

December 3, 2014

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, DC 20426

**RE: Flambeau Hydroelectric Projects**  
**FERC Project Number 2640**                      **FERC Project Number 2421**  
**FERC Project Number 2395**                      **FERC Project Number 2473**  
**Flambeau Hydro LLC**  
**Final Report 2014 Water Quality Monitoring Data**

Dear Ms. Bose:

On behalf of Flambeau Hydro LLC, "Flambeau" (Licensee), Renewable World Energies, LLC (RWE) is submitting a copy of the *Final Report 2014 Water Quality Monitoring Data* for each of the (4) Flambeau Hydroelectric Projects (Flambeau Upper, Flambeau Lower, Flambeau Pixley, and Flambeau Crowley). The report is a requirement of Flambeau's Federal license pursuant to articles 406 and 408 and the approved Water Quality Monitoring Plans for each. 2014 was the eleventh year monitoring was conducted since the license was issued, but is the 3<sup>rd</sup> year of submittal by RWE on the behalf of the Licensee.

Monitoring was conducted on June 10, July 14, and August 12, 2014. No out of the ordinary issues were encountered. Ice-Out occurred later than normal this year. High flows and dangerous water conditions prevented the Ice-Out sampling from occurring until June, as documented in the correspondence sections of the reports. The draft report was sent to the agencies by a letter dated October 29, 2014 as an attachment to an e-mail sent the same day for review and comment. No comments were received from WDNR or the USFWS. The next scheduled monitoring event will be conducted in 2015.

If you have any questions concerning this submittal, please contact Mr. Gary Rast at the Renewable World Energies, LLC offices @ 855-994-9376 Ext 105. He can also be reached by e-mail at [grast@rwehydro.com](mailto:grast@rwehydro.com).

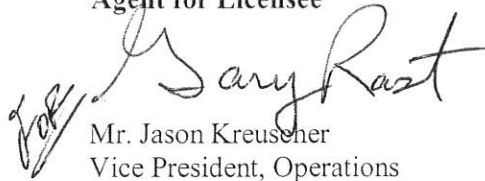
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Sincerely,  
**Renewable World Energies, LLC**  
**Agent for Licensee**

A handwritten signature in black ink, appearing to read "Jason Kreusener". The signature is written in a cursive style and is positioned above the printed name and title.

Mr. Jason Kreusener  
Vice President, Operations

Attachments: Flambeau Upper Final Report 2014 Water Quality Monitoring Data - December 3, 2014  
Flambeau Lower Final Report 2014 Water Quality Monitoring Data - December 3, 2014  
Flambeau Pixley Final Report 2014 Water Quality Monitoring Data - December 3, 2014  
Flambeau Crowley Final Report 2014 Water Quality Monitoring Data - December 3, 2014

Cc: Ms. Cheryl Laatsch, WDNR  
Mr. Nick Utrup, USFWS  
RWE, Corporate

## **Final Report**

2014 Water Quality Monitoring Data

For the

Flambeau (Upper) Hydroelectric Project  
FERC Project #2640  
Flambeau Hydro, LLC

North Fork of the Flambeau River, Price County, Wisconsin

Respectfully Submitted by:

Renewable World Energies, LLC  
100 State Street – P.O. Box 264  
Neshkoro, Wisconsin 54960

Final – December 3, 2014

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## Summary

2014 marked the eleventh year of water quality sampling under the FERC approved "Water Quality Monitoring Plan Per License Article 408 for the Flambeau (Upper) Hydroelectric Project – FERC Project # 2640 – Flambeau Hydro, LLC". Sampling was accomplished according to the plan and was un-eventful, with no major problems or concerns.

Ice-Out occurred between Agenda and Nine Mile Landing on the North Fork of the Flambeau River sometime during the week beginning April 20, 2014. The Licensee traveled to the region during the week of May 5, 2014 thru May 9, 2014 to conduct the monitoring. River flow, based on Flambeau Upper Hydroelectric Project records was over 4000 cubic feet per second during this time. High flows and dangerous conditions prevented sampling from being accomplished. The Licensee contacted agencies with this information and proposed the Ice-Out sampling be abandoned for 2014. The WDNR responded they wished the sampling be performed even if it could not be done until June. The Licensee gave the agencies an update on the sampling progress on May 27, 2014. They were told that nothing had been collected to that point; flows had come down quite a bit, however the boat barriers had not been installed at Upper or Lower. Sampling is on hold until at least the week of June 2<sup>nd</sup> or June 9<sup>th</sup>. The Ice-Out sampling event occurred on June 10, 2014. River flow, based on the Flambeau (Upper) Hydroelectric Project records, was approximately 1246 cubic feet per second. Sampling occurred between 7:30 a.m. and 7:46 a.m. Samples were taken without incident. No unusual D.O. or Temperature readings were observed. Samples for laboratory analysis were delivered to Northern Lake Service, Inc. in Crandon, WI on June 11, 2014. Northern Lake Service, Inc. issued a laboratory report on June 19, 2014. No unusual levels of Chlorophyll a, True Color, or Total Phosphorus were noted in the laboratory reports.

River flow, based on Flambeau (Upper) Hydroelectric Project records, was approximately 1055 cubic feet per second during the July 14, 2014 sampling event. Sampling occurred between 7:30 a.m. Samples were taken without incident. No unusual D.O or Temperature readings were observed. Samples for laboratory analysis were delivered to Northern Lake Service, Inc. in Crandon, WI on July 15, 2014. Northern Lake Service, Inc. issued a laboratory report on July 22, 2014. No unusual levels of Chlorophyll a, True Color, or Total Phosphorus were noted in the laboratory reports.

River flow, based on Flambeau (Upper) Hydroelectric Project records, was approximately 737 cubic feet per second during the August 12, 2014 sampling event. Sampling occurred between 7:30 a.m. and 7:49 a.m. Samples were taken without incident. No unusual D.O or Temperature readings were observed. Samples for laboratory analysis were delivered to Northern Lake Service, Inc. in Crandon, WI on August 13, 2014. Northern Lake Service, Inc. issued a laboratory report on August 18, 2014. No unusual levels of Chlorophyll a, True Color, or Total Phosphorus were noted in the laboratory reports.

In general, the weather (temperature and rainfall) during the 2014 monitoring season appeared cooler in April, slightly warmer in May, June, July, and August with higher than normal precipitation in the months of April, May, June, and August. Temperatures in May, June, July, and August were about .5 degrees warmer than normal but precipitation was slightly (11%) below normal for July. **(Refer to 2014 Monthly Temperature and Precipitation Table page 7)**

A summary of a comparison between the 2011 thru 2014 (**Refer to 2014 Flambeau Upper Project Sampling Comparison Table 2011-2014 page 8**) sampling results are as follows:

1. Water Clarity – Decreased Ice-Out – Normal July – Increased Slightly August
2. Chlorophyll a – Increased Ice-Out – Decreased July/August
3. Color – Increased Ice-Out – Decreased July/August
4. Total Phosphorus – Decreased Ice-Out/August – Normal July
5. Overall, D.O. – Decreased Ice-Out/August – Increased July
6. Water Temperatures – Increased Ice-Out – Decreased July/August

Correspondence from the agencies during 2010 indicated they would prefer that notifications of incidents be by e-mail only and that telephone contacts are not needed. All other correspondence can be found on page 13, **Appendix D**. The next scheduled Water Quality Monitoring at the Upper Hydroelectric Project is set to take place in 2015 beginning with the Ice-Out sampling event.

**2014  
Sampling Results  
Table**

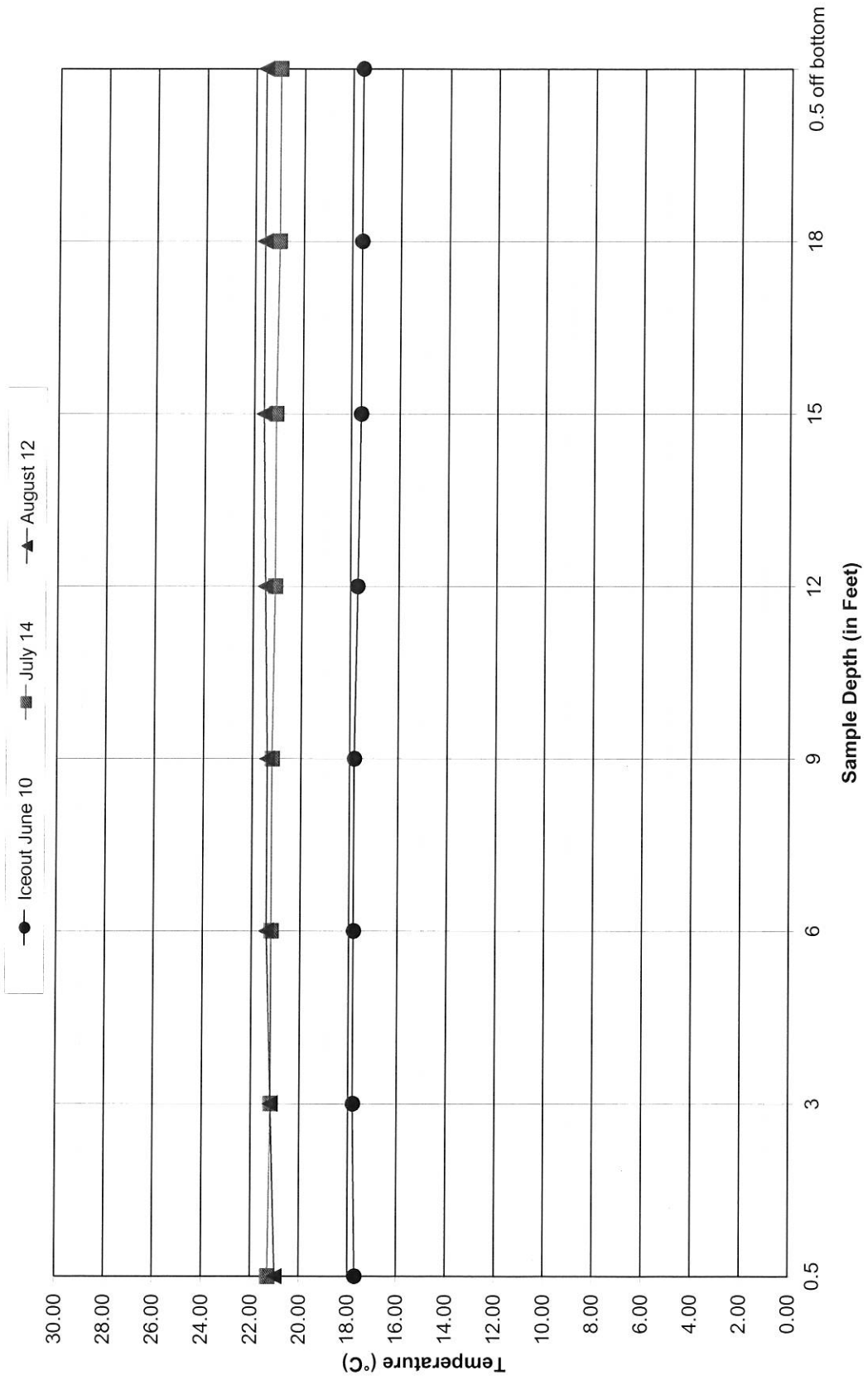
# Flambeau (Upper) Hydroelectric Project - FERC Project # 2640 2014 Water Quality Sampling Data

