							5	

Stabilized?  Yes  No Amount Water Remove 7.5 Gallons

Comments: —

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

## Groundwater Assessment

Sampling Personne

Dusty Ferguson

Site: Otter Tail Power Co./ Big Stone

Facility ID:                     

Date: 7 Sep 16

Unique Station I                     

Sample ID: Well H9

## Well Condition

Well Locked?  Yes  No

Well Labeled? Yes  No

Casing Straight?  Yes  No

Repairs Necessary:                     

Protective Posts  Yes  No

State ID Tag? Yes  No

Grout Seal Intact  Yes  No

## Well Information

Well Depth: 30.71

Constructed Depth: 30.20

Casing Diameter: 2"

Water Level Before Purge: 10:77

Well Volume: 3.25 Gallons

Well Casing Elevation: 1086.21

Static Water Elevation: 1075.44

Previous Static:                     

Water Level After Sample: 13.05

Measurement Method: Elec. WLD Steel Tape

## Sampling Information

Weather Conditions Temp: 70

Wind: L+V

Sky: Cloudy

Sampling Method: Grundfos  Bladder SSD  Disp. Bailer  Whale  Grab Other:                     

Dedicated Equipment  Yes  No

Pumping Rate: 0.25 gpm

Well Purged Dry? Yes  No

Time Pump Began: 1533 am / 6pm

Time Purged Dry?                     

Time of Sampling: 1612 am /                     

Duplicate Sample? Yes  No  ID:                     

Sample EH: 1612

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp	D. O.	Turbidity	Gallons	SEQ #	Comments:
1546	6.56	3165	10.69	NA	NA	3.25	1	
1559	6.60	3162	10.55			6.50	2	
1612	6.62	3164	10.37			9.75	3	
							4	
							5	

Stabiliz  Yes  No

Amount Water Removed 9.75 Gallons

Comments:                     

Exceptions to Protocol:





# MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890  
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2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724  
1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
www.mvtl.com



Page: 27 of 27

Date Reported: 5 Oct 2016

PAUL VUKONICH  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Work Order #: 201631-0455  
Account Number: 006106  
PO #: 48680

Project Name: BIG STONE PLANT CCR

## LABORATORY NARRATIVE

### INORGANIC & METALS ANALYSES:

Internal standard counts associated with arsenic and cadmium failed in the reporting limit checks for samples 16-A46027, 16-A46028, 16-A46030, and 16-A46032 through 16-A46034. Internal standard counts associated with arsenic, cadmium, thallium, and lead failed in the matrix spike for samples 16-A46027 through 16-A46034, and 16-A46025. Internal standard counts associated with arsenic and cadmium failed in the matrix spike duplicate for samples 16-A46027, 16-A46028, 16-A46030, 16-A46032 through 16-A46034. Data was reported based on acceptable recoveries of the reporting limit checks, matrix spike, and matrix spike duplicate.

The laboratory control spike failed high for cobalt for samples 16-A46025 through 16-A46037. Results below the reporting limit were reported.

Due to the high concentration of calcium in the unspiked sample, the matrix spike recovery did not meet acceptable limits for samples 16-A46025, 16-A46027, 16-A46028, 16-A46030, 16-A46032, and 16-A46033. Data was reported based on acceptable recoveries of the laboratory control spike and matrix spike duplicate as well as acceptable relative percent difference between the matrix spike and matrix spike duplicate.

No other problems were encountered with these analyses.

The analysis of radium-226 and radium-228 for samples 16-A46025 through 16-A46038 was subcontracted to:

Pace Analytical Services, Inc.  
1700 Elm Street Suite 200  
Minneapolis, MN 55414  
Phone: (612) 607-1700



**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

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 2616 E. Broadway Ave. ~ Bismarck, ND 58502 ~ 800-279-6885 ~ Fax 701-258-9724  
 1201 Lincoln Highway ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
 www.mvtl.com

MEMBER  
ACIL

**Quality Control Report**

Lab IDs: 16-A46025 to 16-A46039

Project: BIG STONE PLANT CCR

Work Order: 201631-0455

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony ug/L	25.0	102	85-115	25.0	16A46025q	<2.5	26.3	105	75-125	26.3	26.5	106	0.8	10	100	90-110	<0.5
	25.0	102	85-115	25.0	a46292qc	<0.5	26.8	107	75-125	26.8	27.3	109	1.8	10	100	90-110	<0.5
Arsenic ug/L	25.0	102	85-115	25.0	16A46025q	1.81	31.2	118	75-125	31.2	31.0	117	0.6	10	104	90-110	<0.5
	25.0	105	85-115	25.0	16A46025q	<2.5	28.6	114	75-125	28.6	28.0	112	2.1	10	99	90-110	<0.5
	25.0	102	85-115	25.0	a46292qc	1.51	28.9	110	75-125	28.9	29.0	110	0.3	10	98	90-110	<0.5
Barium mg/L	1.000	104	85-115	1.00	16A46029q	0.032	1.130	110	75-125	1.130	1.160	113	2.6	10	106	90-110	<0.005
				1.00	16A46035q	0.052	1.140	109	75-125	1.140	1.140	109	0.0	10	101	90-110	<0.005
Beryllium mg/L	1.000	103	85-115	1.00	16A46029q	<0.005	1.010	101	75-125	1.010	1.010	101	0.0	10	104	90-110	<0.005
				1.00	16A46035q	<0.005	1.020	102	75-125	1.020	1.020	102	0.0	10	102	90-110	<0.005
Boron mg/L	1.000	110	85-115	1.00	16A46029q	1.210	2.390	118	75-125	2.390	2.400	119	0.4	10	103	90-110	<0.1
	1.000	105	85-115	1.00	16A46035q	0.407	1.520	111	75-125	1.520	1.540	113	1.3	10	101	90-110	<0.1
				1.00	A46029qc	1.160	2.110	95	75-125	2.110	2.160	100	2.3	10	100	90-110	<0.1
Cadmium ug/L	5.00	104	85-115	5.00	16A46025q	0.64	6.18	111	75-125	6.18	6.04	108	2.3	10	108	90-110	<0.1
	5.00	108	85-115	5.00	16A46025q	0.55	5.88	107	75-125	5.88	5.76	104	2.1	10	100	90-110	<0.1
	5.00	104	85-115	5.00	a46292qc	<0.1	5.19	104	75-125	5.19	5.25	105	1.1	10	98	90-110	<0.1
Calcium mg/L	50.00	102	85-115	50.0	16A46029q	555.0	570.0	30	75-125	570.0	594.0	78	4.1	10	98	90-110	<0.5
	50.00	105	85-115	50.0	16A46035q	126.0	178.0	104	75-125	178.0	178.0	104	0.0	10	97	90-110	<0.5
				50.0	A46029qc	606.0	644.0	76	75-125	644.0	648.0	84	0.6	10	100	90-110	<0.5
				50.0	16A46035q	131.0	182.0	102	75-125	182.0	184.0	106	1.1	10	99	90-110	<0.5
Chloride mg/L	-	-	-	60.0	16-A46034	5.3	63.7	97	85-120	63.7	63.5	97	0.3	5	101	90-110	<3
	-	-	-	60.0	16-A46405	95.2	151	93	85-120	151	152	95	0.7	5	98	90-110	<3
Chromium mg/L	1.000	111	85-115	1.00	16A46029q	<0.01	1.020	102	75-125	1.020	1.060	106	3.8	10	105	90-110	<0.01
				1.00	16A46035q	<0.01	1.090	109	75-125	1.090	1.090	109	0.0	10	103	90-110	<0.01
Cobalt mg/L	1.000	116	85-115	1.00	16A46029q	<0.005	1.030	103	75-125	1.030	1.050	105	1.9	10	110	90-110	<0.005
	1.000	108	85-115	1.00	16A46035q	<0.005	1.080	108	75-125	1.080	1.080	108	0.0	10	108	90-110	<0.005
				1.00	16A46035q	<0.005	1.060	106	75-125	1.060	1.030	103	2.9	10	105	90-110	<0.005



**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

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 1201 Lincoln Highway ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
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MEMBER  
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**Quality Control Report**

Lab IDs: 16-A46025 to 16-A46039

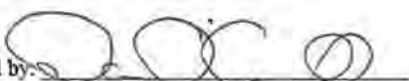
Project: BIG STONE PLANT CCR

Work Order: 201631-0455

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<=)	Known Rec (%)	Known % Rec Limits	Method Blank	
Fluoride mg/L	0.200	110	85-115	0.20	16-A46034	0.400	0.590	95	75-125	0.590	0.590	95	0.0	10	101	90-110	< 0.02	
				0.20	A46038QC	0.090	0.290	100	75-125	0.290	0.300	105	3.4	10	103	90-110		
				0.20	16-A46307	1.05	1.27	110	75-125	1.27	1.22	85	4.0	10				
Lead ug/L	25.0	103	85-115	25.0	16A46025q	< 1	27.5	110	75-125	27.5	26.3	105	4.5	10	100	90-110	< 0.5	
				25.0	16A46025q	< 2.5	26.9	108	75-125	26.9	26.0	104	3.4	10	98	90-110	< 0.5	
				25.0	a46292qc	< 0.5	26.0	104	75-125	26.0	26.0	104	0.0	10	96	90-110	< 0.5	
Lithium mg/L	1.000	101	85-115	1.00	A46029qc	0.136	1.140	100	75-125	1.140	1.170	103	2.6	10	103	90-110	< 0.005	
				1.00	16-A46035	0.058	1.180	112	75-125	1.180	1.150	109	2.6	10	102	90-110		
Mercury ug/L	-	-	-	0.10	16-A46034	0.013	0.104	91	67-106	0.104	0.104	91	0.0	9	95	76-113	< 0.005	
				0.10	16-A46215	< 0.005	0.072	72	67-106	0.072	0.071	71	1.4	9	88	76-113	< 0.005	
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.005
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum mg/L	1.000	106	85-115	1.00	16A46029q	< 0.015	1.010	101	75-125	1.010	1.050	105	3.9	10	101	90-110	< 0.015	
				1.00	16A46035q	< 0.015	1.060	106	75-125	1.060	1.050	105	0.9	10	100	90-110		
pH units	-	-	-	-	-	-	-	-	-	7.3	7.3	-	0.0	2.5	101	90-110	-	
				-	-	-	-	-	-	-	-	-	-	-	-	-	101	90-110
Selenium ug/L	25.0	102	85-115	25.0	16A46025q	27.2	56.3	116	75-125	56.3	54.5	109	3.2	10	100	90-110	< 0.5	
				25.0	a46292qc	1.38	28.9	110	75-125	28.9	30.0	114	3.7	10	97	90-110	< 0.5	
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	925	940	-	1.6	10	105	85-115	< 10	
				-	-	-	-	-	-	-	-	1510	1500	-	0.7	10		
Sulfate mg/L	-	-	-	600	16-A46034	869	1520	108	78-126	1520	1510	107	0.7	5	101	90-110	< 4	
				60.0	16-A46721	21.5	85.4	106	78-126	85.4	85.1	106	0.4	5	100	90-110	< 4	
				600	16-A46514	515	1170	109	79-124	1170	1150	106	1.7	5				
				60.0	16-A45884	54.9	120	108	78-126	120	123	114	2.5	5				
Thallium ug/L	5.00	102	85-115	5.00	16A46025q	< 0.2	5.49	110	75-125	5.49	5.32	106	3.1	10	100	90-110	< 0.1	
				5.00	16A46025q	< 0.5	5.35	107	75-125	5.35	5.26	105	1.7	10	98	90-110	< 0.1	
				5.00	a46292qc	< 0.1	5.25	105	75-125	5.25	5.26	105	0.2	10	96	90-110	< 0.1	

The cobalt LCS recovery was above the acceptance limit, see narrative.

The calcium matrix spike recovery was outside the acceptance limit, see narrative.

Approved by: 



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 872-8945

Your Environmental Monitoring Partner

**Date:** 9/30/2016

**CLIENT:** MVTL Inc  
**Project:** 31-0455  
**Lab Order:** S1609153


**CASE NARRATIVE**  
**Report ID:** S1609153001

Samples A46025 H2OX, A46026 H3OX, A46027 H6, A46028 H8, A46029 H9, A46030 Slag 1, A46031 Slag 4, A46032 Slag 5, A46033 Slag 6, A46034 Slag 7, A46035 Slag 8, A46036 Slag 9, A46037 Slag 9 Deep, and A46038 Slag 2B were received on September 9, 2016.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions  
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition  
40 CFR Parts 136 and 141  
40 CFR Part 50, Appendices B, J, L, and O  
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012  
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:   
Wade Nieuwsma, Assistant Laboratory Manager





Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

### ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc  
Work Order: S1609153  
Project: 31-0455

Date: 9/30/2016  
Report ID: S1609153001

Radium 228 by Ga/Tech		Sample Type	MBLK	Units: pCi/L			
MB-386 (09/23/16 10:43)	Analyte	RunNo: 139110	PrepDate: 09/14/16 12:00	BatchID: 12333			
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual

Total Radium 228 ND 1

Radium 228 by Ga/Tech		Sample Type	LCS	Units: pCi/L			
LCS-386 (09/23/16 13:44)	Analyte	RunNo: 139110	PrepDate: 09/14/16 12:00	BatchID: 12333			
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual

Total Radium 228 44 1 38.5 113 61.3 - 120

Radium 228 by Ga/Tech		Sample Type	MS	Units: pCi/L			
MS-386 (09/23/16 19:47)	Analyte	RunNo: 139110	PrepDate: 09/14/16 12:00	BatchID: 12333			
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual

Total Radium 228 36 1 38.5 ND 94.8 64.3 - 120

Radium 228 by Ga/Tech		Sample Type	MSD	Units: pCi/L			
MSD-386 (09/23/16 22:48)	Analyte	RunNo: 139110	PrepDate: 09/14/16 12:00	BatchID: 12333			
		Result	RL	Conc	%RPD	%REC	% RPD Limits Qual

Total Radium 228 43 1 36 16.1 111 20

Radium 226 in Water - Total by SM7500RA_B		Sample Type	MBLK	Units: pCi/L			
MB-1663 (09/20/16 14:22)	Analyte	RunNo: 138896	PrepDate: 09/14/16 0:00	BatchID: 12315			
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual

Radium 226 ND 0.2

Radium 226 in Water - Total by SM7500RA_B		Sample Type	LCS	Units: pCi/L			
LCS-1663 (09/20/16 14:22)	Analyte	RunNo: 138896	PrepDate: 09/14/16 0:00	BatchID: 12315			
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual

Radium 226 5.4 0.2 5.99 89.6 67.1 - 122

Radium 226 in Water - Total by SM7500RA_B		Sample Type	MS	Units: pCi/L			
MS-1663 (09/20/16 14:22)	Analyte	RunNo: 138896	PrepDate: 09/14/16 0:00	BatchID: 12315			
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual

Radium 226 5.1 0.2 5.99 0.2 81.5 65 - 131

Radium 226 in Water - Total by SM7500RA_B		Sample Type	MSD	Units: pCi/L			
MSD-1663 (09/20/16 14:22)	Analyte	RunNo: 138896	PrepDate: 09/14/16 0:00	BatchID: 12315			
		Result	RL	Conc	%RPD	%REC	% RPD Limits Qual

Radium 226 5.7 0.2 5.1 10.8 91.3 20

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - H Holding times for preparation or analysis exceeded
  - L Analyzed by another laboratory
  - O Outside the Range of Dilutions
  - S Spike Recovery outside accepted recovery limits
  - E Value above quantitation range
  - J Analyte detected below quantitation limits
  - ND Not Detected at the Reporting Limit
  - R RPD outside accepted recovery limits
  - X Matrix Effect

# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

This is an exact copy of the original document

By AB Date 8 Sept 16  
 pages 1-20

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> Alan Gleisner Dusty Ferasyn
<b>Report</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b> 31-0455
<b>Address</b> P.O. Box 496 Fergus Falls, MN 56538-0496	<b>Address:</b>	<b>Lab Numbers:</b>
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1 Gallon none	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
25	H2OX		7 Sept 16	1230	GW		1		1	1	N								See Attached
26	H3OX			1316	GW		1		1	1	N								
	H4OX			NS	GW		1		1	1	N								
27	H-6			1418	GW		1		1	1	N								
28	H-8			1512	GW		1		1	1	N								
29	H-9			1612	GW		1		1	1	N								
30	Slag 1		7 Sept 16	1208	GW		1		1	1	N								
31	Slag 4			1319	GW		1		1	1	N								
32	Slag 5			1725	GW		1		1	1	N								
33	Slag 6			1354	GW		1		1	1	N								

Comments:

<b>Samples Relinquished By:</b> <u>[Signature]</u>	<b>Samples Received By:</b> <u>A. Auden</u>
<b>Date:</b> <u>8 Sept 16</u> <b>Time:</b> <u>1055</u> <b>Temp:</b> <u>30.25</u>	<b>Date:</b> <u>8 Sept 16</u> <b>Time:</b> <u>1055</u> <b>Temp:</b> <u>3.15</u>
<b>Samples Relinquished into:</b> <u>Fridge</u> <u>Log in Cart</u> <b>Other:</b>	
<b>Samples Relinquished By:</b>	<b>Samples Received By:</b>
<b>Date:</b> <b>Time:</b> <b>Temp:</b>	<b>Date:</b> <b>Time:</b> <b>Temp:</b>
<b>Delivery:</b> <u>Samplers</u> <u>Other:</u>	<b>Seal Number(s) - If Used</b>
<b>Transport:</b> <u>Ambient</u> <u>Ice</u> <b>Other:</b>	<b>Seals Intact?</b> Yes No

# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> Alan Gleister Dusty Faresyn
<b>Report:</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b>
<b>Address:</b> P.O. Box 496 Fergus Falls, MN 56538-0496	<b>Address:</b>	<b>Lab Numbers:</b>
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1 Gallon none	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
34	Slag 7		7 Sep 16	1437	GW		1	1	1	N									See Attached
35	Slag 8			1644	GW		1	1	1	N									
36	Slag 9			1819	GW		1	1	1	N									
37	Slag 9 Deep			1827	GW		1	1	1	N									
38	Slag 2B			1852	GW		1	1	1	N									

Comments: Limited sample on Slag 2B - 1000 None, 500 HNO3, 3/5 gallon jug

Samples Relinquished By: <i>AK</i>			Samples Received By: <i>A. Auden</i>		
Date: 8 Sep 16	Time: 1055	Temp: 30.0°C	Date: 8 Sep 16	Time: 1055	Temp: 3.0°C
Samples Relinquished into: Fridge		log in Cart	Other:		
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <del>Samplers</del> Other:		Seal Number(s) - if Used			
Transport: Ambient	ice	Other:	Seals Intact?	Yes	No

## Big Stone Sampling

Site*	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (ml/minute)	Goes Dry?	Sampling Seasons**
WELL10	A	47.43	4	1098.70	Keck/Tsunami	No	3,000	No	1,3
WELL11	A	127.22	4	1104.00	Other Pump	Yes	36,000	No	1,3
WELL12	A	112.40	4	1071.89	Other Pump	Yes	20,000	No	1,3
S1	B	32.50	2	1102.17	Bailer	Yes	N/A	Yes	1,3
S2	B	43.12	2	1102.39	Bailer	Yes	N/A	Yes	1,3
S3	B	62.50	2	1102.65	Bailer	Yes	N/A	No	1,3
S4	B	27.70	2	1090.57	Bailer	Yes	N/A	Yes	1,3
S5	B	46.72	2	1091.40	Bailer	Yes	N/A	Yes	1,3
S6	B	62.05	2	1090.71	Bailer	Yes	N/A	No	1,3
H10X	C, CCR	32.91	2	1115.89	Bailer	Yes	100	Yes	1,3
H11NT	C	60.11	2	1115.81	Keck/Tsunami	No	1500	No	1,3
H20X	C, CCR	32.20	2	1103.91	Bladder	Yes	100	Yes	1,3
H21NT	C	62.30	2	1103.91	Bailer	Yes	N/A	Yes	1,3
H30X	C, CCR	22.55	2	1095.19	Bladder	Yes	100	Yes	1,3
H31NT	C	54.31	2	1095.17	Whale	No	2000	No	1,3
H40X	C, CCR	27.20	2	1108.22	Bladder	Yes	100	No	1,3
H41NT	C	60.01	2	1108.61	Keck/Tsunami	No	2000	Yes	1,3
H5	C	43.30	2	1122.80	Whale	No	1000	No	1,3
H6	C, CCR	15.00	2	1097.76	Bladder	Yes	100	Yes	1,3
H7	C	33.20	2	1106.06	Whale	No	1000	Yes	1,3
H8	C, CCR	22.05	2	1081.23	Bladder	Yes	100	TBD	1,3
H9	CCR	30.20	2	1086.21	Bladder	Yes	100	TBD	1,3
BC1	B	16.26	2	1118.46	Bailer	Yes	N/A	No	1,3
BC101	B	39.30	2	1118.70	Bailer	Yes	N/A	Yes	1,3
BC2R	B	32.48	2	1115.28	Bailer	Yes	N/A	No	1,3
BC3R	B	35.15	2	1114.42	Bailer	Yes	N/A	Yes	1,3
BC4R	B	34.60	2	1113.86	Bailer	Yes	N/A	Yes	1,3
BC5R	B	37.32	2	1123.02	Bailer	Yes	N/A	No	1,3
BC6R	B	33.95	2	1121.58	Bailer	Yes	N/A	No	1,3
SLAG1	CCR	34.90	2	TBD	LOW FLOW	No	100	TBD	1,3
SLAG2	GCR	TBD	2	1111.06	LOW FLOW	TBD	100	TBD	1,3
SLAG3	GCR	TBD	2	TBD	LOW FLOW	TBD	100	TBD	1,3
SLAG4	CCR	39.00	2	TBD	LOW FLOW	No	100	TBD	1,3
SLAG5	CCR	38.80	2	1107.30	LOW FLOW	No	100	TBD	1,3
SLAG6	CCR	37.30	2	1111.51	LOW FLOW	No	100	TBD	1,3
SLAG7	CCR	48.70	2	1114.39	LOW FLOW	No	100	TBD	1,3
SLAG8	CCR	52.09	2	1127.26	LOW FLOW	No	100	TBD	1,3
SLAG9	CCR	49.80	2	1122.35	LOW FLOW	No	100	TBD	1,3
SLAG9 DEEP***	CCR	68.00	2	1121.92	LOW FLOW	No	100	TBD	1,3
SLAG2B	CCR	40.80	2	1111.26	LOW FLOW	No	100	TBD	1,3
COOLING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
EVAPORATION POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
HOLDING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
RECLAIM POND	C	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3

\* Three additional monitoring wells will be installed the Spring of 2016. Each well will be screened approximately 35' below ground surface and will be analyzed for the "C" parameter list. In addition, a new site with 9 wells will be added and will be analyzed for CCR Parameters ONLY.

\*\* 1 = Spring (March 28 - April 28), 2 = Summer (July 1 - August 7), 3 = Fall (October 14- November 14)

\*\*\* Only sample for the first two CCR background sampling events.

## ***Big Stone Plant CCR Appendix III Parameters***

CCR - Appendix III Detection Monitoring

### ***Field Parameters***

pH\*

\* Field and Laboratory Measurements

### ***Total Concentration Parameters***

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

## ***Big Stone CCR Appendix IV Parameters***

CCR - Appendix IV - Assessment Monitoring

### ***Total Concentration Parameters***

Antimony

Arsenic

Barium

Beryllium

Cadmium

Chromium, Total

Cobalt

Fluoride

Lead

Lithium

Mercury

Molybdenum

Selenium

Thallium

Radium 226 + 228



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com



FINAL REPORT COMPLETION DATE: 20 Dec 16 AS

Date Reported: 5 Dec 2016

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0543
Account #: 006106
PO #: 48680

Project Name: BIG STONE PLANT

[Signature] 19 Dec 16
Field Service Manager/Date Reviewed

[Signature] 16 Dec 2016
Chemistry Lab Manager/Date Reviewed

[Signature] 5 Dec 16
Quality Assurance Director/Date Reviewed

- RL = Reporting Limits
NQ = Not Present, Qualitative Only
PQ = Present, Qualitative Only
ND = Not Determined

All data for this report has been approved by MVTl Laboratory Management.

MVTl guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTl to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTl. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.







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www.mvttl.com



CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 15 Dec 2016
Lab Number: 16-A56142
Work Order #: 31-0543
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 17 Oct 2016 18:15
Sampled By: MVTL FIELD PERSONNEL
Date Received: 18 Oct 2016 14:40
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H2OX

Temp at Receipt: 0.0C

As Received Method Method Date
Result RL Reference Analyzed Analyst

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

\* The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND NW/DW # R-040







MINNESOTA VALLEY TESTING LABORATORIES, INC.

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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com



CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 15 Dec 2016
Lab Number: 16-A56144
Work Order #: 31-0543
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 18 Oct 2016 10:01
Sampled By: MVTL FIELD PERSONNEL
Date Received: 18 Oct 2016 14:40
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H40X

Temp at Receipt: 0.0C

As Received Method Method Date
Result RL Reference Analyzed Analyst

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
g = Due to sample matrix # = Due to concentration of other analytes
i = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 MD MICRO # 1013-M ND WW/DW # R-040



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 15 Dec 2016
Lab Number: 16-A56145
Work Order #: 31-0543
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 17 Oct 2016 16:34
Sampled By: MVTL FIELD PERSONNEL
Date Received: 18 Oct 2016 14:40
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H6

Temp at Receipt: 0.0C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include MS Water Digestions, Water Digestions, Radium 226, Radium 228, pH, Field, pH, Sulfate, Chloride, Mercury, Solids, Total Dissolved, Calcium, Lithium, Barium, Cobalt, Boron, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Lead, Molybdenum, Selenium, Thallium, Fluoride.

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

- § = Due to sample matrix
! = Due to sample quantity
\* = Due to concentration of other analytes
+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.





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www.mvtl.com



CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 15 Dec 2016
Lab Number: 16-A56146
Work Order #: 31-0543
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 17 Oct 2016 17:27
Sampled By: MVTL FIELD PERSONNEL
Date Received: 18 Oct 2016 14:40
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H8

Temp at Receipt: 0.0C

As Received Method Method Date
Result RL Reference Analyzed Analyst

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TWI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040







MINNESOTA VALLEY TESTING LABORATORIES, INC.

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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvttl.com



CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 15 Dec 2016
Lab Number: 16-A56147
Work Order #: 31-0543
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 17 Oct 2016 18:21
Sampled By: MVTL FIELD PERSONNEL
Date Received: 18 Oct 2016 14:40
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H9

Temp at Receipt: 0.0C

As Received Method Method Date
Result RL Reference Analyzed Analyst

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

^ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TWI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

g = Due to sample matrix # = Due to concentration of other analytes
l = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND RW/DW # R-040



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890  
2 North German St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890  
2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724  
1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
www.mvtl.com



Page: 30 of 30

Date Reported: 5 Dec 2016

MEGAN LISBURG  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Work Order #: 201631-0543  
Account Number: 006106  
PO #: 48680

Project Name: BIG STONE PLANT

## LABORATORY NARRATIVE

### INORGANIC AND METALS ANALYSES:

Due to the sample matrix of the spiked sample, the recoveries for calcium were outside of acceptance range in the matrix spike and matrix spike duplicate for samples 16-A56133 through 16-A56142. The data was reported based on the acceptable recoveries of the laboratory control spike and relative percent difference between the matrix spikes.

Due to the sample matrix of the spiked sample, the recoveries for boron were outside of acceptance range in the matrix spike and matrix spike duplicate for samples 16-A56133, 16-A56134, 16-A56136, 16-A56137, and 16-A56141. The data was reported based on the acceptable recoveries of the laboratory control spike and relative percent difference between the matrix spikes.

The internal standard count recoveries associated with molybdenum, cadmium, antimony, thallium, and lead failed in the unspiked sample, matrix spike, and matrix spike duplicate for samples 16-A56133 and 16-A56135. The data was reported based on acceptable recoveries of the matrix spikes.

The internal standard count recoveries associated with chromium failed in the reporting limit checks for samples 16-A56133 through 16-A56139, 16-A56141, and 16-A56144 through 16-A56146. The data was reported based on the acceptable recovery of the reporting limit.

The matrix spike recoveries for selenium were above the acceptance limits for sample 16-A56135. The internal standard counts associated with selenium failed in the unspiked sample, matrix spike, and matrix spike duplicate. Data below the reporting limit was reported.

The internal standard count recoveries associated with molybdenum, thallium, and lead failed in the unspiked sample, matrix spike, and matrix spike duplicate for sample 16-A56136. The data was reported based on acceptable recoveries of the matrix spikes.

The internal standard count recoveries associated with molybdenum failed in the unspiked sample, matrix spike, and matrix spike duplicate for samples 16-A56138 and 16-A56145. The data was reported based on acceptable recoveries of the matrix spikes.

The internal standard count recoveries associated with arsenic, molybdenum, cadmium, antimony, thallium, and lead failed in the unspiked sample, matrix spike, and matrix spike duplicate for sample 16-A56141. The data was reported based on acceptable recoveries of the matrix spikes.

Internal standard counts associated with thallium and lead failed in the reporting limit checks for samples 16-A56134, 16-A56137 through 16-A56140, and 16-A56142 through 16-A56147. Data was reported based on acceptable recoveries of the reporting limit checks.

The chromium knowns were above the acceptance limits for samples 16-A56142 and 16-A56147. Results below the reporting limit were reported.

Internal standard counts associated with arsenic and selenium failed in the laboratory control spike for sample 16-A56147. Data was reported based on acceptable recoveries of the laboratory control spike.

No other problems were encountered with these analyses.



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 www.mvttl.com

MEMBER  
 ACIL

**Quality Control Report**

Lab IDs: 16-A56133 to 16-A56147

Project: BIG STONE PLANT CCR

Work Order: 201631-0543

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/Dup Orig Result	MSD/Dup Result	MSD Rec %	MSD/Dup RPD	MSD/Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony ug/L	25.0	107	85-115	25.0	16A56134q	< 0.5	27.7	111	75-125	27.7	27.7	111	0.0	10	106	90-110	< 0.5
	25.0	105	85-115	25.0	16A56146q	< 0.5	28.0	112	75-125	28.0	28.2	113	0.7	10	105	90-110	< 0.5
	25.0	105	85-115	25.0	A56134qc	< 2.5	27.1	108	75-125	27.1	27.1	108	0.0	10	104	90-110	< 0.5
	25.0	106	85-115	25.0	A56146qc	< 2.5	27.7	111	75-125	27.7	27.6	110	0.4	10	104	90-110	< 0.5
				25.0	A56364qc	< 2.5	27.0	108	75-125	27.0	27.2	109	0.7	10	106	90-110	
				25.0	16A56134q	< 2.5	25.9	104	75-125	25.9	26.0	104	0.4	10	104	90-110	
Arsenic ug/L	25.0	104	85-115	25.0	16A56146q	0.67	30.3	119	75-125	30.3	29.9	117	1.3	10	106	90-110	< 0.5
	25.0	107	85-115	25.0	A56134qc	< 2.5	29.7	119	75-125	29.7	29.3	117	1.4	10	101	90-110	< 0.5
	25.0	103	85-115	25.0	A56146qc	< 2.5	27.5	110	75-125	27.5	28.2	113	2.5	10	101	90-110	
				25.0	A56364qc	< 2.5	25.0	100	75-125	25.0	25.0	100	0.0	10	102	90-110	
Barium mg/L	1.000	101	85-115	1.00	16A56142q	0.006	1.060	105	75-125	1.060	1.070	106	0.9	10	93	90-110	< 0.005
				1.00	16A56085q	0.033	1.090	106	75-125	1.090	1.080	105	0.9	10	94	90-110	
Beryllium ug/L	2.50	98	85-115	2.50	16-A56146	< 0.25	2.56	102	75-125	2.56	2.62	105	2.3	10	104	90-110	< 0.05
	2.50	102	85-115	2.50	A56364qc	< 0.25	2.77	111	75-125	2.77	2.95	118	6.3	10	100	90-110	< 0.05
	2.50	104	85-115	2.50	16A56134q	< 0.25	2.72	109	75-125	2.72	2.53	101	7.2	10	93	90-110	
				2.50	16A56134q	< 0.25	2.55	102	75-125	2.55	2.43	97	4.8	10			





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 www.mvtl.com

MEMBER  
ACIL

## Quality Control Report

Lab IDs: 16-A56133 to 16-A56147

Project: BIG STONE PLANT

Work Order: 201631-0543

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Chromium ug/L	25.0	102	85-115	25.0	16A56134q	2.16	23.1	84	75-125	23.1	21.6	78	6.7	10	98	90-110	< 0.5
	25.0	98	85-115	25.0	16A56146q	< 0.5	19.6	78	75-125	19.6	20.7	83	5.5	10	105	90-110	< 0.5
	25.0	99	85-115	25.0	A56146qc	< 5	28.0	112	75-125	28.0	29.7	119	5.9	10	102	90-110	< 0.5
	25.0	113	85-115	25.0	A56364qc	< 5	26.9	108	75-125	26.9	26.9	108	0.0	10	111	90-110	
				25.0	16A56134q	2.85	28.0	101	75-125	28.0	28.0	101	0.0	10	94	90-110	
				25.0	16A56134q	< 2.5	24.9	100	75-125	24.9	24.5	98	1.6	10			
Cobalt mg/L	1.000	107	85-115	1.00	16A56142q	< 0.01	0.985	98	75-125	0.985	0.990	99	0.5	10	98	90-110	< 0.005
				1.00	16A56085q	< 0.01	1.030	103	75-125	1.030	1.040	104	1.0	10	97	90-110	
Fluoride mg/L	0.200	105	85-115	0.20	16-A56678	0.210	0.400	95	75-125	0.400	0.420	105	4.9	10	104	90-110	< 0.02
	0.200	105	85-115	0.20	16-A56141	0.110	0.290	90	75-125	0.290	0.280	85	3.5	10	99	90-110	
Lead ug/L	25.0	100	85-115	25.0	16A56134q	0.72	27.9	109	75-125	27.9	27.3	106	2.2	10	100	90-110	< 0.5
	25.0	100	85-115	25.0	16A56146q	< 0.5	26.2	105	75-125	26.2	25.9	104	1.2	10	100	90-110	< 0.5
	25.0	98	85-115	25.0	A56134qc	< 2.5	26.9	108	75-125	26.9	26.7	107	0.7	10	101	90-110	< 0.5
				25.0	A56146qc	< 2.5	25.8	103	75-125	25.8	25.3	101	2.0	10	100	90-110	
				25.0	A56364qc	< 2.5	24.8	99	75-125	24.8	24.5	98	1.2	10	99	90-110	
Lithium mg/L	1.000	105	85-115	1.00	16-A56142	0.436	1.600	116	75-125	1.600	1.620	118	1.2	10	97	90-110	< 0.005
				1.00	a56085qc	0.008	1.110	110	75-125	1.110	1.120	111	0.9	10	99	90-110	



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MEMBER  
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**Quality Control Report**

Lab IDs: 16-A56133 to 16-A56147

Project: BIG STONE PLANT

Work Order: 201631-0543

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Mercury ug/L	-	-	-	0.10	16-A56142	< 0.005	0.096	96	67-106	0.096	0.096	96	0.0	9	101	76-113	< 0.005
	-	-	-	0.10	16-A56126	0.005	0.097	92	67-106	0.097	0.097	92	0.0	9	99	76-113	< 0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.005
Molybdenum ug/L	25.0	101	85-115	25.0	16A56134q	1.41	25.8	98	75-125	25.8	25.1	95	2.8	10	100	90-110	< 0.5
	25.0	102	85-115	25.0	16A56146q	14.5	39.7	101	75-125	39.7	39.4	100	0.8	10	98	90-110	< 0.5
	25.0	94	85-115	25.0	A56134qc	< 2.5	26.6	106	75-125	26.6	26.3	105	1.1	10	99	90-110	< 0.5
	-	-	-	25.0	A56146qc	14.3	38.6	97	75-125	38.6	38.1	95	1.3	10	96	90-110	-
	-	-	-	25.0	A56364qc	< 2.5	23.9	96	75-125	23.9	24.1	96	0.8	10	95	90-110	-
pH units	-	-	-	-	-	-	-	-	-	7.2	7.2	-	0.0	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	6.8	6.8	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0	103	85-115	25.0	16A56134q	0.78	40.5	159	75-125	40.5	37.9	148	6.6	10	107	90-110	< 0.5
	25.0	110	85-115	25.0	A56134qc	< 2.5	31.1	124	75-125	31.1	29.9	120	3.9	10	102	90-110	< 0.5
	25.0	100	85-115	25.0	A56146qc	8.31	35.9	110	75-125	35.9	36.9	114	2.7	10	102	90-110	< 0.5
	25.0	100	85-115	25.0	A56364qc	< 2.5	27.4	110	75-125	27.4	27.2	109	0.7	10	104	90-110	< 0.5
	-	-	-	25.0	16A56134q	< 2.5	26.7	107	75-125	35.2	35.5	106	0.8	10	100	90-110	< 0.5

**Quality Control Report**

Lab IDs: 16-A56133 to 16-A56147

Project: BIG STONE PLANT

Work Order: 201631-0543

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/Dup Orig Result	MSD/Dup Result	MSD Rec %	MSD/Dup RPD	MSD/Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	1700	1750	-	2.9	10	90	85-115	< 10
	-	-	-	-	-	-	-	-	-	933	954	-	2.2	10	86	85-115	< 10
	-	-	-	-	-	-	-	-	-	1240	1270	-	2.4	10			
	-	-	-	-	-	-	-	-	-	182	184	-	1.1	13			
Sulfate mg/L	-	-	-	600	16-A56134	1400	2000	100	78-126	2000	2010	102	0.5	5	94	90-110	< 4
	-	-	-	600	16-A56144	1200	1920	120	78-126	1920	1890	115	1.6	5	100	90-110	< 4
	-	-	-	600	16-A56147	1550	2200	108	78-126	2200	2280	122	3.6	5	105	90-110	< 4
	-	-	-	60.0	16-A55115	127	186	98	78-126	186	194	112	4.2	5			
Thallium ug/L	5.00	101	85-115	5.00	16A56134q	< 0.1	5.72	114	75-125	5.72	5.62	112	1.8	10	99	90-110	< 0.1
	5.00	101	85-115	5.00	16A56146q	< 0.1	5.38	108	75-125	5.38	5.32	106	1.1	10	102	90-110	< 0.1
	5.00	100	85-115	5.00	A56134qc	< 0.5	5.47	109	75-125	5.47	5.39	108	1.5	10	102	90-110	< 0.1
				5.00	A56146qc	< 0.5	5.29	106	75-125	5.29	5.17	103	2.3	10	100	90-110	
				5.00	A56364qc	< 0.5	4.98	100	75-125	4.98	4.93	99	1.0	10	100	90-110	

The boron matrix spike recoveries were outside the acceptance limits, see narrative.  
 The calcium matrix spike recoveries were outside the acceptance limits, see narrative.  
 The selenium matrix spike recoveries were outside the acceptance limits, see narrative.  
 The calcium duplicate RPD was outside the 10% limit at 10.2%. This result would be rounded down to 10% and meet the limit.  
 The chromium known recovery was outside the acceptance limits, see narrative.

Approved by: 



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Date: 11/30/2016

CLIENT: MVTL Inc  
Project: WO # 31-0543  
Lab Order: S1610332

**CASE NARRATIVE**  
Report ID: S1610332001

Samples A56133 Slag 1, A56134 Slag 4, A56135 Slag 5, A56136 Slag 6, A56137 Slag 7, A56138 Slag 8, A56139 Slag 9, A56140 Slag 9 deep, A56141 Slag 2B, A56142 H2OX, A56143 H3OX, A56144 H4OX, A56145 H6, A56146 H8, and A56147 H9 were received on October 21, 2016.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions  
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition  
40 CFR Parts 136 and 141  
40 CFR Part 50, Appendices B, J, L, and O  
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012  
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 1





Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 11/30/2016
Report ID S1610332001

ProjectName: WO # 31-0543
Lab ID: S1610332-010
ClientSample ID: A56142 H2OX
COC: WO #31-0543

WorkOrder: S1610332
CollectionDate: 10/17/2016 6:15:00 PM
DateReceived: 10/21/2016 2:23:00 PM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Int. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

- C Calculated Value
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTI Inc, 1126 N Front St, New Ulm, MN 56073
Date Reported: 11/30/2016
Report ID: S1610332001
ProjectName: WO # 31-0543
Lab ID: S1610332-011
ClientSample ID: A56143 H3OX
COC: WO #31-0543
WorkOrder: S1610332
CollectionDate: 10/18/2016 8:45:00 AM
DateReceived: 10/21/2016 2:23:00 PM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radium 226 and Radium 228 analyses with results ND and NA.

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank, E Value above quantitation range, J Analyte detected below quantitation limits, M Value exceeds Monthly Ave or MCL or is less than LCL, O Outside the Range of Dilutions, X Matrix Effect, C Calculated Value, H Holding times for preparation or analysis exceeded, L Analyzed by another laboratory, ND Not Detected at the Reporting Limit, S Spike Recovery outside accepted recovery limits

Reviewed by: Wade Nieuwsma, Assistant Laboratory Manager



**Sample Analysis Report**

**Company:** MVTI Inc  
1126 N Front St  
New Ulm, MN 56073

**Date Reported** 11/30/2016  
**Report ID** S1610332001

**ProjectName:** WO # 31-0543  
**Lab ID:** S1610332-012  
**ClientSample ID:** A56144 H4OX  
**COC:** WO #31-0543

**WorkOrder:** S1610332  
**CollectionDate:** 10/18/2016 10:01:00 AM  
**DateReceived:** 10/21/2016 2:23:00 PM  
**FieldSampler:**  
**Matrix:** Water

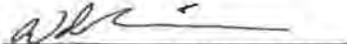
**Comments**

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Int	
<b>Radionuclides - Total</b>							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	11/01/2016 824	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	11/01/2016 824	MB
Radium 228	ND	pCi/L		2	Ga-Tech	11/27/2016 1232	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	11/27/2016 1232	MB

These results apply only to the samples tested.

RL - Reporting Limit

- |                    |  |  |
|--------------------|--|--|
| <b>Qualifiers:</b> | B Analyte detected in the associated Method Blank      | C Calculated Value                                   |
|                    | E Value above quantitation range                       | H Holding times for preparation or analysis exceeded |
|                    | J Analyte detected below quantitation limits           | L Analyzed by another laboratory                     |
|                    | M Value exceeds Monthly Ave or MCL or is less than LCL | ND Not Detected at the Reporting Limit               |
|                    | O Outside the Range of Dilutions                       | S Spike Recovery outside accepted recovery limits    |
|                    | X Matrix Effect  |  |

Reviewed by:   
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 11/30/2016
Report ID S1610332001

ProjectName: WO # 31-0543
Lab ID: S1610332-013
ClientSample ID: A56145 H6
COC: WO #31-0543

WorkOrder: S1610332
CollectionDate: 10/17/2016 4:34:00 PM
DateReceived: 10/21/2016 2:23:00 PM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radium 226 and Radium 228 analyses with results like ND, NA, pCi/L, and MB.

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank, E Value above quantitation range, J Analyte detected below quantitation limits, M Value exceeds Monthly Ave or MCL or is less than LCL, O Outside the Range of Dilutions, X Matrix Effect, C Calculated Value, H Holding times for preparation or analysis exceeded, L Analyzed by another laboratory, ND Not Detected at the Reporting Limit, S Spike Recovery outside accepted recovery limits

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 11/30/2016
Report ID S1610332001

ProjectName: WO # 31-0543
Lab ID: S1610332-014
ClientSample ID: A56146 H8
COC: WO #31-0543

WorkOrder: S1610332
CollectionDate: 10/17/2016 5:27:00 PM
DateReceived: 10/21/2016 2:23:00 PM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank, E Value above quantitation range, J Analyte detected below quantitation limits, M Value exceeds Monthly Ave or MCL or is less than LCL, O Outside the Range of Dilutions, X Matrix Effect, C Calculated Value, H Holding times for preparation or analysis exceeded, L Analyzed by another laboratory, ND Not Detected at the Reporting Limit, S Spike Recovery outside accepted recovery limits

Reviewed by: Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

<b>Company:</b>	MVTL Inc 1126 N Front St New Ulm, MN 56073	<b>Date Reported</b>	11/30/2016
		<b>Report ID</b>	S1610332001
<b>ProjectName:</b>	WO # 31-0543	<b>WorkOrder:</b>	S1610332
<b>Lab ID:</b>	S1610332-015	<b>CollectionDate:</b>	10/17/2016 6:21:00 PM
<b>ClientSample ID:</b>	A56147 H9	<b>DateReceived:</b>	10/21/2016 2:23:00 PM
<b>COC:</b>	WO #31-0543	<b>FieldSampler:</b>	
		<b>Matrix:</b>	Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	11/01/2016 824	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	11/01/2016 824	MB
Radium 228	2.9	pCi/L		2	Ga-Tech	11/27/2016 2145	MB
Radium 228 Precision (±)	3.4	pCi/L			Ga-Tech	11/27/2016 2145	MB

These results apply only to the samples tested.

