Upper Peninsula Power Company
1002 Harbor Hills Drive
Marquette, MI 49855
www.UPPCO.com

October 26, 2016

FERC Project No. 10855
NATDAM No. MI00183

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

Dear Secretary Bose:

Dead River Hydroelectric Project – McClure Development
Article 408 – Water Quality Monitoring – Deviation Reporting

Per the Order Modifying and Approving Water Quality Monitoring Plan under Article 408, dated April 17, 2003, and the Order Approving Modification to approved Water Quality Monitoring Plan (Plan) under Article 408, dated March 3, 2005, Upper Peninsula Power Company (UPPCO) is conducting water quality monitoring at its Developments located on the Dead River Hydroelectric Project.

The Plan requires that water temperature shall be monitored on an hourly basis from May 1 through October 31, annually, and dissolved oxygen (D.O.) levels shall be monitored from June 1 through September 30, annually. Any deviations from the water quality standards shall be filed with the Commission within ten (10) days of the observed deviation.

Calculated Monthly Average Temperature

Upon downloading the final temperature data for the month of September, UPPCO calculated the monthly average temperature in the McClure Bypass exceeded the monthly average requirement for September[1]. The calculated monthly average temperature for the McClure Bypass was 63.52°F and the monthly average standard for September is 63.0°F (See Appendix A).

UPPCO believes the higher calculated monthly temperature average for this location is due to a combination of (1) the above normal warm temperature during the day, (2) the lack of shading vegetation on the Dead River upstream, and (3) UPPCO's inability to release more than the minimum flow requirements upstream at Silver Lake.

1) The average maximum temperature for September 2016 in Marquette, MI was 3.5°F higher than the normal (see Appendix B) and previous months were warmer than normal as well.

[1] The monthly average temperature for the Hoist Tailwater was calculated using 394 hourly readings instead of 720 hourly readings because the device was lost to vandalism as reported on October 21, 2016.

2) The Silver Lake Event in 2003 eliminated all shading vegetation from the stream banks of the Dead River upstream of the AAO Bridge. Although vegetation has been planted and the shading effect is improved, it will take some time for the shading effect to return to the pre-2003 level. This situation results in warmer water being stored in the downstream reservoirs longer in the season. Temperature data from early October show the warmer water being stored in the reservoirs from the previous warm summer months is cooling and moving downstream, through the system.

3) UPPCO is striving to return the Silver Lake Storage Reservoir elevation to normal operation following the dam safety improvement work completed last year. As a result, very little cold water (only the minimum flow of 10 CFS) was released into the downstream system during the summer months. The current elevation of Silver Lake is approximately 1481.7 feet and it needs to be returned to 1485.20 feet before flows greater than the License minimum can be released.

Due to the reasons outlined above, UPPCO does not propose any additional mitigation measures for the calculated monthly average temperature deviation.

UPPCO provided notice of deviation of the monthly average temperature requirement to the Michigan Department of Environmental Quality (MDEQ) and the Michigan Department of Natural Resources (MDNR) by email on October 17, 2016. The MDEQ and the MDNR did not provide a response. For your reference, a documentation of consultation has been included in Appendix C.

If you have any questions regarding this letter, please contact Mr. Jarrod Nelson at (906) 232-1433 or Mr. Shawn Puzen at (920) 593-6865.

Sincerely,

Virgil Schlorke
Director – Energy Supply & Resource Planning

SCP/jfn/klw

Enc: Appendices A-C (20161026 MCL Dev_WQM_attach.pdf)

cc: Mr. Jarrod Nelson, UPPCO
Mr. Keith Moyle, UPPCO
Mr. Shawn Puzen, Mead & Hunt, Inc.
Ms. Koren Carpenter, MDEQ
Mr. Kyle Kruger, MDNR
Ms. Elle Gulotty, MDNR
Ms. Katie Wilkins, UPPCO
Ms. Emily Rushford, UPPCO

APPENDIX A:

McClure Bypass Temperature Data

Date Time, GMT-05:00	Hoist Tailwater Temp, °F	McClure Bypass Temp, °F
9/1/2016 0:00	68.83	64.98
9/1/2016 1:00	68.79	64.98
9/1/2016 2:00	68.76	65.01
9/1/2016 3:00	68.72	65.01
9/1/2016 4:00	68.65	64.98
9/1/2016 5:00	68.58	64.98
9/1/2016 6:00	68.5	64.98
9/1/2016 7:00	68.47	64.98
9/1/2016 8:00	68.4	65.01
9/1/2016 9:00	68.36	65.12
9/1/2016 10:00	68.4	65.26
9/1/2016 11:00	68.54	65.52
9/1/2016 12:00	68.9	65.88
9/1/2016 13:00	69.01	66.09
9/1/2016 14:00	69.19	66.24
9/1/2016 15:00	69.4	66.56
9/1/2016 16:00	69.4	66.63
9/1/2016 17:00	69.15	66.38
9/1/2016 18:00	68.76	65.98
9/1/2016 19:00	68.32	65.44
9/1/2016 20:00	68.07	65.01
9/1/2016 21:00	67.82	64.72
9/1/2016 22:00	67.57	64.4
9/1/2016 23:00	67.39	64.11
9/2/2016 0:00	67.28	63.93
9/2/2016 1:00	67.24	63.82
9/2/2016 2:00	67.17	63.72
9/2/2016 3:00	67.14	63.68
9/2/2016 4:00	67.03	63.64
9/2/2016 5:00	66.92	63.61
9/2/2016 6:00	66.81	63.57
9/2/2016 7:00	66.7	63.54
9/2/2016 8:00	66.67	63.64
9/2/2016 9:00	66.88	64.44
9/2/2016 10:00	PROBE LOST	65.08
9/2/2016 11:00	PROBE LOST	65.73
9/2/2016 12:00	PROBE LOST	66.24
9/2/2016 13:00	PROBE LOST	66.7
9/2/2016 14:00	PROBE LOST	67.06
9/2/2016 15:00	PROBE LOST	67.06
9/2/2016 16:00	PROBE LOST	66.88
9/2/2016 17:00	PROBE LOST	66.49
9/2/2016 18:00	PROBE LOST	65.91
9/2/2016 19:00	PROBE LOST	65.41
9/2/2016 20:00	PROBE LOST	65.08

