



Wisconsin Public Service Corporation
700 North Adams Street
P.O. Box 19001
Green Bay, WI 54307-9001
www.wisconsinpublicservice.com

July 31, 2017

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

Dear Ms. Bose:

SUBJECT: Water Quality Monitoring

<u>Hydro</u>	<u>FERC Project No.</u>	<u>NATDAM No.</u>	<u>License Article</u>
Grand Rapids	2433	MI00022	407

In accordance with the Order Approving Water Quality Monitoring Plan under Article 407, dated April 7, 1999, WPS is required to conduct water quality monitoring upstream and downstream of the Grand Rapids hydroelectric project. As described in the monitoring plan, the results will be supplied to the FERC, Wisconsin Department of Natural Resources (WDNR), Michigan Department of Natural Resources (MDNR), and the U.S. Fish and Wildlife Service (USFWS) in an Excel spreadsheet format every three weeks during the summer monitoring period of June through September. Enclosed please find monitoring data collected from July 5 through July 21, 2017. There are no deviations from water quality standards to note. The monitoring data was provided to the resource agencies on July 21, 2017. Documentation of agency consultation is attached.

If you have any questions about this submittal, please feel free to contact Mr. Mark Metcalf at (920) 433-1833 or email at MWMetcalf@integrysgroup.com.

Sincerely,

A handwritten signature in blue ink that reads 'Todd P. Jastremski'.

Todd P. Jastremski
Asset Manager Hydro Operations
We Energies
800 Industrial Park Drive
Iron Mountain, MI 49801

MWM/rjv

Enc: Agency Consultation

cc: Ms. Cheryl Laatsch – WDNR
Ms. Elle Gulotty – MDNR
Mr. Nick Utrup - USFWS

AGENCY CONSULTATION

From: [Metcalf, Mark W](#)
To: [Laatsch, Cheryl](#); [Utrup, Nick](#); GulottyE@michigan.gov; [Kruger, Kyle](#)
Cc: [Brandt, Edward S](#); [Nuthals, James D](#); [Grisar, Mike](#)
Subject: WPS Grand Rapids water quality monitoring data - July 5 to July 21
Date: Friday, July 21, 2017 2:08:44 PM
Attachments: [Grand Rapids Tailrace DO Summary 2017.xlsx](#)
[Grand Rapids Tailrace pH Summary 2017.xlsx](#)
[Grand Rapids Tailrace Temp Summary 2017.xlsx](#)
[Grand Rapids Upstream DO Summary 2017.xlsx](#)
[Grand Rapids Upstream pH Summary 2017.xlsx](#)
[Grand Rapids Upstream Temp Summary 2017.xlsx](#)

Good afternoon,

As described in the water quality monitoring plan for the Grand Rapids Hydroelectric facility, Wisconsin Public Service (WPS) is monitoring for pH, dissolved oxygen, and temperature on an hourly basis from June 1 through September 30. In accordance with the data submittal and review section of the plan, WPS is providing the monitoring data to the resource agencies throughout the monitoring season.

Attached for your review is monitoring data collected this year, including data for the period of June 5 to July 21 at the two monitoring locations (monitoring data collected since the previous data submittal). There are no water quality deviations to note.

If you have any questions about the monitoring data, please feel free to contact me.