RL - Reporting Limit

- |                    |   |  |    |  |
|--------------------|---|--|----|--|
| <b>Qualifiers:</b> | B | Analyte detected in the associated Method Blank      | C  | Calculated Value                                   |
|                    | E | Value above quantitation range                       | H  | Holding times for preparation or analysis exceeded |
|                    | J | Analyte detected below quantitation limits           | L  | Analyzed by another laboratory                     |
|                    | M | Value exceeds Monthly Ave or MCL or is less than LCL | ND | Not Detected at the Reporting Limit                |
|                    | O | Outside the Range of Dilutions                       | S  | Spike Recovery outside accepted recovery limits    |
|                    | X | Matrix Effect  |    |  |

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



**ANALYTICAL QC SUMMARY REPORT**

CLIENT: MVTL Inc  
 Work Order: S1610332  
 Project: WO # 31-0543

Date: 11/30/2016  
 Report ID: S1610332001

Radium 228 by Ga/Tech		Sample Type	MBLK	Units: pCi/L			
MB-397 (11/15/16 14:37)	RunNo: 141068	PrepDate: 11/02/16 14:00	BatchID: 12558				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		ND	1				

Radium 228 by Ga/Tech		Sample Type	LCS	Units: pCi/L			
LCS-397 (11/15/16 17:41)	RunNo: 141068	PrepDate: 11/02/16 14:00	BatchID: 12558				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		39	1	39.1	98.6	61.3 - 120	

Radium 228 by Ga/Tech		Sample Type	MS	Units: pCi/L			
MS-397 (11/15/16 23:50)	RunNo: 141068	PrepDate: 11/02/16 14:00	BatchID: 12558				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		43	1	39.1	ND	110	61.3 - 120

Radium 228 by Ga/Tech		Sample Type	MSD	Units: pCi/L			
MSD-397 (11/16/16 02:55)	RunNo: 141068	PrepDate: 11/02/16 14:00	BatchID: 12558				
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228		41	1	43	5.30	104	20

Radium 226 in Water - Total by SM7500RA_B		Sample Type	MBLK	Units: pCi/L			
MB-1680 (10/31/16 23:07)	RunNo: 140413	PrepDate: 10/26/16 0:00	BatchID: 12484				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226		ND	0.2				

Radium 226 in Water - Total by SM7500RA_B		Sample Type	LCS	Units: pCi/L			
LCS-1680 (10/31/16 23:07)	RunNo: 140413	PrepDate: 10/26/16 0:00	BatchID: 12484				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226		5.4	0.2	5.99	90.6	67.1 - 122	

Radium 226 in Water - Total by SM7500RA_B		Sample Type	LCSD	Units: pCi/L			
LCSD-1680 (10/31/16 23:07)	RunNo: 140413	PrepDate: 10/26/16 0:00	BatchID: 12484				
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226		6.2	0.2	5.4	13.7	104	20

Radium 226 in Water - Total by SM7500RA_B		Sample Type	MS	Units: pCi/L			
S1610228-007AMS (10/31/16 23:07)	RunNo: 140413	PrepDate: 10/26/16 0:00	BatchID: 12484				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226		11.0	0.2	12	1.0	83.2	65 - 131

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - H Holding times for preparation or analysis exceeded
  - L Analyzed by another laboratory
  - O Outside the Range of Dilutions
  - S Spike Recovery outside accepted recovery limits
  - E Value above quantitation range
  - J Analyte detected below quantitation limits
  - ND Not Detected at the Reporting Limit
  - R RPD Outside accepted recovery limits
  - X Matrix Effect

# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> Alan Glesner, Dusty Feresyn Ben Wolf
<b>Report:</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b>
<b>Address</b> P.O. Box 496 Fergus Falls, MN 56538-0496	<b>Address:</b>	<b>Lab Numbers:</b>
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type											Analysis			
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
156142	H2OX		17Oct16	1815	GW		2	N	1	1	N								See Attached
43	H3OX		18Oct16	845	GW		2	N	1	1	N								
44	H4OX		↓	1001	GW		2	N	1	1	N								
45	H-6		17Oct16	1634	GW		2	N	1	1	N								
46	H-8			1727	GW		2	N	1	1	N								
47	H-9			1821	GW		2	N	1	1	N								
A 16133	Slag 1			1426	GW		2	N	1	1	N								
34	Slag 4			1528	GW		2	N	1	1	N								
35	Slag 5		18Oct16	1059	GW		2	N	1	1	N								
36	Slag 6		17Oct16	1602	GW		2	N	1	1	N								

Comments:  
**WORK ORDER #2**

Samples Relinquished By: <i>[Signature]</i>			Samples Received By: <i>A. Accolas</i>		
Date: 18Oct16	Time: 1440	Temp: 0.0°C	Date: 18Oct16	Time: 1440	Temp: 0.0°C
Samples Relinquished into: <u>Fridge</u> Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <u>Samplers</u> Other:			Seal Number(s) - If Used		
Transport: <u>Ambient</u> <u>Ice</u> Other:			Seals Intact? Yes No		



# Minnesota Valley Testing Laboratories

1126 North Front Street New UIm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> Alan Glusman, Dusty Ferguson Ben Wolf
<b>Report</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b>
<b>Address</b> P.O. Box 496	<b>Address:</b>	<b>Lab Numbers:</b>
Fergus Falls, MN 56538-0496		
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other 150 None	Analysis Required
37	Slag 7		17 Oct 16	1645	GW		2	N	1	1	N								See Attached
38	Slag 8		I	1815	GW		2	N	1	1	N								
39	Slag 9		18 Oct 16	941	GW		2	N	1	1	N								
40	Slag 9 Deep		I	1023	GW		2	N	1	1	N								
41	Slag 2B		I	1059	GW		2	N	1	1	N								

Comments:  
**WORK ORDER #2**

Samples Relinquished By: <i>[Signature]</i>			Samples Received By: <i>[Signature]</i>		
Date: 18 Oct 16	Time: 1440	Temp: 0.0°C	Date: 18 Oct 16	Time: 1440	Temp: O.K.
Samples Relinquished into: <u> fridge </u> Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <u> Samplers </u> Other:			Seal Number(s) - If Used		
Transport: Ambient <u> ice </u> Other:			Seals Intact?	Yes	No

# Big Stone Sampling

Oct  
Both CCR &  
Refine

Site*	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (ml/minute)	Goes Dry?	Sampling Seasons**
WELL10	A	47.43	4	1098.70	Keck/Tsunami	No	3,000	No	1,3
WELL11	A	127.22	4	1104.00	Other Pump	Yes	36,000	No	1,3
WELL12	A	112.40	4	1071.89	Other Pump	Yes	20,000	No	1,3
S1	B	32.50	2	1102.17	Bailer	Yes	N/A	Yes	1,3
S2	B	43.12	2	1102.39	Bailer	Yes	N/A	Yes	1,3
S3	B	62.50	2	1102.65	Bailer	Yes	N/A	No	1,3
S4	B	27.70	2	1090.57	Bailer	Yes	N/A	Yes	1,3
S5	B	46.72	2	1091.40	Bailer	Yes	N/A	Yes	1,3
S6	B	62.05	2	1090.71	Bailer	Yes	N/A	No	1,3
H1OX	C, CCR	32.91	2	1115.89	Bailer	Yes	100	Yes	1,3
H1INT	C	60.11	2	1115.81	Keck/Tsunami	No	1500	No	1,3
H2OX	C, CCR	32.20	2	1103.91	Bladder	Yes	100	Yes	1,3
H2INT	C	62.30	2	1103.91	Bailer	Yes	N/A	Yes	1,3
H3OX	C, CCR	22.55	2	1095.19	Bladder	Yes	100	Yes	1,3
H3INT	C	54.31	2	1095.17	Whale	No	2000	No	1,3
H4OX	C, CCR	27.20	2	1108.22	Bladder	Yes	100	No	1,3
H4INT	C	60.01	2	1108.61	Keck/Tsunami	No	2000	Yes	1,3
H5	C	43.30	2	1122.80	Whale	No	1000	No	1,3
H6	C, CCR	15.00	2	1097.76	Bladder	Yes	100	Yes	1,3
H7	C	33.20	2	1106.06	Whale	No	1000	Yes	1,3
H8	C, CCR	22.05	2	1081.23	Bladder	Yes	100	TBD	1,3
H9	CCR	30.20	2	1086.21	Bladder	Yes	100	TBD	
BC1	B	16.26	2	1118.46	Bailer	Yes	N/A	No	1,3
BC101	B	39.30	2	1118.70	Bailer	Yes	N/A	Yes	1,3
BC2R	B	32.48	2	1115.28	Bailer	Yes	N/A	No	1,3
BC3R	B	35.15	2	1114.42	Bailer	Yes	N/A	Yes	1,3
BC4R	B	34.60	2	1113.86	Bailer	Yes	N/A	Yes	1,3
BC5R	B	37.32	2	1123.02	Bailer	Yes	N/A	No	1,3
BC6R	B	33.95	2	1121.58	Bailer	Yes	N/A	No	1,3
SLAG1	CCR	34.90	2	TBD	LOW FLOW	No	100	TBD	1,3

SLAG2	CCR	TBD	2	1111.06	LOW FLOW	TBD	100	TBD	1,3
SLAG3	CCR	TBD	2	TBD	LOW FLOW	TBD	100	TBD	1,3
SLAG4	CCR	39.00	2	TBD	LOW FLOW	No	100	TBD	1,3
SLAG5	CCR	38.80	2	1107.30	LOW FLOW	No	100	TBD	1,3
SLAG6	CCR	37.30	2	1111.51	LOW FLOW	No	100	TBD	1,3
SLAG7	CCR	48.70	2	1114.39	LOW FLOW	No	100	TBD	1,3
SLAG8	CCR	52.09	2	1127.26	LOW FLOW	No	100	TBD	1,3
SLAG9	CCR	49.80	2	1122.35	LOW FLOW	No	100	TBD	
SLAG9 DEEP***	CCR	68.00	2	1121.92	LOW FLOW	No	100	TBD	
SLAG2B	CCR	40.80	2	1111.26	LOW FLOW	No	100	TBD	
COOLING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
EVAPORATION	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
HOLDING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
RECLAIM POND	C	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3

\* Three additional monitoring wells will be installed the Spring of 2016. Each well will be screened approximately 35' below ground surface and will be analyzed for the "C" parameter list. In addition, a new site with 9 wells will be added and will be analyzed for CCR Parameters ONLY.

\*\* 1 = Spring (March 28 - April 28), 2 = Summer (July 1 - August 7), 3 = Fall (October 14- November 14)

\*\*\* Only sample for the first two CCR background sampling events.

## **Big Stone Plant CCR Appendix III Parameters**

CCR - Appendix III Detection Monitoring

### **Field Parameters**

pH\*

\* Field and Laboratory Measurements

### **Total Concentration Parameters**

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

500 HNO<sub>3</sub>

1000 None

## Big Stone CCR Appendix IV Parameters

CCR - Appendix IV - Assessment Monitoring

### Total Concentration Parameters

Antimony  
Arsenic  
Barium  
Beryllium  
Cadmium  
Chromium, Total  
Cobalt  
Fluoride  
Lead  
Lithium  
Mercury  
Molybdenum  
Selenium  
Thallium  
Radium 226 + 228

500 None

500  $\text{HNO}_3$

2 - 1000  $\text{HNO}_3$

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Site: Otter Tail Power Co./ Big Stone

Sampling Personnel:

Ben Wolf

Facility ID:

Date: 17 Oct 16

Unique Station ID:

Sample ID: Well H2OX

### Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Protective Posts? Yes  No

State ID Tag? Yes  No

Grout Seal Intact?  Yes  No

Repairs Necessary:

### Well Information

Well Depth: 32.83

Well Casing Elevation: 1103.91

Constructed Depth: 32.20

Static Water Elevation: 1094.60

Casing Diameter: 2"

Previous Static: 1095.25

Water Level Before Purge: 9.31

Water Level After Sample: Below pump

Well Volume: 3.84 Gallons

Measurement Method:  Elec. WL  Steel Tape

### Sampling Information

Weather Conditions: Temp: 65 Wind: LBV Sky: cloudy

Sampling Method: Grundfos  Bladder SS/T  Disp. Bailer  Whale  Grab  Other:

Dedicated Equipment:  Yes  No Pumping Rate: .25 gpm

Well Purged Dry?  Yes  No Time Pump Began: 1754 am  pm

Time Purged Dry: 1810 Time of Sampling: 1815 am  pm

Duplicate Sample? Yes  No  ID: — Sample EH: 151.9

Sample Appearance: General: clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1810</u>	<u>6.45</u>	<u>4781</u>	<u>9.88</u>	<u>NA</u>	<u>NA</u>	<u>4</u>	<u>1</u>	
<u>1815</u>	<u>6.54</u>	<u>4771</u>	<u>10.22</u>	<u>1</u>	<u>1</u>	<u>—</u>	<u>2</u>	<u>Recharge</u>
							<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes  No

Amount Water Removed: 4 Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Site: Otter Tail Power Co./ Big Stone

Sampling Personnel:

Ben Wolf

Facility ID:

Date: 18 Oct 16

Unique Station ID:

Sample ID: Well H3OX

### Well Condition

Well Locked?  Yes  No  
 Well Labeled?  Yes  No  
 Casing Straight?  Yes  No

Protective Posts? Yes  No   
 State ID Tag? Yes  No   
 Grout Seal Intact? Yes  No

Repairs Necessary:

### Well Information

Well Depth: 22.68  
 Constructed Depth: 22.55  
 Casing Diameter: 2"  
 Water Level Before Purge: 5.40  
 Well Volume: 2.82 Gallons  
 Well Casing Elevation: 1095.19  
 Static Water Elevation: 1089.79  
 Previous Static: 1090.07  
 Water Level After Sample: Below pump  
 Measurement Method:  Elec. WL  Steel Tape

### Sampling Information

Weather Conditions: Temp: 60 Wind: LEV Sky: clear  
 Sampling Method: Grundfos  Bladder SS  Disp. Baller  Whale  Grab  Other:  
 Dedicated Equipment:  Yes  No Pumping Rate: 0.25 gpm  
 Well Purged Dry?  Yes  No Time Pump Began: 828 am/pm  
 Time Purged Dry? 840 Time of Sampling: 845 am/pm  
 Duplicate Sample? Yes  No  ID: - Sample EH: 163.5  
 Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
12 840	6.57	4729	12.93	NA	NA	3	1	
845	6.67	4704	13.08	1	1	-	2	Recharge
							3	
							4	
							5	

Stabilized? Yes  No  Amount Water Removed: 3 Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Site: Otter Tail Power Co./ Big Stone

Sampling Personnel:

Ben Wolf

Facility ID:

Date: 18 Oct 16

Unique Station ID:

Sample ID: Well H40X

### Well Condition

Well Locked?  Yes  No  
 Well Labeled?  Yes  No  
 Casing Straight?  Yes  No

Protective Posts? Yes  No  
 State ID Tag? Yes  No  
 Grout Seal Intact?  Yes  No

Repairs Necessary:

### Well Information

Well Depth: 27.48

Well Casing Elevation: 1108.22

Constructed Depth: 27.20

Static Water Elevation: 1089.71

Casing Diameter: 2"

Previous Static: 1089.52

Water Level Before Purge: 18.51

Water Level After Sample: 25.42

Well Volume: 1.46 Gallons

Measurement Method:  Elec. WL  Steel Tape

### Sampling Information

Weather Conditions: Temp: 61 Wind: LEW Sky: clear

Sampling Method: Grundfos  Bladder SS  Disp. Bailer  Whale  Grab  Other:

Dedicated Equipment: Yes  No  Pumping Rate: 25 gpm

Well Purged Dry?  Yes  No Time Pump Began: 950  am  pm

Time Purged Dry? 956 Time of Sampling: 1001  am  pm

Duplicate Sample? Yes  No  ID: — Sample EH: 123.3

Sample Appearance: General: Slightly cloudy Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>6</u>								
<u>956</u>	<u>6.76</u>	<u>3188</u>	<u>9.86</u>	<u>NA</u>	<u>NA</u>	<u>1.5</u>	<u>1</u>	
<u>1001</u>	<u>6.59</u>	<u>3125</u>	<u>9.88</u>	<u> </u>	<u> </u>	<u>—</u>	<u>2</u>	<u>Recharge</u>
							<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes  No

Amount Water Removed: 1.5 Gallons

Comments:

Exceptions to Protocol:



# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Dusty Farasyn

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 1/20/16

Unique Station ID: —

Sample ID: Well H6

### Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Protective Posts?  Yes  No

State ID Tag? Yes  No

Grout Seal Intact? Yes  No

Repairs Necessary:

### Well Information

Well Depth: 17.92

Constructed Depth: 17.70

Casing Diameter: 2"

Water Level Before Purge: 15.80

Well Volume: 0.35 Gallons

Well Casing Elevation: NA

Static Water Elevation: I

Previous Static: I

Water Level After Sample: Below Pump

Measurement Method:  Elec. WLD  Steel Tape

### Sampling Information

Weather Conditions: Temp: 63 Wind: NNE @ 16 Sky: Mostly Cloudy

Sampling Method: Grundfos  Plunger SS/T Disp. Bailer  Whale  Grab  Other:

Dedicated Equipment:  Yes  No

Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes  No

Time Pump Began: 1627 am /  pm

Time Purged Dry? 1629

Time of Sampling: 1634 am /  pm

Duplicate Sample? Yes  No  ID: —

Sample EH: 100.5

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1629</u>	<u>7.06</u>	<u>1047</u>	<u>12.64</u>	<u>NA</u>	<u>NA</u>	<u>0.5</u>	1	
				<u>I</u>	<u>I</u>		2	
							3	
							4	
<u>1634</u>	<u>7.11</u>	<u>1026</u>	<u>12.30</u>	<u>I</u>	<u>I</u>	<u>0.5</u>	5	<u>Recharge</u>

Stabilized? Yes  No

Amount Water Removed: 0.5 Gallons

Comments:

\* slow recharge

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Dusty Farsyn

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 17 Oct 16

Unique Station ID: —

Sample ID: Well H8

### Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Protective Posts?  Yes  No

State ID Tag?  Yes  No

Grout Seal Intact?  Yes  No

Repairs Necessary: —

### Well Information

Well Depth: 22.33

Well Casing Elevation: 1081.23

Constructed Depth: 22.05

Static Water Elevation: 1072.98

Casing Diameter: 2"

Previous Static: 1073.00

Water Level Before Purge: 8.25

Water Level After Sample: 9.11

Well Volume: 2.30 Gallons

Measurement Method:  Elec. W/L  Steel Tape

### Sampling Information

Weather Conditions: Temp: 62 Wind: N @ 18 Sky: Pty. Cloudy

Sampling Method: Grundfos  Bladder S/S/T  Disp. Bailer  Whale  Grab  Other: —

Dedicated Equipment:  Yes  No

Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes  No

Time Pump Began: 1657 am /  pm

Time Purged Dry? —

Time of Sampling: 1727 am /  pm

Duplicate Sample?  Yes  No ID: —

Sample EH: 56.8

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1707	6.85	1462	11.04	NA	NA	2.5	1	
1717	6.84	1466	11.04			5	2	
1727	6.84	1469	10.92			7.5	3	
							4	
							5	

Stabilized?  Yes  No

Amount Water Removed: 7.5 Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

## Groundwater Assessment

Sampling Personne

Dusty Farsyn

Site: Otter Tail Power Co./ Big Stone

Facility ID:                     

Date: 17 Oct 16

Unique Station I                     

Sample ID: Well H9

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary:                     

Protective Posts  Yes  No

State ID Tag?  Yes  No

Grout Seal Intact  Yes  No

## Well Information

Well Depth: 30.71

Constructed Depth: 30.20

Casing Diameter: 2"

Water Level Before Purge: 10.82

Well Volume: 3.24 Gallons

Well Casing Elevation: 1086.21

Static Water Elevation: 1075.39

Previous Static: 1075.44

Water Level After Sam 13.12

Measurement Method  Elec. WLD  Steel Tape

## Sampling Information

Weather Conditions Temp: 60

Wind: N @ 16

Sky: Partly Cloudy

Sampling Method: Grundfos  Bladder SSPT  Disp. Bailer  Whale  Grab Other:                     

Dedicated Equipment  Yes  No

Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes  No

Time Pump Beg 1742 am /  pm

Time Purged Dry?                     

Time of Samplin 1821 am /  pm

Duplicate Sample?  Yes  No ID:                     

Sample EH: 124.4

Sample Appearance General: Clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1755	6.33	3316	10.05	NA	NA	3.25	1	
1808	6.34	3315	10.00			6.50	2	
1821	6.33	3316	9.96			9.75	3	
							4	
							5	

Stabiliz  Yes  No

Amount Water Removed 9.75 Gallons

Comments:                     

Exceptions to Protocol:



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www.mvtl.com



Page: 1 of 20

FINAL REPORT COMPLETION DATE: 12 Jan 17 AH

Date Reported: 11 Jan 2017

MEGAN LISBURG  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Work Order #: 31-0620  
Account #: 006106  
PO #: 48680

Project Name: BIG STONE PLANT CCR

T. J. [Signature] 11/5/16  
Field Service Manager/Date Reviewed

[Signature] 11 Jan 2017  
Chemistry Lab Manager/Date Reviewed

[Signature] 11 January 2017  
Quality Assurance Director/Date Reviewed

- RL = Reporting Limits
- NQ = Not Present, Qualitative Only
- PQ = Present, Qualitative Only
- ND = Not Determined

All data for this report has been approved by MVTl Laboratory Management.

MVTl guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTl to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTl. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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Page: 2 of 20

## CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017  
 Lab Number: 16-A63071  
 Work Order #: 31-0620  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 21 Nov 2016 11:18  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 22 Nov 2016 14:00  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H20X

Temp at Receipt: 0.6C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				23 Nov 16	JMS
Water Digestions				23 Nov 16	JMS
Radium 226	See Attached			10 Jan 17 11:04	ABL
Radium 228	See Attached		EPA M9320	10 Jan 17 11:04	ABL
pH, Field	6.35 units	1.00	I-1586-85	21 Nov 16 11:18	BMW
pH	* 6.9 units	1.0	SM 4500 H+B-96	22 Nov 16 14:00	DK
Sulfate	2430 - mg/L	4.0	ASTM D516-02	1 Dec 16 7:51	AKF
Chloride	3.4 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:07	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 10:36	TWB
	See Narrative				
Solids, Total Dissolved	3940 mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	499.0 ~ mg/L	0.500	SW5010C	29 Nov 16 13:52	RMV
Lithium	0.411 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Barium	0.007 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Boron	0.249 mg/L	0.100	SW6010C	29 Nov 16 13:52	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
Arsenic	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 Dec 16 9:10	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 9:10	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Molybdenum	8.87 @ ug/L	0.50	SW6020A	9 Dec 16 9:10	RMV
Selenium	24.0 ug/L	0.50	SW6020A	9 Dec 16 9:10	RMV
	@^See Narrative				
Thallium	< 0.5 ug/L	0.1	SW6020A	7 Dec 16 14:02	RMB
	@See Narrative				
Fluoride	0.170 mg/L	0.020	EPA 300.0	25 Nov 16 10:40	RMB

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix

# = Due to concentration of other analytes

! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # Q27-015-125 MI LAB # 999447680 NJ MICRO # 1013-M ND NR/DN # R-040

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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www.mvtl.com



CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017
Lab Number: 16-A63071
Work Order #: 31-0620
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 21 Nov 2016 11:18
Sampled By: MVTL FIELD PERSONNEL
Date Received: 22 Nov 2016 14:00
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H20X

Temp at Receipt: 0.6C

As Received Result Method RL Method Reference Date Analyzed Analyst

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017
Lab Number: 16-A63072
Work Order #: 31-0620
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 21 Nov 2016 11:54
Sampled By: MVT FIELD PERSONNEL
Date Received: 22 Nov 2016 14:00
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H30X

Temp at Receipt: 0.6C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include MS Water Digestions, Radium 226, pH, Sulfate, Chloride, Mercury, Solids, Total Dissolved, Calcium, Lithium, Barium, Cobalt, Boron, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Lead, Molybdenum, Selenium, Thallium, Fluoride.

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample matrix + = Due to internal standard response

CERTIFICATION: MN LAB # 027-016-125 WI LAB # 999447680 ND MICRO # 1013-M ND WWT/DW # R-040



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## CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017  
 Lab Number: 16-A63073  
 Work Order #: 31-0620  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 21 Nov 2016 12:19  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 22 Nov 2016 14:00  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H40X

Temp at Receipt: 0.6C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				23 Nov 16	JMS
Water Digestions				23 Nov 16	JMS
Radium 226	See Attached			10 Jan 17 11:04	ABL
Radium 228	See Attached		EPA M9320	10 Jan 17 11:05	ABL
pH, Field	6.52 units	1.00	I-1586-85	21 Nov 16 12:19	BMW
pH	* 7.0 units	1.0	SM 4500 H+B-96	22 Nov 16 14:00	DK
Sulfate	1220 ~ mg/L	4.0	ASTM D516-02	1 Dec 16 8:09	AKF
Chloride	48.1 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:25	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 10:36	TWB
	See Narrative				
Solids, Total Dissolved	2250 mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	336.0 mg/L	0.500	SW6010C	29 Nov 16 13:52	RMV
Lithium	0.100 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Barium	0.025 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Boron	0.410 mg/L	0.100	SW6010C	29 Nov 16 13:52	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 15:02	RMB
	@See Narrative				
Cadmium	< 0.5 ug/L	0.1	SW6020A	9 Dec 16 10:01	RMV
Chromium	3.14 @ ug/L	0.50	SW6020A	9 Dec 16 10:01	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Molybdenum	5.95 ug/L	0.50	SW6020A	9 Dec 16 10:01	RMV
Selenium	< 5 ug/L	0.5	SW6020A	9 Dec 16 10:01	RMV
	@^See Narrative				
Thallium	< 0.5 @ ug/L	0.1	SW6020A	7 Dec 16 15:02	RMB
Fluoride	0.420 mg/L	0.020	EPA 300.0	25 Nov 16 10:40	RMB

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix

# = Due to concentration of other analytes

! = Due to sample quantity

\* = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040

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www.mvtl.com



CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017
Lab Number: 16-A63073
Work Order #: 31-0620
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 21 Nov 2016 12:19
Sampled By: MVTL FIELD PERSONNEL
Date Received: 22 Nov 2016 14:00
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H40X

Temp at Receipt: 0.6C

As Received Method Method Date
Result RL Reference Analyzed Analyst

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TWI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447699 ND MICRO # 1013-M ND WWTW # R-040



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## CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017  
 Lab Number: 16-A63074  
 Work Order #: 31-0620  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 21 Nov 2016 12:46  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 22 Nov 2016 14:00  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H6

Temp at Receipt: 0.6C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				23 Nov 16	JMS
Water Digestions				23 Nov 16	JMS
Radium 226	See Attached			10 Jan 17 11:05	ABL
Radium 228	See Attached		EPA M9320	10 Jan 17 11:05	ABL
pH, Field	7.06 units	1.00	I-1586-85	21 Nov 16 12:46	BMK
pH	* 7.2 units	1.0	SM 4500 H+B-96	22 Nov 16 14:00	DR
Sulfate	345 ~ mg/L	4.0	ASTM D516-02	1 Dec 16 8:09	AKF
Chloride	3.8 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:25	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	5 Dec 16 10:36	TWB
	See Narrative				
Solids, Total Dissolved	918 mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	135.0 mg/L	0.500	SW6010C	29 Nov 16 13:52	RMV
Lithium	0.042 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Barium	0.034 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Boron	4.280 mg/L	0.100	SW6010C	29 Nov 16 13:52	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 15:02	RMB
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 Dec 16 10:01	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 10:01	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Molybdenum	14.4 @ ug/L	0.50	SW6020A	9 Dec 16 10:01	RMV
Selenium	< 10 ug/L	0.5	SW6020A	12 Dec 16 13:46	RMB
	@See Narrative				
Thallium	< 0.5 @ ug/L	0.1	SW6020A	7 Dec 16 15:02	RME
Fluoride	0.630 mg/L	0.020	EPA 300.0	25 Nov 16 10:40	RMB

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current INI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix

# = Due to concentration of other analytes

! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017
Lab Number: 16-A63074
Work Order #: 31-0620
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 21 Nov 2016 12:46
Sampled By: MVTL FIELD PERSONNEL
Date Received: 22 Nov 2016 14:00
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H6

Temp at Receipt: 0.6C

As Received Method Method Date
Result RL Reference Analyzed Analyst

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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## CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017  
 Lab Number: 16-A63075  
 Work Order #: 31-0620  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 21 Nov 2016 13:22  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 22 Nov 2016 14:00  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H8

Temp at Receipt: 0.6C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				23 Nov 16	JMS
Water Digestions				23 Nov 16	JMS
Radium 226	See Attached			10 Jan 17 11:05	ABL
Radium 228	See Attached		EPA M9320	10 Jan 17 11:05	ABL
pH, Field	6.77 units	1.00	I-1586-B5	21 Nov 16 13:22	BMW
pH	* 7.2 units	1.0	SM 4500 H+B-96	22 Nov 16 14:00	DK
Sulfate	339 ~ mg/L	4.0	ASTM D516-02	1 Dec 16 8:09	AKF
Chloride	3.9 mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:25	KCJ
Mercury	< 0.005 ug/L	0.005	EPA 245.7	15 Dec 16 9:09	TWB
Solids, Total Dissolved	937 mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	135.0 mg/L	0.500	SW6010C	29 Nov 16 13:52	RMV
Lithium	0.045 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Barium	0.033 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Cobalt	< 0.005 mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Boron	4.320 mg/L	0.100	SW6010C	29 Nov 16 13:52	RMV
Antimony	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Beryllium	< 0.25 ug/L	0.05	SW6020A	7 Dec 16 15:02	RMB
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 Dec 16 10:01	RMV
Chromium	< 2.5 @ ug/L	0.5	SW6020A	9 Dec 16 10:01	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Molybdenum	14.6 @ ug/L	0.50	SW6020A	9 Dec 16 10:01	RMV
Selenium	< 10 ug/L	0.5	SW6020A	12 Dec 16 13:46	RMB
	@*See Narrative				
Thallium	< 0.5 @ ug/L	0.1	SW6020A	7 Dec 16 15:02	RMB
Fluoride	0.590 mg/L	0.020	EPA 300.0	25 Nov 16 10:40	RMB

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit  
 Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.  
 The reporting limit was elevated for any analyte requiring a dilution as coded below:  
 @ = Due to sample matrix # = Due to concentration of other analytes  
 ! = Due to sample quantity + = Due to internal standard response  
 CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-H ND WW/DW # R-040

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890  
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 2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724  
 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
 www.mvtl.com



## CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 11 Jan 2017  
 Lab Number: 16-A63076  
 Work Order #: 31-0620  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 21 Nov 2016 14:04  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 22 Nov 2016 14:00  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H9

Temp at Receipt: 0.6C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					23 Nov 16	JMS
Water Digestions					23 Nov 16	JMS
Radium 226	See Attached				10 Jan 17 11:05	ABL
Radium 228	See Attached			EPA M9320	10 Jan 17 11:05	ABL
pH, Field	6.34	units	1.00	I-1586-85	21 Nov 16 14:04	BMW
pH	* 6.8	units	1.0	SM 4500 H+B-96	22 Nov 16 14:00	DK
Sulfate	1660 ~	mg/L	4.0	ASTM D516-02	1 Dec 16 8:09	AKF
Chloride	17.6	mg/L	3.0	SM 4500 Cl E	1 Dec 16 9:25	KCJ
Mercury	< 0.005	ug/L	0.005	EPA 245.7	15 Dec 16 9:09	TWB
Solids, Total Dissolved	2840	mg/L	10	SM 2540 C-97	23 Nov 16 10:30	RC
Calcium	626.0 ~	mg/L	0.500	SW6010C	29 Nov 16 13:52	RMV
Lithium	0.138	mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Barium	0.030	mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Cobalt	< 0.005	mg/L	0.005	SW6010C	29 Nov 16 13:52	RMV
Boron	1.210	mg/L	0.100	SW6010C	29 Nov 16 13:52	RMV
Antimony	< 2.5 @	ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Arsenic	< 2.5 @	ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Beryllium	< 0.25	ug/L	0.05	SW6020A	7 Dec 16 15:02	RMB
	@See Narrative					
Cadmium	< 0.5 @	ug/L	0.1	SW6020A	9 Dec 16 10:01	RMV
Chromium	< 2.5 @	ug/L	0.5	SW6020A	9 Dec 16 10:01	RMV
Lead	< 2.5 @	ug/L	0.5	SW6020A	7 Dec 16 15:02	RMB
Molybdenum	3.31 @	ug/L	0.50	SW6020A	9 Dec 16 10:01	RMV
Selenium	< 5	ug/L	0.5	SW6020A	9 Dec 16 10:01	RMV
	@^See Narrative					
Thallium	< 0.5 @	ug/L	0.1	SW6020A	7 Dec 16 15:02	RMB
Fluoride	0.200	mg/L	0.020	EPA 300.0	25 Nov 16 10:40	RMB

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit  
 Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.  
 The reporting limit was elevated for any analyte requiring a dilution as coded below:  
 @ = Due to sample matrix # = Due to concentration of other analytes  
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WY/DN # R-040



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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
www.mvtl.com



Page: 20 of 20

Date Reported: 11 Jan 2017

MEGAN LISBURG  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Work Order #: 201631-0620  
Account Number: 006106  
PO #: 48680

Project Name: BIG STONE PLANT CCR

## LABORATORY NARRATIVE

### INORGANIC AND METALS ANALYSES:

The matrix spike recoveries for mercury associated with samples 16-A63071 through 16-A63074, 16-A63077 and 16-A63078 were above the acceptance limits. Only results less than the reporting limit were reported.

The knowns were above the acceptance limits for beryllium for samples 16-A63071 through 16-A63079 and 16-A63081. Data below the reporting limit was reported.

The matrix spike recoveries for beryllium, arsenic, thallium, and lead were above the acceptance limits for sample 16-A63071. Data below the reporting limit was reported.

The matrix spike recoveries for beryllium, arsenic, selenium, thallium, and lead were above the acceptance limits for sample 16-A63072. Data below the reporting limit was reported.

Due to the sample matrix of the spiked sample, the matrix spike duplicate recovery for selenium was outside of acceptance range for sample 16-A63071. Data was reported based on the acceptable recoveries of the blank spike and relative percent difference between the matrix spikes.

Due to the sample matrix of the spiked sample, the matrix spike and matrix spike duplicate recoveries for selenium were above of acceptance range for samples 16-A63073 through 16-A63076, and 16-A63078 through 16-A63081. Data below reporting limit was reported.

The matrix spike recovery for selenium was above the acceptance limits for sample 16-A63077. Data was reported based on acceptable matrix spike duplicate recovery and acceptable relative percent difference between the matrix spike and matrix spike duplicate.

The relative standard deviation between readings for selenium failed in the known for sample 16-A63077. Data was reported based on the acceptable recovery of the known.

No other problems were encountered with these analyses.



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Date: 1/10/2017

**CLIENT:** MVTL Inc  
**Project:** Big Stone Plant CCR  
**Lab Order:** S1611451


**CASE NARRATIVE**  
Report ID: S1611451001

Samples H-6-A63074, H-8-A63075, H-9-A63076, H20X-A63071, H30X-A63072, H40X-A63073, Slag 1-A63077, Slag 2B-A63084, Slag 4-A63078, Slag 5-A63079, Slag 6-A63080, Slag 7-A63081, Slag 8-A63082, and Slag 9-A63083 were received on November 29, 2016.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions  
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition  
40 CFR Parts 136 and 141  
40 CFR Part 50, Appendices B, J, L, and O  
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012  
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:   
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

<b>Company:</b>	MVTL Inc 1126 N Front St New Ulm, MN 56073	<b>Date Reported</b>	1/10/2017
<b>ProjectName:</b>	Big Stone Plant CCR	<b>Report ID</b>	S1611451001
<b>Lab ID:</b>	S1611451-001	<b>WorkOrder:</b>	S1611451
<b>ClientSample ID:</b>	H20X-A63071	<b>CollectionDate:</b>	11/21/2016 11:18:00 AM
<b>COC:</b>	WEB	<b>DateReceived:</b>	11/29/2016 12:30:00 PM
<b>Comments</b>	WO# 31-0620	<b>FieldSampler:</b>	TP
		<b>Matrix:</b>	Water

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	12/13/2016 1302	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	12/13/2016 1302	MB
Radium 228	ND	pCi/L		2	Ga-Tech	12/29/2016 2242	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	12/29/2016 2242	MB

These results apply only to the samples tested.

RL - Reporting Limit

- |                    |  |  |
|--------------------|--|--|
| <b>Qualifiers:</b> | B Analyte detected in the associated Method Blank      | C Calculated Value                                   |
|                    | E Value above quantitation range                       | H Holding times for preparation or analysis exceeded |
|                    | J Analyte detected below quantitation limits           | L Analyzed by another laboratory                     |
|                    | M Value exceeds Monthly Ave or MCL or is less than LCL | ND Not Detected at the Reporting Limit               |
|                    | O Outside the Range of Dilutions                       | S Spike Recovery outside accepted recovery limits    |
|                    | X Matrix Effect  |  |

Reviewed by: Wade Nieuwsma  
 Wade Nieuwsma, Assistant Laboratory Manager





Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 1/10/2017
Report ID S1611451001

ProjectName: Big Stone Plant CCR
Lab ID: S1611451-002
ClientSample ID: H30X-A63072
COC: WEB

WorkOrder: S1611451
CollectionDate: 11/21/2016 11:54:00 AM
DateReceived: 11/29/2016 12:30:00 PM
FieldSampler: TP
Matrix: Water

Comments WO# 31-0620

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank, E Value above quantitation range, J Analyte detected below quantitation limits, M Value exceeds Monthly Ave or MCL or is less than LCL, O Outside the Range of Dilutions, X Matrix Effect, C Calculated Value, H Holding times for preparation or analysis exceeded, L Analyzed by another laboratory, ND Not Detected at the Reporting Limit, S Spike Recovery outside accepted recovery limits

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 1/10/2017
Report ID S1611451001

ProjectName: Big Stone Plant CCR
Lab ID: S1611451-003
ClientSample ID: H40X-A63073
COC: WEB

WorkOrder: S1611451
CollectionDate: 11/21/2016 12:19:00 PM
DateReceived: 11/29/2016 12:30:00 PM
FieldSampler: TP
Matrix: Water

Comments WO# 31-0620

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank, E Value above quantitation range, J Analyte detected below quantitation limits, M Value exceeds Monthly Ave or MCL or is less than LCL, O Outside the Range of Dilutions, X Matrix Effect, C Calculated Value, H Holding times for preparation or analysis exceeded, L Analyzed by another laboratory, ND Not Detected at the Reporting Limit, S Spike Recovery outside accepted recovery limits

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 1/10/2017
Report ID S1611451001

ProjectName: Big Stone Plant CCR
Lab ID: S1611451-004
ClientSample ID: H-6-A63074
COC: WEB

WorkOrder: S1611451
CollectionDate: 11/21/2016 12:46:00 PM
DateReceived: 11/29/2016 12:30:00 PM
FieldSampler: TP
Matrix: Water

Comments WO# 31-0620

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Int. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

- C Calculated Value
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 1/10/2017
Report ID S1611451001

ProjectName: Big Stone Plant CCR
Lab ID: S1611451-005
ClientSample ID: H-8-A63075
COC: WEB

WorkOrder: S1611451
CollectionDate: 11/21/2016 1:22:00 PM
DateReceived: 11/29/2016 12:30:00 PM
FieldSampler: TP
Matrix: Water

Comments WO# 31-0620

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision, Radium 228, and Radium 228 Precision.

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

- C Calculated Value
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 1/10/2017
Report ID S1611451001

ProjectName: Big Stone Plant CCR
Lab ID: S1611451-006
ClientSample ID: H-9-A63076
COC: WEB

WorkOrder: S1611451
CollectionDate: 11/21/2016 2:04:00 PM
DateReceived: 11/29/2016 12:30:00 PM
FieldSampler: TP
Matrix: Water

Comments WO# 31-0620

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Int. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank, E Value above quantitation range, J Analyte detected below quantitation limits, M Value exceeds Monthly Ave or MCL or is less than LCL, O Outside the Range of Dilutions, X Matrix Effect, C Calculated Value, H Holding times for preparation or analysis exceeded, L Analyzed by another laboratory, ND Not Detected at the Reporting Limit, S Spike Recovery outside accepted recovery limits

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



### ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc  
Work Order: S1611451  
Project: Big Stone Plant CCR

Date: 1/10/2017  
Report ID: S1611451001

Radium 228 by Ga/Tech	Sample Type	MBLK	Units: pCi/L				
TAP-407 (12/27/16 12:03)	RunNo:	142210	PrepDate:	12/05/16 12:00	BatchID:	12690	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	2	1					

MB-408 (01/03/17 17:40)	RunNo:	142312	PrepDate:	12/12/16 14:00	BatchID:	12727	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	ND	1					

Radium 228 by Ga/Tech	Sample Type	LCS	Units: pCi/L				
LCS-407 (12/27/16 15:05)	RunNo:	142210	PrepDate:	12/05/16 12:00	BatchID:	12690	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	33	1	39.1	83.5	65.9 - 132		

LCS-408 (01/03/17 14:38)	RunNo:	142312	PrepDate:	12/12/16 14:00	BatchID:	12727	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	39	1	39.1	99.5	65.9 - 132		

Radium 228 by Ga/Tech	Sample Type	MS	Units: pCi/L				
MS-407 (12/27/16 21:08)	RunNo:	142210	PrepDate:	12/05/16 12:00	BatchID:	12690	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	39	1	39.1	2	94.8	50 - 139	

MS-408 (01/03/17 20:42)	RunNo:	142312	PrepDate:	12/12/16 14:00	BatchID:	12727	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	48	1	39.1	2	119	50 - 139	

Radium 228 by Ga/Tech	Sample Type	MSD	Units: pCi/L				
MSD-407 (12/28/16 00:10)	RunNo:	142210	PrepDate:	12/05/16 12:00	BatchID:	12690	
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228	34	1	39	13.6	82.1	20	

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - H Holding times for preparation or analysis exceeded
  - L Analyzed by another laboratory
  - O Outside the Range of Dilutions
  - S Spike Recovery outside accepted recovery limits
  - E Value above quantitation range
  - J Analyte detected below quantitation limits
  - ND Not Detected at the Reporting Limit
  - R RPD outside accepted recovery limits
  - X Matrix Effect



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

### ANALYTICAL QC SUMMARY REPORT

**CLIENT:** MVTL Inc  
**Work Order:** S1611451  
**Project:** Big Stone Plant CCR

**Date:** 1/10/2017  
**Report ID:** S1611451001

Radium 226 In Water -		Sample Type	MBLK	Units: pCi/L				
MB-1700 (12/13/16 13:02)	Analyte	RunNo:	141804	PrepDate:	12/07/16 0:00	BatchID:	12653	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Radium 226 ND 0.2

Radium 226 in Water -		Sample Type	LCS	Units: pCi/L				
LCS-1700 (12/13/16 13:02)	Analyte	RunNo:	141804	PrepDate:	12/07/16 0:00	BatchID:	12653	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Radium 226 6.0 0.2 5.89 101 67.1 - 122

Radium 226 In Water -		Sample Type	LCSD	Units: pCi/L				
LCSD-1700 (12/13/16 13:02)	Analyte	RunNo:	141804	PrepDate:	12/07/16 0:00	BatchID:	12653	
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual

Radium 226 6.2 0.2 6.0 4.62 106 20

Radium 226 In Water -		Sample Type	MS	Units: pCi/L				
S1611451-001AMS (12/13/16 13:03)	Analyte	RunNo:	141804	PrepDate:	12/07/16 0:00	BatchID:	12653	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Radium 226 13 1 11.8 ND 112 65 - 131

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
	O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
	S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

**Quality Control Report**

Lab IDs: 16-A63071 to 16-A63084

Project: BIG STONE PLANT CCR

Work Order: 201631-0620

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<=)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony ug/L	25.0	106	85-115	25.0	16A63072q	<2.5	30.8	123	75-125	30.8	30.7	123	0.3	10	103	90-110	<0.5
	25.0	106	85-115	25.0	16A63081q	<2.5	26.3	105	75-125	26.3	26.4	106	0.4	10	103	90-110	<0.5
	25.0	104	85-115	25.0	A63082qc	<2.5	27.7	111	75-125	27.7	30.4	122	9.3	10	102	90-110	<0.5
				25.0	16A63082q	<2.5	28.4	114	75-125	28.4	27.5	110	3.2	10	102	90-110	<0.5
Arsenic ug/L	25.0	106	85-115	25.0	16A63072q	<2.5	32.7	131	75-125	32.7	32.3	129	1.2	10	102	90-110	<0.5
	25.0	106	85-115	25.0	16A63081q	<2.5	30.8	123	75-125	30.8	29.3	117	5.0	10	102	90-110	<0.5
				25.0	16A63082q	<2.5	28.7	115	75-125	28.7	27.6	110	3.9	10	102	90-110	<0.5
Barium mg/L	1.000	102	85-115	1.00	16A63079q	0.105	1.190	108	75-125	1.190	1.140	104	4.3	10	100	90-110	<0.005
	1.000	102	85-115	1.00	16A63112q	0.059	1.050	99	75-125	1.050	1.050	99	0.0	10	96	90-110	<0.005
Beryllium ug/L	2.50	131	85-115	2.50	16A63072q	<0.25	3.40	136	75-125	3.40	3.34	134	1.8	10	120	90-110	<0.05
	2.50	99	85-115	2.50	16A63081q	<0.25	3.09	124	75-125	3.09	3.07	123	0.6	10	124	90-110	<0.05
	2.50	95	85-115	2.50	a63081qc	<0.25	2.42	97	75-125	2.62	2.64	106	0.8	10	92	90-110	<0.05
				2.50	16A63082q	<0.25	2.62	105	75-125	2.62	2.64	106	0.8	10	100	90-110	<0.05
Boron mg/L	1.000	102	85-115	1.00	16A63079q	0.112	1.220	111	75-125	1.220	1.180	107	3.3	10	101	90-110	<0.1
	1.000	100	85-115	1.00	16A63112q	<0.1	1.040	104	75-125	1.040	1.070	107	2.8	10	100	90-110	<0.1
Cadmium ug/L	5.00	107	85-115	5.00	16A63072q	<0.5	5.51	110	75-125	5.51	5.37	107	2.6	10	98	90-110	<0.1
	5.00	98	85-115	5.00	a63081qc	0.81	6.08	105	75-125	6.08	5.93	102	2.5	10	95	90-110	<0.1
				5.00	16A63082q	<0.5	5.03	101	75-125	5.03	5.27	105	4.7	10	94	90-110	<0.1
Calcium mg/L	50.00	105	85-115	50.0	16A63079q	132.0	186.0	108	75-125	186.0	185.0	106	0.5	10	102	90-110	<0.5
	50.00	106	85-115	50.0	16A63112q	97.10	144.0	94	75-125	144.0	146.0	98	1.4	10	102	90-110	<0.5
Chloride mg/L	-	-	-	60.0	16-A63072	80.9	142	102	85-120	142	139	97	2.1	5	100	90-110	<3
	-	-	-	60.0	16-A63082	38.5	101	104	85-120	101	99.9	102	1.1	5	100	90-110	<3
	-	-	-	60.0	16-A63115	<2	63.1	105	85-120	63.1	61.8	103	2.1	5	101	90-110	<3
	-	-	-	60.0	16-A63637	24.6	87.9	106	88-117	87.9	85.9	102	2.3	5			





**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890  
 2616 E. Broadway Ave. ~ Bismarck, ND 58502 ~ 800-279-6885 ~ Fax 701-258-9724  
 1201 Lincoln Highway ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
 www.mvtl.com

MEMBER  
ACIL

**Quality Control Report**

Lab IDs: 16-A63071 to 16-A63084

Project: BIG STONE PLANT CCR

Work Order: 201631-0620

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig. Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig. Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (≤)	Known Rec (%)	Known % Rec Limits	Method Blank
Chromium ug/L	25.0	112	85-115	25.0	16A63072q	<2.5	24.3	97	75-125	24.3	25.0	100	2.8	10	101	90-110	<0.5
	25.0	108	85-115	25.0	a63081qc	7.86	32.4	98	75-125	32.4	32.6	99	0.6	10	100	90-110	<0.5
	25.0	111	85-115	25.0	A63082qc	<2.5	25.6	102	75-125	25.6	28.0	112	9.0	10	100	90-110	<0.5
	25.0	110	85-115	25.0	16-A63082	<2.5	25.6	102	75-125	25.6	27.6	110	7.5	10	110	90-110	<0.5
	25.0	102	85-115	25.0	A63081qc	7.91	33.0	100	75-125	33.0	32.6	99	1.2	10	110	90-110	<0.5
	25.0	102	85-115	25.0	A65485qc	45.5	72.6	108	75-125	72.6	67.4	88	7.4	10	110	90-110	<0.5
Cobalt mg/L	1.000	106	85-115	1.00	16A63079q	<0.005	1.050	105	75-125	1.050	1.040	104	1.0	10	104	90-110	<0.005
	1.000	106	85-115	1.00	16A63112q	<0.01	0.979	98	75-125	0.979	0.997	100	1.8	10	102	90-110	<0.005
Fluoride mg/L	0.200	100	85-115	0.20	16-A63080	0.600	0.800	100	75-125	0.800	0.800	100	0.0	10	98	90-110	<0.02
				0.20	A63084qc	0.090	0.260	85	75-125	0.260	0.260	85	0.0	10	102	90-110	<0.02
				0.20	16-A63125	0.680	0.880	100	75-125	0.880	0.880	100	0.0	10	100	90-110	<0.02
Lead ug/L	25.0	108	85-115	25.0	16A63072q	<2.5	32.1	128	75-125	32.1	31.3	125	2.5	10	105	90-110	<0.5
				25.0	16A63081q	<2.5	29.4	118	75-125	29.4	29.6	118	0.7	10	104	90-110	<0.5
				25.0	16A63082q	<2.5	28.0	112	75-125	28.0	26.9	108	4.0	10	99	90-110	<0.5
Lithium mg/L	1.000	104	85-115	1.00	16-A63079	0.026	1.120	109	75-125	1.120	1.080	105	3.6	10	103	90-110	<0.005
	1.000	106	85-115	1.00	a63112qc	<0.01	1.030	103	75-125	1.030	1.010	101	2.0	10	100	90-110	<0.005
Mercury ug/L	-	-	-	0.10	16-A63071	<0.005	0.112	112	67-106	0.112	0.112	112	0.0	9	112	76-113	<0.005
	-	-	-	0.10	16-A63933	<0.005	0.106	106	67-106	0.106	0.100	100	5.8	9	110	76-113	<0.005
	-	-	-	0.10	16-A64471	<0.005	0.088	88	67-106	0.088	0.091	91	3.4	9	100	76-113	<0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum ug/L	25.0	103	85-115	25.0	16A63072q	41.4	66.6	101	75-125	66.6	66.7	101	0.2	10	98	90-110	<0.5
	25.0	95	85-115	25.0	a63081qc	4.99	28.9	96	75-125	28.9	28.7	95	0.7	10	92	90-110	<0.5
	25.0	95	85-115	25.0	16A63082q	8.81	31.6	91	75-125	31.6	32.5	95	2.8	10	90	90-110	<0.5
pH units	-	-	-	-	-	-	-	-	-	7.2	7.2	-	0.0	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	7.2	7.2	-	0.0	2.5	101	90-110	-

**Quality Control Report**

Lab IDs: 16-A63071 to 16-A63084

Project: BIG STONE PLANT CCR

Work Order: 201631-0620

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<=)	Known Rec (%)	Known % Rec Limits	Method Blank
Selenium ug/L	25.0	113	85-115	25.0	16A63072q	< 2.5	31.4	126	75-125	31.4	31.9	128	1.6	10	100	90-110	< 0.5
	25.0	98	85-115	25.0	16A63072q	< 5	31.3	125	75-125	31.3	34.0	136	8.3	10	109	90-110	< 0.5
	25.0	102	85-115	25.0	a63081qc	< 5	31.4	126	75-125	31.4	31.5	126	0.3	10	96	90-110	< 0.5
	25.0	109	85-115	25.0	A63365qc	< 2.5	28.7	115	75-125	28.7	30.0	120	4.4	10	97	90-110	< 0.5
	25.0	108	85-115	25.0	A63081qc	< 10	32.7	131	75-125	33.9	31.4	127	7.7	10	104	90-110	< 0.5
	25.0	108	85-115	25.0	A63081qc	< 2.5	32.8	131	75-125	51.4	49.8	121	3.2	10			< 0.5
				25.0	A65485qc	< 0.5	30.9	124	75-125	51.1	49.4	116	3.4	10			< 0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	918	914	-	0.4	10	109	85-115	< 10
	-	-	-	-	-	-	-	-	-	1380	1370	-	0.7	10			
Sulfate mg/L	-	-	-	60.0	16-A62947	64.0	132	113	78-126	132	130	110	1.5	5	103	90-110	< 4
	-	-	-	600	16-A63082	292	974	114	78-126	974	977	114	0.3	5	95	90-110	< 4
	-	-	-	600	16-A63084	745	1400	109	78-126	1400	1420	112	1.4	5	99	90-110	< 4
	-	-	-	60.0	16-A62306	68.9	139	117	78-126	139	142	122	2.1	5			
	-	-	-	60.0	16-A62134	42.3	111	114	78-126	111	110	113	0.9	5			
Thallium ug/L	5.00	106	85-115	5.00	16A63072q	< 0.5	6.55	131	75-125	6.55	6.37	127	2.8	10	104	90-110	< 0.1
	5.00	108	85-115	5.00	16A63081q	< 0.5	5.68	114	75-125	5.68	5.70	114	0.4	10	104	90-110	< 0.1
	5.00	102	85-115	5.00	A63082qc	< 0.5	5.52	110	75-125	5.52	6.10	122	10.0	10	100	90-110	< 0.1
				5.00	16A63082q	< 0.5	5.74	115	75-125	5.74	5.52	110	3.9	10	100	90-110	

The arsenic matrix spike recoveries were outside the acceptance range, see narrative.  
 The beryllium LCS recovery was outside the acceptance limits, see narrative.  
 The beryllium matrix spike recoveries were outside the acceptance limits, see narrative.  
 The beryllium known recoveries were above the acceptance limits, see narrative.  
 The lead matrix spike recovery was above the acceptance limits, see narrative.  
 The selenium matrix spike recoveries were outside the acceptance limits, see narrative.  
 The thallium matrix spike recoveries were outside the acceptance limits, see narrative.  
 The mercury matrix spike recoveries were outside the acceptance limits, see narrative.

