#### LOW IMPACT HYDROPOWER INSTITUTE RECERTIFICATION APPLICATION

Benton Falls Hydroelectric Project (FERC No. 5073, LIHI No. 79)



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JULY 2021

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#### PART I. FACILITY DESCRIPTION

The Benton Falls hydroelectric project (FERC No. 5073) ("Benton Project" or "Project") was first certified by the Low Impact Hydro Institute in November 2010 and was recertified in 2015 to expire in 2020 but a 1-year extension was granted to October 31, 2021. Benton Falls Associates (BFA) submits this application to recertify the Project.

There have been no significant operations changes or significant equipment upgrades since the last recertification in 2015.

The Benton Project in located in the Town of Benton Maine on the Sebasticook River which is a tributary to the Kennebec River. The project is located 5.3 miles upstream of the confluence with the Kennebec River. This facility includes two turbines that together have a peak generation capacity of 4.468 MW.

Figure 1. Map showing location of Benton Falls









Figure 3. Zones of effect

| Item          | Information Requested  | Response (include references to    |  |  |  |
|---------------|--|------------------------------------|--|--|--|
|               |  | further details)                   |  |  |  |
| Name of the   | Facility name (use FERC project name                               | Benton Falls Hydroelectric Project |  |  |  |
| Facility      | or other legal name)   |                                    |  |  |  |
| Reason for    | 1. To participate in state RPS program                             | MA II RPS Program, 100%            |  |  |  |
| applying for  | 2. and specify the state and the total                             |                                    |  |  |  |
| LIHI          | MW/MWh associated with that  |                                    |  |  |  |
| Certification | participation (value and % of facility                             |                                    |  |  |  |
|               | total Mw/MWh).   |                                    |  |  |  |
|               | 3. To participate in voluntary REC                                 |                                    |  |  |  |
|               | market (e.g. <i>,</i> Green-e)                                     |                                    |  |  |  |
|               | 4. To satisfy a direct energy buyer's                              |                                    |  |  |  |
|               | purchasing requirement   |                                    |  |  |  |
|               | 5. To satisfy the facility's own                                   |                                    |  |  |  |
|               | corporate sustainability goals                                     |                                    |  |  |  |
|               | 6. For the facility's corporate                                    |                                    |  |  |  |
|               | marketing purposes   |                                    |  |  |  |
|               | 7. Other (describe)  |                                    |  |  |  |
|               | If applicable, amount of annual                                    | 14,963 MWh, 100%                   |  |  |  |
|               | generation (MWh and % of total                                     |                                    |  |  |  |
|               | generation) for which RECs are                                     |                                    |  |  |  |
|               | currently received or are expected to                              |                                    |  |  |  |
|               | be received upon LIHI Certification                                |                                    |  |  |  |
| Location      | on         River name (USGS proper name)         Sebasticook River |                                    |  |  |  |
|               | Watershed name - Select region, click                              | Lower Kennebec                     |  |  |  |
|               | on the area of interest until the 8-digit                          | HUC 08: 0103000310                 |  |  |  |
|               | HUC number appears. Then identify                                  |                                    |  |  |  |
|               | watershed name and HUC-8 number                                    |                                    |  |  |  |
|               | from the map at:   |                                    |  |  |  |
|               | https://water.usgs.gov/wsc/map_inde                                |                                    |  |  |  |
|               | <u>x.html</u>  |                                    |  |  |  |
|               | Nearest town(s), <u>county(ies)</u> , and Benton, Kennebec, ME     |                                    |  |  |  |
|               | state(s) to dam  |                                    |  |  |  |
|               | River mile of dam above mouth                                      | 5.3                                |  |  |  |
|               | Geographic latitude of dam   | 44.580176                          |  |  |  |
|               | Geographic longitude of dam  | -69.554631                         |  |  |  |
| Facility      | Application contact names (Complete                                | Andrew Locke or Madeleine Mineau,  |  |  |  |
| Owner         | the Contact Form in <u>Section B-4</u> also):                      | Essex Power Services, Inc.         |  |  |  |

## **Table 1 Facility Description Information**

| ltem        | Information Requested                     | Response (include references to further details)  |
|-------------|---|---|
|             | Facility owner company and authorized     | Benton Falls Hydro Associates,                    |
|             | owner representative name.                | Andrew Locke                                      |
|             | For recertifications: If ownership has    |   |
|             | changed since last certification,         |   |
|             | provide the effective date of the         |   |
|             | change.                                   |   |
|             | FERC licensee company name (if            | n/a   |
|             | different from owner)                     |   |
| Regulatory  | FERC Project Number (e.g., P-xxxxx),      | FERC Project No. P-5073                           |
| Status      | issuance and expiration dates, or date    | Issued March 8 <sup>th</sup> 1984, Expires        |
|             | of exemption                              | 2/28/2034   |
|             | FERC license type (major, minor,          | Major   |
|             | exemption) or special classification      |   |
|             | (e.g., "qualified conduit", "non-         |   |
|             | Jurisdictional")                          |   |
|             | Water Quality Certificate identifier,     | Issued September 29 <sup>th</sup> , 1983 by State |
|             | issuance date, and issuing agency         | of Maine Department of                            |
|             | name. Include information on              | Environmental Protection                          |
|             | amendments.                               | FERC Licenses                                     |
|             | FERC a library website or other publicly  | FERC LICENSE:                                     |
|             | accossible data repositorios              | https://olibrary.forc.gov/olibrary/doci           |
|             |   | nfo?document_id=473836                            |
| Powerhouse  | Date of initial operation (past or future | 1984  |
| , encinease | for pre-operational applications)         | 1001  |
|             |   |   |
|             | Total installed capacity (MW)             | 4.33 MW – No change since last                    |
|             | For recertifications: Indicate if         | certification                                     |
|             | installed capacity has changed since      |   |
|             | last certification                        |   |
|             | Average annual generation (MWh) and       | 14,963 MWh 1994-2020                              |
|             | period of record used                     |   |
|             | For recertifications: Indicate if average |   |
|             | annual generation has changed since       |   |
| <u> </u>    | Mode of energian (run of river            | Pup of rivor                                      |
|             | neaking pulsing sossonal storage          |   |
|             | diversion etc.)                           |   |
|             | For recertifications: Indicate if mode    |   |
|             | of operation has changed since last       |   |
|             | certification                             |   |

| Item      | Information Requested                   | Response (include references to further details) |  |  |
|-----------|---|--|--|--|
|           | Number, type, and size of               | Two horizontal kpalan turbines, rated            |  |  |
|           | turbine/generators, including           | total 4.468 MW (3.718MW+0.750MW)                 |  |  |
|           | maximum and minimum hydraulic           | 4.16 kV Generator                                |  |  |
|           | capacity and maximum and minimum        | Total max hydraulic capacity 2,115 cfs           |  |  |
|           | output of each turbine and generator    | and Min 50 cfs                                   |  |  |
|           | unit                                    | Max output 4.468 MW                              |  |  |
|           |   | Min Output 75kW                                  |  |  |
|           | Trashrack clear spacing (inches) for    | Unit 1: 3 inch with a seasonal overlay of        |  |  |
|           | each trashrack                          | 1 inch spacing used Sept 1 to Nov 30.            |  |  |
|           |   | Unit 2: 1 inch                                   |  |  |
|           | Approach water velocity (ft/s) at each  | Unknown  |  |  |
|           | intake if known                         |  |  |  |
|           | Dates and types of major equipment      | N/A no significant upgrades, repairs             |  |  |
|           | upgrades                                | only since last certification                    |  |  |
|           | those since last cortification          |  |  |  |
|           | Dates nurpose and type of any recent    | None since last certification                    |  |  |
|           | operational changes                     | None since last certification                    |  |  |
|           | For recertifications: Indicate only     |  |  |  |
|           | those since last certification          |  |  |  |
|           | Plans, authorization, and regulatory    | N/A  |  |  |
|           | activities for any facility upgrades or |  |  |  |
|           | license or exemption amendments         |  |  |  |
| Dam or    | Date of original dam or diversion       | The current dam was completed in                 |  |  |
| Diversion | construction and description and dates  | 1984. It is on the same site as a                |  |  |
|           | of subsequent dam or diversion          | previous dam that was destroyed by               |  |  |
|           | structure modifications                 | flooding in 1936. It is unknown to us            |  |  |
|           |   | when that previous dam was built.                |  |  |
|           | Dam or diversion structure length,      | 500-foot long, 27-foot high concrete             |  |  |
|           | height including separately the height  | gravity dam with a 300-100t long integral        |  |  |
|           | of any flashboards, inflatable dams,    | high flashboards                                 |  |  |
|           | flashboards and the like                | 5  |  |  |
|           | Spillway maximum bydraulic capacity     | Linknown   |  |  |
|           |   |  |  |  |
|           | Length and type of each penstock and    | 11/a   |  |  |
|           | the impoundment and new rhouse          |  |  |  |
|           | Designated facility purposes (o.g.      | Power supply                                     |  |  |
|           | nower navigation flood control water    | i owei suppiy                                    |  |  |
|           | supply, etc.)                           |  |  |  |