Mark

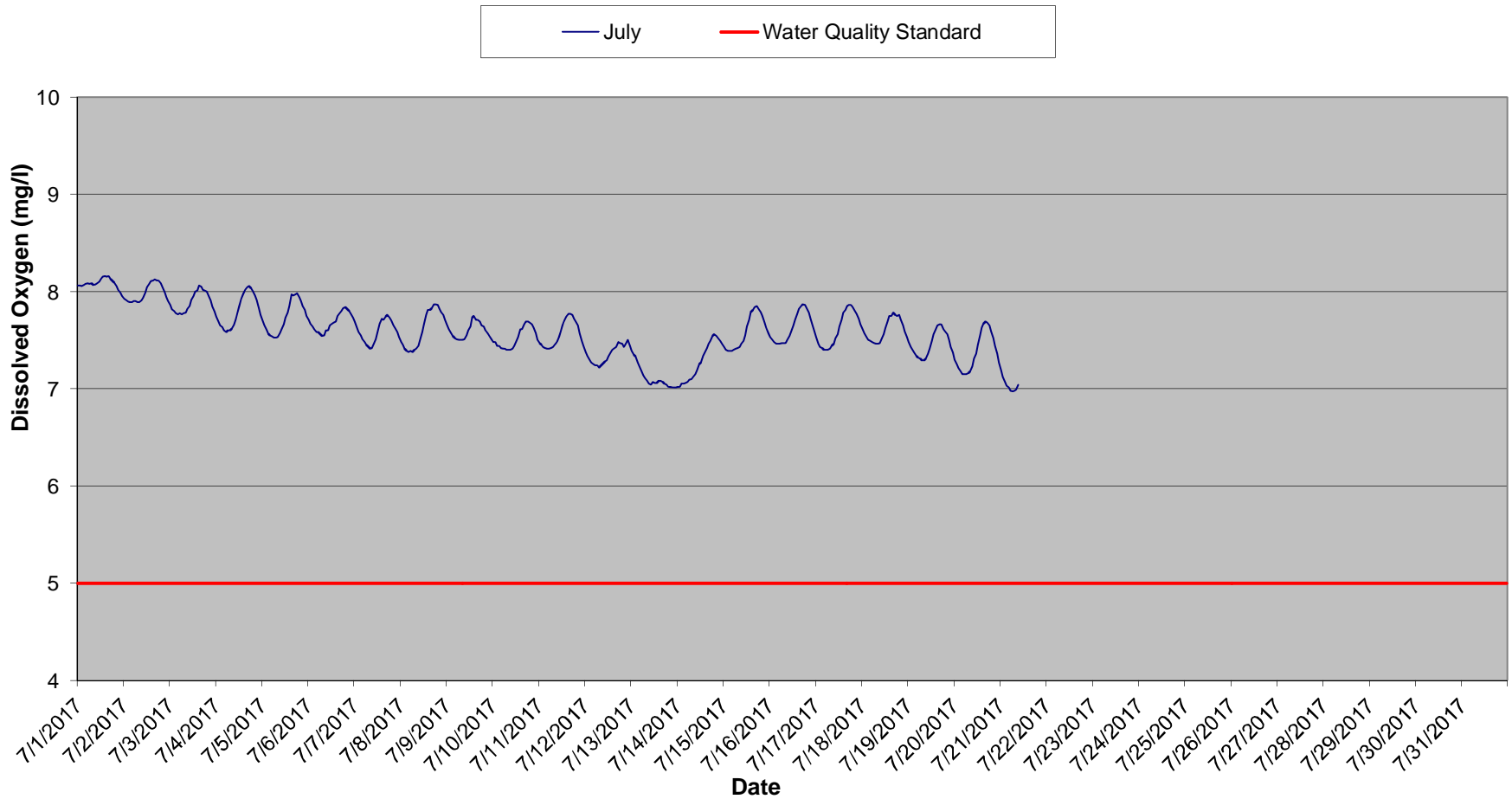
Mark Metcalf

Principal Environmental Consultant

office: 920-433-1833

mobile: 920-246-2717

Grand Rapids Tailrace Dissolved Oxygen - July 2017



Grand Rapids Tailrace Dissolved Oxygen Summary - July 2017

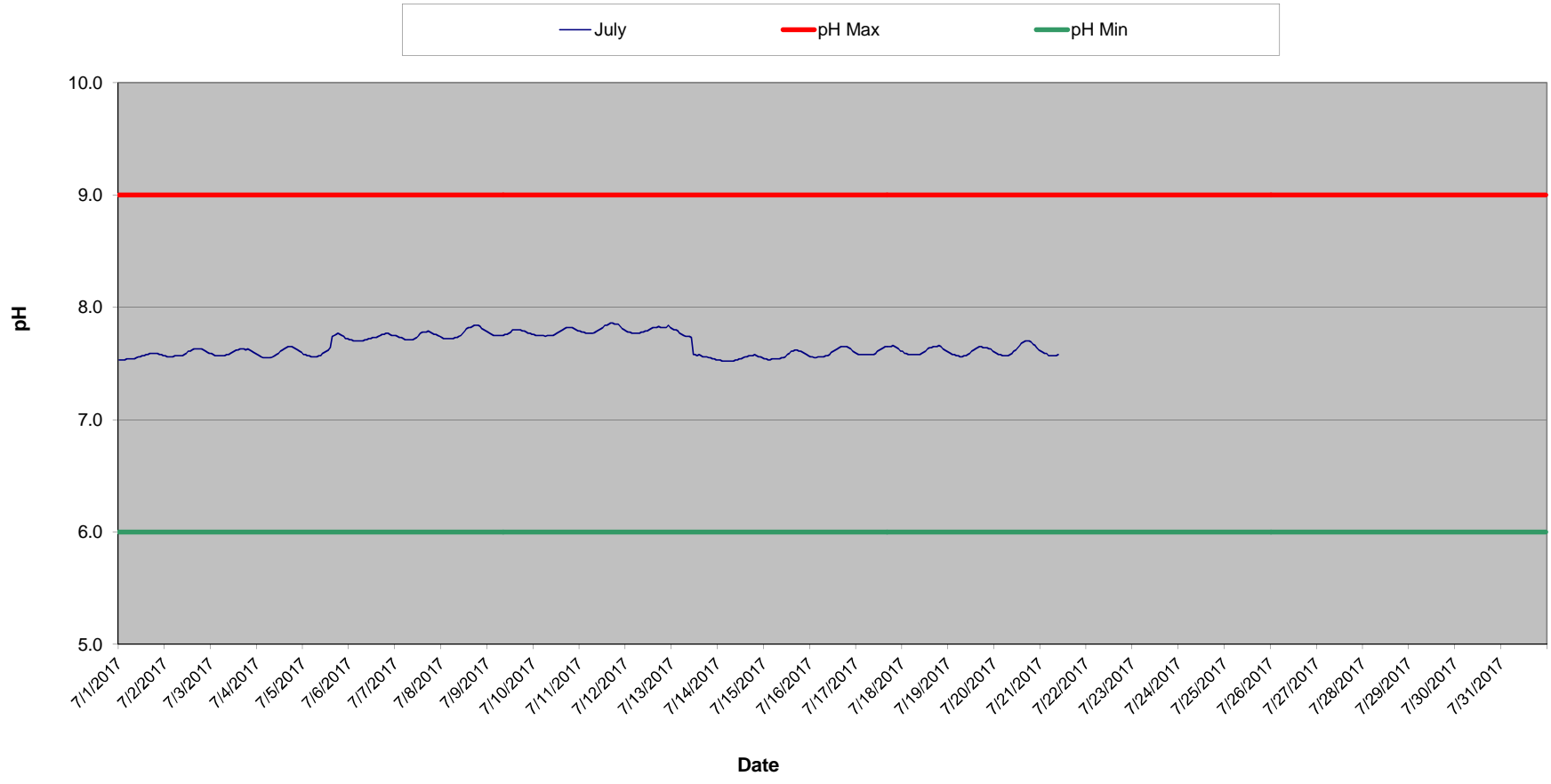
Time HHMMSS	07/01/17	07/02/17	07/03/17	07/04/17	07/05/17	07/06/17	07/07/17	07/08/17	07/09/17	07/10/17	07/11/17	07/12/17	07/13/17	07/14/17	07/15/17	07/16/17
0	8.1	7.9	7.9	7.7	7.7	7.7	7.7	7.5	7.7	7.5	7.5	7.4	7.4	7.0	7.4	7.5
10000	8.1	7.9	7.8	7.7	7.6	7.7	7.6	7.5	7.6	7.5	7.5	7.3	7.4	7.0	7.4	7.5
20000	8.1	7.9	7.8	7.7	7.6	7.6	7.6	7.4	7.6	7.4	7.4	7.3	7.3	7.1	7.4	7.5
30000	8.1	7.9	7.8	7.6	7.6	7.6	7.6	7.4	7.5	7.4	7.4	7.3	7.3	7.1	7.4	7.5
40000	8.1	7.9	7.8	7.6	7.5	7.6	7.5	7.4	7.5	7.4	7.4	7.3	7.2	7.1	7.4	7.5
50000	8.1	7.9	7.8	7.6	7.5	7.6	7.5	7.4	7.5	7.4	7.4	7.2	7.2	7.1	7.4	7.5
60000	8.1	7.9	7.8	7.6	7.5	7.6	7.5	7.4	7.5	7.4	7.4	7.2	7.1	7.1	7.4	7.5
70000	8.1	7.9	7.8	7.6	7.5	7.5	7.4	7.4	7.5	7.4	7.4	7.2	7.1	7.1	7.4	7.5
80000	8.1	7.9	7.8	7.6	7.5	7.6	7.4	7.4	7.5	7.4	7.5	7.2	7.1	7.1	7.4	7.5
90000	8.1	7.9	7.8	7.7	7.6	7.6	7.4	7.4	7.5	7.4	7.5	7.3	7.1	7.2	7.5	7.5
100000	8.1	7.9	7.9	7.7	7.6	7.6	7.5	7.5	7.6	7.4	7.5	7.3	7.0	7.2	7.5	7.5
110000	8.1	8.0	7.9	7.8	7.7	7.7	7.5	7.6	7.6	7.4	7.6	7.3	7.1	7.3	7.6	7.6
120000	8.1	8.0	8.0	7.9	7.7	7.7	7.6	7.7	7.6	7.5	7.7	7.3	7.1	7.3	7.6	7.7
130000	8.2	8.1	8.0	7.9	7.8	7.7	7.7	7.8	7.7	7.5	7.7	7.4	7.1	7.3	7.7	7.7
140000	8.2	8.1	8.0	8.0	7.9	7.7	7.7	7.8	7.8	7.6	7.7	7.4	7.1	7.4	7.8	7.8
150000	8.2	8.1	8.1	8.0	8.0	7.8	7.7	7.8	7.7	7.6	7.8	7.4	7.1	7.4	7.8	7.8
160000	8.2	8.1	8.0	8.0	8.0	7.8	7.7	7.8	7.7	7.7	7.8	7.4	7.1	7.5	7.8	7.9
170000	8.1	8.1	8.0	8.1	8.0	7.8	7.8	7.9	7.7	7.7	7.8	7.5	7.1	7.5	7.9	7.9
180000	8.1	8.1	8.0	8.0	8.0	7.8	7.7	7.9	7.7	7.7	7.7	7.5	7.0	7.5	7.8	7.9
190000	8.1	8.1	8.0	8.0	7.9	7.8	7.7	7.9	7.6	7.7	7.7	7.5	7.0	7.6	7.8	7.8
200000	8.1	8.0	8.0	8.0	7.9	7.8	7.7	7.8	7.6	7.7	7.7	7.4	7.0	7.5	7.8	7.8
210000	8.0	8.0	7.9	7.9	7.9	7.8	7.6	7.8	7.6	7.6	7.6	7.5	7.0	7.5	7.7	7.7
220000	8.0	7.9	7.8	7.8	7.8	7.8	7.6	7.8	7.5	7.6	7.5	7.5	7.0	7.5	7.6	7.7
230000	8.0	7.9	7.8	7.8	7.8	7.7	7.5	7.7	7.5	7.5	7.4	7.4	7.0	7.5	7.6	7.6
Daily Max	8.2	8.1	8.1	8.1	8.0	7.8	7.8	7.9	7.8	7.7	7.8	7.5	7.4	7.6	7.9	7.9
Daily Min	8.0	7.9	7.8	7.6	7.5	7.5	7.4	7.4	7.5	7.4	7.4	7.2	7.0	7.0	7.4	7.5
Average	8.1	8.0	7.9	7.8	7.7	7.7	7.6	7.6	7.6	7.5	7.6	7.4	7.1	7.3	7.6	7.6

License Minimum Dissolved Oxygen: 5.0 mg/l

Grand Rapids Tailrace Dissolved Oxygen Summary - July 2017

Time HHMMSS	07/17/17	07/18/17	07/19/17	07/20/17	07/21/17	07/22/17	07/23/17	07/24/17	07/25/17	07/26/17	07/27/17	07/28/17	07/29/17	07/30/17	07/31/17
0	7.5	7.6	7.5	7.3	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10000	7.5	7.6	7.4	7.3	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20000	7.4	7.5	7.4	7.2	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30000	7.4	7.5	7.4	7.2	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40000	7.4	7.5	7.3	7.2	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50000	7.4	7.5	7.3	7.2	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60000	7.4	7.5	7.3	7.2	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70000	7.4	7.5	7.3	7.2	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80000	7.4	7.5	7.3	7.2	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90000	7.5	7.5	7.3	7.2	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100000	7.5	7.5	7.4	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
110000	7.6	7.6	7.4	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120000	7.6	7.6	7.5	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130000	7.7	7.7	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140000	7.8	7.8	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150000	7.8	7.8	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160000	7.9	7.8	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170000	7.9	7.8	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180000	7.9	7.8	7.6	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
190000	7.8	7.8	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200000	7.8	7.7	7.6	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
210000	7.8	7.7	7.5	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
220000	7.7	7.6	7.4	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
230000	7.7	7.5	7.4	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Max	7.9	7.8	7.7	7.7	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Min	7.4	7.5	7.3	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	7.6	7.6	7.5	7.4	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Grand RapidsTailrace pH Summary - July 2017



Grand Rapids Tailrace pH Summary - July 2017

Time HHMMSS	07/01/17	07/02/17	07/03/17	07/04/17	07/05/17	07/06/17	07/07/17	07/08/17	07/09/17	07/10/17	07/11/17	07/12/17	07/13/17	07/14/17	07/15/17	07/16/17
0	7.5	7.6	7.6	7.6	7.6	7.7	7.8	7.7	7.8	7.8	7.8	7.8	7.8	7.5	7.5	7.6
10000	7.5	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.8	7.8	7.8	7.8	7.8	7.5	7.5	7.6
20000	7.5	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.8	7.8	7.8	7.8	7.8	7.5	7.5	7.6
30000	7.5	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.8	7.8	7.8	7.8	7.8	7.5	7.5	7.6
40000	7.5	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.8	7.8	7.8	7.8	7.8	7.5	7.5	7.6
50000	7.5	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.8	7.8	7.8	7.8	7.8	7.5	7.5	7.6
60000	7.5	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.8	7.7	7.8	7.8	7.8	7.5	7.5	7.6
70000	7.5	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.8	7.8	7.8	7.8	7.7	7.5	7.5	7.6
80000	7.5	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.8	7.8	7.8	7.8	7.7	7.5	7.5	7.6
90000	7.6	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.8	7.8	7.8	7.8	7.7	7.5	7.6	7.6
100000	7.6	7.6	7.6	7.6	7.6	7.7	7.7	7.8	7.8	7.8	7.8	7.8	7.7	7.5	7.6	7.6
110000	7.6	7.6	7.6	7.6	7.6	7.7	7.7	7.8	7.8	7.8	7.8	7.8	7.6	7.5	7.6	7.6
120000	7.6	7.6	7.6	7.6	7.6	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.6	7.5	7.6	7.6
130000	7.6	7.6	7.6	7.6	7.6	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.6	7.6	7.6	7.6
140000	7.6	7.6	7.6	7.6	7.6	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.6	7.6	7.6	7.6
150000	7.6	7.6	7.6	7.6	7.7	7.7	7.8	7.8	7.8	7.8	7.9	7.8	7.6	7.6	7.6	7.6
160000	7.6	7.6	7.6	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.9	7.8	7.6	7.6	7.6	7.7
170000	7.6	7.6	7.6	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.9	7.8	7.6	7.6	7.6	7.7
180000	7.6	7.6	7.6	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.9	7.8	7.6	7.6	7.6	7.7
190000	7.6	7.6	7.6	7.6	7.8	7.8	7.8	7.8	7.8	7.8	7.9	7.8	7.6	7.6	7.6	7.7
200000	7.6	7.6	7.6	7.6	7.8	7.8	7.8	7.8	7.8	7.8	7.9	7.8	7.6	7.6	7.6	7.6
210000	7.6	7.6	7.6	7.6	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.5	7.6	7.6	7.6
220000	7.6	7.6	7.6	7.6	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.5	7.6	7.6	7.6
230000	7.6	7.6	7.6	7.6	7.7	7.8	7.7	7.8	7.8	7.8	7.8	7.8	7.5	7.6	7.6	7.6
Daily Max	7.6	7.6	7.6	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.9	7.8	7.8	7.6	7.6	7.7
Daily Min	7.5	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.8	7.7	7.8	7.8	7.5	7.5	7.5	7.6
Average	7.6	7.6	7.6	7.6	7.6	7.7	7.7	7.8	7.8	7.8	7.8	7.8	7.7	7.5	7.6	7.6

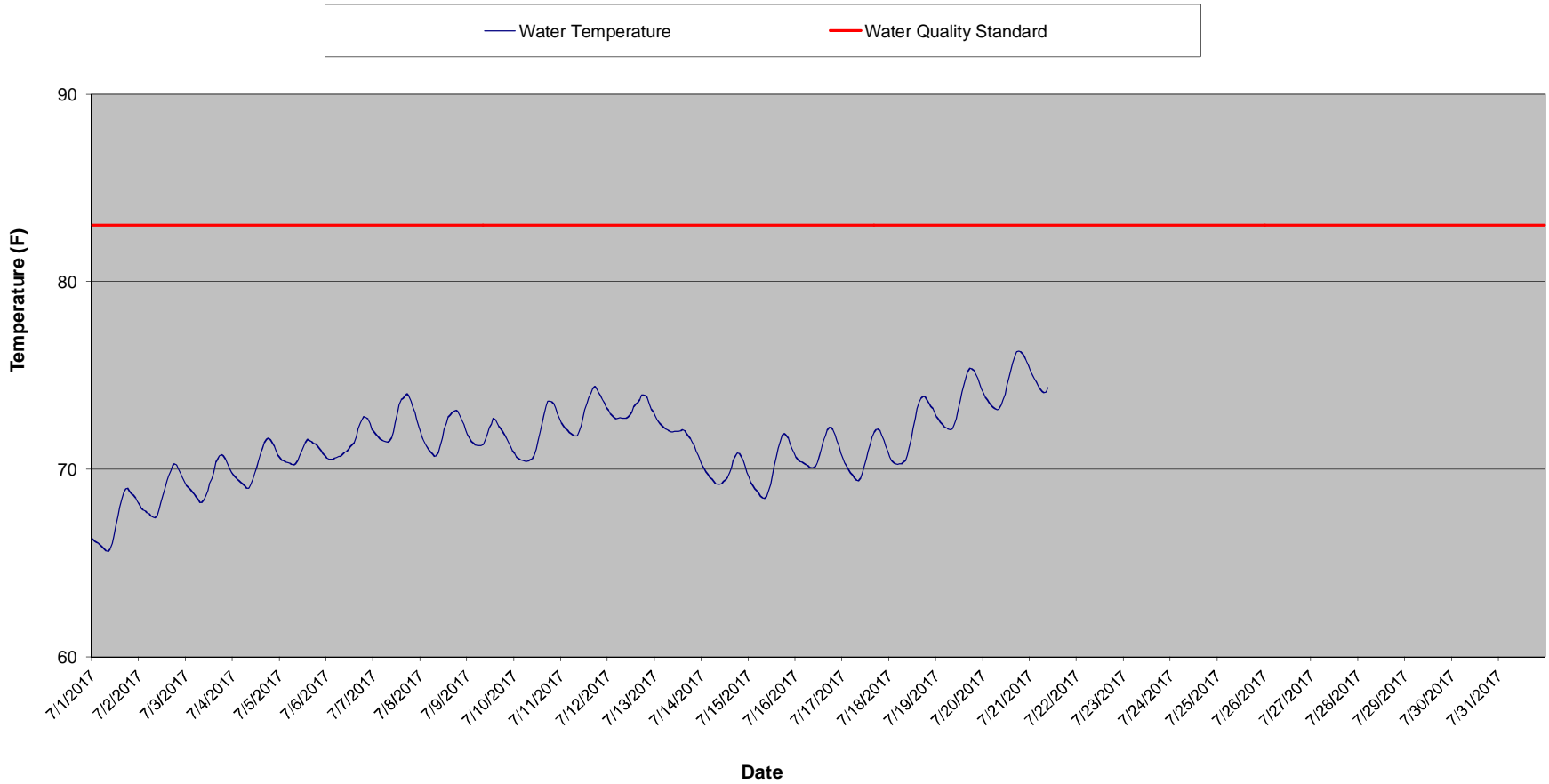
License maximum pH: 9

License minimum pH: 6

Grand Rapids Tailrace pH Summary - July 2017

Time	07/17/17	07/18/17	07/19/17	07/20/17	07/21/17	07/22/17	07/23/17	07/24/17	07/25/17	07/26/17	07/27/17	07/28/17	07/29/17	07/30/17	07/31/17
HHMMSS															
0	7.6	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10000	7.6	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20000	7.6	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30000	7.6	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40000	7.6	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50000	7.6	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60000	7.6	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70000	7.6	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80000	7.6	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90000	7.6	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100000	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
110000	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120000	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130000	7.6	7.6	7.6	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140000	7.6	7.6	7.6	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150000	7.7	7.6	7.6	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160000	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170000	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180000	7.7	7.7	7.6	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
190000	7.7	7.7	7.6	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200000	7.7	7.7	7.6	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
210000	7.6	7.6	7.6	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
220000	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
230000	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Max	7.7	7.7	7.7	7.7	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Min	7.6	7.6	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	7.6	7.6	7.6	7.6	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Grand Rapids Tailrace Water Temperature - July 2017



Grand Rapids Tailrace Temperature Summary - July 2017

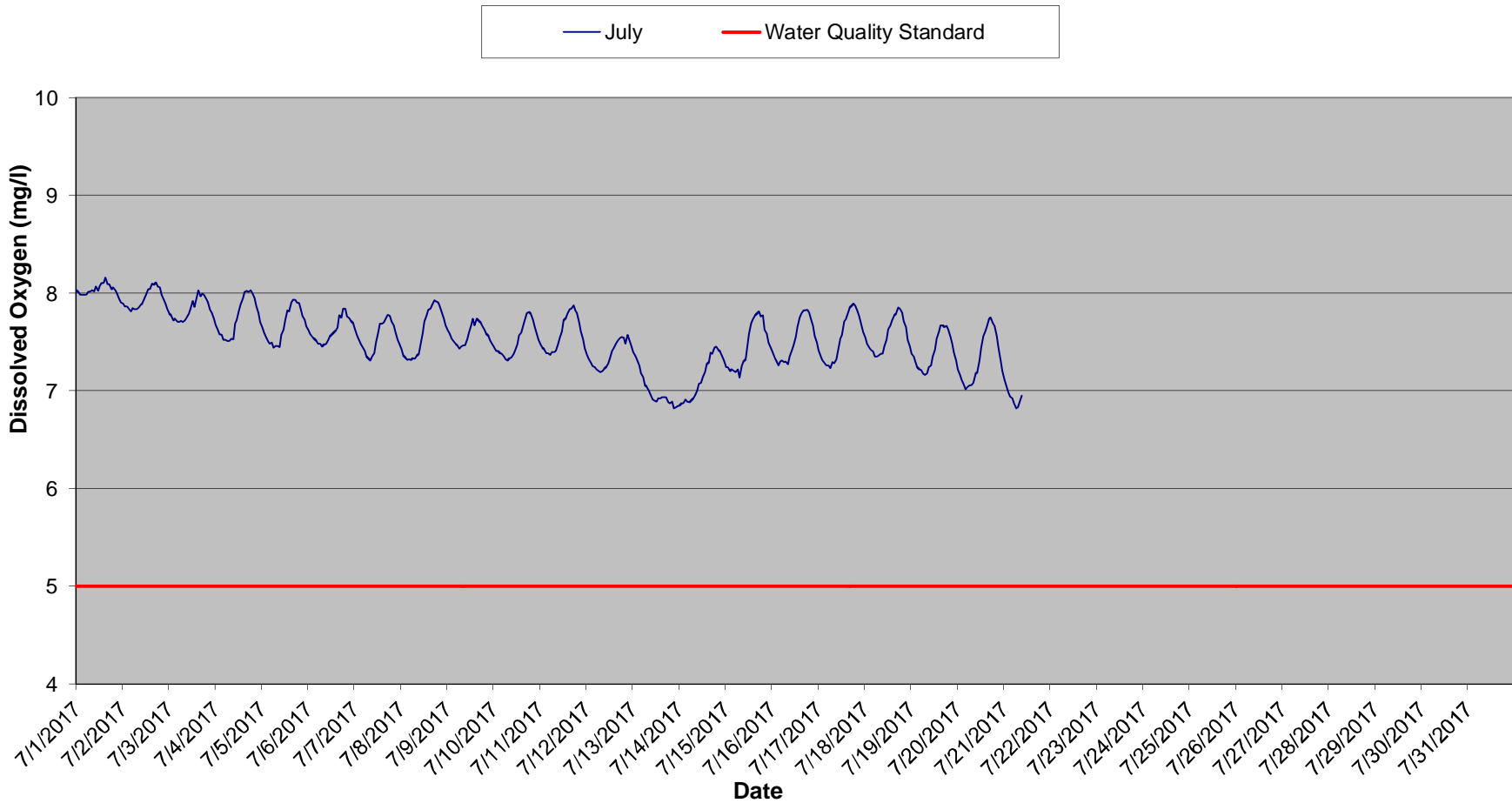
Time HHMMSS	07/01/17	07/02/17	07/03/17	07/04/17	07/05/17	07/06/17	07/07/17	07/08/17	07/09/17	07/10/17	07/11/17	07/12/17	07/13/17	07/14/17	07/15/17	07/16/17
0	66.3	68.1	69.2	69.7	70.6	70.6	72.0	72.0	71.8	70.8	72.5	73.1	72.8	70.2	69.6	70.6
10000	66.2	67.9	69.0	69.6	70.5	70.5	71.9	71.7	71.6	70.7	72.3	73.0	72.6	70.0	69.3	70.5
20000	66.1	67.8	68.9	69.5	70.4	70.5	71.8	71.4	71.5	70.6	72.2	72.8	72.5	69.9	69.1	70.4
30000	66.0	67.8	68.8	69.4	70.4	70.5	71.6	71.2	71.4	70.5	72.1	72.7	72.4	69.7	69.0	70.4
40000	66.0	67.7	68.7	69.3	70.4	70.6	71.6	71.1	71.3	70.5	72.0	72.7	72.3	69.6	68.8	70.3
50000	65.9	67.6	68.5	69.2	70.3	70.6	71.5	70.9	71.3	70.4	71.9	72.7	72.2	69.5	68.7	70.3
60000	65.7	67.5	68.4	69.1	70.3	70.7	71.5	70.8	71.3	70.4	71.8	72.7	72.1	69.3	68.6	70.2
70000	65.6	67.4	68.2	69.0	70.2	70.7	71.4	70.7	71.3	70.4	71.8	72.7	72.1	69.2	68.5	70.1
80000	65.6	67.4	68.2	69.0	70.3	70.8	71.5	70.7	71.3	70.5	71.8	72.7	72.0	69.2	68.5	70.1
90000	65.7	67.5	68.4	69.2	70.5	70.9	71.7	70.9	71.5	70.6	72.0	72.7	72.0	69.2	68.6	70.1
100000	66.0	67.8	68.6	69.5	70.7	71.0	72.0	71.2	71.9	70.7	72.3	72.8	72.0	69.2	68.8	70.2
110000	66.5	68.2	68.9	69.8	71.0	71.1	72.5	71.7	72.2	71.1	72.8	72.9	72.0	69.4	69.2	70.3
120000	67.0	68.6	69.2	70.1	71.2	71.2	73.0	72.1	72.4	71.5	73.2	73.0	72.0	69.4	69.7	70.7
130000	67.5	68.9	69.5	70.5	71.4	71.3	73.4	72.4	72.7	71.9	73.5	73.3	72.0	69.6	70.2	71.1
140000	68.0	69.4	69.8	70.8	71.6	71.4	73.7	72.8	72.7	72.4	73.8	73.5	72.1	69.8	70.7	71.5
150000	68.4	69.6	70.4	71.1	71.5	71.7	73.8	72.9	72.5	72.9	74.0	73.5	72.0	70.1	71.1	71.8
160000	68.8	69.9	70.5	71.4	71.5	72.2	73.9	73.0	72.3	73.3	74.3	73.7	71.9	70.5	71.5	72.1
170000	69.0	70.2	70.7	71.6	71.4	72.5	74.0	73.1	72.1	73.6	74.4	74.0	71.8	70.7	71.8	72.2
180000	69.0	70.3	70.8	71.7	71.3	72.7	73.9	73.1	72.0	73.6	74.3	74.0	71.6	70.9	71.9	72.2
190000	68.8	70.2	70.7	71.6	71.3	72.8	73.6	73.1	71.8	73.6	74.1	73.9	71.4	70.8	71.8	72.1
200000	68.7	70.0	70.5	71.4	71.1	72.7	73.3	72.8	71.6	73.5	73.9	73.8	71.2	70.7	71.6	71.8
210000	68.6	69.8	70.3	71.2	71.0	72.7	73.0	72.6	71.4	73.3	73.7	73.5	71.0	70.4	71.4	71.5
220000	68.5	69.6	70.1	71.0	70.8	72.5	72.6	72.4	71.2	73.0	73.5	73.2	70.7	70.2	71.1	71.2
230000	68.3	69.3	69.9	70.8	70.7	72.1	72.2	72.1	71.0	72.7	73.3	73.0	70.5	69.8	70.9	70.9
Daily Max	69.0	70.3	70.8	71.7	71.6	72.8	74.0	73.1	72.7	73.6	74.4	74.0	72.8	70.9	71.9	72.2
Daily Min	65.6	67.4	68.2	69.0	70.2	70.5	71.4	70.7	71.0	70.4	71.8	72.7	70.5	69.2	68.5	70.1
Average	67.2	68.7	69.4	70.2	70.9	71.4	72.6	71.9	71.7	71.8	73.0	73.2	71.9	69.9	70.0	70.9

Monthly average Temp: 47.0
 License Monthly Maximum Average Temperature: 83 F

Grand Rapids Tailrace Temperature Summary - July 2017

Time HHMMSS	07/17/17	07/18/17	07/19/17	07/20/17	07/21/17	07/22/17	07/23/17	07/24/17	07/25/17	07/26/17	07/27/17	07/28/17	07/29/17	07/30/17	07/31/17
0	70.6	70.7	72.8	74.0	75.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10000	70.3	70.5	72.7	73.8	75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20000	70.1	70.4	72.5	73.7	74.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30000	70.0	70.3	72.4	73.5	74.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40000	69.8	70.3	72.3	73.4	74.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50000	69.7	70.3	72.2	73.3	74.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60000	69.5	70.3	72.1	73.2	74.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70000	69.4	70.4	72.1	73.2	74.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80000	69.4	70.5	72.1	73.2	74.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90000	69.5	70.7	72.4	73.4	74.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100000	69.8	71.2	72.7	73.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
110000	70.1	71.6	73.1	74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120000	70.6	72.2	73.6	74.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130000	71.0	72.7	74.1	74.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140000	71.4	73.2	74.6	75.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150000	71.7	73.6	74.9	75.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160000	72.0	73.8	75.2	76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170000	72.1	73.9	75.4	76.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180000	72.2	73.9	75.3	76.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
190000	72.1	73.7	75.3	76.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200000	71.8	73.5	75.1	76.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
210000	71.5	73.4	74.8	76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
220000	71.2	73.2	74.6	75.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
230000	70.9	73.0	74.3	75.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Max	72.2	73.9	75.4	76.3	75.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Min	69.4	70.3	72.1	73.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	70.7	72.0	73.6	74.6	31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Grand Rapids Upstream Dissolved Oxygen - July 2017



Grand Rapids Upstream Dissolved Oxygen Summary - July 2017

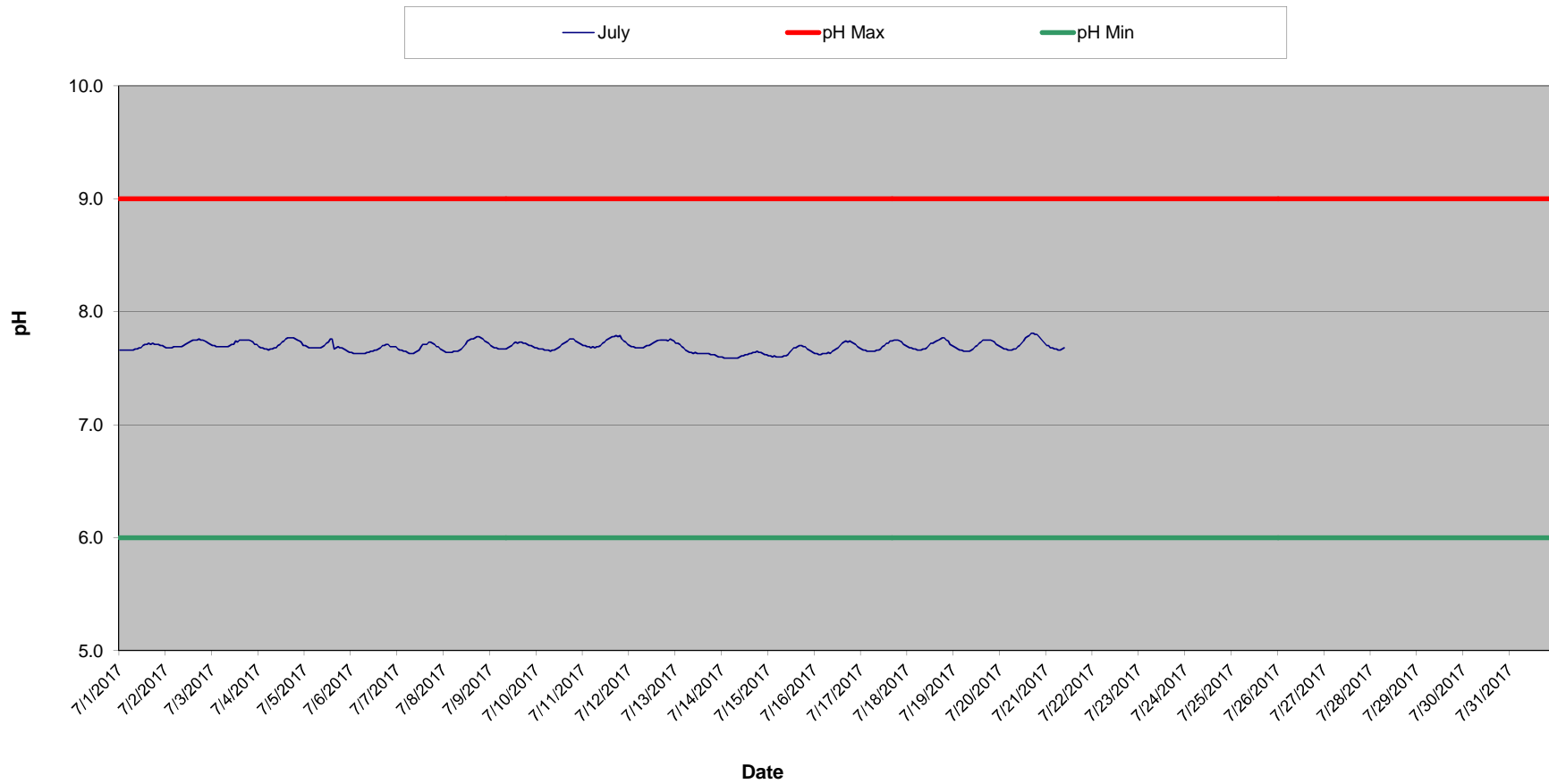
Time HHMMSS	07/01/17	07/02/17	07/03/17	07/04/17	07/05/17	07/06/17	07/07/17	07/08/17	07/09/17	07/10/17	07/11/17	07/12/17	07/13/17	07/14/17	07/15/17	07/16/17
0	8.0	7.9	7.8	7.7	7.6	7.6	7.6	7.4	7.6	7.4	7.5	7.4	7.4	6.9	7.2	7.4
10000	8.0	7.9	7.8	7.6	7.6	7.6	7.6	7.4	7.6	7.4	7.4	7.3	7.4	6.9	7.2	7.3
20000	8.0	7.9	7.7	7.6	7.5	7.5	7.5	7.3	7.5	7.4	7.4	7.3	7.3	6.9	7.2	7.3
30000	8.0	7.8	7.7	7.6	7.5	7.5	7.5	7.3	7.5	7.4	7.4	7.2	7.3	6.9	7.2	7.3
40000	8.0	7.8	7.7	7.5	7.5	7.5	7.4	7.3	7.5	7.4	7.4	7.2	7.2	6.9	7.2	7.3
50000	8.0	7.8	7.7	7.5	7.5	7.5	7.4	7.3	7.5	7.3	7.4	7.2	7.1	6.9	7.2	7.3
60000	8.0	7.8	7.7	7.5	7.4	7.5	7.3	7.3	7.4	7.3	7.4	7.2	7.1	6.9	7.2	7.3
70000	8.0	7.8	7.7	7.5	7.5	7.5	7.3	7.3	7.5	7.3	7.4	7.2	7.0	6.9	7.1	7.3
80000	8.0	7.8	7.7	7.5	7.5	7.5	7.3	7.4	7.5	7.3	7.4	7.2	7.0	7.0	7.3	7.3
90000	8.0	7.9	7.8	7.5	7.4	7.5	7.3	7.4	7.5	7.3	7.5	7.2	7.0	7.0	7.3	7.4
100000	8.1	7.9	7.8	7.7	7.6	7.5	7.4	7.5	7.5	7.4	7.5	7.2	6.9	7.1	7.3	7.4
110000	8.0	7.9	7.8	7.7	7.6	7.6	7.5	7.6	7.6	7.4	7.6	7.3	6.9	7.1	7.5	7.5
120000	8.1	8.0	7.9	7.8	7.7	7.6	7.6	7.7	7.7	7.5	7.7	7.3	6.9	7.1	7.6	7.6
130000	8.1	8.0	7.9	7.9	7.8	7.6	7.7	7.8	7.7	7.6	7.7	7.4	6.9	7.2	7.7	7.7
140000	8.1	8.0	8.0	7.9	7.8	7.6	7.7	7.8	7.7	7.6	7.8	7.4	6.9	7.3	7.7	7.8
150000	8.2	8.1	8.0	8.0	7.9	7.6	7.7	7.8	7.7	7.7	7.8	7.5	6.9	7.3	7.8	7.8
160000	8.1	8.1	8.0	8.0	7.9	7.8	7.7	7.9	7.7	7.7	7.8	7.5	6.9	7.4	7.8	7.8
170000	8.1	8.1	8.0	8.0	7.9	7.7	7.8	7.9	7.7	7.8	7.9	7.5	6.9	7.4	7.8	7.8
180000	8.0	8.1	8.0	8.0	7.9	7.8	7.8	7.9	7.7	7.8	7.8	7.5	6.9	7.4	7.8	7.8
190000	8.1	8.1	7.9	8.0	7.9	7.8	7.7	7.9	7.6	7.8	7.8	7.5	6.9	7.5	7.8	7.8
200000	8.0	8.0	7.9	7.9	7.8	7.8	7.7	7.9	7.6	7.7	7.7	7.5	6.9	7.4	7.6	7.7
210000	8.0	7.9	7.8	7.9	7.8	7.7	7.6	7.8	7.6	7.7	7.6	7.6	6.8	7.4	7.6	7.7
220000	7.9	7.9	7.8	7.8	7.7	7.7	7.5	7.7	7.5	7.6	7.5	7.5	6.8	7.4	7.5	7.6
230000	7.9	7.8	7.7	7.7	7.7	7.7	7.5	7.7	7.5	7.5	7.4	7.5	6.8	7.3	7.4	7.5
Daily Max	8.2	8.1	8.0	8.0	7.9	7.8	7.8	7.9	7.7	7.8	7.9	7.6	7.4	7.5	7.8	7.8
Daily Min	7.9	7.8	7.7	7.5	7.4	7.5	7.3	7.3	7.4	7.3	7.4	7.2	6.8	6.9	7.1	7.3
Average	8.0	7.9	7.8	7.8	7.7	7.6	7.5	7.6	7.6	7.5	7.6	7.4	7.0	7.1	7.5	7.5

License Minimum Dissolved Oxygen: 5.0 mg/l

Grand Rapids Upstream Dissolved Oxygen Summary - July 2017

Time HHMMSS	07/17/17	07/18/17	07/19/17	07/20/17	07/21/17	07/22/17	07/23/17	07/24/17	07/25/17	07/26/17	07/27/17	07/28/17	07/29/17	07/30/17	07/31/17
0	7.4	7.5	7.4	7.2	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10000	7.4	7.5	7.4	7.2	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20000	7.3	7.4	7.3	7.1	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30000	7.3	7.4	7.2	7.1	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40000	7.3	7.4	7.2	7.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50000	7.3	7.4	7.2	7.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60000	7.2	7.4	7.2	7.1	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70000	7.3	7.4	7.2	7.1	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80000	7.3	7.4	7.2	7.1	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90000	7.3	7.4	7.2	7.2	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100000	7.4	7.5	7.3	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
110000	7.5	7.5	7.4	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120000	7.6	7.6	7.4	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130000	7.7	7.7	7.5	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140000	7.7	7.7	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150000	7.8	7.8	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160000	7.9	7.8	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170000	7.9	7.9	7.7	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180000	7.9	7.8	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
190000	7.9	7.8	7.6	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200000	7.8	7.7	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
210000	7.8	7.7	7.5	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
220000	7.7	7.5	7.4	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
230000	7.6	7.5	7.3	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Max	7.9	7.9	7.7	7.8	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Min	7.2	7.4	7.2	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	7.5	7.6	7.4	7.3	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Grand Rapids Upstream pH Summary - July 2017



Grand Rapids Upstream pH Summary - July 2017

Time HHMMSS	07/01/17	07/02/17	07/03/17	07/04/17	07/05/17	07/06/17	07/07/17	07/08/17	07/09/17	07/10/17	07/11/17	07/12/17	07/13/17	07/14/17	07/15/17	07/16/17
0	7.7	7.7	7.7	7.7	7.7	7.6	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6
10000	7.7	7.7	7.7	7.7	7.7	7.6	7.7	7.6	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6
20000	7.7	7.7	7.7	7.7	7.7	7.6	7.7	7.6	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6
30000	7.7	7.7	7.7	7.7	7.7	7.6	7.7	7.6	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6
40000	7.7	7.7	7.7	7.7	7.7	7.6	7.7	7.6	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6
50000	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.7	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6
60000	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.7	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6
70000	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6	7.6
80000	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6	7.6
90000	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6	7.7
100000	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6	7.7
110000	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6	7.7
120000	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.8	7.7	7.6	7.6	7.7	7.7
130000	7.7	7.7	7.7	7.7	7.8	7.7	7.7	7.8	7.7	7.7	7.8	7.7	7.6	7.6	7.7	7.7
140000	7.7	7.8	7.8	7.8	7.8	7.7	7.7	7.8	7.7	7.7	7.8	7.7	7.6	7.6	7.7	7.7
150000	7.7	7.8	7.8	7.8	7.7	7.7	7.7	7.8	7.7	7.7	7.8	7.8	7.6	7.6	7.7	7.7
160000	7.7	7.8	7.8	7.8	7.7	7.7	7.7	7.8	7.7	7.7	7.8	7.8	7.6	7.6	7.7	7.7
170000	7.7	7.8	7.8	7.8	7.7	7.7	7.7	7.8	7.7	7.8	7.8	7.8	7.6	7.6	7.7	7.7
180000	7.7	7.8	7.8	7.8	7.7	7.7	7.7	7.8	7.7	7.8	7.8	7.8	7.6	7.7	7.7	7.7
190000	7.7	7.8	7.8	7.8	7.7	7.7	7.7	7.8	7.7	7.8	7.8	7.8	7.6	7.6	7.7	7.7
200000	7.7	7.7	7.7	7.8	7.7	7.7	7.7	7.8	7.7	7.7	7.8	7.7	7.6	7.6	7.7	7.7
210000	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.8	7.6	7.6	7.7	7.7
220000	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.8	7.6	7.6	7.7	7.7
230000	7.7	7.7	7.7	7.7	7.6	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6	7.7
Daily Max	7.7	7.8	7.8	7.8	7.8	7.7	7.7	7.8	7.7	7.8	7.8	7.8	7.7	7.7	7.7	7.7
Daily Min	7.7	7.7	7.7	7.7	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.7	7.6	7.6	7.6	7.6
Average	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.6	7.6	7.6	7.7

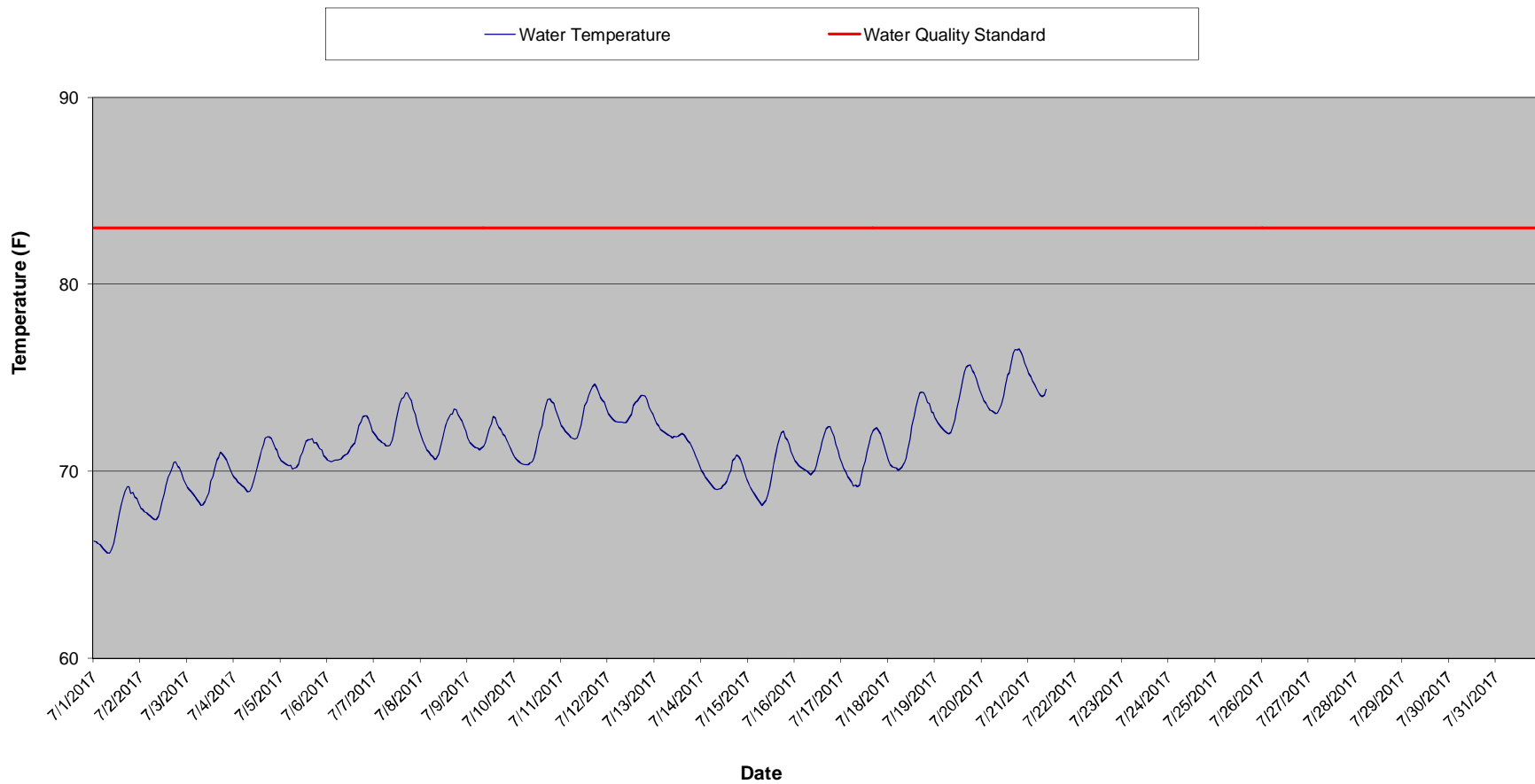
License maximum pH: 9

License minimum pH: 6

Grand Rapids Upstream pH Summary - July 2017

Time	07/17/17	07/18/17	07/19/17	07/20/17	07/21/17	07/22/17	07/23/17	07/24/17	07/25/17	07/26/17	07/27/17	07/28/17	07/29/17	07/30/17	07/31/17
HHMMSS															
0	7.7	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10000	7.7	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20000	7.7	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30000	7.7	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40000	7.7	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50000	7.7	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60000	7.7	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70000	7.7	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80000	7.7	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90000	7.7	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100000	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
110000	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120000	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130000	7.7	7.7	7.7	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140000	7.7	7.7	7.7	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150000	7.7	7.7	7.8	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160000	7.7	7.8	7.8	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170000	7.8	7.8	7.8	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180000	7.8	7.8	7.8	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
190000	7.8	7.8	7.8	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200000	7.7	7.8	7.7	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
210000	7.7	7.7	7.7	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
220000	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
230000	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Max	7.8	7.8	7.8	7.8	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Min	7.7	7.7	7.7	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	7.7	7.7	7.7	7.7	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Grand Rapids Upstream Water Temperature - July 2017



