



1414 West Hamilton Avenue  
P.O. Box 8  
Eau Claire, WI 54702-0008

January 30, 2018

Ms. Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, NE  
Washington, D.C. 20426

**Subject: 2017 Water Quality Monitoring Report – Articles 404 & 406  
Big Falls Hydro (P-2390-01) and Thornapple Hydro (P-2475)**

Dear Secretary:

Enclosed is the 2017 Water Quality Monitoring Report for the Big Falls and Thornapple hydro projects. The report is filed pursuant to license articles 404 (Big Falls) and 406 (Thornapple). The results are summarized for the past five years and while there appears to be some variability in the parameters analyzed, for the most part, the results have been relatively consistent. Xcel Energy (licensee) has also confirmed that the water quality monitoring results for Turtle Flambeau Reservoir (P-2390-02) have been posted on the WDNR's website.

Licensee provided a copy of the report to the WDNR and USFWS for comment via e-mail on November 30, 2017. The WDNR responded that they had no comments. The USFWS did not provide comments. Agency correspondence is included in Appendix D of the report.

Should you have any questions regarding this report, feel free to contact Matthew Miller of this office at (715) 737-1353 or by e-mail at [matthew.j.miller@xcelenergy.com](mailto:matthew.j.miller@xcelenergy.com).

Sincerely,

A handwritten signature in cursive script that reads 'William Zawacki'.

William Zawacki  
Director, Hydro Plants

Enclosure: Water Quality Monitoring Report

c: Jeff Scheirer – WDNR (cover letter only – via e-mail)  
Cheryl Laatsch – WDNR (cover letter only – via email)  
Nick Utrup – USFWS (cover letter only – via e-mail)  
Project Files

**2017 Water Quality Monitoring Report for Big Falls Flowage  
(P-2390-01) and Thornapple Flowage (P-2475)**

Northern States Power Company –WI

An Xcel Energy Company

November 2017

## **APPENDIX A**

**2017 Water Quality Lab Analysis For Big Falls  
and Thornapple Flowages**



Minneapolis Testing Laboratory  
1518 Chestnut Ave N  
Minneapolis, MN 55043  
Certification # MN-027-053-197  
WI-999071150

Christine Keefe, Supervisor (612) 630-4506

Big Falls Hydro	Project Name/Location: Phosphorus	
1400 Western Ave		Reported:
Eau Claire WI, 54701	Project Manager: Matt J Miller	05/11/2017 07:51

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sample Qualifier	Laboratory ID	Matrix	Sampled	Received
Big Falls Flowage Surface		MCE0026-01	Water	04/24/2017 12:09	05/02/2017 13:23
Big Falls Flowage Bottom		MCE0026-02	Water	04/24/2017 12:18	05/02/2017 13:23



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Christine Keefe, Supervisor (612) 630-4506

Big Falls Hydro	Project Name/Location: Phosphorus	
1400 Western Ave		Reported:
Eau Claire WI, 54701	Project Manager: Matt J Miller	05/11/2017 07:51

**Big Falls Flowage Surface**

MCE0026-01 (Water) - Chain of Custody Number: 238396

Analyte	Result	LOD	LOQ	Units	Analyte		Batch	Prepared	Analyzed	Method	Analyst
					Qualifier	Dilution					
<b>Phosphate, Total as P</b>	0.0247	0.00500	0.0160	mg/L		1	BCE0202	5/9/17 11:19	5/10/17 10:22	EPA 365.1	HRD

**Wet Chemistry**



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Christine Keefe, Supervisor (612) 630-4506

Big Falls Hydro	Project Name/Location: Phosphorus	
1400 Western Ave		Reported:
Eau Claire WI, 54701	Project Manager: Matt J Miller	05/11/2017 07:51

**Big Falls Flowage Bottom**

MCE0026-02 (Water) - Chain of Custody Number: 238396

Analyte	Result	LOD	LOQ	Units	Analyte		Batch	Prepared	Analyzed	Method	Analyst
					Qualifier	Dilution					
<b>Phosphate, Total as P</b>	0.0290	0.00500	0.0160	mg/L		1	BCE0202	5/9/17 11:19	5/10/17 10:23	EPA 365.1	HRD

**Wet Chemistry**



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Thornapple Hydro	Project Name/Location: Phosphorus	
W 5506 Dam Road		Reported:
Glen Flora WI, 54563	Project Manager: Matt J Miller	05/11/2017 07:52

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sample Qualifier	Laboratory ID	Matrix	Sampled	Received
Thornapple Flowage Surface		MCE0025-01	Water	04/24/2017 14:12	05/02/2017 13:23
Thornapple Flowage Bottom		MCE0025-02	Water	04/24/2017 14:18	05/02/2017 13:23



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Christine Keefe, Supervisor (612) 630-4506

Thornapple Hydro	Project Name/Location: Phosphorus	
W 5506 Dam Road		Reported:
Glen Flora WI, 54563	Project Manager: Matt J Miller	05/11/2017 07:52

**Thornapple Flowage Surface**

MCE0025-01 (Water) - Chain of Custody Number: 238396

Analyte	Result	LOD	LOQ	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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**Wet Chemistry**

Phosphate, Total as P	0.0182	0.00500	0.0160	mg/L		1	BCE0202	5/9/17 11:19	5/10/17 10:21	EPA 365.1	HRD
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Christine Keefe, Supervisor (612) 630-4506

Thornapple Hydro	Project Name/Location: Phosphorus	
W 5506 Dam Road		Reported:
Glen Flora WI, 54563	Project Manager: Matt J Miller	05/11/2017 07:52

**Thornapple Flowage Bottom**

MCE0025-02 (Water) - Chain of Custody Number: 238396

Analyte	Result	LOD	LOQ	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
<b>Phosphate, Total as P</b>	<b>0.0285</b>	0.00500	0.0160	mg/L		1	BCE0202	5/9/17 11:19	5/10/17 10:21	EPA 365.1	HRD

**Wet Chemistry**

**NORTHERN LAKE SERVICE, INC.**  
 Analytical Laboratory and Environmental Services  
 400 North Lake Avenue - Crandon, WI 54520  
 Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460  
 WDATCP Laboratory Certification No. 105-330  
 EPA Laboratory ID No. WI00034