June 10, 2014		July 14, 2014		August 12, 2014	
Project Flow (c.f.s.)		1055		737	
Dissolved Oxygen		D.O. (mg/L)		D.O. (mg/L)	
0.5 feet below surface		7.35		7.22	
3 feet below surface		7.37		7.24	
6 feet below surface		7.35		7.26	
9 feet below surface		7.26		7.28	
12 feet below surface		7.21		7.30	
15 feet below surface		7.13		7.35	
18 feet below surface		7.11		7.19	
0.5 feet above bottom		7.09		7.19	
Water Temp. (°C)		17.70		21.30	
Time		7:39 AM		7:45 AM	
Time		7:40 AM		7:46 AM	
Time		7:41 AM		7:47 AM	
Time		7:42 AM		7:48 AM	
Time		7:43 AM		7:49 AM	
Time		7:44 AM		7:15 AM	
Time		7:45 AM		7:16 AM	
Time		7:46 AM		7:17 AM	
Time		7:33 AM		7:35 AM	
Time		7:35 AM		7:40 AM	
Time		7:36 AM		7:41 AM	
Time		7:37 AM		7:42 AM	
Time		N/A		N/A	
Time		7:39 AM		7:39 AM	
Time		7:40 AM		7:40 AM	
Time		N/A		N/A	
Time		7:42 AM		7:40 AM	
Time		N/A		N/A	
Time		7:35 AM		7:35 AM	
Time		7:37 AM		7:37 AM	
Time		7:39 AM		7:39 AM	
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Time		N/A		N/A	
Time		7:42 AM		7:40 AM	
Time		N/A		N/A	
Time		7:35 AM		7:35 AM	
Time		7:37 AM		7:37 AM	
Time		7:39 AM		7:39 AM	
Time		7:40 AM		7:40 AM	
Time		N/A		N/A	
Time		7:42 AM		7:40 AM	
Time		N/A		N/A	
Time		7:35 AM		7:35 AM	
Time		7:37 AM		7:37 AM	
Time		7:39 AM		7:39 AM	
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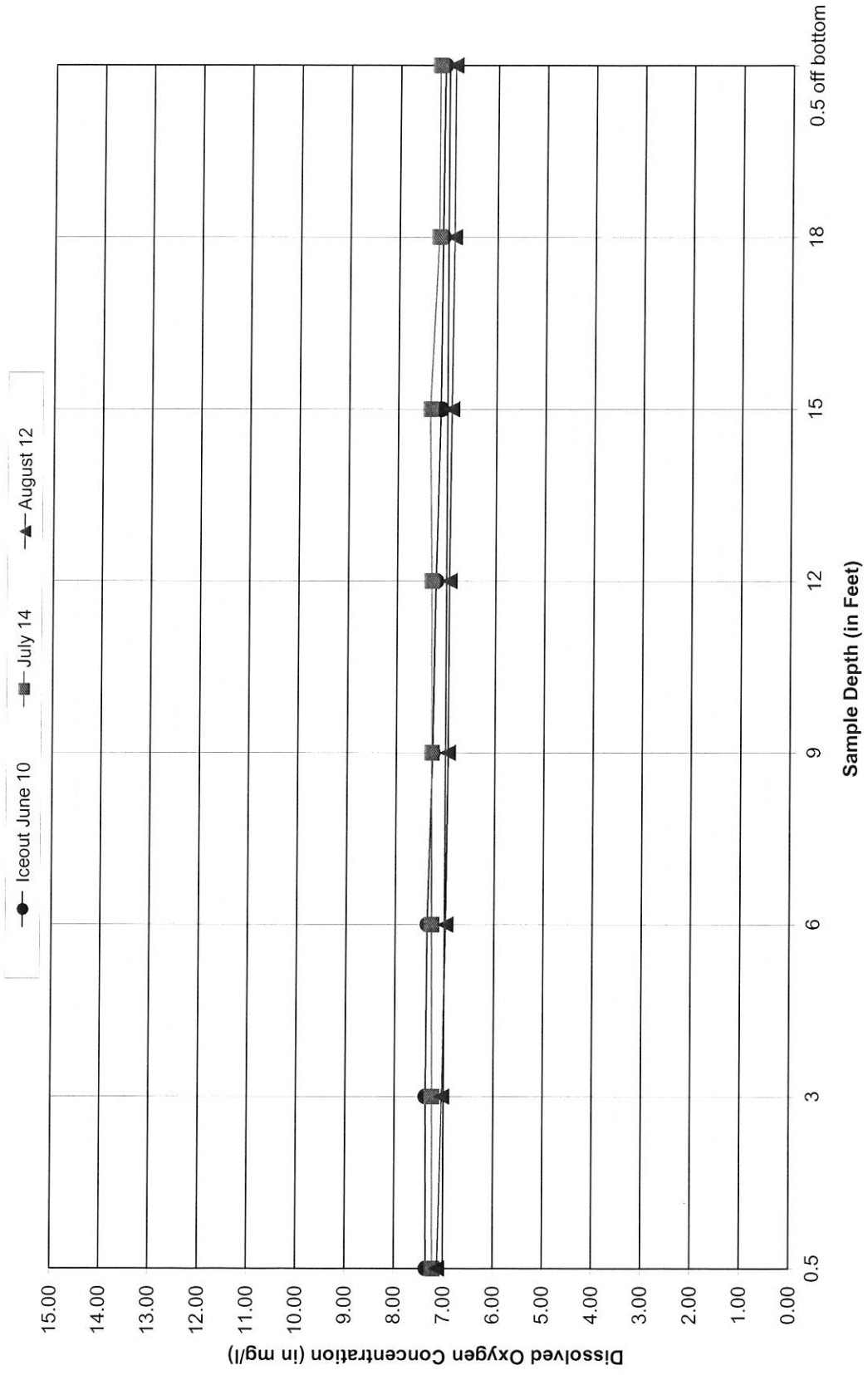


**2014  
Temperature  
and  
Dissolved Oxygen  
Graphs**

# Upper Impoundment - FERC # 2640 2014 Temperature Samples



# Upper Impoundment - FERC # 2640 2014 Dissolved Oxygen Samples



**2014  
Monthly Temperature  
and  
Precipitation  
Table**

## 2014 Water Year Monthly Temperature and Precipitation for Park Falls, Wisconsin

Month	Highest Temp.	Lowest Temp.	Average Temp.	Departure From Normal	Heating Degree Days	Normal Degree Days	Total Precip.	Total Snowfall	Normal Precip.	% of Normal Precipitation
October-13	74	21	45.0	1.8	610	678	3.93	0.3	5.01	78%
November-13	50	-3	27.9	-0.9	1105	1088	0.82	4.7	2.09	39%
December-13	35	-21	4.6	-10.2	1866	1556	2.88	39.9	1.21	238%
January-14	34	-28	1.6	-8.6	1955	1699	0.73	9.4	0.96	76%
February-14	41	-22	5.3	-9.8	1663	1399	2.12	29.5	0.81	262%
March-14	52	-23	18.4	-7.5	1439	1210	1.91	20.9	1.49	128%
April-14	66	11	35.1	-4.5	886	762	3.30	26.3	2.43	136%
May-14	85	31	51.9	0.5	414	426	4.37	T	3.23	135%
June-14	82	42	60.3	0.2	162	179	4.47	T	4.23	106%
July-14	88	45	66.3	0.5	40	63	3.42	0.0	3.85	89%
August-14	83	48	64.7	0.4	37	86	4.63	0.0	3.70	125%
September-14	81	34	57.4	1.8	227	298	1.64	0.0	4.11	40%