| Item                             | Information Requested   | Response (include references to further details)  |  |  |  |
|----------------------------------|---|---|--|--|--|
| Conduit<br>Facilities<br>Only    | Date of conduit construction and primary purpose of conduit   | n/a   |  |  |  |
|                                  | Source water  | n/a   |  |  |  |
|                                  | Receiving water and location of discharge   | n/a   |  |  |  |
| Impoundme<br>nt and<br>Watershed | Authorized maximum and minimum<br>impoundment water surface<br>elevations<br>For recertifications: Indicate if these<br>values have changed since last<br>certification                   | horized maximum and minimum Normal pond elevation is maintained<br>ooundment water surface at 85 ft<br>vations No change<br>recertifications: Indicate if these<br>ues have changed since last<br>tification  |  |  |  |
|                                  | Normal operating elevations and<br>normal fluctuation range<br>For recertifications: Indicate if these<br>values have changed since last<br>certification                                 | Normal pond elevation is maintained<br>at 85 ft<br>Operated as instantaneous run-of-river<br>No change  |  |  |  |
|                                  | Gross storage volume and surface area<br>at full pool<br>For recertifications: Indicate if these<br>values have changed since last<br>certification                                       | Gross storage volume: 953 acre feet<br>Surface Area: 83 acres<br>No change  |  |  |  |
|                                  | Usable storage volume and surface<br>area<br>For recertifications: Indicate if these<br>values have changed since last<br>certification   | None, operated as instantaneous run-<br>of-river but original license stated that<br>the usable storage volume was 310<br>acre feet   |  |  |  |
|                                  | Describe requirements related to<br>impoundment inflow and outflow,<br>elevation restrictions (e.g., fluctuation<br>limits, seasonality) up/down ramping<br>and refill rate restrictions. | According to 1988 license amendment<br>the Benton project is operated in<br>instantaneous run-of-river mode<br>where project so that outflow at the<br>project approximately equals inflow to<br>the reservoir and any fluctuations of<br>the reservoir surface elevation are<br>minimized. |  |  |  |

| ltem                  | Information Requested  | Response (include references to further details)  |
|-----------------------|--|---|
|                       | Upstream dams by name, ownership<br>and river mile. If FERC licensed or<br>exempt, please provide FERC Project<br>number of these dams. Indicate which<br>upstream dams have downstream fish<br>passage. | <ul> <li>The upstream dam on the<br/>Sebasticook is the Burnham dam in<br/>Pittsfield, ME located<br/>approximately 16.5 miles upstream<br/>of Benton Falls. The Burnham<br/>project has both upstream and<br/>downstream fish passage and is<br/>owned by KEI Power management<br/>(FERC No. 11472).</li> </ul>  |
|                       | Downstream dams by name,<br>ownership, river mile and FERC<br>number if FERC licensed or exempt.<br>Indicate which downstream dams have<br>upstream fish passage   | <ul> <li>There are no dams located<br/>downstream of Benton falls on the<br/>Sebsticook River or the Kennebec<br/>River.</li> </ul>   |
|                       | Operating agreements with upstream<br>or downstream facilities that affect<br>water availability and facility operation  | N/A   |
|                       | Area of land (acres) and area of water<br>(acres) inside FERC project boundary or<br>under facility control. Indicate<br>locations and acres of flowage rights<br>versus fee-owned property.             | 27 acres of land (according to original<br>license application)<br>Approximately 84 acres of water  |
| Hydrologic<br>Setting | Average annual flow at the dam, and period of record used  | 1,102 cfs<br>1930-2013 from nearest upstream<br>(now discontinued) USGS gage located<br>in Pittsfield ME 01049000   |
|                       | Average monthly flows and period of record used  | January         717           February         662           March         1,360           April         3,300           May         1,410           June         687           July         363           August         277           September         438           October         566           November         974           December         1,080           Based on 1929-2013 record at USGS |

| Item          | Information Requested                      | Response (include references to      |  |  |
|---------------|--|--------------------------------------|--|--|
|               | Location and name of closest stream        | <i>Jurther details)</i>              |  |  |
|               | gaging stations above and below the        | on the Sebasticook in Pittsfield MF  |  |  |
|               | facility                                   | (01049000) but was discontinued in   |  |  |
|               | (actively)                                 | 2013. There is no gaging station     |  |  |
|               |  | downstream on the Sebasticook, the   |  |  |
|               |  | nearest downstream gaging station is |  |  |
|               |  | on the Kennebec River in N. Sydney   |  |  |
|               |  | (01049265).                          |  |  |
|               | Watershed area at the dam (in square       | 860 sq. miles                        |  |  |
|               | miles). Identify if this value is prorated |                                      |  |  |
|               | from gage locations and provide the        |                                      |  |  |
|               | basis for proration calculation.           |                                      |  |  |
|               | Other facility specific hydrologic         | n/a                                  |  |  |
|               | information                                |                                      |  |  |
| Designated    | Number of zones of effect                  | 3                                    |  |  |
| Zones of      | Type of waterbody (river,                  | Zone 1 – Impoundment                 |  |  |
| Effect        | impoundment, bypassed reach, etc.)         | Zone 2 – Tail race                   |  |  |
|               | Upstream and downstream locations          | Zone 1: KM 6.6 – KM 5.3              |  |  |
|               | by river miles                             | Zone 2: Rivi 5.3 - Rivi 5.2          |  |  |
|               | Delimiting structures or features          | Dam, bypass reach, tailrace below    |  |  |
| Pre-Operation | al Facilities Only                         | power nouse                          |  |  |
| Expected      | Date generation is expected to begin       | n/a                                  |  |  |
| operational   | Date generation is expected to begin       | 17 a                                 |  |  |
| date          |  |                                      |  |  |
| Dam.          | Description of modifications made to a     | n/a                                  |  |  |
| diversion     | pre-existing conduit, dam or diversion     |                                      |  |  |
| structure or  | structure needed to accommodate            |                                      |  |  |
| conduit       | facility generation. This includes         |                                      |  |  |
| modification  | installation of flashboards or raising     |                                      |  |  |
|               | the flashboard height.                     |                                      |  |  |
|               | Date the modification is expected to be    |                                      |  |  |
|               | completed                                  |                                      |  |  |
| Change in     | Description of any change in               | n/a                                  |  |  |
| water flow    | impoundment levels, water flows or         |                                      |  |  |
| regime        | operations required for new                |                                      |  |  |
|               | generation                                 |                                      |  |  |

#### PART II. STANDARDS MATRICES

#### Zone of Effects #1 – Impoundment

|     |  | Alte | rnative | Standar | ds App | lied |
|-----|--|------|---------|---------|--------|------|
|     | Criterion                                    | 1    | 2       | 3       | 4      | Plus |
| Α   | Ecological Flow Regimes                      |      | x       |         |        |      |
| В   | Water Quality                                |      | x       |         |        |      |
| С   | Upstream Fish Passage                        | x    |         |         |        |      |
| D   | Downstream Fish Passage                      |      | x       |         |        |      |
| Ε   | Watershed and Shoreline Protection           | x    |         |         |        |      |
| F   | Threatened and Endangered Species Protection |      | x       |         |        |      |
| G   | Cultural and Historic Resources Protection   |      | x       |         |        |      |
| Н   | Recreational Resources                       |      | x       |         |        |      |
| Zon | Zone of Effects #2 – Dam/Tailrace            |      |         |         |        |      |
|     | Alternative Standards Applied                |      |         | lied    |        |      |
|     | Criterion                                    | 1    | 2       | 3       | 4      | Plus |
| Α   | Ecological Flow Regimes                      |      | x       |         |        |      |
| В   | Water Quality                                |      | x       |         |        |      |
| С   | Upstream Fish Passage                        |      | x       |         |        |      |
| D   | D Downstream Fish Passage                    |      |         |         |        |      |
| Ε   | Watershed and Shoreline Protection           |      |         |         |        |      |
| F   | Threatened and Endangered Species Protection |      | x       |         |        |      |
| G   | G Cultural and Historic Resources Protection |      | x       |         |        |      |
| Н   | Recreational Resources                       |      | x       |         |        |      |

#### PART III. SUPPORTING INFORMATION

III.A.1 Ecological Flows

Criterion A.2 – Agency Recommendation was selected for all three zones.