Printed: 05/05/17 Page 1 of 1

**Client:** Xcel Energy  
 Attn: Matt Miller  
 1414 W. Hamilton Ave  
 P.O. Box 8  
 Eau Claire, WI 54702

**NLS Project:** 278352  
**NLS Customer:** 96708  
 Phone: 715 737 1353

**Project:** Big Falls-Thornapple

**Big Falls Flowage** NLS ID: 985137

COC: 198992:1 Matrix: SW  
 Collected: 04/24/17 12:09 Received: 04/26/17

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	See Attached					05/03/17	10200-H	721026460
Lab filtration for Chlorophyll	yes					04/26/17	NA	721026460

**Thornapple Flowage** NLS ID: 985138

COC: 198992:2 Matrix: SW  
 Collected: 04/24/17 14:12 Received: 04/26/17

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	See Attached					05/03/17	10200-H	721026460
Lab filtration for Chlorophyll	yes					04/26/17	NA	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(\*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution and/or solids content.

ND = Not Detected (< LOD)    LOD = Limit of Detection    LOQ = Limit of Quantitation    NA = Not Applicable  
 DWB = Dry Weight Basis    %DWB = (mg/kg DWB) / 10000    1000 ug/L = 1 mg/L  
 MCL = Maximum Contaminant Levels for Drinking Water Samples.    Shaded results indicate >MCL.

Reviewed by:



Authorized by:  
 R. T. Krueger  
 President

Northern Lake Service, Inc.  
Chlorophyll Results

Customer: Xcel Energy

Project: 278352

Big Falls-Thornapple

<u>Sample</u>	<u>Description</u>	<u>CC a</u>	<u>Pheo a</u>	<u>TC a</u>	<u>TC b</u>	<u>TC c</u>
985137	Big Falls Flowage	3.6	1.8	4.8	0.0*	0.57
985138	Thornapple Flowage	2.5	1.3	3.4	0.0082	0.58

CC a = Corrected Chlorophyll a

Pheo a = Pheophytin a

TC a = Trichromatic Chlorophyll a

TC b = Trichromatic Chlorophyll b

TC c = Trichromatic Chlorophyll c

Units = ug/L for Water, ug/cm<sup>2</sup> for periphyton samplers

\*: The complex calculations used to differentiate the various chlorophyll species magnify error at low concentrations and sometimes produce negative values, which are reported as 0.0 on this report.



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Christine Keefe, Supervisor (612) 630-4506

Big Falls Hydro	Project Name/Location: Phosphorus	
1400 Western Ave		Reported:
Eau Claire WI, 54701	Project Manager: Matt J Miller	08/10/2017 13:51

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sample Qualifier	Laboratory ID	Matrix	Sampled	Received
Big Falls Flowage Surface	M_T	MCG0300-01	Water	07/24/2017 10:35	07/27/2017 13:18
Big Falls Flowage Bottom	M_T	MCG0300-02	Water	07/24/2017 10:42	07/27/2017 13:18



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Big Falls Hydro	Project Name/Location: Phosphorus	
1400 Western Ave		Reported:
Eau Claire WI, 54701	Project Manager: Matt J Miller	08/10/2017 13:51

**Big Falls Flowage Surface**

MCG0300-01 (Water) - Chain of Custody Number: 238397

Analyte	Result	LOD	LOQ	Units	Analyte		Batch	Prepared	Analyzed	Method	Analyst
					Qualifier	Dilution					
<b>Phosphate, Total as P</b>	<b>0.0336</b>	0.00500	0.0160	mg/L		1	BCH0025	8/1/17 12:43	8/7/17 13:49	EPA 365.1	HRD

**Wet Chemistry**



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Certification # MN-027-053-197  
WI-999071150

Christine Keefe, Supervisor (612) 630-4506

Big Falls Hydro	Project Name/Location: Phosphorus	
1400 Western Ave		Reported:
Eau Claire WI, 54701	Project Manager: Matt J Miller	08/10/2017 13:51

**Big Falls Flowage Bottom**

MCG0300-02 (Water) - Chain of Custody Number: 238397

Analyte	Result	LOD	LOQ	Units	Analyte		Batch	Prepared	Analyzed	Method	Analyst
					Qualifier	Dilution					
<b>Phosphate, Total as P</b>	<b>0.0459</b>	0.00500	0.0160	mg/L		1	BCH0025	8/1/17 12:43	8/7/17 13:50	EPA 365.1	HRD

**Wet Chemistry**



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Christine Keefe, Supervisor (612) 630-4506

Thornapple Hydro	Project Name/Location: Phosphorus	
W 5506 Dam Road		Reported:
Glen Flora WI, 54563	Project Manager: Matt J Miller	08/10/2017 13:53

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sample Qualifier	Laboratory ID	Matrix	Sampled	Received
Thornapple Flowage Surface	M_T	MCG0301-01	Water	07/24/2017 13:02	07/27/2017 13:18
Thornapple Flowage Bottom	M_T	MCG0301-02	Water	07/24/2017 13:07	07/27/2017 13:18



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WI-999071150

Christine Keefe, Supervisor (612) 630-4506

Thornapple Hydro	Project Name/Location: Phosphorus	
W 5506 Dam Road		Reported:
Glen Flora WI, 54563	Project Manager: Matt J Miller	08/10/2017 13:53

**Thornapple Flowage Surface**

**MCG0301-01 (Water) - Chain of Custody Number: 238397**

Analyte	Result	LOD	LOQ	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
<b>Phosphate, Total as P</b>	<b>0.0264</b>	0.00500	0.0160	mg/L		1	BCH0025	8/1/17 12:43	8/7/17 13:51	EPA 365.1	HRD

**Wet Chemistry**





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Christine Keefe, Supervisor (612) 630-4506

Thornapple Hydro	Project Name/Location: Phosphorus	
W 5506 Dam Road		Reported:
Glen Flora WI, 54563	Project Manager: Matt J Miller	08/10/2017 13:53