Source: NOAA/Duluth,  
MN

**2014  
Flambeau Upper  
Sampling Comparison Table  
2011—2014**

## Flambeau Upper

## Project Sampling Comparison Table

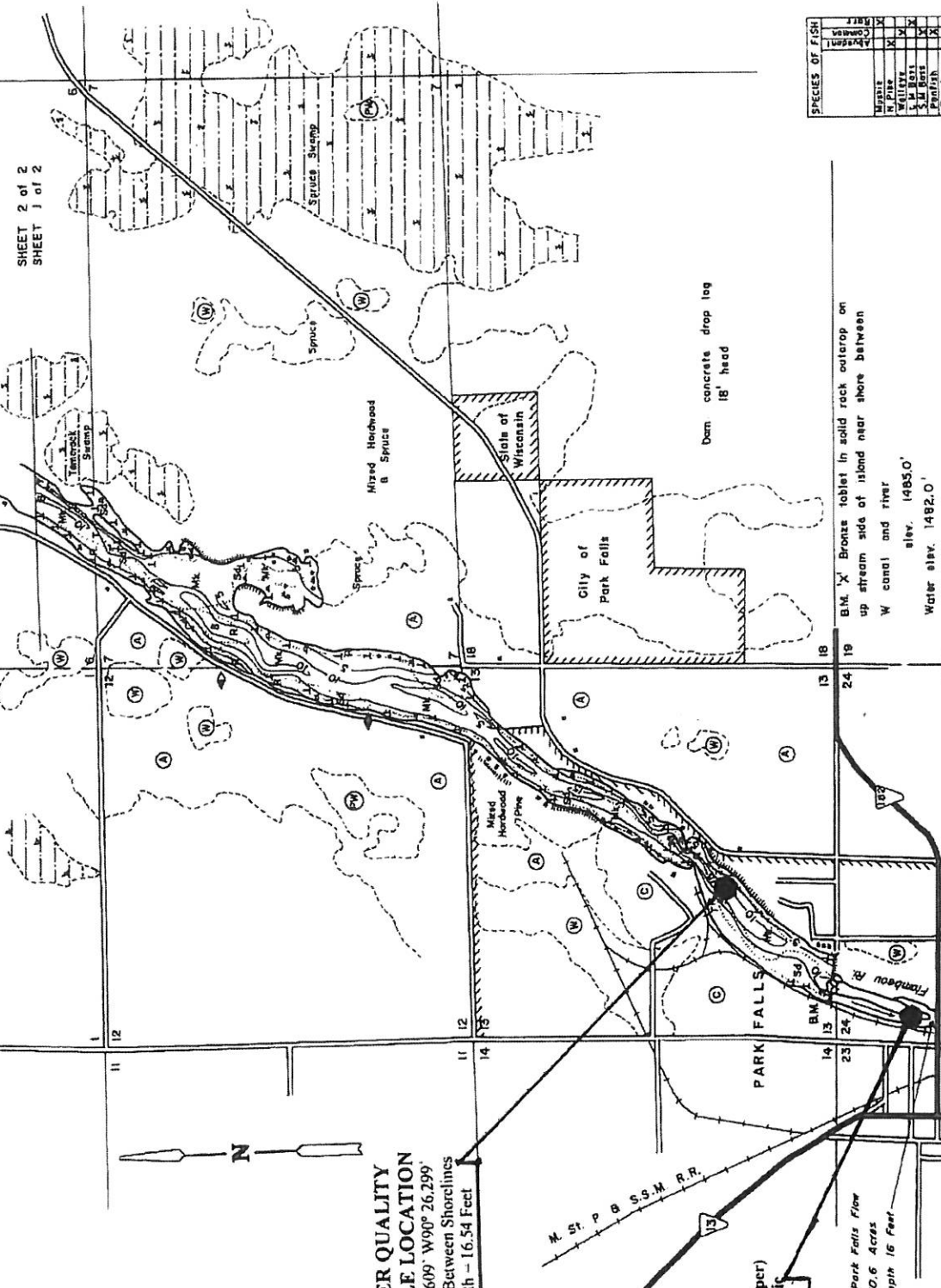
2011 Thru Current Year

Year	Month	Secchi Depth (m)	Chlorophyll a ug/l	Color (True) C.P.U. Units	Total Phosphorus Below Surface mg/l	Total Phosphorus Above Bottom mg/l	Low D.O. mg/l	High D.O. mg/l	Low Water Temp. °C	High Water Temp. °C
2011	April	3.50	0.51	100.00	0.025	0.028	12.63	12.91	5.90	6.40
2012	April	3.50	1.00	100.00	0.027		12.01	11.71	8.50	8.90
2013	May									
2014	June	3.20	1.90	130.00	0.024		7.09	7.37	17.60	17.80
<b>Minimum</b>	April/June	3.20	0.51	100.00	0.024	0.028	7.09	7.37	5.90	6.40
<b>Maximum</b>	April/June	3.50	1.90	130.00	0.027	0.028	12.63	12.91	17.60	17.80
<b>Average</b>	April/June	3.40	1.14	110.00	0.025	0.028	10.58	10.66	10.67	11.03
2011	July	3.80	5.80	70.00	0.038		7.37	7.70	24.40	25.20
2012	July	3.50	5.90	70.00	0.036		6.56	6.91	24.30	24.80
2013	July	3.10	1.60	150.00	0.026		6.35	6.41	24.00	24.20
2014	July	3.50	3.20	100.00	0.035		7.19	7.35	21.00	21.30
<b>Minimum</b>	July	3.10	1.60	70.00	0.026	0.000	6.35	6.41	21.00	21.30
<b>Maximum</b>	July	3.80	5.90	150.00	0.038	0.000	7.37	7.70	24.40	25.20
<b>Average</b>	July	3.48	4.13	97.50	0.034	#DIV/0!	6.87	7.09	23.43	23.88
2011	August	2.90	11.00	120.00	0.033		8.13	8.43	22.20	22.90
2012	August	2.70	12.00	70.00	0.037		7.61	8.08	22.70	22.90
2013	August	3.30	6.00	130.00	0.066		7.45	7.69	19.50	19.70
2014	August	3.10	5.60	100.00	0.024		6.88	7.12	21.00	21.60
<b>Minimum</b>	August	2.70	5.60	70.00	0.024	0.000	6.88	7.12	19.50	19.70
<b>Maximum</b>	August	3.30	12.00	130.00	0.066	0.000	8.13	8.43	22.70	22.90
<b>Average</b>	August	3.00	8.65	105.00	0.040	#DIV/0!	7.52	7.83	21.35	21.78
No Sample or Discontinued										

**Upper Impoundment  
Sampling Location  
Map**



WISCONSIN CONSERVATION DEPARTMENT  
 UPPER PARK FALLS LAKE  
 COUNTY  
 SEC. 6, T. 12, R. 32, N. 40, 41, N. R. 1-1-1- E.W.  
 (Sheet 1 of 2)



**WATER QUALITY  
 SAMPLE LOCATION**  
 N45° 56.609' W90° 26.299'  
 Midway Between Shorelines  
 Depth - 16.54 Feet

**Fiambeau (Upper)  
 Hydroelectric  
 Project**

Lower Park Falls Flow  
 Area 70.6 Acres  
 Max. Depth 16 Feet

SPECIES OF FISH	
Brook Trout	X
Whitefish	X
Walleye	X
Yellow Perch	X
Smallmouth Bass	X
Rock Bass	X
Rock Bass	X

AREA 43.11 ACRES  
 UNDER 3 FT. 24.4 %  
 OVER 20 FT. 0 %  
 VOLUME 3271.8 ACRE FT.  
 TOTAL ALK. 34 P.P.M.  
 SHORELINE 13.4 MILES  
 MAX. DEPTH 17 FEET

Scale: 1" = 1000'  
 0' 1000' 2000' 3000' 4000' 5000'

Access with Parking: Access with Parking  
 Access: Access  
 Boat Livestock: Boat Livestock  
 Field work by: C. Beach, J. Wasser, Sabhar, Drawn by: C. Hall

EQUIPMENT RECORDING SONAR MAPPED JULY 1966  
 NO. 19.

TOPOGRAPHIC SYMBOLS  
 Break   
 Partially wooded   
 Weeded   
 Cleared   
 Agricultural   
 Br. Beach   
 Marsh   
 Spring   
 Intermittent stream   
 Permanent inlet   
 Permanent outlet   
 Dam   
 Dun   
 Rabbitt

LAKE BOTTOM SYMBOLS  
 P. Peat   
 Gr. Gravel   
 S. Slumps & Snags   
 R. Rubble   
 Br. B. Rock   
 T. Submergent vegetation   
 E.M. Emergent vegetation   
 Sd. Sand   
 Sl. Silt

WATER ELEV. 1482

B.M. 'X' Bronze tablet in solid rock outcrop on  
 up stream side of island near shore between  
 W canal and river  
 elev. 1485.0'  
 Water elev. 1482.0'

11 12 13 14  
 1 2 3 4 5 6 7 8



## **Appendix A**

June 10, 2014 Ice-Out Sampling Documents

# IMPOUNDMENT SAMPLING LOG

2014 Water Quality Study - Flambeau Upper Hydroelectric Project - FERC #2640

HWL - 1486.69

Date: 6/10/14

Pre-Sampling Data: TWL-1467.6

CFS - 1216

Time: 7:30 Barometer: 30.02 Air Temp: 13.0 °C Wind Speed: \_\_\_\_\_

Sky Conditions: CALM, FAIR, CLEAR, + BRIGHT SUN

Precipitation within Last 24 Hours: TRACE

D.O. Meter Calibration: \_\_\_\_\_ Instrument Model Used: Hach HQ40d

Were The Batterys Changed?  Yes  No If Yes, When Changed: \_\_\_\_\_

Battery Status: 80% Charge

Calibration Time: FEB. 2014 Method: Factory

Sampling Depth Profile: \_\_\_\_\_ Measured Depth to Bottom of the Impoundment: 19.0 Feet

Secchi Disk Depth: (E0.1 Foot) 3.2 Feet Time: 7:33

## Chlorophyll a (3 Feet Below Surface)

Lab Sample I.D.#: <u>20140610-1A</u>		
Time	Quantity (ml)	Filtered
<u>7:35</u>	<u>1000</u>	<u>NO</u>

## True Color (3 Feet Below Surface)

Lab Sample I.D.#: <u>20140610-1B</u>	
Time	Quantity (ml)
<u>7:36</u>	<u>250</u>

## D.O. Sample Data

Depth	Time	D.O. (mg/l)	°C
.5 Ft Below Surface	<u>7:39</u>	<u>7.35</u>	<u>17.7</u>
3 Feet	<u>7:40</u>	<u>7.37</u>	<u>17.8</u>
6 Feet	<u>7:41</u>	<u>7.35</u>	<u>17.8</u>
9 Feet	<u>7:42</u>	<u>7.26</u>	<u>17.8</u>
12 Feet	<u>7:43</u>	<u>7.21</u>	<u>17.7</u>
15 Feet	<u>7:44</u>	<u>7.13</u>	<u>17.7</u>
18 Feet	<u>7:45</u>	<u>7.11</u>	<u>17.6</u>
21 Feet	<del>_____</del>	<del>_____</del>	<del>_____</del>
24 Feet	<del>_____</del>	<del>_____</del>	<del>_____</del>
.5 Ft Above Bottom	<u>7:46</u>	<u>7.09</u>	<u>17.6</u>

## Phosphorus

Lab Sample I.D.#: <u>20140610-1C</u>	
(3 Feet Below Surface)	
Time	Preserved?
<u>7:37</u>	<u>H2SO4</u>

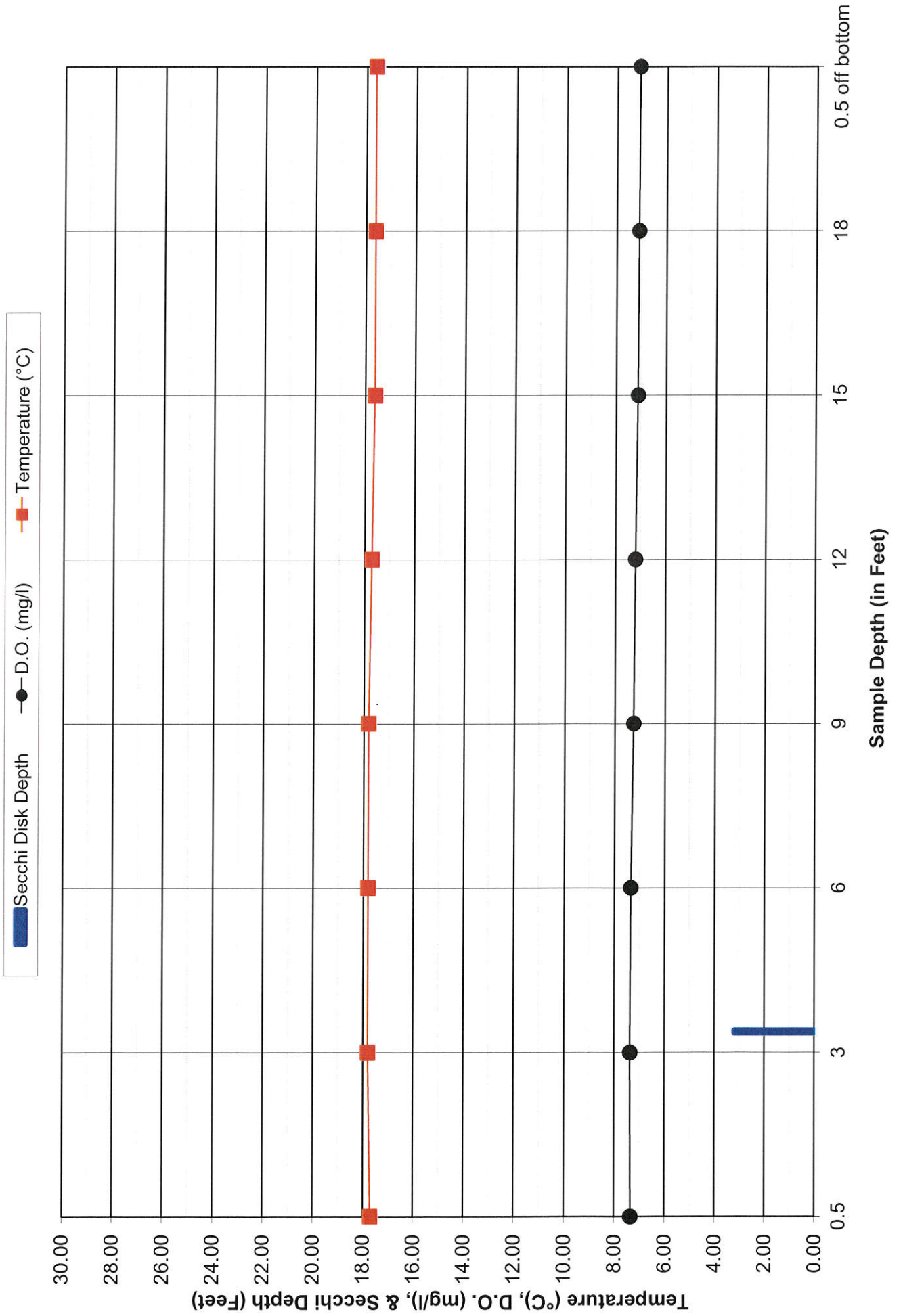
Lab Sample I.D.#: <u>N/A</u>	
(3 Feet Above Bottom)	
Time	Preserved?
<u>N/A</u>	<u>N/A</u>

Sample Location: N45° 56.609' W90° 26.299'

