APPENDIX 5
Suggested Notice of Intent (NOI) Form

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY - REGION 1

Request for General Permit Authorization to Discharge Noncontact Cooling Water to be covered by the Noncontact Cooling Water General Permit (NCCWGP) NPDES General Permits No. MAG250000 and NHG250000

A. Facility Information

1. Indicate applicable General Permit: MAG250000 ■ NHG250000 ☐

2. Facility Information/Location:
Facility Name Wachusett Aqueduct Pumping Station
Street/PO Box 84 D'Angelo Drive City Marlborough
State MA Zip Code 01752
Latitude 42o18'56.8" N Longitude 71o35'20.9" W

Type of Business Public Water Supply Facility
SIC Code(s) 4941

3. Facility Mailing address (if different from Location Address):
Facility Name Massachusetts Water Resources Authority
Street/PO Box Deer Island Treatment Plant ,33 Tafts Avenue City Boston
State MA Zip Code 02128

4. Facility Owner:
Name Massachusetts Water Resources Authority
E-mail Maret.Smolow@mwra.com
Street/PO Box Deer Island Treatment Plant ,33 Tafts Avenue City Boston
State MA Zip Code 02128

Contact Person Maret Smolow Tel 857-331-2594
Owner is (check one): Federal ____ State X Tribal ____ Private ____
Other (describe) ____

5. Facility Operator (if different from above):
Legal Name Massachusetts Water Resources Authority
E-mail Eben.Nash@mwra.com
Street/PO Box 260 Boston Road City Southboro Zip Code 01772
State MA Contact Eben Nash Telephone 508-424-3669

6. Current permit coverage: yes■ no☐

a) Has a prior NPDES permit (individual or general permit coverage) been granted for the discharge that is listed on the NOI? yes■ no☐ If Yes, permit number MAG250985

b) Is the facility covered by an individual NPDES permit for other discharges? yes☐ no■
If yes, Permit Number: _____

c) Is there a pending NPDES application on file with EPA for this discharge? yes☐ no■
If yes, date of submittal: _____ and permit number, if available _____

7. Attach a topographic map indicating the location of the facility and the outfall(s) to the receiving water.

B. Map attached? ▣ **Attachment B**

Discharge Information (attach additional sheets as needed):

1. Name of receiving water into which discharge will occur: Forebay to Wachusett Aqueduct Open Canal to Sudbury Reservoir
Freshwater ▣ Marine Water ☐; State Water Quality Classification Class N/A
Type of Receiving Water Body (e.g., stream, river, lake, reservoir, estuary, etc.) constructed water conveyance channel

2. Attach a line drawing or flow schematic showing water flow through the facility including sources of intake water, operations contributing to flow, treatment units, outfalls, and receiving water(s).
Line drawing or flow diagram attached? ▣ **Attachment C**

3. Describe the discharge activities for which the owner/applicant is seeking coverage (e.g., building cooling, process line cooling, etc.) Building heating and cooling

4. Number of Outfalls 2 Latitude and Longitude to the nearest second for each Outfall. See EPA's siting tool at http:/www.epa.gov/tri/reporting/siting_tool. Attach additional pages if necessary.

Outfall # **101** Latitude 42o18'47.1" N Longitude 71o34'57.1" W
Outfall # **102** Latitude 42°18'45.1" N Longitude 71°34'52.8" W
Outfall # Latitude _____ Longitude _____

5. For each Outfall provide the following discharge information:

Outfall # 101
a) Maximum Daily Flow 0.60 MGD Average Monthly Flow 0.53 MGD
NOTE: EPA will use the flow reported here as the facility's permitted effluent flow limit.
b) Maximum Daily Temperature 77.5 °F Average Monthly Temperature 59.9 °F
c) Maximum Monthly pH 8.05 s.u. Minimum Monthly pH 6.96 s.u.
d) Outfall's discharge is: continuous ☐ intermittent ▣ seasonal ☐

Outfall # 102
a) Maximum Daily Flow 0.60 MGD Average Monthly Flow 0.53 MGD
NOTE: EPA will use the flow reported here as the facility's permitted effluent flow limit.
b) Maximum Daily Temperature 72.3 °F Average Monthly Temperature 52.4 °F
c) Maximum Monthly pH 7.91 s.u. Minimum Monthly pH 7.18 s.u.
d) Outfall's discharge is: continuous ☐ intermittent ▣ seasonal ☐

Outfall # _____

a) Maximum Daily Flow _____MGD Average Monthly Flow _____MGD
NOTE: EPA will use the flow reported here as the facility's permitted effluent flow limit.
b) Maximum Daily Temperature _____°F Average Monthly Temperature _____°F
c) Maximum Monthly pH _____s.u. Minimum Monthly pH _____s.u.
d) Outfall's discharge is: continuous ☐ intermittent ☐ seasonal ☐

6. Is the source of the NCCW potable water? yes☐ no■
If yes, EPA will calculate a Total Residual Chlorine effluent limit for your facility.

7. Provide the reported or calculated seven day-ten year low flow (7Q10) of the receiving water NA* MGD
Attach any calculation sheets used to support stream flow and/or dilution calculations. **The dilution factor of the receiving water was determined to be 10:1 by MassDEP.)**

8. **For facilities that discharge to Massachusetts surface waters:**

a) Submit the completed engineering calculation of the surface water temperature rise as shown in Attachment B of the General Permit. Calculation attached? ■ Attachment D
b) Does the discharge occur in an Area of Critical Environmental Concern (ACEC)? yes☐ no■
If yes, provide the name of ACEC _____
c) Does the discharge occur to an Outstanding Resource Water (ORW)? yes■ no☐
If yes, enclose antidegradation waiver approval provided by MassDEP. Anti-degradation review request attached

Note: See Appendix 1 of the General Permit for more information on ACEC.

C. Chemical Additives

1. Are any non-toxic neutralization and/or dechlorination chemicals used in the discharge(s)? yes☐ no■

2. If yes, attach a list of each chemical used and include the chemical name and manufacturer; maximum and average daily quantity used on a monthly basis, as well as the maximum and average daily expected concentrations (mg/L) in the discharge, and the vendor's reported aquatic toxicity (NOAEL and/or LC_{50} in percent for typically acceptable aquatic organism).

3. Was this list submitted with the facility's 2014 NCCWGP NOI? yes☐ no☐

D. NCCW Source Water Information

1. State the source of the NCCW (e.g., municipal water supply, private well, surface water withdrawal, etc.).
Source constructed water conveyance channel Name of Source Water Hultman Aqueduct Forebay Channel

2. Is the source water registered/permitted under MA Water Management Act or NHDES User Registration Rule (ENV WQ 2202)? yes☐ no■ If yes, registration number _____

3. If the source water is groundwater (non-municipal well water), see Appendix 9 of the General Permit and submit effluent (and receiving water hardness) test results, as required in Part 5.4 of the General Permit.
Test results attached? ☐

4. Does the facility use both a primary and backup source of NCCW? yes☐ no■ If yes, **attach information** that identifies and describes the primary and backup sources of NCCW and how often any backup supply was used in the past five years.