**Thornapple Flowage Bottom**

**MCG0301-02 (Water) - Chain of Custody Number: 238397**

Analyte	Result	LOD	LOQ	Units	Analyte		Batch	Prepared	Analyzed	Method	Analyst
					Qualifier	Dilution					
<b>Phosphate, Total as P</b>	<b>0.0360</b>	0.00500	0.0160	mg/L		1	BCH0025	8/1/17 12:43	8/7/17 13:52	EPA 365.1	HRD

**Wet Chemistry**

**NORTHERN LAKE SERVICE, INC.**  
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# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460  
 WDATCP Laboratory Certification No. 105-330  
 EPA Laboratory ID No. WI00034

Printed: 07/31/17 Page 1 of 1

**Client:** Xcel Energy  
 Attn: Matt Miller  
 1414 W. Hamilton Ave  
 P.O. Box 8  
 Eau Claire, WI 54702

**NLS Project:** 283861  
**NLS Customer:** 96708  
 Phone: 715 737 1353

**Project:** Big Falls-Thornapple

**Big Falls Flowage** NLS ID: 1006952

COC: 226593:1 Matrix: SW

Collected: 07/24/17 10:35 Received: 07/27/17

Notes: Noncompliance: Sample(s) received at 11.7 degrees C, which is above WDNR protocol of 6 degrees C.

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	See Attached					07/29/17	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/28/17	NA	721026460

**Thornapple Flowage** NLS ID: 1006953

COC: 226593:2 Matrix: SW

Collected: 07/24/17 13:05 Received: 07/27/17

Notes: Noncompliance: Sample(s) received at 11.7 degrees C, which is above WDNR protocol of 6 degrees C.

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	See Attached					07/29/17	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/28/17	NA	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(\*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution and/or solids content.

ND = Not Detected (< LOD)    LOD = Limit of Detection    LOQ = Limit of Quantitation    NA = Not Applicable  
 DWB = Dry Weight Basis    %DWB = (mg/kg DWB) / 10000    1000 ug/L = 1 mg/L  
 MCL = Maximum Contaminant Levels for Drinking Water Samples.    Shaded results indicate >MCL.

Reviewed by:



Authorized by:  
 R. T. Krueger  
 President

Northern Lake Service, Inc.  
Chlorophyll Results

Customer: Xcel Energy

Project: 283861

Big Falls-Thornapple

<u>Sample</u>	<u>Description</u>	<u>CC a</u>	<u>Pheo a</u>	<u>TC a</u>	<u>TC b</u>	<u>TC c</u>
1006952	Big Falls Flowage	1.6	1.7	2.6	0.79	1.1
1006953	Thornapple Flowage	1.3	0.53	1.7	0.65	0.9

CC a = Corrected Chlorophyll a

Pheo a = Pheophytin a

TC a = Trichromatic Chlorophyll a

TC b = Trichromatic Chlorophyll b

TC c = Trichromatic Chlorophyll c

Units = ug/L for Water, ug/cm<sup>2</sup> for periphyton samplers

\*: The complex calculations used to differentiate the various chlorophyll species magnify error at low concentrations and sometimes produce negative values, which are reported as 0.0 on this report.



Minneapolis Testing Laboratory  
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Minneapolis, MN 55043  
Certification # MN-027-053-197  
WI-999071150

Christine Keefe, Supervisor (612) 630-4506

Big Falls Hydro	Project Name/Location: Phosphorus	
1400 Western Ave		Reported:
Eau Claire WI, 54701	Project Manager: Matt J Miller	09/15/2017 07:48

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sample Qualifier	Laboratory ID	Matrix	Sampled	Received
Big Falls Flowage Surface	M_T	MCI0005-01	Water	08/29/2017 9:58	09/05/2017 7:00
Big Falls Flowage Bottom	M_T	MCI0005-02	Water	08/29/2017 10:02	09/05/2017 7:00



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 WI-999071150

Christine Keefe, Supervisor (612) 630-4506

Big Falls Hydro	Project Name/Location: Phosphorus	
1400 Western Ave		Reported:
Eau Claire WI, 54701	Project Manager: Matt J Miller	09/15/2017 07:48

**Big Falls Flowage Surface**

**MCI0005-01 (Water) - Chain of Custody Number: 238397**

Analyte	Result	LOD	LOQ	Units	Analyte		Batch	Prepared	Analyzed	Method	Analyst
					Qualifier	Dilution					
<b>Phosphate, Total as P</b>	<b>0.0235</b>	0.00500	0.0160	mg/L		1	BCI0244	9/13/17 10:18	9/14/17 9:54	EPA 365.1	HRD

**Wet Chemistry**



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 WI-999071150

Christine Keefe, Supervisor (612) 630-4506

Big Falls Hydro	Project Name/Location: Phosphorus	
1400 Western Ave		Reported:
Eau Claire WI, 54701	Project Manager: Matt J Miller	09/15/2017 07:48

**Big Falls Flowage Bottom**

**MCI0005-02 (Water) - Chain of Custody Number: 238397**

Analyte	Result	LOD	LOQ	Units	Analyte		Batch	Prepared	Analyzed	Method	Analyst
					Qualifier	Dilution					

**Wet Chemistry**

<b>Phosphate, Total as P</b>	<b>0.0553</b>	0.00500	0.0160	mg/L			1	BCI0244	9/13/17 10:18	9/14/17 9:55	EPA 365.1	HRD
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Certification # MN-027-053-197  
WI-999071150

Christine Keefe, Supervisor (612) 630-4506

Thornapple Hydro	Project Name/Location: Phosphorus	
W 5506 Dam Road		Reported:
Glen Flora WI, 54563	Project Manager: Matt J Miller	09/15/2017 07:50

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sample Qualifier	Laboratory ID	Matrix	Sampled	Received
Thornapple Flowage Surface	M_T	MCI0006-01	Water	08/29/2017 11:38	09/05/2017 7:00
Thornapple Flowage Bottom	M_T	MCI0006-02	Water	08/29/2017 11:43	09/05/2017 7:00



Minneapolis Testing Laboratory  
 1518 Chestnut Ave N  
 Minneapolis, MN 55043  
 Certification # MN-027-053-197  
 WI-999071150