## Zone of Effects #1 – Impoundment

| А | 2 | Agency Recommendation (see Appendix A for definitions):                    |  |  |
|---|---|--|--|--|
|   |   | • Identify the proceeding and source, date, and specifics of the agency    |  |  |
|   |   | ecommendation applied (NOTE: there may be more than one; identify          |  |  |
|   |   | and explain which is most environmentally protective).                     |  |  |
|   |   | • Explain the scientific or technical basis for the agency recommendation, |  |  |
|   |   | including methods and data used. This is required regardless of whether    |  |  |
|   |   | the recommendation is or is not part of a Settlement Agreement.            |  |  |
|   |   | • Explain how the recommendation relates to formal agency                  |  |  |
|   |   | management goals and objectives for fish and wildlife.                     |  |  |
|   |   | • Explain how the recommendation provides fish and wildlife protection,    |  |  |

| mitigation and enhancement (including in-stream flows, ramping and |
|--|
| peaking rate conditions, and seasonal and episodic instream flow   |
| variations).   |
| • Explain how flows are monitored for compliance.                  |

#### Supporting Information:

In accordance with the 1988 license amendment (Appendix 2), the Benton Falls project is operated in run-of-river mode. The project is operated in a manner to minimize fluctuations of the surface elevation of the impoundment and discharge from the project approximates the inflow to the reservoir. The license amendment agreed that operating the project in run-of-river mode would protect fish and wildlife resources. Water surface elevation of the impoundment is monitored using pressure transducer. The license amendment also states that the change to run-of-river operations precludes the need for minimum flow requirement.

#### Zone of Effects #2 – Dam/tailrace

See Supporting Information in Zone of Effects #1 in Ecological Flows section above.

#### III.B.1 Water Quality

#### Zone of Effects #1 - Impoundment

| В | 2 | Agency Recommendation:  |
|---|---|---|
|   |   | • Provide a copy of the most recent Water Quality Certificate and any           |
|   |   | subsequent amendments, including the date(s) of issuance. If more than          |
|   |   | 10 years old, provide documentation that the certification terms and            |
|   |   | conditions remain valid and in effect for the facility (e.g., a letter from the |
|   |   | agency).  |
|   |   | • Identify any other agency recommendations related to water quality            |
|   |   | and explain their scientific or technical basis.                                |
|   |   | • Describe all compliance activities related to water quality and any           |
|   |   | agency recommendations for the facility, including on-going monitoring,         |
|   |   | and how those are integrated into facility operations.                          |

#### **Supporting Information:**

In 1983 the Maine Department of Environmental Protection (DEP) issued a 401-water quality certificate (Appendix 3) with a finding that the Benton Falls project did not negatively impact water quality. The 401 water quality certificate was amended in 2005 to update fish passage requirement (see Appendix 4).

As part of LIHI recertification in 2015, a condition to recertification was added requiring that the Benton Falls project conduct water quality sampling in consultation with Maine DEP to verify that the project does not cause or contribute to violations of Maine water quality standards. BFA hired a consultant ("TRC") to implement the MEDEP-approved water quality sampling plan that sought to evaluate the role of Benton falls dam and impoundment in the nonattainment status of the Sebasticook River. This testing included both upstream and downstream monitoring of dissolved

oxygen concentrations using data sondes deployed during 7Q10 low flow conditions. Additionally, biweekly vertical profile sampling and grab samples were collected from June through October 2016. MEDEP was consulted regularly for input regarding sampling locations and frequencies. TRC has completed their report summarizing the results of testing (see Appendix 5), and their report includes a description of other point-source discharges in the vicinity of the facility to provide context for the facility's potential effects. TRC concluded that the Benton Falls dam is not causing or contributing to state water quality standards. However, MDEP was not satisfied with the data trends recorded by the downstream sonde and the way the instrument was calibrated during deployment.

In 2017, BFA staff received approval from MDEP to perform a truncated version of the previous sampling effort to provide additional context for MDEP's evaluation. In July and August, BFA staff performed monitoring of DO and temperature in the impoundment, tailrace and upstream of the impoundment. This data was submitted to MDEP and in September 2017, MDEP provided a statement as follows:

"...the impoundment did not stratify thermally during either generation or nongeneration, and that dissolved oxygen levels met the Class C water quality criteria, as applies to the Sebasticook River at Benton Falls. The trophic state monitoring in 2016 showed no Secchi disk transparencies or chlorophyll-a concentrations that indicated an algal bloom which would constitute non-attainment of the designated use of "recreation in and on the water" in the Class C standards. Based on these monitoring results, the Department finds that the project does not cause or contribute to non-attainment of the State's water quality standards"

Therefore the requirements of the LIHI recertification water quality condition were satisfied and continues to meet the agency recommendations in regards to water quality.

### Zone of Effects #2 – Dam/tailrace

See Supporting Information in Zone of Effects #1 in Ecological Flows section above.

| Zone of Effects #1 - Impoundment |   |   |  |  |
|----------------------------------|---|---|--|--|
| С                                | 1 | Not Applicable / De Minimis Effect:   |  |  |
|                                  |   | • Explain why the facility does not impose a barrier to upstream fish passage in the designated zone. |  |  |
|                                  |   | • Document available fish distribution data and the lack of migratory fish species in the vicinity.   |  |  |

### III.C.1 Upstream Fish Passage

|  | If migratory fish species have been extirpated from the area, explain |
|--|---|
|  | why the facility is or was not the cause of this.                     |

#### **Supporting Information:**

N/A – No facility barrier exists above the project's dam to further upstream movement.

#### Zone of Effects #2 – Dam/Tail Race

| С | 2 | Agency Recommendation:   |
|---|---|--|
|   |   | Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent).<br>Explain the scientific or technical basis for the agency recommendation, |
|   |   | including methods and data used. This is required regardless of<br>whether the recommendation is or is not part of a Settlement<br>Agreement.  |
|   |   | Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.   |

#### **Supporting Information:**

The Benton project operates a fish lift and eel ladder for upstream fish passage and submits annual fish passage reports and operating plan for agency review in accordance with its FERC license, water quality certification and the 1998 KHDG agreement. The most recent report for the 2020 fish passage season and proposed 2021 operating plan is included with this application in Appendix 6.

In 2020, the fish lift was in operation from May 7<sup>th</sup> to June 30<sup>th</sup> and passed 2,847,171 river herring and 10 shad. No Atlantic salmon were observed passing the fish lift last year. 1,304 American eels were counted using the upstream eel ladder.

#### III.D.1 Downstream Fish Passage

#### ZoE #1 - Impoundment

| D | 2 | Agency Recommendation:  |
|---|---|---|
|   |   | <ul> <li>Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally protective).</li> <li>Explain the scientific or technical basis for the agency recommendation, including method and data used. This is required regardless of whether the recommendation is part of a Settlement Agreement or not.</li> <li>Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation and</li> </ul> |
|   |   | how these are being implemented.  |

#### **Supporting Information:**

The downstream fish passage facility at Benton is designed to pass all species and consists of a surface bypass system (two 3-foot wide intakes leading to transition chamber and then a 24 inch bypass pipe with a total capacity of 30 cfs that discharges to the project tailrace of the project's smaller turbine).

Downstream eel passage is available through the downstream fish passage, over the spillway or through any of the project's gates. A hinged overlay is installed over the intake for Unit #1 by September 1 and is raised for storage on December 1. The overlay is made of grating bars with one inch clear spacing. Unit #2 has permanent trash racks with one inch clear spacing.