9/2/2016 21:00	PROBE LOST	64.8
9/2/2016 22:00	PROBE LOST	64.62
9/2/2016 23:00	PROBE LOST	64.47
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9/3/2016 1:00	PROBE LOST	64.4
9/3/2016 2:00	PROBE LOST	64.29
9/3/2016 3:00	PROBE LOST	64.22
9/3/2016 4:00	PROBE LOST	64.22
9/3/2016 5:00	PROBE LOST	64.29
9/3/2016 6:00	PROBE LOST	64.36
9/3/2016 7:00	PROBE LOST	64.47
9/3/2016 8:00	PROBE LOST	64.62
9/3/2016 9:00	PROBE LOST	64.83
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9/5/2016 10:00	PROBE LOST	65.84
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9/15/2016 17:00	PROBE LOST	64.44
9/15/2016 18:00	PROBE LOST	64.08
9/15/2016 19:00	PROBE LOST	63.79
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9/16/2016 3:00	PROBE LOST	63.28
9/16/2016 4:00	PROBE LOST	63.32
9/16/2016 5:00	PROBE LOST	63.36
9/16/2016 6:00	PROBE LOST	63.39
9/16/2016 7:00	PROBE LOST	63.43
9/16/2016 8:00	PROBE LOST	Calibration
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9/16/2016 12:00	PROBE LOST	63.57
9/16/2016 13:00	PROBE LOST	63.43

9/16/2016 14:00	65.08	63.43
9/16/2016 15:00	65.55	63.61
9/16/2016 16:00	65.77	63.79
9/16/2016 17:00	65.98	64.08
9/16/2016 18:00	65.95	64.15
9/16/2016 19:00	65.88	64.04
9/16/2016 20:00	65.84	63.86
9/16/2016 21:00	65.8	63.72
9/16/2016 22:00	65.8	63.57
9/16/2016 23:00	65.77	63.43
9/17/2016 0:00	65.8	63.39
9/17/2016 1:00	65.8	63.43
9/17/2016 2:00	65.8	63.43
9/17/2016 3:00	65.88	63.43
9/17/2016 4:00	65.88	63.46
9/17/2016 5:00	65.84	63.43
9/17/2016 6:00	65.8	63.36
9/17/2016 7:00	65.77	63.32
9/17/2016 8:00	65.84	63.39
9/17/2016 9:00	65.95	63.57
9/17/2016 10:00	66.13	63.68
9/17/2016 11:00	66.45	63.97
9/17/2016 12:00	66.38	64.44
9/17/2016 13:00	66.49	64.8
9/17/2016 14:00	66.6	64.94
9/17/2016 15:00	66.85	65.16
9/17/2016 16:00	66.7	64.98
9/17/2016 17:00	66.67	64.8
9/17/2016 18:00	66.7	64.51
9/17/2016 19:00	66.6	64.22
9/17/2016 20:00	66.45	63.93
9/17/2016 21:00	66.34	63.68
9/17/2016 22:00	66.31	63.54
9/17/2016 23:00	66.24	63.39
9/18/2016 0:00	66.24	63.25
9/18/2016 1:00	66.2	63.21
9/18/2016 2:00	66.13	63.21
9/18/2016 3:00	66.16	63.28
9/18/2016 4:00	66.09	63.36
9/18/2016 5:00	66.06	63.43
9/18/2016 6:00	66.06	63.46
9/18/2016 7:00	66.06	63.46
9/18/2016 8:00	66.06	63.54
9/18/2016 9:00	66.16	63.64
9/18/2016 10:00	66.2	63.72
9/18/2016 11:00	66.45	63.82
9/18/2016 12:00	66.56	64.15