Approved by: 

This is an exact copy of  
the original document  
By AD Date 22 Nov 16  
Pages 1-23

# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> Dusty Fergusyn, Ben Wolf
<b>Report</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b> 31-0620
<b>Address</b> P.O. Box 496	<b>Address:</b>	<b>Lab Numbers:</b>
Fergus Falls, MN 56538-0496		
<b>Phone:</b> 218-739-8349		

### Sample Information

### Bottle Type

### Analysis

Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
At 3521	H2OX		21 Nov 16	1118	GW		2	N	1	1	N								See Attached
72	H3OX			1154	GW		2	N	1	1	N								
73	H4OX			124	GW		2	N	1	1	N								
74	H-6			1246	GW		2	N	1	1	N								
75	H-8			322	GW		2	N	1	1	N								
76	H-9			404	GW		2	N	1	1	N								
77	Slag 1			1123	GW		2	N	1	1	N								
78	Slag 4			1236	GW		2	N	1	1	N								
79	Slag 5			1453	GW		2	N	1	1	N								
80	Slag 6			1319	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

<b>Samples Relinquished By:</b> <u>Paul Vukonich</u>	<b>Samples Received By:</b> <u>B. Fergusyn</u>
<b>Date:</b> <u>22 Nov 16</u> <b>Time:</b> <u>1400</u> <b>Temp:</b> <u>0.6</u>	<b>Date:</b> <u>22 Nov 16</u> <b>Time:</b> <u>1400</u> <b>Temp:</b> <u>0.6 C</u>
<b>Samples Relinquished into:</b> Fridge <u>log in Car</u> Other:	
<b>Samples Relinquished By:</b>	<b>Samples Received By:</b>
<b>Date:</b> <b>Time:</b> <b>Temp:</b>	<b>Date:</b> <b>Time:</b> <b>Temp:</b>
<b>Delivery:</b> <u>Samplers</u> Other:	<b>Seal Number(s) - If Used</b>
<b>Transport:</b> <u>Ambient</u> <u>Ice</u> Other:	<b>Seals Intact?</b> Yes No

# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> Dusty Fossyn, Ben Wolf
<b>Report</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b>
<b>Address</b> P.O. Box 496	<b>Address:</b>	<b>Lab Numbers:</b>
Fergus Falls, MN 56538-0496		
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
81	Slag 7		21 Nov 16	1405	GW		2	N	1	1	N								See Attached
82	Slag 8			1533	GW		2	N	1	1	N								
83	Slag 9			1647	GW		2	N	1	1	N								
	Slag 9 Deep				GW		2	N	1	1	N								
84	Slag 2B			1714	GW		2	N	1	1	N								

Comments:  
**WORK ORDER #2**

Samples Relinquished By: <i>Dusty Fossyn</i>			Samples Received By: <i>D. Fossyn</i>		
Date: 22 Nov 16	Time: 1400	Temp: 0.6	Date: 22 Nov 16	Time: 1400	Temp: 0.6
Samples Relinquished into: Fridge <u>Log in Cart</u> Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <u>Samplers</u> Other:			Seal Number(s) - If Used		
Transport: Ambient <u>TCB</u> Other:			Seals Intact? Yes No		

NOV  
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# Big Stone Sampling

Site*	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (ml/minute)	Goes Dry?	Sampling Seasons**
WELL10	A	47.43	4	1098.70	Keck/Tsunami	No	3,000	No	1,3
WELL11	A	127.22	4	1104.00	Other Pump	Yes	36,000	No	1,3
WELL12	A	112.40	4	1071.89	Other Pump	Yes	20,000	No	1,3
S1	B	32.50	2	1102.17	Bailer	Yes	N/A	Yes	1,3
S2	B	43.12	2	1102.39	Bailer	Yes	N/A	Yes	1,3
S3	B	62.50	2	1102.65	Bailer	Yes	N/A	No	1,3
S4	B	27.70	2	1090.57	Bailer	Yes	N/A	Yes	1,3
S5	B	46.72	2	1091.40	Bailer	Yes	N/A	Yes	1,3
S6	B	62.05	2	1090.71	Bailer	Yes	N/A	No	1,3
H1OX	C,-CCR	32.91	2	1115.89	Bailer	Yes	100	Yes	1,3
H1INT	C	60.11	2	1115.81	Keck/Tsunami	No	1500	No	1,3
H2OX	C, CCR	32.20	2	1103.91	Bladder	Yes	100	Yes	1,3
H2INT	C	62.30	2	1103.91	Bailer	Yes	N/A	Yes	1,3
H3OX	C, CCR	22.55	2	1095.19	Bladder	Yes	100	Yes	1,3
H3INT	C	54.31	2	1095.17	Whale	No	2000	No	1,3
H4OX	C, CCR	27.20	2	1108.22	Bladder	Yes	100	No	1,3
H4INT	C	60.01	2	1108.61	Keck/Tsunami	No	2000	Yes	1,3
H5	C	43.30	2	1122.80	Whale	No	1000	No	1,3
H6	C, CCR	15.00	2	1097.76	Bladder	Yes	100	Yes	1,3
H7	C	33.20	2	1106.06	Whale	No	1000	Yes	1,3
H8	C, CCR	22.05	2	1081.23	Bladder	Yes	100	TBD	1,3
H9	CCR	30.20	2	1086.21	Bladder	Yes	100	TBD	1,3
BC1	B	16.26	2	1118.46	Bailer	Yes	N/A	No	1,3
BC101	B	39.30	2	1118.70	Bailer	Yes	N/A	Yes	1,3
BC2R	B	32.48	2	1115.28	Bailer	Yes	N/A	No	1,3
BC3R	B	35.15	2	1114.42	Bailer	Yes	N/A	Yes	1,3
BC4R	B	34.60	2	1113.86	Bailer	Yes	N/A	Yes	1,3
BC5R	B	37.32	2	1123.02	Bailer	Yes	N/A	No	1,3
BC6R	B	33.95	2	1121.58	Bailer	Yes	N/A	No	1,3
SLAG1	CCR	34.90	2	TBD	LOW FLOW	No	100	TBD	1,3

SLAG2	CCR	TBD	2	1111.06	LOW FLOW	TBD	100	TBD	1,3
SLAG3	CCR	TBD	2	TBD	LOW FLOW	TBD	100	TBD	1,3
SLAG4	CCR	39.00	2	TBD	LOW FLOW	No	100	TBD	1,3
SLAG5	CCR	38.80	2	1107.30	LOW FLOW	No	100	TBD	1,3
SLAG6	CCR	37.30	2	1111.51	LOW FLOW	No	100	TBD	1,3
SLAG7	CCR	48.70	2	1114.39	LOW FLOW	No	100	TBD	1,3
SLAG8	CCR	52.09	2	1127.26	LOW FLOW	No	100	TBD	1,3
SLAG9	CCR	49.80	2	1122.35	LOW FLOW	No	100	TBD	
SLAG9 DEEP***	CCR	68.00	2	1121.92	LOW FLOW	No	100	TBD	
SLAG2B	CCR	40.80	2	1111.26	LOW FLOW	No	100	TBD	
COOLING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
EVAPORATION	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
HOLDING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
RECLAIM POND	C	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3

\* Three additional monitoring wells will be installed the Spring of 2016. Each well will be screened approximately 35' below ground surface and will be analyzed for the "C" parameter list. In addition, a new site with 9 wells will be added and will be analyzed for CCR Parameters ONLY.

\*\* 1 = Spring (March 28 - April 28), 2 = Summer (July 1 - August 7), 3 = Fall (October 14- November 14)

\*\*\* Only sample for the first two CCR background sampling events.

## **Big Stone Plant CCR Appendix III Parameters**

CCR - Appendix III Detection Monitoring

### **Field Parameters**

pH\*

\* Field and Laboratory Measurements

### **Total Concentration Parameters**

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

500 HNO<sub>3</sub>

1000 NO<sub>2</sub>

## Big Stone CCR Appendix IV Parameters

CCR - Appendix IV - Assessment Monitoring

### Total Concentration Parameters

Antimony  
Arsenic  
Barium  
Beryllium  
Cadmium  
Chromium, Total  
Cobalt  
Fluoride  
Lead  
Lithium  
Mercury  
Molybdenum  
Selenium  
Thallium  
Radium 226 + 228

500 None

500  $\text{HNO}_3$

2 - 1000  $\text{HNO}_3$



## Big Stone Parameter List "A"

### Field Parameters

Field pH  
Field Temperature  
Field Conductivity

### Lab Parameters

Lab pH  
Lab Conductivity  
Total Alkalinity  
Chloride  
Hardness, Calcium  
Hardness, Total  
Nitrate-Nitrite as N  
Potassium - Total  
Sodium - Total  
Sulfate

500  $HNO_3$   
500  $H_2SO_4$   
1000 None

## Big Stone Parameter List "B"

### Field Parameters

Field pH  
Field Temperature  
Field Conductivity

### Lab Parameters

Lab pH  
Lab Conductivity  
Total Alkalinity  
Chloride  
Hardness, Calcium  
Hardness, Total  
Nitrate-Nitrite as N  
Potassium - Total  
Sodium - Total  
Sulfate  
Arsenic - dissolved  
Boron - dissolved  
Cadmium - dissolved  
Lead - dissolved  
Manganese - dissolved  
Strontium - dissolved

1000 none

500 HNO<sub>3</sub>

500 HNO<sub>3</sub> Filtered

500 H<sub>2</sub>SO<sub>4</sub>

## Big Stone Parameter List "C"

### Field Parameters

Field pH  
Field Temperature  
Field Conductivity

### Lab Parameters

Lab pH  
Lab Conductivity  
Total Alkalinity  
Chloride  
Hardness, Calcium  
Hardness, Total  
Nitrate-Nitrite as N  
Potassium - Total  
Sodium - Total  
Sulfate  
Arsenic - Dissolved  
Arsenic - Total \*\*  
Barium - Dissolved  
Barium - Total \*\*  
Boron - Dissolved  
Boron - Total \*\*  
Cadmium - Dissolved  
Cadmium - Total \*\*  
Chromium - Dissolved  
Chromium - Total \*\*  
Copper - Dissolved  
Copper - Total \*\*  
Lead - Dissolved  
Lead - Total \*\*  
Manganese - Dissolved  
Manganese - Total \*\*  
Mercury - Dissolved  
Mercury - Total \*\*  
Selenium - Dissolved  
Selenium - Total \*\*  
Silver - Dissolved  
Silver - Total \*\*  
Strontium - Dissolved  
Strontium - Total \*\*  
Vanadium - Dissolved  
Vanadium - Total \*\*  
Zinc - Dissolved  
Zinc - Total \*\*

Pond  
1000 NO<sub>2</sub>  
500 H<sub>2</sub>SO<sub>4</sub>  
500 HNO<sub>3</sub>

Well  
1000 NO<sub>2</sub>  
500 H<sub>2</sub>SO<sub>4</sub>  
500 HNO<sub>3</sub> Filter

**\*\* NOTE: ONLY Reclaim Pond is required to have Total metals run.  
The groundwater samples are required to have the Dissolved metals run only.**

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Site: Otter Tail Power Co./ Big Stone

Sampling Personnel:

Ben Wolf

Facility ID: \_\_\_\_\_

Date: 21 Nov 16

Unique Station ID: \_\_\_\_\_

Sample ID: Well H2OX

### Well Condition

Well Locked?  Yes  No  
 Well Labeled?  Yes  No  
 Casing Straight?  Yes  No

Protective Posts?  Yes  No  
 State ID Tag?  Yes  No  
 Grout Seal Intact?  Yes  No

Repairs Necessary: \_\_\_\_\_

### Well Information

Well Depth: 32.83

Well Casing Elevation: 1103.91

Constructed Depth: 32.20

Static Water Elevation: 1094.76

Casing Diameter: 2"

Previous Static: 1094.60

Water Level Before Purge: 9.15

Water Level After Sample: Below pump

Well Volume: 3.86 Gallons

Measurement Method:  Elec. W/L  Steel Tape

### Sampling Information

Weather Conditions: Temp: 27 Wind: SE @ 10 Sky: clear

Sampling Method: Grundfos  Bladder SS/T  Disp. Bailer  Whale  Grab  Other: \_\_\_\_\_

Dedicated Equipment:  Yes  No

Pumping Rate: .25 gpm

Well Purged Dry?  Yes  No

Time Pump Began: 1057 (am) / pm

Time Purged Dry? 1113

Time of Sampling: 1118 (am) / pm

Duplicate Sample? Yes  No  ID: -

Sample EH: 190.2

Sample Appearance: General: clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1113</u>	<u>6.31</u>	<u>4548</u>	<u>9.83</u>	<u>NA</u>	<u>NA</u>	<u>4</u>	<u>1</u>	
<u>1118</u>	<u>6.35</u>	<u>4600</u>	<u>9.41</u>	<u>L</u>	<u>L</u>	<u>-</u>	<u>2</u>	<u>Recharge</u>
							<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes  No

Amount Water Removed: 4

Gallons

Comments: \_\_\_\_\_

Exceptions to Protocol: \_\_\_\_\_

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 21 Nov 10

Unique Station ID:

Sample ID: Well H3OX

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary:

Protective Posts? Yes  No

State ID Tag? Yes  No

Grout Seal Intact? Yes  No

## Well Information

Well Depth: 2268

Constructed Depth: 22.55

Casing Diameter: 2"

Water Level Before Purge: 5.42

Well Volume: 282 Gallons

Well Casing Elevation: 1095.19

Static Water Elevation: 1089.77

Previous Static: 1089.79

Water Level After Sampl: Below Pump

Measurement Method: Elec. Well Steel Tape

## Sampling Information

Weather Conditions: Temp: 28 Wind: SW 10 Sky: Clear

Sampling Method: Grundfos Bladder SS/T Disp. Bailer Whale Grab Other:

Dedicated Equipment:  Yes  No Pumping Rate: .25 gpm

Well Purged Dry?  Yes  No Time Pump Began: 1137  am  pm

Time Purged Dry? 1149 Time of Sampling: 1154  am  pm

Duplicate Sample? Yes  No  ID: - Sample EH: 163.4

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1144</u>	<u>6.52</u>	<u>4684</u>	<u>11.78</u>	<u>NA</u>	<u>NA</u>	<u>3</u>	<u>1</u>	
<u>1154</u>	<u>6.49</u>	<u>4665</u>	<u>11.85</u>	<u>I</u>	<u>I</u>	<u>-</u>	<u>2</u>	<u>Recharge</u>
							<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes  No

Amount Water Removed: 3

Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 21 Nov 16

Unique Station ID:

Sample ID: Well H4OX

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary:

Protective Posts? Yes  No

State ID Tag? Yes  No

Grout Seal Intact?  Yes  No

## Well Information

Well Depth: 27.48

Constructed Depth: 27.20

Casing Diameter: 2"

Water Level Before Purge: 18.22

Well Volume: 1.51 Gallons

Well Casing Elevation: -1108.22

Static Water Elevation: 1090.00

Previous Static: 1089.71

Water Level After Sample: 25.12

Measurement Method:  Elec. WL  Steel Tape

## Sampling Information

Weather Conditions: Temp: 29 Wind: S @ 10 Sky: Clear

Sampling Method:  Grundfos  Bladder SS  Disp. E/Whale  Grab  Other:

Dedicated Equipment:  Yes  No Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes  No Time Pump Began: 1207 am  pm

Time Purged Dry? 1214 Time of Sampling: 1219 am  pm

Duplicate Sample? Yes  No  ID: - Sample E 131.3

Sample Appearance: General: Slightly Milky Color: tan Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O.	Turbidity NTU	Gallons Removed	SE Q #	Comments:
<u>7</u>								
<u>1214</u>	<u>6.47</u>	<u>3174</u>	<u>8.69</u>	<u>NA</u>	<u>NA</u>	<u>1.75</u>	<u>1</u>	
<u>1219</u>	<u>6.52</u>	<u>3124</u>	<u>8.66</u>	<u>↓</u>	<u>↓</u>		<u>2</u>	<u>Recharge</u>
							<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes  No  Amount Water 1.75 Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 21 Nov 16

Unique Station ID:

Sample ID: Well H6

### Well Condition

Well Locked?  Yes  No  
 Well Labeled?  Yes  No  
 Casing Straight?  Yes  No  
 Repairs Necessary:

Protective Posts?  Yes  No  
 State ID Tag?  Yes  No  
 Grout Seal Intact?  Yes  No

### Well Information

Well Depth: 17.92  
 Constructed Depth: 17.70  
 Casing Diameter: 2"  
 Water Level Before Purge: 15.83  
 Well Volume: .74 Gallons

Well Casing Elevation: NA  
 Static Water Elevation:  
 Previous Static:  
 Water Level After Sample: Below Pump  
 Measurement Method:  Elec. WLD  Steel Tape

### Sampling Information

Weather Conditions: Temp: 28 Wind: S @ 10 Sky: clear  
 Sampling Method: Grundfos  Bladder SS/1  Disp. Bailer  Whale  Grab  Other:  
 Dedicated Equipment:  Yes  No Pumping Rate: .25 gpm  
 Well Purged Dry?  Yes  No Time Pump Began: 12:39 am /  pm  
 Time Purged Dry? 12:41 Time of Sampling: 12:46 am /  pm  
 Duplicate Sample? Yes  No ID: — Sample EH: 111.0  
 Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1241	7.14	1085	11.42	NA	NA	.5	1	
1246	7.06	1071	11.30	I	I	—	2	Recharge
							3	
							4	
							5	

Stabiliz Yes  No Amount Water Removed: .5 Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 21 Nov 16

Unique Station ID:

Sample ID: Well H8

### Well Condition

Well Locked?  Yes  No  
 Well Labeled?  Yes  No  
 Casing Straight?  Yes  No  
 Repairs Necessary:

Protective Posts?  Yes  No  
 State ID Tag?  Yes  No  
 Grout Seal Intact?  Yes  No

### Well Information

Well Depth: 22.33  
 Constructed Depth: 22.05  
 Casing Diameter: 2"  
 Water Level Before Purge: 8.50  
 Well Volume: 2.25 Gallons

Well Casing Elevation: 1081.23  
 Static Water Elevation: 1072.73  
 Previous Static: 1072.98  
 Water Level After Sample: 9.04  
 Measurement Method:  Elec. WL  Steel Tape

### Sampling Information

Weather Conditions: Temp: 27 Wind: S@10 Sky: clear  
 Sampling Method: Grundfos  Bladder SS/T  Disp. Bailer  Whale  Grab  Other:  
 Dedicated Equipment:  Yes  No Pumping Rate: 25 gpm  
 Well Purged Dry?  Yes  No Time Pump Began: 1255 am /  pm  
 Time Purged Dry? - Time of Sampling: 1322 am /  pm  
 Duplicate Sample?  Yes  No ID: - Sample EH: -14.7  
 Sample Appearance: General: clear Color: NR Phase: NR Odor: NR

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1304	6.87	1581	10.10	NA	NA	2.25	1	
1313	6.78	1583	10.20	I	I	4.50	2	
1322	6.77	1584	10.18	I	I	6.75	3	
							4	
							5	

Stabilized?  Yes  No Amount Water Remove 6.75 Gallons  
 Comments:

Exceptions to Protocol:





# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

## Groundwater Assessment

Sampling Personne Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID: \_\_\_\_\_

Date: 21 Nov 16

Unique Station I \_\_\_\_\_

Sample ID: Well H9

### Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary: \_\_\_\_\_

Protective Posts  Yes  No

State ID Tag?  Yes  No

Grout Seal Intac  Yes  No

### Well Information

Well Depth: 30.71

Constructed Depth: 30.20

Casing Diameter: 2"

Water Level Before Purge: 11.05

Well Volume: 3.21 Gallons

Well Casing Elevation: 1086.21

Static Water Elevation: 1075.6

Previous Static: 1075.39

Water Level After Sam 13.91

Measurement Method  Elec. W/L  Steel Tape

### Sampling Information

Weather Conditions Temp: 28 Wind: S @ 10 Sky: clear

Sampling Method: Grundfos  Bladder SS/T  Disp. Bailer  Whale  Grab Other: \_\_\_\_\_

Dedicated Equipment  Yes  No Pumping Rate: .25 gpm

Well Purged Dry? Yes  No  Time Pump Beg 13:25 am  pm

Time Purged Dry? \_\_\_\_\_ Time of Samplin 1404 am  pm

Duplicate Sample? Yes  No  ID: \_\_\_\_\_ Sample EH: 113.2

Sample Appearance General: clear Color: NO2 Phase: NO2 Odor: NO2

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1338	6.32	3564	9.78	NA	NA	3.25	1	
1351	6.33	3563	9.79	↓	↓	6.50	2	
1404	6.34	3555	9.67	↓	↓	9.75	3	
							4	
							5	

Stabiliz  Yes  No Amount Water Removed 9.75 Gallons

Comments: \_\_\_\_\_

Exceptions to Protocol: \_\_\_\_\_



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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FINAL REPORT COMPLETION DATE: 7 Apr 17 AS

Date Reported: 4 Apr 2017

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0070
Account #: 006106
PO #: 48680

Project Name: BIG STONE PLANT CCR

[Signature] 04 Apr 17
Field Service Manager/Date Reviewed
[Signature] 04 April 17
Chemistry Lab Manager/Date Reviewed
[Signature] for 4 Apr 2017
Quality Assurance Director/Date Reviewed

- RL = Reporting Limits
NQ = Not Present, Qualitative Only
PQ = Present, Qualitative Only
ND = Not Determined



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 4 Apr 2017  
 Lab Number: 17-A6378  
 Work Order #: 31-0070  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 27 Feb 2017 11:03  
 Sampled By: MVTI FIELD PERSONNEL  
 Date Received: 27 Feb 2017 19:06  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H20X

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					28 Feb 17	JMS
Water Digestions					28 Feb 17	JMS
Radium 226	SEE ATTACHED				3 Apr 17 8:39	ABL
Radium 228	SEE ATTACHED			EPA M9320	3 Apr 17 8:39	ABL
pH, Field	6.57	units	1.00	I-1586-85	27 Feb 17 11:03	BWV
pH	* 7.1	units	1.0	SM 4500 H+B-96	28 Feb 17 9:20	CEH
	See Narrative					
Sulfate	1790	mg/L	4.0	ASTM D516-02	9 Mar 17 9:29	KCJ
Chloride	3.7	mg/L	3.0	SM 4500 Cl E	2 Mar 17 9:29	KCJ
Mercury	< 0.005	ug/L	0.005	EPA 245.7	1 Mar 17 9:30	TWE
Solids, Total Dissolved	3800	mg/L	10	SM 2540 C-97	28 Feb 17 13:24	RC
Calcium	522.0	mg/L	0.500	SW6010C	3 Mar 17 11:15	RMB
Lithium	0.465	mg/L	0.005	SW6010C	2 Mar 17 12:23	RMB
Barium	0.008	mg/L	0.005	SW6010C	2 Mar 17 12:23	RMB
Cobalt	< 0.01	mg/L	0.005	SW6010C	2 Mar 17 12:23	RMB
Boron	0.270	mg/L	0.100	SW6010C	3 Mar 17 11:15	RMB
Antimony	< 2.5	ug/L	0.5	SW6020A	3 Mar 17 15:38	RMV
Arsenic	< 2.5	ug/L	0.5	SW6020A	3 Mar 17 15:38	RMV
Beryllium	< 0.25	ug/L	0.05	SW6020A	3 Mar 17 15:38	RMV
Cadmium	< 0.5	ug/L	0.1	SW6020A	3 Mar 17 15:38	RMV
Chromium	< 2.5	ug/L	0.5	SW6020A	3 Mar 17 15:38	RMV
Lead	< 2.5	ug/L	0.5	SW6020A	3 Mar 17 15:38	RMV
Molybdenum	3.66	ug/L	0.50	SW6020A	3 Mar 17 15:38	RMV
Selenium	20.4	ug/L	0.50	SW6020A	3 Mar 17 15:38	RMV
Thallium	< 0.5	ug/L	0.1	SW6020A	3 Mar 17 15:38	RMV
Fluoride	0.150	mg/L	0.020	EPA 300.0	1 Mar 17 12:34	RMB

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit  
 Analyses performed under our Minnesota Department of Health Accreditation conform to the current INI standards.  
 The reporting limit was elevated for any analyte requiring a dilution as coded below:  
 # = Due to sample matrix    \* = Due to concentration of other analytes  
 ! = Due to sample quantity    + = Due to internal standard response  
 CERTIFICATION: MN LAB # 027-015-125    WI LAB # 999447680    ND MICRO # 1013-M    ND HW/DW # R-040

MVTI guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTI to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTI. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 4 Apr 2017  
 Lab Number: 17-A6379  
 Work Order #: 31-0070  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 27 Feb 2017 11:29  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 27 Feb 2017 19:06  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H30X

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					28 Feb 17	JMS
Water Digestions					28 Feb 17	JMS
Radium 226	SEE ATTACHED				3 Apr 17 8:39	ABL
Radium 228	SEE ATTACHED			EPA M9320	3 Apr 17 6:39	ABL
pH, Field	6.67 units		1.00	I-1586-85	27 Feb 17 11:29	BMH
pH	* 7.0 units		1.0	SM 4500 H+B-96	28 Feb 17 9:20	CEH
	See Narrative					
Sulfate	1940 ~ mg/L		4.0	ASTM D516-02	9 Mar 17 9:29	KCJ
Chloride	75.9 mg/L		3.0	SM 4500 Cl E	2 Mar 17 9:29	KCJ
Mercury	< 0.005 ug/L		0.005	EPA 245.7	1 Mar 17 9:30	TWB
Solids, Total Dissolved	3320 mg/L		10	SM 2540 C-97	28 Feb 17 13:24	RC
Calcium	432.0 ~ mg/L		0.500	SW6010C	3 Mar 17 11:15	RMB
Lithium	0.155 mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Barium	0.017 mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Cobalt	< 0.01 ^ mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Boron	8.290 ~ mg/L		0.100	SW6010C	3 Mar 17 11:15	RMB
Antimony	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Arsenic	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Beryllium	< 0.25 @ ug/L		0.05	SW6020A	3 Mar 17 15:38	RMV
Cadmium	< 0.5 @ ug/L		0.1	SW6020A	3 Mar 17 15:38	RMV
Chromium	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Lead	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Molybdenum	37.0 @ ug/L		0.50	SW6020A	3 Mar 17 15:38	RMV
Selenium	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Thallium	< 0.5 @ ug/L		0.1	SW6020A	3 Mar 17 15:38	RMV
Fluoride	0.280 mg/L		0.020	EPA 300.0	1 Mar 17 12:34	RMB

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix

# = Due to concentration of other analytes

! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 4 Apr 2017  
 Lab Number: 17-A6380  
 Work Order #: 31-0070  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 27 Feb 2017 11:55  
 Sampled By: MVT L FIELD PERSONNEL  
 Date Received: 27 Feb 2017 19:06  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H40X

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					28 Feb 17	JMS
Water Digestions					28 Feb 17	JMS
Radium 226	SEE ATTACHED				3 Apr 17 8:39	ABL
Radium 228	SEE ATTACHED			EPA M9320	3 Apr 17 8:39	ABL
pH, Field	6.73 units		1.00	I-1586-85	27 Feb 17 11:55	BMW
pH	* 6.9 units		1.0	SM 4500 H+B-96	28 Feb 17 9:20	CEH
	See Narrative					
Sulfate	1200 ~ mg/L		4.0	ASTM D516-02	9 Mar 17 9:29	KCJ
Chloride	45.5 mg/L		3.0	SM 4500 Cl E	2 Mar 17 9:29	KCJ
Mercury	< 0.005 ug/L		0.005	EPA 245.7	1 Mar 17 9:30	TWS
Solids, Total Dissolved	2220 mg/L		10	SM 2540 C-97	28 Feb 17 13:24	KC
Calcium	343.0 mg/L		0.500	SW6010C	2 Mar 17 12:23	RMB
Lithium	0.112 mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Barium	0.019 mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Cobalt	< 0.01 ~ mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Boron	0.374 mg/L		0.100	SW6010C	3 Mar 17 11:15	RMB
Antimony	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Arsenic	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Beryllium	< 0.25 @ ug/L		0.05	SW6020A	3 Mar 17 15:38	RMV
Cadmium	< 0.5 @ ug/L		0.1	SW6020A	3 Mar 17 15:38	RMV
Chromium	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Lead	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Molybdenum	5.61 @ ug/L		0.50	SW6020A	3 Mar 17 15:38	RMV
Selenium	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Thallium	< 0.5 @ ug/L		0.1	SW6020A	3 Mar 17 15:38	RMV
Fluoride	0.410 mg/L		0.020	EPA 300.0	1 Mar 17 12:34	RME

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL - Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix    # = Due to concentration of other analytes

! = Due to sample quantity    + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125   WI LAB # 999447680   ND MICRO # 1013-M   ND HW/DW # R-040

MVT L guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVT L to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVT L. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 4 Apr 2017  
 Lab Number: 17-A6381  
 Work Order #: 31-0070  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 27 Feb 2017 12:11  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 27 Feb 2017 19:06  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H-6

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					28 Feb 17	JMS
Water Digestions					28 Feb 17	JMS
Radium 226	SEE ATTACHED				3 Apr 17 8:39	ABL
Radium 228	SEE ATTACHED			EPA M9320	3 Apr 17 8:39	ABL
pH, Field	7.00	units	1.00	I-1586-85	27 Feb 17 12:11	BMW
pH	* 6.9	units	1.0	SM 4500 H+B-96	28 Feb 17 9:20	CEH
	See Narrative					
Sulfate	1180	mg/L	4.0	ASTM D516-02	9 Mar 17 12:41	KCJ
Chloride	45.4	mg/L	3.0	SM 4500 Cl E	2 Mar 17 9:47	KCJ
Mercury	< 0.005	ug/L	0.005	EPA 245.7	1 Mar 17 9:30	TWE
Solids, Total Dissolved	2220	mg/L	10	SM 2540 C-97	28 Feb 17 13:24	RC
Calcium	330.0	mg/L	0.500	SW6010C	2 Mar 17 12:23	RMB
Lithium	0.107	mg/L	0.005	SW6010C	2 Mar 17 12:23	RMB
Barium	0.034	mg/L	0.005	SW6010C	2 Mar 17 12:23	RMB
Cobalt	< 0.01	mg/L	0.005	SW6010C	2 Mar 17 12:23	RMB
Boron	0.381	mg/L	0.100	SW6010C	3 Mar 17 11:15	RMB
Antimony	< 2.5 @	ug/L	0.5	SW6020A	3 Mar 17 15:38	RMV
Arsenic	< 2.5 @	ug/L	0.5	SW6020A	3 Mar 17 15:38	RMV
Beryllium	< 0.25 @	ug/L	0.05	SW6020A	3 Mar 17 15:38	RMV
Cadmium	< 0.5 @	ug/L	0.1	SW6020A	3 Mar 17 15:38	RMV
Chromium	2.81 @	ug/L	0.50	SW6020A	3 Mar 17 15:38	RMV
Lead	< 2.5 @	ug/L	0.5	SW6020A	3 Mar 17 15:38	RMV
Molybdenum	4.72 @	ug/L	0.50	SW6020A	3 Mar 17 15:38	RMV
Selenium	< 2.5 @	ug/L	0.5	SW6020A	3 Mar 17 15:38	RMV
Thallium	< 0.5 @	ug/L	0.1	SW6020A	3 Mar 17 15:38	RMV
Fluoride	0.410	mg/L	0.020	EPA 300.0	1 Mar 17 12:34	RMB

\* Holding Time Exceeded.

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix

# = Due to concentration of other analytes

! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DW # R-040

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www.mvtl.com



CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 4 Apr 2017
Lab Number: 17-A6382
Work Order #: 31-0070
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 27 Feb 2017 12:50
Sampled By: MVTL FIELD PERSONNEL
Date Received: 27 Feb 2017 19:06
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H-8

Temp at Receipt: 0.0C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include MS Water Digestions, Radium 226, Radium 228, pH, Sulfate, Chloride, Mercury, Solids, Total Dissolved, Calcium, Lithium, Barium, Cobalt, Boron, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Lead, Molybdenum, Selenium, Thallium, Fluoride.

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
! = Due to sample matrix # = Due to concentration of other analytes
? = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040



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## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 4 Apr 2017  
 Lab Number: 17-A6383  
 Work Order #: 31-0070  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 27 Feb 2017 13:40  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 27 Feb 2017 19:06  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H-9

Temp at Receipt: 0.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					28 Feb 17	JMS
Water Digestions					28 Feb 17	JMS
Radium 226	SEE ATTACHED				3 Apr 17 8:40	ABL
Radium 228	SEE ATTACHED			EPA M9320	3 Apr 17 8:40	ABL
pH, Field	6.52 units		1.00	I-1586-85	27 Feb 17 13:40	BMW
pH	* 6.8 units		1.0	SM 4500 H+B-96	28 Feb 17 9:20	CEH
	See Narrative					
Sulfate	1490 ~ mg/L		4.0	ASTM D516-02	9 Mar 17 12:41	KCJ
Chloride	11.6 mg/L		3.0	SM 4500 Cl E	2 Mar 17 9:47	KCJ
Mercury	0.007 ug/L		0.005	EPA 245.7	1 Mar 17 9:30	TWB
Solids, Total Dissolved	2670 mg/L		10	SM 2540 C-97	28 Feb 17 13:24	RC
Calcium	620.0 ~ mg/L		0.500	SW6010C	3 Mar 17 11:15	RMB
Lithium	0.140 mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Barium	0.051 mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Cobalt	< 0.01 ^ mg/L		0.005	SW6010C	2 Mar 17 12:23	RMB
Boron	1.150 ^ mg/L		0.100	SW6010C	2 Mar 17 12:23	RMB
Antimony	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Arsenic	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Beryllium	< 0.25 @ ug/L		0.05	SW6020A	3 Mar 17 15:38	RMV
Cadmium	< 0.5 @ ug/L		0.1	SW6020A	3 Mar 17 15:38	RMV
Chromium	4.04 @ ug/L		0.50	SW6020A	3 Mar 17 15:38	RMV
Lead	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Molybdenum	2.53 @ ug/L		0.50	SW6020A	3 Mar 17 15:38	RMV
Selenium	< 2.5 @ ug/L		0.5	SW6020A	3 Mar 17 15:38	RMV
Thallium	< 0.5 @ ug/L		0.1	SW6020A	3 Mar 17 15:38	RMV
Fluoride	0.210 mg/L		0.020	EPA 300.0	1 Mar 17 12:34	RMB

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current ENI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix

# = Due to concentration of other analytes

! = Due to sample quantity

+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DW # R-040

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### INORGANIC & METALS ANALYSES:

The pH sample set that included samples 17-A6378 through 17-A6387 contained 11 samples before a duplicate. Data was reported based on acceptable knowns, duplication, and ample QC for the entire worklist.

The boron matrix spike recovery did not meet acceptable limits for samples 17-A6388 through 17-A6391. Data was reported based on acceptable blank spike and matrix spike duplicate recoveries and acceptable relative percent difference between the matrix spike and matrix spike duplicate.

Due to the high concentration of calcium in the unspiked sample, the matrix spike duplicate recovery did not meet acceptable limits for sample 17-A6390. Data was reported based on acceptable blank spike and matrix spike recoveries and acceptable relative percent difference between the matrix spike and matrix spike duplicate.

No other problems were encountered with these analyses.



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**MEMBER  
ACIL**

**Quality Control Report**

Lab IDs: 17-A6378 to 17-A6391

Project: BIG STONE PLANT CCR

Work Order: 201731-0070

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (%)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony ug/L	25.0	97	85-115	25.0	17A6386q	<2.5	25.7	103	75-125	25.7	26.1	104	1.5	10	94	90-110	<0.5
	25.0	104	85-115	25.0	17A6391q	<2.5	25.8	103	75-125	25.8	25.8	103	0.0	10	94	90-110	<0.5
Arsenic ug/L	25.0	96	85-115	25.0	17A6386q	<2.5	26.5	106	75-125	26.5	26.7	107	0.8	10	92	90-110	<0.5
	25.0	105	85-115	25.0	17A6391q	<2.5	26.4	106	75-125	26.4	27.2	109	3.0	10	93	90-110	<0.5
				25.0	17A6310q	6.68	34.0	109	75-125	34.0	33.7	108	0.9	10			
Barium mg/L	1.000	104	85-115	1.00	17A6387q	0.107	1.210	110	75-125	1.210	1.220	111	0.8	10	98	90-110	<0.005
				1.00	17A6390q	0.026	1.140	111	75-125	1.140	1.150	112	0.9	10	96	90-110	
Beryllium ug/L	2.50	100	85-115	2.50	17A6386q	<0.25	2.50	100	75-125	2.50	2.41	96	3.7	10	94	90-110	<0.05
	2.50	114	85-115	2.50	17A6391q	<0.25	2.38	95	75-125	2.38	2.56	102	7.3	10	98	90-110	<0.05
Boron mg/L	1.000	105	85-115	1.00	17A6387q	2.630	3.700	107	75-125	3.700	3.810	118	2.9	10	100	90-110	<0.1
	1.000	103	85-115	1.00	A6387qc	2.570	3.500	93	75-125	3.500	3.630	106	3.6	10	98	90-110	<0.1
				1.00	A6390qc	<0.5	1.280	128	75-125	1.280	1.200	120	6.5	10	98	90-110	
Cadmium ug/L	5.00	101	85-115	5.00	17A6386q	<0.5	5.35	107	75-125	5.35	5.45	109	1.9	10	98	90-110	<0.1
	5.00	109	85-115	5.00	17A6391q	<0.5	5.52	110	75-125	5.52	5.37	107	2.8	10	100	90-110	<0.1
Calcium mg/L	50.00	109	85-115	50.0	17A6387q	162.0	212.0	100	75-125	212.0	220.0	116	3.7	10	101	90-110	<0.5
	50.00	107	85-115	50.0	17A6390q	394.0	436.0	84	75-125	436.0	439.0	90	0.7	10	98	90-110	<0.5
				50.0	A6387qc	167.0	214.0	94	75-125	214.0	220.0	106	2.8	10	102	90-110	
				50.0	A6390qc	412.0	460.0	96	75-125	460.0	435.0	46	5.6	10	101	90-110	
Chloride mg/L	-	-	-	60.0	17-A6380	45.5	103	96	85-121	103	99.3	90	3.7	5	95	90-110	<3
	-	-	-	60.0	17-A6390	6.3	61.6	92	85-121	61.6	62.8	94	1.9	5	92	90-110	<3
	-	-	-	60.0	17-A6391	30.9	85.1	90	85-121	85.1	84.6	90	0.6	5	92	90-110	<3
	-	-	-	60.0	17-A6607	<3	54.7	91	85-120	54.7	53.7	90	1.8	6			
Chromium ug/L	25.0	95	85-115	25.0	17A6386q	<2.5	22.4	90	75-125	22.4	21.6	86	3.6	10	91	90-110	<0.5
	25.0	103	85-115	25.0	17-A6390	<2.5	23.1	92	75-125	23.1	23.5	94	1.7	10	102	90-110	<0.5



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MEMBER  
 ACIL

**Quality Control Report**

Lab IDs: 17-A6378 to 17-A6391

Project: BIG STONE PLANT CCR

Work Order: 201731-0070

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<=)	Known Rec (%)	Known % Rec Limits	Method Blank
Cobalt mg/L	1.000	107	85-115	1.00	17A6387q	< 0.01	1.020	102	75-125	1.020	1.020	102	0.0	10	102	90-110	< 0.005
	1.000	110	85-115	1.00	A6390qc	< 0.05	1.010	101	75-125	1.010	0.953	95	5.8	10	104	90-110	
Fluoride mg/L	0.200	105	85-115	0.20	17-A6387	0.740	0.920	90	75-125	0.920	0.930	95	1.1	10	102	90-110	< 0.02
	0.200	100	85-115	0.20	17-A6390	0.220	0.390	85	75-125	0.390	0.400	90	2.5	10	98	90-110	< 0.02
				0.20	A6359qc	0.020	0.210	95	75-125	0.210	0.220	100	4.7	10			
Lead ug/L	25.0	102	85-115	25.0	17A6386q	< 2.5	25.6	102	75-125	25.6	25.7	103	0.4	10	95	90-110	< 0.5
	25.0	107	85-115	25.0	17A6391q	< 2.5	25.0	100	75-125	25.0	25.4	102	1.6	10	96	90-110	< 0.5
Lithium mg/L	1.000	102	85-115	1.00	17-A6387	0.113	1.220	111	75-125	1.220	1.240	113	1.6	10	95	90-110	< 0.005
				1.00	17-A6390	0.135	1.270	114	75-125	1.270	1.290	116	1.6	10	93	90-110	
Mercury ug/L	-	-	-	0.10	17-A6378	< 0.005	0.086	86	63-111	0.086	0.087	87	1.2	18	86	76-113	< 0.005
	-	-	-	0.10	17-A6244	0.016	0.099	83	63-111	0.099	0.101	85	2.0	18	103	76-113	< 0.005
	-	-	-														< 0.005
	-	-	-														< 0.005
Molybdenum ug/L	25.0	98	85-115	25.0	17A6386q	11.8	37.7	104	75-125	37.7	38.1	105	1.1	10	96	90-110	< 0.5
	25.0	104	85-115	25.0	17A6391q	5.08	30.2	100	75-125	30.2	30.2	100	0.0	10	96	90-110	< 0.5
pH units	-	-	-	-	-	-	-	-	-	7.2	7.2	-	0.0	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	7.7	7.7	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0	96	85-115	25.0	17A6386q	< 2.5	24.0	96	75-125	24.0	22.2	89	7.8	10	93	90-110	< 0.5
	25.0	105	85-115	25.0	17A6391q	< 2.5	26.6	106	75-125	26.6	26.9	108	1.1	10	92	90-110	< 0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	903	912	-	1.0	8	89	85-115	< 10
	-	-	-	-	-	-	-	-	-	1830	1900	-	3.8	8			
Sulfate mg/L	-	-	-	500	17-A6390	1050	1480	86	74-128	1480	1460	82	1.4	5	106	80-120	< 5
	-	-	-	500	17-A6391	743	1170	85	74-128	1170	1170	85	0.0	5	104	80-120	< 5
	-	-	-	50.0	17-A6689	12.1	70.6	117	74-128	70.6	71.2	118	0.8	5	111	80-120	< 5
	-	-	-	500	17-A6380	1200	1640	88	74-128	1640	1660	92	1.2	5			

**Quality Control Report**

Lab IDs: 17-A6378 to 17-A6391

Project: BIG STONE PLANT CCR

Work Order: 201731-0070

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Thallium ug/L	5.00	103	85-115	5.00	17A6386q	< 0.5	5.30	106	75-125	5.30	5.30	106	0.0	10	96	90-110	< 0.1
	5.00	107	85-115	5.00	17A6391q	< 0.5	5.18	104	75-125	5.18	5.20	104	0.4	10	96	90-110	< 0.1

The boron matrix spike recovery was outside the acceptance limits, see narrative.  
 The calcium matrix spike duplicate recovery was outside the acceptance limits, see narrative.