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

Performed By: GARY RAST

# Upper Impoundment - FERC # 2640 June 10, 2014 Iceout Sampling Event



# ANALYTICAL REPORT

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

**Client:** Renewable World Energies  
**Attn:** Gary Rast  
 100 State Street  
 P.O. Box 264  
 Neshkoro, WI 54960

**WDNR Laboratory ID No.** 721026460  
**WDATCP Laboratory Certification No.** 105-330  
**EPA Laboratory ID No.** WI000034

**Printed:** 06/19/14 **Code:** NNNN-S **Page** 1 of 3  
**NLS Project:** 220578  
**NLS Customer:** 102823  
**Phone:** 855 994 9376

Project	Flambeau (4)	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
<b>20140610-1A NLS ID: 795605</b>									
COC: 174085:1 Matrix: SW									
Collected: 06/10/14 13:19 Received: 06/11/14									
<b>Parameter</b>		see attached							
Chlorophyll, all species		yes					06/17/14	10200-H	721026460
Lab filtration for Chlorophyll							06/12/14	NA	721026460
<b>20140610-2A NLS ID: 795606</b>									
COC: 174085:1 Matrix: SW									
Collected: 06/10/14 13:19 Received: 06/11/14									
<b>Parameter</b>		see attached							
Chlorophyll, all species		yes					06/17/14	10200-H	721026460
Lab filtration for Chlorophyll							06/12/14	NA	721026460
<b>20140610-3A NLS ID: 795607</b>									
COC: 174085:1 Matrix: SW									
Collected: 06/10/14 13:19 Received: 06/11/14									
<b>Parameter</b>		see attached							
Chlorophyll, all species		yes					06/17/14	10200-H	721026460
Lab filtration for Chlorophyll							06/12/14	NA	721026460
<b>20140610-4A NLS ID: 795608</b>									
COC: 174085:1 Matrix: SW									
Collected: 06/10/14 13:19 Received: 06/11/14									
<b>Parameter</b>		see attached							
Chlorophyll, all species		yes					06/17/14	10200-H	721026460
Lab filtration for Chlorophyll							06/12/14	NA	721026460
<b>20140610-1B NLS ID: 795609</b>									
COC: 174085:2 Matrix: SW									
Collected: 06/10/14 13:20 Received: 06/11/14									
<b>Parameter</b>		see attached							
Color, APHA (true)		130	C.P.U.	5	25*		06/17/14	SM 2120-B 20ed	721026460
Lab filtration		yes					06/12/14	NA	721026460
<b>20140610-2B NLS ID: 795610</b>									
COC: 174085:2 Matrix: SW									
Collected: 06/10/14 13:20 Received: 06/11/14									
<b>Parameter</b>		see attached							
Color, APHA (true)		130	C.P.U.	5	25*		06/17/14	SM 2120-B 20ed	721026460
Lab filtration		yes					06/12/14	NA	721026460
<b>20140610-3B NLS ID: 795611</b>									
COC: 174085:2 Matrix: SW									
Collected: 06/10/14 13:20 Received: 06/11/14									
<b>Parameter</b>		see attached							
Color, APHA (true)		130	C.P.U.	5	25*		06/17/14	SM 2120-B 20ed	721026460
Lab filtration		yes					06/12/14	NA	721026460

# ANALYTICAL REPORT

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 Analytical Laboratory and Environmental Services  
 400 North Lake Avenue - Crandon, WI 54520  
 Ph: (715)-478-2777 Fax: (715)-478-3060

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

**Client:** Renewable World Energies  
**Aftr:** Gary Rast  
 100 State Street  
 P.O. Box 264  
 Neshkoro, WI 54960

Printed: 06/19/14 Code: NNNN-S Page 2 of 3  
**NLS Project:** 220578  
**NLS Customer:** 102823  
 Phone: 855 994 9376

**Project:** Flambeau (4)

<b>20140610-4B NLS ID: 795612</b>									
COC: 174085:2 Matrix: SW									
Collected: 06/10/14 13:20 Received: 06/11/14									
<b>Parameter</b>									
Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab		
150 yes	C.P.U.	5	25*		06/12/14	SM 2120-B 20ed	721026460		
					06/12/14	NA	721026460		
<b>20140610-1C NLS ID: 795613</b>									
COC: 174085:3 Matrix: SW									
Collected: 06/10/14 13:22 Received: 06/11/14									
<b>Parameter</b>									
Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab		
0.024	mg/L	1	0.0070*		06/12/14	SM 4500P-E 20ed	721026460		
<b>20140610-2C NLS ID: 795614</b>									
COC: 174085:3 Matrix: SW									
Collected: 06/10/14 13:22 Received: 06/11/14									
<b>Parameter</b>									
Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab		
0.025	mg/L	1	0.0070*		06/12/14	SM 4500P-E 20ed	721026460		
<b>20140610-3C NLS ID: 795615</b>									
COC: 174085:3 Matrix: SW									
Collected: 06/10/14 13:22 Received: 06/11/14									
<b>Parameter</b>									
Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab		
0.030	mg/L	1	0.0070*		06/12/14	SM 4500P-E 20ed	721026460		
<b>20140610-4C NLS ID: 795616</b>									
COC: 174085:3 Matrix: SW									
Collected: 06/10/14 13:22 Received: 06/11/14									
<b>Parameter</b>									
Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab		
0.031	mg/L	1	0.0070*		06/12/14	SM 4500P-E 20ed	721026460		
<b>20140610-2D NLS ID: 795618</b>									
COC: 174085:4 Matrix: SW									
Collected: 06/10/14 13:25 Received: 06/11/14									
<b>Parameter</b>									
Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab		
0.027	mg/L	1	0.0070*		06/12/14	SM 4500P-E 20ed	721026460		
<b>20140610-3D NLS ID: 795619</b>									
COC: 174085:4 Matrix: SW									
Collected: 06/10/14 13:25 Received: 06/11/14									
<b>Parameter</b>									
Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab		
0.031	mg/L	1	0.0070*		06/12/14	SM 4500P-E 20ed	721026460		
<b>20140610-4D NLS ID: 795620</b>									
COC: 174085:4 Matrix: SW									
Collected: 06/10/14 13:25 Received: 06/11/14									
<b>Parameter</b>									
Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab		
0.029	mg/L	1	0.0070*		06/12/14	SM 4500P-E 20ed	721026460		

# ANALYTICAL REPORT

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

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

Printed: 06/19/14 Code: NNNN-S Page 3 of 3  
NLS Project: 220578  
NLS Customer: 102823  
Phone: 855 994 9376

Client: Renewable World Energies  
Attn: Gary Rast  
100 State Street  
P.O. Box 264  
Neshkoro, WI 54960

Project: Flambeau (4)

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.

LOD = Limit of Detection      LOQ = Limit of Quantitation      ND = Not Detected (< LOD)      1000 ug/L = 1 mg/L  
DWB = Dry Weight Basis      NA = Not Applicable      %DWB = (mg/kg DWB) / 10000  
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: Renewable World Energies  
Project: 220578  
Flambeau (4)

Sample	Description	CC a	Pheo a	TC a	TC b	TC c
795605	20140610-1A	1.9	0.0*	1.9	0.14	0.16
795606	20140610-2A	0.83	0.43	1.1	0.064	0.11
795607	20140610-3A	1.2	0.2	1.4	0.032	0.024
795608	20140610-4A	0.0*	4.1	0.047	0.82	0.38

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.

**NORTHERN LAKE SERVICE, INC.**  
 Analytical Laboratory and Environmental Services  
 400 North Lake Avenue • Crandon, WI 54520-1298  
 Tel: (715) 478-2777 • Fax: (715) 478-3060

**SAMPLE COLLECTION AND CHAIN OF CUSTODY RECORD**  
 Wisconsin Lab Cert. No. 721026460  
 WISCONSIN WPC 105-000330

CLIENT: **RENEWABLE WORLD ENERGIES LLC**  
 ADDRESS: **100 S STATE STREET**  
 CITY: **WESTBROOK WI 54980**  
 PROJECT DESCRIPTION: **FLAMBEAU (4)**  
 QUOTATION NO.  
 DNR FID #  
 DNR LICENSE #  
 CONTACT: **GARY**  
 PHONE: **855-994-9376**  
 PURCHASE ORDER NO.: **VERBAL**  
 QUOTATION NO.: **200-223-4100**

USE BOXES BELOW: Indicate Y or N if GW Sample is field filtered.  
 Indicate G or C if WW Sample is Grab or Composite.

MATRIX:  
 SW = surface water  
 WW = waste water  
 GW = groundwater  
 DW = drinking water  
 TIS = tissue  
 AIR = air  
 SOIL = soil  
 SED = sediment  
 PROD = product  
 SL = sludge  
 OTHER

ANALYZE PER ORDER OF ANALYSIS

NO. 174085

ITEM NO.	SAMPLE ID	COLLECTION		MATRIX (See above)	COLLECTION REMARKS (i.e. DNR Well ID #)
		DATE	TIME		
1.	20140610-1A-4A	6/10/14	7:35-1:19	RIVER WATER	
2.	20140610-1B-4B	6/10/14	7:36-1:20	"	
3.	20140610-1C-4C	6/10/14	7:37-1:20	"	
4.	20140610-1D-4D	6/10/14	7:35-1:25	"	
5.					
6.					
7.					
8.					
9.					
10.					

OHIO STATE UNIVERSITY  
 TRUS DOLOR  
 PHOS  
 PHOS

REPORT TO: **SAME AS ABOVE**  
 ATTN: **GARY**  
 INVOICE TO: **RENEWABLE WORLD OPERATIONS,**  
**1001 STEPHENSON STREET**  
**NORWAY MI 49870**

COLLECTED BY (signature): *[Signature]*  
 RECEIVED BY (signature): *[Signature]*  
 DATE/TIME: **6/10/14 3:00PM**  
 CUSTODY SEAL NO. (IF ANY)  
 METHOD OF TRANSPORT: **UPS**

DATE/TIME: **6-11-14 10:15 AM**  
 CONDITION: **OK**  
 REMARKS & OTHER INFORMATION  
 WDNR FACILITY NUMBER  
 E-MAIL ADDRESS  
 COOLER #  
 PRESERVATIVE: N = nitric acid, OH = sodium hydroxide, NP = no preservative, Z = zinc acetate, HA = hydrochloric & ascorbic acid, M = methanol, H = hydrochloric acid, S = sulfuric acid  
 1. TO MEET REGULATORY REQUIREMENTS, THIS FORM MUST BE COMPLETED IN DETAIL AND INCLUDED IN THE COOLER CONTAINING THE SAMPLES DESCRIBED.  
 2. PLEASE USE ONE LINE PER SAMPLE. NOT PER BOTTLE.  
 3. RETURN THIS FORM WITH SAMPLES - CLIENT MAY KEEP PINK COPY.  
 4. PARTIES COLLECTING SAMPLE, LISTED AS REPORT TO AND LISTED AS INVOICE TO AGREE TO STANDARD TERMS & CONDITIONS ON REVERSE.