9/18/2016 13:00	66.6	64.4
9/18/2016 14:00	66.7	64.87
9/18/2016 15:00	66.74	64.9
9/18/2016 16:00	66.52	64.98
9/18/2016 17:00	66.31	64.83
9/18/2016 18:00	66.13	64.4
9/18/2016 19:00	65.95	63.86
9/18/2016 20:00	65.84	63.46
9/18/2016 21:00	65.84	63.28
9/18/2016 22:00	65.8	63.25
9/18/2016 23:00	65.77	63.25
9/19/2016 0:00	65.73	63.32
9/19/2016 1:00	65.7	63.36
9/19/2016 2:00	65.7	63.43
9/19/2016 3:00	65.73	63.43
9/19/2016 4:00	65.73	63.5
9/19/2016 5:00	65.66	63.54
9/19/2016 6:00	65.66	63.54
9/19/2016 7:00	65.7	63.46
9/19/2016 8:00	65.73	63.46
9/19/2016 9:00	65.8	63.64
9/19/2016 10:00	65.98	63.93
9/19/2016 11:00	66.06	64.26
9/19/2016 12:00	66.02	64.51
9/19/2016 13:00	66.06	64.44
9/19/2016 14:00	66.31	64.54
9/19/2016 15:00	66.38	64.9
9/19/2016 16:00	66.27	64.87
9/19/2016 17:00	66.27	64.8
9/19/2016 18:00	66.34	64.58
9/19/2016 19:00	66.27	64.11
9/19/2016 20:00	66.06	63.79
9/19/2016 21:00	65.98	63.46
9/19/2016 22:00	65.91	63.18
9/19/2016 23:00	65.88	63
9/20/2016 0:00	65.84	62.82
9/20/2016 1:00	65.73	62.67
9/20/2016 2:00	65.66	62.49
9/20/2016 3:00	65.55	62.38
9/20/2016 4:00	65.48	62.28
9/20/2016 5:00	65.41	62.2
9/20/2016 6:00	65.37	62.13
9/20/2016 7:00	65.34	62.06
9/20/2016 8:00	65.34	62.02
9/20/2016 9:00	65.41	62.13
9/20/2016 10:00	65.59	62.35
9/20/2016 11:00	65.62	62.74

9/20/2016 12:00	65.84	63.18
9/20/2016 13:00	65.91	63.64
9/20/2016 14:00	66.16	64.15
9/20/2016 15:00	66.2	64.33
9/20/2016 16:00	66.2	64.4
9/20/2016 17:00	66.2	64.26
9/20/2016 18:00	66.09	64
9/20/2016 19:00	65.98	63.72
9/20/2016 20:00	65.8	63.36
9/20/2016 21:00	65.77	63.14
9/20/2016 22:00	65.77	63.03
9/20/2016 23:00	65.73	63
9/21/2016 0:00	65.7	63
9/21/2016 1:00	65.7	63.03
9/21/2016 2:00	65.66	63.07
9/21/2016 3:00	65.66	63.1
9/21/2016 4:00	65.59	63.1
9/21/2016 5:00	65.55	63.07
9/21/2016 6:00	65.48	62.96
9/21/2016 7:00	65.44	62.78
9/21/2016 8:00	65.41	62.67
9/21/2016 9:00	65.48	62.71
9/21/2016 10:00	65.62	62.85
9/21/2016 11:00	65.77	63.32
9/21/2016 12:00	65.7	63.75
9/21/2016 13:00	65.66	63.97
9/21/2016 14:00	65.66	64
9/21/2016 15:00	65.62	63.97
9/21/2016 16:00	65.55	63.86
9/21/2016 17:00	65.48	63.68
9/21/2016 18:00	65.44	63.54
9/21/2016 19:00	65.37	63.39
9/21/2016 20:00	65.34	63.25
9/21/2016 21:00	65.34	63.18
9/21/2016 22:00	65.3	63.1
9/21/2016 23:00	65.26	63.07
9/22/2016 0:00	65.23	63.03
9/22/2016 1:00	65.23	63.03
9/22/2016 2:00	65.19	63
9/22/2016 3:00	65.19	62.96
9/22/2016 4:00	65.19	62.96
9/22/2016 5:00	65.19	63
9/22/2016 6:00	65.16	63
9/22/2016 7:00	65.16	63.03
9/22/2016 8:00	65.16	63.07
9/22/2016 9:00	65.19	63.21
9/22/2016 10:00	65.3	63.43

9/22/2016 11:00	65.26	63.61
9/22/2016 12:00	65.26	63.72
9/22/2016 13:00	65.34	63.79
9/22/2016 14:00	65.34	63.82
9/22/2016 15:00	65.3	63.82
9/22/2016 16:00	65.26	63.75
9/22/2016 17:00	65.19	63.54
9/22/2016 18:00	65.16	63.36
9/22/2016 19:00	65.08	63.21
9/22/2016 20:00	65.05	63.07
9/22/2016 21:00	65.01	62.96
9/22/2016 22:00	65.01	62.92
9/22/2016 23:00	64.98	62.78
9/23/2016 0:00	64.98	62.67
9/23/2016 1:00	64.94	62.64
9/23/2016 2:00	64.9	62.6
9/23/2016 3:00	64.87	62.53
9/23/2016 4:00	64.83	62.46
9/23/2016 5:00	64.76	62.38
9/23/2016 6:00	64.72	62.31
9/23/2016 7:00	64.69	62.24
9/23/2016 8:00	64.69	62.24
9/23/2016 9:00	64.72	62.42
9/23/2016 10:00	64.76	62.67
9/23/2016 11:00	64.83	62.96
9/23/2016 12:00	64.9	63.18
9/23/2016 13:00	64.9	63.39
9/23/2016 14:00	65.01	63.5
9/23/2016 15:00	65.01	63.54
9/23/2016 16:00	64.9	63.25
9/23/2016 17:00	64.8	63.03
9/23/2016 18:00	64.72	62.74
9/23/2016 19:00	64.65	62.42
9/23/2016 20:00	64.54	62.17
9/23/2016 21:00	64.51	61.95
9/23/2016 22:00	64.47	61.77
9/23/2016 23:00	64.44	61.66
9/24/2016 0:00	64.4	61.56
9/24/2016 1:00	64.36	61.48
9/24/2016 2:00	64.33	61.3
9/24/2016 3:00	64.29	61.2
9/24/2016 4:00	64.26	61.16
9/24/2016 5:00	64.26	61.16
9/24/2016 6:00	64.22	61.2
9/24/2016 7:00	64.22	61.23
9/24/2016 8:00	64.26	61.34
9/24/2016 9:00	64.26	61.56