Approved by 



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Date: 3/31/2017

**CLIENT:** MVTL Inc  
**Project:** Ottetail Power Big Stone  
**Lab Order:** S1703017


**CASE NARRATIVE**  
**Report ID:** S1703017001

Samples H-6-A6381, H-8-A6382, H-9-A6383, H2OX-A6378, H3OX-A6379, H4OX-A6380, Slag 2B A6391, Slag-1-A6384, Slag-4-A6385, Slag-5-A6386, Slag-6-A6387, Slag-7-A6388, Slag-8-A6389, and Slag-9-A6390 were received on March 2, 2017.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions  
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition  
40 CFR Parts 136 and 141  
40 CFR Part 50, Appendices B, J, L, and O  
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012  
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:   
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

<b>Company:</b>	MVTL Inc 1126 N Front St New Ulm, MN 56073	<b>Date Reported</b>	3/31/2017
<b>ProjectName:</b>	Ottertail Power Big Stone	<b>Report ID</b>	S1703017001
<b>Lab ID:</b>	S1703017-001	<b>WorkOrder:</b>	S1703017
<b>ClientSample ID:</b>	H2OX-A6378	<b>CollectionDate:</b>	2/27/2017 11:03:00 AM
<b>COC:</b>	WEB	<b>DateReceived:</b>	3/2/2017 10:11:00 AM
<b>Comments</b>	WO# 31-0070	<b>FieldSampler:</b>	DF
		<b>Matrix:</b>	Water


Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
<b>Radionuclides - Total</b>						
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/21/2017 1151 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/21/2017 1151 MB
Radium 228	ND	pCi/L		2	Ga-Tech	03/19/2017 2014 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	03/19/2017 2014 MB

**These results apply only to the samples tested.**

**RL - Reporting Limit**

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - E Value above quantitation range
  - H Holding times for preparation or analysis exceeded
  - L Analyzed by another laboratory
  - ND Not Detected at the Reporting Limit
  - S Spike Recovery outside accepted recovery limits

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by:   
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 3/31/2017
Report ID S1703017001

ProjectName: Ottertail Power Big Stone
Lab ID: S1703017-002
ClientSample ID: H3OX-A6379
COC: WEB

WorkOrder: S1703017
CollectionDate: 2/27/2017 11:29:00 AM
DateReceived: 3/2/2017 10:11:00 AM
FieldSampler: DF
Matrix: Water

Comments WO# 31-0070

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 3/31/2017
Report ID S1703017001

ProjectName: Ottertail Power Big Stone
Lab ID: S1703017-003
ClientSample ID: H4OX-A6380
COC: WEB

WorkOrder: S1703017
CollectionDate: 2/27/2017 11:55:00 AM
DateReceived: 3/2/2017 10:11:00 AM
FieldSampler: DF
Matrix: Water

Comments WO# 31-0070

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radium 226, Radium 226 Precision, Radium 228, and Radium 228 Precision.

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL, or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: Wade Nieuwsma, Assistant Laboratory Manager





Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 3/31/2017
Report ID S1703017001

ProjectName: Ottertail Power Big Stone
Lab ID: S1703017-004
ClientSample ID: H-6-A6381
COC: WEB

WorkOrder: S1703017
CollectionDate: 2/27/2017 12:11:00 PM
DateReceived: 3/2/2017 10:11:00 AM
FieldSampler: DF
Matrix: Water

Comments WO# 31-0070

Table with columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

### Sample Analysis Report

**Company:** MVTL Inc  
1126 N Front St  
New Ulm, MN 56073

**Date Reported** 3/31/2017  
**Report ID** S1703017001

**ProjectName:** Ottertail Power Big Stone  
**Lab ID:** S1703017-005  
**ClientSample ID:** H-8-A6382  
**COC:** WEB

**WorkOrder:** S1703017  
**CollectionDate:** 2/27/2017 12:50:00 PM  
**DateReceived:** 3/2/2017 10:11:00 AM  
**FieldSampler:** DF  
**Matrix:** Water

**Comments** WO# 31-0070

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	03/21/2017 1524	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	03/21/2017 1524	MB
Radium 228	ND	pCi/L		2	Ga-Tech	03/20/2017 834	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	03/20/2017 834	MB

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - E Value above quantitation range
  - H Holding times for preparation or analysis exceeded
  - L Analyzed by another laboratory
  - ND Not Detected at the Reporting Limit
  - S Spike Recovery outside accepted recovery limits

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 3/31/2017
Report ID S1703017001

ProjectName: Ottetail Power Big Stone
Lab ID: S1703017-006
ClientSample ID: H-9-A6383
COC: WEB

WorkOrder: S1703017
CollectionDate: 2/27/2017 1:40:00 PM
DateReceived: 3/2/2017 10:11:00 AM
FieldSampler: DF
Matrix: Water

Comments WO# 31-0070

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: Wade Nieuwsma, Assistant Laboratory Manager



### ANALYTICAL QC SUMMARY REPORT

**CLIENT:** MVTL Inc  
**Work Order:** S1703017  
**Project:** Ottertail Power Big Stone

**Date:** 3/31/2017  
**Report ID:** S1703017001

<b>Radium 228 by Ga/Tech</b>		<b>Sample Type</b> MBLK		<b>Units:</b> pCi/L			
MB-423 (03/18/17 10:24)	RunNo: 144032	PrepDate: 03/13/17 12:00	BatchID 12937				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Total Radium 228

ND 1

<b>Radium 228 by Ga/Tech</b>		<b>Sample Type</b> LCS		<b>Units:</b> pCi/L			
LCS-423 (03/18/17 13:28)	RunNo: 144032	PrepDate: 03/13/17 12:00	BatchID 12937				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Total Radium 228

40 1 40.1 100 65.9 - 132

<b>Radium 228 by Ga/Tech</b>		<b>Sample Type</b> MS		<b>Units:</b> pCi/L			
MS-423 (03/18/17 19:36)	RunNo: 144032	PrepDate: 03/13/17 12:00	BatchID 12937				
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual

Total Radium 228

40 1 40.1 ND 99.6 65.9 - 132

<b>Radium 228 by Ga/Tech</b>		<b>Sample Type</b> MSD		<b>Units:</b> pCi/L			
MSD-423 (03/18/17 22:42)	RunNo: 144032	PrepDate: 03/13/17 12:00	BatchID 12937				
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual

Total Radium 228

43 1 40 6.64 106 20

<b>Qualifiers:</b>	B Analyte detected in the associated Method Blank	E Value above quantitation range
	G Analyzed at IML Gillette laboratory	H Holding times for preparation or analysis exceeded
	J Analyte detected below quantitation limits	L Analyzed by another laboratory
	ND Not Detected at the Reporting Limit	O Outside the Range of Dilutions
	R RPD outside accepted recovery limits	S Spike Recovery outside accepted recovery limits
	X Matrix Effect	



ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc
Work Order: S1703017
Project: Ottertail Power Big Stone

Date: 3/31/2017
Report ID: S1703017001

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: MB-1727 (03/21/17 11:51), MBLK, 144019, 03/15/17 0:00, 12952, Radium 226, ND, 0.2

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: MB-1728 (03/27/17 11:19), MBLK, 144273, 03/20/17 0:00, 12974, Radium 226, ND, 0.2

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: LCS-1727 (03/21/17 11:51), LCS, 144019, 03/15/17 0:00, 12952, Radium 226, 5.8, 0.2, 5.89, 98.8, 67.1 - 122

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: LCS-1728 (03/27/17 11:19), LCS, 144273, 03/20/17 0:00, 12974, Radium 226, 5.8, 0.2, 5.89, 99.0, 67.1 - 122

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Conc, %RPD, %REC, % RPD Limits, Qual. Row 1: LCSD-1727 (03/21/17 11:51), LCSD, 144019, 03/15/17 0:00, 12952, Radium 226, 6.6, 0.2, 5.8, 12.4, 112, 20

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Conc, %RPD, %REC, % RPD Limits, Qual. Row 1: LCSD-1728 (03/27/17 11:19), LCSD, 144273, 03/20/17 0:00, 12974, Radium 226, 5.4, 0.2, 5.8, 8.50, 90.9, 20

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: S1702327-005AMS (03/21/17 11:51), MS, 144019, 03/15/17 0:00, 12952, Radium 226, 11, 1, 11.8, ND, 91.7, 65 - 131

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: S1703036-003AMS (03/27/17 11:19), MS, 144273, 03/20/17 0:00, 12974, Radium 226, 6.1, 0.2, 5.89, 0.2, 99.9, 65 - 131

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Conc, %RPD, %REC, % RPD Limits, Qual. Row 1: S1703036-003AMSD (03/27/17 14:28), MSD, 144273, 03/20/17 0:00, 12974, Radium 226, 5.3, 0.2, 6.1, 13.7, 86.5, 20

- Qualifiers: B Analyte detected in the associated Method Blank, G Analyzed at IML Gillette laboratory, J Analyte detected below quantitation limits, ND Not Detected at the Reporting Limit, R RPD outside accepted recovery limits, X Matrix Effect, E Value above quantitation range, H Holding times for preparation or analysis exceeded, L Analyzed by another laboratory, O Outside the Range of Dilutions, S Spike Recovery outside accepted recovery limits



**Inter-Mountain Labs**  
Sheridan, WY and Gillette, WY

<b>- CHAIN OF CUSTODY RECORD -</b>	Page      of
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<b>#WEB</b>	

Client Name <b>MVTI</b>	Project Identification Offertail Power Big Stone	Sampler (Signature/Attestation of Authenticity) <i>[Signature]</i>	Telephone # 507-276-8089
Report Address 1126 North Front St New Ulm, Mn 56073	Contact Name Tim Portner		<b>ANALYSES / PARAMETERS</b>
Invoice Address Same	Email tportner@mvtl.com	<b>REMARKS</b>	
	Phone 507-276-8089		
	Purchase Order #	Quote #	

ITEM	LAB ID <small>(Lab Use Only)</small>	DATE SAMPLED	TIME	SAMPLE IDENTIFICATION	Matrix	# of Containers	ANALYSES / PARAMETERS										REMARKS			
							Radium 226 + 228													
1	S1703017-001	27 Feb 17	1103	H2OX - A6378	WT	2	x													
2	002		1129	H3OX - A6379	WT	2	x													
3	003		1155	H4OX - A6380	WT	2	x													
4	004		1211	H-6 - A6381	WT	2	x													
5	005		1250	H-8 - A6382	WT	2	x													
6	006		1340	H-9 - A6383	WT	2	x													
7	007		1048	Slag-1 A6384	WT	2	x													
8	008		1152	Slag-4 A6385	WT	2	x													
9	009		1415	Slag-5 A6386	WT	2	x													
10	010		1226	Slag-6 A6387	WT	2	x													
11	011		1309	Slag-7 A6388	WT	2	x													
12	012		1425	Slag-8 A6389	WT	2	x													
13																				
14																				

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
13.4 13.1	<i>[Signature]</i>	27 Feb 17	1906	Kathy Boy	3.2.17	10:11

SHIPPING INFO	MATRIX CODES	TURN AROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
<input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> USPS <input type="checkbox"/> Hand Carried <input type="checkbox"/> Other	Water WT Soil SL Solid SD Filter FT Other OT	Check desired service <input type="checkbox"/> Standard turnaround <input type="checkbox"/> RUSH - 5 Working Days <input type="checkbox"/> URGENT - < 2 Working Days <i>Rush &amp; Urgent Surcharges will be applied</i>	Compliance Monitoring? <b>Y/N</b> Program (SDWA, NPDES,...) PWSID / Permit # Chlorinated? <b>Y/N</b> Sample Disposal: Lab Client	



**Inter-Mountain Labs**  
 Sheridan, WY and Gillette, WY

**- CHAIN OF CUSTODY RECORD -**

*All shaded fields must be completed.*

This is a legal document; any misrepresentation may be construed as fraud.

Page \_\_\_\_\_ of \_\_\_\_\_  
**#WEB**

<b>Client Name</b> MVTI	<b>Project Identification</b> Ottertail Power Big Stone	<b>Sampler (Signature/Attestation of Authenticity)</b> <i>[Signature]</i>	<b>Telephone #</b> 507-276-8089
<b>Report Address</b> 1126 North Front St New Ulm, Mn 56073	<b>Contact Name</b> Tim Portner	<b>ANALYSES / PARAMETERS</b>	
<b>Invoice Address</b> Same	<b>Email</b> tportner@mvti.com	Radium 226 + 228	REMARKS
	<b>Phone</b> 507-276-8089		
	<b>Purchase Order #</b>		
	<b>Quote #</b>		

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME	SAMPLE IDENTIFICATION	Matrix	# of Containers												
1	51703017-013	2 Feb 17	1559	Slag 9 A6390	WT	2	x											
2	<del>51703017-014</del>	L	-	Slag 9 Deep <sup>N/D</sup> Sample	WT	2	x											
3	014015	L	1450	Slag 2B A6391	WT	2	x											
4							x											
5							x											
6				MVTL WO # 31-0070			x											
7							x											
8							x											
9							x											
10							x											
11							x											
12							x											
13							x											
14							x											

<b>LAB COMMENTS</b> 13.1 13.4	<b>Relinquished By (Signature/Printed)</b> <i>[Signature]</i>	<b>DATE</b> 2 Feb 17	<b>TIME</b> 1906	<b>Received By (Signature/Printed)</b> Kathy Boyd	<b>DATE</b> 3.2.17	<b>TIME</b> 10:11
-------------------------------------	--	-------------------------	---------------------	--	-----------------------	----------------------

<b>SHIPPING INFO</b>	<b>MATRIX CODES</b>	<b>TURN AROUND TIMES</b>	<b>COMPLIANCE INFORMATION</b>	<b>ADDITIONAL REMARKS</b>
<input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> USPS <input type="checkbox"/> Hand Carried <input type="checkbox"/> Other	Water WT Soil SL Solid SD Filter FT Other OT	Check desired service <input type="checkbox"/> Standard turnaround <input type="checkbox"/> RUSH - 5 Working Days <input checked="" type="checkbox"/> URGENT - < 2 Working Days <i>Rush &amp; Urgent Surcharges will be applied</i>	Compliance Monitoring? <b>Y/N</b> Program (SDWA, NPDES,...) PWSID / Permit # Chlorinated? <b>Y/N</b> Sample Disposal: Lab Client	

# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

This is an exact copy of  
 the original document

*AK* Date 28 Feb 17

pages 1-23

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> <i>Dusty Ferguson, Ben Wolf</i>
<b>Report</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b> <i>31-0070</i>
<b>Address</b> P.O. Box 496 Fergus Falls, MN 56538-0496	<b>Address:</b>	<b>Lab Numbers:</b>
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
<i>A6878</i>	H2OX		<i>27 Feb 17</i>	<i>1103</i>	GW		<i>2</i>	<i>N</i>	<i>1</i>	<i>1</i>	<i>N</i>								See Attached
<i>79</i>	H3OX			<i>1129</i>	GW		<i>2</i>	<i>N</i>	<i>1</i>	<i>1</i>	<i>N</i>								
<i>80</i>	H4OX			<i>1155</i>	GW		<i>2</i>	<i>N</i>	<i>1</i>	<i>1</i>	<i>N</i>								
<i>81</i>	H-6			<i>1211</i>	GW		<i>2</i>	<i>N</i>	<i>1</i>	<i>1</i>	<i>N</i>								
<i>82</i>	H-8			<i>1250</i>	GW		<i>2</i>	<i>N</i>	<i>1</i>	<i>1</i>	<i>N</i>								
<i>83</i>	H-9			<i>1340</i>	GW		<i>2</i>	<i>N</i>	<i>1</i>	<i>1</i>	<i>N</i>								
<i>84</i>	Slag 1			<i>1048</i>	GW		<i>2</i>	<i>N</i>	<i>1</i>	<i>1</i>	<i>N</i>								
<i>85</i>	Slag 4			<i>1152</i>	GW		<i>2</i>	<i>N</i>	<i>1</i>	<i>1</i>	<i>N</i>								
<i>86</i>	Slag 5			<i>1415</i>	GW		<i>2</i>	<i>N</i>	<i>1</i>	<i>1</i>	<i>N</i>								
<i>87</i>	Slag 6			<i>1220</i>	GW		<i>2</i>	<i>N</i>	<i>1</i>	<i>1</i>	<i>N</i>								

Comments:

**WORK ORDER #2**

Samples Relinquished By: <i>AK</i>			Samples Received By: <i>Alice Aedin</i>		
Date: <i>27 Feb 17</i>	Time: <i>1906</i>	Temp: <i>0.0</i>	Date: <i>28 Feb 17</i>	Time: <i>800</i>	Temp: <i>3.8C</i>
Samples Relinquished into: <u>Fridge</u> Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <u>Samplers</u> Other:			Seal Number(s) - If Used		
Transport: Ambient <u>Ice</u> Other:			Seals Intact? Yes No		



# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> Dusty Faresyn, Ben Witt
<b>Report</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b>
<b>Address</b> P.O. Box 496	<b>Address:</b>	<b>Lab Numbers:</b>
Fergus Falls, MN 56538-0496		
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type										Analysis					
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required	
88	Slag 7		27 Feb 17	1309	GW		2	N	1	1	N								See Attached	
89	Slag 8		I	1425	GW		2	N	1	1	N									
90	Slag 9			1559	GW		2	N	1	1	N									
	Slag 9 Deep					GW		2	N	1	1	N								
91	Slag 2B				1450	GW		2	N	1	1	N								

Comments:  
**WORK ORDER #2**

<b>Samples Relinquished By:</b> D. Witt	<b>Samples Received By:</b> Alice Audin
<b>Date:</b> 27 Feb 17	<b>Date:</b> 28 Feb 17
<b>Time:</b> 1900	<b>Time:</b> 800
<b>Temp:</b> 0.0	<b>Temp:</b> 3.80
<b>Samples Relinquished into:</b> Bridge	<b>Log in Cart</b> Other:
<b>Samples Relinquished By:</b>	<b>Samples Received By:</b>
<b>Date:</b>	<b>Date:</b>
<b>Time:</b>	<b>Time:</b>
<b>Temp:</b>	<b>Temp:</b>
<b>Delivery:</b> Samplers	<b>Seal Number(s) - If Used</b>
<b>Transport:</b> Ambient	<b>Seals Intact?</b> Yes No

CCR 2017  
(make copy)

February  
CCR

# Big Stone Sampling

Site*	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (ml/minute)	Goes Dry?	Sampling Seasons**
WELL10	A	47.43	4	1098.70	Keck/Tsunami	No	3,000	No	1,3
WELL11	A	127.22	4	1104.00	Other Pump	Yes	36,000	No	1,3
WELL12	A	112.40	4	1071.89	Other Pump	Yes	20,000	No	1,3
S1	B	32.50	2	1102.17	Bailer	Yes	N/A	Yes	1,3
S2	B	43.12	2	1102.39	Bailer	Yes	N/A	Yes	1,3
S3	B	62.50	2	1102.65	Bailer	Yes	N/A	No	1,3
S4	B	27.70	2	1090.57	Bailer	Yes	N/A	Yes	1,3
S5	B	46.72	2	1091.40	Bailer	Yes	N/A	Yes	1,3
S6	B	62.05	2	1090.71	Bailer	Yes	N/A	Yes	1,3
H1OX	C, CCR	32.91	2	1115.89	Bailer	Yes	100	Yes	1,3
H1INT	C	60.11	2	1115.81	Keck/Tsunami	No	1500	No	1,3
H2OX	C, CCR	32.20	2	1103.91	Bladder	Yes	100	Yes	1,3
H2INT	C	62.30	2	1103.91	Bailer	Yes	N/A	Yes	1,3
H3OX	C, CCR	22.55	2	1095.19	Bladder	Yes	100	Yes	1,3
H3INT	C	54.31	2	1095.17	Whale	No	2000	No	1,3
H4OX	C, CCR	27.20	2	1108.22	Bladder	Yes	100	No	1,3
H4INT	C	60.01	2	1108.61	Keck/Tsunami	No	2000	Yes	1,3
H5	C	43.30	2	1122.80	Whale	No	1000	No	1,3
H6	C, CCR	15.00	2	1097.76	Bladder	Yes	100	Yes	1,3
H7	C	33.20	2	1106.06	Whale	No	1000	Yes	1,3
H8	C, CCR	22.05	2	1081.23	Bladder	Yes	100	TBD	1,3
H9	CCR	30.20	2	1086.21	Bladder	Yes	100	TBD	1,3
BC1	B	16.26	2	1118.46	Bailer	Yes	N/A	No	1,3
BC101	B	39.30	2	1118.70	Bailer	Yes	N/A	Yes	1,3
BC2R	B	32.48	2	1115.28	Bailer	Yes	N/A	No	1,3
BC3R	B	35.15	2	1114.42	Bailer	Yes	N/A	Yes	1,3
BC4R	B	34.60	2	1113.86	Bailer	Yes	N/A	Yes	1,3
BC5R	B	37.32	2	1123.02	Bailer	Yes	N/A	No	1,3
BC6R	B	33.95	2	1121.58	Bailer	Yes	N/A	No	1,3
SLAG1	CCR	34.90	2	TBD	LOW FLOW	No	100	TBD	1,3

SLAG2	CCR	TBD	2	1111.06	LOW FLOW	TBD	100	TBD	1,3
SLAG3	CCR	TBD	2	TBD	LOW FLOW	TBD	100	TBD	1,3
SLAG4	CCR	39.00	2	TBD	LOW FLOW	No	100	TBD	1,3
SLAG5	CCR	38.80	2	1107.30	LOW FLOW	No	100	TBD	1,3
SLAG6	CCR	37.30	2	1111.51	LOW FLOW	No	100	TBD	1,3
SLAG7	CCR	48.70	2	1114.39	LOW FLOW	No	100	TBD	1,3
SLAG8	CCR	52.09	2	1127.26	LOW FLOW	No	100	TBD	1,3
SLAG9	CCR	49.80	2	1122.35	LOW FLOW	No	100	TBD	
SLAG9 DEEP***	CCR	68.00	2	1121.92	LOW FLOW	No	100	TBD	
SLAG2B	CCR	40.80	2	1111.26	LOW FLOW	No	100	TBD	
COOLING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
EVAPORATION	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
HOLDING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
RECLAIM POND	C	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3

\* Three additional monitoring wells will be installed the Spring of 2016. Each well will be screened approximately 35' below ground surface and will be analyzed for the "C" parameter list. In addition, a new site with 9 wells will be added and will be analyzed for CCR Parameters ONLY.

\*\* 1 = Spring (March 28 - April 28), 2 = Summer (July 1 - August 7), 3 = Fall (October 14- November 14)

\*\*\* Only sample for the first two CCR background sampling events.

# Big Stone Plant CCR Appendix III Parameters

CCR - Appendix III Detection Monitoring

## Field Parameters

pH\*

\* Field and Laboratory Measurements

## Total Concentration Parameters

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

500 HNO<sub>3</sub>

1000 None

## Big Stone CCR Appendix IV Parameters

CCR - Appendix IV - Assessment Monitoring

### Total Concentration Parameters

Antimony  
Arsenic  
Barium  
Beryllium  
Cadmium  
Chromium, Total  
Cobalt  
Fluoride  
Lead  
Lithium  
Mercury  
Molybdenum  
Selenium  
Thallium  
Radium 226 + 228

500 None

500  $\text{HNO}_3$

2 - 1000  $\text{HNO}_3$

## Big Stone Parameter List "A"

### Field Parameters

Field pH  
Field Temperature  
Field Conductivity

### Lab Parameters

Lab pH  
Lab Conductivity  
Total Alkalinity  
Chloride  
Hardness, Calcium  
Hardness, Total  
Nitrate-Nitrite as N  
Potassium - Total  
Sodium - Total  
Sulfate

500  $HNO_3$

500  $H_2SO_4$

1000  $NO_2^-$

## Big Stone Parameter List "B"

### Field Parameters

Field pH  
Field Temperature  
Field Conductivity

### Lab Parameters

Lab pH  
Lab Conductivity  
Total Alkalinity  
Chloride  
Hardness, Calcium  
Hardness, Total  
Nitrate-Nitrite as N  
Potassium - Total  
Sodium - Total  
Sulfate  
Arsenic - dissolved  
Boron - dissolved  
Cadmium - dissolved  
Lead - dissolved  
Manganese - dissolved  
Strontium - dissolved

1000 none

500  $HNO_3$

500  $HNO_3$

500  $H_2SO_4$

Filtered

## Big Stone Parameter List "C"

### Field Parameters

Field pH  
Field Temperature  
Field Conductivity

### Lab Parameters

Lab pH  
Lab Conductivity  
Total Alkalinity  
Chloride  
Hardness, Calcium  
Hardness, Total  
Nitrate-Nitrite as N  
Potassium - Total  
Sodium - Total  
Sulfate  
Arsenic - Dissolved  
Arsenic - Total \*\*  
Barium - Dissolved  
Barium - Total \*\*  
Boron - Dissolved  
Boron - Total \*\*  
Cadmium - Dissolved  
Cadmium - Total \*\*  
Chromium - Dissolved  
Chromium - Total \*\*  
Copper - Dissolved  
Copper - Total \*\*  
Lead - Dissolved  
Lead - Total \*\*  
Manganese - Dissolved  
Manganese - Total \*\*  
Mercury - Dissolved  
Mercury - Total \*\*  
Selenium - Dissolved  
Selenium - Total \*\*  
Silver - Dissolved  
Silver - Total \*\*  
Strontium - Dissolved  
Strontium - Total \*\*  
Vanadium - Dissolved  
Vanadium - Total \*\*  
Zinc - Dissolved  
Zinc - Total \*\*

Pond  
1000 none  
500  $H_2SO_4$   
500  $HNO_3$

Well  
1000 none  
500  $H_2SO_4$   
500  $HNO_3$  Filter

**\*\* NOTE: ONLY Reclaim Pond is required to have Total metals run.  
The groundwater samples are required to have the Dissolved metals run only.**



# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Site: Otter Tail Power Co./ Big Stone

Sampling Personnel:

Ben Wolf

Facility ID: \_\_\_\_\_

Date: 27 Feb 17

Unique Station ID: \_\_\_\_\_

Sample ID: Well H2OX

### Well Condition

Well Locked?  Yes  No  
 Well Labeled?  Yes  No  
 Casing Straight?  Yes  No

Protective Posts? Yes  No  
 State ID Tag? Yes  No  
 Grout Seal Intact?  Yes  No

Repairs Necessary: \_\_\_\_\_

### Well Information

Well Depth: 32.81  
 Constructed Depth: 32.20  
 Casing Diameter: 2"  
 Water Level Before Purge: 7.17  
 Well Volume: 4.18 Gallons

Well Casing Elevation: 1103.91  
 Static Water Elevation: 1096.74  
 Previous Static: 1094.76  
 Water Level After Sample: Below pump  
 Measurement Method:  Elec. W/L  Steel Tape

### Sampling Information

Weather Conditions: Temp: 39 Wind: S @ 5-10 Sky: cloudy  
 Sampling Method: Grundfos  Bladder S&T  Disp. Bailer  Whale  Grab  Other:  
 Dedicated Equipment:  Yes  No Pumping Rate: 25 gpm  
 Well Purged Dry?  Yes  No Time Pump Began: 1040 am/pm  
 Time Purged Dry? 1058 Time of Sampling: 1103 am/pm  
 Duplicate Sample? Yes  No ID: \_\_\_\_\_ Sample EH: 153.7  
 Sample Appearance: General: clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1057</u>	<u>6.53</u>	<u>4283</u>	<u>7.77</u>	<u>NA</u>	<u>NA</u>	<u>4.25</u>	<u>1</u>	
<u>1103</u>	<u>6.57</u>	<u>4305</u>	<u>8.00</u>	<u> </u>	<u> </u>	<u>-</u>	<u>2</u>	<u>Recharge</u>
							<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes  No

Amount Water Removed: 4.25 Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 27 Feb 17

Unique Station ID:

Sample ID: Well H3OX

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary:

Protective Posts? Yes  No

State ID Tag? Yes  No

Grout Seal Intact? Yes  No

## Well Information

Well Depth: 22.68

Constructed Depth: 22.55

Casing Diameter: 2"

Water Level Before Purge: 5.15

Well Volume: 2.86 Gallons

Well Casing Elevation: 1095.19

Static Water Elevation: 1090.04

Previous Static: 1089.77

Water Level After Sampl Bottom Pump

Measurement Method: Elec. WLI Steel Tape

## Sampling Information

Weather Conditions: Temp: 40 Wind: SE 5-10 Sky: cloudy

Sampling Method: Grundfos (Bladder SS) Disp. Bailer  Whale  Grab  Other:

Dedicated Equipment:  Yes  No Pumping Rate: .25 gpm

Well Purged Dry?  Yes  No Time Pump Began: 1112 am / pm

Time Purged Dry? 1124 Time of Sampling: 1129 am / pm

Duplicate Sample? Yes  No  ID: - Sample EH: 130.7

Sample Appearance: General: clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1124	6.73	4315	8.53	NA	NA	3	1	
1129	6.67	4246	9.43			-	2	Recharge
							3	
							4	
							5	

Stabilized? Yes  No  Amount Water Removed 3 Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 27 Feb 17

Unique Station ID:

Sample ID: Well H4OX

## Well Condition

Well Locked?  Yes  No

Protective Posts? Yes  No

Well Labeled?  Yes  No

State ID Tag? Yes  No

Casing Straight?  Yes  No

Grout Seal Intact?  Yes  No

Repairs Necessary:

## Well Information

Well Depth: 27.48

Well Casing Elevation: 1108.22

Constructed Depth: 27.20

Static Water Elevation: 1091.11

Casing Diameter: 2"

Previous Static: 1090.00

Water Level Before Purge: 17.11

Water Level After Sample: 24.92

Well Volume: 1.69 Gallons

Measurement Method: Elec. WL Steel Tape

## Sampling Information

Weather Conditions: Temp: 39 Wind: SE 5-10 Sky: cloudy

Sampling Method:  Groundfos  Bladder S/S  Disp. E/Whale  Grab  Other:

Dedicated Equipment:  Yes  No Pumping Rate: 2.5 gpm

Well Purged Dry?  Yes  No Time Pump Began: 1142 (am) pm

Time Purged Dry? 1150 Time of Sampling: 1155 (am) pm

Duplicate Sample? Yes  No  ID: — Sample E 134.6

Sample Appearance: General: clear Color: NTU Phase: NOTU Odor: NOTU

Time	pH	Specific Cond.	Temp °C	D. O.	Turbidity NTU	Gallons Removed	SE Q #	Comments:
<u>1149</u>	<u>6.65</u>	<u>2850</u>	<u>8.81</u>	<u>MP</u>	<u>NA</u>	<u>1.75</u>	<u>1</u>	
<u>1155</u>	<u>6.73</u>	<u>2857</u>	<u>8.81</u>	<u> </u>	<u> </u>	<u>—</u>	<u>2</u>	<u>Recharge</u>
							<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes  No  Amount Water I 1.75 Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 27 Feb 17

Unique Station ID:

Sample ID: Well H6

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary:

Protective Posts?  Yes  No

State ID Tag? Yes  No

Grout Seal Intact? Yes  No

## Well Information

Well Depth: 17.92

Constructed Depth: 17.70

Casing Diameter: 2"

Water Level Before Purge: 15.57

Well Volume: .38 Gallons

Well Casing Elevation: NA

Static Water Elevation:

Previous Static:

Water Level After Sample: Below pump

Measurement Method: Elec. WL Steel Tape

## Sampling Information

Weather Conditions: Temp: 38

Wind: LEV

Sky: cloudy

Sampling Method:  Grundfos  Bladder SS/A  Disp. Bailer  Whale  Grab  Other:

Dedicated Equipment:  Yes  No

Pumping Rate: .25 gpm

Well Purged Dry?  Yes  No

Time Pump Began 1204 am / pm

Time Purged Dry? 1206

Time of Sampling: 1211 am / pm

Duplicate Sample? Yes  No  ID: →

Sample EH: 124.9

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1206	6.48	1061	9.03	NA	NA	.5	1	
1211	7.00	1055	9.19				2	Recharge
							3	
							4	
							5	

Stabiliz Yes  No

Amount Water Removed: .5

Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 27 Feb 17

Unique Station ID:

Sample ID: Well H8

## Well Condition

Well Locked?  Yes  No  
 Well Labeled?  Yes  No  
 Casing Straight?  Yes  No  
 Repairs Necessary:

Protective Posts?  Yes  No  
 State ID Tag?  Yes  No  
 Grout Seal Intact?  Yes  No

## Well Information

Well Depth: 22.33  
 Constructed Depth: 22.05  
 Casing Diameter: 2"  
 Water Level Before Purge: 6.61  
 Well Volume: 2.56 Gallons

Well Casing Elevation: 1081.23  
 Static Water Elevation: 1074.62  
 Previous Static: 1072.73  
 Water Level After Sample: 8.95  
 Measurement Method:  Elec. W/L  Steel Tape

## Sampling Information

Weather Conditions: Temp: 39 Wind: SW 10 Sky: cloudy  
 Sampling Method:  Grundfos  Bladder SS/T  Disp. Bailer  Whale  Grab  Other:  
 Dedicated Equipment:  Yes  No Pumping Rate: .25 gpm  
 Well Purged Dry?  Yes  No Time Pump Began: 1217 am / pm  
 Time Purged Dry? — Time of Sampling: 1250 am / pm  
 Duplicate Sample?  Yes  No ID: — Sample EH: -39.0  
 Sample Appearance: General: Clear Color: None Phase: None Odor: None

ii	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1228	6.93	1476	7.83	NA	NA	2.75	1	
1234	6.93	1478	7.90	↓	↓	5.50	2	
1250	6.43	1481	7.98	↓	↓	8.25	3	
							4	
							5	

Stabilized?  Yes  No Amount Water Remove 8.25 Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

## Groundwater Assessment

Sampling Personne

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 27 Feb 17

Unique Station I

Sample ID: Well H9

## Well Condition

Well Locked?  Yes No

Well Labeled?  Yes No

Casing Straight?  Yes No

Repairs Necessary:

Protective Posts  Yes No

State ID Tag? Yes  No

Grout Seal Intac  Yes No

## Well Information

Well Depth: 30.71

Constructed Depth: 30.20

Casing Diameter: 2"

Water Level Before Purge: 8.12

Well Volume: 3.69 Gallons

Well Casing Elevation: 1086.21

Static Water Elevation: 1078.09

Previous Static: 1075.16

Water Level After Sam 10.22

Measurement Method: Elec. W/L Steel Tape

## Sampling Information

Weather Conditions Temp: 40 Wind: S @ 10 Sky: cloudy

Sampling Method: Grundfos Bladder SS Disp. Bailer Whale Grab Other:

Dedicated Equipme  Yes No Pumping Rate: 25 gpm

Well Purged Dry? Yes  No Time Pump Beg 1255 am /  pm

Time Purged Dry? Time of Samplin 1340 am /  pm

Duplicate Sample? Yes  No ID: - Sample EH: 104.1

Sample Appearance General: Slightly cloudy Color: Tan Phase: None Odor: None

15 Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1310	6.52	3190	9.04	NA	NA	3.75	1	
1325	6.52	3203	9.13	I	I	7.50	2	
1340	6.52	3208	9.14	I	I	11.25	3	
							4	
							5	

Stabiliz  Yes No Amount Water Removed 11.25 Gallons

Comments:

Exceptions to Protocol:



MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
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FINAL REPORT COMPLETION DATE: 17 May 17 AB

Date Reported: 4 May 2017

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0123
Account #: 006106
PO #: 48680

Project Name: BIG STONE PLANT

T- [Signature] 15 May 17
Field Service Manager/Date Reviewed
[Signature] 10 May 2017
Chemistry Lab Manager/Date Reviewed
[Signature] 10 May 2017
Quality Assurance Director/Date Reviewed

- RL = Reporting Limits
NQ = Not Present, Qualitative Only
PQ = Present, Qualitative Only
ND = Not Determined

All data for this report has been approved by MVTl Laboratory Management.

MVTl guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTl to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTl. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 4 May 2017  
 Lab Number: 17-A11085  
 Work Order #: 31-0123  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 29 Mar 2017 15:24  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 30 Mar 2017 13:27  
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H6

Temp at Receipt: 0.4C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					3 Apr 17	JMS
Water Digestions					3 Apr 17	JMS
Radium 226	SEE ATTACHED				4 May 17 7:52	ABL
Radium 228	SEE ATTACHED			EPA M9320	4 May 17 7:52	ABL
pH, Field	7.30	units	1.00	I-1586-85	29 Mar 17 15:24	DGF
pH	* 7.4	units	1.0	SM 4500 H+ B-2000	31 Mar 17 11:42	DS
Sulfate	67.9 @	mg/L	5.0	ASTM D516-07	6 Apr 17 8:20	KCJ
Chloride	< 3	mg/L	3	SM 4500 Cl E	6 Apr 17 9:15	MRW
Mercury	< 0.005	ug/L	0.005	EPA 245.7	7 Apr 17 11:44	RMB
Solids, Total Dissolved	555	mg/L	10	SM 2540 C-97	31 Mar 17 12:50	RC
Calcium	58.70	mg/L	0.500	SW6010C	12 Apr 17 10:54	RMV
	See Narrative					
Lithium	0.032	mg/L	0.005	SW6010C	12 Apr 17 10:54	RMV
Barium	0.086	mg/L	0.005	SW6010C	12 Apr 17 10:54	RMV
Chromium	< 0.01	mg/L	0.01	SW6010C	12 Apr 17 10:54	RMV
Cobalt	< 0.01 ^	mg/L	0.005	SW6010C	12 Apr 17 10:54	RMV
Boron	4.610	mg/L	0.100	SW6010C	12 Apr 17 10:54	RMV
	See Narrative					
Antimony	< 2.5 @	ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Arsenic	< 2.5 @	ug/L	0.5	SW6020A	10 Apr 17 9:52	RMV
Beryllium	< 0.25	ug/L	0.05	SW6020A	5 Apr 17 11:37	RMV
	@See Narrative					
Cadmium	< 0.5 @	ug/L	0.1	SW6020A	5 Apr 17 11:37	RMV
Lead	< 2.5 @	ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Molybdenum	22.6 @	ug/L	0.50	SW6020A	10 Apr 17 9:52	RMV
Selenium	8.39 @	ug/L	0.50	SW6020A	5 Apr 17 11:37	RMV
Thallium	< 0.5 @	ug/L	0.1	SW6020A	5 Apr 17 11:37	RMV
Fluoride	0.480	mg/L	0.020	EPA 300.0	7 Apr 17 10:37	RC

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit  
 Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.  
 The reporting limit was elevated for any analyte requiring a dilution as coded below:  
 @ = Due to sample matrix # = Due to concentration of other analytes  
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DH # R-040





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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 4 May 2017
Lab Number: 17-A11086
Work Order #: 31-0123
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 29 Mar 2017 16:06
Sampled By: MVTL FIELD PERSONNEL
Date Received: 30 Mar 2017 13:27
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H8

Temp at Receipt: 0.4C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include MS Water Digestions, Radium 226, Radium 228, pH, Field, Sulfate, Chloride, Mercury, Solids, Total Dissolved, Calcium, Lithium, Barium, Chromium, Cobalt, Boron, Antimony, Arsenic, Beryllium, Cadmium, Lead, Molybdenum, Selenium, Thallium, Fluoride.

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
# = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WWT/DW # R-040



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## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 4 May 2017  
 Lab Number: 17-A11087  
 Work Order #: 31-0123  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 29 Mar 2017 17:06  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 30 Mar 2017 13:27  
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H9

Temp at Receipt: 0.4C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				3 Apr 17	JMS
Water Digestions				3 Apr 17	JMS
Radium 226	SEE ATTACHED			4 May 17 7:52	ABL
Radium 228	SEE ATTACHED		EPA M9320	4 May 17 7:52	ABL
pH, Field	6.56 units	1.00	I-1586-85	29 Mar 17 17:06	DGF
pH	* 6.8 units	1.0	SM 4500 H+ B-2000	31 Mar 17 11:42	DS
Sulfate	1450 ~ mg/L	5.0	ASTM D516-07	6 Apr 17 8:56	KCJ
Chloride	12.3 mg/L	3.0	SM 4500 Cl E	6 Apr 17 9:33	MRW
Mercury	0.009 ug/L	0.005	EPA 245.7	7 Apr 17 11:44	RMB
Solids, Total Dissolved	2640 mg/L	10	SM 2540 C-97	31 Mar 17 12:50	RC
Calcium	599.0 mg/L	0.500	SW6010C	12 Apr 17 10:54	RMV
	~See Narrative				
Lithium	0.135 mg/L	0.005	SW6010C	12 Apr 17 10:54	RMV
Barium	0.036 mg/L	0.005	SW6010C	12 Apr 17 10:54	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	12 Apr 17 10:54	RMV
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	12 Apr 17 10:54	RMV
Boron	1.150 mg/L	0.100	SW6010C	12 Apr 17 10:54	RMV
	See Narrative				
Antimony	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Arsenic	< 5 @ ug/L	0.5	SW6020A	10 Apr 17 9:52	RMV
Beryllium	< 0.5 ug/L	0.05	SW6020A	5 Apr 17 11:37	RMV
	@See Narrative				
Cadmium	< 1 @ ug/L	0.1	SW6020A	5 Apr 17 11:37	RMV
Lead	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Molybdenum	< 5 @ ug/L	0.5	SW6020A	10 Apr 17 9:52	RMV
Selenium	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Thallium	< 1 @ ug/L	0.1	SW6020A	5 Apr 17 11:37	RMV
Fluoride	0.200 mg/L	0.020	EPA 300.0	7 Apr 17 10:37	RC

RL = Reporting Limit  
 Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.  
 The reporting limit was elevated for any analyte requiring a dilution as coded below:  
 @ = Due to sample matrix      # = Due to concentration of other analytes  
 ! = Due to sample quantity      + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125    WI LAB # 999447590    ND MICRO # 1013-M    ND WW/DW # R-040



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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
www.mvtl.com



## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Report Date: 4 May 2017  
Lab Number: 17-A11087  
Work Order #: 31-0123  
Account #: 006106  
Sample Matrix: GROUNDWATER  
Date Sampled: 29 Mar 2017 17:06  
Sampled By: MVT L FIELD PERSONNEL  
Date Received: 30 Mar 2017 13:27  
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H9

Temp at Receipt: 0.4C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
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\* Holding Time Exceeded

Radium 226 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

Radium 228 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

### RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

g = Due to sample matrix # = Due to concentration of other analytes  
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WR/DR # R-040





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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
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## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Report Date: 4 May 2017  
Lab Number: 17-A11088  
Work Order #: 31-0123  
Account #: 006106  
Sample Matrix: GROUNDWATER  
Date Sampled: 29 Mar 2017 16:28  
Sampled By: MVTL FIELD PERSONNEL  
Date Received: 30 Mar 2017 13:27  
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H2OX

Temp at Receipt: 0.4C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
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\* Holding Time Exceeded

Radium 226 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

Radium 228 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit  
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.  
The reporting limit was elevated for any analyte requiring a dilution as coded below:  
@ = Due to sample matrix # = Due to concentration of other analytes  
! = Due to sample quantity + = Due to internal standard response  
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 4 May 2017
Lab Number: 17-A11089
Work Order #: 31-0123
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 29 Mar 2017 17:01
Sampled By: MVTL FIELD PERSONNEL
Date Received: 30 Mar 2017 13:27
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H30X

Temp at Receipt: 0.4C

Table with 6 columns: Analyte, As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include MS Water Digestions, Radium 226, Radium 228, pH, Sulfate, Chloride, Mercury, Solids, Calcium, Lithium, Barium, Chromium, Cobalt, Boron, Antimony, Arsenic, Beryllium, Cadmium, Lead, Molybdenum, Selenium, Thallium, Fluoride.

RL - Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
& = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND MW/DW # R-040

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Project Name: BIG STONE PLANT

Sample Description: WELL H30X

Report Date: 4 May 2017  
Lab Number: 17-A11089  
Work Order #: 31-0123  
Account #: 006106  
Sample Matrix: GROUNDWATER  
Date Sampled: 29 Mar 2017 17:01  
Sampled By: MVTL FIELD PERSONNEL  
Date Received: 30 Mar 2017 13:27  
PO #: 48680

Temp at Receipt: 0.4C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
--------------------	-----------	------------------	---------------	---------

\* Holding Time Exceeded

Radium 226 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

Radium 228 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit  
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.  
The reporting limit was elevated for any analyte requiring a dilution as coded below:  
@ = Due to sample matrix # = Due to concentration of other analytes  
! = Due to sample quantity + = Due to internal standard response  
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447660 ND MICRO # 1013-H ND SW/DW # R-040

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
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## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 4 May 2017  
 Lab Number: 17-A11090  
 Work Order #: 31-0123  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 30 Mar 2017 8:24  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 30 Mar 2017 13:27  
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H40X

Temp at Receipt: 0.4C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				3 Apr 17	JMS
Water Digestions				4 Apr 17	JMS
Radium 226	SEE ATTACHED			2 May 17 16:10	ABL
Radium 228	SEE ATTACHED			2 May 17 16:10	ABL
pH, Field	6.55 units	1.00	EPA M9320	30 Mar 17 8:24	BMW
pH	* 6.9 units	1.0	SM 4500 H+ B-2000	31 Mar 17 11:52	DS
Sulfate	1190 ~ mg/L	5.0	ASTM D516-07	6 Apr 17 8:56	KCJ
Chloride	46.4 mg/L	3.0	SM 4500 Cl E	6 Apr 17 9:33	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	7 Apr 17 11:44	RMB
Solids, Total Dissolved	2320 mg/L	10	SM 2540 C-97	31 Mar 17 12:50	RC
Calcium	330.0 mg/L	0.500	SW6010C	12 Apr 17 11:27	RMV
Lithium	0.106 mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Barium	0.016 mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Chromium	< 0.01 mg/L	0.01	SW6010C	12 Apr 17 11:27	RMV
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	12 Apr 17 11:27	RMV
Boron	0.392 mg/L	0.100	SW6010C	12 Apr 17 11:27	RMV
Antimony	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Arsenic	< 5 @ ug/L	0.5	SW6020A	10 Apr 17 9:52	RMV
Beryllium	< 0.5 ug/L	0.05	SW6020A	5 Apr 17 11:37	RMV
	@See Narrative				
Cadmium	< 1 @ ug/L	0.1	SW6020A	5 Apr 17 11:37	RMV
Lead	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Molybdenum	< 5 @ ug/L	0.5	SW6020A	10 Apr 17 9:52	RMV
Selenium	< 5 @ ug/L	0.5	SW6020A	5 Apr 17 11:37	RMV
Thallium	< 1 @ ug/L	0.1	SW6020A	5 Apr 17 11:37	RMV
Fluoride	0.410 mg/L	0.020	EPA 300.0	7 Apr 17 10:37	RC

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

### RL - Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TWI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes  
 j = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040





## MINNESOTA VALLEY TESTING LABORATORIES, INC.

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### INORGANIC & METALS ANALYSES:

The internal standard counts associated with beryllium were outside of acceptance range in the blank spike for samples 17-A11085 through 17-A11097. Data was reported based on the acceptable recovery of beryllium in the blank spike. Beryllium recoveries were elevated in the knowns for the same set of samples. Data that was below the reporting limit was reported.

Due to the sample matrix of the spiked sample, the recoveries of the matrix spike and matrix spike duplicate were outside of acceptance limits for boron and calcium for samples 17-A11085 through 17-A11089. Data was reported based on the acceptable recoveries of the blank spike and relative percent difference of the matrix spikes.

No other problems were encountered with these analyses.