Grand Rapids Upstream Temperature Summary - July 2017

Time HHMMSS	07/01/17	07/02/17	07/03/17	07/04/17	07/05/17	07/06/17	07/07/17	07/08/17	07/09/17	07/10/17	07/11/17	07/12/17	07/13/17	07/14/17	07/15/17	07/16/17
0	66.3	68.0	69.1	69.7	70.6	70.6	72.0	71.9	71.8	70.8	72.4	73.1	72.8	70.1	69.4	70.6
10000	66.2	68.0	69.0	69.6	70.5	70.5	71.9	71.6	71.5	70.6	72.3	73.0	72.6	69.9	69.1	70.4
20000	66.1	67.8	68.9	69.4	70.4	70.5	71.7	71.4	71.4	70.5	72.2	72.8	72.4	69.7	68.9	70.3
30000	66.1	67.8	68.8	69.3	70.4	70.6	71.6	71.1	71.3	70.5	72.0	72.7	72.2	69.5	68.8	70.2
40000	66.0	67.7	68.6	69.2	70.3	70.6	71.5	71.0	71.3	70.4	71.9	72.7	72.1	69.4	68.6	70.1
50000	65.8	67.6	68.5	69.1	70.3	70.6	71.5	70.9	71.2	70.4	71.8	72.6	72.1	69.3	68.5	70.1
60000	65.7	67.5	68.3	69.0	70.1	70.6	71.4	70.8	71.1	70.3	71.7	72.6	72.0	69.2	68.4	70.0
70000	65.6	67.4	68.2	68.9	70.2	70.7	71.4	70.6	71.2	70.3	71.7	72.6	71.9	69.0	68.2	69.9
80000	65.6	67.4	68.2	68.9	70.2	70.8	71.4	70.7	71.3	70.4	71.8	72.6	71.9	69.0	68.3	69.8
90000	65.8	67.6	68.4	69.1	70.4	70.9	71.7	70.9	71.5	70.5	72.1	72.6	71.8	69.0	68.4	69.9
100000	66.1	67.9	68.6	69.5	70.8	70.9	72.0	71.3	71.9	70.7	72.5	72.7	71.9	69.1	68.7	70.1
110000	66.6	68.3	68.9	69.9	71.0	71.1	72.6	71.8	72.2	71.2	73.0	72.9	71.8	69.2	69.2	70.3
120000	67.1	68.8	69.5	70.3	71.3	71.3	73.2	72.2	72.5	71.7	73.5	73.1	71.9	69.3	69.7	70.7
130000	67.7	69.2	69.7	70.7	71.6	71.4	73.6	72.6	72.9	72.1	73.7	73.5	72.0	69.5	70.3	71.2
140000	68.2	69.7	70.1	71.1	71.7	71.5	73.9	72.8	72.9	72.4	74.0	73.7	72.0	69.8	70.9	71.6
150000	68.6	69.9	70.6	71.4	71.7	72.0	73.9	73.1	72.5	73.1	74.3	73.8	71.9	70.0	71.3	72.0
160000	68.9	70.2	70.8	71.8	71.7	72.4	74.2	73.1	72.4	73.5	74.5	73.9	71.8	70.6	71.8	72.3
170000	69.2	70.5	71.0	71.8	71.5	72.6	74.2	73.3	72.2	73.8	74.7	74.0	71.6	70.7	72.0	72.4
180000	69.2	70.5	70.9	71.9	71.5	72.9	74.0	73.3	72.0	73.9	74.5	74.1	71.5	70.9	72.1	72.4
190000	68.8	70.3	70.8	71.8	71.4	73.0	73.7	73.0	71.9	73.7	74.3	74.0	71.3	70.8	71.8	72.1
200000	68.9	70.2	70.6	71.5	71.2	73.0	73.3	72.8	71.6	73.6	74.0	73.9	71.0	70.6	71.7	71.9
210000	68.6	69.9	70.4	71.2	71.1	72.8	73.0	72.7	71.4	73.3	73.8	73.4	70.8	70.3	71.4	71.4
220000	68.5	69.6	70.1	71.1	70.8	72.5	72.6	72.4	71.2	73.1	73.7	73.2	70.5	70.0	71.0	71.1
230000	68.3	69.3	69.8	70.8	70.7	72.1	72.2	72.2	71.0	72.7	73.4	73.0	70.3	69.7	70.8	70.7
Daily Max	69.2	70.5	71.0	71.9	71.7	73.0	74.2	73.3	72.9	73.9	74.7	74.1	72.8	70.9	72.1	72.4
Daily Min	65.6	67.4	68.2	68.9	70.1	70.5	71.4	70.6	71.0	70.3	71.7	72.6	70.3	69.0	68.2	69.8
Average	67.2	68.8	69.5	70.3	70.9	71.5	72.6	72.0	71.8	71.8	73.1	73.2	71.8	69.8	70.0	70.9

Monthly Average Temp: 47.0
 License Maximum Temperature: 89 F

Grand Rapids Upstream Temperature Summary - July 2017

Time	07/17/17	07/18/17	07/19/17	07/20/17	07/21/17	07/22/17	07/23/17	07/24/17	07/25/17	07/26/17	07/27/17	07/28/17	07/29/17	07/30/17	07/31/17
0	70.4	70.6	72.8	74.0	75.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10000	70.1	70.3	72.6	73.8	75.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20000	69.9	70.2	72.5	73.6	74.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30000	69.7	70.2	72.3	73.4	74.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40000	69.6	70.2	72.2	73.3	74.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50000	69.4	70.1	72.1	73.2	74.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60000	69.2	70.2	72.1	73.2	74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70000	69.2	70.2	72.0	73.1	74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80000	69.2	70.4	72.1	73.1	74.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90000	69.3	70.7	72.4	73.4	74.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100000	69.7	71.2	72.8	73.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
110000	70.2	71.7	73.3	74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
120000	70.5	72.4	73.8	74.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130000	71.0	72.9	74.3	75.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
140000	71.5	73.4	74.9	75.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
150000	71.9	73.9	75.3	75.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
160000	72.2	74.2	75.6	76.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
170000	72.3	74.2	75.7	76.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
180000	72.3	74.2	75.7	76.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
190000	72.2	74.0	75.4	76.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
200000	72.0	73.7	75.2	76.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
210000	71.6	73.6	74.9	76.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
220000	71.3	73.2	74.6	75.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
230000	70.9	73.1	74.3	75.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Max	72.3	74.2	75.7	76.5	75.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Min	69.2	70.1	72.0	73.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	70.6	72.0	73.7	74.7	31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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