Christine Keefe, Supervisor (612) 630-4506

Thornapple Hydro	Project Name/Location: Phosphorus	
W 5506 Dam Road		Reported:
Glen Flora WI, 54563	Project Manager: Matt J Miller	09/15/2017 07:50

**Thornapple Flowage Surface**

**MCI0006-01 (Water) - Chain of Custody Number: 238398**

Analyte	Result	LOD	LOQ	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
<b>Phosphate, Total as P</b>	<b>0.0276</b>	0.00500	0.0160	mg/L		1	BCI0244	9/13/17 10:18	9/14/17 9:56	EPA 365.1	HRD

**Wet Chemistry**





Minneapolis Testing Laboratory  
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 Minneapolis, MN 55043  
 Certification # MN-027-053-197  
 WI-999071150

Christine Keefe, Supervisor (612) 630-4506

Thornapple Hydro	Project Name/Location: Phosphorus	
W 5506 Dam Road		Reported:
Glen Flora WI, 54563	Project Manager: Matt J Miller	09/15/2017 07:50

**Thornapple Flowage Bottom**

**MCI0006-02 (Water) - Chain of Custody Number: 238398**

Analyte	Result	LOD	LOQ	Units	Analyte Qualifier	Dilution	Batch	Prepared	Analyzed	Method	Analyst
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**Wet Chemistry**

<b>Phosphate, Total as P</b>	<b>0.0291</b>	0.00500	0.0160	mg/L		1	BCI0244	9/13/17 10:18	9/14/17 9:57	EPA 365.1	HRD
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**NORTHERN LAKE SERVICE, INC.**  
 Analytical Laboratory and Environmental Services  
 400 North Lake Avenue - Crandon, WI 54520  
 Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460  
 WDATCP Laboratory Certification No. 105-330  
 EPA Laboratory ID No. WI00034

Printed: 09/14/17 Page 1 of 1

**Client:** Xcel Energy  
 Attn: Matt Miller  
 1414 W. Hamilton Ave  
 P.O. Box 8  
 Eau Claire, WI 54702

**NLS Project:** 286261  
**NLS Customer:** 96708  
 Phone: 715 737 1353

**Project:** Big Falls-Thornapple

**Big Falls Flowage** NLS ID: 1015087

COC: 227575:1 Matrix: SW  
 Collected: 08/29/17 09:58 Received: 08/31/17

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	See Attached					09/13/17	10200-H	721026460
Lab filtration for Chlorophyll	yes					09/01/17	NA	721026460

**Thornapple Flowage** NLS ID: 1015088

COC: 227575:2 Matrix: SW  
 Collected: 08/29/17 11:38 Received: 08/31/17

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	See Attached					09/13/17	10200-H	721026460
Lab filtration for Chlorophyll	yes					09/01/17	NA	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(\*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution and/or solids content.

ND = Not Detected (< LOD)    LOD = Limit of Detection    LOQ = Limit of Quantitation    NA = Not Applicable  
 DWB = Dry Weight Basis    %DWB = (mg/kg DWB) / 10000    1000 ug/L = 1 mg/L  
 MCL = Maximum Contaminant Levels for Drinking Water Samples.    Shaded results indicate >MCL.

Reviewed by:



Authorized by:  
 R. T. Krueger  
 President

Northern Lake Service, Inc.  
Chlorophyll Results

Customer: Xcel Energy

Project: 286261

Big Falls-Thornapple

<u>Sample</u>	<u>Description</u>	<u>CC a</u>	<u>Pheo a</u>	<u>TC a</u>	<u>TC b</u>	<u>TC c</u>
1015087	Big Falls Flowage	3.1	0.46	3.5	0.23	0.56
1015088	Thornapple Flowage	1.1	0.75	1.6	0.19	0.2

CC a = Corrected Chlorophyll a

Pheo a = Pheophytin a

TC a = Trichromatic Chlorophyll a

TC b = Trichromatic Chlorophyll b

TC c = Trichromatic Chlorophyll c

Units = ug/L for Water, ug/cm<sup>2</sup> for periphyton samplers

\*: The complex calculations used to differentiate the various chlorophyll species magnify error at low concentrations and sometimes produce negative values, which are reported as 0.0 on this report.

## **APPENDIX B**

**Summary Of Total Phosphorous And Chlorophyll A  
Data For Big Falls And Thornapple Flowages  
2013 - 2017**

## Summary of Water Quality Data for Big Falls and Thornapple Flowages (2013-2017)

<u>Date</u>	<u>Big Falls Flowage</u>			<u>Thornapple Flowage</u>		
	Surface	Surface	Bottom	Surface	Surface	Bottom
	Total Phosphorus (mg/L P)	Chlorophyll-A (CCa) (ug/L)	Total Phosphorus (mg/L P)	Total Phosphorus (mg/L P)	Chlorophyll-A (CCa) (ug/L)	Total Phosphorus (mg/L P)
5/29/2013	<0.05	2.6	0.06	0.07	1.3	0.07
7/30/2013	<0.05	3.1	<0.05	<0.05	1.3	0.05
8/27/2013	<0.05	5.0	0.06	<0.05	18.0	0.05
7/22/2014*	0.04	5.0	0.05	0.04	1.9	0.05
8/27/2014	0.03	3.6	0.10	0.04	14.0	<0.01
4/28/2015	0.02	1.3	0.03	0.03	1.7	0.02
7/21/2015	0.04	6.8	0.05	0.03	0.6	0.03
8/26/2015	0.03	4.1	0.03	0.03	2.4	0.03
5/3/2016	0.02	1.9	0.02	0.02	2.1	0.02
7/19/2016	0.03	2.0	0.06	0.03	0.6	0.03
8/30/2016	0.02	4.7	0.03	0.03	1.3	0.03
<b>4/24/2017</b>	<b>0.02</b>	<b>3.6</b>	<b>0.03</b>	<b>0.02</b>	<b>2.5</b>	<b>0.03</b>
<b>7/24/2017</b>	<b>0.03</b>	<b>1.6</b>	<b>0.05</b>	<b>0.03</b>	<b>1.3</b>	<b>0.04</b>
<b>8/29/2017</b>	<b>0.02</b>	<b>3.1</b>	<b>0.06</b>	<b>0.03</b>	<b>1.1</b>	<b>0.03</b>
<i>Average (Ice-out sample)</i>	0.02	1.93	0.04	0.04	1.70	0.04
<i>Average (July sample)</i>	0.03	4.23	0.05	0.03	1.10	0.04
<i>Average (August sample)</i>	0.03	4.35	0.06	0.03	8.93	0.04