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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MEMBER  
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## Quality Control Report

Lab IDs: 17-A11085 to 17-A11097

Project: BIG STONE PLANT CCR

Work Order: 201731-0123

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony ug/L	25.0	100	85-115	25.0	17A11094q	<5	25.8	103	75-125	25.8	26.1	104	1.2	10	98	90-110	<0.5
	25.0	100	85-115	25.0	17A11097q	<5	26.5	106	75-125	26.5	24.8	99	6.6	10	98	90-110	<0.5
Arsenic ug/L	25.0	102	85-115	25.0	17A10348q	2.25	28.6	105	75-125	28.6	28.7	106	0.3	10	92	90-110	<0.5
	25.0	97	85-115	25.0	17A10930q	<0.5	22.6	90	75-125	22.6	24.3	97	7.2	10	96	90-110	<0.5
				25.0	17A11097q	<5	26.4	106	75-125	26.4	23.9	96	9.9	10			
				25.0	17A11094q	<5	27.9	112	75-125	27.9	28.6	114	2.5	10			
Barium mg/L	1.000	104	85-115	1.00	a10486qc	0.092	1.100	101	75-125	1.100	1.180	109	7.0	10	98	90-110	<0.005
	1.000	103	85-115	1.00	17-A11089	0.013	1.130	112	75-125	1.130	1.120	111	0.9	10	98	90-110	<0.005
	1.000	102	85-115	1.00	17A11064q	0.041	1.120	108	75-125	1.120	1.090	105	2.7	10			<0.005
Beryllium ug/L	2.50	116	85-115	2.50	17A11094q	<0.5	2.76	110	75-125	2.76	2.85	114	3.2	10	112	90-110	<0.05
	2.50	116	85-115	2.50	17A11097q	<0.5	2.77	111	75-125	2.77	2.67	107	3.7	10	110	90-110	<0.05
Boron mg/L	1.000	101	85-115	1.00	a10486qc	0.168	1.220	105	75-125	1.220	1.270	110	4.0	10	98	90-110	<0.1
	1.000	100	85-115	1.00	17-A11089	8.040	9.490	145	75-125	9.490	9.400	136	1.0	10	101	90-110	<0.1
	1.000	105	85-115	1.00	17A11064q	1.200	2.280	108	75-125	2.280	2.200	100	3.6	10			<0.1

**Quality Control Report**

Lab IDs: 17-A11085 to 17-A11097

Project: BIG STONE PLANT CCR

Work Order: 201731-0123

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Cadmium ug/L	5.00	100	85-115	5.00	17A11094q	<1	5.55	111	75-125	5.55	5.29	106	4.8	10	96	90-110	<0.1
	5.00	100	85-115	5.00	17A11097q	1.30	6.24	99	75-125	6.24	5.91	92	5.4	10	98	90-110	<0.1
Calcium mg/L	50.00	104	85-115	50.0	a10486qc	106.0	157.0	102	75-125	157.0	160.0	108	1.9	10	100	90-110	<0.5
	50.00	104	85-115	50.0	17-A11089	376.0	491.0	230	75-125	491.0	450.0	148	8.7	10	102	90-110	<0.5
	50.00	106	85-115	50.0	17A11064q	169.0	218.0	98	75-125	218.0	213.0	88	2.3	10			<0.5
Chloride mg/L	-	-	-	60.0	17-A11086	4.0	61.9	96	85-121	61.9	62.9	98	1.6	5	94	90-110	<3
	-	-	-	60.0	17-A11096	6.9	64.7	96	85-121	64.7	66.2	99	2.3	5	94	90-110	<3
	-	-	-	60.0	17-A11777	125	182	95	85-121	182	183	97	0.5	5	95	90-110	<3
Chromium mg/L	1.000	102	85-115	1.00	a10486qc	<0.01	0.976	98	75-125	0.976	1.020	102	4.4	10	101	90-110	<0.01
	1.000	105	85-115	1.00	17-A11089	<0.01	1.020	102	75-125	1.020	1.020	102	0.0	10	99	90-110	<0.01
	1.000	103	85-115	1.00	17A11064q	<0.01	0.986	99	75-125	0.986	0.953	95	3.4	10			<0.01
Cobalt mg/L	1.000	107	85-115	1.00	a10486qc	<0.005	1.010	101	75-125	1.010	1.060	106	4.8	10	103	90-110	<0.005
	1.000	110	85-115	1.00	17-A11089	<0.01	1.040	104	75-125	1.040	1.040	104	0.0	10	103	90-110	<0.005
	1.000	109	85-115	1.00	17A11064q	<0.01	1.030	103	75-125	1.030	1.000	100	3.0	10			<0.005
Fluoride mg/L	-	-	-	0.20	17-A11094	0.470	0.660	95	75-125	0.660	0.670	100	1.5	10	97	90-110	<0.02
	-	-	-	0.20	17-A11967	0.170	0.400	115	75-125	0.400	0.400	115	0.0	10	99	90-110	<0.02

**Quality Control Report**

Lab IDs: 17-A11085 to 17-A11097

Project: BIG STONE PLANT CCR

Work Order: 201731-0123

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/Dup Orig Result	MSD/Dup Result	MSD/Rec %	MSD/Dup RPD	MSD/Dup RPD Limit (<=)	Known Rec (%)	Known % Rec Limits	Method Blank
Lead ug/L	25.0	105	85-115	25.0	17A11094q	<5	26.9	108	75-125	26.9	26.0	104	3.4	10	100	90-110	<0.5
				25.0	17A10930q	7.46	27.4	80	75-125	27.4	29.3	87	6.7	10	100	90-110	<0.5
				25.0	17A11097q	<5	27.4	110	75-125	27.4	25.6	102	6.8	10			
Lithium mg/L	1.000	106	85-115	1.00	17-A11089	0.134	1.340	121	75-125	1.340	1.350	122	0.7	10	102	90-110	<0.005
	1.000	106	85-115	1.00	a11064qc	0.212	1.390	118	75-125	1.390	1.340	113	3.7	10	105	90-110	<0.005
Mercury ug/L	-	-	-	0.10	17-A11094	<0.005	0.101	101	63-111	0.101	0.108	108	6.7	18	107	76-113	<0.005
	-	-	-	0.10	17-A10931	<0.005	0.074	74	63-111	0.074	0.075	75	1.3	18	105	76-113	<0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum ug/L	25.0	100	85-115	25.0	17A11094q	<5	29.1	116	75-125	29.1	29.0	116	0.3	10	95	90-110	<0.5
	25.0	100	85-115	25.0	17A10930q	<2.5	25.8	103	75-125	25.8	26.7	107	3.4	10	95	90-110	<0.5
				25.0	17A11097q	5.24	30.3	100	75-125	30.3	29.4	97	3.0	10			

**Quality Control Report**

Lab IDs: 17-A11085 to 17-A11097

Project: BIG STONE PLANT CCR

Work Order: 201731-0123

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/Dup Orig Result	MSD/Dup Result	MSD Rec %	MSD/Dup RPD	MSD/Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
pH units	-	-	-	-	-	-	-	-	-	6.9	6.9	-	0.0	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	7.8	7.9	-	1.3	2.5	101	90-110	-
Selenium ug/L	25.0	101	85-115	25.0	17A11094q	<5	29.3	117	75-125	29.3	30.4	122	3.7	10	96	90-110	<0.5
	25.0	101	85-115	25.0	17A10930q	0.56	24.0	94	75-125	24.0	25.9	101	7.6	10	96	90-110	<0.5
				25.0	17A11097q	<5	26.7	107	75-125	26.7	25.0	100	6.6	10			
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	2640	2740	-	3.7	8	100	85-115	<10
	-	-	-	-	-	-	-	-	-	1670	1630	-	2.4	8			
Sulfate mg/L	-	-	-	500	17-A11086	272	801	106	74-128	801	812	108	1.4	5	98	80-120	<5
	-	-	-	500	17-A11096	824	1280	91	74-128	1280	1260	87	1.6	5	98	80-120	<5
	-	-	-	50.0	17-A11783	<5	42.0	84	74-128	42.0	42.1	84	0.2	5	98	80-120	<5

**Quality Control Report**

Lab IDs: 17-A11085 to 17-A11097

Project: BIG STONE PLANT CCR

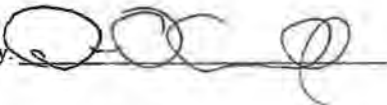
Work Order: 201731-0123

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/Dup Orig Result	MSD/Dup Result	MSD Rec %	MSD/Dup RPD	MSD/Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Thallium ug/L	5.00	106	85-115	5.00	17A11094q	< 1	5.44	109	75-125	5.44	5.18	104	4.9	10	102	90-110	< 0.1
	5.00	106	85-115	5.00	17A10930q	< 0.1	4.33	87	75-125	4.33	4.64	93	6.9	10	103	90-110	< 0.1
				5.00	17A11097q	< 1	5.36	107	75-125	5.36	5.05	101	6.0	10			

The beryllium LCS recovery and known recovery were above the acceptance limits, see narrative.

The boron matrix spike and spike duplicate recoveries were outside the acceptance limits, see narrative.

The calcium matrix spike and spike duplicate recoveries were outside the acceptance limits, see narrative.

Approved by: 



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 872-8945

Your Environmental Monitoring Partner

Date: 5/1/2017

**CLIENT:** MVTL Inc  
**Project:** Ottertail Power Big Stone  
**Lab Order:** S1704052

**CASE NARRATIVE**  
**Report ID:** S1704052001

Samples H-6-A11085, H-8-A11086, H-9-A11087, H2OX-A11088, H3OX-A11089, H4OX-A11090, Slag 2B A11097, Slag 9-A11096, Slag-4-A11091, Slag-5-A11092, Slag-6-A11093, Slag-7-A11094, and Slag-8-A11095 were received on April 5, 2017.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions  
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition  
40 CFR Parts 136 and 141  
40 CFR Part 50, Appendices B, J, L, and O  
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012  
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Qualifiers by sample

S1704140-003 - Radium 228 by Ga/Tech/Total Radium 228 - RPD outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 1



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073
ProjectName: Ottertail Power Big Stone
Lab ID: S1704052-001
ClientSample ID: H2OX-A11088
COC: WEB 31-0123

Date Reported 5/1/2017
Report ID S1704052001
WorkOrder: S1704052
CollectionDate: 3/29/2017 4:28:00 PM
DateReceived: 4/5/2017 11:28:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager





Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

### Sample Analysis Report

**Company:** MVTL Inc  
 1126 N Front St  
 New Ulm, MN 56073  
**ProjectName:** Ottetail Power Blg Stone  
**Lab ID:** S1704052-002  
**ClientSample ID:** H3OX-A11089  
**COC:** WEB 31-0123

**Date Reported:** 5/1/2017  
**Report ID:** S1704052001  
**WorkOrder:** S1704052  
**CollectionDate:** 3/29/2017 5:01:00 PM  
**DateReceived:** 4/5/2017 11:28:00 AM  
**FieldSampler:**  
**Matrix:** Water

#### Comments


Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
<b>Radionuclides - Total</b>						
Radium 226	ND	pCi/L		0.4	SM 7500 Ra-B	04/20/2017 1647 MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/20/2017 1647 MB
Radium 228	ND	pCi/L		2	Ga-Tech	04/23/2017 733 MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	04/23/2017 733 MB

These results apply only to the samples tested.

RL - Reporting Limit

**Qualifiers:** B Analyte detected in the associated Method Blank  
 E Value above quantitation range  
 H Holding times for preparation or analysis exceeded  
 L Analyzed by another laboratory  
 ND Not Detected at the Reporting Limit  
 S Spike Recovery outside accepted recovery limits

C Calculated Value  
 G Analyzed at IML Gillette laboratory  
 J Analyte detected below quantitation limits  
 M Value exceeds Monthly Ave or MCL or is less than LCL  
 O Outside the Range of Dilutions  
 X Matrix Effect

Reviewed by:   
 Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073
ProjectName: Ottertail Power Big Stone
Lab ID: S1704052-003
ClientSample ID: H4OX-A11090
COC: WEB 31-0123

Date Reported 5/1/2017
Report ID S1704052001
WorkOrder: S1704052
CollectionDate: 3/30/2017 8:24:00 AM
DateReceived: 4/5/2017 11:28:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Inc  
 1126 N Front St  
 New Ulm, MN 56073

**ProjectName:** Ottertail Power Big Stone  
**Lab ID:** S1704052-004  
**ClientSample ID:** H-6-A11085  
**COC:** WEB 31-0123

**Date Reported:** 5/1/2017  
**Report ID:** S1704052001

**WorkOrder:** S1704052  
**CollectionDate:** 3/29/2017 3:24:00 PM  
**DateReceived:** 4/5/2017 11:28:00 AM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	ND	pCi/L		0.4	SM 7500 Ra-B	04/20/2017 1647	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/20/2017 1647	MB
Radium 228	4.0	pCi/L		2	Ga-Tech	04/23/2017 1341	MB
Radium 228 Precision (±)	2.8	pCi/L			Ga-Tech	04/23/2017 1341	MB

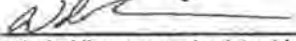
These results apply only to the samples tested.

RL - Reporting Limit

**Qualifiers:**

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by:   
 Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Inc  
 1126 N Front St  
 New Ulm, MN 56073

**ProjectName:** Ottertail Power Big Stone  
**Lab ID:** S1704052-005  
**ClientSample ID:** H-8-A11086  
**COC:** WEB 31-0123

**Date Reported:** 5/1/2017  
**Report ID:** S1704052001

**WorkOrder:** S1704052  
**CollectionDate:** 3/29/2017 4:06:00 PM  
**DateReceived:** 4/5/2017 11:28:00 AM  
**FieldSampler:**  
**Matrix:** Water

**Comments**

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	04/24/2017 1203	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	04/24/2017 1203	MB
Radium 228	ND	pCi/L		2	Ga-Tech	04/23/2017 1645	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	04/23/2017 1645	MB

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - E Value above quantitation range
  - H Holding times for preparation or analysis exceeded
  - L Analyzed by another laboratory
  - ND Not Detected at the Reporting Limit
  - S Spike Recovery outside accepted recovery limits

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
 Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073
ProjectName: Ottertail Power Big Stone
Lab ID: S1704052-008
ClientSample ID: H-9-A11087
COC: WEB 31-0123

Date Reported 5/1/2017
Report ID S1704052001
WorkOrder: S1704052
CollectionDate: 3/29/2017 5:06:00 PM
DateReceived: 4/5/2017 11:28:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

### ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc  
Work Order: S1704052  
Project: Ottertail Power Big Stone

Date: 5/1/2017  
Report ID: S1704052001

Radium 228 by Ga/Tech		Sample Type	MBLK		Units: pCi/L				
MB-429 (04/21/17 15:43)	Analyte	RunNo: 145273	PrepDate: 04/12/17 12:00	BatchID 13101					
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		ND	1						

MB-430 (04/26/17 11:52)	Analyte	RunNo: 145297	PrepDate: 04/17/17 14:00	BatchID 13102					
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		ND	1						

Radium 228 by Ga/Tech		Sample Type	LCS		Units: pCi/L				
LCS-429 (04/21/17 18:45)	Analyte	RunNo: 145273	PrepDate: 04/12/17 12:00	BatchID 13101					
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		40	1	40.1		99.4	65.9 - 132		

LCS-430 (04/26/17 14:57)	Analyte	RunNo: 145297	PrepDate: 04/17/17 14:00	BatchID 13102					
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		39	1	40.1		98.1	65.9 - 132		

Radium 228 by Ga/Tech		Sample Type	LCSD		Units: pCi/L				
LCSD-430 (04/26/17 18:01)	Analyte	RunNo: 145297	PrepDate: 04/17/17 14:00	BatchID 13102					
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228		41	1	39	3.17	101	20		

Radium 228 by Ga/Tech		Sample Type	MS		Units: pCi/L				
MS-429 (04/22/17 00:54)	Analyte	RunNo: 145273	PrepDate: 04/12/17 12:00	BatchID 13101					
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		41	1	40.1	ND	101	50 - 139		

S1704140-003AMS (04/28/17 15:59)	Analyte	RunNo: 145297	PrepDate: 04/17/17 14:00	BatchID 13102					
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		25	1	40.1	ND	62.8	50 - 139		

Radium 228 by Ga/Tech		Sample Type	MSD		Units: pCi/L				
MSD-429 (04/22/17 03:57)	Analyte	RunNo: 145273	PrepDate: 04/12/17 12:00	BatchID 13101					
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228		43	1	41	5.19	107	20		

S1704140-003AMSD (04/28/17 19:04)	Analyte	RunNo: 145297	PrepDate: 04/17/17 14:00	BatchID 13102					
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228		35	1	25	31.3	86.1	20	R	

**Qualifiers:** B Analyte detected in the associated Method Blank  
 G Analyzed at IML Gillette laboratory  
 J Analyte detected below quantitation limits  
 ND Not Detected at the Reporting Limit  
 R RPD outside accepted recovery limits  
 X Matrix Effect

E Value above quantitation range  
 H Holding times for preparation or analysis exceeded  
 L Analyzed by another laboratory  
 O Outside the Range of Dilutions  
 S Spike Recovery outside accepted recovery limits



ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc
Work Order: S1704052
Project: Ottertail Power Big Stone

Date: 5/1/2017
Report ID: S1704052001

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: MB-1738 (04/20/17 14:04), MBLK, 145012, 04/12/17 0:00, 13074, Radium 226, ND, 0.2.

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: MB-1739 (04/24/17 12:03), MBLK, 145172, 04/17/17 0:00, 13086, Radium 226, ND, 0.2.

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: LCS-1738 (04/20/17 14:04), LCS, 145012, 04/12/17 0:00, 13074, Radium 226, 6.5, 0.2, 5.89, 110, 67.1 - 122.

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: LCS-1739 (04/24/17 12:03), LCS, 145172, 04/17/17 0:00, 13086, Radium 226, 6.1, 0.2, 5.89, 103, 67.1 - 122.

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Conc, %RPD, %REC, % RPD Limits, Qual. Row 1: LCSD-1738 (04/20/17 14:04), LCSD, 145012, 04/12/17 0:00, 13074, Radium 226, 6.2, 0.2, 6.5, 4.82, 105, 20.

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Conc, %RPD, %REC, % RPD Limits, Qual. Row 1: LCSD-1739 (04/24/17 12:03), LCSD, 145172, 04/17/17 0:00, 13086, Radium 226, 7.0, 0.2, 6.1, 14.3, 119, 20.

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: S1704026-003AMS (04/20/17 14:04), MS, 145012, 04/12/17 0:00, 13074, Radium 226, 11.0, 0.4, 11.8, ND, 93.3, 65 - 131.

Table with 10 columns: Sample ID, Sample Type, RunNo, PrepDate, BatchID, Analyte, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: S1704052-005AMS (04/24/17 12:03), MS, 145172, 04/17/17 0:00, 13086, Radium 226, 11, 1, 11.8, ND, 96.8, 65 - 131.

- Qualifiers: B Analyte detected in the associated Method Blank, G Analyzed at IML Gillette laboratory, J Analyte detected below quantitation limits, ND Not Detected at the Reporting Limit, R RPD outside accepted recovery limits, X Matrix Effect, E Value above quantitation range, H Holding times for preparation or analysis exceeded, L Analyzed by another laboratory, O Outside the Range of Dilutions, S Spike Recovery outside accepted recovery limits.

# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> Jeff Hoffmann, Dusty Farnsworth Ben Wolf
<b>Report:</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b>
<b>Address:</b> P.O. Box 496 Fergus Falls, MN 56538-0496	<b>Address:</b>	<b>Lab Numbers:</b>
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other 150 None	Analysis Required
88	H2OX		29 Mar 17	1628	GW		2	N	1	1	N								See Attached
89	H3OX			1701	GW		2	N	1	1	N								
90	H4OX		30 Mar 17	824	GW		2	N	1	1	N								
A11085	H-6		29 Mar 17	1524	GW		2	N	1	1	N								
86	H-8			1606	GW		2	N	1	1	N								
87	H-9			1706	GW		2	N	1	1	N								
	Slag 4				GW		2	N	1	1	N								
A11091	Slag 4		29 Mar 17	1344	GW		2	N	1	1	N								
92	Slag 5		30 Mar 17	824	GW		2	N	1	1	N								
93	Slag 6		29 Mar 17	1925	GW		2	N	1	1	N								

Comments:  
**WORK ORDER #2**

Samples Relinquished By: <i>R35</i>			Samples Received By: <i>A. Linder</i>		
Date: 30 Mar 17	Time: 1327	Temp: 4.58°C	Date: 30 Mar 17	Time: 1327	Temp: 0.4°C
Samples Relinquished into: Fridge Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery:	Samplers	Other:	Seal Number(s) - If Used		
Transport:	Ambient	Ice	Other:	Seals Intact?	Yes No



# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> Jeff Koshman, Dusty Farnsworth Ben Volf
<b>Report</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b>
<b>Address</b> P.O. Box 496	<b>Address:</b>	<b>Lab Numbers:</b>
Fergus Falls, MN 56538-0496		
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
94	Slag 7		29 Mar 17	15:25	GW		2	N	1	1	N								See Attached
95	Slag 8		1	16:48	GW		2	N	1	1	N								
96	Slag 9			18:19	GW		2	N	1	1	N								
	Slag 9 Deep				GW		2	N	1	1	N								
97	Slag 2B			8:56	GW		2	N	1	1	N								

Comments:  
**WORK ORDER #2**

R35

Samples Relinquished By: <u>Ben Volf</u>			Samples Received By: <u>A. Reed</u>		
Date: <u>30 Mar 17</u>	Time: <u>13:27</u>	Temp: <u>4.58</u>	Date: <u>30 Mar 17</u>	Time: <u>13:27</u>	Temp: <u>0.4C</u>
Samples Relinquished into: Fridge Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery:	Samplers	Other:	Seal Number(s) - If Used		
Transport:	Ambient	Ice	Other:	Seals Intact?	Yes No

Spring 2017

A=3 500 HNO<sub>3</sub>  
500 H<sub>2</sub>SO<sub>4</sub>  
1000 NONE

# Big Stone Sampling 2017

Site	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (ml/minute)	Goes Dry?	Sampling Seasons**
WELL10	A	47.43	4	1098.70	Keck/Tsunami	No	3,000	No	1,3
WELL11	A	127.22	4	1104.00	Other Pump	Yes	38,000	No	1,3
WELL12	A	112.40	4	1071.89	Other Pump	Yes	20,000	No	1,3
S1	B	32.50	2	1102.17	Bailer	Yes	N/A	Yes	1,3
S2	B	43.12	2	1102.39	Bailer	Yes	N/A	Yes	1,3
S3	B	62.50	2	1102.65	Bailer	Yes	N/A	No	1,3
S4	B	27.70	2	1090.57	Bailer	Yes	N/A	Yes	1,3
S5	B	48.72	2	1091.40	Bailer	Yes	N/A	Yes	1,3
S6	B	62.05	2	1090.71	Bailer	Yes	N/A	No	1,3
H10X	C	32.91	2	1115.89	Bailer	Yes	100	Yes	1,3
H1INT	C	60.11	2	1115.81	Keck/Tsunami	No	1500	No	1,3
H20X	C, CCR	32.20	2	1103.91	Bladder	Yes	100	Yes	1,3
H2INT	C	62.30	2	1103.91	Bailer	Yes	N/A	Yes	1,3
H30X	C, CCR	22.55	2	1095.19	Bladder	Yes	100	Yes	1,3
H3INT	C	54.31	2	1095.17	Whale	No	2000	No	1,3
H40X	C, CCR	27.20	2	1108.22	Bladder	Yes	100	No	1,3
H4INT	C	60.01	2	1108.61	Keck/Tsunami	No	2000	Yes	1,3
H5	C	43.30	2	1122.80	Whale	No	1000	No	1,3
H6	C, CCR	15.00	2	1097.76	Bladder	Yes	100	Yes	1,3
H7	C	33.20	2	1106.06	Whale	No	1000	Yes	1,3
H8	C, CCR	22.05	2	1081.23	Bladder	Yes	100	No	1,3
H9	C, CCR	30.20	2	1088.21	Bladder	Yes	100	No	1,3
BC1	B	16.26	2	1118.46	Bailer	Yes	N/A	No	1,3
BC101	B	39.30	2	1118.70	Bailer	Yes	N/A	Yes	1,3
BC2R	B	32.48	2	1115.28	Bailer	Yes	N/A	No	1,3
BC3R	B	35.15	2	1114.42	Bailer	Yes	N/A	Yes	1,3
BC4R	B	34.60	2	1113.86	Bailer	Yes	N/A	Yes	1,3
BC5R	B	37.32	2	1123.02	Bailer	Yes	N/A	No	1,3
BC6R	B	33.95	2	1121.58	Bailer	Yes	N/A	No	1,3
STAG1		34.90	2	TBD	LOW FLOW	No	100	Yes	1,3
STAG2			2	4444.06			400		
STAG3			2				400		
STAG4	CCR	39.00	2	TBD	LOW FLOW	No	100	No	1,3
STAG5	CCR	38.80	2	1107.30	LOW FLOW	No	100	Yes	1,3
STAG6	CCR	37.30	2	1111.51	LOW FLOW	No	100	Yes	1,3
STAG7	CCR	48.70	2	1114.39	LOW FLOW	No	100	Yes	1,3
STAG8	CCR	52.09	2	1127.26	LOW FLOW	No	100	No	1,3
STAG9	CCR	49.80	2	1122.35	LOW FLOW	No	100	No	1,3
STAG9 DEEP		68.00	2	1121.92	LOW FLOW	No	100	Yes	
STAG2B	CCR	40.80	2	1111.26	LOW FLOW	No	100	Yes	
COOLING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
EVAPORATION POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
HOLDING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
RECLAIM POND	C	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3

B=4 1000 NONE  
500 HNO<sub>3</sub>  
500 HNO<sub>3</sub> Filter  
500 H<sub>2</sub>SO<sub>4</sub>

C=3 1000 NONE  
500 H<sub>2</sub>SO<sub>4</sub>  
500 HNO<sub>3</sub> Filter  
500 HNO<sub>3</sub>

C=3 "Pond"  
1000 NONE  
500 H<sub>2</sub>SO<sub>4</sub>  
500 HNO<sub>3</sub>

CCR=4  
2-1000 HNO<sub>3</sub>  
1000 NONE  
500 HNO<sub>3</sub>

\*\* 1 = Spring (March 28 - April 28), 2 = Summer (July 1 - August 7), 3 = Fall (October 14 - November 14)

*[Handwritten scribbles]*

## ***Big Stone Plant CCR Appendix III Parameters***

CCR - Appendix III Detection Monitoring

### ***Field Parameters***

pH\*

\* Field and Laboratory Measurements

### ***Total Concentration Parameters***

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

## ***Big Stone CCR Appendix IV Parameters***

CCR - Appendix IV - Assessment Monitoring

### ***Total Concentration Parameters***

Antimony

Arsenic

Barium

Beryllium

Cadmium

Chromium, Total

Cobalt

Fluoride

Lead

Lithium

Mercury

Molybdenum

Selenium

Thallium

Radium 226 + 228

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Dusty Farasyn

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 29 Mar 17

Unique Station ID: —

Sample ID: Well H6

### Well Condition

Well Locked?  Yes No

Well Labeled?  Yes No

Casing Straight?  Yes No

Protective Posts?  Yes No

State ID Tag? Yes  No

Grout Seal Intact? Yes  No

Repairs Necessary:

### Well Information

Well Depth: 17.92

Constructed Depth: 17.70

Casing Diameter: 2"

Water Level Before Purge: 12.35

Well Volume: 0.91 Gallons

Well Casing Elevation: NA

Static Water Elevation: L

Previous Static: L

Water Level After Sample: Below Pump

Measurement Method:  Elec. Well  Steel Tape

### Sampling Information

Weather Conditions: Temp: 56 Wind: SE @ 10 Sky: Mostly Cloudy

Sampling Method: Grundfos  Bladder SS/D  Disp. Bailer  Whale  Grab  Other:

Dedicated Equipment:  Yes No

Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes No

Time Pump Began: 1515 am /  PM

Time Purged Dry? 1519

Time of Sampling: 1524 am /  PM

Duplicate Sample? Yes  ID: —

Sample EH: 62.5

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1519</u>	<u>7.41</u>	<u>1098</u>	<u>8.60</u>	<u>NA</u>	<u>NA</u>	<u>1</u>	<u>1</u>	
							<u>2</u>	
							<u>3</u>	
							<u>4</u>	
<u>1524</u>	<u>7.30</u>	<u>1078</u>	<u>8.47</u>			<u>1</u>	<u>5</u>	<u>Recharge</u>

Stabilized? Yes  No

Amount Water Removed: 1 Gallons

Comments:

\* slow recharge

Exceptions to Protocol:

See

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Site: Otter Tail Power Co./ Big Stone

Sampling Personnel:

Facility ID: —

Dusty Farasyn

Date: 29 Mar 17

Unique Station ID: —

Sample ID: Well H8

### Well Condition

Well Locked?  Yes No  
 Well Labeled?  Yes No  
 Casing Straight?  Yes No

Protective Posts?  Yes No  
 State ID Tag?  Yes  No  
 Grout Seal Intact?  Yes No

Repairs Necessary:

### Well Information

Well Depth: 22.33

Well Casing Elevation: 1081.23

Constructed Depth: 22.05

Static Water Elevation: 1074.46

Casing Diameter: 2"

Previous Static: 1072.98

Water Level Before Purge: 6.77

Water Level After Sample: 7.80

Well Volume: 2.54 Gallons

Measurement Method:  Elec. W/L  Steel Tape

### Sampling Information

Weather Conditions: Temp: 56 Wind: SE @ P Sky: Mostly Cloudy

Sampling Method: Grundfos  Bradder SSP  Disp. Bailer  Whale  Grab  Other:

Dedicated Equipment:  Yes No Pumping Rate: 0.25 gpm

Well Purged Dry? Yes  No  Time Pump Began: 1543 am /  pm

Time Purged Dry?  Time of Sampling: 1606 am /  pm

Duplicate Sample? Yes  No  ID: — Sample EH: 41.0

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1544</u>	<u>7.06</u>	<u>1420</u>	<u>8.01</u>	<u>NA</u>	<u>NA</u>	<u>2.75</u>	<u>1</u>	
<u>1555</u>	<u>7.06</u>	<u>1421</u>	<u>8.03</u>			<u>5.50</u>	<u>2</u>	
<u>1606</u>	<u>7.05</u>	<u>1422</u>	<u>7.91</u>			<u>8.25</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized?  Yes No

Amount Water Removed: 8.25 Gallons

Comments:

*\* Not in FS Notes program*

Exceptions to Protocol:

*S, CLR*

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Dusty Farquhar

Site: Otter Tail Power Co./ Big Stone

Facility ID: —

Date: 29 Mar 17

Unique Station ID: —

Sample ID: Well H9

### Well Condition

Well Locked?  Yes No

Well Labeled?  Yes No

Casing Straight?  Yes No

Protective Posts?  Yes No

State ID Tag? Yes  No

Grout Seal Intact?  Yes No

Repairs Necessary:

### Well Information

Well Depth: 30.71

Well Casing Elevation: 1086.21

Constructed Depth: 30.20

Static Water Elevation: 1077.58

Casing Diameter: 2"

Previous Static: 1075.39

Water Level Before Purge: 8.63

Water Level After Sample: 11.30

Well Volume: 3.60 Gallons

Measurement Method:  Elec. WLP  Steel Tape

### Sampling Information

Weather Conditions: Temp: 56 Wind: SE @ 10 Sky: Mostly Cloudy

Sampling Method: Grundfos  Bladder SST  Disp. Bailer  Whale  Grab  Other:

Dedicated Equipment:  Yes No Pumping Rate: 0.25 gpm

Well Purged Dry? Yes  No Time Pump Began: 1621 am /  pm

Time Purged Dry? — Time of Sampling: 1706 am /  pm

Duplicate Sample? Yes  No ID: — Sample EH: 142.3

Sample Appearance: General: Sl. Cloudy Color: None Phase: None Odor: None

Time <sup>(15)</sup>	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1636	6.57	3091	8.95	NA	NA	3.75	1	
1651	6.55	3109	9.04			7.50	2	
1706	6.56	3123	9.08			11.25	3	
							4	
							5	

Stabilized?  Yes No

Amount Water Removed: 11.25 Gallons

Comments:

\* Not in FS Notes program

Exceptions to Protocol:

See R

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Site: Otter Tail Power Co./ Big Stone

Sampling Personnel:

Ben Wolf

Facility ID:

Date: 29 Mar 17

Unique Station ID:

Sample ID: Well H2OX

### Well Condition

Well Locked?  Yes No  
 Well Labeled?  Yes No  
 Casing Straight?  Yes No

Protective Posts? Yes  No  
 State ID Tag? Yes  No  
 Grout Seal Intact?  Yes No

Repairs Necessary:

### Well Information

Well Depth: 32.83  
 Constructed Depth: 32.20  
 Casing Diameter: 2"  
 Water Level Before Purge: 7.55  
 Well Volume: 4.12 Gallons

Well Casing Elevation: 1103.91  
 Static Water Elevation: 1096.36  
 Previous Static: 1094.60  
 Water Level After Sample: Below pump  
 Measurement Method:  Elec. WLI  Steel Tape

### Sampling Information

Weather Conditions: Temp: 54 Wind: S @ 5 Sky: cloudy

Sampling Method: Grundfos  Bladder SS/  Disp. Bailer  Whale  Grab  Other:

Dedicated Equipment:  Yes No Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes No Time Pump Began: 1606 am /  pm

Time Purged Dry? 1623 Time of Sampling: 1628 am /  pm

Duplicate Sample? Yes  No ID: - Sample EH: 147.0

Sample Appearance: General: clear Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
17 1623	7.01	4606	8.08	NA	NA	4.25	1	
							2	
1628	7.07	4612	8.10			-	3	Recharge
							4	
							5	

Stabilized? Yes  No Amount Water Removed: 4.25 Gallons

Comments:

Exceptions to Protocol:



# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID: \_\_\_\_\_

Date: 29 Mar 17

Unique Station ID: \_\_\_\_\_

Sample ID: Well H3OX

### Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Protective Posts? Yes  No

State ID Tag? Yes  No

Grout Seal Intact? Yes  No

Repairs Necessary: \_\_\_\_\_

### Well Information

Well Depth: 22.68

Well Casing Elevation: 1095.19

Constructed Depth: 22.55

Static Water Elevation: 1090.65

Casing Diameter: 2"

Previous Static: 1089.79

Water Level Before Purge: 5.14

Water Level After Sample: Below Pump

Well Volume: 2.86 Gallons

Measurement Method:  Elec. WLI  Steel Tape

### Sampling Information

Weather Conditions: Temp: 49 Wind: S@10 Sky: cloudy

Sampling Method: Grundfos  Bladder SST  Disp. Baller  Whale  Grab  Other: \_\_\_\_\_

Dedicated Equipment:  Yes  No

Pumping Rate: .25 gpm

Well Purged Dry?  Yes  No

Time Pump Began: 1644 am /  pm

Time Purged Dry? 1656

Time of Sampling: 1701 am /  pm

Duplicate Sample? Yes  No  ID: -

Sample EH: 137.9

Sample Appearance: General: clear Color: none Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
12 1656	6.92	4586	8.06	NA	NA	3.0	1	
							2	
1701	6.85	4536	9.38	↓	↓	-	3	Recharge
							4	
							5	

Stabilized? Yes  No

Amount Water Removed: 3.0 Gallons

Comments: \_\_\_\_\_

Exceptions to Protocol: \_\_\_\_\_

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Ben Wolf

Site: Otter Tail Power Co./ Big Stone

Facility ID: \_\_\_\_\_

Date: 30 Mar 17

Unique Station ID: \_\_\_\_\_

Sample ID: Well H40X

### Well Condition

Well Locked?  Yes No  
 Well Labeled?  Yes No  
 Casing Straight?  Yes No

Protective Posts? Yes  No  
 State ID Tag? Yes  No  
 Grout Seal Intact?  Yes No

Repairs Necessary: \_\_\_\_\_

### Well Information

Well Depth: 27.48

Well Casing Elevation: 1108.22

Constructed Depth: 27.20

Static Water Elevation: 1096.80

Casing Diameter: 2"

Previous Static: 1089.71

Water Level Before Purge: 17.42

Water Level After Sample: 24.90

Well Volume: 1.64 Gallons

Measurement Method:  Elec. W/L  Steel Tape

### Sampling Information

Weather Conditions: Temp: 42 Wind: LLW Sky: cloudy

Sampling Method:  Grundfos  Bladder SS/T  Disp. Baller  Whale  Grab  Other:

Dedicated Equipment:  Yes No

Pumping Rate: .25 gpm

Well Purged Dry?  Yes No

Time Pump Began: 812  am /  pm

Time Purged Dry? 819

Time of Sampling: 824  am /  pm

Duplicate Sample? Yes  No ID: -

Sample EH: 161.5

Sample Appearance: General: Slightly cloudy Color: None Phase: None Odor: None

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>7</u> <u>819</u>	<u>6.30</u>	<u>2961</u>	<u>8.32</u>	<u>NA</u>	<u>NA</u>	<u>1.75</u>	<u>1</u>	
							<u>2</u>	
<u>824</u>	<u>6.55</u>	<u>2946</u>	<u>8.27</u>			<u>-</u>	<u>3</u>	<u>Recharge</u>
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes  No

Amount Water Removed: 1.75 Gallons

Comments: \_\_\_\_\_

Exceptions to Protocol: \_\_\_\_\_



**Inter-Mountain Labs**  
 Sheridan, WY and Gillette, WY

Client Name <b>MVTL</b>		Project Identification Ottertail Power Big Stone		Sampler (Signature/Attestation of Authenticity)		Telephone #	
Report Address 1126 North Front St. New Ulm, Mn 56073		Contact Name Tim Portner		<b>ANALYSES / PARAMETERS</b> Radium 226 + 228			
Invoice Address Same		Email tportner@mvtl.com					
		Phone 507-276-8089					
		Purchase Order #		Quote #		<b>REMARKS</b>	

ITEM	LAB ID <i>(Lab Use Only)</i>	DATE SAMPLED	TIME	SAMPLE IDENTIFICATION	Matrix	# of Containers	Radium 226 + 228	ANALYSES / PARAMETERS						REMARKS
1		29 Mar 17	1628	H2OX - A11088	WT	2	x							MVTL Work
2			1701	H3OX A11090 A11089	WT	2	x							Order - 31-0123
3		30 Mar 17	824	H4OX A11090	WT	2	x							
4		29 Mar 17	1524	H-6 - A11085	WT	2	x							
5			1606	H-8 - A11086	WT	2	x							
6			1706	H-9 - A11087	WT	2	x							
7				Slag-1 <i>no sample</i>	<del>WT</del>	<del>2</del>	<del>x</del>							
8		29 Mar 17	1344	Slag-4 - A11091	WT	2	x							
9		30 Mar 17	824	Slag-5 - A11092	WT	2	x							
10		29 Mar 17	1425	Slag-6 - A11093	WT	2	x							
11			1525	Slag-7 - A11094	WT	2	x							
12			1648	Slag-8 - A11095	WT	2	x							
13														
14														

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	<i>[Signature]</i>	30 Mar 17	1327			

SHIPPING INFO	MATRIX CODES	TURN AROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
<input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> USPS <input type="checkbox"/> Hand Carried <input type="checkbox"/> Other	Water WT Soil SL Solid SD Filter FT Other OT	Check desired service: <input type="checkbox"/> Standard turnaround <input type="checkbox"/> RUSH - 5 Working Days <input type="checkbox"/> URGENT - < 2 Working Days <i>Rush &amp; Urgent Surcharges will be applied</i>	Compliance Monitoring? Y / N Program (SDWA, NPDES,...) PWSID / Permit # Chlorinated? Y / N Sample Disposal: Lab Client	



**Inter-Mountain Labs**  
Sheridan, WY and Gillette, WY

**- CHAIN OF CUSTODY RECORD -**

*All shaded fields must be completed.*

This is a legal document; any misrepresentation may be construed as fraud.

Page \_\_\_\_\_ of \_\_\_\_\_

**#WEB**

Client Name <b>MVTL</b>		Project Identification <b>Ottertail Power Big Stone</b>		Sampler (Signature/Attestation of Authenticity)		Telephone #	
Report Address <b>1126 North Front St New Ulm, Mn 56073</b>		Contact Name <b>Tim Portner</b>		<b>ANALYSES / PARAMETERS</b>			
Invoice Address <b>Same</b>		Email <b>tportner@mvtl.com</b>					
		Phone <b>507-276-8089</b>		Purchase Order #		Quote #	

ITEM	LAB ID <small>(Lab Use Only)</small>	DATE SAMPLED	TIME	SAMPLE IDENTIFICATION	Matrix	# of Containers	ANALYSES / PARAMETERS							REMARKS	
							Radium 226 + 228								
1		29 Mar 17	18:19	Slag 9 - A11096	WT	2	x								
2		—	—	Slag 9 Deep <sup>no</sup> sample	<del>WT</del>	<del>2</del>	<del>x</del>								
3		30 Mar 17	8:56	Slag 2B A11097	WT	2	x								
4							x								
5							x								
6							x								
7							x								
8							x								
9							x								
10							x								
11							x								
12							x								
13							x								
14							x								

LAB COMMENTS		Relinquished By (Signature/Printed)		DATE		TIME		Received By (Signature/Printed)		DATE		TIME	
				30 Mar 17		13:57							

SHIPPING INFO	MATRIX CODES	TURN AROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
<input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> USPS <input type="checkbox"/> Hand Carried <input type="checkbox"/> Other	Water WT Soil SL Solid SD Filter FT Other OT	<b>Check desired service</b> <input type="checkbox"/> Standard turnaround <input type="checkbox"/> RUSH - 5 Working Days <input type="checkbox"/> URGENT - < 2 Working Days <i>Rush &amp; Urgent Surcharges will be applied</i>	Compliance Monitoring? <b>Y / N</b> Program (SDWA, NPDES,...) PWSID / Permit # Chlorinated? <b>Y / N</b> Sample Disposal: Lab Client	



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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
www.mvtl.com



FINAL REPORT COMPLETION DATE: 23 Jun 17 AD

Date Reported: 20 Jun 2017

PAUL VUKONICH  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Work Order #: 31-0190  
Account #: 006106  
PO #: 48680

Project Name: BIG STONE PLANT

J. G. [Signature] 2250-17  
Field Service Manager/Date Reviewed  
[Signature] 20 Jun 17  
Chemistry Lab Manager/Date Reviewed  
[Signature] for 20 Jun 2017  
Quality Assurance Director/Date Reviewed

- RL = Reporting Limits
- NQ = Not Present, Qualitative Only
- PQ = Present, Qualitative Only
- ND = Not Determined

All data for this report has been approved by MVTl Laboratory Management.

MVTl guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTl to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTl. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
 www.mvtl.com



CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 20 Jun 2017  
 Lab Number: 17-A18617  
 Work Order #: 31-0190  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 3 May 2017 10:56  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 3 May 2017 18:47  
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H20X

Temp at Receipt: 1.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				5 May 17	JMS
Water Digestions				5 May 17	JMS
Radium 226	SEE ATTACHED			20 Jun 17 7:22	ABL
Radium 228	SEE ATTACHED		EPA M9320	20 Jun 17 7:22	ABL
pH, Field	6.93 units	1.00	I-1586-85	3 May 17 10:56	MS
pH	* 7.0 units	1.0	SM 4500 H+ B-2000	4 May 17 15:30	DK
Sulfate	2450 ~ mg/L	5.0	ASTM D516-07	11 May 17 8:01	KCJ
Chloride	3.3 mg/L	3.0	SM 4500 Cl E	5 May 17 11:53	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	18 May 17 14:34	RMB
Solids, Total Dissolved	3850 mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	504.0 mg/L	0.500	SW6010C	9 May 17 10:11	RC
	~See Narrative				
Lithium	0.453 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Barium	0.008 mg/L	0.005	SW6010C	9 May 17 10:11	RC
Chromium	< 0.01 mg/L	0.01	SW6010C	9 May 17 10:11	RC
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	9 May 17 10:11	RC
Boron	0.246 mg/L	0.100	SW6010C	9 May 17 10:11	RC
Antimony	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Beryllium	< 0.25 @ ug/L	0.05	SW6020A	17 May 17 12:06	RMV
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	9 May 17 19:04	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	9 May 17 19:04	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 12:06	RMV
Selenium	21.4 @^ ug/L	0.50	SW6020A	17 May 17 12:06	RMV
Thallium	< 0.5 ug/L	0.1	SW6020A	17 May 17 12:06	RMV
	@See Narrative				
Fluoride	0.120 mg/L	0.020	EPA 300.0	5 May 17 10:06	RC

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit  
 Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.  
 The reporting limit was elevated for any analyte requiring a dilution as coded below:  
 @ = Due to sample matrix    # = Due to concentration of other analytes  
 ! = Due to sample quantity   + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125    WI LAB # 999447680    ND MICRO # 1013-M    ND WW/DW # R-040

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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 www.mvtl.com



## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 20 Jun 2017  
 Lab Number: 17-A18618  
 Work Order #: 31-0190  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 3 May 2017 11:39  
 Sampled By: MVTl FIELD PERSONNEL  
 Date Received: 3 May 2017 18:47  
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H30X

Temp at Receipt: 1.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					5 May 17	JMS
Water Digestions					5 May 17	JMS
Radium 226	SEE ATTACHED				20 Jun 17 7:22	ABL
Radium 228	SEE ATTACHED			EPA M9320	20 Jun 17 7:22	ABL
pH, Field	6.91 units		1.00	I-1586-85	3 May 17 11:39	MS
pH	* 7.0 units		1.0	SM 4500 H+ B-2000	4 May 17 15:30	DK
Sulfate	1910 ~ mg/L		5.0	ASTM D516-07	11 May 17 8:01	KCJ
Chloride	80.3 mg/L		3.0	SM 4500 Cl E	5 May 17 11:53	AKF
Mercury	< 0.005 ug/L		0.005	EPA 245.7	18 May 17 14:34	RMB
Solids, Total Dissolved	3550 mg/L		10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	372.0 mg/L		0.500	SW6010C	9 May 17 10:11	RC
	See Narrative					
Lithium	0.134 mg/L		0.005	SW6010C	9 May 17 10:11	RC
Barium	0.014 mg/L		0.005	SW6010C	9 May 17 10:11	RC
Chromium	< 0.01 mg/L		0.01	SW6010C	9 May 17 10:11	RC
Cobalt	0.010 ^ mg/L		0.005	SW6010C	9 May 17 10:11	RC
Boron	7.460 ~ mg/L		0.100	SW6010C	9 May 17 10:11	RC
Antimony	< 2.5 @ ug/L		0.5	SW6020A	9 May 17 19:04	RMV
Arsenic	< 2.5 @ ug/L		0.5	SW6020A	9 May 17 19:04	RMV
Beryllium	< 0.25 @ ug/L		0.05	SW6020A	17 May 17 12:06	RMV
Cadmium	< 0.5 @ ug/L		0.1	SW6020A	9 May 17 19:04	RMV
Lead	< 2.5 @ ug/L		0.5	SW6020A	9 May 17 19:04	RMV
Molybdenum	34.0 @ ug/L		0.50	SW6020A	17 May 17 12:06	RMV
Selenium	< 5 @^ ug/L		0.5	SW6020A	17 May 17 12:06	RMV
Thallium	< 0.5 ug/L		0.1	SW6020A	17 May 17 12:06	RMV
	@See Narrative					
Fluoride	0.440 mg/L		0.020	EPA 300.0	5 May 17 10:06	RC

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

### RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

- @ = Due to sample matrix
- ! = Due to sample quantity
- ^ = Due to concentration of other analytes
- \* = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447690 ND MICRO # 1013-M ND WR/DW # R-040



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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com



CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 20 Jun 2017
Lab Number: 17-A18619
Work Order #: 31-0190
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 3 May 2017 12:14
Sampled By: MVTL FIELD PERSONNEL
Date Received: 3 May 2017 18:47
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H40X

Temp at Receipt: 1.0C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include MS Water Digestions, Radium 226, Radium 228, pH, Field, Sulfate, Chloride, Mercury, Solids, Total Dissolved, Calcium, Lithium, Barium, Chromium, Cobalt, Boron, Antimony, Arsenic, Beryllium, Cadmium, Lead, Molybdenum, Selenium, Thallium, Fluoride.