9/24/2016 10:00	64.33	61.88
9/24/2016 11:00	64.44	62.28
9/24/2016 12:00	64.62	62.56
9/24/2016 13:00	64.62	62.89
9/24/2016 14:00	64.62	63.03
9/24/2016 15:00	64.54	63.25
9/24/2016 16:00	64.51	63.39
9/24/2016 17:00	64.4	63.21
9/24/2016 18:00	64.33	62.89
9/24/2016 19:00	64.26	62.46
9/24/2016 20:00	64.18	62.1
9/24/2016 21:00	64.15	61.81
9/24/2016 22:00	64.08	61.56
9/24/2016 23:00	64.11	61.38
9/25/2016 0:00	64.08	61.27
9/25/2016 1:00	64.08	61.2
9/25/2016 2:00	64.04	61.16
9/25/2016 3:00	64	61.2
9/25/2016 4:00	64	61.3
9/25/2016 5:00	64	61.52
9/25/2016 6:00	64	61.74
9/25/2016 7:00	64	61.88
9/25/2016 8:00	63.97	62.02
9/25/2016 9:00	64.04	62.17
9/25/2016 10:00	64.15	62.42
9/25/2016 11:00	64.26	62.78
9/25/2016 12:00	64.26	63.14
9/25/2016 13:00	64.18	63.21
9/25/2016 14:00	64.18	63.18
9/25/2016 15:00	64.18	63.07
9/25/2016 16:00	64.11	62.96
9/25/2016 17:00	64.08	62.89
9/25/2016 18:00	64.04	62.82
9/25/2016 19:00	64	62.71
9/25/2016 20:00	63.97	62.67
9/25/2016 21:00	64	62.71
9/25/2016 22:00	64.08	62.71
9/25/2016 23:00	64.08	62.67
9/26/2016 0:00	64.04	62.6
9/26/2016 1:00	64	62.53
9/26/2016 2:00	64	62.35
9/26/2016 3:00	63.97	62.17
9/26/2016 4:00	63.97	62.02
9/26/2016 5:00	63.86	61.88
9/26/2016 6:00	63.79	61.7
9/26/2016 7:00	63.68	61.45
9/26/2016 8:00	63.61	61.2

9/26/2016 9:00	63.64	61.2
9/26/2016 10:00	63.64	61.34
9/26/2016 11:00	63.64	61.66
9/26/2016 12:00	63.64	61.92
9/26/2016 13:00	63.61	61.99
9/26/2016 14:00	63.46	62.02
9/26/2016 15:00	63.36	61.88
9/26/2016 16:00	63.21	61.77
9/26/2016 17:00	63.21	61.59
9/26/2016 18:00	63.07	61.38
9/26/2016 19:00	62.92	61.12
9/26/2016 20:00	62.89	60.94
9/26/2016 21:00	62.82	60.84
9/26/2016 22:00	62.82	60.73
9/26/2016 23:00	62.78	60.69
9/27/2016 0:00	62.67	60.62
9/27/2016 1:00	62.64	60.62
9/27/2016 2:00	62.6	60.62
9/27/2016 3:00	62.56	60.62
9/27/2016 4:00	62.53	60.58
9/27/2016 5:00	62.46	60.55
9/27/2016 6:00	62.38	60.48
9/27/2016 7:00	62.28	60.44
9/27/2016 8:00	62.24	60.44
9/27/2016 9:00	62.24	60.44
9/27/2016 10:00	62.24	60.48
9/27/2016 11:00	62.24	60.51
9/27/2016 12:00	62.42	60.73
9/27/2016 13:00	62.42	60.94
9/27/2016 14:00	62.42	61.05
9/27/2016 15:00	62.38	61.12
9/27/2016 16:00	62.42	61.2
9/27/2016 17:00	62.35	61.16
9/27/2016 18:00	62.28	60.98
9/27/2016 19:00	62.2	60.73
9/27/2016 20:00	62.13	60.55
9/27/2016 21:00	62.1	60.37
9/27/2016 22:00	62.06	60.3
9/27/2016 23:00	61.99	60.22
9/28/2016 0:00	61.95	60.22
9/28/2016 1:00	61.88	60.19
9/28/2016 2:00	61.88	60.22
9/28/2016 3:00	61.84	60.19
9/28/2016 4:00	61.81	60.19
9/28/2016 5:00	61.77	60.19
9/28/2016 6:00	61.74	60.15
9/28/2016 7:00	61.7	60.08