A successful downstream effectiveness test was conducted for Alewife as part of the fish facility commissioning. Due to low numbers being observed at the project, with agreement from agency staff, effectiveness testing has not been conducted and is not planned at this time for American Shad or Atlantic salmon. During the 2021 downstream eel migration season (September-October), Benton staff will collaborate with Maine MDMR to monitor the movement of eels as they approach the dam. A DIDSON sonar above the downstream surface passage and will be operated nightly to record eel movement through the downstream surface passage and identify if eels are passing through or become impinged on the trash racks. Based on the outcome of these observations, we will determine along with agency staff if further downstream eel passage effectiveness testing is needed or if any modifications to our downstream eel passage operations should be considered. See most recent 2020 fish passage report and 2021 operating plan for more detail in appendix 6.

| D | 1 | Not Applicable / De Minimis Effect:   |
|---|---|---|
|   |   | • Explain why the facility does not impose a barrier to downstream                      |
|   |   | fish passage in the designated zone, considering both physical                          |
|   |   | obstruction and increased mortality relative to natural downstream                      |
|   |   | movement (e.g., entrainment into hydropower turbines).                                  |
|   |   | • For riverine fish populations that are known to move downstream,                      |
|   |   | explain why the facility does not contribute adversely to the                           |
|   |   | sustainability of these populations or to their access to habitat                       |
|   |   | necessary for successful completion of their life cycles.                               |
|   |   | <ul> <li>Document available fish distribution data and the lack of migratory</li> </ul> |
|   |   | fish species in the vicinity.   |
|   |   | • If migratory fish species have been extirpated from the area, explain                 |
|   |   | why the facility is or was not the cause of this.                                       |

### Zone of Effects #2 – Tailrace

### Supporting Information:

There is no facility barrier to further downstream movement below the dam and powerhouse.

## III.E.1 Watershed and Shoreline Protection

| Zone o | of Effect #1 | - Impoundment   |
|--------|--------------|---|
| E      | 1            | Not Applicable / De Minimis Effect:   |
|        |              | • If there are no lands with significant ecological value associated with the     |
|        |              | facility, document and justify this (e.g., describe the land use and land cover   |
|        |              | within the FERC project or facility boundary, and absence of critical habitat for |
|        |              | protected species).   |
|        |              | Document that there have been no Shoreline Management Plans or similar            |
|        |              | protection requirements for the facility.   |

#### **Supporting Information:**

The license for the Benton project includes no watershed or shoreline protection requirement. Landuse surrounding the project area includes agricultural and residential with limited small commercial uses. Operating the project as run-of-river limits any impact of project operations on the impoundment shoreline and no shoreline erosion was documented during long term monitoring of archeological sites (see Appendix 8).

#### Zone of Effect #2 – Dam and tailrace

| E | 1 | Not Applicable / De Minimis Effect:   |
|---|---|---|
|   |   | <ul> <li>If there are no lands with significant ecological value associated with the facility, document and justify this (e.g., describe the land use and land cover within the FERC project or facility boundary, and absence of critical habitat for protected species).</li> <li>Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.</li> </ul> |

Supporting Information: see same as above for zone #1

#### III.F.1 Threatened and Endangered Species

#### Zone of Effects #1 –Impoundment

| F | 2 | Finding of No Negative Effects:   |
|---|---|---|
|   |   | <ul> <li>Identify all federal and state listed species that are or may be in the immediate facility area based on current data from the appropriate state and federal natural resource management agencies.</li> <li>Provide documentation that there is no demonstrable negative effect of the facility on any listed species in the area from an appropriate natural resource management agency or provide documentation that habitat for the species does not exist within the ZoE or is not impacted by facility operations.</li> </ul> |

#### Supporting Information:

In 1981, USFWS determined that there were at the time no federally listed or proposed species in the project affect area, except for occasional transient individuals. A recent online data check of the USFWS IPaC website shows that the federally-threatened Northern long-eared bat could be present in the Project vicinity as well as federally-endangered Atlantic Salmon. However, there is no critical habitat designated for the bat located within the project area. There is "final critical habitat" for Atlantic Salmon identified in the area but the report states that the location of the critical habitat is not available. We have also occasionally observed bald eagles near the project but project operations would not negatively affect this species.

We have submitted a request to Maine Inland Fisheries and Wildlife staff for information regarding the known presence of any species of concern to the state. We will submit to LIHI any response we receive in response to this request.

## Zone of Effects #2 –Dam/tailrace

Supporting Information: see same as above for zone #1

## III.G.1 Cultural and Historic Resources

#### Zone of Effects #1 – Impoundment

| G | 2 | Approved Plan:  |
|---|---|---|
|   |   | <ul> <li>Provide documentation of all approved state, federal, and<br/>recognized tribal plans for the protection, enhancement, and<br/>mitigation of impacts to cultural and historic resources affected<br/>by the facility.</li> </ul> |
|   |   | <ul> <li>Document that the facility is in compliance with all such plans.</li> </ul>  |

### Supporting Information:

Article 30 of the FERC license requires the completion of a cultural resources survey evaluation and the preparation of a cultural resources management plan. This was necessary because six archeological sites were discovered within the project area in 1981. A letter dated November 22, 2010 from the Maine Historic Preservation Commission (Appendix 8) states that "Benton Falls Associates have discharged all responsibilities concerning archeological sites around the Benton Falls impoundment stemming form the Benton Falls FERC license." Long term monitoring of erosion at archeological site 52.34 was conducted from 1988 to 2008 and detected no significant erosional damage to this site. This finding concluded any required monitoring for archeological sites.

### Zone of Effects #2 –Dam/tailrace

Supporting Information: see same as above for zone #1

#### III.H.1 Recreational Resources

#### Zone of Effects #1 – Impoundment

| H 2 Agency Recommendation: |
|----------------------------|
|----------------------------|

|  | ٠ | Document    | any co  | ompre | ehensive  | re  | sour   | ce agency re    | comm    | enda  | ations |
|--|---|-------------|---------|-------|-----------|-----|--------|-----------------|---------|-------|--------|
|  |   | and enforce | able re | ecrea | tion plan | tha | t is i | n place for red | creatio | nal a | iccess |
|  |   | or accommo  | odatio  | ns.   |           |     |        |                 |         |       |        |
|  | • | Document    | that    | the   | facility  | is  | in     | compliance      | with    | all   | such   |
|  |   | recommend   | lations | s and | plans.    |     |        |                 |         |       |        |

### Supporting Information:

As a condition of its FERC license, the Benton Falls Hydroelectric facility provides canoe portage along the east bank of the Sebasticook River along with 1.6 acres of land for fishing and boat launching access. These recreational resources were developed in conjunction with the U.S. Department of the Interior ("USDOI"), the Maine State Comprehensive Outdoor Recreation Plan's goal and objectives, the Town of Benton, and the Maine Bureau of Parks and Recreation as part of the FERC licensing process. USDOI concluded at the time of licensing that the recreational resources were adequate for meeting any anticipated recreational needs at the project site.

As a result of the successful fish restoration program, the MDMR has issued an alewife harvesting permit to the Town of Benton. BFA has entered into a cooperative agreement with Benton under which terms agents of the Town have used BFA land to harvest alewives that were surplus to the upstream migration goals of the MDMR.

The Benton Falls facility ("the facility") is in compliance with the recreational access, accommodation and facilities conditions in its FERC license.



## Zone of Effects #2 –Dam/tailrace

Supporting Information: see same as above for zone #1

## PART IV. CONTACTS

## **Company Contacts**

| Project Owner:    | Project Owner: Messalonskee Stream Hydro, LLC                                   |  |  |  |  |  |
|-------------------|---|--|--|--|--|--|
| Name and Title    | Andrew Locke, President   |  |  |  |  |  |
| Company           | HCE Dodge Falls, Inc., Operating Member   |  |  |  |  |  |
| Phone             | (617) 367-0032  |  |  |  |  |  |
| Email Address     | alocke@essexhydro.com   |  |  |  |  |  |
| Mailing Address   | 55 Union Street, Boston, MA 02108   |  |  |  |  |  |
| Project Operator  | (if different from Owner):  |  |  |  |  |  |
| Name and Title    | Robert Thornton, Operations Manager   |  |  |  |  |  |
| Company           | Essex Power Services, Inc.  |  |  |  |  |  |
| Phone             | 617-367-0032  |  |  |  |  |  |
| Email Address     | rthornton@essexhydro.com  |  |  |  |  |  |
| Mailing Address   | c/o Essex Hydro Associates, 55 Union St, 4 <sup>th</sup> Floor Boston, MA 02108 |  |  |  |  |  |
| Consulting Firm / | Agent for LIHI Program (if different from above):                               |  |  |  |  |  |
| Name and Title    |   |  |  |  |  |  |
| Company           |   |  |  |  |  |  |
| Phone             |   |  |  |  |  |  |
| Email Address     |   |  |  |  |  |  |
| Mailing Address   |   |  |  |  |  |  |
| Compliance Cont   | act (responsible for LIHI Program requirements):                                |  |  |  |  |  |
| Name and Title    | Madeleine Mineau, Chief Operating Officer                                       |  |  |  |  |  |
| Company           | Essex Power Services, Inc.  |  |  |  |  |  |
| Phone             | (617) 367-0032  |  |  |  |  |  |
| Email Address     | mmineau@essexhydro.com  |  |  |  |  |  |
| Mailing Address   | c/o Essex Hydro Associates, 55 Union Street, Boston, MA 02108                   |  |  |  |  |  |
| Party responsible | e for accounts payable:   |  |  |  |  |  |
| Name and Title    | Maureen Donnelly  |  |  |  |  |  |
| Company           | Essex Power Services, Inc.  |  |  |  |  |  |
| Phone             | (617) 367-0032  |  |  |  |  |  |
| Email Address     | mdonnelly@essexhydro.com  |  |  |  |  |  |
| Mailing Address   | c/o Essex Hydro Associates, 55 Union Street, Boston, MA 02108                   |  |  |  |  |  |