\* No spring sampling conducted due to high river flows

## **APPENDIX C**

**Summary Of Dissolved Oxygen and Temperature  
Data for Big Falls Flowage and Thornapple Flowage  
2013-2017**

**Dissolved Oxygen and Temperature Profiles for the Big Falls Flowage in 2013.**

Date: 5/29/2013			Date: 7/30/2013			Date: 8/27/2013		
Secchi Disk (ft.): 4.5			Secchi Disk (ft.): 4.0			Secchi Disk (ft.): 5.0		
Depth of Bottom Sample (ft): 38			Depth of Bottom Sample (ft): 36			Depth of Bottom Sample: 38		
Weather Conditions: mostly cloudy, light winds			Weather Conditions: overcast, light winds			Weather Conditions: mostly cloudy, calm winds		
Temperature (F): 59			Temperature (F): 64			Temperature (F): 65		
Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)
Surface	15.3	9.22	Surface	20.8	7.89	Surface	26.0	7.35
2.0	15.3	9.17	2.0	20.7	7.83	2.0	26.0	7.31
4.0	15.2	9.13	4.0	20.6	7.75	4.0	25.9	7.27
6.0	15.2	9.13	6.0	20.5	7.62	6.0	25.9	7.23
8.0	15.2	9.10	8.0	19.8	7.81	8.0	25.9	7.22
10.0	15.2	9.10	10.0	19.4	7.56	10.0	25.8	7.25
12.0	15.2	9.07	12.0	19.0	7.60	12.0	25.7	7.22
14.0	15.2	9.07	14.0	18.9	7.39	14.0	25.7	7.26
16.0	15.2	9.07	16.0	18.5	7.63	16.0	25.7	7.30
18.0	15.2	9.07	18.0	18.4	7.66	18.0	25.4	7.10
20.0	15.2	9.06	20.0	18.3	7.86	20.0	25.2	7.00
22.0	15.2	9.06	22.0	18.1	7.98	22.0	24.8	6.94
24.0	15.2	9.05	24.0	18.0	7.99	24.0	24.7	6.77
26.0	15.2	9.05	26.0	18.0	8.01	26.0	24.6	6.68
28.0	15.2	9.04	28.0	18.0	7.85	28.0	24.5	6.54
30.0	15.2	9.04	30.0	18.0	7.88	30.0	24.4	6.29
32.0	15.2	9.04	32.0	17.9	8.02	32.0	23.9	5.69
34.0	15.2	9.03	34.0	17.9	7.81	34.0	23.8	5.40
36.0	15.2	9.01	36.0	17.9	7.7	36.0	23.3	4.0
38.0	Bottom	Bottom	38.0	Bottom	Bottom	38.0	Bottom	Bottom

**Dissolved Oxygen and Temperature Profiles for the Big Falls Flowage in 2014.**

Date: April 2014	Date: 7/22/2014	Date: 8/27/2014
Secchi Disk (ft.):	Secchi Disk (ft.): 3.5	Secchi Disk (ft.): 5.0
Depth of Bottom Sample (ft):	Depth of Bottom Sample (ft): 36	Depth of Bottom Sample: 36
Weather Conditions:	Weather Conditions: mostly cloudy, NW wind 10-15	Weather Conditions: mostly sunny, light winds
Temperature (F):	Temperature (F): 75	Temperature (F): 68

**Not Sampled Due To  
High River Flows**

Depth (ft.)	Temperature (celsius)	Dissolved	Depth (ft.)	Temperature (celsius)	Dissolved
		Oxygen (mg/l)			Oxygen (mg/l)
Surface	24.9	7.75	Surface	24.1	7.43
2.0	24.8	7.74	2.0	24.1	7.41
4.0	24.7	7.71	4.0	24.1	7.43
6.0	24.7	7.69	6.0	24.0	7.36
8.0	24.7	7.68	8.0	24.0	7.32
10.0	24.7	7.68	10.0	23.9	7.13
12.0	24.6	7.65	12.0	23.8	7.15
14.0	24.6	7.65	14.0	23.8	7.15
16.0	24.6	7.64	16.0	23.8	7.17
18.0	24.5	7.60	18.0	23.8	7.16
20.0	24.4	7.62	20.0	23.8	7.15
22.0	24.3	7.61	22.0	23.7	6.91
24.0	24.0	7.31	24.0	23.6	6.80
26.0	23.7	7.22	26.0	23.5	6.59
28.0	23.5	7.19	28.0	23.3	6.38
30.0	23.5	7.17	30.0	23.0	6.13
32.0	23.4	7.04	32.0	22.9	6.00
34.0	23.1	6.93	34.0	22.9	5.90
36.0	22.9	6.73	36.0	21.7	4.97
38.0	Bottom	Bottom	38.0	Bottom	Bottom