**IMPORTANT!**

## **Appendix B**

July 14, 2014 Sampling Documents

# IMPOUNDMENT SAMPLING LOG

2014 Water Quality Study - Flambeau Upper Hydroelectric Project - FERC #2640

HWL - 1486.72

Date: 7/14/14

Pre-Sampling Data: TWL - 1467.4

CFS - 1055

Time: 7:30 Barometer: 29.84 Air Temp: 13.9 °C Wind Speed: W 3 MPH

Sky Conditions: CLOUDY, MISTING, OVERCAST

Precipitation within Last 24 Hours: NO - CURRENTLY MISTING

D.O. Meter Calibration: Instrument Model Used: Hach HQ40d

Were The Batterys Changed?  Yes  No If Yes, When Changed: \_\_\_\_\_

Battery Status: 70% Charge

Calibration Time: FEB. 2014 Method: Factory

Sampling Depth Profile: Measured Depth to Bottom of the Impoundment: 18.5 Feet

Secchi Disk Depth: (E0.1 Foot) 3.5 Feet Time: 7:35

## Chlorophyll a (3 Feet Below Surface)

Lab Sample I.D.# : <u>07142014 1A</u>		
Time	Quantity (ml)	Filtered
<u>7:40</u>	<u>1000</u>	<u>NO</u>

## True Color (3 Feet Below Surface)

Lab Sample I.D.# : <u>07142014 1B</u>	
Time	Quantity (ml)
<u>7:41</u>	<u>260</u>

## D.O. Sample Data

Depth	Time	D.O. (mg/l)	°C
.5 Ft Below Surface	<u>7:45</u>	<u>7.22</u>	<u>21.3</u>
3 Feet	<u>7:46</u>	<u>7.24</u>	<u>21.2</u>
6 Feet	<u>7:47</u>	<u>7.26</u>	<u>21.2</u>
9 Feet	<u>7:48</u>	<u>7.28</u>	<u>21.2</u>
12 Feet	<u>7:49</u>	<u>7.30</u>	<u>21.1</u>
15 Feet	<u>7:5</u>	<u>7.35</u>	<u>21.1</u>
18 Feet	<u>7:16</u>	<u>7.19</u>	<u>21.0</u>
21 Feet			
24 Feet			
.5 Ft Above Bottom	<u>7:17</u>	<u>7.19</u>	<u>21.0</u>

## Phosphorus

Lab Sample I.D.# : <u>07142014 1C</u>	
(3 Feet Below Surface)	
Time	Preserved?
<u>7:42</u>	<u>H2SO4</u>

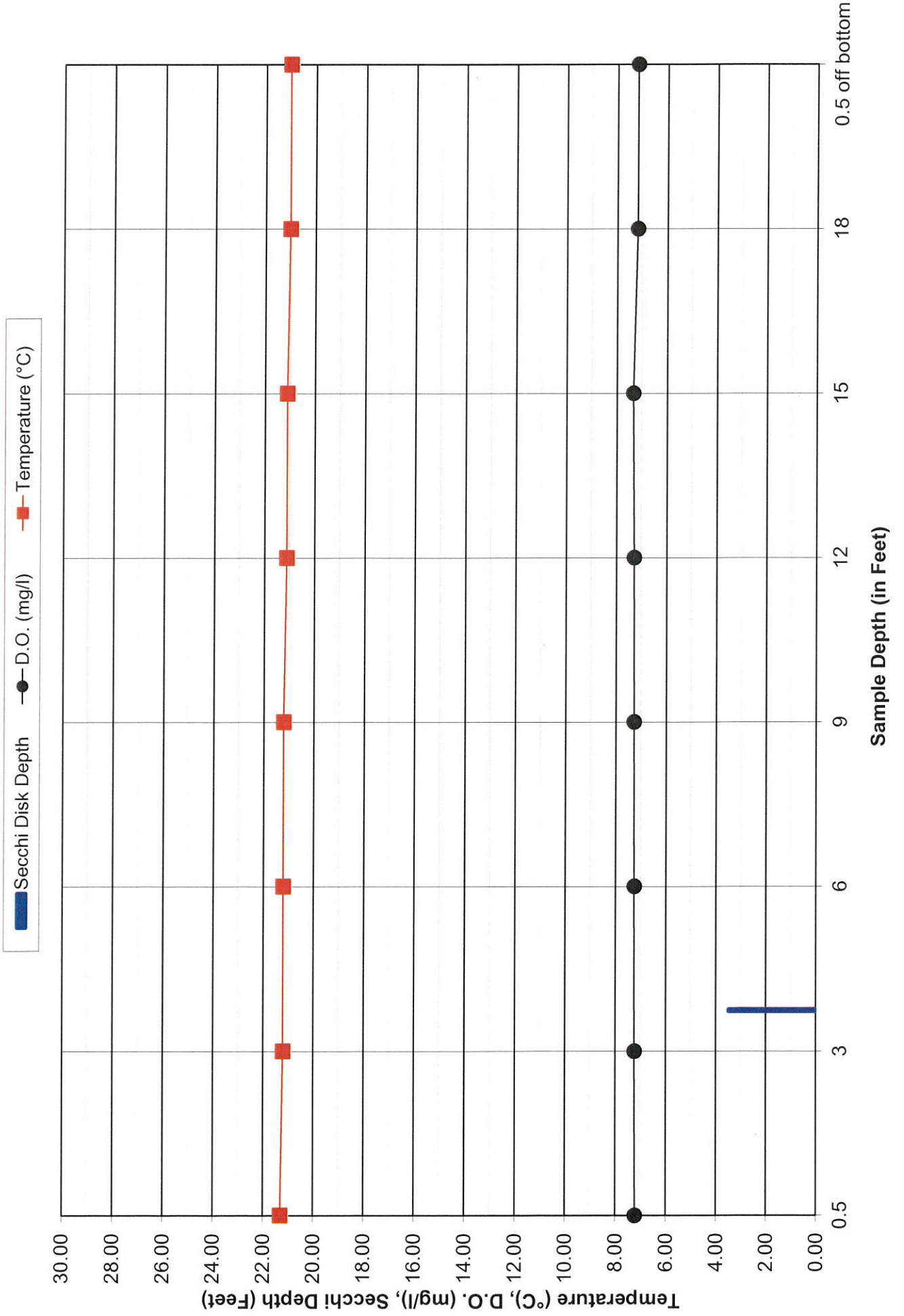
Lab Sample I.D.# : _____	
(3 Feet Above Bottom)	
Time	Preserved?

Sample Location: N45° 56.609' W90° 26.299'

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

Performed By: Gary Rast

# Upper Impoundment - FERC # 2640 July 14, 2014 Sampling Event



# ANALYTICAL REPORT

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

WDNR Laboratory ID No. 721026460  
 WDATCP Laboratory Certification No. 105-330  
 EPA Laboratory ID No. WI000034

Printed: 07/22/14 Code: NNNN-S Page 1 of 3  
 NLS Project: 222726  
 NLS Customer: 102823  
 Phone: 855 994 9376

**Client:** Renewable World Energies  
 Attn: Gary Rast  
 100 State Street  
 P.O. Box 264  
 Neshkoro, WI 54960

Project:	FLAM (4)	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
<b>07142014 1A</b>	<b>NLS ID: 802602</b>								
COC: 154999:1 Matrix: SW									
Collected: 07/14/14 13:12 Received: 07/15/14									
<b>Parameter</b>		see attached					07/21/14	10200-H	721026460
Chlorophyll, all species									
Lab filtration for Chlorophyll									
<b>07142014 2A</b>	<b>NLS ID: 802603</b>								
COC: 154999:1 Matrix: SW									
Collected: 07/14/14 13:12 Received: 07/15/14									
<b>Parameter</b>		see attached					07/21/14	10200-H	721026460
Chlorophyll, all species									
Lab filtration for Chlorophyll									
<b>07142014 3A</b>	<b>NLS ID: 802604</b>								
COC: 154999:1 Matrix: SW									
Collected: 07/14/14 13:12 Received: 07/15/14									
<b>Parameter</b>		see attached					07/21/14	10200-H	721026460
Chlorophyll, all species									
Lab filtration for Chlorophyll									
<b>07142014 4A</b>	<b>NLS ID: 802605</b>								
COC: 154999:1 Matrix: SW									
Collected: 07/14/14 13:12 Received: 07/15/14									
<b>Parameter</b>		see attached					07/21/14	10200-H	721026460
Chlorophyll, all species									
Lab filtration for Chlorophyll									
<b>07142014 1B</b>	<b>NLS ID: 802606</b>								
COC: 154999:2 Matrix: SW									
Collected: 07/14/14 13:14 Received: 07/15/14									
<b>Parameter</b>		100	C.P.U.	5	25*		07/15/14	SM 2120-B 20ed	721026460
Color, APHA (true)									
Lab filtration									
<b>07142014 2B</b>	<b>NLS ID: 802607</b>								
COC: 154999:2 Matrix: SW									
Collected: 07/14/14 13:14 Received: 07/15/14									
<b>Parameter</b>		100	C.P.U.	5	25*		07/15/14	SM 2120-B 20ed	721026460
Color, APHA (true)									
Lab filtration									
<b>07142014 3B</b>	<b>NLS ID: 802608</b>								
COC: 154999:2 Matrix: SW									
Collected: 07/14/14 13:14 Received: 07/15/14									
<b>Parameter</b>		130	C.P.U.	5	25*		07/15/14	SM 2120-B 20ed	721026460
Color, APHA (true)									
Lab filtration									

# ANALYTICAL REPORT

**NORTHERN LAKE SERVICE, INC.**  
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**Client:** Renewable World Energies  
 Attn: Gary Rast  
 100 State Street  
 P.O. Box 264  
 Neshkoro, WI 54960

**WDNR Laboratory ID No. 721026460**  
**WDATCP Laboratory Certification No. 105-330**  
**EPA Laboratory ID No. W100034**  
 Printed: 07/22/14 Code: NNNN-S Page 2 of 3  
**NLS Project: 222726**  
**NLS Customer: 102823**  
 Phone: 855 994 9376

Project	FLAM (4)	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
<b>07142014 4B NLS ID: 802609</b>									
COC: 154999:2 Matrix: SW									
Collected: 07/14/14 13:14 Received: 07/15/14									
<b>Parameter</b>									
Color: APHA (true)		130	C.P.U.	5	25*		07/15/14	SM 2120-B 20ed	721026460
Lab filtration		yes					07/15/14	NA	721026460
<b>07142014 1C NLS ID: 802610</b>									
COC: 154999:3 Matrix: SW									
Collected: 07/14/14 13:15 Received: 07/15/14									
<b>Parameter</b>									
Phosphorus, tot. as P		0.035	mg/L	1	0.0070*		07/17/14	SM 4500P-E 20ed	721026460
<b>07142014 2C NLS ID: 802611</b>									
COC: 154999:3 Matrix: SW									
Collected: 07/14/14 13:15 Received: 07/15/14									
<b>Parameter</b>									
Phosphorus, tot. as P		0.037	mg/L	1	0.0070*		07/17/14	SM 4500P-E 20ed	721026460
<b>07142014 3C NLS ID: 802612</b>									
COC: 154999:3 Matrix: SW									
Collected: 07/14/14 13:15 Received: 07/15/14									
<b>Parameter</b>									
Phosphorus, tot. as P		0.047	mg/L	1	0.0070*		07/17/14	SM 4500P-E 20ed	721026460
<b>07142014 4C NLS ID: 802613</b>									
COC: 154999:3 Matrix: SW									
Collected: 07/14/14 13:15 Received: 07/15/14									
<b>Parameter</b>									
Phosphorus, tot. as P		0.046	mg/L	1	0.0070*		07/17/14	SM 4500P-E 20ed	721026460
<b>07142014 2D NLS ID: 802614</b>									
COC: 154999:4 Matrix: SW									
Collected: 07/14/14 13:17 Received: 07/15/14									
<b>Parameter</b>									
Phosphorus, tot. as P		0.038	mg/L	1	0.0070*		07/17/14	SM 4500P-E 20ed	721026460
<b>07142014 3D NLS ID: 802615</b>									
COC: 154999:4 Matrix: SW									
Collected: 07/14/14 13:17 Received: 07/15/14									
<b>Parameter</b>									
Phosphorus, tot. as P		0.050	mg/L	1	0.0070*		07/17/14	SM 4500P-E 20ed	721026460
<b>07142014 4D NLS ID: 802616</b>									
COC: 154999:4 Matrix: SW									
Collected: 07/14/14 13:17 Received: 07/15/14									
<b>Parameter</b>									
Phosphorus, tot. as P		0.044	mg/L	1	0.0070*		07/17/14	SM 4500P-E 20ed	721026460

# ANALYTICAL REPORT

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

WDNR Laboratory ID No. 721026460  
WDATCP Laboratory Certification No. 105-330  
EPA Laboratory ID No. W100034  
Printed: 07/22/14 Code: NNNN-S Page 3 of 3

**Client:** Renewable World Energies  
Attn: Gary Rast  
100 State Street  
P.O. Box 264  
Neshkoro, WI 54960

**NLS Project:** 222726  
**NLS Customer:** 102823  
Phone: 855 994 9376

**Project:** FLAM (4)

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.