9/28/2016 8:00	61.7	60.08
9/28/2016 9:00	61.77	60.22
9/28/2016 10:00	61.92	60.44
9/28/2016 11:00	62.06	60.69
9/28/2016 12:00	61.95	60.8
9/28/2016 13:00	61.95	60.84
9/28/2016 14:00	61.92	60.87
9/28/2016 15:00	62.02	60.94
9/28/2016 16:00	62.02	60.94
9/28/2016 17:00	61.92	60.87
9/28/2016 18:00	61.84	60.69
9/28/2016 19:00	61.77	60.48
9/28/2016 20:00	61.74	60.33
9/28/2016 21:00	61.74	60.22
9/28/2016 22:00	61.7	60.15
9/28/2016 23:00	61.7	60.12
9/29/2016 0:00	61.66	60.12
9/29/2016 1:00	61.63	60.01
9/29/2016 2:00	61.56	59.9
9/29/2016 3:00	61.56	59.79
9/29/2016 4:00	61.52	59.76
9/29/2016 5:00	61.52	59.76
9/29/2016 6:00	61.52	59.86
9/29/2016 7:00	61.52	59.97
9/29/2016 8:00	61.52	60.01
9/29/2016 9:00	61.63	60.19
9/29/2016 10:00	61.74	60.4
9/29/2016 11:00	61.84	60.62
9/29/2016 12:00	62.06	60.91
9/29/2016 13:00	62.13	61.09
9/29/2016 14:00	62.28	61.23
9/29/2016 15:00	62.24	61.2
9/29/2016 16:00	61.99	60.98
9/29/2016 17:00	61.74	60.87
9/29/2016 18:00	61.56	60.73
9/29/2016 19:00	61.52	60.51
9/29/2016 20:00	61.48	60.26
9/29/2016 21:00	61.45	60.04
9/29/2016 22:00	61.48	59.94
9/29/2016 23:00	61.56	59.9
9/30/2016 0:00	61.59	59.86
9/30/2016 1:00	61.56	59.83
9/30/2016 2:00	61.48	59.76
9/30/2016 3:00	61.45	59.68
9/30/2016 4:00	61.48	59.65
9/30/2016 5:00	61.48	59.68
9/30/2016 6:00	61.52	59.83

9/30/2016 7:00	61.52	59.97
9/30/2016 8:00	61.59	60.04
9/30/2016 9:00	61.66	60.22
9/30/2016 10:00	62.17	60.33
9/30/2016 11:00	61.92	60.37
9/30/2016 12:00	62.1	60.48
9/30/2016 13:00	62.17	60.62
9/30/2016 14:00	62.13	60.73
9/30/2016 15:00	62.02	60.84
9/30/2016 16:00	61.88	60.69
9/30/2016 17:00	61.63	60.58
9/30/2016 18:00	61.48	60.4
9/30/2016 19:00	61.38	60.19
9/30/2016 20:00	61.3	59.97
9/30/2016 21:00	61.27	59.83
9/30/2016 22:00	61.23	59.76
9/30/2016 23:00	61.23	59.83
Total number of Measurements	394	720
Average	**62.31**	**63.52**
September Monthly Average Standard	63	63

APPENDIX B:

NOAA Weather Data for Marquette County

Select Other Date

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

Climatological Report (Monthly)

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CXUS53 KMQT 030949
CLMMQT

CLIMATE REPORT...PRELIMINARY
NATIONAL WEATHER SERVICE MARQUETTE MI
549 AM EDT MON OCT 3 2016

.....................................

...THE MARQUETTE MI CLIMATE SUMMARY FOR THE MONTH OF SEPTEMBER
2016...

CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 1961 TO 2016
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WEATHER	OBSERVED VALUE	OBSERVED DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR`S VALUE	LAST YEAR`S DATE(S)
TEMPERATURE (F)						
RECORD						
HIGH	93	09/09/2002				
LOW	21	09/27/1965				
HIGHEST	80	09/05	63	17	86	09/01
LOWEST	41	09/02	44	-3	30	09/30
AVG. MAXIMUM	67.7		65.8	1.9	71.7	
AVG. MINIMUM	50.8		45.8	5.0	51.0	
MEAN	59.3		55.8	3.5	61.4	
DAYS MAX >= 90	0		0.1	-0.1	0	
DAYS MAX <= 32	0		0.0	0.0	0	
DAYS MIN <= 32	0		1.6	-1.6	2	
DAYS MIN <= 0	0		0.0	0.0	0	
PRECIPITATION (INCHES)						
RECORD						
MAXIMUM	7.60	1968				

MINIMUM	1.21	1989			
TOTALS	5.70		3.72	1.98	1.60
DAILY AVG.	0.19		0.12	0.07	0.05
DAYS >= .01	13		13.4	-0.4	8
DAYS >= .10	7		7.8	-0.8	5
DAYS >= .50	4		2.5	1.5	0
DAYS >= 1.00	3		0.7	2.3	0
GREATEST					
24 HR. TOTAL	1.55	09/10 TO 09/10			

SNOWFALL (INCHES)					
RECORDS					
TOTAL	1.7	1993			
TOTALS	0.0		0.1	-0.1	0.0
SINCE 7/1	T		0.1	-0.1	0.0
SNOWDEPTH AVG.	0		MM	MM	0
DAYS >= 1.0	0		0.0	0.0	0
GREATEST					
SNOW DEPTH	0	MM			0 MM
24 HR TOTAL	0.0	MM			

DEGREE_DAYS				
HEATING TOTAL	173	297	-124	165
SINCE 7/1	273	482	-209	333
COOLING TOTAL	10	21	-11	65
SINCE 1/1	246	241	5	247

.....