## Agency Contacts

| Agency Contact (Check area of responsibility: Flows, Water Quality, Fish/Wildlife |  |  |  |  |  |
|---|--|--|--|--|--|
| Resources _X_, W  | /atersheds _X_, T/E Spp, Cultural/Historic Resources, Recreation): |  |  |  |  |
| Agency Name   | US Fish and Wildlife Service, Hydropower Program FERC Coordinator  |  |  |  |  |
| Name and Title  | Julianne Rosset  |  |  |  |  |
| Phone   | 609-309-4842   |  |  |  |  |
| Email address   | Julianne_Rosset@fws.gov  |  |  |  |  |
| Mailing Address   | 306 Hatchery Road East Orland, ME 04431                            |  |  |  |  |

| Agency Contact (Check area of responsibility: Flows_x_, Water Quality _X_, Fish/Wildlife |  |  |
|--|--|--|
| Resources, Watersheds _X_, T/E Spp, Cultural/Historic Resources, Recreation):            |  |  |
| Agency Name  | Maine Department of Environmental Protection     |  |
| Name and Title   | Kathy Howatt, Hydropower Coordinator, DLRR       |  |
| Phone  | 207-446-2642                                     |  |
| Email address  | Kathy.Howatt@maine.gov                           |  |
| Mailing Address  | 17 State House Station Augusta, Maine 04333-0017 |  |

| Agency Contact  | (Check area of responsibility: Flows, Water Quality, Fish/Wildlife |  |
|---|--|--|
| Resources _, Watersheds, T/E Spp, Cultural/Historic Resources _x_, Recreation): |  |  |
| Agency Name   | Maine Historic Preservation Commission                             |  |
| Name and Title  | Dr. Arthur Spiess, PhD., Chief Historic Preservationist            |  |
| Phone   | 207-287-2789   |  |
| Email address   | arthur.spiess@maine.gov  |  |
| Mailing Address   | 55 Capitol Street  |  |
|   | 65 State House Station Augusta, Maine, 04333-0065                  |  |

| Agency Contact   | (Check area of responsibility: Flows, Water Quality, Fish/Wildlife |
|------------------|--|
| Resources _X_, W | /atersheds, T/E Spp, Cultural/Historic Resources, Recreation):     |
| Agency Name      | Maine Department of Marine Resources                               |
| Name and Title   | Gail Wipplehauser  |
| Phone            | 207-624-6349   |
| Email address    | gail.wippelhauser@maine.gov  |
| Mailing Address  | #172 State House Station Augusta, ME 04333                         |

| Agency Contact  | (Check area of responsibility: Flows, Water Quality, Fish/Wildlife |  |
|---|--|--|
| Resources, Watersheds, T/E Spp, Cultural/Historic Resources, Recreation _x_): |  |  |
| Agency Name   | Bureau of Parks and Lands  |  |
| Name and Title  | James Vogel, Senior Planner  |  |
| Phone   | 207-287-2163   |  |
| Email address   |  |  |
| Mailing Address   | 22 State House Station Augusta, ME 04333-0022                      |  |

| Agency Contact (Check area of responsibility: Flows, Water Quality, Fish/Wildlife |  |  |
|---|--|--|
| Resources _X_, W  | /atersheds _x_, T/E Spp, Cultural/Historic Resources, Recreation): |  |
| Agency Name   | Maine Department of Inland Fisheries                               |  |
| Name and Title  | John Perry, Environmental Review Coordinator                       |  |
| Phone   | 207-287-5254   |  |
| Email address   | John.perry@maine.gov   |  |
| Mailing Address   | 284 State Street, 41 SHS Augusta, ME 04333                         |  |

| Agency Contact   | (Check area of responsibility: Flows, Water Quality, Fish/Wildlife |  |
|------------------|--|--|
| Resources _X_, W | /atersheds, T/E Sppx , Cultural/Historic Resources, Recreation):   |  |
| Agency Name      | Maine Department of Inland Fisheries                               |  |
| Name and Title   | Keel Kemper, Regional Wildlife Biologist                           |  |
| Phone            | 207-287-5369   |  |
| Email address    | Keel.Kemper@maine.gov  |  |
| Mailing Address  | 270 Lyons Road   |  |
|                  | Sidney, ME 04988   |  |

#### PART V. SWORN STATEMENT

All applications for LIHI Certification must include the following sworn statement before they can be reviewed by LIHI:

#### SWORN STATEMENT

As an Authorized Representative of Benton Falls Associates the Undersigned attests that the material presented in the application is true and complete.

The Undersigned acknowledges that the primary goal of the Low Impact Hydropower Institute's certification program is public benefit, and that the LIHI Governing Board and its agents are not responsible for financial or other private consequences of its certification decisions.

The Undersigned further acknowledges that if LIHI Certification of the applying facility is granted, the LIHI Certification Mark License Agreement must be executed prior to marketing the electricity product as LIHI Certified<sup>®</sup>.

The Undersigned further agrees to hold the Low Impact Hydropower Institute, the Governing Board and its agents harmless for any decision rendered on this or other applications, from any consequences of disclosing or publishing any submitted certification application materials to the public, or on any other action pursuant to the Low Impact Hydropower Institute's certification program.

Company Name: Benton Falls Associates Authorized Representative: Name: Andrew Locke Title: President, Benton Falls Associates Authorized Signature:

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## Everett E. Whitman, Project No. 5073-000

#### Order Issuing License (Major) ·· · · ..

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Lawrence R. Anderson, Director, Office of Electric Power Regulation. and a second second

is an in the time of program and and and Everett E. Whitman (Whitman) filed on July 14, 1981, an application for license under Part J of the Federal Power Act to construct, operate and maintain the Benton-Falls Project No. 5073)<sup>1</sup> The project would be located at a former dam site on the Sebasticook River, near the town of Benton, Kennebec County, Maine and would affect the interests of interstate or · · · · · forcign commerce

Notice of the application has been published and comments have been received from interested Federal, state and local agencies. No protests or motions to intervene have been received, and none of the agencies objected to issuance of the license.

The proposed project would consist of a new 27-foot high, 500-foot-long concrete dam with a 300-foot long uncontrolled spillway topped by 4-foot high flashboards, a new 83acre reservoir with a usable storage capacity of 310 acre feet and 4 feet of drawdown, a new powerhouse containing two turbine-generators with a total rated capacity of 3,400 kW and a 350 foot-long tailrace channel. The new dam would be located at the site of the dam destroyed by flooding in 1936. In addition Whitman proposes to construct'a canoe portage along the east bank of the river and will make available up to 1:6 acres of land for eventual fishing access or boat launching.

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The site of the project is owned by Whitman. The project would generate up to 12,509,000 kWh annually saving the equivalent of 20,500 barrels of oil or 5,800 tons coal. Energy produced at the project would be sold to Central Maine Power Company. in a subscription of the second se . . .: • ···· · · ···

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Water Quality

The Maine Department of Environmental Protection (DEP), the U.S. Environmental Protection Agency (EPA) and the U.S. Department of the Interior (Interior) expressed concern that the proposed impoundment would be eutrophic and that the water quality problems associated with eutrophic reservoirs (i.e., low DO and algal blooms) would adversely impact the water quality of the Sebasticook River. The DEP, by conditioning the 401 water quality certificate issued September 29, 1983, required Whitman to draw down the project reservoir to natural river elevations from July 1 to September 15 in an attempt to preclude the formation of algal blooms. The DEP and EPA also recommended that water quality studies be conducted during project operation to assess project impacts on the water quality of the impoundment and the river downstream of the project dam, and, if necessary, determine appropriate mitigative . ..... 1 8 4 measures.

Federal Energy Guidelines

Whitman agreed to draw down the project reservoir in accordance with the schedule. outlined by the DEP. In addition, Whitman proposed to install mechanical aeration devices in an attempt to ensure that the DO concentration of the discharge waters are maintained at acceptable levels.