**Dissolved Oxygen and Temperature Profiles for the Big Falls Flowage in 2015.**

Date: 4/28/2015			Date: 7/21/2015			Date: 8/26/2015		
Secchi Disk (ft.):	4.0		Secchi Disk (ft.):	4.0		Secchi Disk (ft.):	5.0	
Depth of Bottom Sample (ft):	34		Depth of Bottom Sample (ft):	34		Depth of Bottom Sample:	36	
Weather Conditions:	sunny, winds calm		Weather Conditions:	mostly sunny, NW winds @ 10		Weather Conditions:	mostly sunny, NW winds @ 5	
Temperature (F):	57		Temperature (F):	68		Temperature (F):	60	
Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)
Surface	13.4	10.75	Surface	24.3	7.52	Surface	18.1	7.84
2.0	12.0	10.83	2.0	24.3	7.51	2.0	18.0	7.82
4.0	11.9	10.81	4.0	24.1	7.37	4.0	17.7	7.81
6.0	11.7	10.77	6.0	24.0	7.39	6.0	17.6	7.83
8.0	11.6	10.75	8.0	23.9	7.40	8.0	17.0	8.24
10.0	11.6	10.72	10.0	23.9	7.38	10.0	16.6	8.40
12.0	11.6	10.71	12.0	23.9	7.35	12.0	16.6	8.42
14.0	11.5	10.69	14.0	23.9	7.32	14.0	16.4	8.42
16.0	11.5	10.69	16.0	23.8	7.30	16.0	16.3	8.47
18.0	11.4	10.66	18.0	23.8	7.27	18.0	16.3	8.47
20.0	11.3	10.64	20.0	23.8	7.26	20.0	16.3	8.51
22.0	11.2	10.60	22.0	23.8	7.26	22.0	16.3	8.52
24.0	11.1	10.57	24.0	23.8	7.26	24.0	16.3	8.54
26.0	11.1	10.57	26.0	23.8	7.25	26.0	16.2	8.57
28.0	11.0	10.59	28.0	23.8	7.25	28.0	16.1	8.55
30.0	11.0	10.56	30.0	23.8	7.21	30.0	16.1	8.59
32.0	10.8	10.45	32.0	23.8	7.20	32.0	16.0	8.56
34.0	10.7	10.4	34.0	23.8	7.03	34.0	16.0	8.58
36.0	Bottom	Bottom	36.0	Bottom	Bottom	36.0	16.0	8.55
						38.0	Bottom	Bottom

**Dissolved Oxygen and Temperature Profiles for the Big Falls Flowage in 2016.**

Date: 5/3/2016  
 Secchi Disk (ft.): 4.5  
 Depth of Bottom Sample (ft): 35  
 Weather Conditions: hazy sun, wind west @ 10  
 Temperature (F): 55

Date: 7/19/2016  
 Secchi Disk (ft.): 4.0  
 Depth of Bottom Sample (ft): NA  
 Weather Conditions: Sunny, calm wind  
 Temperature (F): 74

Date: 8/30/2016  
 Secchi Disk (ft.): 4.0  
 Depth of Bottom Sample: 34  
 Weather Conditions: cloudy, calm wind  
 Temperature (F): 60

Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)
Surface	13.2	10.18	Surface			Surface	22.9	7.80
2	13.0	10.21	<b>No sampling - DO meter malfunctioned</b>			2	22.9	7.77
4	12.9	10.17		4	22.7	7.74		
6	12.8	10.15		6	22.7	7.73		
8	12.8	10.13		8	22.7	7.71		
10	12.8	10.12		10	22.7	7.71		
12	12.8	10.11		12	22.7	7.69		
14	12.8	10.11		14	22.6	7.66		
16	12.8	10.10		16	22.6	7.66		
18	12.8	10.10		18	22.6	7.64		
20	12.8	10.10		20	22.6	7.64		
22	12.8	10.08		22	22.6	7.60		
24	12.8	10.05		24	22.6	7.53		
26	12.7	10.03		26	22.5	7.46		
28	12.8	10.04		28	22.5	7.31		
30	12.7	10.03		30	22.5	7.29		
32	12.7	10.04		32	22.3	7.35		
34	12.7	10.0	34	22.0	7.35			
36	Bottom	Bottom	36	Bottom	Bottom			

**Dissolved Oxygen and Temperature Profiles for the Big Falls Flowage in 2017.**

Date: 4/24/2017  
 Secchi Disk (ft.): 4.0  
 Depth of Bottom Sample (ft): 34  
 Weather Conditions: Overcast, south wind @ 15  
 Temperature (F): 55

Date: 7/24/2017  
 Secchi Disk (ft.): 4.0  
 Depth of Bottom Sample (ft): 36  
 Weather Conditions: Partly cloudy, light winds  
 Temperature (F): 62

Date: 8/29/2017  
 Secchi Disk (ft.): 5.0  
 Depth of Bottom Sample: 34  
 Weather Conditions: Overcast, calm winds  
 Temperature (F): 58

Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)
Surface	11.6	11.09	Surface	24.5	6.27	Surface	18.7	8.25
2	11.4	11.06	2	24.1	6.23	2	18.7	8.23
4	11.3	11.05	4	24.1	6.23	4	18.5	8.20
6	11.3	11.02	6	24.1	6.25	6	18.5	8.18
8	11.3	11.00	8	24.1	6.26	8	18.4	8.17
10	11.3	10.98	10	24.0	6.26	10	18.4	8.13
12	11.3	10.98	12	24.0	6.26	12	18.4	8.09
14	11.2	10.97	14	24.0	6.25	14	18.4	8.08
16	11.2	10.96	16	24.0	6.24	16	18.4	8.08
18	11.2	10.95	18	23.9	6.25	18	18.4	8.07
20	11.2	10.95	20	23.9	6.27	20	18.4	8.07
22	11.2	10.94	22	23.8	6.26	22	18.4	8.07
24	11.2	10.94	24	23.7	6.28	24	18.4	8.05
26	11.2	10.93	26	23.7	6.28	26	18.4	8.04
28	11.1	10.92	28	23.7	6.25	28	18.3	8.01
30	11.1	10.90	30	23.7	6.27	30	18.3	8.01
32	11.1	10.89	32	23.7	6.25	32	18.3	8.01
34	11.1	10.87	34	23.7	6.22	34	18.2	7.84
36	Bottom	Bottom	36	23.7	6.13	36	Bottom	Bottom
			38	Bottom	Bottom			