LOD = Limit of Detection      LOQ = Limit of Quantitation      ND = Not Detected (< LOD)      1000 ug/L = 1 mg/L  
DWB = Dry Weight Basis      NA = Not Applicable      %DWB = (mg/kg DWB) / 10000  
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: Renewable World Energies  
Project: 222726  
FLAM (4)

Sample	Description	CC a	Pheo a	TC a	TC b	TC c
802602	07142014 1A	2.8	0.56	3.2	0.08	0.35
802603	07142014 2A	2.5	0.71	3	0.062	0.24
802604	07142014 3A	4.5	1.1	5.4	0.083	0.51
802605	07142014 4A	4.5	0.95	5.3	0.15	0.57

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/cm² 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.

**RENEWABLE WORLD ENERGIES**  
 400 North Lake Avenue • Grandon, WI 54520-1298  
 Tel: (715) 478-2777 • Fax: (715) 478-3060

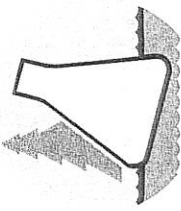
**RENEWABLE WORLD ENERGIES**  
 Wisconsin Lab Cert. No. 721026460  
 Analytical Laboratory and Environmental Services  
 400 North Lake Avenue • Grandon, WI 54520-1298  
 Tel: (715) 478-2777 • Fax: (715) 478-3060

**RENEWABLE WORLD ENERGIES**  
 100 S. STATES STREET  
 NESHKORO WI 54960  
 PHONE 855-994-9376  
 FAX 920-293-4160

USE BOXES BELOW: Indicate Y or N if GW Sample is field filtered.  
 Indicate G or C if WW Sample is Grab or Composite.

ANALYZE PER ORDER OF ANALYSIS

MATRIX:  
 SW = surface water  
 WW = waste water  
 GW = groundwater  
 DW = drinking water  
 TIS = tissue  
 AIR = air  
 SOIL = soil  
 SED = sediment  
 PROD = product  
 SL = sludge  
 OTHER



NO. 154999

ITEM NO.	MIS LAB NO.	SAMPLE ID	COLLECTION DATE	TIME	MATRIX (See above)	COLLECTION REMARKS (i.e. DNR Well ID #)
1.	071420141A-4A		7/14/14	7:40-1:12	RIVER	
2.	606-609	11	7/14-1/14	11		
3.	610-613	11	7/14-1/15	11		
4.	614-616	11	9/15-1/17	11		
5.						
6.						
7.						
8.						
9.						
10.						

REPORT TO: SAME AS ABOVE  
 ATTN: GARY  
 INVOICE TO: RENEWABLE WORLD OPERATIONS  
 1001 STAFFENSON STREET,  
 NORWAY MICH 49870

COLLECTED BY (signature): *[Signature]* DATE/TIME: 7/14/14 7:40-1:17  
 CUSTODY SEAL NO. (IF ANY):  
 RECEIVED BY (signature): *[Signature]* DATE/TIME: 7/14/14 3:00  
 METHOD OF TRANSPORT: UPS  
 DATE/TIME: 7-15-14 10:00  
 CONDITION: ON W  
 REMARKS & OTHER INFORMATION:  
 WDNR FACILITY NUMBER: E-MAIL ADDRESS:  
 COOLER #:  
 PRESERVATIVE: N = nitric acid OH = sodium hydroxide  
 NP = no preservative Z = zinc acetate HA = hydrochloric & ascorbic acid  
 S = sulfuric acid M = methanol H = hydrochloric acid

1. TO MEET REGULATORY REQUIREMENTS, THIS FORM MUST BE COMPLETED IN DETAIL AND INCLUDED IN THE COOLER CONTAINING THE SAMPLES DESCRIBED.  
 2. PLEASE USE ONE LINE PER SAMPLE, NOT PER BOTTLE.  
 3. RETURN THIS FORM WITH SAMPLES - CLIENT MAY KEEP PINK COPY.  
 4. PARTIES COLLECTING SAMPLE, LISTED AS REPORT TO AND LISTED AS INVOICE TO AGREE TO STANDARD TERMS & CONDITIONS ON REVERSE.

## **Appendix C**

August 12, 2014 Sampling Documents

# IMPOUNDMENT SAMPLING LOG

2014 Water Quality Study - Flambeau Upper Hydroelectric Project - FERC #2640

Pre-Sampling Data: HWL - 1486.60 Date: 8/12/14  
TWL - 1467.4 PROJECT FLOW - 737 CFS  
 Time: 7:30 Barometer: 30.00 Air Temp: 12.22 °C Wind Speed: 15 MPH  
 Sky Conditions: SUNNY, PARTLY CLOUDY, + BREEZY  
 Precipitation within Last 24 Hours: YES

D.O. Meter Calibration: \_\_\_\_\_ Instrument Model Used: Hach HQ40d  
 Were The Batterys Changed?  Yes  No If Yes, When Changed: \_\_\_\_\_

Battery Status: 50% Charge

Calibration Time: FEB. 2014 Method: \_\_\_\_\_ Factory \_\_\_\_\_

Sampling Depth Profile: Measured Depth to Bottom of the Impoundment: 19.0 Feet

Secchi Disk Depth: (E0.1 Foot) 3.1 Feet Time: 7:35

### Chlorophyll a (3 Feet Below Surface)

Lab Sample I.D.#: <u>20140812-1A</u>		
Time	Quantity (ml)	Filtered
<u>7:37</u>	<u>1000</u>	<u>NO</u>

### True Color (3 Feet Below Surface)

Lab Sample I.D.#: <u>20140812-1B</u>	
Time	Quantity (ml)
<u>7:39</u>	<u>250</u>

### D.O. Sample Data

Depth	Time	D.O. (mg/l)	°C
.5 Ft Below Surface	<u>7:42</u>	<u>7.12</u>	<u>21.0</u>
3 Feet	<u>7:43</u>	<u>7.04</u>	<u>21.2</u>
6 Feet	<u>7:44</u>	<u>6.98</u>	<u>21.4</u>
9 Feet	<u>7:45</u>	<u>6.95</u>	<u>21.4</u>
12 Feet	<u>7:46</u>	<u>6.94</u>	<u>21.5</u>
15 Feet	<u>7:47</u>	<u>6.91</u>	<u>21.6</u>
18 Feet	<u>7:48</u>	<u>6.88</u>	<u>21.6</u>
21 Feet			
24 Feet			
.5 Ft Above Bottom	<u>7:49</u>	<u>6.88</u>	<u>21.6</u>

### Phosphorus

Lab Sample I.D.#: <u>20140812-1C</u>	
(3 Feet Below Surface)	
Time	Preserved?
<u>7:40</u>	<u>H2SO4</u>

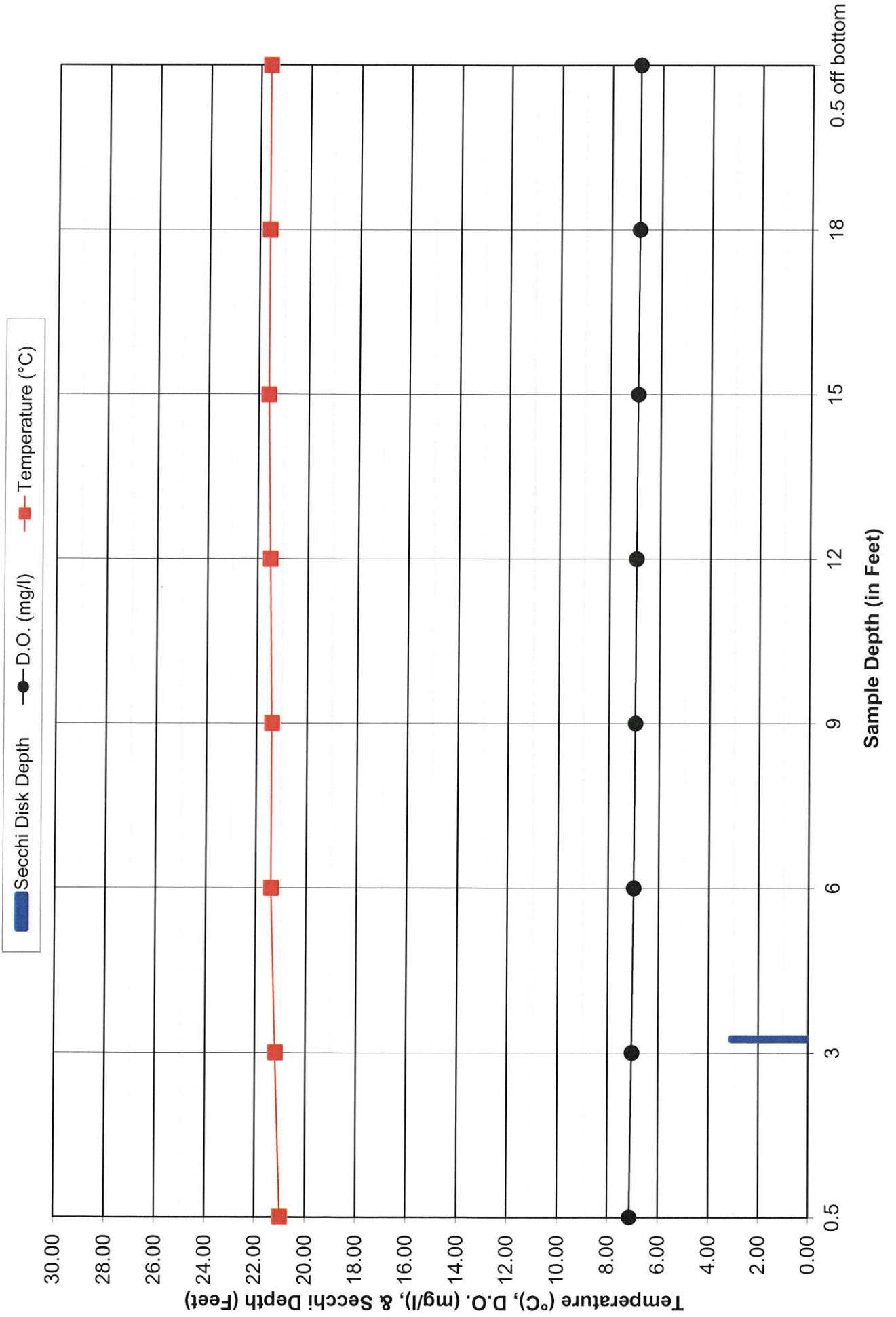
Lab Sample I.D.#: _____	
(3 Feet Above Bottom)	
Time	Preserved?