It is concluded that impounding the waters of the Sebasticook River would decrease DO concentrations below preproject levels, by eliminating the reaeration that is presently characteristic of the free flowing river. Additionally, the project reservoir could be eutrophic and the decomposition of organic materials in the eutrophic reservoir would act to further reduce the DO levels. The proposal to draw down the impoundment to the natural river elevations during the summer low flow months would minimize project impacts on water quality by restoring the aeration effect of the river and minimizing formation of algal blooms in the reservoir. A water quality study should, however, be conducted to determine the effectiveness of the proposed drawdown in protecting water quality, and to determine if the presence of the proposed -reservoir adversely impacts water quality during the remainder of the year when the reservoir would be full (September 16 to June 30). Article 26 requires the Licensee to draw down the impoundment in accordance with guidelines set forth by the DEP. Article 27 requires the Licensee to conduct a water quality study in cooperation with relevant resource agencies to assess the impacts of project operation on the water quality of the Sebasticook River and, if necessary, determine measures necessary to minimize adverse impacts.

#### Minimum Flow

The DEP, EPA, and Interior stated that insufficient information exists to accurately assess the impacts of the Applicant's proposed minimum flow release of 100 cubic feet per second (cfs) on the fisheries and water quality of the river downstream of the project. The agencies recommended that studies be conducted to determine the instream flow necessary to protect the fishery resources and water quality of the Sebasticook River during the proposed peak power generating period (September 15 through April 30). The DEP and Interior recommended interim minimum flow releases from the dam of 100 and 440 cfs for the protection of the fishery and water quality respectively, until the aforementioned studies are completed.

Additional information should be obtained to determine instream flows necessary to protect the aquatic resources of the Sebasticook River downstream of the project

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**FERC.** Reports 024-55

dam. Article 29 requires the Licensee to conduct studies in cooperation with relevant resource agencies to determine an appropriate instream minimum flow. In addition, a release Minimum of an interim minimum flow of 100 cfs during FWW the peak power generating period would minimize impacts to aquatic resources. Article article 2 28 requires the release of an interim minimum flow of 100 cfs. The run-of-river mode of operation, proposed to be implemented during run-ofthe remainder of the year (May I through September 14) would preclude the need to establish an instream flow.

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#### Fish Passage

The DEP, National Marine Fisheries Fish Service, and Interior stated that an Figh a. 1 . anadromous fishery (i.e., alewives and American shad) may be established in the river arice 1 in the future and recommended the license be conditioned to provide for construction of fishpassage facilities when such facilities are deemed necessary by the fish and wildlife agencies. Article 15 would provide for future construction and maintenance of fish and wildlife facilities, including fish passage facilities, should they become necessary.

#### Cultural Resources

The proposed project area was surveyed in June of 1981. Six archeological sites were discovered within the project boundaries. Four of these sites may be potentially eligible for the National Register of Historic Places. No further consultation has occurred between Whitman and the State Historic Preservation Officer (SHPO) after July 9, 1981, when the SHPO confirmed that the consultant retained by Whitman had complied with the necessary requirements for the preparation of a permit application.

Based on the summary information presented in the Phase I section of archeological investigations within the project area, four archeological sites (MSM \$53-24, MSM #53-25, MSM #53-26, and MSM #53-28) may be eligible for inclusion in the National Register. Survey activities and subsequent data evaluation are necessary. It is concluded that additional investigations should be conducted to: (1) establish the significance of the potentially eligible sites; and (2) prepare a cultural resources management plan which would assess any impacts to the sites and present measures to avoid or mitigate these impacts.

The cultural resources management plan should consist of: (1) the results of Phase II investigation of sites MSM #53-24, MSM #53-25, MSM #53-26, and MSM #53-28;

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401 Article 26

Minimum Flow

...

(2) documentation to determine the eligibility of these sites for the National Register; (3) a discussion of project impacts to any sites; (4) specific proposals to avoid or mitigate impacts to any sites determined eligible for the National Register, and, (5) a time table for any data recovery work that may be necessary. The plan should be prepared in cooperation with the SHPO and adhere, as appropriate, to the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation and the Advisory Council on Historic Preservation's Handbook on the Treatment of Archeological Properties. Article 30 requires the completion of cultural resources survey evaluation in addition to the preparation of a cultural resources management plan.

#### . . Recreational-Resources.

The U.S. Department of the Interior indicated that the proposed recreational development plan is in agreement with the Maine State Comprehensive Outdoor Recreation Plan goals and objectives and was formulated in consultation with the Town of Benton and the Maine Bureau of Parks and Recreation. Interior concluded that the plan was adequate for meeting anticipated recreational needs and indicated no objection 1 . · · · · to its approval: ..

The State of Maine Department of Environmental Protection indicated no objection to Whitman's plans for recreational development at the project. The State did indicate concern about public safety in the project tailrace area and recommended that Whitman formulate appropriate plans for control of access to this area. Section 12.42 of the Commission's Dam Safety Regulations requires that a Licensee implement reasonable and necessary measures to warn the public of fluctuations in flow from the project or otherwise to protect the public in the use of project lands and waters.

The proposed project reservoir would be drawn down to the natural river elevation during the peak summer recreational season each year, resulting in adverse aesthetic and recreational impacts, including some shortterm odor from the decomposition of vegetation on the exposed banks. This problem would be of short duration, and following dehydration of the banks, recreational access would not be impaired. . .

#### Evaluation of Design, Construction and Performance

Based on an inspection of the project site by staff of the New York Regional Office, the proposed structure is classified low hazard.

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The project design drawings are preliminary in nature. Staff's stability analysis of the dam shows that potential overturning forces applied to the dam result in tension at the heel of the dam. Current engineering practice requires that structures be designed so that the concrete/rock foundation that: interfaces be in compression under flood and ice conditions (the site of the Benton Falls Dam would not be subject to large earthquake forces). Article 31 requires the dam and powerhouse to be designed so that the base of the dam is in compression under flood and ice. • : . . ..... loads.

The dam may be constructed as a roller compacted concrete (RCC) gravity structure. RCC is defined as a no-slump concrete that. can be hauled in dump trucks, spread with a bulldozer or grader, and compacted with a vibratory roller. RCC, when fully cured. hardens into a material with physicalproperties similar to conventional concrete.

RCC has some properties which need to be closely evaluated to assure a safe and durable structure. RCC durability is known to be a problem under freeze-thaw action. The problem is directly related to the amount of silt in the aggregate and the fact that RCC is not air entrained. High flows over the dam also affect the durability of RCC because the cured surface has a coarse texture and is subject to greater scouring action than a smoother conventional concrete surface.

Other factors in constructing an RCC dam which need to be closely evaluated are the availability of suitable aggregate, mix ratios, construction techniques and quality control.

Article 36 requires one or more independent engineering consultant(s) experienced in RCC dams be retained by the Licensee to approve the design specifications and construction of the dam if Licensee chooses to utilize RCC. The project will be safe and adequate upon compliance with the terms and conditions of the license.

Hydroelectric Power and Resource Utilization Evaluation

Troject The proposed project would be operated as an intermediate type peaking plant. The powerhouse will contain two adjustable blade, fixed vane propeller units with a total rated hydraulic capacity of 1765 cfs under a gross head of 29.5 feet. The project will utilize all of the available head and about 79% of the

The Benton Falls Project is not in conflict with any existing or planned development in the basin. The proposed development will make good use of the flow and fall of the

streamflow.

Federal Energy Guidelines 018-59

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Sebasticook River and will be best adapted to the comprehensive development of the basin upon compliance with the terms and conditions of the license.

#### Economic Feasibility me

Staff's economic feasibility analysis of the Benton Falls Project shows that the project is economically feasible to develop based on the sale of project power at the avoided cost in the State of Maine adjusted for escalation. The analysis included appropriate reductions in the annual energy output of the project for the water quality mitigation measures required by Articles 26 and 28.

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#### Other Environmental Impacts

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The proposed project would be located at the site of a former hydroelectric project. The project would be located in a steeply sloped river valley and would result in the additional flooding of 27 acres of land to form the 83-acre project reservoir. Construction of the project would result in increases in hoise levels, engine exhaust emissions, dust from construction activities and-sedimentation-and erosion fromdisturbance of river bed and land surfaces. License articles requiring water quality mitigative measures, minimum flows and an archeological/cultural resources management plan will ensure protection of the environmental resources of the project area.

On the basis of the record, including agency comments and the Commission staff's independent analysis, it is concluded that issuance of this license would not constitute a major Federal action significantly affecting the human environment.