E. Best Technology Available for Cooling Water Intake Structures (CWISs)

If the facility's non-contact cooling water discharge is covered by this General Permit and the facility **withdraws water from a surface water**, it is subject to the BTA requirements at Part 4.2 of the General Permit.

1. Are you subject to the BTA requirements of the General Permit? yes☐ no■
   a) If no, explain source water is a constructed water conveyance channel, see Attachment E and skip to F.
   b) If yes, submit a facility-specific BTA description that accurately describes the facility's operations and practices, including, but not limited to, the measures described in Part 5.5 of the General Permit. For additional information and guidance, see Section IV of the Fact Sheet.

Include in your description:
a) Measures to meet the General Permit Part 4.2.1 general BTA requirements, including documentation that describes the facility's monitoring program for impinged fish and/or invertebrates; or the required alternative monitoring plan frequency and/or protocol.
b) The attributes of the current CWIS.
c) The design measures of the CWIS.
d) The operational measures of the CWIS.
e) The historical occurrence of impinged fish for the past five years.
f) If applicable, a demonstration that the facility's intake rate is commensurate with a closed-cycle recirculation system.
g) Other components to reduce impingement and/or entrainment of aquatic life.

2. Provide the following information for each CWIS to support your attached facility-specific BTA description:
   a) The design capacity of the of the CWIS _____MGD
   b) Maximum monthly average intake of the CWIS during the previous five years _____MGD
   c) The month and year in which this flow reported in 2.b. occurred _____
   d) The maximum through-screen design intake velocity _____feet/second (fps)

3. For facilities where the CWIS is located on a freshwater river or stream, provide the following information:
   a) The source water's annual mean flow in MGD as available from USGS or other appropriate source _____MGD
   b) The design intake flow as a % of the source water's annual mean flow _____% Attach calculations if equal to or less than 5% of annual mean flow.
   c) The source water's 7Q10 _____MGD
   d) The design intake flow as a percent of the source water's 7Q10 _____%

4. Provide a map showing the location of each cooling water intake structure; NCCW Outfall(s) and CWIS features referred to in the BTA description. **Map attached?** ☐

F. Endangered Species Act Eligibility Information

If your facility is listed in Table A as one of the 37 facilities covered under the 2014 NCCW GP, check this box. ■
Your ESA consultation responsibilities have been satisfied by EPA. Proceed to Part G.

If your facility is not included as one of the 37 facilities covered under the 2014 NCCW GP, complete this Part.

Using the instructions in Appendix 2, Parts B(1) and B(2) of the NCCW GP, which of the following criteria apply to your facility?

United States Fish and Wildlife Service (USFWS) Criteria: A ☐ B ☐ C ☐

National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) Criteria: A☐ B☐ C☐

1. If you selected USFWS criterion B, has consultation with the USFWS been completed? yes☐ no☐
   If you selected NOAA Fisheries criterion B, has consultation with NOAA Fisheries been completed?
   yes☐ no☐

2. If consultation with USFWS and/or NOAA Fisheries Service was completed, was a written concurrence finding that the discharge is "not likely to adversely affect" listed species or critical habitat received?
   USFWS yes☐ no☐ N/A☐ NOAA Fisheries yes☐ no☐ N/A☐

3. Attach documentation of ESA eligibility for USFWS and NOAA Fisheries as required at Appendix 2, Part C. of the General Permit. **Documentation attached?** USFWS☐ NOAA Fisheries ☐

4. Please indicate if your facility **directly intakes water for non-contact cooling from, or discharges any NCCW effluent to,** any of the following waterbodies:

   ☐ Merrimack River
   ☐ Connecticut River
   ☐ Westfield River
   ☐ Deerfield River
   ☐ Piscataqua River
   ☐ Salmon Falls River
   ☐ Cocheco River
   ☐ Taunton River

   EPA will consult with NOAA Fisheries on any cooling water intakes or discharges covered under this permit in areas (in the above waterbodies) that overlap with the presence of shortnose sturgeon (endangered) and Atlantic sturgeon (threatened/endangered).

   Please indicate if your facility **directly intakes water for non-contact cooling** from, **or discharges non-contact cooling water effluent to**, the Connecticut River Watershed. EPA will consult with the U.S Fish and Wildlife Service on cooling water intakes and discharges covered under this permit in areas of the Connecticut River Watershed that overlap with the presence of the dwarf wedgemussel (endangered).
   yes☐ no■

G. National Historic Properties Act Eligibility

1. Are any historic properties listed or eligible for listing on the National Register of Historic Places located on the facility site or in proximity to the discharge? yes☐ no■

2. Have any State or Tribal Historic Preservation Officers been consulted in this determination? yes■no☐
   If yes, attach the results of the consultation(s). **Attachment F**

3. Which of the three National Historic Preservation Act scenarios listed in Appendix 3, Section C has the facility met?
   1 ☐ 2 ■ 3

H. Supplemental Information

Please provide any supplemental information, including antidegradation review information applicable to new or increased discharges. Attach any analytical data used to support the application. Attach any certification(s) required by the General Permit. **See Attachment G**

I. Signature Requirements

The NOI must be signed by the operator in accordance with the signatory requirements of 40 CFR§ 122.22 (see below) including the following certification:

> I certify under penalty of law that (1) no biocides or other chemical additives except for those used for pH adjustment and/or dechlorination are used in the noncontact cooling water (NCCW) system; (2) the discharge consists solely of NCCW (to reduce temperature) and authorized pH adjustment and/or dechlorination chemicals; (3) the discharge does not come in contact with any raw materials, intermediate product, water product (other than heat) or finished product; (4) if the discharge of noncontact cooling water subsequently mixes with other wastewater (i.e. stormwater) prior to discharging to the receiving water, any monitoring provided under this permit will be only for noncontact cooling water; (5) where applicable, the facility has complied with the requirements of this permit specific to the Endangered Species Act and National Historic Preservation Act; and (6) this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.
>
> Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I certify that I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature _____ Date June 17, 2024

Printed Name and Title FREDERICK A. LASICZ

Federal regulations require this application to be signed as follows:

1. For a corporation, by a principal executive officer of at least the level of vice president;
2. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively, or,
3. For a municipality, State, Federal or other public facility, by either a principal executive officer or ranking elected official.