WIND (MPH)			
AVERAGE WIND SPEED	MM		
HIGHEST WIND SPEED/DIRECTION	MM	DATE	MM
HIGHEST GUST SPEED/DIRECTION	36/270	DATE	09/19

SKY COVER	
POSSIBLE SUNSHINE (PERCENT)	MM
AVERAGE SKY COVER	MM
NUMBER OF DAYS FAIR	MM
NUMBER OF DAYS PC	MM
NUMBER OF DAYS CLOUDY	MM

AVERAGE RH (PERCENT) MM

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM	0	MIXED PRECIP	0
HEAVY RAIN	4	RAIN	4
LIGHT RAIN	18	FREEZING RAIN	0
LT FREEZING RAIN	0	HAIL	0
HEAVY SNOW	0	SNOW	0
LIGHT SNOW	0	SLEET	0
FOG	8	FOG W/VIS <= 1/4 MILE	3

HAZE 0

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

&&

...SEPTEMBER 2016 MONTHLY CLIMATE SUMMARY FOR UPPER MICHIGAN...
/THIS DISCUSSION DOES NOT INCLUDE CHIPPEWA AND MACKINAC COUNTIES/

...VERY WARM...
...SIXTH WARMEST SEPTEMBER AT THE MARQUETTE NWS...

...WETTER THAN NORMAL...

SEPTEMBER CLIMATE STATISTICS FOR THE MARQUETTE NWS
IN NEGAUNEE TOWNSHIP

		NORMAL	DEPARTURE	
AVERAGE TEMPERATURE	59.3	55.8	PLUS	3.5
AVERAGE HIGH TEMPERATURE	67.7	65.8	PLUS	1.9
AVERAGE LOW TEMPERATURE	50.8	45.8	PLUS	5.0
HEATING DEGREE DAYS	173	297	MINUS	124
COOLING DEGREE DAYS	10	21	MINUS	11
TOTAL PRECIPITATION	5.70	3.72	PLUS	1.98
TOTAL SNOWFALL	0	0.1	MINUS	0.1

HIGHEST TEMPERATURE:	80	ON	9/5
LOWEST TEMPERATURE:	41	ON	9/2
GREATEST CALENDAR DAY PRECIPITATION:	1.55	ON	9/10
GREATEST 24 HOUR PRECIPITATION:	1.55	ON	9/10
GREATEST CALENDAR DAY SNOWFALL:	0		
PEAK WIND SPEED:	36 MPH FROM THE WEST	ON	9/19

DAILY RECORD PRECIPITATION ON 9/16...1.28 /OLD RECORD 0.89...1972/
SIXTH HIGHEST SEPTEMBER MEAN TEMPERATURES...59.3 /RECORD 61.8...2004/

GREAT LAKES WATER LEVELS (FEET/METERS ABOVE MEAN SEA LEVEL)

	LAKE SUPERIOR	LAKE MICHIGAN-HURON
9/01/16 DAILY MEAN	602.68/183.70	580.06/176.80
9/29/16 DAILY MEAN	602.75/183.72	579.81/176.72
AVG AUG 2016 DAILY MEAN	602.69/183.70	580.11/176.82
AVG SEP 2015 DAILY MEAN	602.65/183.69	579.72/176.70
LONG TERM SEP DAILY MEAN	602.13/183.53	579.07/176.50
MAXIMUM SEP DAILY MEAN	603.22/183.86	581.96/177.38
	(1985)	(1986)
MINIMUM SEP DAILY MEAN	600.46/183.02	576.64/175.76

(2007) (1964)

...GREAT LAKES WATER LEVELS STILL WELL ABOVE NORMAL IN SEPTEMBER...

EVEN THOUGH LAKE SUPERIOR WATER LEVELS NORMALLY REMAIN STEADY FROM AUGUST INTO SEPTEMBER DUE TO INCREASED EVAPORATION AT A TIME WATER TEMPERATURES ARE HIGHEST, ABOVE NORMAL RAINFALL IN THE SUPERIOR DRAINAGE BASIN THROUGH THE SUMMER RESULTED IN AN INCH RISE IN WATER LEVEL FROM AUGUST TO SEPTEMBER IN 2016. AT THE END OF SEPTEMBER, WATER LEVELS ON LAKE SUPERIOR WERE 7 TO 8 INCHES ABOVE NORMAL AND AROUND AN INCH HIGHER THAN OBSERVED IN SEPTEMBER 2015. SINCE THE LOWER LAKES HAVE BEEN DRIER THIS SUMMER AND ABOVE NORMAL TEMPERATURES HAVE RESULTED IN A GOOD DEAL OF EVAPORATION, THE LEVEL ON LAKES MICHIGAN AND HURON FELL ABOUT 3 INCHES DURING SEPTEMBER. BUT THE LEVEL ON THESE LAKES REMAINED 8 TO 9 INCHES ABOVE NORMAL AT THE END OF THE MONTH AND ABOUT AN INCH HIGHER THAN IN SEPTEMBER 2015.