Sample Location: N45° 56.609' W90° 26.299'

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

Performed By: GARY RAST + BEN RICHARD

# Upper Impoundment - FERC # 2640 August 12, 2014 Sampling Event



# ANALYTICAL REPORT

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

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

**Client:** Renewable World Energies  
 Attn: Gary Rast  
 100 State Street  
 P.O. Box 264  
 Neshkoro, WI 54960

Printed: 08/18/14 Code: NNNN-S Page 1 of 3  
 NLS Project: 224853  
 NLS Customer: 102823  
 Phone: 855 994 9376

Project	Flambeau (4)	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
<b>20140812 1-A NLS ID: 809771</b>									
COC: 160942:1 Matrix: SW									
Collected: 08/12/14 13:35 Received: 08/13/14									
<b>Parameter</b>									
Chlorophyll, all species									
Lab filtration for Chlorophyll									
<b>20140812 2-A NLS ID: 809772</b>									
COC: 160942:1 Matrix: SW									
Collected: 08/12/14 13:35 Received: 08/13/14									
<b>Parameter</b>									
Chlorophyll, all species									
Lab filtration for Chlorophyll									
<b>20140812 3-A NLS ID: 809773</b>									
COC: 160942:1 Matrix: SW									
Collected: 08/12/14 13:35 Received: 08/13/14									
<b>Parameter</b>									
Chlorophyll, all species									
Lab filtration for Chlorophyll									
<b>20140812 4-A NLS ID: 809774</b>									
COC: 160942:1 Matrix: SW									
Collected: 08/12/14 13:35 Received: 08/13/14									
<b>Parameter</b>									
Chlorophyll, all species									
Lab filtration for Chlorophyll									
<b>20140812 1-B NLS ID: 809775</b>									
COC: 160942:2 Matrix: SW									
Collected: 08/12/14 13:40 Received: 08/13/14									
<b>Parameter</b>									
Color, APHA (true)									
Lab filtration									
<b>20140812 2-B NLS ID: 809776</b>									
COC: 160942:2 Matrix: SW									
Collected: 08/12/14 13:40 Received: 08/13/14									
<b>Parameter</b>									
Color, APHA (true)									
Lab filtration									
<b>20140812 3-B NLS ID: 809777</b>									
COC: 160942:2 Matrix: SW									
Collected: 08/12/14 13:40 Received: 08/13/14									
<b>Parameter</b>									
Color, APHA (true)									
Lab filtration									

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: 08/18/14 Code: NNNN-S Page 2 of 3  
 NLS Project: 224853  
 NLS Customer: 102823  
 Phone: 855 994 9376

Client: Renewable World Energies  
 Attn: Gary Raast  
 100 State Street  
 P.O. Box 264  
 Neshkoro, WI 54960

Project: Flambeau (4)

**20140812 4-B NLS ID: 809778**

COC: 160942:2 Matrix: SW  
 Collected: 08/12/14 13:40 Received: 08/13/14

Parameter

Color, APHA (true)

Lab filtration

Result  
100  
Yes

Units  
C.P.U.

Dilution  
5

LOD  
25\*

LOQ

Analyzed  
08/13/14  
08/13/14

Method  
SM 2120-B 20ed  
NA

Lab  
721026460  
721026460

**20140812 1-C NLS ID: 809779**

COC: 160942:3 Matrix: SW  
 Collected: 08/12/14 13:42 Received: 08/13/14

Parameter

Phosphorus, tot. as P

Result  
0.024

Units  
mg/L

Dilution  
1

LOD  
0.0070\*

LOQ

Analyzed  
08/14/14

Method  
SM 4500P-E 20ed

Lab  
721026460

**20140812 2-C NLS ID: 809780**

COC: 160942:3 Matrix: SW  
 Collected: 08/12/14 13:42 Received: 08/13/14

Parameter

Phosphorus, tot. as P

Result  
0.029

Units  
mg/L

Dilution  
1

LOD  
0.0070\*

LOQ

Analyzed  
08/14/14

Method  
SM 4500P-E 20ed

Lab  
721026460

**20140812 3-C NLS ID: 809781**

COC: 160942:3 Matrix: SW  
 Collected: 08/12/14 13:42 Received: 08/13/14

Parameter

Phosphorus, tot. as P

Result  
0.037

Units  
mg/L

Dilution  
1

LOD  
0.0070\*

LOQ

Analyzed  
08/14/14

Method  
SM 4500P-E 20ed

Lab  
721026460

**20140812 4-C NLS ID: 809782**

COC: 160942:3 Matrix: SW  
 Collected: 08/12/14 13:42 Received: 08/13/14

Parameter

Phosphorus, tot. as P

Result  
0.047

Units  
mg/L

Dilution  
1

LOD  
0.0070\*

LOQ

Analyzed  
08/14/14

Method  
SM 4500P-E 20ed

Lab  
721026460

**20140812 2-D NLS ID: 809783**

COC: 160942:4 Matrix: SW  
 Collected: 08/12/14 13:45 Received: 08/13/14

Parameter

Phosphorus, tot. as P

Result  
0.033

Units  
mg/L

Dilution  
1

LOD  
0.0070\*

LOQ

Analyzed  
08/14/14

Method  
SM 4500P-E 20ed

Lab  
721026460

**20140812 3-D NLS ID: 809784**

COC: 160942:4 Matrix: SW  
 Collected: 08/12/14 13:45 Received: 08/13/14

Parameter

Phosphorus, tot. as P

Result  
0.035

Units  
mg/L

Dilution  
1

LOD  
0.0070\*

LOQ

Analyzed  
08/14/14

Method  
SM 4500P-E 20ed

Lab  
721026460

**20140812 4-D NLS ID: 809785**

COC: 160942:4 Matrix: SW  
 Collected: 08/12/14 13:45 Received: 08/13/14

Parameter

Phosphorus, tot. as P

Result  
0.051

Units  
mg/L

Dilution  
1

LOD  
0.0070\*

LOQ

Analyzed  
08/14/14

Method  
SM 4500P-E 20ed

Lab  
721026460

# ANALYTICAL REPORT

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

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

Printed: 08/18/14 Code: NNNN-S Page 3 of 3  
NLS Project: 224853  
NLS Customer: 102823  
Phone: 855 994 9376

Client: Renewable World Energies  
Attn: Gary Rast  
100 State Street  
P.O. Box 264  
Neshkoro, WI 54960

Project: Flambeau (4)

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.

LOD = Limit of Detection  
DWB = Dry Weight Basis  
MCL = Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL.

ND = Not Detected (< LOD)  
%DWB = (mg/kg DWB) / 10000  
1000 ug/L = 1 mg/L

Reviewed by: 

Authorized by:  
R. T. Krueger  
President



Northern Lake Service, Inc.  
Chlorophyll Results

Customer: Renewable World Energies  
Project: 224853  
Flambeau (4)

<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>
809771	20140812 1-A	5.2	0.26	5.6	0.0*	0.44
809772	20140812 2-A	5.1	0.3	5.5	0.0*	0.37
809773	20140812 3-A	5.7	0.53	6.2	0.0*	0.36
809774	20140812 4-A	6.2	0.74	6.9	0.00082	0.48

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.

**NORTHERN LAKE SERVICE, INC.**

Analytical Laboratory and Environmental Services  
 400 North Lake Avenue • Crandon, WI 54520-1298  
 Tel: (715) 478-2777 • Fax: (715) 478-3060

**SAMPLE COLLECTION AND CHAIN OF CUSTODY RECORD**

Wisconsin Lab Cert. No. 721026460  
 ANALYTICAL LABORATORY DATE 105-000330

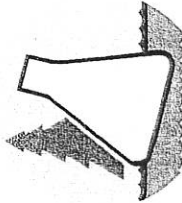
CLIENT: RENEWABLE WORLD ENERGY  
 ADDRESS: PO BOX 264 100 S. STATE STREET  
 CITY: NESHKORO WI 54960  
 PROJECT DESCRIPTION / NO.: FLAMBEAU (4)  
 QUOTATION NO.: \_\_\_\_\_  
 DNR FID #: \_\_\_\_\_  
 DNR LICENSE #: \_\_\_\_\_  
 CONTACT: GARY  
 PHONE: 855-994-9376  
 PURCHASE ORDER NO.: \_\_\_\_\_  
 FAX: 820-293-4100  
 VERBAL

MATRIX:  
 SW = surface water  
 WW = waste water  
 GW = groundwater  
 DW = drinking water  
 TIS = tissue  
 AIR = air  
 SOIL = soil  
 SED = sediment  
 PROD = product  
 SL = sludge  
 OTHER

USE BOXES BELOW: Indicate Y or N if GW Sample is field filtered.  
 Indicate G or C if WW Sample is Grab or Composite.

ANALYZE PER ORDER OF ANALYSIS

PHOS  
 PHOS  
 TRUE DO  
 CHLOROPHYLL A



NO. 160942

ITEM NO.	NLS LAB NO.	SAMPLE ID	DATE	COLLECTION TIME	MATRIX (See above)	COLLECTION REMARKS (i.e. DNR Well ID #)
1.	771-774	20140812-1,2,3,4-A	8/12/14	7:37-1:35	RUNNING WATER	
2.	775-778	"	8/12/14	7:35-1:40	"	
3.	779-782	"	8/12/14	7:40-1:42	"	
4.	783-785	"	8/12/14	7:45-1:45	"	
5.						
6.						
7.						
8.						
9.						
10.						

\*NO TEMP BLANK SENT OR FOLLOWS

COLLECTED BY (signature): [Signature] DATE/TIME: 8/12/14 7:37-1:45  
 RECEIVED BY (signature): [Signature] DATE/TIME: \_\_\_\_\_  
 DISPATCHED BY (signature): [Signature] DATE/TIME: 8/12/14 8:15  
 RECEIVED AT NLS BY (signature): [Signature] DATE/TIME: \_\_\_\_\_  
 COOLER # \_\_\_\_\_  
 PRESERVATIVE: N = nitric acid OH = sodium hydroxide  
 NP = no preservative Z = zinc acetate HA = hydrochloric & ascorbic acid  
 S = sulfuric acid M = methanol H = hydrochloric acid

REPORT TO: SAME AS  
 INVOICE TO: ATTN: GARY  
RENEWABLE WORLD OPERATIONS  
1001 STEPHENSON STREET  
NORWAY, MI 49870

1. TO MEET REGULATORY REQUIREMENTS, THIS FORM MUST BE COMPLETED IN DETAIL AND INCLUDED IN THE COOLER CONTAINING THE SAMPLES DESCRIBED.  
 2. PLEASE USE ONE LINE PER SAMPLE. NOT PER BOTTLE.  
 3. RETURN THIS FORM WITH SAMPLES - CLIENT MAY KEEP PINK COPY.  
 4. PARTIES COLLECTING SAMPLE, LISTED AS REPORT TO AND LISTED AS INVOICE TO AGREE TO STANDARD TERMS & CONDITIONS ON REVERSE.

**IMPORTANT!**

**Appendix D**

Agency Correspondence

**Gary Rast**

---



**From:** Gary Rast  
**Sent:** Wednesday, October 29, 2014 8:30 AM  
**To:** 'Laatsch, Cheryl - DNR'; Utrup, Nick  
**Cc:** Aneta Rietveld  
**Subject:** 4 Flam 2014 Draft WQ Reports Message 1  
**Attachments:** 14-10-29 GGR Flam In Ag Comment Draft 14 WQ Rpts.pdf; 14-10-27 GGR FLUP Draft Report 2014 WQM Data.pdf

Cheryl & Nick,

**Flambeau Upper**

RWE is submitting the 4 Flambeau 2014 Draft WQ Reports for comment should you have any to offer. Because the files are large I will be sending 4 e-mail messages each with 1 project report and letter (October 29) attached. This message has Flambeau Upper attached. Submittal list is found below:

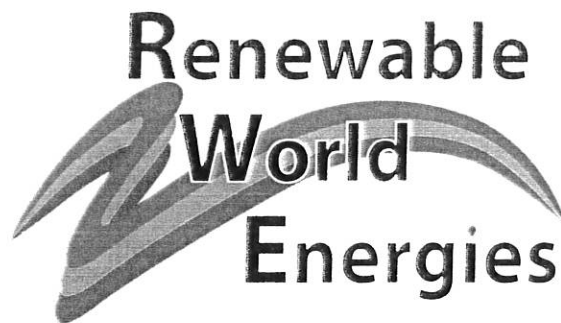
- Message 1 – Flambeau Upper (Dated October 27)
- Message 2 – Flambeau Lower (Dated October 27)
- Message 3 – Flambeau Pixley (Dated October 28)
- Message 4 – Flambeau Crowley (Dated October 29)

Gary

Gary Rast  
Regulatory/Compliance Manager



Renewable World Energies, LLC  
100 S. State Street  
P.O. Box 264  
Neshkoro, WI 54960  
Phone: 855-994-9376 Ext. 105  
Fax: 920-293-4100  
Cell: 920-570-0995  
E-mail: [grast@rwehydro.com](mailto:grast@rwehydro.com)



 COPY

October 29, 2014

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

Ms. Cheryl Laatsch  
Statewide FERC Coordinator  
Wisconsin Dept. of Natural Resources  
N7725 HWY 28  
Horicon, WI 53032

Re: **Flambeau Hydroelectric Projects**  
**FERC Project Numbers-Upper FERC # 2640, Lower FERC # 2421,**  
**Pixley FERC # 2395, Crowley FERC # 2473**  
**Flambeau Hydro LLC**  
**Draft Reports 2014 Water Quality Monitoring Data**

Dear Agencies:

On behalf of Flambeau Hydro LLC ("Flambeau"), Licensee, Renewable World Energies, LLC is submitting a copy of its Draft Report 2014 Water Quality Monitoring Data for each of the Flambeau Projects. No problems were encountered with equipment, data, or the monitoring schedule in general. The report is a requirement of Flambeau's Federal license pursuant to article 406 and 408 and the approved Water Quality Monitoring Plans. The purpose of this letter is to formally invite you to comment on the draft reports. The Federal Energy Regulatory Commission's regulations allow for a 30 day formal review and comment period. Nothing out of the ordinary was experienced during the 2014 monitoring season except as noted in the reports. Thank you in advance for providing your responses in a timely manner so we can include your comments and recommendations, as appropriate, into our reports.

If you have any questions concerning the report, please contact Mr. Gary Rast at the Renewable World Energies, LLC offices @ 855-994-9376 ext. 105, or by email at: [grast@rwehydro.com](mailto:grast@rwehydro.com)

**Corporate Office**  
P.O. Box 264  
100 S. State Street  
Neshkoro, WI 54960  
Fax: 920-293-4100

Phone: 855-99HYDRO  
(855-994-9376)  
[www.renewableworldenergies.com](http://www.renewableworldenergies.com)

**Administrative Office**  
1001 Stephenson Street  
Norway, MI 49870  
Fax: 906-563-9344



Sincerely,  
Renewable World Energies, LLC  
Agent For Licensee

  
Mr. Jason Kreuscher  
Vice President, Operations

Attachments: Draft Report 2014 Water Quality Monitoring Data Flambeau Upper Hydroelectric Project  
- October 27, 2014

Draft Report 2014 Water Quality Monitoring Data Flambeau Lower Hydroelectric  
Project - October 27, 2014

Draft Report 2014 Water Quality Monitoring Data Flambeau Pixley Hydroelectric  
Project - October 28, 2014


Draft Report 2014 Water Quality Monitoring Data Flambeau Crowley Hydroelectric  
Project - October 29, 2014

Cc: RWE, Corporate

## Gary Rast

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**From:** Gary Rast  
**Sent:** Tuesday, May 27, 2014 8:58 AM  
**To:** 'Laatsch, Cheryl - DNR'; Utrup, Nick  
**Subject:** RE: water quality data collection

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Everyone,

Just sending an update on water sample collections (Ice-Out) at Winter and Flambeau projects. Nothing collected to this point. Flows have come down quite a bit in the last two weeks. However, the boat barriers are not in at Winter, Flambeau Upper or Flambeau Lower. Two of the three sites have access just slightly above the dams and sample points near the dams at most a couple hundred feet (Winter & Flambeau Lower). I will not attempt any sampling unless they are installed. A side note is that the 4 Flambeau projects must be done in sequence and on the same day. Sampling is on hold until at least the week of June 2<sup>nd</sup> or June 9<sup>th</sup> if you still want it done. I need to schedule Turtle/Eagle/Erosion and KBB surveys from now on as well.

Gary

Gary Rast  
Regulatory/Compliance Manager



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E-mail: [grast@rwehydro.com](mailto:grast@rwehydro.com)

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**From:** Laatsch, Cheryl - DNR [<mailto:Cheryl.Laatsch@wisconsin.gov>]  
**Sent:** Tuesday, May 13, 2014 11:38 AM  
**To:** Gary Rast  
**Subject:** FW: water quality data collection

I have asked for clarification from Craig. Here is his response.

Thanks, Cheryl

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**From:** Roesler, Craig P - DNR  
**Sent:** Tuesday, May 13, 2014 11:12 AM  
**To:** Laatsch, Cheryl - DNR; Hansen, James P - DNR  
**Cc:** Aartila, Tom P - DNR  
**Subject:** RE: water quality data collection

I would have them collect the samples as soon as conditions become safe. If it isn't possible in May, try for early June.

**Gary Rast**

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## Gary Rast

---

**From:** Gary Rast  
**Sent:** Tuesday, May 13, 2014 9:52 AM  
**To:** 'Laatsch, Cheryl - DNR'  
**Cc:** 'Jason Kreuzscher'; Cindy Skowronski; Aneta Rietveld  
**Subject:** RE: water quality data collection

 COPY

Cheryl,

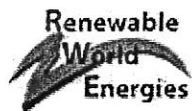
Thanks for the response. However, last year a similar situation occurred at the Flambeau projects and we abandoned the sampling with agency consult. Why the inconsistency from year to year? Below is exact content of an e-mail sent to the agencies on May 22, 2013 addressing same type of issue and agencies agreed. Just asking where is the difference. **FYI- As of this morning, the flows at the Winter project are now 3,000 CFS as opposed to 2,000 CFS last week and the flows at the (4) Flambeau projects are at 6,500 CFS as opposed to 3,500 - 4,000 CFS last week.** We can try to check back together but next week is the last full week of May because Memorial Day is the following Monday. Gary

Everyone,

About 1 to 1.5 weeks ago I notified you that because of water conditions and no boat barriers being installed at the Flambeau projects the Ice-Out WQ monitoring would or could not be performed during the 2 week time period following Ice-Out. On Monday 5/20 I was notified that the barriers were installed and river conditions were approaching more normal conditions. Because weather looked favorable for Thursday 5/23 I made plans for that day. I was not aware that the area had received so much rain in the past couple of days and that runoff from surrounding areas were contributing so much. River conditions today 5/22 are horrible to say the least, about 1000 CFS more than when you were originally notified. I believe they are slightly one side or the other of 4000 CFS. I have been informed that another 500 CFS is to be released from the flowage later today, so conditions will worsen. I spoke to Jeff less than an hour ago and discussed doing some sort of modified monitoring while I am here. We agreed that was not a good thing because comparison to other years Ice-Out results would be very hard to make and the effort would not be worth much. Jeff and I agreed to skip the Ice-Out sampling all together because the effort would not yield good results and the safety concerns involving the monitoring. RWE asks for your understanding and agreement. Thanks

Gary

Gary Rast  
Regulatory/Compliance Manager



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**From:** Laatsch, Cheryl - DNR [<mailto:Cheryl.Laatsch@wisconsin.gov>]

**Sent:** Tuesday, May 13, 2014 8:28 AM

**To:** Gary Rast

**Subject:** water quality data collection

Staff agree that the sampling should be postponed. They have requested that you try to collect samples before the end of May. Lets check back with each other at the end of May to see how things are going. Thanks

Cheryl Laatsch

Statewide FERC Coordinator

Wisconsin Dept of Natural Resources

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[Cheryl.laatsch@wisconsin.gov](mailto:Cheryl.laatsch@wisconsin.gov)

**Gary Rast**

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Cheryl Laatsch  
Statewide FERC Coordinator  
Wisconsin Dept of Natural Resources  
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(T) 920-387-7869 (Fax) 920-387-7888  
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**Gary Rast**

---

**From:** Reinecke, Sue -FS <sreinecke@fs.fed.us>  
**Sent:** Thursday, May 08, 2014 12:00 PM  
**To:** Gary Rast  
**Cc:** Higgins, Dale -FS  
**Subject:** RE: Winter Ice Out WQ

 COPY

Hi Gary, FS concurs with your decision to not sample for safety reason due to high flows.

thanks  
sue

\*\*\*\*\*  
Sue Reinecke, Forest Fisheries Biologist  
Chequamegon-Nicolet NF  
1170 4<sup>th</sup> Ave South  
Park Falls, WI 54552  
715-762-5185  
[sreinecke@fs.fed.us](mailto:sreinecke@fs.fed.us)  
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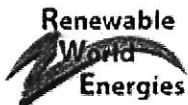
**From:** Gary Rast [<mailto:grast@rwehydro.com>]  
**Sent:** Thursday, May 08, 2014 10:42 AM  
**To:** Laatsch, Cheryl - DNR; Utrup, Nick; Higgins, Dale -FS; Reinecke, Sue -FS  
**Cc:** Jason Kreuzscher; Cindy Skowronski; Aneta Rietveld; David Anderson  
**Subject:** Winter Ice Out WQ

Everyone,

I traveled up to the Winter Hydro this week to perform the Ice Out WQ sampling. The photos were taken May 7, 2014. The 1<sup>st</sup> photo shows the discharge (2004) CFS and 2<sup>nd</sup> photo is looking upstream from the dam. As you can see it is wild and no buoys are installed yet because of dangerous conditions. Sample site is just upstream of the buoys and just to the right of the large evergreen on left side of photo. The power canal is not shown but is on left side of the photo. According to WQ plan, the sampling can be done within 3 weeks of Ice Out. This week was the 2<sup>nd</sup> week since Ice Out. We do not expect conditions to improve in the near future which would put the Ice Out sampling outside of the 3 week window. **The licensee proposes to abandon the Ice Out sampling for 2014 because of these conditions and asks for your agreement.** If you require sampling to be performed, we can do it outside the timeframe when conditions improve but not until then. As a side note sampling was accomplished at the Clam River and Danbury projects this week. Please respond as soon as possible.


Gary

Gary Rast  
Regulatory/Compliance Manager



Renewable World Energies, LLC

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**To:** 'Laatsch, Cheryl - DNR'; Utrup, Nick; Higgins, Dale -FS (dhiggins@fs.fed.us); 'Reinecke, Sue -FS'  
**Cc:** 'Jason Kreuzscher'; Cindy Skowronski; Aneta Rietveld; David Anderson  
**Subject:** Winter Ice Out WQ  
**Attachments:** WNTR Discharge May 7 (1).JPG; WNTR Upstream May 7.JPG

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Document Content(s)

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