MASSACHUSETTS WATER RESOURCES AUTHORITY
Deer Island
33 Tafts Avenue
Boston, MA 02128

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
TTY: (617) 788-4971

June 15, 2024

George Papadopoulos
US Environmental Protection Agency
NCCW GP Processing
Mail code: OEP 06-4
5 Post Office Square, Suite 100
Boston, MA 02109

Xiaodan Ruan
Environmental Engineer
Massachusetts Department of
Environmental Protection
100 Cambridge Street, suite 900,
Boston, MA 02114

Re.: NPDES Permit Application Transmittal
Application for Permit to Discharge
Wachusett Aqueduct Pumping Station Geothermal System
84 D'Angelo Drive, Marlborough, MA 01752
Non-Contact Cooling Water General Permit MAG250000

Dear Mr. Papadopoulos and Ms. Ruan:

Attached please find a copy of the Notice of Intent (NOI) and supporting documents for the Non-Contact Cooling Water General Permit. The specifics of the facility and the discharges are summarized on the attached forms. This NOI includes information relating to a Pumping Station with a Geothermal System located on the grounds of the John J. Carroll Water Treatment Plant. Discharge from the Wachusett Aqueduct Pumping Station Geothermal System is covered under the general permit MAG250985 as of June 8, 2018 and was administratively continued in November 2019. Additional explanatory facility details are summarized below.

Facility Description

The Wachusett Aqueduct Pumping Station (WAPS) was completed in February 2019. The facility provides a redundant raw water supply from the Wachusett Reservoir to the Carroll Water Treatment Plant via the Wachusett Aqueduct. The facility is used either during emergency or planned shutdown of the Cosgrove Tunnel.

A number of green energy attributes, including photovoltaic panels and an open-loop geothermal system are installed to reduce the reliance on fossil fuels and electricity for heating and cooling of the station. The geothermal system takes advantage of the constant supply of water in the Forebay.

NPDES Permit Application Transmittal
Wachusett Aqueduct Pumping Station Geothermal System
Non-Contact Cooling Water General Permit

Discharges

Discharges from Outfalls 101 and 102 relate to the operation of the geothermal heating and cooling system for the Wachusett Aqueduct Pumping Station. The geothermal discharge mixes with other flows including leakage and occasional water transfers from the Wachusett Aqueduct, and natural flows due to precipitation, within the Forebay, a constructed water conveyance channel, which is part of the MWRA's emergency water supply works. The Forebay was constructed for water supply purposes and extends from MWRA's Wachusett Aqueduct Terminal Chamber to the Hultman Weir, a distance of approximately 2,000 feet. MWRA does not believe that activities associated with traditional water supply purposes conducted within the Forebay are jurisdictional for NPDES permitting purposes.

Contrasted with the Forebay, the Sudbury Reservoir and the Wachusett Aqueduct Open Channel (Canal) are classified by the Massachusetts Department of Environmental Protection as Class A waters, Public Water Supply. To this end, in past NPDES permitting activities (*e.g.,* for startup of the Metro West Tunnel and the temporary use of Wachusett Aqueduct), MWRA and EPA differentiated between the Forebay and the Canal, and MWRA continues to make this differentiation in the enclosed application forms. Accordingly, MWRA has identified Outfall 101 as the point where water associated with the geothermal heating and cooling system leaves the Forebay at the Hultman Weir and enters the Canal, for purposes of NPDES permitting. Outfall 102 (Hultman Intake Bypass) is located adjacent to the Weir, and consists of a bypass line to accommodate lowering of the Forebay, and can pass the large volumes of flow that occur during startup and shutdown of the WAPS.

Should you have any questions, or if you would like to arrange a meeting to discuss the geothermal system discharge, please feel free to contact Maret Smolow at Maret.Smolow@mwra.com

Sincerely,

Frederick A. Laskey
Executive Director

Attachments:
Notice of Intent Form
Attachment A: Individual Permit Application Cover Letter
Attachment B: Topographic Map
Attachment C: Facility Flow Schematic

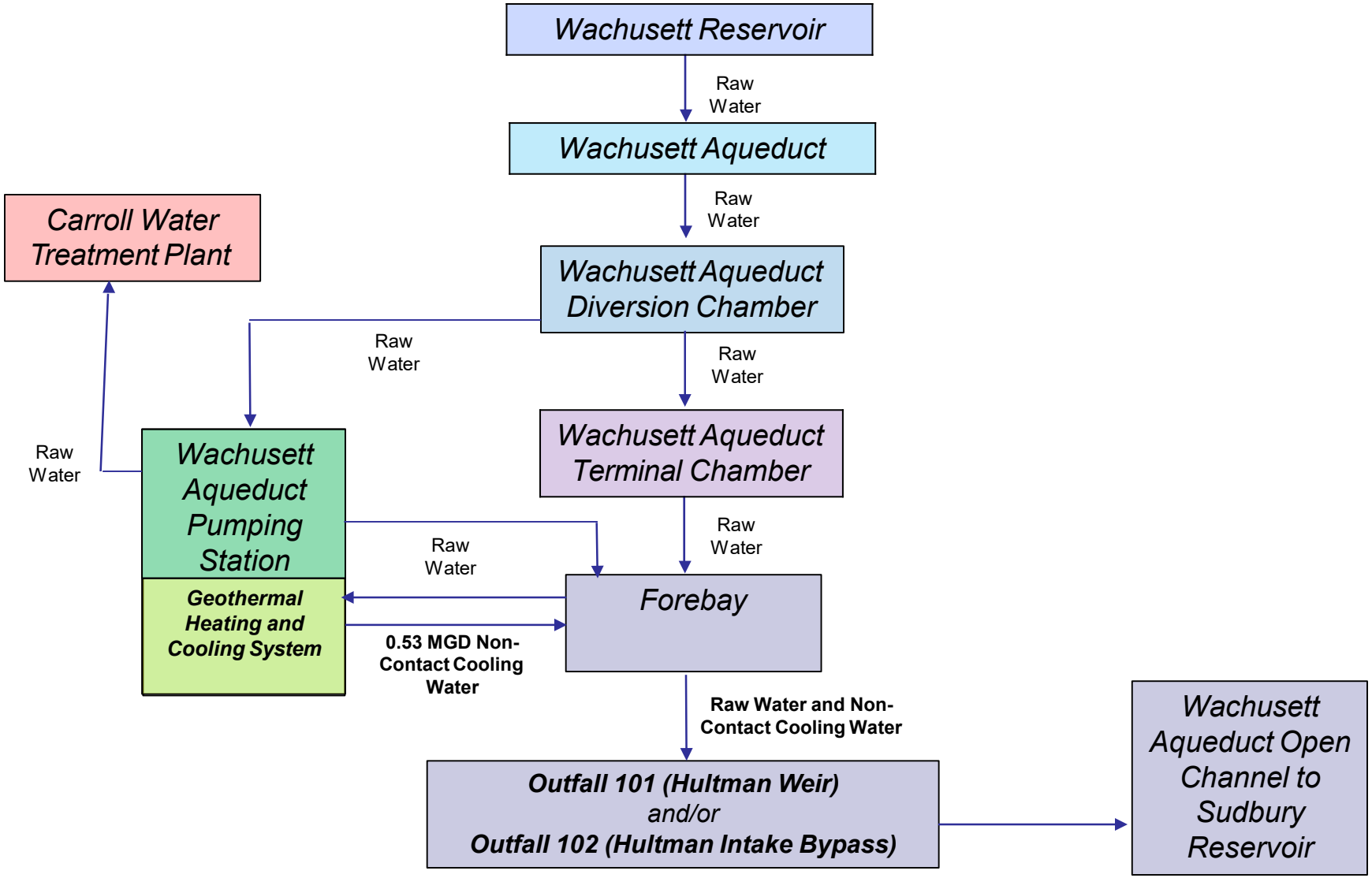
NPDES Permit Application Transmittal
Wachusett Aqueduct Pumping Station Geothermal System
Non-Contact Cooling Water General Permit