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity \* = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DW # R-040





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 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
 www.mvtl.com



## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 20 Jun 2017  
 Lab Number: 17-A18620  
 Work Order #: 31-0190  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 3 May 2017 12:53  
 Sampled By: MVT L FIELD PERSONNEL  
 Date Received: 3 May 2017 18:47  
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H6

Temp at Receipt: 1.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				5 May 17	JMS
Water Digestions				5 May 17	JMS
Radium 226	SEE ATTACHED			20 Jun 17 7:22	ABL
Radium 228	SEE ATTACHED		EPA M9320	20 Jun 17 7:23	ABL
pH, Field	7.47 units	1.00	I-1586-85	3 May 17 12:53	MS
pH	* 7.5 units	1.0	SM 4500 H+ B-2000	4 May 17 17:01	DK
Sulfate	71.1 @ mg/L	5.0	ASTM D516-07	11 May 17 8:19	KCJ
Chloride	< 3 mg/L	3	SM 4500 Cl E	5 May 17 12:11	AKF
Mercury	< 0.005 ug/L	0.005	EPA 245.7	18 May 17 15:10	RMB
Solids, Total Dissolved	530 mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	49.90 mg/L	0.500	SW6010C	9 May 17 10:44	RC
Lithium	0.028 mg/L	0.005	SW6010C	9 May 17 10:44	RC
Barium	0.072 mg/L	0.005	SW6010C	9 May 17 10:44	RC
Chromium	< 0.01 mg/L	0.01	SW6010C	9 May 17 10:44	RC
Cobalt	< 0.01 ^ mg/L	0.005	SW6010C	9 May 17 10:44	RC
Boron	4.540 mg/L	0.100	SW6010C	9 May 17 10:44	RC
Antimony	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	17 May 17 13:16	RMV
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Molybdenum	22.7 @ ug/L	0.50	SW6020A	17 May 17 13:16	RMV
Selenium	7.13 @^ ug/L	0.50	SW6020A	17 May 17 13:16	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Fluoride	0.510 mg/L	0.020	EPA 300.0	5 May 17 16:57	RC

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix  
 ! = Due to sample quantity

# = Due to concentration of other analytes  
 † = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 MI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040



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 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
 www.mvtl.com



## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 20 Jun 2017  
 Lab Number: 17-A18621  
 Work Order #: 31-0190  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 3 May 2017 13:48  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 3 May 2017 18:47  
 PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H8

Temp at Receipt: 1.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					5 May 17	JMS
Water Digestions					5 May 17	JMS
Radium 226	SEE ATTACHED				20 Jun 17 7:23	ABL
Radium 228	SEE ATTACHED			EPA M9320	20 Jun 17 7:23	ABL
pH, Field	7.19	units	1.00	I-1586-85	3 May 17 13:48	MS
pH	* 7.2	units	1.0	SM 4500 H+ B-2000	4 May 17 17:01	DK
Sulfate	273 @	mg/L	5.0	ASTM D516-07	11 May 17 8:19	KCJ
Chloride	3.7	mg/L	3.0	SM 4500 Cl E	5 May 17 12:11	AKF
Mercury	< 0.005	ug/L	0.005	EPA 245.7	18 May 17 15:10	RMB
Solids, Total Dissolved	893	mg/L	10	SM 2540 C-97	5 May 17 13:54	RC
Calcium	120.0	mg/L	0.500	SW6010C	9 May 17 10:44	RC
Lithium	0.040	mg/L	0.005	SW6010C	9 May 17 10:44	RC
Barium	0.027	mg/L	0.005	SW6010C	9 May 17 10:44	RC
Chromium	< 0.01	mg/L	0.01	SW6010C	9 May 17 10:44	RC
Cobalt	< 0.01 ^	mg/L	0.005	SW6010C	9 May 17 10:44	RC
Boron	3.830	mg/L	0.100	SW6010C	9 May 17 10:44	RC
Antimony	< 2.5 @	ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Arsenic	< 2.5 @	ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Beryllium	< 0.5	ug/L	0.05	SW6020A	17 May 17 13:16	RMV
	@See Narrative					
Cadmium	< 0.5 @	ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Lead	< 2.5 @	ug/L	0.5	SW6020A	17 May 17 13:16	RMV
Molybdenum	14.6 @	ug/L	0.50	SW6020A	17 May 17 13:16	RMV
Selenium	8.23 @^	ug/L	0.50	SW6020A	17 May 17 13:16	RMV
Thallium	< 0.5 @	ug/L	0.1	SW6020A	17 May 17 13:16	RMV
Fluoride	0.560	mg/L	0.020	EPA 300.0	5 May 17 16:57	RC

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit  
 Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.  
 The reporting limit was elevated for any analyte requiring a dilution as coded below:  
 @ = Due to sample matrix # = Due to concentration of other analytes  
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WH/DW # R-040



MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvttl.com



CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 20 Jun 2017
Lab Number: 17-A18622
Work Order #: 31-0190
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 3 May 2017 14:50
Sampled By: MVTL FIELD PERSONNEL
Date Received: 3 May 2017 18:47
PO #: 48680

Project Name: BIG STONE PLANT

Sample Description: WELL H9

Temp at Receipt: 1.0C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include MS Water Digestions, Radium 226, Radium 228, pH, Field pH, Sulfate, Chloride, Mercury, Solids, Total Dissolved, Calcium, Lithium, Barium, Chromium, Cobalt, Boron, Antimony, Arsenic, Beryllium, Cadmium, Lead, Molybdenum, Selenium, Thallium, Fluoride.

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity † = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040



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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
www.mvvl.com



Page: 15 of 15

Date Reported: 20 Jun 2017

PAUL VUKONICH  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Work Order #: 201731-0190  
Account Number: 006106  
PO #: 48680

Project Name: BIG STONE PLANT

## LABORATORY NARRATIVE

### INORGANIC & METALS ANALYSES:

The relative percent difference between the matrix spike and matrix spike duplicate for Thallium was above the acceptance range for samples 17-A18617 through 17-A18619. The laboratory control spike, matrix spike, and matrix spike duplicate recoveries were all acceptable. Data that was below the reporting limit was reported.

The recovery of Beryllium was above the acceptance range in the known for samples 17-A18620 through A18629. Data that was below the reporting limit was reported.

Due to the concentration of calcium in the spiked sample, calcium failed to recover in the matrix spike for samples 17-A18617 through 17-A18619. Data was reported based on acceptable laboratory control spike recovery and relative percent difference between the matrix spike and matrix spike duplicate.

No other problems were encountered with these analyses.



Date: 6/19/2017

**CLIENT:** MVTL Inc  
**Project:** Ottertail Power Big Stone  
**Lab Order:** S1705190


**CASE NARRATIVE**  
**Report ID: S1705190001**

Samples A18617 H2OX, A18618 H3OX, A18619 H4OX, A18620 H-6, A18621 H-8, A18622 H-9, A18623 Slag-4, A18624 Slag-5, A18625 Slag-6, A18626 Slag-7, A18627 Slag-8, A18628 Slag-9, and A18629 Slag-2B were received on May 9, 2017.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions  
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition  
40 CFR Parts 136 and 141  
40 CFR Part 50, Appendices B, J, L, and O  
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012  
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:   
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 6/19/2017
Report ID S1705190001

ProjectName: Ottetail Power Big Stone
Lab ID: S1705190-001
ClientSample ID: A18617 H2OX
COC: WEB

WorkOrder: S1705190
CollectionDate: 5/3/2017 10:56:00 AM
DateReceived: 5/9/2017 11:24:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073
ProjectName: Ottetail Power Big Stone
Lab ID: S1705190-002
ClientSample ID: A18618 H3OX
COC: WEB

Date Reported 6/19/2017
Report ID S1705190001
WorkOrder: S1705190
CollectionDate: 5/3/2017 11:39:00 AM
DateReceived: 5/9/2017 11:24:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (x), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073
ProjectName: Ottetail Power Big Stone
Lab ID: S1705190-003
ClientSample ID: A18619 H4OX
COC: WEB

Date Reported 6/19/2017
Report ID S1705190001
WorkOrder: S1705190
CollectionDate: 5/3/2017 12:14:00 PM
DateReceived: 5/9/2017 11:24:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager





Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073
ProjectName: Ottertall Power Big Stone
Lab ID: S1705190-004
ClientSample ID: A18620 H-6
COC: WEB

Date Reported 6/19/2017
Report ID S1705190001
WorkOrder: S1705190
CollectionDate: 5/3/2017 12:53:00 PM
DateReceived: 5/9/2017 11:24:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 6/19/2017
Report ID S1705190001

ProjectName: Ottertail Power Big Stone
Lab ID: S1705190-005
ClientSample ID: A18621 H-8
COC: WEB

WorkOrder: S1705190
CollectionDate: 5/3/2017 1:48:00 PM
DateReceived: 5/9/2017 11:24:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 6/19/2017
Report ID S1705190001

ProjectName: Ottertail Power Big Stone
Lab ID: S1705190-006
ClientSample ID: A18622 H-9
COC: WEB

WorkOrder: S1705190
CollectionDate: 5/3/2017 2:50:00 PM
DateReceived: 5/9/2017 11:24:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



### ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Inc  
Work Order: S1705190  
Project: Ottetail Power Big Stone

Date: 6/19/2017  
Report ID: S1705190001

Radium 228 by Ga/Tech		Sample Type	MBLK	Units: pCi/L				
MB-440 (06/03/17 11:39)	Analyte	RunNo: 146325	PrepDate: 05/24/17 14:00	BatchID 13229				
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		ND	1					

MB-439 (06/16/17 21:41)	Analyte	RunNo: 146951	PrepDate: 05/22/17 13:02	BatchID 13303				
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		ND	1					

Radium 228 by Ga/Tech		Sample Type	LCS	Units: pCi/L				
LCS-440 (06/03/17 14:42)	Analyte	RunNo: 146325	PrepDate: 05/24/17 14:00	BatchID 13229				
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		43	1	40.1		108	65.9 - 132	

LCS-439 (06/17/17 00:44)	Analyte	RunNo: 146951	PrepDate: 05/22/17 13:02	BatchID 13303				
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		43	1	40.1		108	65.9 - 132	

Radium 228 by Ga/Tech		Sample Type	LCSD	Units: pCi/L				
LCSD-439 (06/17/17 03:47)	Analyte	RunNo: 146951	PrepDate: 05/22/17 13:02	BatchID 13303				
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228		46	1	43	6.54	115	20	

Radium 228 by Ga/Tech		Sample Type	MS	Units: pCi/L				
MS-440 (06/03/17 20:48)	Analyte	RunNo: 146325	PrepDate: 05/24/17 14:00	BatchID 13229				
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		45	1	40.1	ND	111	50 - 139	

S1705188-004AMS (06/19/17 01:34)	Analyte	RunNo: 146951	PrepDate: 05/22/17 13:02	BatchID 13303				
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228		86	1	80.1	1	105	50 - 139	

Radium 228 by Ga/Tech		Sample Type	MSD	Units: pCi/L				
MSD-440 (06/03/17 23:51)	Analyte	RunNo: 146325	PrepDate: 05/24/17 14:00	BatchID 13229				
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228		44	1	45	2.64	108	20	

S1705188-004AMSD (06/19/17 04:37)	Analyte	RunNo: 146951	PrepDate: 05/22/17 13:02	BatchID 13303				
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228		73	1	86	15.7	89.7	20	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
G	Analyzed at IML Gillette laboratory	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit	O	Outside the Range of Dilutions
R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		



### ANALYTICAL QC SUMMARY REPORT

**CLIENT:** MVTL Inc  
**Work Order:** S1705190  
**Project:** Otertail Power Big Stone

**Date:** 6/19/2017  
**Report ID:** S1705190001

Radium 226 In Water -		Sample Type	MBLK		Units: pCi/L				
MB-1754 (05/30/17 09:52)	Analyte	RunNo:	146341	PrepDate:	05/22/17 0:00	BatchID	13230		
		Result	RL	Spike	Ref Samp	%REC	% Rec	Limits	Qual
	Radium 226		ND						0.2

Radium 226 In Water -		Sample Type	LCS		Units: pCi/L				
LCS-1754 (05/30/17 09:52)	Analyte	RunNo:	146341	PrepDate:	05/22/17 0:00	BatchID	13230		
		Result	RL	Spike	Ref Samp	%REC	% Rec	Limits	Qual
	Radium 226		5.8	0.2	6.41		90.6	67.1 - 122	

Radium 226 In Water -		Sample Type	LCSD		Units: pCi/L				
LCSD-1754 (05/30/17 09:52)	Analyte	RunNo:	146341	PrepDate:	05/22/17 0:00	BatchID	13230		
		Result	RL	Conc	%RPD	%REC	% RPD	Limits	Qual
	Radium 226		6.4	0.2	5.8	9.14	98.8	20	

Radium 226 In Water -		Sample Type	MS		Units: pCi/L				
S1705189-003AMS (05/30/17 09:52)	Analyte	RunNo:	146341	PrepDate:	05/22/17 0:00	BatchID	13230		
		Result	RL	Spike	Ref Samp	%REC	% Rec	Limits	Qual
	Radium 226		11	1	12.8	ND	83.2	65 - 131	

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
G	Analyzed at IML Gillette laboratory	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit	O	Outside the Range of Dilutions
R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		



**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

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 www.mvttl.com

MEMBER  
ACIL

**Quality Control Report**

Lab IDs: 17-A18617 to 17-A18629

Project: BIG STONE PLANT

Work Order: 201731-0190

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD/ Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony ug/L	25.0	104	85-115	25.0	17A18619q	<2.5	27.3	109	75-125	27.3	27.9	112	2.2	10	102	90-110	<0.5
	25.0	104	85-115	25.0	17A18628q	<5	24.4	98	75-125	24.4	24.9	100	2.0	10	104	90-110	<0.5
Arsenic ug/L	25.0	104	85-115	25.0	17A18619q	<2.5	28.2	113	75-125	28.2	29.5	118	4.5	10	100	90-110	<0.5
	25.0	106	85-115	25.0	17A18628q	<2.5	25.8	103	75-125	25.8	27.5	110	6.4	10	102	90-110	<0.5
Barium mg/L	1.000	102	85-115	1.00	17A18619q	0.011	0.949	94	75-125	0.949	1.040	103	9.2	10	101	90-110	<0.005
				1.00	17A18629q	0.101	1.050	95	75-125	1.050	1.070	97	1.9	10	100	90-110	<0.005
Beryllium ug/L	2.50	114	85-115	2.50	17A18619q	<0.25	2.50	100	75-125	2.50	2.54	102	1.6	10	106	90-110	<0.05
	2.50	114	85-115	2.50	17A18628q	<0.5	2.45	98	75-125	2.45	2.39	96	2.5	10	110	90-110	<0.05
															112	90-110	<0.05
Boron mg/L	1.000	102	85-115	1.00	17A18619q	0.428	1.280	85	75-125	1.280	1.400	97	9.0	10	98	90-110	<0.1
				1.00	17A18629q	3.660	4.690	103	75-125	4.690	4.730	107	0.8	10	99	90-110	<0.1
Cadmium ug/L	5.00	105	85-115	5.00	17A18619q	<0.5	5.47	109	75-125	5.47	5.39	108	1.5	10	100	90-110	<0.1
	5.00	105	85-115	5.00	17A18628q	<0.5	4.85	97	75-125	4.85	5.34	107	9.6	10	103	90-110	<0.1
Calcium mg/L	50.00	104	85-115	50.0	17A18619q	316.0	329.0	26	75-125	329.0	360.0	88	9.0	10	107	90-110	<0.5
				50.0	17A18629q	248.0	294.0	92	75-125	294.0	298.0	100	1.4	10	100	90-110	<0.5
Chloride mg/L	-	-	-	60.0	17-A18619	47.9	108	100	85-121	108	110	104	1.8	5	97	90-110	<3
	-	-	-	60.0	17-A18629	35.7	98.5	105	85-121	98.5	101	109	2.5	5	97	90-110	<3
Chromium mg/L	1.000	104	85-115	1.00	17A18619q	<0.01	0.894	89	75-125	0.894	0.977	98	8.9	10	103	90-110	<0.01
				1.00	17A18629q	0.015	0.898	88	75-125	0.898	0.910	90	1.3	10	101	90-110	<0.01
Cobalt mg/L	1.000	105	85-115	1.00	17A18619q	0.009	0.864	86	75-125	0.864	0.945	94	9.0	10	104	90-110	<0.005
				1.00	17A18629q	0.009	0.870	86	75-125	0.870	0.880	87	1.1	10	101	90-110	<0.005
Fluoride mg/L	-	-	-	0.20	a18619qc	0.540	0.720	90	75-125	0.720	0.720	90	0.0	10	101	90-110	<0.02
	-	-	-	0.20	a18627qc	0.540	0.740	100	75-125	0.740	0.750	105	1.3	10	96	90-110	<0.02
Lead ug/L	25.0	101	85-115	25.0	17A18619q	<2.5	24.9	100	75-125	24.9	27.0	108	8.1	10	100	90-110	<0.5
	25.0	102	85-115	25.0	17A18628q	<2.5	24.4	98	75-125	24.4	26.5	106	8.3	10	102	90-110	<0.5
Lithium mg/L	1.000	101	85-115	1.00	17-A18619	0.105	1.100	100	75-125	1.100	1.170	106	6.2	10	102	90-110	<0.005
	1.000	101	85-115	1.00	17-A18629	0.036	1.030	99	75-125	1.030	1.030	99	0.0	10	103	90-110	<0.005

**Quality Control Report**

Lab IDs: 17-A18617 to 17-A18629

Project: BIG STONE PLANT

Work Order: 201731-0190

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Mercury ug/L	-	-	-	0.10	17-A18618	< 0.005	0.101	101	63-111	0.101	0.102	102	1.0	18	94	76-113	< 0.005
	-	-	-	0.10	17-A18627	< 0.005	0.103	103	63-111	0.103	0.105	105	1.9	18	98	76-113	< 0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.005
Molybdenum ug/L	25.0	102	85-115	25.0	17A18619q	4.12	30.1	104	75-125	30.1	30.7	106	2.0	10	102	90-110	< 0.5
	25.0	102	85-115	25.0	17A18628q	9.54	31.8	89	75-125	31.8	34.8	101	9.0	10	102	90-110	< 0.5
pH units	-	-	-	-	-	-	-	-	-	7.0	7.0	-	0.0	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	7.1	7.1	-	0.0	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	8.1	8.1	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0	107	85-115	25.0	17A18619q	< 5	31.2	125	75-125	31.2	29.5	118	5.6	10	102	90-110	< 0.5
	25.0	107	85-115	25.0	17A18628q	< 5	27.0	108	75-125	27.0	26.6	106	1.5	10	103	90-110	< 0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	2160	2260	-	4.5	8	102	85-115	< 10
	-	-	-	-	-	-	-	-	-	1790	1770	-	1.1	8	-	-	-
Sulfate mg/L	-	-	-	500	17-A18609	140	651	102	74-128	651	674	107	3.5	5	101	80-120	< 5
	-	-	-	500	17-A18620	71.1	550	96	74-128	550	557	97	1.3	5	101	80-120	< 5
Thallium ug/L	5.00	102	85-115	5.00	17A18619q	< 0.5	5.10	102	75-125	5.10	5.69	114	10.9	10	99	90-110	< 0.1
	5.00	102	85-115	5.00	17A18628q	< 0.5	4.96	99	75-125	4.96	5.10	102	2.8	10	102	90-110	< 0.1

The calcium matrix spike recovery was outside the acceptance limits, see narrative.  
 The thallium duplicate RPD was outside the acceptance limits, see narrative.  
 The beryllium known was outside the acceptance limits, see narrative.

Approved by: 

# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

This is an exact copy of the original document

By DF Date 4 May 17  
 pages 1-21

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> DF, MS
<b>Report</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b> 31-0190
<b>Address</b> P.O. Box 496	<b>Address:</b>	<b>Lab Numbers:</b>
Fergus Falls, MN 56538-0496		
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
A186A	H2OX		3 May 17	1056	GW		2	N	1	1	N								See Attached
18	H3OX			1139	GW		2	N	1	1	N								
19	H4OX			1214	GW		2	N	1	1	N								
20	H-6			1253	GW		2	N	1	1	N								
21	H-8			1348	GW		2	N	1	1	N								
22	H-9			1450	GW		2	N	1	1	N								
	Slag 1				GW		2	N	1	1	N								
23	Slag 4			1110	GW		2	N	1	1	N								
24	Slag 5			1536	GW		2	N	1	1	N								
25	Slag 6			1255	GW		2	N	1	1	N								

Comments:

WORK ORDER #2

Samples Relinquished By: <u>DF</u>			Samples Received By: <u>A. J. J. J.</u>		
Date: <u>3 May 17</u>	Time: <u>1847</u>	Temp: <u>0.0</u>	Date: <u>4 May 17</u>	Time: <u>1:15</u>	Temp: <u>1.0C</u>
Samples Relinquished into: <u>Fridge</u> Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <u>Samplers</u> Other:			Seal Number(s) - If Used		
Transport: <u>Ambient</u> <u>Ice</u> Other:			Seals Intact? Yes No		



# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> DF, MS
<b>Report</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b>
<b>Address</b> P.O. Box 496	<b>Address:</b>	<b>Lab Numbers:</b>
Fergus Falls, MN 56538-0496		
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
26	Slag 7		3 May 17	1155	GW		2	N	1	1	N								See Attached
27	Slag 8		I	1421	GW		2	N	1	1	N								
28	Slag 9		I	1532	GW		2	N	1	1	N								
—	Slag 9 Deep		I	—	GW		2	N	1	1	N								
29	Slag 2B		I	1226	GW		2	N	1	1	N								

Comments:  
**WORK ORDER #2**

Samples Relinquished By: <i>DF, MS</i>			Samples Received By: <i>D. [Signature]</i>		
Date: 3 May 17	Time: 1847	Temp: 0.0	Date: 4 May 17	Time: 715	Temp: 1.0C
Samples Relinquished into: <i>Ridge</i> Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: <del>Samplers</del> Other:			Seal Number(s) - If Used		
Transport: Ambient <i>ics</i> Other:			Seals Intact? Yes No		

Spring 2017

A=3 500 HNO<sub>3</sub>  
500 H<sub>2</sub>SO<sub>4</sub>  
1000 NONE

# Big Stone Sampling 2017

Site	Parameter List	Well Depth	Diameter (Inches)	Well Elevation	Sample Equipment	Dedicated?	Pump Rate (ml/minute)	Goes Dry?	Sampling Seasons**
WELL10	A	47.43	4	1098.70	Keck/Tsunami	No	3,000	No	1,3
WELL11	A	127.22	4	1104.00	Other Pump	Yes	36,000	No	1,3
WELL12	A	112.40	4	1071.89	Other Pump	Yes	20,000	No	1,3
S1	B	32.50	2	1102.17	Bailer	Yes	N/A	Yes	1,3
S2	B	43.12	2	1102.39	Bailer	Yes	N/A	Yes	1,3
S3	B	62.50	2	1102.65	Bailer	Yes	N/A	No	1,3
S4	B	27.70	2	1090.57	Bailer	Yes	N/A	Yes	1,3
S5	B	48.72	2	1091.40	Bailer	Yes	N/A	Yes	1,3
S6	B	62.05	2	1090.71	Bailer	Yes	N/A	No	1,3
H10X	C	32.91	2	1115.89	Bailer	Yes	100	Yes	1,3
H1INT	C	60.11	2	1115.81	Keck/Tsunami	No	1500	No	1,3
H20X	C, CCR	32.20	2	1103.91	Bladder	Yes	100	Yes	1,3
H2INT	C	62.30	2	1103.91	Bailer	Yes	N/A	Yes	1,3
H30X	C, CCR	22.55	2	1095.19	Bladder	Yes	100	Yes	1,3
H3INT	C	54.31	2	1095.17	Whale	No	2000	No	1,3
H40X	C, CCR	27.20	2	1108.22	Bladder	Yes	100	No	1,3
H4INT	C	60.01	2	1108.61	Keck/Tsunami	No	2000	Yes	1,3
H5	C	43.30	2	1122.80	Whale	No	1000	No	1,3
H6	C, CCR	15.00	2	1097.76	Bladder	Yes	100	Yes	1,3
H7	C	33.20	2	1105.06	Whale	No	1000	Yes	1,3
H8	C, CCR	22.05	2	1081.23	Bladder	Yes	100	No	1,3
H9	C, CCR	30.20	2	1086.21	Bladder	Yes	100	No	1,3
BC1	B	16.28	2	1118.46	Bailer	Yes	N/A	No	1,3
BC101	B	39.30	2	1118.70	Bailer	Yes	N/A	Yes	1,3
BC2R	B	32.48	2	1115.28	Bailer	Yes	N/A	No	1,3
BC3R	B	35.15	2	1114.42	Bailer	Yes	N/A	Yes	1,3
BC4R	B	34.80	2	1113.86	Bailer	Yes	N/A	Yes	1,3
BC5R	B	37.32	2	1123.02	Bailer	Yes	N/A	No	1,3
BC6R	B	33.95	2	1121.58	Bailer	Yes	N/A	No	1,3
SLAG4		34.90	2	TBD	LOW FLOW	No	100	Yes	1,3
SLAG2			2	4444.96			499		
SLAG3			2				499		
SLAG4	CCR	39.00	2	TBD	LOW FLOW	No	100	No	1,3
SLAG5	CCR	38.80	2	1107.30	LOW FLOW	No	100	Yes	1,3
SLAG6	CCR	37.30	2	1111.51	LOW FLOW	No	100	Yes	1,3
SLAG7	CCR	48.70	2	1114.39	LOW FLOW	No	100	Yes	1,3
SLAG8	CCR	52.09	2	1127.26	LOW FLOW	No	100	No	1,3
SLAG9	CCR	49.80	2	1122.35	LOW FLOW	No	100	No	1,3
SLAG9-DEEP	/	68.00	2	1121.92	LOW FLOW	No	100	Yes	
SLAG2B	CCR	40.80	2	1111.26	LOW FLOW	No	100	Yes	
COOLING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
EVAPORATION POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
HOLDING POND	A	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3
RECLAIM POND	C	N/A	N/A	N/A	Grab	N/A	N/A	No	1,3

B=4 1000 NONE  
500 HNO<sub>3</sub>  
500 HNO<sub>3</sub> Filter  
500 H<sub>2</sub>SO<sub>4</sub>

C=3 1000 none  
500 H<sub>2</sub>SO<sub>4</sub>  
500 HNO<sub>3</sub> Filter  
500 HNO<sub>3</sub>

C=3 "Pond"  
1000 none  
500 H<sub>2</sub>SO<sub>4</sub>  
500 HNO<sub>3</sub>

CCR=4  
2-1000 HNO<sub>3</sub>  
1000 none  
500 HNO<sub>3</sub>

\*\* 1 = Spring (March 28 - April 28), 2 = Summer (July 1 - August 7), 3 = Fall (October 14 - November 14)

10/11/17  
10/12/17  
10/13/17  
10/14/17  
10/15/17  
10/16/17  
10/17/17  
10/18/17  
10/19/17  
10/20/17  
10/21/17  
10/22/17  
10/23/17  
10/24/17  
10/25/17  
10/26/17  
10/27/17  
10/28/17  
10/29/17  
10/30/17  
10/31/17

## ***Big Stone Plant CCR Appendix III Parameters***



CCR - Appendix III Detection Monitoring

### ***Field Parameters***

pH\*

\* Field and Laboratory Measurements

### ***Total Concentration Parameters***

Boron

Calcium

Chloride


Fluoride

pH

Sulfate

Dissolved Solids, Total

## **Big Stone CCR Appendix IV Parameters**

 CCR - Appendix IV - Assessment Monitoring

### ***Total Concentration Parameters***

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium, Total
- Cobalt
- Fluoride
- Lead
- Lithium
- Mercury
- Molybdenum
- Selenium
- Thallium
- Radium 226 + 228



## ***Big Stone Parameter List "A"***



### ***Field Parameters***

Field pH

Field Temperature

Field Conductivity

### ***Lab Parameters***

Lab pH

Lab Conductivity

Total Alkalinity

Chloride

Hardness, Calcium

Hardness, Total

Nitrate-Nitrite as N

Potassium - Total

Sodium - Total

Sulfate



## ***Big Stone Parameter List "B"***

### ***Field Parameters***

Field pH  
Field Temperature  
Field Conductivity

### ***Lab Parameters***

Lab pH  
Lab Conductivity  
Total Alkalinity  
Chloride  
Hardness, Calcium  
Hardness, Total  
Nitrate-Nitrite as N  
Potassium - Total  
Sodium - Total  
Sulfate  
Arsenic - dissolved  
Boron - dissolved  
Cadmium - dissolved  
Lead - dissolved  
Manganese - dissolved  
Strontium - dissolved

## ***Big Stone Parameter List "C"***

### ***Field Parameters***

Field pH  
Field Temperature  
Field Conductivity

### ***Lab Parameters***

Lab pH  
Lab Conductivity  
Total Alkalinity  
Chloride  
Hardness, Calcium  
Hardness, Total  
Nitrate-Nitrite as N  
Potassium - Total  
Sodium - Total  
Sulfate  
Arsenic - Dissolved  
Arsenic - Total \*\*  
Barium - Dissolved  
Barium - Total \*\*  
Boron - Dissolved  
Boron - Total \*\*  
Cadmium - Dissolved  
Cadmium - Total \*\*  
Chromium - Dissolved  
Chromium - Total \*\*  
Copper - Dissolved  
Copper - Total \*\*  
Lead - Dissolved  
Lead - Total \*\*  
Manganese - Dissolved  
Manganese - Total \*\*  
Mercury - Dissolved  
Mercury - Total \*\*  
Selenium - Dissolved  
Selenium - Total \*\*  
Silver - Dissolved  
Silver - Total \*\*  
Strontium - Dissolved  
Strontium - Total \*\*  
Vanadium - Dissolved  
Vanadium - Total \*\*  
Zinc - Dissolved  
Zinc - Total \*\*

**\*\* NOTE: ONLY Reclaim Pond is required to have Total metals run.  
The groundwater samples are required to have the Dissolved metals run only.**

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Mat Stan

Site: Offer Tail Power Co./ Big Stone

Facility ID: \_\_\_\_\_

Date: 3 May 17

Unique Station ID: \_\_\_\_\_

Sample ID: Well H2OX

### Well Condition

Well Locked?  Yes  No  
 Well Labeled?  Yes  No  
 Casing Straight?  Yes  No

Protective Posts? Yes  No   
 State ID Tag? Yes  No   
 Grout Seal Intact?  Yes  No

Repairs Necessary: \_\_\_\_\_

### Well Information

Well Depth: 32.81

Well Casing Elevation: 1103.91

Constructed Depth: 32.20

Static Water Elevation: 1097.76

Casing Diameter: 2"

Previous Static: 1096.74

Water Level Before Purge: 6.15

Water Level After Sample: Below Pump

Well Volume: 4,341 Gallons

Measurement Method:  Elec. WLI  Steel Tape

### Sampling Information

Weather Conditions: Temp: 58 Wind: W@8 Sky: Sunny

Sampling Method: Grundfos  Bladder SST  Disp. Bailer  Whale  Grab  Other: \_\_\_\_\_

Dedicated Equipment:  Yes  No

Pumping Rate: 25 gpm

Well Purged Dry?  Yes  No

Time Pump Began: 1033  am  pm

Time Purged Dry? 1051

Time of Sampling: 1056  am  pm

Duplicate Sample? Yes  No  ID: \_\_\_\_\_

Sample EH: 235.9

Sample Appearance: General: clear Color: none Phase: none Odor: none

18 Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1051	6.84	4015	8.52	11.76 <sup>NA</sup>	0 <sup>NA</sup>	4.5	1	
							2	
1056	6.93	4086	9.44				3	recheck
							4	
							5	

Stabilized? Yes  No

Amount Water Removed: 4.5 Gallons

Comments: \_\_\_\_\_

Exceptions to Protocol: \_\_\_\_\_



# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

*Matt + Skim*

Site: Otter Tail Power Co./ Big Stone

Facility ID: \_\_\_\_\_

Date: 3 May 17

Unique Station ID: \_\_\_\_\_

Sample ID: Well H3OX

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary: \_\_\_\_\_

Protective Posts? Yes  No

State ID Tag? Yes  No

Grout Seal Intact? Yes  No

## Well Information

Well Depth: 22.68

Constructed Depth: 22.55

Casing Diameter: 2"

Water Level Before Purge: 5.05

Well Volume: 2.88 Gallons

Well Casing Elevation: 1095.19

Static Water Elevation: 1090.14

Previous Static: 1090.04

Water Level After Sampl: Below pump

Measurement Method:  Elec. WLI  Steel Tape

## Sampling Information

Weather Conditions: Temp: 58 Wind: W@8 Sky: Sunny

Sampling Method:  Grundfos  Bladder SS/T  Disp. Bailor  Whale  Grab  Other: \_\_\_\_\_

Dedicated Equipment:  Yes  No

Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes  No

Time Pump Began: 11:22 am / pm

Time Purged Dry? 11:34

Time of Sampling: 11:39 am / pm

Duplicate Sample? Yes  No  ID: \_\_\_\_\_

Sample EH: 235.4

Sample Appearance: General: Clear Color: none Phase: none Odor: none

ID	Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
	<u>11:34</u>	<u>6.85</u>	<u>4075</u>	<u>9.09</u>	<u>NA</u>	<u>NA</u>	<u>3</u>	<u>1</u>	
								<u>2</u>	
	<u>11:39</u>	<u>6.91</u>	<u>4067</u>	<u>9.90</u>				<u>3</u>	<u>recharge</u>
								<u>4</u>	
								<u>5</u>	

Stabilized? Yes  No

Amount Water Removed: 3 Gallons

Comments: \_\_\_\_\_

Exceptions to Protocol: \_\_\_\_\_

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Mark Stein

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 2 May 17

Unique Station ID:

Sample ID: Well H4OX

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary:

Protective Posts? Yes  No

State ID Tag? Yes  No

Grout Seal Intact?  Yes  No

## Well Information

Well Depth: 27.48

Constructed Depth: 27.20

Casing Diameter: 2"

Water Level Before Purge: 16.75

Well Volume: 1.75 Gallons

Well Casing Elevation: 1108.22

Static Water Elevation: 1091.47

Previous Static: 1090.44

Water Level After Sample: 24.56

Measurement Method: Elec. Well Steel Tape

## Sampling Information

Weather Conditions: Temp: 62 Wind: NW @ 7 Sky: Sunny

Sampling Method: Grundfos  Bladder SS/Disp. EWhale  Grab  Other:

Dedicated Equipment:  Yes  No Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes  No Time Pump Began: 1202 am / pm

Time Purged Dry: 1209 Time of Sampling: 1214 am / pm

Duplicate Sample? Yes  No  ID: --- Sample E 231.5

Sample Appearance: General: clear Color: none Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O.	Turbidity NTU	Gallons Removed	SE Q #	Comments:
<u>7</u> 1209	<u>6.89</u>	<u>2712</u>	<u>9.00</u>	<u>NA</u>	<u>NA</u>	<u>1.75</u>	1	
							2	
1214	<u>6.98</u>	<u>2725</u>	<u>10.10</u>				3	<u>recharge</u>
							4	
							5	

Stabilized? Yes  No  Amount Water 1.75 Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

*Matt Sten*

Site: Otter Tail Power Co./ Big Stone

Facility ID: \_\_\_\_\_

Date: 3 May 17

Unique Station ID: \_\_\_\_\_

Sample ID: Well H6

### Well Condition

Well Locked?  Yes  No  
 Well Labeled?  Yes  No  
 Casing Straight?  Yes  No

Protective Posts?  Yes  No  
 State ID Tag?  Yes  No  
 Grout Seal Intact?  Yes  No

Repairs Necessary: \_\_\_\_\_

### Well Information

Well Depth: 17.92  
 Constructed Depth: 17.70  
 Casing Diameter: 2"  
 Water Level Before Purge: 11.00  
 Well Volume: 1.13 Gallons

Well Casing Elevation: wt  
 Static Water Elevation: \_\_\_\_\_  
 Previous Static: \_\_\_\_\_  
 Water Level After Sample: Below Pump  
 Measurement Method: Elec. W/L Steel Tape

### Sampling Information

Weather Conditions: Temp: 63 Wind: W 10-7 Sky: Mostly Sunny  
 Sampling Method: Grundfos  Bladder SS/T  Disp. Baller  Whale  Grab  Other: \_\_\_\_\_  
 Dedicated Equipment:  Yes  No Pumping Rate: 0.25 gpm  
 Well Purged Dry?  Yes  No Time Pump Began: 1243 am / pm  
 Time Purged Dry? \_\_\_\_\_ Time of Sampling: 1253 am / pm  
 Duplicate Sample? Yes  No  ID: \_\_\_\_\_ Sample EH: 223.7  
 Sample Appearance: General: Clear Color: none Phase: none Odor: none

5								
Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1248	7.70	1094	9.79	NA	NA	1.25	1	
							2	
							3	
1253	7.47	999	8.57				4	recheck
							5	

Stabiliz Yes  No  Amount Water Removed: 1.25 Gallons

Comments: \_\_\_\_\_

Exceptions to Protocol: \_\_\_\_\_

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Matt Stein

Site: Offet Tail Power Co./ Big Stone

Facility ID: \_\_\_\_\_

Date: 2 May 17

Unique Station ID: \_\_\_\_\_

Sample ID: Well H8

### Well Condition

Well Locked?  Yes  No  
 Well Labeled?  Yes  No  
 Casing Straight?  Yes  No

Protective Posts?  Yes  No  
 State ID Tag?  Yes  No  
 Grout Seal Intact?  Yes  No

Repairs Necessary: \_\_\_\_\_

### Well Information

Well Depth: 22.33  
 Constructed Depth: 22.05  
 Casing Diameter: 2"  
 Water Level Before Purge: 5.16  
 Well Volume: 2.87 Gallons

Well Casing Elevation: 1081.23  
 Static Water Elevation: 1076.07  
 Previous Static: 1074.62  
 Water Level After Sample: 6.02  
 Measurement Method:  Elec. WL  Steel Tape

### Sampling Information

Weather Conditions: Temp: 64 Wind: W @ 10 Sky: Partly Sunny  
 Sampling Method: Grundfos  Ladder SST  Disp. Bailer  Whale  Grab  Other: \_\_\_\_\_  
 Dedicated Equipment:  Yes  No Pumping Rate: 0.25 gpm  
 Well Purged Dry?  Yes  No Time Pump Began: 13:12 am /  pm  
 Time Purged Dry? \_\_\_\_\_ Time of Sampling: 13:48 am /  pm  
 Duplicate Sample? Yes  No ID: \_\_\_\_\_ Sample EH: 169.0  
 Sample Appearance: General: Clear Color: none Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1324	7.17	1330	8.07	NA	NA	3	1	
1336	7.16	1334	8.05			6	2	
1348	7.19	1333	8.00			9	3	
							4	
							5	

Stabilized?  Yes  No Amount Water Remove 9 Gallons

Comments: \_\_\_\_\_

\*well not in Field Notes Program

Exceptions to Protocol: \_\_\_\_\_

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

## Groundwater Assessment

Sampling Personne

Matt Stern

Site: Otter Tail Power Co./ Big Stone

Facility ID: \_\_\_\_\_

Date: 3 May 17

Unique Station I \_\_\_\_\_

Sample ID: Well H9

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary: \_\_\_\_\_

Protective Posts  Yes  No

State ID Tag?  Yes  No

Grout Seal Intac  Yes  No

## Well Information

Well Depth: 30.71

Constructed Depth: 30.20

Casing Diameter: 2"

Water Level Before Purge: 7.61

Well Volume: 3.77 Gallons

Well Casing Elevation: 1086.21

Static Water Elevation: 1078.6

Previous Static: 1078.09

Water Level After Sam 8.62

Measurement Method: Elec. Well Steel Tape

## Sampling Information

Weather Conditions Temp: 65 Wind: W@10 Sky: Partly Sunny

Sampling Method: Grundfos  Bladder SS/S  Disp. Bailer  Whale  Grab Other: \_\_\_\_\_

Dedicated Equipment  Yes  No

Well Purged Dry?  Yes  No

Time Purged Dry? \_\_\_\_\_

Duplicate Sample?  Yes  No ID: \_\_\_\_\_

Sample Appearance General: Clear Color: none Phase: none Odor: none

Pumping Rate: 0.25 gpm

Time Pump Beg 1402 am /  pm

Time of Samplin 1450 am /  pm

Sample EH: 191.7

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1418	6.70	2999	9.00	ns	ns	4	1	
1434	6.69	3003	9.04			8	2	
1450	6.70	3013	9.06			12	3	
							4	
							5	

Stabiliz  Yes  No

Amount Water Removed 12 Gallons

Comments: \_\_\_\_\_

*\*well not in Field Notes Program*

Exceptions to Protocol: \_\_\_\_\_



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Page: 1 of 24

FINAL REPORT COMPLETION DATE: 18 Jul 17 AS

Date Reported: 12 Jul 2017

PAUL VUKONICH  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Work Order #: 31-0261  
Account #: 006106  
PO #: 48680

Project Name: BIG STONE PLANT CCR

[Signature] 17 July 17  
Field Service Manager/Date Reviewed

[Signature] 13 July 2017  
Chemistry Lab Manager/Date Reviewed

[Signature] 13 July 2017  
Quality Assurance Director/Date Reviewed

- RL = Reporting Limits
- NQ = Not Present, Qualitative Only
- PQ = Present, Qualitative Only
- ND = Not Determined

All data for this report has been approved by MVTl Laboratory Management.

MVTl guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTl to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTl. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017  
 Lab Number: 17-A25505  
 Work Order #: 31-0261  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 6 Jun 2017 10:56  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 6 Jun 2017 19:07  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H20X

Temp at Receipt: 0.8C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				8 Jun 17	JMS
Water Digestions				8 Jun 17	JMS
Radium 226	SEE ATTACHED			10 Jul 17 14:24	ABL
Radium 228	SEE ATTACHED		EPA M9320	10 Jul 17 14:25	ABL
pH, Field	6.68 units	1.00	I-1586-85	6 Jun 17 10:56	MS
pH	* 6.9 units	1.0	SM 4500 H+ B-2000	8 Jun 17 11:31	JFG
Sulfate	202 @ mg/L	5.0	ASTM D516-07	21 Jun 17 7:17	AKF
Chloride	4.0 mg/L	3.0	SM 4500 Cl E	8 Jun 17 9:21	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	15 Jun 17 15:04	RMB
Solids, Total Dissolved	3980 mg/L	10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	494.0 ~ mg/L	0.500	SW6010C	13 Jun 17 13:05	KAM
Lithium	0.418 mg/L	0.005	SW6010C	12 Jun 17 11:28	KAM
Barium	0.007 mg/L	0.005	SW6010C	12 Jun 17 11:28	KAM
Chromium	< 0.02 ^ mg/L	0.01	SW6010C	12 Jun 17 11:28	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	12 Jun 17 11:28	KAM
Boron	0.254 mg/L	0.100	SW6010C	12 Jun 17 11:28	KAM
Antimony	< 1 @ ug/L	0.5	SW6020A	14 Jun 17 14:52	RMV
Arsenic	1.70 @ ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
Beryllium	< 0.1 ug/L	0.05	SW6020A	14 Jun 17 14:52	RMV
	@See Narrative				
Cadmium	< 0.2 @ ug/L	0.1	SW6020A	14 Jun 17 14:52	RMV
Lead	< 1 ug/L	0.5	SW6020A	14 Jun 17 14:52	RMV
	@See Narrative				
Molybdenum	1.60 @ ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
Selenium	20.1 @^ ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
Thallium	< 0.2 ug/L	0.1	SW6020A	14 Jun 17 14:52	RMV
	@ See Narrative				
Fluoride	0.120 mg/L	0.020	EPA 300.0	9 Jun 17 10:17	RC

## RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.  
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix      # = Due to concentration of other analytes  
 ! = Due to sample quantity      + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125    WI LAB # 999447600    ND MICRO # 1013-M    ND NW/DW # R-040



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## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017  
Lab Number: 17-A25505  
Work Order #: 31-0261  
Account #: 006106  
Sample Matrix: GROUNDWATER  
Date Sampled: 6 Jun 2017 10:56  
Sampled By: MVTL FIELD PERSONNEL  
Date Received: 6 Jun 2017 19:07  
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H20X

Temp at Receipt: 0.8C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
--------------------	-----------	------------------	---------------	---------

\* Holding Time Exceeded

Radium 226 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

Radium 228 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes  
! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040





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## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017  
 Lab Number: 17-A25506  
 Work Order #: 31-0261  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 6 Jun 2017 11:31  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 6 Jun 2017 19:07  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H30X

Temp at Receipt: 0.8C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				8 Jun 17	JMS
Water Digestions				8 Jun 17	JMS
Radium 226	SEE ATTACHED			10 Jul 17 14:25	ABL
Radium 228	SEE ATTACHED		EPA M9320	10 Jul 17 14:25	ABL
pH, Field	6.84 units	1.00	I-1586-85	6 Jun 17 11:31	MS
pH	* 6.9 units	1.0	SM 4500 H+ B-2000	8 Jun 17 11:31	JFG
Sulfate	1910 ~ mg/L	5.0	ASTM D516-07	21 Jun 17 7:17	AKF
Chloride	80.8 mg/L	3.0	SM 4500 Cl E	8 Jun 17 9:21	MRW
Mercury	0.006 ug/L	0.005	EPA 245.7	15 Jun 17 15:04	RMB
Solids, Total Dissolved	3530 mg/L	10	SM 2540 C-97	9 Jun 17 13:12	RC
Calcium	416.0 ~ mg/L	0.500	SW6010C	13 Jun 17 13:05	KAM
Lithium	0.129 mg/L	0.005	SW6010C	12 Jun 17 11:28	KAM
Barium	0.016 mg/L	0.005	SW6010C	12 Jun 17 11:28	KAM
Chromium	< 0.02 ^ mg/L	0.01	SW6010C	12 Jun 17 11:28	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	12 Jun 17 11:28	KAM
Boron	7.170 mg/L	0.100	SW6010C	12 Jun 17 11:28	KAM
Antimony	< 1 @ ug/L	0.5	SW6020A	14 Jun 17 14:52	RMV
Arsenic	1.18 @ ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
Beryllium	< 0.1 ug/L	0.05	SW6020A	14 Jun 17 14:52	RMV
	@See Narrative				
Cadmium	< 0.2 @ ug/L	0.1	SW6020A	14 Jun 17 14:52	RMV
Lead	< 1 ug/L	0.5	SW6020A	14 Jun 17 14:52	RMV
	@See Narrative				
Molybdenum	33.7 @ ug/L	0.50	SW6020A	14 Jun 17 14:52	RMV
Selenium	< 2 @^ ug/L	0.5	SW6020A	14 Jun 17 14:52	RMV
Thallium	< 0.2 ug/L	0.1	SW6020A	14 Jun 17 14:52	RMV
	@ See Narrative				
Fluoride	0.370 mg/L	0.020	EPA 300.0	9 Jun 17 10:17	RC

### RE - Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TBI standards.  
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes  
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017
Lab Number: 17-A25506
Work Order #: 31-0261
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 6 Jun 2017 11:31
Sampled By: MVTL FIELD PERSONNEL
Date Received: 6 Jun 2017 19:07
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H30X

Temp at Receipt: 0.8C

As Received Method Method Date
Result RL Reference Analyzed Analyst

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity \* = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 RI LAB # 999447680 ND MICRO # 1013-H ND WH/DW # R-040





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## CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017  
 Lab Number: 17-A25507  
 Work Order #: 31-0261  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 6 Jun 2017 12:03  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 6 Jun 2017 19:07  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H40X

Temp at Receipt: 0.8C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
--------------------	-----------	------------------	---------------	---------

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit  
 Analysis performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.  
 The reporting limit was elevated for any analyte requiring a dilution as coded below:  
 @ = Due to sample matrix # = Due to concentration of other analytes  
 ? = Due to sample quantity \* = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 W1 LAB # 999447680 ND MICRO # 1013-M ND W1/DW # R-040

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.