**Dissolved Oxygen and Temperature Profiles for the Thornapple Flowage in 2013.**

Date: 5/29/2013			Date: 7/30/2013			Date: 8/27/2013		
Secchi Disk (ft.): 4.0			Secchi Disk (ft.): 5			Secchi Disk (ft.): 4.5		
Depth of Bottom Sample (ft): 20			Depth of Bottom Sample (ft): 19.5			Depth of Bottom Sample (ft): 20		
Weather Conditions: mostly cloudy, light winds			Weather Conditions: overcast, light winds			Weather Conditions: partly sunny, light winds		
Temperature (F): 62			Temperature (F): 65			Temperature (F): 88		
Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)
Surface	15.7	8.95	Surface	22.7	7.30	Surface	26.2	8.32
2.0	15.2	8.95	2.0	22.5	7.25	2.0	26.0	8.34
4.0	15.2	8.96	4.0	22.5	7.29	4.0	25.1	7.36
6.0	15.2	8.94	6.0	22.5	7.27	6.0	24.8	7.23
8.0	15.2	8.94	8.0	22.3	7.16	8.0	24.7	7.08
10.0	15.2	8.95	10.0	22.2	7.00	10.0	24.7	6.94
12.0	15.2	8.94	12.0	21.9	6.62	12.0	24.5	6.68
14.0	15.2	8.94	14.0	21.1	6.42	14.0	24.3	6.69
16.0	15.2	8.93	16.0	20.6	6.14	16.0	23.9	6.59
18.0	15.2	8.92	18.0	20.3	5.87	18.0	23.7	6.23
20.0	15.2	8.92	20.0	20.1	5.73	20.0	23.7	6.18
22.0	Bottom	Bottom	22.0	Bottom	Bottom	22.0	Bottom	Bottom

**Dissolved Oxygen and Temperature Profiles for the Thornapple Flowage in 2014.**

Date: April 2014			Date: 7/22/2014			Date: 8/27/2014			
Secchi Disk (ft.): 4.0			Secchi Disk (ft.): 3.5			Secchi Disk (ft.): 5			
Depth of Bottom Sample (ft): 20			Depth of Bottom Sample (ft): 20			Depth of Bottom Sample (ft): 20			
Weather Conditions: mostly cloudy, light winds			Weather Conditions: mostly cloudy, sw wind @ 10			Weather Conditions: mostly sunny			
Temperature (F): 62			Temperature (F): 79			Temperature (F): 74			
<b>Not Sampled Due To High River Flows</b>	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)
	Surface	25.4	6.90	Surface	23.9	7.81	Surface	23.9	7.81
	2.0	25.1	6.86	2.0	23.1	7.83	2.0	23.1	7.83
	4.0	24.8	6.84	4.0	22.8	7.41	4.0	22.8	7.41
	6.0	24.7	6.80	6.0	22.8	7.42	6.0	22.8	7.42
	8.0	24.1	6.72	8.0	22.7	7.41	8.0	22.7	7.41
	10.0	24.0	6.69	10.0	22.3	7.07	10.0	22.3	7.07
	12.0	24.0	6.67	12.0	22.2	6.90	12.0	22.2	6.90
	14.0	24.0	6.65	14.0	22.2	6.77	14.0	22.2	6.77
	16.0	23.9	6.63	16.0	22.1	6.67	16.0	22.1	6.67
	18.0	23.9	6.60	18.0	21.8	6.58	18.0	21.8	6.58
	20.0	23.9	6.59	20.0	21.8	6.59	20.0	21.8	6.59
	22.0	Bottom	Bottom	22.0	Bottom	Bottom	22.0	Bottom	Bottom

**Dissolved Oxygen and Temperature Profiles for the Thornapple Flowage in 2015.**

Date:	4/28/2015	Date:	7/21/2015	Date:	8/26/2015
Secchi Disk (ft.):	4.0	Secchi Disk (ft.):	5.5	Secchi Disk (ft.):	6.0
Depth of Bottom Sample (ft):	18	Depth of Bottom Sample (ft):	20	Depth of Bottom Sample (ft)	18
Weather Conditions:	sunny, calm winds	Weather Conditions:	sunny, NW winds @ 10	Weather Conditions:	mostly sunny, NW winds @ 5
Temperature (F):	63	Temperature (F):	78	Temperature (F):	66

Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)
Surface	13.8	10.52	Surface	24.3	6.77	Surface	20.4	8.22
2.0	10.9	10.41	2.0	23.8	6.69	2.0	19.4	8.23
4.0	10.6	10.42	4.0	23.8	6.66	4.0	18.8	8.20
6.0	10.3	10.31	6.0	23.4	6.61	6.0	18.5	8.07
8.0	10.3	10.28	8.0	22.9	6.55	8.0	18.4	7.99
10.0	10.0	10.14	10.0	22.8	6.52	10.0	18.3	7.90
12.0	9.9	10.09	12.0	22.8	6.48	12.0	18.3	7.89
14.0	9.9	10.11	14.0	22.8	6.48	14.0	18.3	7.87
16.0	9.9	10.10	16.0	22.7	6.47	16.0	18.3	7.88
18.0	9.9	10.08	18.0	22.7	6.46	18.0	18.2	7.80
20.0	Bottom	Bottom	20.0	22.7	6.44	20.0	Bottom	Bottom
			22.0	Bottom	Bottom			

**Dissolved Oxygen and Temperature Profiles for the Thornapple Flowage in 2016.**

Date:	5/3/2016	Date:	7/19/2016	Date:	8/30/2016
Secchi Disk (ft.):	4.5	Secchi Disk (ft.):	4.5	Secchi Disk (ft.):	4.5
Depth of Bottom Sample (ft):	20	Depth of Bottom Sample (ft):	NA	Depth of Bottom Sample (ft)	20
Weather Conditions:	overcast, wind west @ 15-20	Weather Conditions:	mostly sunny, s wind @ 5-10	Weather Conditions:	partly sunny, light winds
Temperature (F):	65	Temperature (F):	79	Temperature (F):	80

Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)
Surface	11.0	10.65	<b>No Sampling - DO meter malfunctioned</b>			Surface	24.3	6.99
2.0	10.9	10.58				2.0	23.9	6.88
4.0	10.8	10.59				4.0	23.6	6.85
6.0	10.8	10.59				6.0	23.4	6.77
8.0	10.5	10.60				8.0	23.4	6.76
10.0	10.5	10.63				10.0	23.3	6.72
12.0	10.5	10.61				12.0	23.2	6.66
14.0	10.4	10.59				14.0	23.2	6.66
16.0	10.4	10.58				16.0	23.2	6.65
18.0	10.4	10.59				18.0	23.2	6.64
20.0	10.4	10.57				20.0	23.2	6.57
22.0	Bottom	Bottom				22.0	Bottom	Bottom