#### It is ordered that:

(A) This license is issued to Everett E. Whitman (Licensee), under Part I of the Federal Power Act (Act), for a period of 50 years, effective the first day of the month in which this order is issued, for the construction, operation and maintenance of the Benton Falls Project No. 5073 located on the Sebasticook River in Kennebec County, Maine.

This license is subject to the terms and conditions of the Act, which are incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the Act.

(B) The Benton Falls Project No. 5073 consists of:

(1) All lands, to the extent of the Licensee's interest in those lands, constituting the project area and enclosed by the project boundary. The project area and boundary are shown and described by certain exhibits that

FERC Reports

form part of the application for license and that are designated and described as:

| FERC No. | Showing  | •  |
|----------|--|--|
| 5073-1   | 'General Map                                     |  |
| 5073-2   | Detailed Map                                     |  |
| 5073-3   | Detailed Map .                                   |  |
| 5073-4   | Property Map                                     | 1  |
|          | FERC No.<br>5073-1<br>5073-2<br>5073-3<br>5073-3 | FERC No.Showing5073.1General Map5073.2Detailed Map5073.3Detailed Map5073.4Property Map |

(2) Project works consisting of: (1) a 500foot long, 27-foot high concrete gravity dam with a 300-foot long integral uncontrolled spillway topped by 4-foot high flashboards; (2) an 83-acre reservoir with a usable storage capacity of 310 acre feet at 4 feet of drawdown from a normal maximum water surface elevation of 85 feet m.s.1.; (3) a powerhouse located near the west dam abutment, constructed integrally with the dam, containing two turbine generators with a total rated capacity of 3.4 MW; (4) a 350-foot-long tailrace channel; (5) the 4.16-kV generator leads, 4.16/12-kV step-up transformers and a 170-foot-long, 12-kV transmission line; and (6) appurtenant facilities.

The location, nature, and character of these project works are generally shown and described by the exhibits cited above and more specifically shown and described by certain other exhibits and reports that also form part of the application for license and that are designated and described as:

| Exhibit L | FERC No. | Showing   |
|-----------|----------|---|
| Sheet 1   | 5073-5   | Plan, Section of                                    |
| Sheet 2   | 5073-6   | Dam and Tailrace<br>Powerhouse Plan and<br>Sections |

(3) All of the structures, fixtures, equipment, or facilities used or useful in the operation or maintenance of the project that are located within the project boundary, all portable property that may be employed in connection with the project, located within or outside the project boundary as approved by the Commission, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(4) Exhibit M—consisting of two typed pages entitled "General Description of the Mechanical and Electrical Equipment and the Transmission Line."

.(5) Exhibit R—consisting of three typed pages and a drawing (FERC No. 5073-7) entitled "Aesthetic and Recreational Renderings."

(C) Exhibits K, M and R are approved and made a part of the license and Exhibit L is approved only to the extent that it shows the preliminary design of the project.

(D) This license is also subject to Articles 1 through 23 set forth in Form L-11 (revised

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October, 1975) entitled "Terms and Conditions of License for Unconstructed Major Project Affecting the Interest of Interstate or Foreign Commerce," attached to [reported at 54 FPC 1864] and made a part of this license. The license is also subject to the following additional articles:

Article 24. The Licensee shall pay the United States the following annual charge, effective the first day of the month in which this license is issued:

(a) For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 4,530 horsepower.

Article 25. The Licensee shall prepare a study analyzing the impact of restoration of the Benton Falls Dam on upstream flood risks. The study shall be undertaken in coordination with and must be acceptable to the Federal Emergency Management Agency (FEMA) and the City of Benton, Maine pursuant to the requirements of the National Flood Insurance Program. A letter of acceptance of the study by FEMA shall be filed with the Commission within 2 years from the date of issuance of this license

Article 26. Licensee shall annually draw down the Benton Falls Reservoir to the preproject river surface elevation by July 1 and begin refilling the reservoir no sooner than September 15 of each year for the purpose of protecting the water quality of the Sebasticook River. This drawdown schedule may be modified if required by operating emergencies beyond the control of the Licensee; for maintenance and inspection activities and for the water quality and flow studies required by Articles 27 and 29 and for short periods for fishery management and water quality purposes upon mutual agreement between the Licensee and the Maine Department of Environmental Protection and the Maine Department of Inland Fisheries and Wildlife.

Article 27. Licensee shall, after consultation with the Maine Department of Environmental Protection, and Maine Department of Inland Fisherics and Wildlife develop a study plan to assess the impact of project operation on the water quality of the Sebasticook River. Within 3 months from the date of issuance of this license, the Licensee shall file a description of the study plan with the Commission, for approval along with comments from the above agencies on the adequacy of the study. The Commission reserves the right to require modification of the plan.

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Within 6 months from the date of completion of the study, the results of the study shall be submitted to the Commission. Further, if the results of the study indicate that changes in project structures or operations are necessary to maintain the State of Maine water quality standards, Licensee shall also file for Commission approval within 6 months from the date of completion of the study, a schedule for implementing the specific changes in project structures or operations. At the same time, copies of the schedule shall be served upon the agencies consulted.

Article 28. The Licensee shall discharge an interim continuous minimum flow of 100 cubic feet per second from the Benton Falls Project min flow or the inflow to the reservoir; whichever is less, for the purpose of protecting fish and wildlife resources and water quality of the Sebasticook River. Interim minimum flows shall be maintained by Licensee until alternative minimum flow requirements are approved by the Commission. This flow may be temporarily modified if required by operating emegencies beyond the control of the Licensee, for maintenance-and-inspection-activities and for the water quality and minimum flow studies required by Articles 27 and 29 respectively, and for short periods for fishery management and water quality purposes upon mutual agreement between the Licensee and the Maine Department of Environmental Protection and the Maine Department of Inland Fisheries and Wildlife.

Article 29. Licensee shall, in cooperation with the Maine Department of Environmental Protection and U.S. Fish and Wildlife Service develop a study plan to determine the minimum flow releases from the project dam that are necessary to protect and enhance fish and wildlife resources and water quality of the Sebasticook River. Within 3 months from the date of issuance of this license, the Licensee shall file the plan with the Commission for approval, along with comments from the above agencies on the adequacy of the plan. The Commission reserves the right to require modifications to the plan.

Within 3 months from the date of completion of the study, the Licensee shall file, with copies to the agencies consulted, a report on the results of study and, for Commission approval, recommendations for flow releases from the project dam. Copies of agencies' letters of comment on the adequacy of the recommended minimum flow shall be included in the filing.

Article 30. Licensee shall, prior to the commencement of any construction, file a comprehensive cultural resources management plan for Commission review and approval. The

**Federal Energy Guidelines** 

plan shall be prepared in consultation with, and in a manner satisfactory to the Maine State Historic Preservation Officer (SHPO). The plan shall include: (1) the results of a Phase II survey of archeological sites MSM #53-24, MSM #53-25, MSM #53:26, and MSM 153-28; (2) documentation (on National Register forms) sufficient to enable Determinations of Eligibility for sites MSM #53-24, MSM #53-25, MSM #53-26, and MSM # 53-28 (as appropriate) by the Keeper of the National Register; (3) a list of project impacts. on these eligible sites; (4) specific proposals to avoid or mitigate impacts upon any eligible. sites; and (5) a time table for commencement and completion of Phase II survey work; filing of a management plan; and, any data recovery .. The plan must be filed with the Commission 60. days after acceptance of the license by the Licensee. Any data recovery proposed as part of the management plan shall be approved by the SHPO, filed with and approved by the Commission, and carried out prior to the commencement of any construction activity which would disturb such archeological sites within the project area All-survey and data recovery work shall be carried out in a manner consistent with the Secretary of the Interior's Standards and Guidelines, for Archeology and Historic Preservation, and the Advisory Council on Historic Preservation's Handbook on the Treatment of Archeological Properties. Licensee shall make available funds in a reasonable amount for survey and data recovery as required. If any previously unrecorded archeological or, historical sites are discovered during the course of construction or development of any project works or other facilities at the project, construction activity shall be halted, a qualified, archeologist shall be consulted to determine the significance of the site, and Licensee shall consult with the SHPO to develop a mitigation plan for the protection of significant archeological and historical resources. If Licensee and the SHPO cannot agree on the amount of money to be expended on the archeological or historical work related to the project, the Commission reserves the right to require Licensee to conduct, at its own expense, any such work found necessary.