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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017
Lab Number: 17-A25509
Work Order #: 31-0261
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 6 Jun 2017 13:25
Sampled By: MVT L FIELD PERSONNEL
Date Received: 6 Jun 2017 19:07
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H8

Temp at Receipt: 0.8C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include MS Water Digestions, Radium 226, Radium 228, pH, Field, Sulfate, Chloride, Mercury, Solids, Total Dissolved, Calcium, Lithium, Barium, Chromium, Cobalt, Boron, Antimony, Arsenic, Beryllium, Cadmium, Lead, Molybdenum, Selenium, Thallium, Fluoride.

\* Holding Time Exceeded

Radium 226 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

Radium 228 subcontracted to:
Inter-Mountain Labs
1673 Terra Ave
Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040



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CERTIFICATE of ANALYSIS - CCR

PAUL VUKONICH
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 12 Jul 2017
Lab Number: 17-A25510
Work Order #: 31-0261
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 6 Jun 2017 14:19
Sampled By: MVT L FIELD PERSONNEL
Date Received: 6 Jun 2017 19:07
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H9

Temp at Receipt: 0.8C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include MS Water Digestions, Water Digestions, Radium 226, Radium 228, pH, Field, pH, Sulfate, Chloride, Mercury, Solids, Total Dissolved, Calcium, Lithium, Barium, Chromium, Cobalt, Boron, Antimony, Arsenic, Beryllium, Cadmium, Lead, Molybdenum, Selenium, Thallium, Fluoride.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND HW/DN # R-040







# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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Page: 24 of 24

Date Reported: 12 Jul 2017

PAUL VUKONICH  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Work Order #: 201731-0261  
Account Number: 006106  
PO #: 48680

Project Name: BIG STONE PLANT CCR

## LABORATORY NARRATIVE

### INORGANIC AND METALS ANALYSES:

Beryllium recovery was elevated in the laboratory control spike associated with samples 17-A25505 through 17-A25517. Data that was below the reporting limit was reported.

The internal standard counts for lead and thallium were outside of limits in the laboratory control spike associated with samples 17-A25505 through 17-A25517. Data was reported based on the acceptable recovery of lead and thallium in the laboratory control spike.

No other problems were encountered with these analyses.

# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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ACIL**

Page: 1 of 2

## Quality Control Report

Lab IDs: 17-A25505 to 17-A25517

Project: BIG STONE PLANT CCR

Work Order: 201731-0261

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<=)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony ug/L	25.0	99	85-115	25.0	17A25514q	< 1	21.5	86	75-125	21.5	23.1	92	7.2	10	100	90-110	< 0.5
	25.0	99	85-115	25.0	a25082qc	< 0.5	25.5	102	75-125	25.5	25.5	102	0.0	10	98	90-110	< 0.5
Arsenic ug/L	25.0	99	85-115	25.0	17A25514q	2.32	27.1	99	75-125	27.1	29.3	108	7.8	10	98	90-110	< 0.5
	25.0	99	85-115	25.0	a25082qc	2.64	29.1	106	75-125	29.1	28.8	105	1.0	10	100	90-110	< 0.5
Barium mg/L	1.000	98	85-115	1.00	17A25512q	0.132	1.150	102	75-125	1.150	1.140	101	0.9	10	99	90-110	< 0.005
	1.000	98	85-115	1.00	17A25012q	0.068	1.040	97	75-125	1.040	1.070	100	2.8	10	100	90-110	< 0.005
Beryllium ug/L	2.50	121	85-115	2.50	17A25514q	< 0.25	2.36	94	75-125	2.36	2.30	92	2.6	10	107	90-110	< 0.05
	2.50	121	85-115	2.50	a25082qc	< 0.5	2.47	99	75-125	2.47	2.50	100	1.2	10	93	90-110	< 0.05
Boron mg/L	1.000	98	85-115	1.00	17A25512q	0.495	1.570	108	75-125	1.570	1.540	104	1.9	10	95	90-110	< 0.1
	1.000	98	85-115	1.00	17A25012q	< 0.1	1.000	100	75-125	1.000	1.040	104	3.9	10	96	90-110	< 0.1
Cadmium ug/L	5.00	100	85-115	5.00	17A25514q	0.31	4.79	90	75-125	4.79	5.27	99	9.5	10	98	90-110	< 0.1
	5.00	100	85-115	5.00	a25082qc	< 0.1	5.14	103	75-125	5.14	5.09	102	1.0	10	102	90-110	< 0.1
Calcium mg/L	50.00	106	85-115	50.0	A25512q	107.0	164.0	114	75-125	164.0	169.0	124	3.0	10	105	90-110	< 0.5
	50.00	110	85-115	50.0	a25012qc	79.60	139.0	119	75-125	139.0	140.0	121	0.7	10	106	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	17-A25509	4.1	62.6	98	85-121	62.6	62.1	97	0.8	5	96	90-110	< 3
	-	-	-	60.0	17-A25519	12.4	72.5	100	85-121	72.5	72.5	100	0.0	5	96	90-110	< 3
Chromium mg/L	1.000	101	85-115	1.00	17A25512q	< 0.01	1.010	101	75-125	1.010	0.996	100	1.4	10	102	90-110	< 0.01
	1.000	101	85-115	1.00	17A25012q	< 0.01	0.981	98	75-125	0.981	1.020	102	3.9	10	102	90-110	< 0.01
Cobalt mg/L	1.000	101	85-115	1.00	17A25512q	< 0.005	0.957	96	75-125	0.957	0.948	95	0.9	10	100	90-110	< 0.005
	1.000	101	85-115	1.00	17A25012q	< 0.005	0.956	96	75-125	0.956	0.988	99	3.3	10	100	90-110	< 0.005
Fluoride mg/L	-	-	-	0.20	17-A25512	0.240	0.420	90	75-125	0.420	0.420	90	0.0	10	95	90-110	< 0.02
	-	-	-	0.20	17-A25523	0.240	0.450	105	75-125	0.450	0.450	105	0.0	10	100	90-110	< 0.02
Lead ug/L	25.0	100	85-115	25.0	17A25514q	2.32	25.4	92	75-125	25.4	27.6	101	8.3	10	100	90-110	< 0.5
	25.0	100	85-115	25.0	a25082qc	1.78	28.1	105	75-125	28.1	27.7	104	1.4	10	101	90-110	< 0.5
Lithium mg/L	1.000	99	85-115	1.00	17-A25512	0.022	1.060	104	75-125	1.060	1.050	103	0.9	10	102	90-110	< 0.005
	1.000	99	85-115	1.00	a25012qc	0.007	0.979	97	75-125	0.979	1.000	99	2.1	10	105	90-110	< 0.005

**Quality Control Report**

Lab IDs: 17-A25505 to 17-A25517

Project: BIG STONE PLANT CCR

Work Order: 201731-0261

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<=)	Known Rec (%)	Known % Rec Limits	Method Blank
Mercury ug/L	-	-	-	0.10	17-A25505	<0.005	0.098	98	63-111	0.098	0.099	99	1.0	18	106	76-113	<0.005
	-	-	-	0.10	17-A25524	<0.005	0.093	93	63-111	0.093	0.104	104	11.2	18	99	76-113	<0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.005
Molybdenum ug/L	25.0	102	85-115	25.0	17A25514q	4.56	24.9	81	75-125	24.9	26.9	89	7.7	10	105	90-110	<0.5
	25.0	102	85-115	25.0	a25082qc	1.20	26.6	102	75-125	26.6	26.2	100	1.5	10	98	90-110	<0.5
pH units	-	-	-	-	-	-	-	-	-	7.3	7.4	-	1.4	2.5	100	90-110	-
	-	-	-	-	-	-	-	-	-	7.0	7.1	-	1.4	2.5	100	90-110	-
Selenium ug/L	25.0	104	85-115	25.0	17A25514q	2.07	29.8	111	75-125	29.8	30.6	114	2.6	10	102	90-110	<0.5
	25.0	104	85-115	25.0	a25082qc	<1	27.0	108	75-125	27.0	27.5	110	1.8	10	107	90-110	<0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	1170	1170	-	0.0	8	93	85-115	<10
	-	-	-	-	-	-	-	-	-	561	550	-	2.0	8	-	-	-
Sulfate mg/L	-	-	-	500	17-A25514	513	1070	111	74-128	1070	1040	105	2.8	5	99	80-120	<5
	-	-	-	500	17-A25524	97.4	647	110	74-128	647	647	110	0.0	5	99	80-120	<5
Thallium ug/L	5.00	98	85-115	5.00	17A25514q	<0.2	4.91	98	75-125	4.91	5.29	106	7.5	10	100	90-110	<0.1
	5.00	98	85-115	5.00	a25082qc	<0.1	5.24	105	75-125	5.24	5.18	104	1.2	10	102	90-110	<0.1

The beryllium LCS recoveries were outside the acceptance limits, see narrative.

Approved by: \_\_\_\_\_



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Date: 7/10/2017

**CLIENT:** MVTL Inc  
**Project:** Ottertail Power Big Stone  
**Lab Order:** S1706214


**CASE NARRATIVE**  
**Report ID: S1706214001**

Samples H-6 A25508, H-8 A25509, H2OX A25505, H3OX A25506, H4OX A25507, H9 A25510, Slag-2B A25517, Slag-4 A25511, Slag-5 A25512, Slag-6 A25513, Slag-7 A25514, Slag-8 A25515, and Slag-9 A25516 were received on June 9, 2017.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions  
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition  
40 CFR Parts 136 and 141  
40 CFR Part 50, Appendices B, J, L, and O  
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012  
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:   
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 7/10/2017
Report ID S1706214001

ProjectName: Ottertail Power Big Stone
Lab ID: S1706214-001
ClientSample ID: H2OX A25505
COC: WEB

WorkOrder: S1706214
CollectionDate: 6/7/2017 10:56:00 AM
DateReceived: 6/9/2017 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

Table with columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 228 Precision (±), Radium 228, Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 7/10/2017
Report ID S1706214001

ProjectName: Ottertail Power Big Stone
Lab ID: S1706214-002
ClientSample ID: H3OX A25506
COC: WEB

WorkOrder: S1706214
CollectionDate: 6/7/2017 11:31:00 AM
DateReceived: 6/9/2017 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 7/10/2017
Report ID S1706214001

ProjectName: Ottertail Power Big Stone
Lab ID: S1706214-003
ClientSample ID: H4OX A25507
COC: WEB

WorkOrder: S1706214
CollectionDate: 6/7/2017 12:03:00 PM
DateReceived: 6/9/2017 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTI Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 7/10/2017
Report ID S1706214001

ProjectName: Ottertail Power Big Stone
Lab ID: S1706214-004
ClientSample ID: H-6 A25508
COC: WEB

WorkOrder: S1706214
CollectionDate: 6/7/2017 12:40:00 PM
DateReceived: 6/9/2017 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager





Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 7/10/2017
Report ID S1706214001

ProjectName: Ottertail Power Big Stone
Lab ID: S1706214-005
ClientSample ID: H-8 A25509
COC: WEB

WorkOrder: S1706214
CollectionDate: 6/7/2017 1:25:00 PM
DateReceived: 6/9/2017 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

Table with columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radium 226, Radium 226 Precision, Radium 228, and Radium 228 Precision.

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 7/10/2017
Report ID S1706214001

ProjectName: Ottertail Power Big Stone
Lab ID: S1706214-006
ClientSample ID: H9 A25510
COC: WEB

WorkOrder: S1706214
CollectionDate: 6/7/2017 2:19:00 PM
DateReceived: 6/9/2017 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

### ANALYTICAL QC SUMMARY REPORT

**CLIENT:** MVTL Inc  
**Work Order:** S1706214  
**Project:** Ottertail Power Big Stone

**Date:** 7/10/2017  
**Report ID:** S1706214001

Radium 228 by Ga/Tech		Sample Type	MBLK	Units: pCi/L					
MB-444 (06/28/17 22:40)	Analyte	RunNo:	147536	PrepDate:	06/12/17 14:00	BatchID	13368		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		ND	1						

MB-445 (07/04/17 18:34)	Analyte	RunNo:	147649	PrepDate:	06/14/17 12:00	BatchID	13385		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		ND	1						

Radium 228 by Ga/Tech		Sample Type	LCS	Units: pCi/L					
LCS-444 (06/29/17 01:43)	Analyte	RunNo:	147536	PrepDate:	06/12/17 14:00	BatchID	13368		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		43	1	40.1		107	65.9 - 132		

LCS-445 (07/04/17 15:31)	Analyte	RunNo:	147649	PrepDate:	06/14/17 12:00	BatchID	13385		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		44	1	39.3		112	65.9 - 132		

Radium 228 by Ga/Tech		Sample Type	MS	Units: pCi/L					
MS-444 (06/29/17 07:49)	Analyte	RunNo:	147536	PrepDate:	06/12/17 14:00	BatchID	13368		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		47	1	40.1	ND	116	65.9 - 132		

MS-445 (07/04/17 21:37)	Analyte	RunNo:	147649	PrepDate:	06/14/17 12:00	BatchID	13385		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		42	1	39.1	2	104	50 - 139		

Radium 228 by Ga/Tech		Sample Type	MSD	Units: pCi/L					
MSD-444 (06/29/17 10:53)	Analyte	RunNo:	147536	PrepDate:	06/12/17 14:00	BatchID	13368		
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228		47	1	47	0.532	117	20		

MSD-445 (07/05/17 00:40)	Analyte	RunNo:	147649	PrepDate:	06/14/17 12:00	BatchID	13385		
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228		47	1	42	11.4	117	20		

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
G	Analyzed at IML Gillette laboratory	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit	O	Outside the Range of Dilutions
R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		



Inter-Mountain Labs

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Your Environmental Monitoring Partner

### ANALYTICAL QC SUMMARY REPORT

**CLIENT:** MVTL Inc  
**Work Order:** S1706214  
**Project:** Ottertail Power Big Stone

**Date:** 7/10/2017  
**Report ID:** S1706214001

Radium 226 in Water -		Sample Type	MBLK	Units: pCi/L				
MB-1761 (06/20/17 11:47)	Analyte	RunNo:	147123	PrepDate:	06/12/17 0:00	BatchID	13322	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
	Radium 226	ND	0.2					

MB-1762 (06/21/17 10:48)	Analyte	RunNo:	147141	PrepDate:	06/14/17 0:00	BatchID	13329	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
	Radium 226	ND	0.2					

Radium 226 in Water -		Sample Type	LCS	Units: pCi/L				
LCS-1761 (06/20/17 11:47)	Analyte	RunNo:	147123	PrepDate:	06/12/17 0:00	BatchID	13322	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
	Radium 226	5.4	0.2	6.41		84.7	67.1 - 122	

LCS-1762 (06/21/17 10:48)	Analyte	RunNo:	147141	PrepDate:	06/14/17 0:00	BatchID	13329	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
	Radium 226	5.7	0.2	6.41		89.1	67.1 - 122	

Radium 226 in Water -		Sample Type	LCSD	Units: pCi/L				
LCSD-1761 (06/20/17 11:47)	Analyte	RunNo:	147123	PrepDate:	06/12/17 0:00	BatchID	13322	
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
	Radium 226	6.0	0.2	5.4	9.83	93.5	20	

LCSD-1762 (06/21/17 10:48)	Analyte	RunNo:	147141	PrepDate:	06/14/17 0:00	BatchID	13329	
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
	Radium 226	6.0	0.2	5.7	5.31	93.9	20	

Radium 226 in Water -		Sample Type	MS	Units: pCi/L				
S1706157-004AMS (06/20/17 11:47)	Analyte	RunNo:	147123	PrepDate:	06/12/17 0:00	BatchID	13322	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
	Radium 226	6.5	0.2	6.41	0.3	97.8	65 - 131	

S1706214-002AMS (06/21/17 10:48)	Analyte	RunNo:	147141	PrepDate:	06/14/17 0:00	BatchID	13329	
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
	Radium 226	12	1	12.8	ND	85.8	65 - 131	

<b>Qualifiers:</b>	B Analyte detected in the associated Method Blank	E Value above quantitation range
	G Analyzed at IML Gillette laboratory	H Holding times for preparation or analysis exceeded
	J Analyte detected below quantitation limits	L Analyzed by another laboratory
	ND Not Detected at the Reporting Limit	O Outside the Range of Dilutions
	R RPD outside accepted recovery limits	S Spike Recovery outside accepted recovery limits
	X Matrix Effect	

# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

This is an exact copy of  
the original document

By AK Date 6 Jun 17  
pages 1-16

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> Ben Wolf Matt Stein
<b>Report:</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b> 31-0261
<b>Address:</b> P.O. Box 496 Fergus Falls, MN 56538-0496	<b>Address:</b>	<b>Lab Numbers:</b>
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other 150 None	Analysis Required
A3305	H2OX		6 Jun 17	1056	GW		2	N	1	1	N								See Attached
06	H3OX			1131	GW		2	N	1	1	N								
07	H4OX			1203	GW		2	N	1	1	N								
08	H-6			1240	GW		2	N	1	1	N								
09	H-8			1325	GW		2	N	1	1	N								
10	H-9			1419	GW		2	N	1	1	N								
11	Slag 1				GW		2	N	1	1	N								
12	Slag 4			1118	GW		2	N	1	1	N								
13	Slag 5			1453	GW		2	N	1	1	N								
14	Slag 6			1222	GW		2	N	1	1	N								

Comments:  
WORK ORDER #2

Samples Relinquished By: <u>Ben Wolf</u>			Samples Received By: <u>A. Stein</u>		
Date: <u>6 Jun 17</u>	Time: <u>1907</u>	Temp: <u>37.65</u>	Date: <u>6 Jun 17</u>	Time: <u>1907</u>	Temp: <u>0.50</u>
Samples Relinquished into: <u>Fridge</u> Log in Cart			Other:		
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: Samplers Other:			Seal Number(s) - If Used		
Transport: Ambient Ice Other:			Seals Intact? Yes No		

# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> Ben wolf Matt Stein
<b>Report</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b>
<b>Address</b> P.O. Box 496 Fergus Falls, MN 56538-0496	<b>Address:</b>	<b>Lab Numbers:</b>
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
14	Slag 7		6 Jun 17	1159	GW		2	N	1	1	N								See Attached
15	Slag 8			1350	GW		2	N	1	1	N								
16	Slag 9			1515	GW		2	N	1	1	N								
	Slag 9 Deep				GW		2	N	1	1	N								
17	Slag 2B			1538	GW		2	N	1	1	N								

Comments:  
**WORK ORDER #2**

Samples Relinquished By: Ben Wolf			Samples Received By: A. Head		
Date: 6 June 17	Time: 1907	Temp: 8.7°C	Date: 6 Jun 17	Time: 1907	Temp: 0.8°C
Samples Relinquished into: Fridge Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: Samplers Other:			Seal Number(s) - If Used		
Transport: Ambient Ice Other:			Seals Intact? Yes No		

## **Big Stone Plant CCR Appendix III Parameters**

CCR - Appendix III Detection Monitoring

### **Field Parameters**

pH\*

\* Field and Laboratory Measurements

### **Total Concentration Parameters**

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

## **Big Stone CCR Appendix IV Parameters**

CCR - Appendix IV - Assessment Monitoring

### **Total Concentration Parameters**

Antimony

Arsenic

Barium

Beryllium

Cadmium

Chromium, Total

Cobalt

Fluoride

Lead

Lithium

Mercury

Molybdenum

Selenium

Thallium

Radium 226 + 228



# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Site: Offer Tail Power Co./ Big Stone

Sampling Personnel:

Facility ID: \_\_\_\_\_

Mat + Steen

Date: 6 Jun 17

Unique Station ID: \_\_\_\_\_

Sample ID: \_\_\_\_\_

Well H2OX

### Well Condition

Well Locked?  Yes  No

Protective Posts? Yes  No

Well Labeled?  Yes  No

State ID Tag? Yes  No

Casing Straight?  Yes  No

Grout Seal Intact?  Yes  No

Repairs Necessary: \_\_\_\_\_

### Well Information

Well Depth: 32.81

Well Casing Elevation: 1103.91

Constructed Depth: 32.20

Static Water Elevation: 1097.36

Casing Diameter: 2"

Previous Static: 1097.76

Water Level Before Purge: 6.52

Water Level After Sample: Below Pump

Well Volume: 4.29 Gallons

Measurement Method:  Elec. W/L  Steel Tape

### Sampling Information

Weather Conditions: Temp: 75 Wind: E@13 Sky: Sunny

Sampling Method: Grundfos  Bladder SS/T  Disp. Baller  Whale  Grab  Other: \_\_\_\_\_

Dedicated Equipment:  Yes  No

Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes  No

Time Pump Began: 1033  am  pm

Time Purged Dry: 1051

Time of Sampling: 1056  am  pm

Duplicate Sample? Yes  No  ID: \_\_\_\_\_

Sample EH: 235.0

Sample Appearance: General: Clear Color: none Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1051	6.72	4021	8.72	NA	NA	4.5	1	
							2	
							3	
							4	
1056	6.68	4140	9.86				5	recharge

Stabilized? Yes  No

Amount Water Removed: 4.5 Gallons

Comments: \_\_\_\_\_

Exceptions to Protocol: \_\_\_\_\_

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

*Max Stem*

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 6 Jun 17

Unique Station ID:

Sample ID: Well H30X

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary:

Protective Posts? Yes  No

State ID Tag? Yes  No

Grout Seal Intact? Yes  No

## Well Information

Well Depth: 22.68

Constructed Depth: 22.55

Casing Diameter: 2"

Water Level Before Purge: 5.05

Well Volume: 288 Gallons

Well Casing Elevation: 1095.19

Static Water Elevation: 1190.14

Previous Static: 1090.14

Water Level After Sampl: Below Pump

Measurement Method: Elec. WLI Steel Tape

## Sampling Information

Weather Conditions: Temp: 77

Wind: ESE

Sky: Sunny

Sampling Method:  Grundfos  Bladder SS/T  Disp. Baller  Whale  Grab  Other:

Dedicated Equipment:  Yes  No

Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes  No

Time Pump Began: 1115 (am) / pm

Time Purged Dry? 1127

Time of Sampling: 1131 (am) / pm

Duplicate Sample? Yes  No  ID: \_\_\_\_\_

Sample EH: 209.0

Sample Appearance: General: clear

Color: none

Phase: none

Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1127</u>	<u>6.76</u>	<u>4077</u>	<u>10.68</u>	<u>NA</u>	<u>NA</u>	<u>3.0</u>	1	
							2	
							3	
<u>1131</u>	<u>6.84</u>	<u>4042</u>	<u>11.40</u>				4	<u>recharge</u>
							5	

Stabilized? Yes  No

Amount Water Removed

3.0

Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Matt Stern

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 25 June 17

Unique Station ID:

Sample ID: Well H40X

## Well Condition

Well Locked? Yes No

Well Labeled? Yes No

Casing Straight? Yes No

Repairs Necessary:

Protective Posts? Yes No

State ID Tag? Yes No

Grout Seal Intact? Yes No

## Well Information

Well Depth: 27.48

Constructed Depth: 27.20

Casing Diameter: 2"

Water Level Before Purge: 16.89

Well Volume: 1.73 16.89 Gallons

Well Casing Elevation: 1108.22

Static Water Elevation: 1091.33

Previous Static: 1091.47

Water Level After Sample: Below Pump

Measurement Method: Elec. WLI Steel Tape

## Sampling Information

Weather Conditions: Temp: 80 Wind: SE @ 10 Sky: Sunny

Sampling Method: Grundfos Bladder S/S Disp. EWhale Grab Other:

Dedicated Equipment: Yes No Pumping Rate: 0.25 gpm

Well Purged Dry? Yes No Time Pump Began: 1151 am/pm

Time Purged Dry? 1158 Time of Sampling: 1203 am/pm

Duplicate Sample? Yes No ID: --- Sample E 219.3

Sample Appearance: General: Clear Color: none Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O.	Turbidity NTU	Gallons Removed	SE Q #	Comments:
<u>1158</u>	<u>6.84</u>	<u>2763</u>	<u>10.09</u>	<u>NA</u>	<u>NA</u>	<u>1.75</u>	1	
							2	
							3	
							4	
<u>1203</u>	<u>6.94</u>	<u>2703</u>	<u>10.35</u>	<u>0</u>	<u>0</u>		5	<u>recharge</u>

Stabilized? Yes No Amount Water I 1.75 Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Matt Stein

Site: Offter Tail Power Co./ Big Stone

Facility ID:

Date: 6 Jun 17

Unique Station ID:

Sample ID: Well H6

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary:

Protective Posts?  Yes  No

State ID Tag?  Yes  No

Grout Seal Intact?  Yes  No

## Well Information

Well Depth: 17.92

Constructed Depth: 17.70

Casing Diameter: 2"

Water Level Before Purge: 11.45

Well Volume: 1.06 Gallons

Well Casing Elevation: N/A

Static Water Elevation:

Previous Static:

Water Level After Sample: Below Pump

Measurement Method:  Elec. Well  Steel Tape

## Sampling Information

Weather Conditions: Temp: 82

Wind: SEA9

Sky: Sunny

Sampling Method: Grundfos  Bladder SS/T

Disp. Bailor

Whale

Grab Other:

Dedicated Equipment:  Yes  No

Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes  No

Time Pump Began 1230 am /  pm

Time Purged Dry? 1235

Time of Sampling: 1240 am /  pm

Duplicate Sample?  Yes  No ID: ---

Sample EH: 226.1

Sample Appearance: General: Clear

Color: none

Phase: none

Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1235</u>	<u>7.48</u>	<u>1116</u>	<u>11.98</u>	<u>NA</u>	<u>NA</u>	<u>1.25</u>	<u>1</u>	
							<u>2</u>	
							<u>3</u>	
<u>1240</u>	<u>7.29</u>	<u>994</u>	<u>10.55</u>				<u>4</u>	<u>recharge</u>
							<u>5</u>	

Stabiliz Yes

No

Amount Water Removed: 1.25

Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Matt Stein

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 6 Jun 17

Unique Station ID:

Sample ID: Well H8

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary:

Protective Posts?  Yes  No

State ID Tag?  Yes  No

Grout Seal Intact?  Yes  No

## Well Information

Well Depth: 22.33

Constructed Depth: 22.05

Casing Diameter: 2"

Water Level Before Purge: 6.55

Well Volume: 2.57 Gallons

Well Casing Elevation: 1081.23

Static Water Elevation: 1074.68

Previous Static: 1076.07

Water Level After Sample: 6.96

Measurement Method:  Elec. WLI  Steel Tape

## Sampling Information

Weather Conditions: Temp: 84

Wind: SE @ 8

Sky: SUNNY

Sampling Method: Grundfos  Bladder SST  Disp. Bailer  Whale  Grab  Other:

Dedicated Equipment?  Yes  No

Well Purged Dry?  Yes  No

Time Purged Dry?

Duplicate Sample? Yes  No  ID: \_\_\_\_\_

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Pumping Rate: 0.25 gpm

Time Pump Began: 1252 am / pm

Time of Sampling: 1325 am / pm

Sample EH: 181.7

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1303</u>	<u>7.08</u>	<u>1315</u>	<u>8.37</u>	<u>N/A</u>	<u>N/A</u>	<u>2.75</u>	<u>1</u>	
<u>1314</u>	<u>7.10</u>	<u>1316</u>	<u>8.34</u>			<u>5.5</u>	<u>2</u>	
<u>1325</u>	<u>7.12</u>	<u>1317</u>	<u>8.36</u>			<u>8.25</u>	<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized?  Yes  No Amount Water Remove 8.25 Gallons

Comments:

\* well not in Field Notes Program

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

## Groundwater Assessment

Sampling Personne

Matt Stan

Site: Otter Tail Power Co./ Big Stone

Facility ID: \_\_\_\_\_

Date: 6 Jun 17

Unique Station I \_\_\_\_\_

Sample ID: Well H9

## Well Condition

Well Locked?  Yes  No

Protective Posts  Yes  No

Well Labeled?  Yes  No

State ID Tag?  Yes  No

Casing Straight?  Yes  No

Grout Seal Intac  Yes  No

Repairs Necessary: \_\_\_\_\_

## Well Information

Well Depth: 30.71

Well Casing Elevation: 1086.21

Constructed Depth: 30.20

Static Water Elevation: \_\_\_\_\_

Casing Diameter: 2"

Previous Static: 1078.6

Water Level Before Purge: 9.02

Water Level After Sam 10.61

Well Volume: 3,541 Gallons

Measurement Method: Elec. Well Steel Tape

## Sampling Information

Weather Conditions Temp: 55

Wind: SE 28

Sky: Sunny

Sampling Method: Grundfos

Bladder SS/T

Disp. Bailer

Whale

Grab Other: \_\_\_\_\_

Dedicated Equipment?  Yes  No

Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes  No

Time Pump Beg 1334 am / pm

Time Purged Dry? \_\_\_\_\_

Time of Samplin 1419 am / pm

Duplicate Sample?  Yes  No

ID: \_\_\_\_\_

Sample EH: 1964

Sample Appearance General: Clear

Color: None

Phase: None

Odor: None

15	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1349	6.62	2919	9.64	NA	NA	3.75	1	
1414	6.61	2921	9.56			7.5	2	
1419	6.64	2924	9.64			11.25	3	
							4	
							5	

Stabiliz  Yes  No

Amount Water Removed 11.25

Gallons

Comments:

\* well not in Field Notes Program

Exceptions to Protocol:

1404



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FINAL REPORT COMPLETION DATE: 21 Aug 17 *AK*

Date Reported: 16 Aug 2017

MEGAN LISBURG  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Work Order #: 31-0334  
Account #: 006106  
PO #: 48680

Project Name: BIG STONE PLANT CCR

*T. J. ... 12 Aug 17*  
Field Service Manager/Date Reviewed  
*... 16 Aug 17*  
Chemistry Lab Manager/Date Reviewed  
*... 16 August 2017*  
Quality Assurance Director/Date Reviewed

- RL = Reporting Limits
- NQ = Not Present, Qualitative Only
- PQ = Present, Qualitative Only
- ND = Not Determined

All data for this report has been approved by MVTL Laboratory Management.

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017
Lab Number: 17-A32926
Work Order #: 31-0334
Account #: 006106
Sample Matrix: GROUNDWATER
Date Sampled: 11 Jul 2017 11:16
Sampled By: MVTL FIELD PERSONNEL
Date Received: 11 Jul 2017 17:46
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H20X

Temp at Receipt: 4.2C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Lists various chemical analyses such as Radium 226, pH, Sulfate, Chloride, Mercury, etc.

RL = Reporting Limit
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.
The reporting limit was elevated for any analyte requiring a dilution as coded below:
@ = Due to sample matrix
! = Due to sample quantity
\* = Due to concentration of other analytes
+ = Due to internal standard response
CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040

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Page: 4 of 18

## CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017  
 Lab Number: 17-A32927  
 Work Order #: 31-0334  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 11 Jul 2017 11:49  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 11 Jul 2017 17:46  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H30X

Temp at Receipt: 4.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				17 Jul 17	JMS
Water Digestions				17 Jul 17	JMS
Radium 226	See Attached			15 Aug 17 15:57	ABL
Radium 228	See Attached		EPA M9320	15 Aug 17 15:57	ABL
pH, Field	6.99 units	1.00	I-1586-85	11 Jul 17 11:49	MS
pH	* 7.0 units	1.0	SM 4500 H+ B-2000	12 Jul 17 10:25	AJM
Sulfate	1790 ~ mg/L	5.0	ASTM D516-07	18 Jul 17 8:59	MRW
Chloride	80.6 mg/L	3.0	SM 4500 Cl E	14 Jul 17 8:30	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	24 Jul 17 15:19	RMB
Solids, Total Dissolved	3480 mg/L	10	SM 2540 C-97	12 Jul 17 15:00	AJM
Calcium	383.0 mg/L	0.500	SW6010C	19 Jul 17 13:58	KAM
	~ See narrative				
Lithium	0.134 mg/L	0.005	SW6010C	20 Jul 17 14:04	KAM
Barium	0.014 mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Chromium	< 0.01 mg/L	0.01	SW6010C	19 Jul 17 13:58	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Boron	7.070 mg/L	0.100	SW6010C	19 Jul 17 13:58	KAM
Antimony	< 5 @^ ug/L	0.5	SW6020A	2 Aug 17 12:25	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	1 Aug 17 19:25	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	2 Aug 17 12:25	RMV
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	1 Aug 17 19:25	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	1 Aug 17 19:25	RMV
	@See Narrative				
Molybdenum	30.5 @ ug/L	0.50	SW6020A	1 Aug 17 19:25	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	2 Aug 17 12:25	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	2 Aug 17 12:25	RMV
Fluoride	0.490 # mg/L	0.020	EPA 300.0	12 Jul 17 13:24	RC

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.  
 The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes  
 I = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-K ND WW/DR # R-040

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### CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017  
Lab Number: 17-A32927  
Work Order #: 31-0334  
Account #: 006106  
Sample Matrix: GROUNDWATER  
Date Sampled: 11 Jul 2017 11:49  
Sampled By: MVTL FIELD PERSONNEL  
Date Received: 11 Jul 2017 17:46  
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H30X

Temp at Receipt: 4.2C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
--------------------	-----------	------------------	---------------	---------

\* Holding Time Exceeded

Radium 226 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

Radium 228 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes  
! = Due to sample quantity \* = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-K ND HW/DW # R-040



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## CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017  
 Lab Number: 17-A32928  
 Work Order #: 31-0334  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 11 Jul 2017 12:09  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 11 Jul 2017 17:46  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H40X

Temp at Receipt: 4.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				17 Jul 17	JMS
Water Digestions				17 Jul 17	JMS
Radium 226	See Attached			15 Aug 17 15:58	ABL
Radium 228	See Attached		EPA M9320	15 Aug 17 15:58	ABL
pH, Field	7.00 units	1.00	I-1586-85	11 Jul 17 12:09	MS
pH	* 7.0 units	1.0	SM 4500 H+ B-2000	12 Jul 17 10:25	AJM
Sulfate	1170 ~ mg/L	5.0	ASTM D516-07	18 Jul 17 8:59	MRW
Chloride	49.3 mg/L	3.0	SM 4500 Cl E	14 Jul 17 8:30	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	24 Jul 17 15:19	RMB
Solids, Total Dissolved	2260 mg/L	10	SM 2540 C-97	12 Jul 17 15:00	AJM
Calcium	327.0 mg/L	0.500	SW6010C	19 Jul 17 13:58	KAM
	~ See narrative				
Lithium	0.107 mg/L	0.005	SW6010C	20 Jul 17 14:04	KAM
Barium	0.018 mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Chromium	< 0.01 mg/L	0.01	SW6010C	19 Jul 17 13:58	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Boron	0.353 mg/L	0.100	SW6010C	19 Jul 17 13:58	KAM
Antimony	< 5 @ ug/L	0.5	SW6020A	2 Aug 17 12:25	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	1 Aug 17 19:25	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	2 Aug 17 12:25	RMV
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	1 Aug 17 19:25	RMV
Lead	< 2.5 ug/L	0.5	SW6020A	1 Aug 17 19:25	RMV
	@See Narrative				
Molybdenum	4.48 @ ug/L	0.50	SW6020A	1 Aug 17 19:25	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	2 Aug 17 12:25	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	2 Aug 17 12:25	RMV
Fluoride	0.630 # mg/L	0.020	EPA 300.0	12 Jul 17 13:24	RC

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes  
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NW/DW # R-040

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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## CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017  
Lab Number: 17-A32928  
Work Order #: 31-0334  
Account #: 006106  
Sample Matrix: GROUNDWATER  
Date Sampled: 11 Jul 2017 12:09  
Sampled By: MVTL FIELD PERSONNEL  
Date Received: 11 Jul 2017 17:46  
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H40X

Temp at Receipt: 4.2C

As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
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\* Holding Time Exceeded

Radium 226 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

Radium 228 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards. The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes  
? = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND NH/DH # R-040



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## CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017  
 Lab Number: 17-A32929  
 Work Order #: 31-0334  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 11 Jul 2017 12:37  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 11 Jul 2017 17:46  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H6

Temp at Receipt: 4.2C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					17 Jul 17	JMS
Water Digestions					17 Jul 17	JMS
Radium 226	See Attached				15 Aug 17 15:58	ABL
Radium 228	See Attached			EPA M9320	15 Aug 17 15:58	ABL
pH, Field	7.41	units	1.00	I-1586-85	11 Jul 17 12:37	MS
pH	* 7.3	units	1.0	SM 4500 H+ B-2000	12 Jul 17 10:25	AJM
Sulfate	64.2	mg/L	5.0	ASTM D516-07	18 Jul 17 8:59	MRW
Chloride	< 3	mg/L	3	SM 4500 Cl E	14 Jul 17 8:30	MRW
Mercury	< 0.005	ug/L	0.005	EPA 245.7	24 Jul 17 15:19	RMB
Solids, Total Dissolved	517	mg/L	10	SM 2540 C-97	12 Jul 17 15:00	AJM
Calcium	46.90	mg/L	0.500	SW6010C	19 Jul 17 13:58	KAM
	See Narrative					
Lithium	0.036	mg/L	0.005	SW6010C	20 Jul 17 14:04	KAM
Barium	0.076	mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Chromium	< 0.01	mg/L	0.01	SW6010C	19 Jul 17 13:58	KAM
Cobalt	< 0.005	mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Boron	3.690	mg/L	0.100	SW6010C	19 Jul 17 13:58	KAM
Antimony	< 2 @^	ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Arsenic	< 1 @	ug/L	0.5	SW6020A	1 Aug 17 20:10	RMV
Beryllium	< 0.1	ug/L	0.05	SW6020A	2 Aug 17 13:07	RMV
	@See Narrative					
Cadmium	< 0.2 @	ug/L	0.1	SW6020A	1 Aug 17 20:10	RMV
Lead	< 1 @	ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Molybdenum	22.9 @	ug/L	0.50	SW6020A	1 Aug 17 20:10	RMV
Selenium	7.64 @^	ug/L	0.50	SW6020A	1 Aug 17 20:10	RMV
Thallium	< 0.2 @	ug/L	0.1	SW6020A	2 Aug 17 13:07	RMV
Fluoride	0.560 #	mg/L	0.020	EPA 300.0	12 Jul 17 13:24	RC

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNJ standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes  
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040



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www.mvttl.com



## CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017  
Lab Number: 17-A32930  
Work Order #: 31-0334  
Account #: 006106  
Sample Matrix: GROUNDWATER  
Date Sampled: 11 Jul 2017 13:17  
Sampled By: MVTL FIELD PERSONNEL  
Date Received: 11 Jul 2017 17:46  
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H8

Temp at Receipt: 4.2C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					17 Jul 17	JMS
Water Digestions					17 Jul 17	JMS
Radium 226	See Attached				15 Aug 17 15:58	ABL
Radium 228	See Attached			EPA M9320	15 Aug 17 15:58	ABL
pH, Field	7.14	units	1.00	I-1586-85	11 Jul 17 13:17	MS
pH	* 7.3	units	1.0	SM 4500 H+ B-2000	12 Jul 17 10:25	AJM
Sulfate	269 @	mg/L	5.0	ASTM D516-07	18 Jul 17 8:59	MRW
Chloride	4.3	mg/L	3.0	SM 4500 Cl E	14 Jul 17 8:30	MRW
Mercury	< 0.005	ug/L	0.005	EPA 245.7	24 Jul 17 15:19	RMB
Solids, Total Dissolved	878	mg/L	10	SM 2540 C-97	12 Jul 17 15:00	AJM
Calcium	114.0	mg/L	0.500	SW6010C	19 Jul 17 13:58	KAM
	See Narrative					
Lithium	0.039	mg/L	0.005	SW6010C	20 Jul 17 14:04	KAM
Barium	0.026	mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Chromium	< 0.01	mg/L	0.01	SW6010C	19 Jul 17 13:58	KAM
Cobalt	< 0.005	mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Boron	3.740	mg/L	0.100	SW6010C	19 Jul 17 13:58	KAM
Antimony	< 2 @^	ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Arsenic	< 1 @	ug/L	0.5	SW6020A	1 Aug 17 20:10	RMV
Beryllium	< 0.1	ug/L	0.05	SW6020A	2 Aug 17 13:07	RMV
	@See Narrative					
Cadmium	< 0.2 @	ug/L	0.1	SW6020A	1 Aug 17 20:10	RMV
Lead	< 1 @	ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Molybdenum	14.1 @	ug/L	0.50	SW6020A	1 Aug 17 20:10	RMV
Selenium	8.82 @^	ug/L	0.50	SW6020A	1 Aug 17 20:10	RMV
Thallium	< 0.2 @	ug/L	0.1	SW6020A	2 Aug 17 13:07	RMV
Fluoride	0.510 #	mg/L	0.020	EPA 300.0	12 Jul 17 13:24	RC

\* Holding Time Exceeded

Radium 226 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

Radium 228 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

^ The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit  
Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.  
The reporting limit was elevated for any analyte requiring a dilution as coded below:  
@ = Due to sample matrix # = Due to concentration of other analytes  
! = Due to sample quantity + = Due to internal standard response  
CERTIFICATION: MN LAB # 027-015-125 NI LAB # 999447680 ND MICRO # 1013-K ND HW/DW # R-040



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## CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG  
OTTER TAIL POWER CO  
PO BOX 496  
FERGUS FALLS MN 56538-0496

Report Date: 16 Aug 2017  
Lab Number: 17-A32931  
Work Order #: 31-0334  
Account #: 006106  
Sample Matrix: GROUNDWATER  
Date Sampled: 11 Jul 2017 14:03  
Sampled By: MVT L FIELD PERSONNEL  
Date Received: 11 Jul 2017 17:46  
PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: WELL H9

Temp at Receipt: 4.2C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions				17 Jul 17	JMS
Water Digestions				17 Jul 17	JMS
Radium 226	See Attached			15 Aug 17 15:58	ABL
Radium 228	See Attached		EPA M9320	15 Aug 17 15:58	ABL
pH, Field	6.69 units	1.00	I-1586-85	11 Jul 17 14:03	MS
pH	* 6.8 units	1.0	SM 4500 H+ B-2000	12 Jul 17 10:25	AJM
Sulfate	1470 ~ mg/L	5.0	ASTM D516-07	18 Jul 17 8:59	MRW
Chloride	16.4 mg/L	3.0	SM 4500 Cl E	14 Jul 17 8:30	MRW
Mercury	< 0.005 ug/L	0.005	EPA 245.7	24 Jul 17 15:19	RMB
Solids, Total Dissolved	2770 mg/L	10	SM 2540 C-97	13 Jul 17 9:14	AJM
Calcium	548.0 mg/L	0.500	SW6010C	19 Jul 17 13:58	KAM
	~ See narrative				
Lithium	0.132 mg/L	0.005	SW6010C	20 Jul 17 14:04	KAM
Barium	0.013 mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Chromium	< 0.01 mg/L	0.01	SW6010C	19 Jul 17 13:58	KAM
Cobalt	< 0.005 mg/L	0.005	SW6010C	19 Jul 17 13:58	KAM
Boron	1.040 mg/L	0.100	SW6010C	19 Jul 17 13:58	KAM
Antimony	< 5 @ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Arsenic	< 2.5 @ ug/L	0.5	SW6020A	1 Aug 17 20:10	RMV
Beryllium	< 0.25 ug/L	0.05	SW6020A	2 Aug 17 13:07	RMV
	@See Narrative				
Cadmium	< 0.5 @ ug/L	0.1	SW6020A	1 Aug 17 20:10	RMV
Lead	< 2.5 @ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Molybdenum	< 2.5 @ ug/L	0.5	SW6020A	1 Aug 17 20:10	RMV
Selenium	< 2.5 @ ug/L	0.5	SW6020A	2 Aug 17 13:07	RMV
Thallium	< 0.5 @ ug/L	0.1	SW6020A	2 Aug 17 13:07	RMV
Fluoride	0.420 # mg/L	0.020	EPA 300.0	12 Jul 17 13:24	RC

\* Holding Time Exceeded

Radium 226 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

Radium 228 subcontracted to:  
Inter-Mountain Labs  
1673 Terra Ave  
Sheridan, WY 82801

- Sample diluted due to result above calibration of linear range.

\* The reporting limit (RL) was elevated due to instrument performance at the lower limit of quantitation (LLOQ). This will only impact results that are found to be below the elevated RL. Results above the elevated RL are unaffected.

RL = Reporting Limit

Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to sample matrix  
! = Due to sample quantity

¶ = Due to concentration of other analytes  
+ = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447600 ND MICRO # 1013-M ND WQ/DW # R-040





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### INORGANIC & METALS ANALYSES:

Due to the high concentration of calcium in the spiked sample, the recovery for calcium was outside the acceptance range in the matrix spike duplicate for samples 17-A32926 through 17-A32935. The data was reported based on the acceptable recoveries of the blank spike and relative percent difference of the matrix spikes.

The internal standard associated with beryllium was outside of acceptance range in the blank spike, matrix spike, and matrix spike duplicate in samples 17-A32926 through 17-A32933 and 17-A32935 through 17-A32938. Data was reported based on the acceptable recovery of beryllium in the blank spike, matrix spike, and matrix spike duplicate.

For samples 17-A32929 through 17-A32933 and 17-A32935 through 17-A32938, the beryllium recovery was elevated outside of acceptance range in the knowns. Data that was below the reporting limit was reported.

Lead was detected in the blank associated with samples 17-A32926 through 17-A32928 at 1.57 ug/L. Data that was below the reporting limit was reported.

No other problems were encountered with these analyses.