OBTAIN GREAT LAKES WATER LEVEL DATA AS REPORTED BY THE U.S. ARMY CORPS OF ENGINEERS AT

HTTP://WWW.LRE.USACE.ARMY.MIL/MISSIONS/GREATLAKESINFORMATION/
GREATLAKESWATERLEVELS/CURRENTCONDITIONS.ASPX.

OCTOBER FORECAST

THE CLIMATE PREDICTION CENTER (CPC) IS FORECASTING A GREATER THAN CLIMATOLOGICAL CHANCE OF AN ABOVE NORMAL MONTHLY MEAN TEMPERATURE BUT EQUAL CHANCES OF ABOVE AND BELOW NORMAL MONTHLY PRECIPITATION ACROSS ALL OF UPPER MICHIGAN IN OCTOBER 2016.

OCTOBER CLIMATOLOGY

AVERAGE TEMPERATURES IN OCTOBER CONTINUE THEIR DOWNWARD SPIRAL AS THE SUN STAYS UP LESS AND LESS EACH DAY. THE OCTOBER MEAN TEMPERATURE ACROSS UPPER MICHIGAN IS ABOUT TEN DEGREES LOWER THAN IN SEPTEMBER AT MOST PLACES. POSSIBLE DAILY SUNSHINE DECREASES ABOUT 3 OR 4 MINUTES EVERY DAY DURING THE TENTH MONTH FROM 703 MINUTES ON 10/1 TO 607 MINUTES ON HALLOWEEN.

ALTHOUGH AVERAGE TEMPERATURES DECREASE DURING OCTOBER...RECORD HIGH TEMPERATURES AT MANY PLACES IN UPPER MICHIGAN ARE STILL IN THE 80S DURING THE FIRST WEEK OF THE MONTH. IN FACT...RESIDENTS OF IRON MOUNTAIN BASKED IN A SUMMER-LIKE HIGH OF 88 ON 10/3/92. DOWNTOWN MARQUETTE ENJOYED A TASTE OF SUMMER EVEN AS LATE AS 10/18 IN 1950... WHEN THE MERCURY REACHED A BALMY 86 DEGREES.

BUT BY THE END OF OCTOBER...THE ICY HAND OF WINTER USUALLY BEGINS TO GRIP UPPER MICHIGAN HARDER AND HARDER. RECORD LOW TEMPERATURES AT MONTHS END FALL INTO THE TEENS EVERYWHERE AND EVEN AS LOW AS THE SINGLE NUMBERS ABOVE ZERO AWAY FROM THE WARMING INFLUENCE OF LAKE

SUPERIOR. ON 10/30/1925...IRONWOOD RECORDED A LOW OF 2 DEGREES ABOVE ZERO. OCTOBER 2002 WAS THE COLDEST OCTOBER ON RECORD AT THE MARQUETTE NWS...AND AMONG THE TOP TEN COLDEST AT IRONWOOD AND IRON MOUNTAIN. MONTHLY TEMPERATURES AVERAGED 4 TO 6 DEGREES BELOW NORMAL ACROSS UPPER MICHIGAN. OCTOBER 2009 WAS ALSO QUITE CHILLY WITH AN AVERAGE MONTHLY TEMPERATURE 3 TO 5 DEGREES BELOW THE MEAN. MUNISING REPORTED THE COLDEST OCTOBER ON RECORD IN 2009...AND MANY PLACES EXPERIENCED A TOP FIVE OR TEN COLDEST TENTH MONTH.

EVEN THOUGH AVERAGE PRECIPITATION IN OCTOBER IS LOWER THAN IN SEPTEMBER AT MOST SPOTS...THE RESIDUAL WARMTH OF LAKE SUPERIOR USUALLY CAUSES INCREASED LAKE EFFECT RAIN AND SNOW SHOWER ACTIVITY DURING THE TENTH MONTH. MORE NUMEROUS ARCTIC AIR MASSES PLUNGING SOUTH FROM CANADA ARE DESTABILIZED AS THEY CROSS THE RELATIVELY WARM WATER...RESULTING IN THE INCREASED CONVECTIVE ACTIVITY. IF THE AIR IS COLD ENOUGH...HEAVY SNOW CAN FALL...ESPECIALLY OVER HIGHER TERRAIN JUST DOWNWIND OF LAKE SUPERIOR. BETWEEN 10/11 AND 10/14 IN 2006...AN UNUSUALLY EARLY WINTER STORM BLASTED THE HIGHER TERRAIN OF THE WEST HALF OF UPPER MICHIGAN WITH 20 OR MORE INCHES OF SNOW... INCLUDING AS MUCH AS 26.6 INCHES AT TWIN LAKES IN HOUGHTON COUNTY. IN OCTOBER 1967...ALMOST 27 INCHES OF SNOW WHITENED IRONWOOD... INCLUDING 15 INCHES ON 10/25/67. HEAVY SNOW CAN FALL EVEN EARLIER IN THE MONTH. ON 10/6 TO 10/8 IN 2000...UP TO A FOOT OF SNOW SMOTHERED THE HIGHER TERRAIN OF NORTH CENTRAL UPPER MICHIGAN. BUT DURING WARM OCTOBERS...LITTLE OR NO SNOW CAN FALL AS WELL. THE MARQUETTE NWS SAW NO SNOW AT ALL IN OCTOBER 1971...AS DID THE HOUGHTON COUNTY AIRPORT IN 1986.

THE SAME SURFACE HEATING AND DESTABILIZATION OF COLD AIRMASSES THAT CAUSES LAKE EFFECT SNOW ALSO RESULTS IN INCREASED WINDINESS OVER LAKE SUPERIOR. THE GALES OF NOVEMBER OFTEN DO COME EARLY DURING OCTOBER.

OUTLOOK FOR LATE FALL INTO WINTER

THE CPC IS FORECASTING AN EQUAL CHANCE OF AN ABOVE AND BELOW NORMAL 3-MONTH AVERAGE TEMPERATURE AND 3-MONTH PRECIPITATION OVER ALL OF UPPER MICHIGAN IN NOVEMBER 2016 THROUGH JANUARY 2017.

GO TO HTTP://WWW.WEATHER.GOV/CLIMATE/L3MTO.PHP TO ACCESS DETAILED LOCAL THREE-MONTH AVERAGE TEMPERATURE OUTLOOKS FOR A NUMBER OF SITES IN UPPER MICHIGAN.

CHECK OUT HTTP://WWW.CPC.NCEP.NOAA.GOV FOR MORE INFORMATION ABOUT THE CLIMATE PREDICTION CENTER AND MORE LONG RANGE PREDICTIONS.

NOTE THAT STATISTICS FOR THE NATIONAL WEATHER SERVICE OFFICE IN NEGAUNEE TOWNSHIP ARE BASED ON RECORDS WHICH BEGAN IN OCTOBER 1961. THIRTY YEAR NORMALS USED ARE FOR THE PERIOD OF 1981 THROUGH 2010. NOTE ALL TEMPERATURES ARE IN FAHRENHEIT AND PRECIPITATION IS IN

INCHES. ALL CLIMATE DATA LISTED IN THIS PRODUCT ARE UNOFFICIAL. FOR OFFICIAL DATA...PLEASE REFER TO THE NATIONAL CLIMATIC DATA CENTER. ALSO NOTE THIS DISCUSSION DOES NOT INCLUDE DATA FROM CHIPPEWA AND MACKINAC COUNTIES.

THE NWS MARQUETTE WEB PAGE IS AT HTTP://WWW.WEATHER.GOV/MQT (ALL LOWER CASE). CONTACT THE NATIONAL CLIMATIC DATA CENTER AT (828) 271-4800 OR WWW.NCDC.NOAA.GOV.

KC

APPENDIX C:

DOCUMENTATION OF CONSULTATION

Shawn Puzen

From: Shawn Puzen
Sent: Monday, October 17, 2016 9:19 AM
To: Carpenter, Koren (DEQ); Kruger, Kyle (DNR); Gulotty, Elle (DNR)
Cc: jfnelson@uppco.com; Schlorke, Virgil E; Shawn Puzen; kwilkins@uppco.com
Subject: Dead River-September 2016 Monthly Average Temperature Deviation
Attachments: September Climate Data.pdf; 20160930 Monthly Temperatures.pdf

Good Morning Koren, Elle, and Kyle!

Upon calculating the monthly average temperatures for September, UPPCO identified the calculated monthly average temperature exceeded the FERC monthly average requirement of 63 degrees F in the following location:

McClure Bypass Reach: 63.52 Degrees F (see enclosed data)

Please Note: In early September, the monitoring device in the Hoist Tailwater was lost to vandalism. As a result, the average temperature for the Hoist Tailwater was averaged over 394 hourly readings instead of the 720 hourly readings for the entire month.

UPPCO believes the higher calculated monthly temperature averages for these locations are due to a combination of (1) the above normal warm temperatures, (2) the lack of shading vegetation on the Dead River upstream, and (3) UPPCO's inability to release more than the minimum flow requirements.

1) The average maximum temperature for September 2016 in Marquette, MI was 3.5 degrees F higher than the normal (see enclosed climate data) and previous months were warmer than normal also.
2) The Silver Lake Event in 2003 eliminated all shading vegetation from the stream banks of the Dead River upstream of the AAO Bridge. Although vegetation has been planted and the shading effect is improved, it will take some time for shading effect to return to the pre-2003 level.
3) UPPCO was striving to return the Silver Lake Storage Reservoir elevation to normal operation following the Dam Safety Improvement work completed last year and very little cold water (only the minimum flow of 10 cfs) was allowed to be released into the downstream system during the summer months. The current elevation of Silver Lake is approximately 1481.7 feet and it needs to be returned to 1485.20 feet before normal operation of the river system can resume.

Early October temperature monitoring data show the warmer water being stored in the reservoirs from the previous warm months is finally cooling and moving its way through the river system (downstream).

UPPCO is providing you this notification prior to filing the report with the Commission.

Please feel free to contact us with any questions.

Thanks,

Shawn Puzen | FERC Licensing & Compliance Senior Project Manager
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