Attachment D: Surface Water Temperature Rise Engineering Calculations
Attachment E: Source Water Information
Attachment F: Documentation of National Historic Preservation Act Requirements
Attachment G: Supplemental Information

cc:
David Coppes, MWRA
Rebecca Weidman, MWRA
David Wu, MWRA
Chris John, MWRA

Attachment B
Site Location Map
MWRA Wachusett Aqueduct Pumping Station Marlborough MA

Attachment C
Schematic of Water Flow
Wachusett Aqueduct Pumping Station
Marlborough, Massachusetts



Attachment D
Wachusett Aqueduct Pumping Station
Geothermal System Operation
Impacts on Forebay Temperature
Calculations in accordance with Attachment B of the Non Contact Cooling Water General Permit

With station operating at full capacity, and With cooling system operating at maximum capacity:

Forebay flow rate (station overflow) 10,000,000 gal/day

$\Delta T_r = (m_p/m_r) \times \Delta T_p$

Where: ΔT_r = change in river temperature, ^oF

m_p = mass of effluent, lbs (gal/day if volume)	0.6 MGD	=	600,000	gal/day
m_r = mass of river, lbs (gal/day if volume)		=	10,000,000	gal/day
ΔT_p = change in effluent temperature, ^oF	ΔTp (101)	=	6.4	^oF
	ΔTp(102)	=	11.9	^oF

$\Delta T_{r\,(101)} = (600{,}000/10{,}000{,}000) \times 6.4 =$ **0.38** ^oF
$\Delta T_{r(102)} = (600{,}000/10{,}000{,}000) \times 11.9 =$ **0.71** ^oF

With station operating at reduced or zero capacity (ready mode), and
With cooling system operating to meet typical daily loads:

Forebay volume at elevation 278.5 ft ("Hultman Weir") = 11,738,281 gallons

Calculation assumes all heat rejected by the pumping station is absorbed by the Forebay so that:

$\Delta T_r = Q_r/(C_p \times m_r)$

Where: ΔT_r = change in river temperature, ^oF

Q_r = heat rejection of water, Btu = rated capacity of cooling unit	=	24.0 tons	=	8,640,000.0	BTU/day
C_p = heat capacity (specific heat) of water, BTU/lb^{o}F			=	1	BTU/lb^{o}F
m_r = mass of river, lbs	=	11,738,281 gallons	=	97,960,673.73	lbs

$\Delta T_r = 8{,}640{,}000/(1 \times 97{,}957{,}128) =$ **0.088 ^{o}F per day**

Attachment E
Source Water Information

The MWRA's Hultman Aqueduct Forebay Channel was constructed for water supply purposes and MWRA does not believe it is federally jurisdictional as a Water of the United States.

The Forebay extends from MWRA's Wachusett Aqueduct Terminal Chamber to the Hultman Weir, a distance of approximately 2,000 feet. The only inlet to the Forebay is the Wachusett Aqueduct and the water level between the Terminal Chamber and the Hultman Weir is determined by MWRA operations. Flows exits the Forebay, by overflowing the Hultman Weir outfall 101 or through the Hultman Intake Bypass outfall 102.

The Wachusett Aqueduct and dam were constructed in 1898 to create the Wachusett Reservoir and provide a means of transferring the water from the Wachusett Reservoir to the Sudbury Reservoir. The Wachusett Aqueduct system was in continuous use until 1964, when the Cosgrove Tunnel was constructed. Water was discharged from the Wachusett Aqueduct into the Forebay Channel. The water in the Forebay is comprised of occasional discharges from Wachusett Aqueduct, groundwater that seeps into the Aqueduct and natural flows due to precipitation. The Hultman Weir at the end of the Forebay keeps a constant water level in this constructed water conveyance channel.

The Forebay is distinguished from the MWRA's Open Channel which begins at the Hultman Weir below/at the terminus of the Hultman Forebay Channel and ends at Deerfoot Road, (Deerfoot Road is the beginning of Sudbury Reservoir). The Open Channel is variable in width. The Wachusett Aqueduct, including the Forebay, the Hultman Weir and the open channel to the Sudbury Reservoir was, and continues to be maintained as an emergency source of water supply.

When the Wachusett Aqueduct was originally constructed, water from the Wachusett Reservoir entered the aqueduct at a hydraulic grade line (HGL) elevation of 287 feet and at the end of the aqueduct, flows passed through a terminal chamber and into an Open Channel. In 1940, the Hultman Aqueduct was constructed to bypass and replace the Open Channel and Sudbury Reservoir system. The Hultman Aqueduct was supplied from the Wachusett system, and received water supply at a HGL elevation of 278.5 feet, which was established by constructing a circular weir (the Hultman Weir) about 2,000 feet downstream of the Wachusett Aqueduct Terminal Chamber. The circular weir keeps a constant water level in the Forebay. Flows entered the Hultman Aqueduct through a gate house that was constructed just upstream of the circular weir.

The Forebay Channel is rip-rapped along its sides near the Wachusett Aqueduct Terminal Chamber and the bottom is devoid of natural habit. Drainage from the adjacent Crane Swamp drains to constructed channels paralleling the Forebay (the Northern and Southern Diversion Channels) in order to prevent natural surrounding drainage from entering the Forebay Channel and then the Hultman Aqueduct. The diversion channels divert flow to the Open Channel downstream of the Hultman Weir. By design, the catchment area that drains into the Forebay is extremely limited.

The Forebay flow is comprised of the geothermal discharge, leakage and occasional water transfers from the Wachusett Aqueduct, and natural flows due to precipitation. The Forebay Channel is a constructed water conveyance channel, which is part of the MWRA's emergency water supply distribution system and work in those areas is exempt under 310 CMR 10.02(2)(a)(2) and thus not regulated under the Commonwealth's Wetlands Protection Act. In addition, MWRA does not believe the Forebay Channel is a water of the United States, an Outstanding Resource Water, or Land Under Water. Further, the Forebay is neither a river, stream, lake, pond spring, impoundment, estuary, wetland, etc., but instead is part of the MWRA's water transmission system.