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Page: 1 of 3

## Quality Control Report

Lab IDs: 17-A32926 to 17-A32938

Project: BIG STONE PLANT CCR

Work Order: 201731-0334

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony ug/L	25.0	98	85-115	25.0	17A32928q	< 5	26.3	105	75-125	26.3	27.8	111	5.5	10	102	90-110	< 0.5
	25.0	98	85-115	25.0	17A32938q	< 5	26.4	106	75-125	26.4	26.3	105	0.4	10	102	90-110	< 0.5
Arsenic ug/L	25.0	98	85-115	25.0	17A32928q	< 2.5	28.1	112	75-125	28.1	29.6	118	5.2	10	98	90-110	< 0.5
	25.0	98	85-115	25.0	17A32938q	1.60	28.4	107	75-125	28.4	28.1	106	1.1	10	100	90-110	< 0.5
Barium mg/L	1.000	100	85-115	1.00	17A32935q	0.036	1.050	101	75-125	1.050	1.060	102	0.9	10	97	90-110	< 0.005
				1.00	17A32945q	0.070	1.080	101	75-125	1.080	1.090	102	0.9	10	99	90-110	
Beryllium ug/L	2.50	98	85-115	2.50	17A32928q	< 0.25	2.36	94	75-125	2.36	2.56	102	8.1	10	104	90-110	< 0.05
	2.50	98	85-115	2.50	17A32938q	< 0.25	2.53	101	75-125	2.53	2.54	102	0.4	10	110	90-110	< 0.05
	2.50	102	85-115	2.50	a32938qc	< 0.25	2.63	105	75-125	2.63	2.58	103	1.9	10	108	90-110	< 0.05
Boron mg/L	1.000	96	85-115	1.00	17A32935q	1.110	2.230	112	75-125	2.230	2.330	122	4.4	10	94	90-110	< 0.1
				1.00	17A32945q	< 0.1	1.040	104	75-125	1.040	1.050	105	1.0	10	96	90-110	
Cadmium ug/L	5.00	98	85-115	5.00	17A32928q	< 0.5	5.35	107	75-125	5.35	5.65	113	5.5	10	99	90-110	< 0.1
	5.00	98	85-115	5.00	17A32938q	0.25	5.35	102	75-125	5.35	5.37	102	0.4	10	98	90-110	< 0.1
Calcium mg/L	50.00	98	85-115	50.0	17A32935q	229.0	279.0	100	75-125	279.0	303.0	148	8.2	10	94	90-110	< 0.5
				50.0	17A32945q	117.0	170.0	106	75-125	170.0	169.0	104	0.6	10	97	90-110	
Chloride mg/L	-	-	-	60.0	17-A32901	15.6	82.0	111	85-121	82.0	79.4	106	3.2	5	95	90-110	< 3
	-	-	-	60.0	17-A32939	< 3	61.3	102	85-121	61.3	61.6	103	0.5	5	95	90-110	< 3
Chromium mg/L	1.000	101	85-115	1.00	17A32935q	< 0.01	0.994	99	75-125	0.994	1.010	101	1.6	10	98	90-110	< 0.01
				1.00	17A32945q	< 0.01	1.020	102	75-125	1.020	1.010	101	1.0	10	102	90-110	
Cobalt mg/L	1.000	102	85-115	1.00	17A32935q	< 0.005	0.923	92	75-125	0.923	0.944	94	2.2	10	96	90-110	< 0.005
				1.00	17A32945q	< 0.005	0.959	96	75-125	0.959	0.962	96	0.3	10	100	90-110	
Fluoride mg/L	-	-	-	2.00	17-A32935	0.600	2.54	97	75-125	2.54	2.54	97	0.0	10	99	90-110	< 0.02
	-	-	-	2.00	17-A32945	0.320	2.13	91	75-125	2.13	2.21	94	3.7	10	97	90-110	< 0.02



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**Quality Control Report**

Lab IDs: 17-A32926 to 17-A32938

Project: BIG STONE PLANT CCR

Work Order: 201731-0334

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/Dup Orig Result	MSD/Dup Result	MSD Rec %	MSD/Dup RPD	MSD/Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Lead ug/L	25.0	91	85-115	25.0	17A32928q	<2.5	26.3	105	75-125	26.3	27.8	111	5.5	10	97	90-110	1.57
	25.0	101	85-115	25.0	17A32938q	<2.5	26.7	107	75-125	26.7	27.0	108	1.1	10	102	90-110	<0.5
Lithium mg/L	1.000	105	85-115	1.00	17-A32935	0.081	1.200	112	75-125	1.200	1.200	112	0.0	10	105	90-110	<0.005
				1.00	17-A32944	0.025	1.140	112	75-125	1.140	1.140	112	0.0	10	106 107	90-110 90-110	
Mercury ug/L	-	-	-	0.10	17-A32931	<0.005	0.102	102	63-111	0.102	0.102	102	0.0	18	103	76-113	<0.005
	-	-	-	0.10	17-A32942	<0.005	0.099	99	63-111	0.099	0.099	99	0.0	18	99	76-113	<0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.005
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum ug/L	25.0	101	85-115	25.0	17A32928q	4.48	30.5	104	75-125	30.5	32.7	113	7.0	10	99	90-110	<0.5
	25.0	101	85-115	25.0	17A32938q	5.29	30.4	100	75-125	30.4	29.9	98	1.7	10	100	90-110	<0.5
pH units	-	-	-	-	-	-	-	-	-	7.1	7.1	-	0.0	2.5	101	90-110	-
	-	-	-	-	-	-	-	-	-	7.1	7.1	-	0.0	2.5	101	90-110	-
Selenium ug/L	25.0	98	85-115	25.0	17A32928q	<5	30.3	121	75-125	30.3	30.6	122	1.0	10	98	90-110	<2
	25.0	94	85-115	25.0	17A32938q	<4	29.4	118	75-125	29.4	27.5	110	6.7	10	102	90-110	<2
	25.0	98	85-115	25.0	17A32928q	<2.5	27.5	110	75-125	27.5	28.0	112	1.8	10	101	90-110	<0.5
	25.0	94	85-115	25.0	17A32938q	<2.5	26.7	107	75-125	26.7	26.8	107	0.4	10	100	90-110	<0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	878	876	-	0.2	8	100	85-115	<10
	-	-	-	-	-	-	-	-	-	645	649	-	0.6	8	88	85-115	<10
Sulfate mg/L	-	-	-	50.0	17-A33239	57.6	107	99	74-128	107	109	103	1.9	5	100	80-120	<5
	-	-	-	5000	17-A32926	2510	8350	117	74-128	8350	8360	117	0.1	5	105	80-120	<5
	-	-	-	500	17-A32936	264	816	110	74-128	816	823	112	0.9	5	102	80-120	<5
	-	-	-	500	17-A32946	305	917	122	74-128	917	909	121	0.9	5			
Thallium ug/L	5.00	99	85-115	5.00	17A32928q	<0.5	5.38	108	75-125	5.38	5.54	111	2.9	10	105	90-110	<0.1
	5.00	99	85-115	5.00	17A32938q	<0.5	5.32	106	75-125	5.32	5.38	108	1.1	10	104	90-110	<0.1

The calcium matrix spike duplicate recovery was outside the acceptance limits, see narrative  
Lead was found in the laboratory blank at 1.57 ug/L, see narrative.

Approved by:

A handwritten signature in black ink, consisting of several loops and a final flourish, written over a horizontal line.



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Date: 8/15/2017

**CLIENT:** MVTL Inc  
**Project:** Ottertail Power Big Stone  
**Lab Order:** S1707202

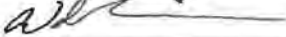
**CASE NARRATIVE**  
**Report ID: S1707202001**

Samples H-6-A32929, H-8-A32930, H-9-A32931, H2OX-A32926, H3OX-A32927, H4OX-A32928, SLAG-4-A32932, SLAG-5-A32933, SLAG-6-A32934, SLAG-7-A32935, SLAG-8-A32936, SLAG-9-A32937, and SLAG2B-A32938 were received on July 14, 2017.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions  
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition  
40 CFR Parts 136 and 141  
40 CFR Part 50, Appendices B, J, L, and O  
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012  
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:   
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

Your Environmental Monitoring Partner

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

### Sample Analysis Report

**Company:** MVTL Inc  
1126 N Front St  
New Ulm, MN 56073

**Date Reported** 8/15/2017  
**Report ID** S1707202001

**ProjectName:** Ottertail Power Big Stone  
**Lab ID:** S1707202-001  
**ClientSample ID:** H2OX-A32926  
**COC:** wo#31-0334

**WorkOrder:** S1707202  
**CollectionDate:** 7/11/2017 11:16:00 AM  
**DateReceived:** 7/14/2017 11:21:00 AM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	08/11/2017 1129	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/11/2017 1129	MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/11/2017 2005	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/11/2017 2005	MB

These results apply only to the samples tested.

RL - Reporting Limit

**Qualifiers:**

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 8/15/2017
Report ID S1707202001

ProjectName: Ottertail Power Big Stone
Lab ID: S1707202-002
ClientSample ID: H3OX-A32927
COC: wo#31-0334

WorkOrder: S1707202
CollectionDate: 7/11/2017 11:49:00 AM
DateReceived: 7/14/2017 11:21:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 8/15/2017
Report ID S1707202001

ProjectName: Ottertail Power Big Stone
Lab ID: S1707202-003
ClientSample ID: H4OX-A32928
COC: wo#31-0334

WorkOrder: S1707202
CollectionDate: 7/11/2017 12:09:00 PM
DateReceived: 7/14/2017 11:21:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager





Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 8/15/2017
Report ID S1707202001

ProjectName: Ottertail Power Big Stone
Lab ID: S1707202-004
ClientSample ID: H-6-A32929
COC: wo#31-0334

WorkOrder: S1707202
CollectionDate: 7/11/2017 12:37:00 PM
DateReceived: 7/14/2017 11:21:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Inc  
1126 N Front St  
New Ulm, MN 56073

**Date Reported** 8/15/2017  
**Report ID** S1707202001

**ProjectName:** Ottetail Power Big Stone  
**Lab ID:** S1707202-005  
**ClientSample ID:** H-8-A32930  
**COC:** wo#31-0334

**WorkOrder:** S1707202  
**CollectionDate:** 7/11/2017 1:17:00 PM  
**DateReceived:** 7/14/2017 11:21:00 AM  
**FieldSampler:**  
**Matrix:** Water

**Comments**

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	08/11/2017 1129	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/11/2017 1129	MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/12/2017 818	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/12/2017 818	MB

**These results apply only to the samples tested.**

**RL - Reporting Limit**

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - E Value above quantitation range
  - H Holding times for preparation or analysis exceeded
  - L Analyzed by another laboratory
  - ND Not Detected at the Reporting Limit
  - S Spike Recovery outside accepted recovery limits

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Inc
1126 N Front St
New Ulm, MN 56073

Date Reported 8/15/2017
Report ID S1707202001

ProjectName: Ottetail Power Big Stone
Lab ID: S1707202-006
ClientSample ID: H-9-A32931
COC: wo#31-0334

WorkOrder: S1707202
CollectionDate: 7/11/2017 2:03:00 PM
DateReceived: 7/14/2017 11:21:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Your Environmental Monitoring Partner

### ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTl Inc  
 Work Order: S1707202  
 Project: Ottertail Power Big Stone

Date: 8/15/2017  
 Report ID: S1707202001

Radium 228 by Ga/Tech		Sample Type	MBLK		Units: pCi/L				
MB-452 (08/10/17 22:43)	Analyte	RunNo:	148962	PrepDate:	07/19/17 12:00	BatchID	13543		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		ND	1						

Radium 228 by Ga/Tech		Sample Type	LCS		Units: pCi/L				
LCS-452 (08/11/17 01:46)	Analyte	RunNo:	148962	PrepDate:	07/19/17 12:00	BatchID	13543		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		33	1	39.5		83.8	65.9 - 132		

Radium 228 by Ga/Tech		Sample Type	MS		Units: pCi/L				
MS-452 (08/11/17 07:52)	Analyte	RunNo:	148962	PrepDate:	07/19/17 12:00	BatchID	13543		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		44	1	39.5	ND	111	50 - 139		

Radium 228 by Ga/Tech		Sample Type	MSD		Units: pCi/L				
MSD-452 (08/11/17 10:55)	Analyte	RunNo:	148962	PrepDate:	07/19/17 12:00	BatchID	13543		
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228		42	1	44	4.14	106	20		

Radium 226 in Water -		Sample Type	MBLK		Units: pCi/L				
MB-1778 (08/11/17 11:29)	Analyte	RunNo:	148977	PrepDate:	07/31/17 0:00	BatchID	13532		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		ND	0.2						

Radium 226 in Water -		Sample Type	LCS		Units: pCi/L				
LCS-1778 (08/11/17 11:29)	Analyte	RunNo:	148977	PrepDate:	07/31/17 0:00	BatchID	13532		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		5.8	0.2	6.41		90.6	67.1 - 122		

Radium 226 in Water -		Sample Type	MS		Units: pCi/L				
MS-1778 (08/11/17 11:29)	Analyte	RunNo:	148977	PrepDate:	07/31/17 0:00	BatchID	13532		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		5.8	0.2	6.41	ND	89.5	65 - 131		

Radium 226 in Water -		Sample Type	MSD		Units: pCi/L				
MSD-1778 (08/11/17 11:29)	Analyte	RunNo:	148977	PrepDate:	07/31/17 0:00	BatchID	13532		
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Radium 226		6.2	0.2	5.8	7.76	96.7	20		

**Qualifiers:**

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
G	Analyzed at IML Gillette laboratory	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit	O	Outside the Range of Dilutions
R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery limits
X	Matrix Effect		



**Inter-Mountain Labs**  
Sheridan, WY and Gillette, WY

**- CHAIN OF CUSTODY RECORD -**

*All shaded fields must be completed.*

This is a legal document; any misrepresentation may be construed as fraud.

Page \_\_\_\_\_ of \_\_\_\_\_  
**#WEB**

Client Name <b>MVTL</b>		Project Identification <b>Ottertail Power Big Stone</b>		Sampler (Signature/Attestation of Authenticity)		Telephone #	
Report Address <b>1126 North Front St New Ulm, Mn. 56073</b>		Contact Name <b>Tim Portner</b>		<b>ANALYSES / PARAMETERS</b>			
Invoice Address <b>Same</b>		Email <b>tpartner@mvtl.com</b>					
		Phone <b>507-276-8089</b>		Purchase Order #		Quote #	

ITEM	LAB ID <i>(Lab Use Only)</i>	DATE SAMPLED	TIME	SAMPLE IDENTIFICATION	Matrix	# of Containers	Radium 226 + 228	ANALYSES / PARAMETERS						REMARKS
1	51707202-01	11 Jul 17	1116	H2OX - A32926	WT	2	x							
2	-002		1149	H3OX - A32927	WT	2	x							
3	-003		1209	H4OX - A32928	WT	2	x							
4	-004		1237	H-6 - A32929	WT	2	x							
5	-005		1317	H-8 - A32930	WT	2	x							
6	-006		1403	H-9 - A32931	WT	2	x							
7				Slag-1 No Sample	WT	2	x							
8	-007		1107	Slag-4 A32932	WT	2	x							
9	-008		1433	Slag-5 A32933	WT	2	x							
10	-009		1234	Slag-6 A32934	WT	2	x							
11	-010		1212	Slag-7 A32935	WT	2	x							
12	-011		1509	Slag-8 A32936	WT	2	x							
13														
14														

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
23.5°C				<i>[Signature]</i>	7/14/17	11:22

SHIPPING INFO	MATRIX CODES	TURN AROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
<input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> USPS <input type="checkbox"/> Hand Carried <input type="checkbox"/> Other	Water WT Soil SL Solid SD Filter FT Other OT	Check desired service <input type="checkbox"/> Standard turnaround <input type="checkbox"/> RUSH - 5 Working Days <input type="checkbox"/> URGENT - < 2 Working Days <i>Rush &amp; Urgent Surcharges will be applied</i>	Compliance Monitoring? <b>Y/N</b> Program (SDWA, NPDES,...) PWSID / Permit # Chlorinated? <b>Y/N</b> Sample Disposal: Lab _____ Client _____	



**Inter-Mountain Labs**  
Sheridan, WY and Gillette, WY

**CHAIN OF CUSTODY RECORD**

*All shaded fields must be completed.*

This is a legal document; any misrepresentation may be construed as fraud.

Page \_\_\_\_\_ of \_\_\_\_\_

#WEB

<b>Client Name</b> MVTL	<b>Project Identification</b> Ottertail Power Big Stone	<b>Sampler (Signature/Attestation of Authenticity)</b>	<b>Telephone #</b>
----------------------------	--	--	--------------------

<b>Report Address</b> 1126 North Front St New Ulm, Mn 56073	<b>Contact Name</b> Tim Portner	<b>ANALYSES / PARAMETERS</b>	
<b>Invoice Address</b> Same	<b>Email</b> tportner@mvtl.com	Radium 226 + 228	REMARKS
	<b>Phone</b> 507-276-8089		
	<b>Purchase Order #</b>	<b>Quote #</b>	

ITEM	LAB ID <i>(Lab Use Only)</i>	DATE SAMPLED	TIME	SAMPLE IDENTIFICATION	Matrix	# of Containers	Radium 226 + 228											
1	-02	11/20/17	1355	Slag 9 - A32937	WT	2	x											
2				Slag 9 Deep - No Sample	WT	2	x											
3	-013	11/20/17	1137	Slag 2B - A32938	WT	2	x											
4				MVTL WO# 31-D334			x											
5							x											
6							x											
7							x											
8							x											
9							x											
10							x											
11							x											
12							x											
13							x											
14							x											

<b>LAB COMMENTS</b>	<b>Relinquished By (Signature/Printed)</b>	<b>DATE</b>	<b>TIME</b>	<b>Received By (Signature/Printed)</b>	<b>DATE</b>	<b>TIME</b>
23.50C				<i>Tim Portner</i>	11/20/17	11:21

<b>SHIPPING INFO</b>	<b>MATRIX CODES</b>	<b>TURN AROUND TIMES</b>	<b>COMPLIANCE INFORMATION</b>	<b>ADDITIONAL REMARKS</b>
<input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> USPS <input type="checkbox"/> Hand Carried <input type="checkbox"/> Other	Water WT Soil SL Solid SD Filter FT Other OT	Check desired service <input type="checkbox"/> Standard turnaround <input checked="" type="checkbox"/> RUSH - 5 Working Days <input checked="" type="checkbox"/> URGENT - < 2 Working Days <i>Rush &amp; Urgent Surcharges will be applied</i>	Compliance Monitoring? <u>Y / N</u> Program (SDWA, NPDES,...) PWSID / Permit # Chlorinated? <u>Y / N</u> Sample Disposal: Lab Client	

# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

This is an exact copy of the original document  
 By AW Date 12 Jul 17  
 pages 1-17

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> Ben Wolf, Matt Stein
<b>Report</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b> 31-0334
<b>Address</b> P.O. Box 496	<b>Address:</b>	<b>Lab Numbers:</b>
Fergus Falls, MN 56538-0496		
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
A32926	H2OX		11 July 17	1116	GW		2	N	1	1	N								See Attached
21	H3OX			1149	GW		2	N	1	1	N								
28	H4OX			1209	GW		2	N	1	1	N								
29	H-6			1237	GW		2	N	1	1	N								
30	H-8			1317	GW		2	N	1	1	N								
31	H-9			1403	GW		2	N	1	1	N								
	Slag 1				GW		2	N	1	1	N								
32	Slag 4			1107	GW		2	N	1	1	N								
33	Slag 5			1433	GW		2	N	1	1	N								
34	Slag 6			1234	GW		2	N	1	1	N								

Comments:  
**WORK ORDER #2**

Samples Relinquished By: <u>Ben Wolf</u>			Samples Received By: <u>De Guder</u>		
Date: <u>11 Jul 17</u>	Time: <u>1740</u>	Temp: <u>2.7</u>	Date: <u>12 Jul 17</u>	Time: <u>900</u>	Temp: <u>4.20</u>
Samples Relinquished into: <u>Fridge</u> Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery:	Samplers	Other:	Seal Number(s) - If Used		
Transport:	Ambient	Ice	Other:	Seals Intact?	Yes No

# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

<b>Project</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> Ben Wolf, Matt Stein
<b>Report</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b>
<b>Address</b> P.O. Box 496	<b>Address:</b>	<b>Lab Numbers:</b>
Fergus Falls, MN 56538-0496		
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type										Analysis				
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required
35	Slag 7		11 July 17	1212	GW		2	N	1	1	N								See Attached
36	Slag 8			1509	GW		2	N	1	1	N								
37	Slag 9			1355	GW		2	N	1	1	N								
	Slag 9 Deep				GW		2	N	1	1	N								
38	Slag 2B			1137	GW		2	N	1	1	N								

Comments:  
**WORK ORDER #2**

Samples Relinquished By: Ben Wolf			Samples Received By: A. Stein		
Date: 11 Jul 17	Time: 1746	Temp: 2.4/15	Date: 12 Jul 17	Time: 900	Temp: 4.8C
Samples Relinquished into: (Fridge) Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: Samplers Other:			Seal Number(s) - If Used		
Transport: Ambient Ice	Other:		Seals Intact? Yes No		



## ***Big Stone Plant CCR Appendix III Parameters***

CCR - Appendix III Detection Monitoring

### ***Field Parameters***

pH\*

\* Field and Laboratory Measurements

### ***Total Concentration Parameters***

Boron

Calcium

Chloride

Fluoride

pH

Sulfate

Dissolved Solids, Total

## **Big Stone CCR Appendix IV Parameters**

CCR - Appendix IV - Assessment Monitoring

### ***Total Concentration Parameters***

Antimony  
Arsenic  
Barium  
Beryllium  
Cadmium  
Chromium, Total  
Cobalt  
Fluoride  
Lead  
Lithium  
Mercury  
Molybdenum  
Selenium  
Thallium  
Radium 226 + 228

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Site: Otter Tail Power Co./ Big Stone

Sampling Personnel:

Facility ID: \_\_\_\_\_

Matt Stein

Date: July 17

Unique Station ID: \_\_\_\_\_

Sample ID: Well H2OX

### Well Condition

Well Locked?  Yes  No  
 Well Labeled?  Yes  No  
 Casing Straight?  Yes  No

Protective Posts?  Yes  No  
 State ID Tag?  Yes  No  
 Grout Seal Intact?  Yes  No

Repairs Necessary: \_\_\_\_\_

### Well Information

Well Depth: 32.81  
 Constructed Depth: 32.20  
 Casing Diameter: 2"  
 Water Level Before Purge: 6.73  
 Well Volume: 3.92 Gallons

Well Casing Elevation: 1103.91  
 Static Water Elevation: 1095.18  
 Previous Static: 1097.36  
 Water Level After Sample: Below Pump  
 Measurement Method: Electrode Steel Tape

### Sampling Information

Weather Conditions: Temp: 78° Wind: SE 10-15 Sky: cloudy  
 Sampling Method:  Grundfos  Bladder SST  Disp. Baller  Whale  Grab  Other:  
 Dedicated Equipment:  Yes  No  
 Well Purged Dry?  Yes  No  
 Time Purged Dry? 11:11  
 Duplicate Sample? Yes  No ID: \_\_\_\_\_  
 Pumping Rate: 0.25 gpm  
 Time Pump Began: 10:55 (am) / pm  
 Time of Sampling: 11:16 (am) / pm  
 Sample EH: 144.3  
 Sample Appearance: General: clear Color: none Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>11:11</u>	<u>6.76</u>	<u>4241</u>	<u>12.00</u>	<u>NA</u>	<u>NA</u>	<u>4.0</u>	1	
							2	
<u>11:16</u>	<u>7.35</u>	<u>4233</u>	<u>10.39</u>				3	<u>recharge</u>
							4	
							5	

Stabilized? Yes  No  Amount Water Removed: 4.0 Gallons

Comments: \_\_\_\_\_

Exceptions to Protocol: \_\_\_\_\_

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Matt Sten

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 11 July 07

Unique Station ID:

Sample ID: Well H3OX

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary:

Protective Posts? Yes  No

State ID Tag? Yes  No

Grout Seal Intact? Yes  No

## Well Information

Well Depth: 22.68

Constructed Depth: 22.55

Casing Diameter: 2"

Water Level Before Purge: 5.48

Well Volume: 2.81 Gallons

Well Casing Elevation: 1095.19

Static Water Elevation: 1089.71

Previous Static: 1190.12

Water Level After Sample: Below Pump

Measurement Method: Elec. W/L Steel Tape

## Sampling Information

Weather Conditions: Temp: 78 Wind: SE 5-10 Sky: Partly Sunny

Sampling Method: Grundfos  Bladder S&T  Disp. Bailor  Whale  Grab  Other:

Dedicated Equipment:  Yes  No

Well Purged Dry?  Yes  No

Time Purged Dry? 1:44

Duplicate Sample? Yes  No  ID:           

Sample Appearance: General: Clear Color: None Phase: None Odor: None

Pumping Rate: 0.25 gpm

Time Pump Began: 11:32 am / pm

Time of Sampling: 12:19 am / pm

Sample EH: 207.6

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>11:44</u>	<u>6.86</u>	<u>4224</u>	<u>11.63</u>	<u>NA</u>	<u>NA</u>	<u>3</u>	<u>1</u>	
<u>11:49</u>	<u>6.99</u>	<u>446</u>	<u>13.11</u>	<u> </u>	<u> </u>	<u>-</u>	<u>2</u>	<u>recharge</u>
							<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes  No

Amount Water Removed: 3.0 Gallons

Comments:

Exceptions to Protocol:



# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

*Matt Sten*

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: *11 July 17*

Unique Station ID:

Sample ID: Well H40X

## Well Condition

*\*wall closest to wooden post.*

Well Locked?  Yes  No

Protective Posts? Yes  No

Well Labeled?  Yes  No

State ID Tag? Yes  No

Casing Straight?  Yes  No

Grout Seal Intact?  Yes  No

Repairs Necessary:

## Well Information

Well Depth: *27.48*

Well Casing Elevation: 1108.22

Constructed Depth: 27.20

Static Water Elevation: *1089.94*

Casing Diameter: 2"

Previous Static: *1091.33*

Water Level Before Purge: *18.28*

Water Level After Sample:

Well Volume: *1.50* Gallons

Measurement Method:  Elec. W/L  Steel Tape

## Sampling Information

Weather Conditions: Temp: *79* Wind: *SSSE-10* Sky: *Cloudy*

Sampling Method:  Grundfos  Ladder  SS/Disp.  E/Whale  Grab  Other:

Dedicated Equipment:  Yes  No Pumping Rate: *6.25* gpm

Well Purged Dry?  Yes  No Time Pump Began: *1158*  am  pm

Time Purged Dry? *1804* Time of Sampling: *1209*  am  pm

Duplicate Sample? Yes  No  ID: *←* Sample EH: *225.9*

Sample Appearance: General: *Clear* Color: *none* Phase: *none* Odor: *none*

Time	pH	Specific Cond.	Temp °C	D. O.	Turbidity NTU	Gallons Removed	SE Q #	Comments:
<i>6</i> <i>1204</i>	<i>7.12</i>	<i>3007</i>	<i>13.37</i>	<i>NA</i>	<i>NA</i>	<i>1.5</i>	1	
							2	
							3	
<i>1209</i>	<i>7.00</i>	<i>2647</i>	<i>11.11</i>	<i>↓</i>	<i>↓</i>	<i>-</i>	4	<i>recharge</i>
							5	

Stabilized? Yes  No  Amount Water *1.5* Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Maart Sten

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 7/5 July 17

Unique Station ID:

Sample ID: Well H6

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary:

Protective Posts?  Yes  No

State ID Tag?  Yes  No

Grout Seal Intact? Yes  No

## Well Information

Well Depth: 17.92

Constructed Depth: 17.70

Casing Diameter: 2"

Water Level Before Purge: 13.09

Well Volume: 0.79 Gallons

Well Casing Elevation: NA

Static Water Elevation: +

Previous Static: +

Water Level After Sample: Below Pump

Measurement Method: Elec. Well  Steel Tape

## Sampling Information

Weather Conditions: Temp: 83 Wind: SE 5-10 Sky: fair

Sampling Method:  Grundfos  Bladder SS/T  Disp. Bailer  Whale  Grab  Other:

Dedicated Equipment:  Yes  No Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes  No Time Pump Began: 1229 am /  pm

Time Purged Dry? 1233 Time of Sampling: 1237 am /  pm

Duplicate Sample? Yes  No  ID: \_\_\_\_\_ Sample EH: 175.3

Sample Appearance: General: clear Color: none Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
<u>1233</u>	<u>7.52</u>	<u>1062</u>	<u>14.53</u>	<u>NA</u>	<u>NA</u>	<u>1</u>	<u>1</u>	
<u>1237</u>	<u>7.41</u>	<u>1026</u>	<u>11.79</u>	<u>]</u>	<u>]</u>	<u>-</u>	<u>2</u>	<u>recharge</u>
							<u>3</u>	
							<u>4</u>	
							<u>5</u>	

Stabiliz Yes  No  Amount Water Removed: 1 Gallons

Comments:

\*Well goes dry very fast!

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel:

Matt Skon

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 11 July 17

Unique Station ID:

Sample ID: Well H8

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary:

Protective Posts?  Yes  No

State ID Tag?  Yes  No

Grout Seal Intact?  Yes  No

## Well Information

Well Depth: 22.33

Constructed Depth: 22.05

Casing Diameter: 2"

Water Level Before Purge: 860

Well Volume: 2.24 Gallons

Well Casing Elevation: 1081.23

Static Water Elevation: 1072.63

Previous Static: 1074.68

Water Level After Sample: 9.15

Measurement Method:  Elec. W/L  Steel Tape

## Sampling Information

Weather Conditions: Temp: 85 Wind: SE 10-15 Sky: Fair

Sampling Method:  Grandfos  Bladder  SST  Disp.  Bailor  Whale  Grab  Other:

Dedicated Equipment:  Yes  No Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes  No Time Pump Began: 1250 am / pm

Time Purged Dry? Time of Sampling: 1317 am / pm

Duplicate Sample?  Yes  No ID: --- Sample EH: 21602

Sample Appearance: General: Clear Color: none Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1259	7.07	1376	9.26	na	na	2.25	1	
1308	7.06	1379	9.21			4.5	2	
1317	7.14	1377	9.21			6.75	3	
							4	
							5	

Stabilized:  Yes  No Amount Water Remove: 6.75 Gallons

Comments:

Exceptions to Protocol:

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 5607

507 354 8517

## Groundwater Assessment

Sampling Personne

Matt Stein

Site: Otter Tail Power Co./ Big Stone

Facility ID:

Date: 11 July 17

Unique Station I

Sample ID: Well H9

## Well Condition

Well Locked?  Yes  No

Well Labeled?  Yes  No

Casing Straight?  Yes  No

Repairs Necessary:

Protective Posts  Yes  No

State ID Tag?  Yes  No

Grout Seal Intact  Yes  No

## Well Information

Well Depth: 30.71

Constructed Depth: 30.20

Casing Diameter: 2"

Water Level Before Purge: 10.95

Well Volume: 3.22 Gallons

Well Casing Elevation: 1086.21

Static Water Elevation: 1075.26

Previous Static: 1078.6

Water Level After Sam 12.02

Measurement Method: Elec. W/L Steel Tape

## Sampling Information

Weather Conditions Temp: 86

Wind: SE @ 16

Sky: Sunny

Sampling Method: Grundfos  Bladder S/T  Disp. Bailer  Whale  Grab Other:

Dedicated Equipme  Yes  No

Pumping Rate: 0.25 gpm

Well Purged Dry?  Yes  No

Time Pump Beg 1324 am  pm

Time Purged Dry?

Time of Samplin 1403 am  pm

Duplicate Sample?  Yes  No ID: —

Sample EH: 212.5

Sample Appearance General: Clear Color: none Phase: none Odor: none

Time	pH	Specific Cond.	Temp °C	D. O. mg/L	Turbidity NTU	Gallons Removed	SEQ #	Comments:
1337	6.65	3113	16.66	NA	NA	3.25	1	
1350	6.70	3120	16.32			6.5	2	
1403	6.69	3116	16.39			9.75	3	
							4	
							5	

Stability  Yes  No

Amount Water Removed 9.75 Gallons

Comments:

Exceptions to Protocol:





MINNESOTA VALLEY TESTING LABORATORIES, INC.

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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com



FINAL REPORT COMPLETION DATE: 15Sept17AK

Date Reported: 11 Sep 2017

MEGAN LISBURG
OTTER TAIL POWER CO
PO BOX 496
FERGUS FALLS MN 56538-0496

Work Order #: 31-0400
Account #: 006106
PO #: 48680

Project Name: BIG STONE PLANT CCR

[Handwritten signature] 13 Sept 17
Field Service Manager/Date Reviewed
[Handwritten signature] 11 Sept 17
Chemistry Lab Manager/Date Reviewed
[Handwritten signature] for 11 September 2017
Quality Assurance Director/Date Reviewed

- RL = Reporting Limits
NQ = Not Present, Qualitative Only
PQ = Present, Qualitative Only
ND = Not Determined

All data for this report has been approved by MVTl Laboratory Management

MVTl guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTl to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTl. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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 www.mvtl.com



## CERTIFICATE of ANALYSIS - CCR

MEGAN LISBURG  
 OTTER TAIL POWER CO  
 PO BOX 496  
 FERGUS FALLS MN 56538-0496

Report Date: 11 Sep 2017  
 Lab Number: 17-A39211  
 Work Order #: 31-0400  
 Account #: 006106  
 Sample Matrix: GROUNDWATER  
 Date Sampled: 14 Aug 2017 11:21  
 Sampled By: MVTL FIELD PERSONNEL  
 Date Received: 14 Aug 2017 15:10  
 PO #: 48680

Project Name: BIG STONE PLANT CCR

Sample Description: H40X

Temp at Receipt: 0.7C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
MS Water Digestions					17 Aug 17	JMS
Water Digestions					16 Aug 17	JMS
Radium 226	SEE ATTACHED				6 Sep 17 17:42	ABL
Radium 228	SEE ATTACHED			EPA M9320	6 Sep 17 17:42	ABL
pH, Field	6.81 units		1.00	I-1586-85	14 Aug 17 11:21	DGF
pH	* 6.9 units		1.0	SM 4500 H+ B-2000	15 Aug 17 13:20	MCS
Sulfate	1000 ~ mg/L		5.0	ASTM D516-07	17 Aug 17 10:26	MRW
Chloride	48.8 mg/L		3.0	SM 4500 Cl E	17 Aug 17 9:28	AKF
Mercury	< 0.005 ug/L		0.005	EPA 245.7	18 Aug 17 14:35	RMB
Solids, Total Dissolved	2300 mg/L		10	SM 2540 C-97	16 Aug 17 21:35	JFG
Calcium	369.0 ~ mg/L		0.500	SW6010C	21 Aug 17 17:22	KAM
Lithium	0.097 # mg/L		0.005	SW6010C	21 Aug 17 17:22	KAM
Barium	0.011 mg/L		0.005	SW6010C	18 Aug 17 21:13	KAM
Chromium	< 0.01 mg/L		0.01	SW6010C	18 Aug 17 21:13	KAM
Cobalt	< 0.005 mg/L		0.005	SW6010C	18 Aug 17 21:13	KAM
Boron	0.317 mg/L		0.100	SW6010C	18 Aug 17 21:13	KAM
Antimony	< 0.5 ug/L		0.5	SW6020A	24 Aug 17 9:31	RMV
Arsenic	0.54 ug/L		0.50	SW6020A	21 Aug 17 10:14	DS
Beryllium	< 0.05 ug/L		0.05	SW6020A	21 Aug 17 10:14	DS
	See Narrative					
Cadmium	< 0.1 ug/L		0.1	SW6020A	21 Aug 17 10:14	DS
Lead	< 0.5 ug/L		0.5	SW6020A	21 Aug 17 10:14	DS
Molybdenum	3.50 ug/L		0.50	SW6020A	24 Aug 17 9:31	RMV
Selenium	< 2.5 ug/L		0.5	SW6020A	24 Aug 17 9:31	RMV
	@See Narrative					
Thallium	< 0.1 ug/L		0.1	SW6020A	21 Aug 17 10:14	DS
Fluoride	0.490 @ mg/L		0.020	EPA 300.0	23 Aug 17 13:45	RMV

\* Holding Time Exceeded

Radium 226 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

Radium 228 subcontracted to:  
 Inter-Mountain Labs  
 1673 Terra Ave  
 Sheridan, WY 82801

~ Sample diluted due to result above calibration of linear range.

RL = Reporting Limit  
 Analyses performed under our Minnesota Department of Health Accreditation conform to the current TNI standards.  
 The reporting limit was elevated for any analyte requiring a dilution as coded below:  
 @ = Due to sample matrix # = Due to concentration of other analytes  
 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040



**INORGANIC AND METALS ANALYSES:**

One of the beryllium knowns associated with 17-A39211 was above acceptance limits. Data that was below the reporting limit of 0.05 ug/L was reported.

The internal standard associated with selenium was outside of acceptance range in the laboratory control spike for sample 17-A39211. The data was reported based on the acceptable recovery of selenium in the laboratory control spike.

No other problems were encountered with these analyses.



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 1201 Lincoln Highway ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
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MEMBER  
ACIL

## Quality Control Report

Lab ID: 17-A39211

Project: BIG STONE PLANT CCR

Work Order: 201731-0400

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony ug/L	25.0	102	85-115	25.0	17-A39211	<0.5	26.0	104	75-125	26.0	26.2	105	0.8	10	100	90-110	< 0.5
Arsenic ug/L	25.0	101	85-115	25.0 25.0	17-A39131 17-A39211	<0.5 0.54	25.6 27.4	102 107	75-125 75-125	25.6 27.4	26.9 27.8	108 109	5.0 1.4	10 10	101	90-110	< 0.5
Barium mg/L	1.000	97	85-115	1.00	17-A39302	0.061	1.050	99	75-125	1.050	1.040	98	1.0	10	95	90-110	< 0.005
Beryllium ug/L	2.50	112	85-115	2.50	17-A39211	< 0.05	2.13	85	75-125	2.13	2.10	84	1.4	10	106	90-110	< 0.05
Boron mg/L	1.000	97	85-115	1.00	17-A39302	0.214	1.240	103	75-125	1.240	1.210	100	2.4	10	94	90-110	< 0.1
Cadmium ug/L	5.00	105	85-115	4.00	17-A39211	< 0.1	4.71	118	75-125	4.71	4.89	122	3.7	10	103	90-110	< 0.1
Calcium mg/L	50.00	113	85-115	50.0	17-A39302	90.90	142.0	102	75-125	142.0	139.0	96	2.1	10	105	90-110	< 0.5
Chloride mg/L	-	-	-	60.0	17-A38499	26.6	84.6	97	85-120	84.6	86.1	99	1.8	6	95	90-110	< 3
Chromium mg/L	1.000	100	85-115	1.00	17-A39302	< 0.01	1.020	102	75-125	1.020	0.990	99	3.0	10	100	90-110	< 0.01
Cobalt mg/L	1.000	101	85-115	1.00	17-A39302	< 0.005	1.000	100	75-125	1.000	0.966	97	3.5	10	99	90-110	< 0.005
Fluoride mg/L	-	-	-	0.20	17-A39660	0.540	0.770	115	75-125	0.770	0.770	115	0.0	10	105	90-110	< 0.02
Lead ug/L	25.0	108	85-115	25.0 25.0	17-A39131 17-A39211	< 0.5 < 0.5	26.7 25.7	107 103	75-125 75-125	26.7 25.7	27.7 26.5	111 106	3.7 3.1	10 10	106	90-110	< 0.5
Lithium mg/L	1.000	112	85-115	1.00	17-A39211	0.097	1.160	106	75-125	1.160	1.100	100	5.3	10	106	90-110	< 0.005
Mercury ug/L	- -	- -	- -	0.10	17-A39426	< 0.005	0.105	105	63-111	0.105	0.102	102	2.9	18	98	76-113	< 0.005 < 0.005
Molybdenum ug/L	25.0	98	85-115	25.0	17-A39211	3.50	27.8	97	75-125	27.8	27.7	97	0.4	10	96	90-110	< 0.5
pH units	-	-	-	-	-	-	-	-	-	6.9	7.0	-	1.4	2.5	101	90-110	-
Selenium ug/L	25.0	105	85-115	25.0	17-A39211	< 2.5	29.8	119	75-125	29.8	29.0	116	2.7	10	100	90-110	< 0.5
Solids, Total Dissolved mg/L	-	-	-	-	-	-	-	-	-	3360	3360	-	0.0	8	102	85-115	< 10

**Quality Control Report**

Lab ID: 17-A39211

Project: BIG STONE PLANT CCR

Work Order: 201731-0400

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Sulfate mg/L	-	-	-	500	17-A39211	1000	1520	104	74-128	1520	1510	102	0.7	5	93	80-120	< 5
	-	-	-	500	17-A39659	125	601	95	74-128	601	623	100	3.6	5			
Thallium ug/L	5.00	109	85-115	5.00	17-A39211	< 0.1	5.38	108	75-125	5.38	5.55	111	3.1	10	108	90-110	< 0.1

Approved by: \_\_\_\_\_





Date: 9/6/2017

**CLIENT:** MVTL Inc  
**Project:** Ottertail Power Big Stone  
**Lab Order:** S1708284

**CASE NARRATIVE**  
**Report ID:** S1708284001

Sample H4OX-A39211 was received on August 16, 2017.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions  
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition  
40 CFR Parts 136 and 141  
40 CFR Part 50, Appendices B, J, L, and O  
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012  
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Inc  
 1126 N Front St  
 New Ulm, MN 56073

**ProjectName:** Ottertail Power Big Stone

**Lab ID:** S1708284-001

**ClientSample ID:** H4OX-A39211

**COC:** WO#31-0400

**Date Reported:** 9/6/2017

**Report ID:** S1708284001

**WorkOrder:** S1708284

**CollectionDate:** 8/14/2017 11:21:00 AM

**DateReceived:** 8/16/2017 10:34:00 AM

**FieldSampler:**

**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	ND	pCi/L		1	SM 7500 Ra-B	08/28/2017 1047	MB
Radium 226 Precision (±)	NA	pCi/L			SM 7500 Ra-B	08/28/2017 1047	MB
Radium 228	ND	pCi/L		2	Ga-Tech	08/30/2017 032	MB
Radium 228 Precision (±)	NA	pCi/L			Ga-Tech	08/30/2017 032	MB

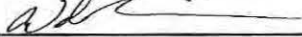
#### These results apply only to the samples tested.

#### RL - Reporting Limit

**Qualifiers:**

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by:   
 Wade Nieuwsma, Assistant Laboratory Manager



### ANALYTICAL QC SUMMARY REPORT

**CLIENT:** MVTL Inc  
**Work Order:** S1708284  
**Project:** Ottertail Power Big Stone

**Date:** 9/6/2017  
**Report ID:** S1708284001

Radium 228 by Ga/Tech	Sample Type	MBLK	Units: pCi/L			
MB-457 (08/29/17 09:16)	RunNo:	149627	PrepDate:	08/23/17 12:00	BatchID	13621
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual

Total Radium 228 ND 1

Radium 228 by Ga/Tech	Sample Type	LCS	Units: pCi/L			
LCS-457 (08/29/17 12:20)	RunNo:	149627	PrepDate:	08/23/17 12:00	BatchID	13621
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual

Total Radium 228 44 1 39.5 110 65.9 - 132

Radium 228 by Ga/Tech	Sample Type	MS	Units: pCi/L			
MS-457 (08/29/17 18:26)	RunNo:	149627	PrepDate:	08/23/17 12:00	BatchID	13621
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual

Total Radium 228 40 1 39.5 ND 101 50 - 139

Radium 228 by Ga/Tech	Sample Type	MSD	Units: pCi/L			
MSD-457 (08/29/17 21:29)	RunNo:	149627	PrepDate:	08/23/17 12:00	BatchID	13621
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits Qual

Total Radium 228 41 1 40 2.30 104 20

Radium 226 in Water -	Sample Type	MBLK	Units: pCi/L			
MB-1788 (09/01/17 09:29)	RunNo:	149629	PrepDate:	08/23/17 0:00	BatchID	13620
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual

Radium 226 ND 0.2

Radium 226 in Water -	Sample Type	LCS	Units: pCi/L			
LCS-1788 (08/28/17 10:47)	RunNo:	149629	PrepDate:	08/23/17 0:00	BatchID	13620
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual

Radium 226 6.5 0.2 6.41 102 67.1 - 122

Radium 226 in Water -	Sample Type	LCSD	Units: pCi/L			
LCSD-1788 (08/28/17 10:47)	RunNo:	149629	PrepDate:	08/23/17 0:00	BatchID	13620
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits Qual

Radium 226 7.0 0.2 6.5 7.12 109 20

Radium 226 in Water -	Sample Type	MS	Units: pCi/L			
S1708355-008AMS (08/28/17 14:12)	RunNo:	149629	PrepDate:	08/23/17 0:00	BatchID	13620
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual

Radium 226 12.6 0.2 12.8 ND 98.4 65 - 131

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - G Analyzed at IML Gillette laboratory
  - J Analyte detected below quantitation limits
  - ND Not Detected at the Reporting Limit
  - R RPD outside accepted recovery limits
  - X Matrix Effect
  - E Value above quantitation range
  - H Holding times for preparation or analysis exceeded
  - L Analyzed by another laboratory
  - O Outside the Range of Dilutions
  - S Spike Recovery outside accepted recovery limits



# Minnesota Valley Testing Laboratories

1126 North Front Street New Ulm, MN 56003  
 Phone: 800 782 3557 Fax: 507 359 2890

## Field Service Chain of Custody Record

<b>Project:</b> Otter Tail Power Company	<b>Project Type:</b> Big Stone Plant CCR	<b>Name of Samplers:</b> Ben wolf
<b>Report:</b> Otter Tail Power Company	<b>Carbon Copy:</b>	<b>Quote Number:</b>
<b>Attn:</b> Paul Vukonich	<b>Attn:</b>	<b>Work Order Number:</b> 31-0400
<b>Address:</b> P.O. Box 496	<b>Address:</b>	<b>Lab Numbers:</b>
Fergus Falls, MN 56538-0496		
<b>Phone:</b> 218-739-8349		

Sample Information					Bottle Type												Analysis			
Lab Number	Sample ID	Unique Station ID	Date	Time	Sample Type	Sample Location	1000 HNO3	Filtered Y or N	1000 none	500 HNO3	Filter? Y or N	500 H2SO4	Filter? Y or N	1000 Amber none	1000 Amber H2SO4	500 NaOH	Other: 150 H2SO4	Other: 150 None	Analysis Required	
A3921	H4OX		14 Aug 17	1121	GW		2	N	1	1	N								See Attached	
					GW															
					GW															
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					GW															
					GW															

Comments:  
**WORK ORDER #2**

Samples Relinquished By: Ben wolf			Samples Received By: D. Reeder		
Date: 14 Aug 17	Time: 1516	Temp: 7.1 MG	Date: 14 Aug 17	Time: 1510	Temp: 0.7C
Samples Relinquished into: Fridge Log in Cart Other:					
Samples Relinquished By:			Samples Received By:		
Date:	Time:	Temp:	Date:	Time:	Temp:
Delivery: Samplers Other:			Seal Number(s) - If Used		
Transport: Ambient Ice Other:			Seals Intact? Yes No		

# Minnesota Valley Testing Laboratories, Inc.

New Ulm, MN 56073

507 354 8517

## Groundwater Assessment

Sampling Personnel: Ben wolf

Site: Otter Tail Power Co./ Big Stone  
 Facility ID: \_\_\_\_\_  
 Date: 14 Aug 17  
 Unique Station ID: \_\_\_\_\_  
 Sample ID: Well H40X

## Well Condition

Well Locked?  Yes  No  
 Well Labeled?  Yes  No  
 Casing Straight?  Yes  No  
 Repairs Necessary: \_\_\_\_\_

Protective Posts? Yes  No  
 State ID Tag? Yes  No  
 Grout Seal Intact?  Yes  No

## Well Information

Well Depth: 27.48  
 Constructed Depth: 27.20  
 Casing Diameter: 2"  
 Water Level Before Purge: 18.41  
 Well Volume: 1.48 Gallons

Well Casing Elevation: 1108.22  
 Static Water Elevation: 1089.81  
 Previous Static: 1091.47  
 Water Level After Sample: 24.42  
 Measurement Method: Elec. W/L Steel Tape

## Sampling Information

Weather Conditions: Temp: 107 Wind: W Sky: cloudy  
 Sampling Method:  Groundfos  Bladder SS  Disp. E/Whale  Grab  Other:  
 Dedicated Equipment:  Yes  No Pumping Rate: 25 gpm  
 Well Purged Dry?  Yes  No Time Pump Began: 1110  am  pm  
 Time Purged Dry? 1116 Time of Sampling: 1121  am  pm  
 Duplicate Sample? Yes  No ID: - Sample E 104.3  
 Sample Appearance: General: Clear Color: NR Phase: NR Odor: NR

Time	pH	Specific Cond.	Temp °C	D. O.	Turbidity NTU	Gallons Removed	SE Q #	Comments:
<u>6</u>								
<u>1116</u>	<u>6.65</u>	<u>2829</u>	<u>9.21</u>	<u>NA</u>	<u>NA</u>	<u>1.5</u>	<u>1</u>	
							<u>2</u>	
<u>1121</u>	<u>6.81</u>	<u>2845</u>	<u>9.40</u>	<u>I</u>	<u>I</u>	<u>-</u>	<u>3</u>	<u>Recharge</u>
							<u>4</u>	
							<u>5</u>	

Stabilized? Yes  No Amount Water I 1.5 Gallons

Comments:

Exceptions to Protocol: