



**We Energies**  
 Iron Mountain Hydro Operations  
 800 Industrial Park Drive  
 Iron Mountain, MI 49801  
 Phone 906-779-2400  
 www.we-energies.com

October 16, 2018

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

Dear Ms. Bose,

**SUBJECT: Water Quality Monitoring Report**

<u>Hydro</u>	<u>FERC Project No.</u>	<u>NATDAM No.</u>	<u>License Article</u>
<b>Chalk Hill</b>	<b>2394</b>	<b>MI00160</b>	<b>405 &amp; 406</b>
<b>White Rapids</b>	<b>2357</b>	<b>MI00207</b>	<b>405 &amp; 406</b>

In accordance with the FERC Order Modifying monitoring plans under Articles 405 and 406, dated July 28, 2004, Wisconsin Electric Power Company (d.b.a We Energies) is submitting water quality monitoring data collected in 2018 at the Chalk Hill and White Rapids Hydroelectric Projects.

As described in the water quality monitoring plan for the Chalk Hill and White Rapids hydroelectric facilities, We Energies conducts water quality monitoring every five years for dissolved oxygen (DO) and temperature at two locations on the Menominee River:

- Upstream of the Chalk Hill plant adjacent to the USGS gauging station #04066003 (on the east bank of the Menominee River at County Road Z);
- At a point approximately 100 yards downstream of the White Rapids plant in the tailrace.

Aerial photos depicting the monitoring locations are provided in Figures 1 and 2 in Attachment 1.

The DO and temperature water quality standards for these locations are 5.0 mg/l and 89°F, respectively. The monitoring plan indicates that spot check measurements are to be taken three times per week, in the morning hours, from June 1 through September 30. Historically company staff performed the spot checks by taking manual readings with a hand-held meter at the frequency described in the plan. For the 2018 monitoring season, We Energies utilized portable, programmable water quality monitoring equipment manufactured by YSI, Inc. (EXO 1 multi-parameter sondes) to monitor for dissolved oxygen and temperature at the locations described above. In lieu of recording monitoring data three times a week, the monitoring equipment was programmed to take a water quality reading on a daily basis. The sondes were deployed for a two week period. At the end of the monitoring period the equipment was retrieved, a newly calibrated sonde deployed, and data for the previous monitoring period was downloaded.

**Monitoring Results**

During the 2018 monitoring season, no deviations from the dissolved oxygen or temperature water quality standards were observed. In general, dissolved oxygen levels at the two monitoring locations were very similar. The lowest DO readings observed occurred at the Chalk Hill monitoring location in mid-August when water temperatures ranged between 75°F and 80°F and river flows were at the lowest levels for the year.

A comparison of water temperature data shows that water temperature downstream of the White Rapids powerhouse was consistently higher than at the upstream monitoring location. Water temperatures averaged 3°F higher downstream of the White Rapids Powerhouse compared to the Chalk Hill monitoring location. Water quality monitoring data, along with figures depicting the monitoring locations, can be found in Attachment 1.


During the monitoring season, there was a two week period at the Chalk Hill monitoring location where data is missing. The missing data was due to a typographical error that was made when programming the water quality monitor. At the time the equipment was programmed, the start date was inadvertently entered as 07/29/18 rather than 06/29/18. As a result, no monitoring data was collected during this period. However; based on the monitoring data available for the rest of the monitoring season, We Energies does not believe there was a potential for a deviation from water quality standards during the period of missing data. Prior to and immediately following the period of missing monitoring data, DO readings at the two monitoring locations were near or above 7 mg/l. Notification of the missing water quality monitoring data was provided to the resource agencies on July 16, 2018. Documentation of agency consultation can be found in Attachment 2.

**Upcoming Monitoring**

As described in the monitoring plan, water quality monitoring is to be conducted on a 5 year interval. The next sampling event will occur in 2023, and every 5 years thereafter for the term of the license.

Should you have any questions regarding this submittal, please do not hesitate to call Mr. Mark Metcalf at (920) 433-1833 or email at [mark.metcalf@wecenergygroup.com](mailto:mark.metcalf@wecenergygroup.com).

Sincerely,



Todd Jastremski  
Asset Manager Hydro Operations

MWM/ace

Enc: Attachment 1 – 2018 Water quality monitoring data (10 pages)  
Attachment 2 – Agency notification of missing monitoring data (3 pages)

cc: John Zygaj – FERC CRO  
Elle Gulotty – MDNR  
Amira Oun – MDEQ  
Cheryl Laatsch – WDNR  
Nicholas Utrup – USFWS

**Attachment 1**

**2018 Water Quality Monitoring Data**

Figure 1 Chalk Hill Hydroelectric Facility - Water Quality Monitoring Location

Chalk Hill at County Road Z

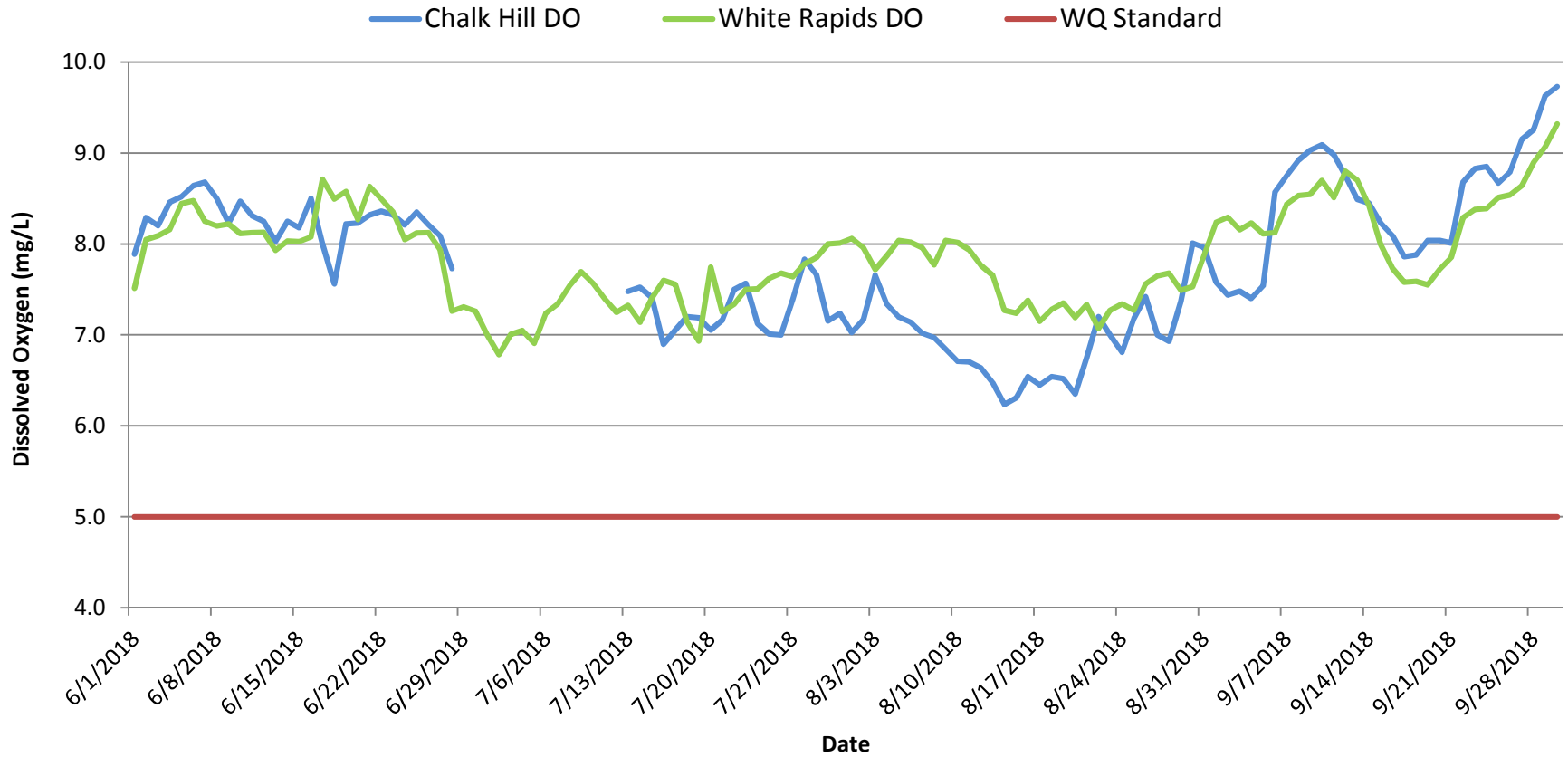


Figure 2 White Rapids Hydroelectric Facility - Water Quality Monitoring Location

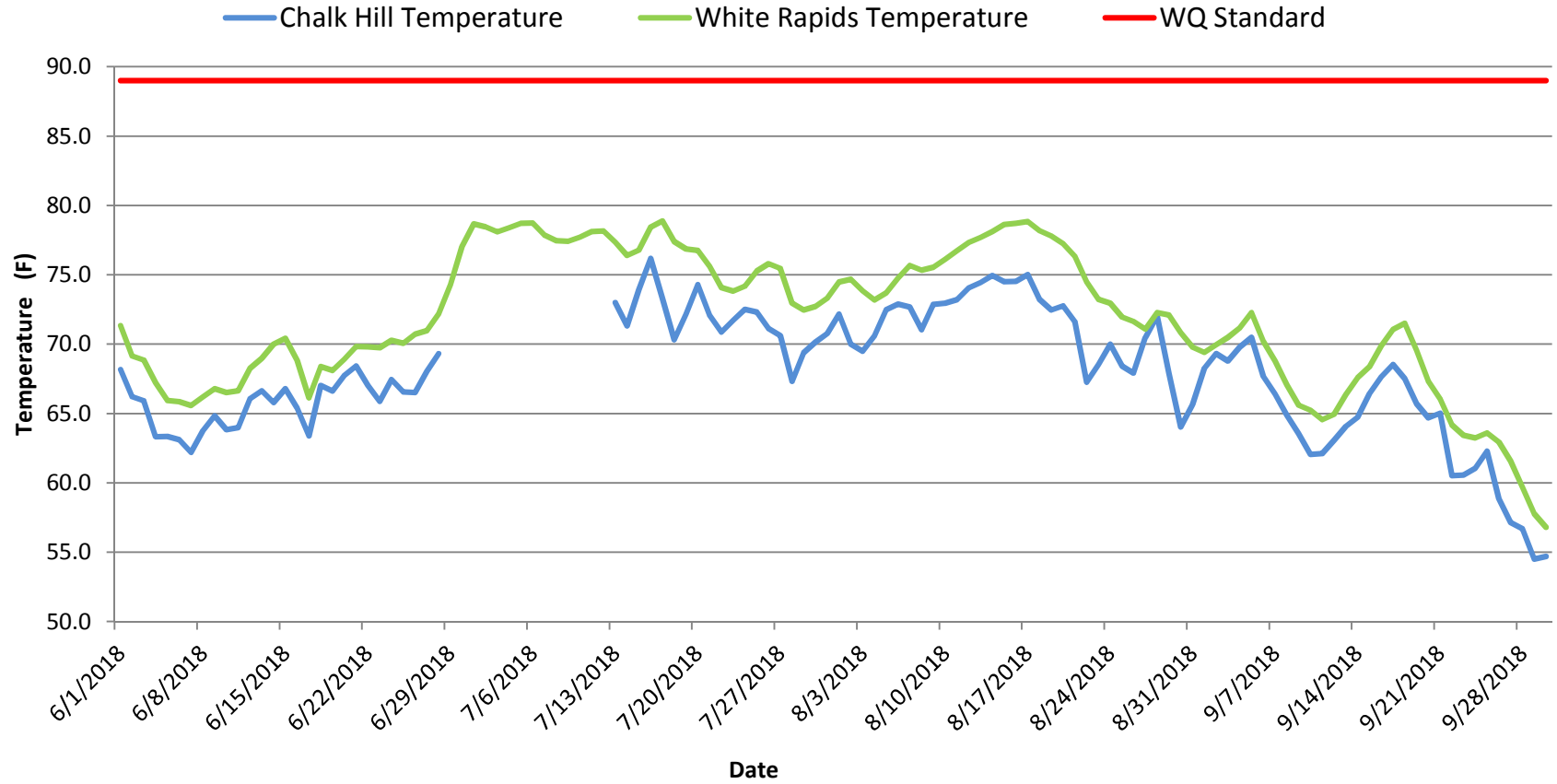
White Rapids Tailrace



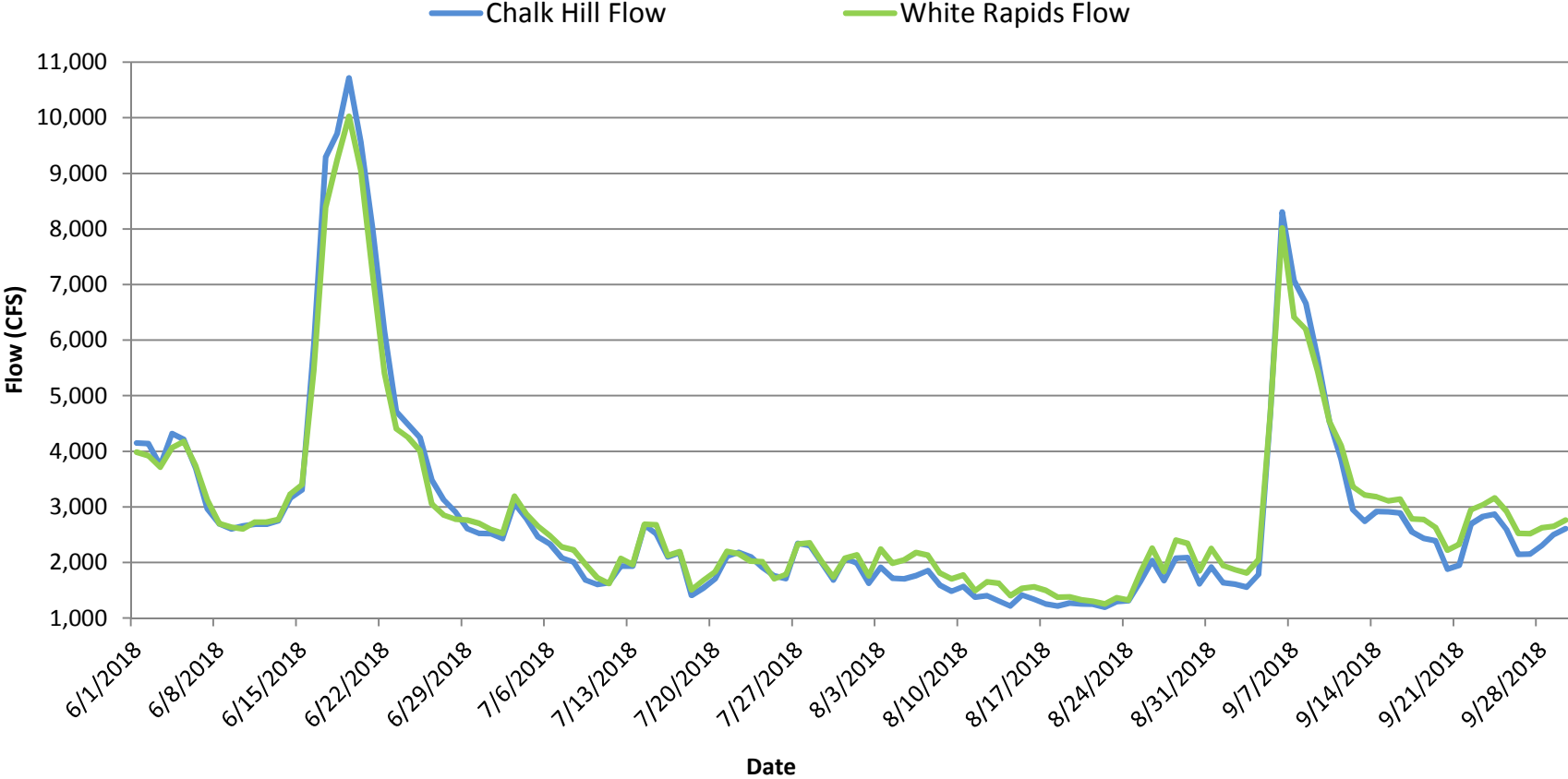
## Chalk Hill & White Rapids - 2018 Dissolved Oxygen Monitoring Data



## Chalk Hill & White Rapids - 2018 Temperature Monitoring Data



### Chalk Hill & White Rapids - 2018 Daily Average Flow Data





**We Energies - Chalk Hill & White Rapids Hydroelectric Facilities**  
**FERC Project Nos. 2394 and 2357**  
**Article 405 - Water Quality Monitoring Plan**

Date	Time	Chalk Hill	Chalk Hill	White	White	Chalk Hill	White
		@ Cty Rd Z DO mg/l	@ Cty Rd Z Temp F	Rapids Tailrace DO mg/l	Rapids Tailrace Temp F	Daily Ave Flow CFS	Rapids Daily Ave Flow CFS
6/1/2018	8:00:00	7.9	68.2	7.5	71.3	4,149	3,984
6/2/2018	8:00:00	8.3	66.2	8.0	69.2	4,141	3,923
6/3/2018	8:00:00	8.2	65.9	8.1	68.8	3,747	3,712
6/4/2018	8:00:00	8.5	63.3	8.2	67.2	4,317	4,066
6/5/2018	8:00:00	8.5	63.3	8.4	65.9	4,215	4,177
6/6/2018	8:00:00	8.6	63.1	8.5	65.9	3,695	3,743
6/7/2018	8:00:00	8.7	62.2	8.2	65.6	2,960	3,123
6/8/2018	8:00:00	8.5	63.8	8.2	66.2	2,694	2,697
6/9/2018	8:00:00	8.2	64.8	8.2	66.8	2,605	2,634
6/10/2018	8:00:00	8.5	63.8	8.1	66.5	2,656	2,605
6/11/2018	8:00:00	8.3	64.0	8.1	66.6	2,688	2,725
6/12/2018	8:00:00	8.3	66.1	8.1	68.2	2,687	2,726
6/13/2018	8:00:00	8.0	66.6	7.9	69.0	2,750	2,773
6/14/2018	8:00:00	8.3	65.8	8.0	70.0	3,158	3,232
6/15/2018	8:00:00	8.2	66.8	8.0	70.4	3,304	3,401
6/16/2018	8:00:00	8.5	65.4	8.1	68.8	5,919	5,463
6/17/2018	8:00:00	8.0	63.4	8.7	66.1	9,295	8,396
6/18/2018	8:00:00	7.6	67.0	8.5	68.4	9,717	9,244
6/19/2018	8:00:00	8.2	66.6	8.6	68.1	10,716	10,028
6/20/2018	8:00:00	8.2	67.8	8.3	68.9	9,565	9,053
6/21/2018	8:00:00	8.3	68.4	8.6	69.8	7,994	7,184
6/22/2018	8:00:00	8.4	67.0	8.5	69.8	6,157	5,401
6/23/2018	8:00:00	8.3	65.9	8.3	69.8	4,716	4,407
6/24/2018	8:00:00	8.2	67.4	8.0	70.3	4,484	4,248
6/25/2018	8:00:00	8.4	66.6	8.1	70.1	4,251	4,012
6/26/2018	8:00:00	8.2	66.5	8.1	70.7	3,484	3,048
6/27/2018	8:00:00	8.1	68.0	7.9	71.0	3,129	2,853
6/28/2018	8:00:00	7.7	69.3	7.3	72.2	2,912	2,778
6/29/2018	8:00:00			7.3	74.3	2,610	2,760
6/30/2018	8:00:00			7.3	77.0	2,521	2,703
7/1/2018	8:00:00			7.0	78.7	2,521	2,594
7/2/2018	8:00:00			6.8	78.4	2,430	2,526
7/3/2018	8:00:00			7.0	78.1	3,059	3,193
7/4/2018	8:00:00			7.0	78.4	2,792	2,875
7/5/2018	8:00:00			6.9	78.7	2,459	2,651
7/6/2018	8:00:00			7.2	78.7	2,330	2,479
7/7/2018	8:00:00			7.3	77.9	2,080	2,281

**We Energies - Chalk Hill & White Rapids Hydroelectric Facilities**  
**FERC Project Nos. 2394 and 2357**  
**Article 405 - Water Quality Monitoring Plan**

Date	Time	Chalk Hill	Chalk Hill	White	White	Chalk Hill	White
		@ Cty Rd Z DO mg/l	@ Cty Rd Z Temp F	Rapids Tailrace DO mg/l	Rapids Tailrace Temp F	Daily Ave Flow CFS	Rapids Daily Ave Flow CFS
7/8/2018	8:00:00			7.5	77.5	2,010	2,228
7/9/2018	8:00:00			7.7	77.4	1,683	1,965
7/10/2018	8:00:00			7.6	77.7	1,607	1,726
7/11/2018	8:00:00			7.4	78.1	1,637	1,622
7/12/2018	8:00:00			7.2	78.2	1,936	2,074
7/13/2018	8:00:00	7.5	73.0	7.3	77.4	1,937	1,963
7/14/2018	8:00:00	7.5	71.3	7.1	76.4	2,673	2,687
7/15/2018	8:00:00	7.4	73.9	7.4	76.8	2,515	2,678
7/16/2018	8:00:00	6.9	76.2	7.6	78.4	2,098	2,123
7/17/2018	8:00:00	7.1	73.3	7.6	78.9	2,174	2,194
7/18/2018	8:00:00	7.2	70.3	7.1	77.4	1,409	1,510
7/19/2018	8:00:00	7.2	72.2	6.9	76.9	1,539	1,681
7/20/2018	8:00:00	7.1	74.3	7.7	76.8	1,708	1,833
7/21/2018	8:00:00	7.2	72.1	7.3	75.6	2,108	2,201
7/22/2018	8:00:00	7.5	70.9	7.3	74.1	2,184	2,159
7/23/2018	8:00:00	7.6	71.7	7.5	73.8	2,104	2,025
7/24/2018	8:00:00	7.1	72.5	7.5	74.2	1,914	2,012
7/25/2018	8:00:00	7.0	72.3	7.6	75.3	1,758	1,706
7/26/2018	8:00:00	7.0	71.1	7.7	75.8	1,710	1,785
7/27/2018	8:00:00	7.4	70.6	7.6	75.5	2,344	2,335
7/28/2018	8:00:00	7.8	67.3	7.8	72.9	2,306	2,356
7/29/2018	8:00:00	7.7	69.4	7.9	72.5	1,999	2,024
7/30/2018	8:00:00	7.2	70.1	8.0	72.7	1,687	1,737
7/31/2018	8:00:00	7.2	70.8	8.0	73.3	2,070	2,077
8/1/2018	8:00:00	7.0	72.2	8.1	74.5	1,989	2,137
8/2/2018	8:00:00	7.2	70.0	8.0	74.7	1,628	1,760
8/3/2018	8:00:00	7.7	69.5	7.7	73.8	1,912	2,243
8/4/2018	8:00:00	7.3	70.6	7.9	73.2	1,717	1,985
8/5/2018	8:00:00	7.2	72.5	8.0	73.7	1,707	2,046
8/6/2018	8:00:00	7.1	72.9	8.0	74.8	1,766	2,178
8/7/2018	8:00:00	7.0	72.7	8.0	75.7	1,854	2,131
8/8/2018	8:00:00	7.0	71.0	7.8	75.3	1,596	1,811
8/9/2018	8:00:00	6.8	72.9	8.0	75.5	1,484	1,707
8/10/2018	8:00:00	6.7	73.0	8.0	76.1	1,566	1,775
8/11/2018	8:00:00	6.7	73.2	7.9	76.7	1,375	1,491
8/12/2018	8:00:00	6.6	74.1	7.8	77.3	1,405	1,651
8/13/2018	8:00:00	6.5	74.4	7.7	77.7	1,306	1,625

**We Energies - Chalk Hill & White Rapids Hydroelectric Facilities**  
**FERC Project Nos. 2394 and 2357**  
**Article 405 - Water Quality Monitoring Plan**

Date	Time	Chalk Hill	Chalk Hill	White	White	Chalk Hill	White
		@ Cty Rd Z DO mg/l	@ Cty Rd Z Temp F	Rapids Tailrace DO mg/l	Rapids Tailrace Temp F	Daily Ave Flow CFS	Rapids Daily Ave Flow CFS
8/14/2018	8:00:00	6.2	75.0	7.3	78.1	1,218	1,405
8/15/2018	8:00:00	6.3	74.5	7.2	78.6	1,416	1,534
8/16/2018	8:00:00	6.5	74.5	7.4	78.7	1,337	1,561
8/17/2018	8:00:00	6.5	75.0	7.2	78.8	1,256	1,500
8/18/2018	8:00:00	6.5	73.2	7.3	78.2	1,216	1,376
8/19/2018	8:00:00	6.5	72.5	7.4	77.8	1,272	1,379
8/20/2018	8:00:00	6.4	72.8	7.2	77.3	1,255	1,330
8/21/2018	8:00:00	6.8	71.6	7.3	76.3	1,248	1,301
8/22/2018	8:00:00	7.2	67.3	7.1	74.5	1,195	1,252
8/23/2018	8:00:00	7.0	68.5	7.3	73.2	1,295	1,366
8/24/2018	8:00:00	6.8	70.0	7.3	73.0	1,312	1,321
8/25/2018	8:00:00	7.2	68.4	7.3	71.9	1,656	1,821
8/26/2018	8:00:00	7.4	67.9	7.6	71.6	2,035	2,257
8/27/2018	8:00:00	7.0	70.5	7.7	71.1	1,674	1,840
8/28/2018	8:00:00	6.9	72.0	7.7	72.3	2,079	2,403
8/29/2018	8:00:00	7.4	67.9	7.5	72.1	2,089	2,343
8/30/2018	8:00:00	8.0	64.0	7.5	70.8	1,617	1,848
8/31/2018	8:00:00	8.0	65.6	7.9	69.8	1,916	2,253
9/1/2018	8:00:00	7.6	68.3	8.2	69.4	1,639	1,946
9/2/2018	8:00:00	7.4	69.3	8.3	70.0	1,608	1,868
9/3/2018	8:00:00	7.5	68.8	8.2	70.5	1,555	1,813
9/4/2018	8:00:00	7.4	69.8	8.2	71.2	1,784	2,051
9/5/2018	8:00:00	7.5	70.5	8.1	72.3	4,682	4,705
9/6/2018	8:00:00	8.6	67.7	8.1	70.2	8,302	8,019
9/7/2018	8:00:00	8.8	66.4	8.4	68.8	7,070	6,414
9/8/2018	8:00:00	8.9	64.9	8.5	67.1	6,662	6,194
9/9/2018	8:00:00	9.0	63.6	8.5	65.6	5,670	5,443
9/10/2018	8:00:00	9.1	62.1	8.7	65.2	4,530	4,531
9/11/2018	8:00:00	9.0	62.1	8.5	64.6	3,866	4,109
9/12/2018	8:00:00	8.8	63.1	8.8	64.9	2,951	3,362
9/13/2018	8:00:00	8.5	64.1	8.7	66.4	2,740	3,214
9/14/2018	8:00:00	8.5	64.7	8.4	67.6	2,914	3,184
9/15/2018	8:00:00	8.2	66.4	8.0	68.4	2,912	3,106
9/16/2018	8:00:00	8.1	67.6	7.7	69.9	2,892	3,142
9/17/2018	8:00:00	7.9	68.5	7.6	71.1	2,552	2,784
9/18/2018	8:00:00	7.9	67.5	7.6	71.5	2,433	2,773
9/19/2018	8:00:00	8.0	65.7	7.6	69.6	2,389	2,629

**We Energies - Chalk Hill & White Rapids Hydroelectric Facilities**  
**FERC Project Nos. 2394 and 2357**  
**Article 405 - Water Quality Monitoring Plan**

Date	Time	Chalk Hill	Chalk Hill	White	White	Chalk Hill	White
		@ Cty Rd Z DO mg/l	@ Cty Rd Z Temp F	Rapids Tailrace DO mg/l	Rapids Tailrace Temp F	Daily Ave Flow CFS	Rapids Daily Ave Flow CFS
9/20/2018	8:00:00	8.0	64.7	7.7	67.3	1,880	2,223
9/21/2018	8:00:00	8.0	65.0	7.9	66.1	1,950	2,326
9/22/2018	8:00:00	8.7	60.5	8.3	64.2	2,694	2,947
9/23/2018	8:00:00	8.8	60.6	8.4	63.4	2,825	3,041
9/24/2018	8:00:00	8.9	61.1	8.4	63.2	2,868	3,161
9/25/2018	8:00:00	8.7	62.3	8.5	63.6	2,594	2,921
9/26/2018	8:00:00	8.8	58.9	8.5	62.9	2,149	2,525
9/27/2018	8:00:00	9.2	57.1	8.6	61.6	2,152	2,521
9/28/2018	8:00:00	9.3	56.7	8.9	59.7	2,307	2,627
9/29/2018	8:00:00	9.6	54.5	9.1	57.8	2,500	2,650
9/30/2018	8:00:00	9.7	54.7	9.3	56.8	2,610	2,762

Missing data. Log file accidently set up to start on 7/29/18 rather than 6/29/18.

**Attachment 2**

**Agency Notification of Missing Monitoring Data**

**From:** [Metcalf, Mark W](#)  
**To:** [Laatsch, Cheryl](#); [GulottyE@michigan.gov](mailto:GulottyE@michigan.gov); [Oun, Amira](#); [Utrup, Nick](#)  
**Cc:** [Grisar, Mike L](#); [Barens, Jeffrey D](#)  
**Subject:** Water Quality Monitoring - We Energies Chalk Hill & White Rapids hydros  
**Date:** Monday, July 16, 2018 4:05:54 PM  
**Attachments:** [2018 CH WR monitoring summary.xlsx](#)  
[2018 Monitoring Locations.pdf](#)

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Good afternoon,

Pursuant to Article 405 and the water quality monitoring plan for the Chalk Hill and White Rapids hydroelectric facilities (FERC No. 2394 and 2357, respectively), We Energies is conducting water quality monitoring for dissolved oxygen and temperature every 5 years during the term of the license. As described in the monitoring plan, monitoring is occurring at two locations on the Menominee River:

- Upstream of the Chalk Hill plant adjacent to the USGS gauging station #04066003 (on the east bank of the Menominee River at County Road Z);
- At a point approximately 100 yards downstream of the White Rapids plant in the tailrace.

The monitoring plan indicates spot check measurements are to be taken three times per week, in the morning hours, from June 1 through September 30. Historically the spot checks were performed by taking manual readings with a hand-held meter by company staff. For the 2018 monitoring season, We Energies is utilizing portable, programmable water quality monitoring equipment manufactured by YSI, Inc. to monitor for dissolved oxygen and temperature at the locations described above (EXO 1 multi-parameter sondes). These sondes are the same equipment that is used for continuous monitoring downstream of the Twin Falls hydroelectric project. The sondes are being deployed for a two week period, and at the end of the monitoring period the equipment is retrieved, a newly calibrated sonde deployed, and data downloaded for the previous monitoring period. In lieu of readings every three days, the sondes have been programmed to take a water quality reading on a daily basis.

We Energies would like to inform you that a period of a period missing monitoring data has occurred. On Thursday, July 12, I went to the Chalk Hill monitoring location to retrieve water quality monitor deployed for the previous two week period. When I retrieved the monitor I discovered that monitoring data was not collected over the previous two weeks. The cause of the missing data was a typographical error in the monitoring program. When the monitor for the Chalk Hill monitoring location was programmed to operate on June 28, 2018, the equipment program start date was accidentally set up to start on 7/29/18, instead of 6/29/18. As a result, data is missing from the monitoring location upstream of the Chalk Hill facility from June 29 through July 12.

I have reviewed the downstream monitoring data collected below White Rapids and there were no deviations from the water quality standard of 5 mg/l DO during the previous two week monitoring period. The lowest DO reading observed during this time downstream of White Rapids was 6.7 mg/l. DO monitoring since the beginning of June has shown DO levels upstream of Chalk Hill are typically equal to or higher than downstream of White Rapids. Since no deviations were observed downstream of White Rapids during this two week period, there is no reasons to suspect there were water quality issues upstream of Chalk Hill. Monitoring data collected since June 1<sup>st</sup> is attached for

your review.

Please feel free to contact me if you have any questions

Thanks,  
Mark

**Mark Metcalf**

Principal Environmental Consultant

office: 920-433-1833

mobile: 920-246-2717

*Please note my email address has changed: [mark.metcalf@wecenergygroup.com](mailto:mark.metcalf@wecenergygroup.com)*