In prior NPDES permitting (July 2003) for startup of the MetroWest Tunnel, the temporary use of the Wachusett Aqueduct, which required disinfection of the water transmissions system necessitating MWRA to discharge chlorinated water into the Forebay, MWRA, and EPA differentiated between the Forebay and Open Channel. In that 2003 NPDES permit (MA0103357), EPA regulated discharges from the Forebay Channel at Outfall 001 below the Hultman Weir, but not upstream.

MWRA's current authorization to discharge under the Non-contact Cooling Water General Permit (MAG250985), issued in 2018, also regulates discharges from the Forebay Channel below the Hultman weir and intake bypass (Outfalls 101 and 102, respectively).

Attachment F

November 4, 2013

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth

Massachusetts Historical Commission

Marianne Connolly
Senior Program Manager
Environment Review and Compliance
Massachusetts Water Resources Authority
100 First Avenue, Building 39
Boston, MA 02129

RE: Proposed Wachusett Aqueduct Pumping Station Project, Marlborough, MA. MHC #RC.55010.

Dear Ms. Connolly:

Thank you for providing the Massachusetts Historical Commission (MHC), the office of the State Historic Preservation Officer, with information regarding the proposed project referenced above.

The project is proposed for federal funding through the Drinking Water State Revolving Fund, as well as state agency permitting and funding.

The project proposes the demolition of the Westborough State Hospital Pumping Station, included in the MHC's Inventory of Historic Assets of the Commonwealth (MRB.1306). It is the opinion of the MHC that the 1975 structure does not meet the Criteria of Eligibility (36 CFR Part 60) for listing in the National Register of Historic Places.

Please notify the MHC of the date of demolition of the Westborough State Hospital Pumping Station so that the MHC can update its inventory files.

The area of potential effect for the project also includes the Wachusett Aqueduct Linear District (MRB.AR) part of the Water Supply System of Metropolitan Boston (MRB.AS), listed in the State and National Registers of Historic Places.

After review of the MHC's files and the information that provided, the MHC believes that the project as proposed will have no adverse effect (36 CFR 800.5(b), 950 CMR 71.07(2)(b)(2)) on the Wachusett Aqueduct Linear District (MRB.AR) part of the Water Supply System of Metropolitan Boston.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800) and MGL c. 9, ss. 26-27C (950 CMR 71). Please contact Edward L. Bell, Deputy State Historic Preservation Officer, if you have any questions.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
Massachusetts Historical Commission

xc:
Secretary Richard K. Sullivan, Jr. EEA-MEPA Office
John Felix, DEP-SRF Program
Donald St. Marie, DEP
Eric Friedman, Mass. Dept. of Energy Resources-Leading By Example Program
Marlborough Historical Commission

220 Morrissey Boulevard, Boston, Massachusetts 02125
(617) 727-8470 • Fax: (617) 727-5128
www.state.ma.us/sec/mhc

Attachment G
Wachusett Aqueduct Pumping Station Supplemental Information

Purpose of adding emergency pumping station to the Carroll Water Treatment Plant facility

The Wachusett Aqueduct Pumping Station provides a redundant raw water supply from the Wachusett Reservoir to MWRA's Carroll Water Treatment Plant (CWTP). Since the Wachusett Aqueduct operates at a lower hydraulic grade line than the Cosgrove Tunnel, water cannot flow from it into the CWTP's ozone contactors without pumping.

The Wachusett Aqueduct with the emergency pumping station can deliver approximately 240 million gallons per day (MGD) of raw water to the Carroll Plant for full treatment. The 240-MGD capacity allows unrestricted supply for at least eight months in the lower-demand fall/winter/spring period during a planned or emergency shutdown of the Cosgrove Tunnel.

The pumping station allows the Wachusett Aqueduct to provide redundancy for the Cosgrove Tunnel. Completion of the Hultman Aqueduct rehabilitation and interconnections project provides redundancy for the MetroWest Water Supply Tunnel. Together, these projects provide water transmission redundancy from the Wachusett Reservoir to metropolitan Boston.

Low carbon footprint design

In addition to the geothermal heating/cooling system described below, the pumping station includes other energy-saving measures, including a cold roof with photovoltaic panels, light and temperature monitoring and sensors, premium efficiency motors, and high-efficiency pumps.

The geothermal heating/cooling system is designed to lower the energy footprint of this emergency facility. The system is an open loop system that uses water from/to the Wachusett Aqueduct Forebay. The Forebay was an integral component of MWRA's active water transmission system before the construction of the Cosgrove Tunnel in the 1960s.

Discharges from Outfall 101 and Outfall 102 relate to the operation of the geothermal heating and cooling system for the Wachusett Aqueduct Pumping Station. The geothermal discharge mixes with other flows including leakage and occasional water transfers from the Wachusett Aqueduct and natural flows due to precipitation, within the Forebay. Which is a constructed water conveyance channel and is part of the MWRA's emergency water supply works. The Forebay was constructed for water supply purposes and extends from MWRA's Wachusett Aqueduct Terminal Chamber to the Hultman Weir, a distance of approximately 2,000 feet. MWRA does not believe that activities associated with traditional water supply purposes conducted within the Forebay are federally jurisdictional for NPDES permitting purposes.

Contrasted with the Forebay, the Sudbury Reservoir and the Wachusett Aqueduct Open Channel (Canal) are classified by the Massachusetts Department of Environmental Protection as Class A waters, Public Water Supply. To this end, in past NPDES permitting activities (e.g., for the startup

of the MetroWest Tunnel, and the temporary use of Wachusett Aqueduct), MWRA and EPA differentiated between the Forebay and the Canal, and MWRA continues to make this differentiation in the enclosed Notice of Intent (NOI). Accordingly, for purposes of NPDES permitting, MWRA has identified Outfall 101 as the point where water associated with the geothermal heating and cooling system leaves the Forebay at the Hultman Weir and enters the Canal. Outfall 102 (Hultman Intake Bypass) is located at the base of the conduit built to lower the water level in the Forebay by bypassing the Hultman Weir.

Operating conditions and environmental impact

The geothermal system takes advantage of the constant supply of water in the Forebay. Water temperatures in the Forebay generally fluctuate between 32°Fand 63°F. Water is pumped from the Forebay through heat exchangers that are used to heat or cool the building. After passing through the system, the water is returned to the Forebay. The geothermal system continuously circulates 0.53 MGD under all operating and weather conditions, however Outfall 101 and Outfall 102 discharge only intermittently.

When the pumping station is not operating ("Ready Mode"), the geothermal system moderates the building temperature to protect the pumping station electronics and other equipment; temperature is to be maintained at 55°F in the winter and 85°F in the summer, respectively. While in "Ready Mode" there is little to no flow in the Forebay, but the peak cooling load is much less and is estimated to increase the temperature in the Forebay minimally in summer.

During station operation, there will be a minimum of 10 MGD (15.5 cfs) flowing through the Forebay, so the increase in Forebay temperature is estimated to be less than 0.5°F. While full operation of the station only occurs during an emergency or planned maintenance, the station pumping equipment and controls are operated monthly to ensure their reliability and to maintain the equipment.

Up to 250 MGD of water, including the Wachusett Aqueduct Pumping Station non-contact cooling water, may flow through the Forebay and into the Wachusett Aqueduct Open Channel via the bypass conduit (Outfall 102) as the pumping station transitions from ready mode to full operation. Once the pumping station is pumping water to CWTP, flow through the Forebay will drop to a minimum of 10 MGD, which will exit the Forebay at Outfall 101.

The Forebay is part of the water system, is rip-rapped along its sides, and past investigations have shown it does not provide any significant habitat. Nonetheless, the geothermal system intake was designed using the Best Technology Available (BTA), including an intake velocity of 0.14 fps and a screen mesh size of 3.3 mm, to protect any aquatic life that might incidentally occur in the vicinity of the cooling water intake structure.

The purpose of requesting an antidegradation review

The Massachusetts General permit authorizing non-contact cooling water facilities to release pollutants into surface water requires an additional condition for applicants seeking coverage under the 2024 NCCW GP. Specifically, any applicant seeking coverage under the 2024 NCCW GP to discharge to Outstanding Resource Waters as identified in 314 CMR 4.06 must submit a copy of the EPA NOI to MassDEP for review. Furthermore, Massachusetts Department of Environmental Protection (MassDEP) may request more information to conduct an antidegradation review.

In previous NPDES permitting of the Wachusett Aqueduct Pumping station, the MassDEP classified the Sudbury Reservoir, and the Wachusett Aqueduct Open Channel (Canal) as Class A waters, designated for Public Water Supply. However, the 2022 publication of 314 CMR 4.06 now designates the Sudbury Reservoir and MWRA open canal as Outstanding Resource Waters. Consequently, MWRA is submitting this NOI to MassDEP for review, along with a request for an antidegradation review for the discharge entering the Forebay and subsequently flowing into the Wachusett Aqueduct Open Canal and the Sudbury Reservoir. MWRA is providing the information requested by MassDEP to conduct this review to this application. Please refer to the attached letter to Xiaodan Ruan dated June 15, 2024, for further details.

MASSACHUSETTS WATER RESOURCES AUTHORITY
Deer Island
33 Tafts Avenue
Boston, MA 02128

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
TTY: (617) 788-4971

June 15, 2024

Xiaodan Ruan
Environmental Engineer
Massachusetts Department of Environmental Protection
100 Cambridge Street, suite 900, Boston, MA 02114

Re.: Non-contact cooling water General Permits (NCCW GP) – Information for conducting anti-degradation review
Wachusett Aqueduct Pumping Station Geothermal System
84 D'Angelo Drive
Marlborough, MA 01752

Dear Ms. Ruan:

MWRA is providing additional information for our Non-contact cooling water General Permits (NCCW GP) application submitted to the Massachusetts Department of Environmental Protection (MassDEP) for conducting an anti-degradation review.

1. *Describe how the discharge is for the express purpose and intent of maintaining or enhancing the resource for its designated use.*

   The MWRA supplies wholesale water to local water departments in 53 communities, primarily in the Boston metropolitan area. On average, MWRA supplies approximately 200 million gallons per day to its water system customers. MWRA's water comes from the Quabbin Reservoir, about 65 miles west of Boston, and the Wachusett Reservoir, about 35 miles west of Boston. Both Quabbin and Wachusett Reservoirs are man-made reservoirs, constructed for water supply purposes. On average, more than 50% of the inflow into the Wachusett Reservoir is transferred from Quabbin Reservoir via the Quabbin Aqueduct, a deep-rock tunnel that connects the Quabbin and Wachusett Reservoirs. Quabbin Reservoir water is required to meet MWRA's metropolitan demand. The Quabbin Aqueduct is one component of a transmission system consisting of over 100 miles of tunnels and aqueducts that transport water largely by gravity to points of distribution within the MWRA service area.

   The purpose of the Wachusett Aqueduct Pumping Station is to provide raw water supply to the Carroll Water Treatment Plant (CWTP) in the event of an unforeseen emergency or for scheduled maintenance on the Cosgrove Tunnel. The Pumping Station can deliver approximately 240 million gallons per day (MGD) of raw water to the CWTP for full treatment. The station is not operated close to its capacity for long periods but is maintained in a state of readiness. It is, however, subject to periodic maintenance to

ensure that the station components remain operational and reliable. The pump station also has operational modes that require distinct heating and cooling conditions due to the use of the facility.

During full operation of the station, any of the six of seven pumps are in operation, with the cooling system operating at its maximum capacity. As more pumps are operated, cooling requirements increase as the outside temperature increases. Full operation would only occur during an emergency or planned maintenance. Full operation entails up to 240 MGD of water, including the Wachusett Aqueduct Pumping Station non-contact cooling water, flowing through the Forebay and into the Wachusett Aqueduct Open Channel via the bypass conduit (Outfall 102) as the pumping station transitions from ready mode to full operation. Once the pumping station is pumping water to CWTP, flow through the Forebay will drop to a minimum of 10 MGD, which will exit the Forebay at Outfall 101.

During "Ready Mode" no pumps are operating, with the cooling system operating at a lower capacity. The station is operated in "Ready Mode" for the large majority of the time. With the station in "Ready Mode," there would typically be little or no flow in the Forebay.

The facility is equipped with a geothermal heating/cooling system, which is designed to lower the energy footprint of this emergency facility. This system is an open loop system using water from/to the Hultman Weir Forebay. The Forebay was an integral component of MWRA's active water transmission system before the construction of the Cosgrove Tunnel in the 1960s. The geothermal system takes advantage of the constant supply of water in the Forebay. Water is pumped from the Forebay through heat exchangers used to heat or cool the building. After passing through the system, the water is returned to the Forebay. The geothermal system continuously circulates 0.53 MGD under all operating and weather conditions. For purposes of NPDES permitting, MWRA has identified Outfall 101 as the point where water associated with the geothermal heating and cooling system leaves the Forebay at the Hultman Weir and enters the Canal.

2. *Are there less environmentally damaging alternative sites for the discharge, sources for disposal, or methods to eliminate the discharge that are reasonably available or feasible? Examples of what this demonstration may include are: an analysis of the reuse and conservation of discharge water, land application of discharge water or use of closed systems, improved process controls, improved discharge water treatment facility operation, discharge to sewer for treatment at wastewater treatment plant, alternative methods of treatment and treatment beyond applicable technology requirements of the Federal Clean Water Act. Technologically feasible alternatives must be compared with the potential environmental degradation.*

   The system is an open loop system using water from/to the Hultman Weir Forebay. The water taken from the Forebay for cooling/heating does not come into direct contact with any raw material, intermediate product, waste product (other than heat), or finished product. Discharge from the Wachusett Aqueduct pumping station has consistently met the Non-Contact Cooling Water Permit limits.

   During the design phase of the project, the use of a closed system was evaluated. It was concluded that the longer length of piping required increased the possibility of a leak and

maintenance issues. Additionally, the closed system would require the addition of chemicals to protect against low temperatures, which increased the possibility of a chemical release. Ground source loops were also evaluated as a potential of a heat sink/sources. Water or a mixture of water and antifreeze would circulate in vertical or horizontal closed piping loops and exchanges heat with the ground. However, the horizontal piping loops require large land areas, which are not available at this location. There is also no ability to discharge to a sanitary or storm sewer, as neither type of collection system is located at the site.

3. *To the maximum extent feasible, are the discharge and activity designed and conducted to minimize adverse impacts on water quality, including implementation of source reduction practices? All reasonable efforts to minimize the environmental impacts of the proposed discharge must be made.*

   As discussed in the response to Question 2, the system is an open loop system using water from/to the Hultman Weir Forebay. The water taken from the Forebay for cooling/heating does not come into direct contact with any raw material, intermediate product, waste product (other than heat) or finished product.

   Additionally, during construction, Stantec the project design engineer, performed calculations demonstrating the temperature impacts of the flow will be minor, and only in the worst case condition could there be the potential for a temperature change of 0.3 ˚F. Current calculations, demonstrated a temperature change of 0.38 to 0.71 ˚F. These are within the allowable temperature difference between the discharge location and background location of 1.5 ˚F per the current permit. Regardless of the calculated impacts, reporting and monitoring is a requirement per the NPDES permit.

4. *Will the discharge impair existing uses of the receiving water or result in a level of water quality less than that specified for the Class?*

   EPA and MassDEP authorized MWRA to discharge under the 2014 Non-Contact Cooling water permit, on June 8 2018 and the permit was administratively continued on November 12, 2019. Discharge from the facility's geothermal heating/cooling system enters the Forebay, which empties into the Wachusett Aqueduct Open Channel and eventually the Sudbury Reservoir. Contrasted with the Forebay, the Sudbury Reservoir and the Wachusett Aqueduct Open Channel (Canal) are classified by the MassDEP as Class A waters, and an Outstanding Resource water and designated as a Public Water Supply. The Sudbury Reservoir has impairments for Eurasian Water Milfoil Myriophyllum spicatum, Water Chestnut (TMDL not required), and Mercury in Fish Tissue.

   Under the 2014 Non-Contact Cooling water permit, MWRA received a waiver for in-stream water body temperature monitoring based on calculations outlined in attachment B of the general permit. These calculations, were also conducted for the 2023 permit, and are provided in Attachment D of the NOI application. The most recent calculations show a temperature change of 0.38 to 0.71 ˚F when the station and cooling water system operates at full capacity (0.6MGD). These values remain well within the permissible temperature deviation of 1.5 ˚F between the discharge point and background location.

However, required by the NPDES permit requirements, reporting and monitoring is mandatory. Since monitoring began in 2019, MWRA has consistently met the 2014 Non-Contact cooling water limits. The effluent water data collected at the facility from 2019 through 2024 are included in Attachment 1.

MWRA has a waiver from filtration for its Quabbin and Wachusett Reservoirs; these waivers attest to the excellent raw water quality that is maintained throughout the Quabbin and Wachusett reservoirs and MWRA's drinking water supply system, including the Wachusett Aqueduct Pumping Station.

The Sudbury Reservoir is an emergency backup water supply for over two million residents of Eastern Massachusetts. The Sudbury Reservoir is located in Southborough and Marlborough. Although not currently in use, the reservoir is on standby status and could be activated in the event of an emergency.

The lands that drain into the Sudbury Reservoir watersheds are protected. MWRA and the Massachusetts Department of Conservation and Recreation (DCR) work together to protect MWRA's reservoirs and watersheds. MWRA manages and protects the water within the reservoirs, while the DCR manages and protects the surrounding watersheds. The reservoir and the protected open space provide passive recreation opportunities, and a Public Access Plan was developed for the Sudbury and Foss Reservoirs Watershed.

If you have any additional questions, please contact David Wu at David.Wu@MWRA.com.

Sincerely,

Rebecca Weidman
Deputy Chief Operating Officer

Attachment 1 Influent, Effluent, and Receiving Water Data, 2019 – 2024

Cc: George Papadopoulos, EPA

Effluent and Background Water Data
January 2019- May 2024
Wachusett Aqueduct Pumping Station

Date Range: 01/01/2019 through 11/18/2021						
	Outfall 101		Outfall 102		Background (Forebay)	
	PH (SU)	TEMP (^{0}F)	PH (SU)	TEMP (0 F)	PH (SU)	TEMP (0 F)
1/1/2019			7.00	36.0		36
7/1/2019	7.01	71.2			6.91	37.2
8/1/2019	7.00	70.0			6.97	43
3/24/2020	7.42	43.5			6.82	40.3
3/26/2020	7.55	45.5	7.18	42.8	7.17	69.8
6/10/2020			7.36	55.9	7	72.7
6/18/2020	6.94	62.2			7.37	79.3
6/25/2020	6.96	63.9	7.05	72.3	6.87	50.5
3/23/2021	7.17	50.9			7.04	52.5
3/31/2021	7.30	53.2			7.21	56.7
4/9/2021	7.36	52.5	7.59	53.6		49.8
4/16/2021	7.54	47.8				48.7
4/23/2021	7.03	46.8	7.75	49.8	7.05	56.5
5/20/2021	7.07	56.3			7.39	71.8
5/26/2021	7.07	68.7				65.7
6/3/2021	6.93	62.6				76.6
6/10/2021	6.94	72.1				68.2
6/17/2021	7.07	65.7				79.2
6/22/2021	7.10	71.8			7.08	82.9
6/29/2021	7.10	77.5			6.74	70.9
7/8/2021	7.27	70.7			6.65	67.8
7/15/2021	7.08	68.9			6.74	65.7
7/22/2021	6.92	65.8				71.1
7/28/2021	7.52	71.4				69.8
8/6/2021	7.38	70.2				80.1
8/11/2021	7.39	76.8				75.6
8/19/2021	7.70	74.7			6.69	76.6
8/25/2021	6.99	73.6				72.7
9/1/2021	7.33	70.9				69.3
9/10/2021	7.42	68.7			6.69	68.4
9/16/2021	7.49	70.5			6.78	66.4
9/22/2021	7.32	67.5			6.94	60.8
10/1/2021	7.24	61.5			6.64	61.5
10/8/2021	7.38	63.9			6.9	63.5
10/14/2021	7.29	65.5			7.09	61.7
10/21/2021	7.45	62.6			6.77	52.2
10/28/2021	7.31	55.2			6.83	48.2
11/4/2021	7.32	52.9			6.8	50.4
11/12/2021	7.35	51.6				
11/18/2021	7.33	52.0				46.6

Date Range: 11/22/2021 through 10/06/2022						
	Outfall 101		Outfall 102		Background (Forebay)	
	PH (SU)	TEMP (^{0}F)	PH (SU)	TEMP (0 F)	PH (SU)	TEMP (0 F)
11/22/2021	7.77	49.1			7.04	38.5
12/1/2021	7.42	42.4			7	39.7
12/10/2021	7.36	39.9			6.98	39.2
12/15/2021	7.98	41.2	7.91	40.8		33.6
1/19/2022	7.28	36.9			6.53	36
1/28/2022	6.97	38.8				34.7
2/2/2022	7.27	39.7				
2/9/2022	7.24	39.4				
2/15/2022	7.28	37.4				
2/23/2022	7.29	42.1				
3/2/2022	7.23	40.3				
3/10/2022	7.56	44.4				
3/15/2022	7.60	44.1				
3/21/2022	7.33	49.1				
3/30/2022	7.28	42.1				
4/7/2022	7.39	49.1				
4/12/2022	7.28	51.4				
4/20/2022	7.50	50.0				
4/27/2022	7.52	53.2				
5/5/2022	7.40	53.8				
5/12/2022	7.46	59.2				
5/17/2022	7.37	67.1				
5/25/2022	7.42	67.5				
6/2/2022	7.37	65.8				
6/10/2022	7.26	67.3				
6/15/2022	7.38	70.3				
6/22/2022	7.43	66.6				
7/1/2022	7.42	71.6				
7/6/2022	7.19	70.9				
7/12/2022	7.19	73.2			7.29	80.4
7/19/2022	7.41	75.7			7.39	80.8
7/27/2022	8.05	77.2			7.55	82.9
8/3/2022	7.27	76.5				82
8/10/2022	7.20	76.5			7.22	75.9
8/17/2022	7.36	72.1			7.32	75
8/23/2022	7.25	71.4			7.24	79.9
8/31/2022	7.24	75.4			6.74	66.9
9/9/2022	7.08	65.5			6.89	68.2
9/16/2022	7.30	65.5				
9/21/2022	7.23	65.1				
9/28/2022	7.14	62.6				
10/6/2022	7.21	59.4				

Date Range: 10/12/2022 through 07/17/2023						
	Outfall 101		Outfall 102		Background (Forebay)	
	PH (SU)	TEMP (^{0} F)	PH (SU)	TEMP (0 F)	PH (SU)	TEMP (0 F)
10/12/2022	7.36	58.8				
10/20/2022	7.15	55.0				
10/26/2022	7.15	58.6				
11/3/2022	7.19	54.9				
11/9/2022	7.32	54.5				
11/18/2022	7.32	46.8				
11/22/2022	7.34	42.6				
11/30/2022	7.41	44.8				
12/7/2022	7.79	46.2				
12/14/2022	7.36	38.5				
12/21/2022	7.31	38.1				
12/30/2022	7.33	41.0				
1/6/2023	7.33	41.5				
1/12/2023	7.37	39.0				
1/19/2023	7.40	41.0				
1/27/2023	7.38	38.3				
2/2/2023	7.42	39.9				
2/8/2023	7.21	39.0				
2/10/2023	7.44	39.9				
2/16/2023	7.32	45.1				
2/22/2023	7.37	42.3				
2/27/2023	7.26	40.3				
3/7/2023	7.19	41.2				
3/15/2023	6.87	42.6				
3/22/2023	7.17	47.7				
3/30/2023	7.48	45.5				
4/5/2023	7.46	49.5				
4/10/2023	7.24	53.6				
4/18/2023	7.41	57.0				
4/24/2023	7.30	53.6				
5/1/2023	7.41	55.2				
5/8/2023	7.23	61.9				
5/15/2023	7.42	62.4				
5/23/2023	7.47	61.5				
5/30/2023	7.61	65.5				
6/7/2023	7.45	63.7				
6/12/2023	6.88	61.2				
6/22/2023	7.21	65.8			7.07	75.9
6/27/2023	7.10	70.9			6.7	70.2
7/5/2023	6.96	70.7			6.7	67.8
7/12/2023	6.92	61.7			6.71	69.3
7/17/2023	7.16	67.1			6.91	65.5

Date Range: 07/24/2023 through 05/01/2024						
	Outfall 101		Outfall 102		Background (Forebay)	
	PH (SU)	TEMP (^{0}F)	PH (SU)	TEMP (0 F)	PH (SU)	TEMP (0 F)
7/24/2023	6.96	63.1				66.4
7/31/2023	7.01	66.6				64.4
8/7/2023	6.94	64.9			6.75	66.2
8/14/2023	6.82	64.2			6.9	63.3
8/23/2023	7.29	66.7				61.9
9/1/2023	6.75	63.3				65.8
9/5/2023	6.65	64.8			6.77	70.9
9/12/2023	7.49	73.4			6.7	60.4
9/22/2023	6.98	63.5			6.75	56.5
9/27/2023	7.15	59.5			6.77	59.4
10/3/2023	7.20	61.3				
10/13/2023	7.58	59.5				
10/18/2023	6.98	58.3				
10/25/2023	7.17	57.6				
11/1/2023	7.65	54.5				
11/8/2023	7.34	52.2				
11/15/2023	7.29	48.0				
11/21/2023	7	48.7				
11/28/2023	7.2	46.2				
12/5/2023	7.1	44.4				
12/13/2023	7.12	43				
12/20/2023	7.48	42.4				
12/27/2023	7.21	43.9				
1/4/2024	7.28	42.3				
1/11/2024	7.16	39.6				
1/19/2024	7.04	38.1				
1/24/2024	7.01	37.4				
2/2/2024	7.19	38.7			6.98	36.7
2/2/2024						
2/5/2024	7.18	38.3			6.95	35.4
2/5/2024						
2/16/2024	7.53	36.5				
2/22/2024	7.12	36.7				
2/27/2024	7.09	39.4				
4/5/2024	7.12	41.7				
4/10/2024	7.36	50.9				
4/17/2024	7.46	51.8				
4/24/2024	7.67	52.5				
4/29/2024	7.12	53.8				
5/1/2024	7.28	51.1				

	Outfall(101) PH	Outfall(102) PH	Background PH
Max	8.05	7.91	7.55
Min	6.65	7.00	6.53

	Outfall(101) TEMP	Outfall(102) TEMP	Background TEMP	Δ T (101)	Δ T (102)
Max	77.5	72.3	82.9	-5.4	-10.6
Min	36.5	36.0	33.6	2.9	2.4
Avg	55.7	50.2	62.1	**-6.4**	**-11.9**