**Dissolved Oxygen and Temperature Profiles for the Thornapple Flowage in 2017.**

Date: 4/24/2017  
 Secchi Disk (ft.): 4.0  
 Depth of Bottom Sample (ft): 20  
 Weather Conditions: Overcast, windy  
 Temperature (F): 60

Date: 7/24/2017  
 Secchi Disk (ft.): 5.0  
 Depth of Bottom Sample (ft): 20  
 Weather Conditions: Mostly sunny, light winds  
 Temperature (F): 72

Date: 8/29/2017  
 Secchi Disk (ft.): 6.0  
 Depth of Bottom Sample (ft): 18  
 Weather Conditions: Cloudy, light winds  
 Temperature (F): 62

Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)	Depth (ft.)	Temperature (celsius)	Dissolved Oxygen (mg/l)
Surface	10.1	11.15	Surface	24.5	6.82	Surface	21.6	7.59
2.0	10.1	11.05	2.0	23.4	6.84	2.0	21.3	7.47
4.0	10.1	10.95	4.0	23.1	6.83	4.0	21.2	7.42
6.0	10.0	10.97	6.0	23.0	6.80	6.0	21.1	7.39
8.0	10.0	10.94	8.0	22.9	6.79	8.0	21.1	7.35
10.0	10.0	10.97	10.0	22.9	6.79	10.0	21.0	7.33
12.0	10.0	10.95	12.0	22.9	6.77	12.0	21.0	7.30
14.0	10.0	10.90	14.0	22.9	6.76	14.0	21.0	7.24
16.0	10.0	10.95	16.0	22.9	6.73	16.0	21.0	7.23
18.0	10.0	10.90	18.0	22.9	6.72	18.0	20.9	7.21
20.0	10.0	10.9	20.0	22.9	6.69	20.0	Bottom	Bottom
22.0	Bottom	Bottom	22.0	Bottom	Bottom			

## **APPENDIX D**

### **Agency Correspondence**



1414 West Hamilton Avenue  
P.O. Box 8  
Eau Claire, WI 54702-0008

November 30, 2017

Cheryl Laatsch – Statewide FERC Coordinator  
WI Dept. of Natural Resources  
N7725 Hwy 28  
Horicon, WI 53032

Nick Utrup  
U.S. Fish and Wildlife Service  
Wisconsin/Minnesota Ecological Services Field Office  
4101 American Boulevard East  
Bloomington, MN 55425

**Subject: 2017 Water Quality Monitoring Report  
Big Falls (P-2390-01), Thornapple (P-2475) & Turtle-Flambeau (P-2390-02)**

Dear Ms. Laatsch and Mr. Utrup:

Enclosed is the 2017 Water Quality Sampling Report for Big Falls and Thornapple flowages. The samples were taken in April, July and August from the deepest point of each reservoir immediately upstream of the boat restraining barrier. The report includes results for the past five years.

Annual water quality monitoring for the Turtle Flambeau Flowage is conducted by the Citizens Lake Monitoring Program and the results are published on the WDNR's website. The link is <http://dnr.wi.gov/lakes/clmn/Stations.aspx?location=26>. Should citizen monitoring be discontinued in the future, NSPW shall provide replacement services as stipulated in the 2008 Water Quality Certification for Big Falls Hydro.

Should you have any questions concerning this report, you may contact me at (715) 737-1353 or at [matthew.j.miller@xcelenergy.com](mailto:matthew.j.miller@xcelenergy.com). Please provide any comments you may have by **December 30, 2017**.

Sincerely,

Matthew J. Miller  
Hydro License Compliance Consultant

Enclosure

c: General Project Files



**From:** [Laatsch, Cheryl - DNR](#)  
**To:** [Miller, Matthew J](#)  
**Subject:** RE: 2017 Annual Water Quality Report  
**Date:** Wednesday, January 24, 2018 11:18:50 AM

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No comments. thanks

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Cheryl Laatsch  
Statewide FERC Coordinator  
Bureau of Environmental Analysis and Sustainability  
Wisconsin Dept of Natural Resources  
N7725 Hwy 28  
Horicon WI 53032  
(T) 920-387-7869 (Fax) 920-387-7888  
[Cheryl.laatsch@wisconsin.gov](mailto:Cheryl.laatsch@wisconsin.gov)



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**From:** Miller, Matthew J [mailto:Matthew.J.Miller@xcelenergy.com]  
**Sent:** Wednesday, January 24, 2018 8:53 AM  
**To:** Laatsch, Cheryl - DNR <Cheryl.Laatsch@wisconsin.gov>; (Nick\_Utrup@fws.gov) <Nick\_Utrup@fws.gov>  
**Subject:** RE: 2017 Annual Water Quality Report

I will be filing my report by the end of the week. The filing deadline is January 31.

---

**From:** Miller, Matthew J  
**Sent:** Friday, January 19, 2018 1:15 PM  
**To:** Laatsch, Cheryl - DNR; ([Nick\\_Utrup@fws.gov](mailto:Nick_Utrup@fws.gov))  
**Subject:** RE: 2017 Annual Water Quality Report

Hello Cheryl and Nick,

Please let me know if you have any comments regarding our annual water quality report for Big Falls and Thornapple so I may file the report with FERC.

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**From:** Miller, Matthew J  
**Sent:** Thursday, November 30, 2017 1:02 PM  
**To:** Laatsch, Cheryl - DNR; ([Nick\\_Utrup@fws.gov](mailto:Nick_Utrup@fws.gov))  
**Subject:** 2017 Annual Water Quality Report

Hello Cheryl and Nick,

Attached for your review and comment is Xcel Energy's Annual Water Quality Report for Big Falls and Thornapple. Let me know if you would like a hard copy. I plan to file the report with FERC in early January.

**Matthew Miller**

**Xcel Energy | Responsible By Nature**

**Hydro License Compliance Consultant**

1414 W. Hamilton Ave., P.O. Box 8, Eau Claire, WI 54702

P: 715.737-1353 F: 715.737.1077

E: [matthew.j.miller@xcelenergy.com](mailto:matthew.j.miller@xcelenergy.com)

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