Article 31. The Licensee shall submit at least 90 days prior to the start of project construction in accordance with the Commission's rules and regulations revised Exhibit L drawings and a supporting design report showing the final design of major project works. The project shall be designed so that the base of the dam and powerhouse will be in compression for normal pool plus ice and for the 100 year flood loading conditions. Construction of any major project structure shall not begin until the Director, Office of

FERC Reports

Electric Power Regulation has approved the Exhibit L drawings.

Article 32. The Licensee shall commence construction of the project within two years from the effective date of the license and shall thereafter in good faith and with due diligence prosecute such construction and shall complete construction of such project works within five years from the effective date of the license.

Article 33. The Licensee shall within 90 days of completion of construction, file for approval of the Director, Office of Electric Power Regulation revised Exhibits K, L and M to show and describe project as built.

Article 34. The Licensee shall review and approve the design of contractor-designed collerdams and deep excavations prior to the start of construction and shall ensure that construction of cofferdams and deep excavations are consistent with the approved design. At least 30 days prior to start of construction of the cofferdam the Licensee shall file with the Commission's Regional Engineer and Director, Office of Electric Power Regulation, one copy of the approved cofferdam construction drawings-and specifications and a copy of the letter(s) of approval.

Article 35. The Licensee shall file with the Commission's Regional Engineer and the Director, Office of Electric Power Regulation one copy each of the final contract drawings and specifications for pertinent features of the project, such as water retention structures, powerhouse, and water conveyance structures, at least 60 days prior to start of construction. The Director, Office of Electric Power Regulation, may require changes in the plans and specifications to assure a safe and adequate project.

Article 36. If the roller compacted concrete method of dam construction is selected, the Licensee shall retain the services of one or more qualified, independent, engineering consultant(s) to review and approve the design, specifications and construction of the roller compacted concrete dam. The name(s) and qualifications of the consultant(s) shall be submitted to the Director, Office of Electric Power Regulation for approval. Among other things, the consultant(s) shall assess the durability of RCC, considering site specific freeze-thaw action, thermal stresses, cracking potential, and hydraulic flow conditions; the suitability of aggregate, the adequacy of mix proportions; the suitability of construction techniques; and the adequacy of quality control and the concrete strength in place. The consultant(s) approval of the proposed dam design shall be submitted prior to or simultaneously with the submission of the

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corresponding Exhibit L and final design report specified in Article 31. Upon completion of construction the Licensee shall forward the consultant(s) final evaluation of the safety and adequacy of the dam.

Article 37. (a) In accordance with the provisions of this article, the Licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project-lands and waters for certain other types of use and occupancy, without prior Commission approval. The Licensee may: exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the Licensee shall, also have continuing responsibility to supervise and control the uses and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the Licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the Licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The types of use and occupancy of project lands and waters for which the Licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time where said facility is intended to serve single-family type dwellings; and (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the Licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The Licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the uses and occupancies for which it grants permission are maintained in good repair and comply with applicable State and local health and safety requirements. Before granting permission for construction of

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for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the Licensee's costs of administering the permit program. The Commission reserves the right to require the Licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures. (c) The Licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary State and Federal approvals have been obtained; (2) short detained water.

all necessary State and Federal approvals have been obtained: (2) storm: drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines, (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary: (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the Licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

bulkheads or retaining walls, the Licensee.

shall: (1) inspect the "site of the proposed

construction, (2) consider whether the planting

of vegetation or the use of riprap would be

adequate to control erosion at the site, and (3) determine that the proposed construction is

needed and would not change the basic contour

of the reservoir shoreline. To implement this

paragraph (b), the Licensee may, among other

things, establish a program for issuing permits

(d) The Licensee may convey fee titles to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary State and Federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary Federal and State water quality certificates or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary Federal and State approvals have been obtained; (5) private or public marinas that

Federal Energy Guidelines

can accommodate no more than 10 watercraft at a time and are located at least one-half mile from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from the edge of the project reservoir-at normal maximum surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause. (d)(7), in any calendar year. At least 45 days before conveying any interest in project lands under this paragraph (d), the Licensee must file a letter to the Director, Office of Electric Power Regulation, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G or K map may be used), the nature of the proposed use, the identity of any Federal or State agency official consulted, and any Federal or State approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the Licensee to file an application for prior approval, the Licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraphs (c) or (d) of this article:

(1), Before conveying the interest, the Licensee shall consult with Federal and State fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the Licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved Exhibit R or approved report on recreational resources of an Exhibit E; or, if the project does not have an approved Exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include covenants running with the land adequate to ensure that: (i) the use of the lands conveyed shall not cadanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; and (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project.

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(4) The Commission reserves the right to require the Licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G or K drawings would be filed for approval for other purposes.

: 27 Article 38. Pursuant to Section 10(d) of the Act, during the first 20 years of operation of the project under license, a specified reasonable rate of return upon the net investment in the project shall be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. One half of the project surplus earnings, if any, accumulated after the first 20 years of operation under the license, in excess of the specified rate of return per annum on the net investment, shall be set aside in a project amortization reserve account at the end of each fiscal year. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year after the first 20 years of operation under the license, the amount of that deficiency shall be deducted from the amount of any surplus earnings subsequently accumulated, until absorbed. One-half of the remaining surplus carnings, if any, cumulatively computed, shall be set aside in the project amortization reserve account. The amounts established in the project amortization reserve. account shall be maintained until further order, of the Commission. .: : ...

The annual specified reasonable rate of return shall be the sum of the annual weighted costs of long-term debt, preferred stock, and common equity, as defined below. The annual weighted cost for each component of the

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reasonable rate of return is the product of its capital ratio and cost rate. The annual capital ratio for each component of the rate of return shall be calculated based on an average of 13 monthly balances of amounts properly · · · · includable in the Licensee's long-term debt and proprietary capital accounts as listed in the Commission's - Uniform System of Accounts. The cost rates for long-term debt and preferred stock shall be their respective weighted average costs for the year, and the cost, of common equity shall be the interest rate on 10-year government bonds (reported as the Treasury Department 10-year constant maturity series) computed on the monthly

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percentage points (400 basis points). (F) The Licensee's failure to file a petition appealing this order to the Commission shall constitute acceptance of this license. In

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average for the year in question plus four

acknowledgment of acceptance of this order and its terms and conditions, it shall be signed by the Licensee and returned to the Commission within 60 days from the date this order is issued.

#### - Footnotes -

<sup>3</sup> Authority to act on this matter is delegated to the Director, Office of Electric Power Regulation, under § 375.308 of the Commission's regulations, 18 C.F.R. § 375.308 (1983). This order may be appealed to the Commission by any party within 30 days of its issuance pursuant to. Rule 1902, 18 C.F.R. § 385.3902, (1983). Filing an appeal and final Commission action on that appeal are prerequisites for filing an application for rehearing as provided in Section 313(a) of the Act. Filing an appeal does not operate as a stay of the effective date of this order or of any other date specified in this order, except as specifically directed by the Commission.

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# Order Amending License (Major)

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Everett E. Whitman, Project No. 5073-001

#### (Issued July 30, 1984)

#### Ouentin A. Edson, Director, Office of Hydropower Licensing.

On June 1, 1984, Everett E. Whitman, Licensee for the proposed Benton Falls Project No. 5073, filed a request for extensions of time to submit plans of study regarding water quality and minimum flow, required under Articles 27 and 29 of the license. 1 The major license was issued on March 8, 1984. 2

Article 27 of the license required the Licensee to conduct a water quality study in cooperation with relevant resource agencies to assess the impacts of project operation on the water quality of the river. A study plan was required to be filed within three months of the issuance of the license. Article 29 required the submission of a similar plan of study to determine the minimum flow releases, by the same date. and is said to make the said

The Licensee has requested a 60-day extension of time in which to file the aforementioned studies."

The Licensee states that: (1) he has experienced-difficulty-in retaining-local experts to assist him in dealing with the unique problems of the Sebasticook River: (2) the record spring rainfall has hindered progress; and that (3) he has been preoccupied with finalizing the power sales contract with Central Maine Power Company, an issue which

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is now pending before the Maine Public Utility Commission.

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The consultant has now been retained and has assured the Licensee that the plans of study can be submitted within the extended period. Since the requested extension of time is minimal and it is likely that the plans will be submitted within the period, it is determined that it is reasonable and in the public interest to grant the extension of time. It is ordered that:

(A). The request to extend the due dates for environmental plans under Articles 27, and 29 of the license is granted.

(B) Articles 27 and 29 of the Order Issuing Major License for Project No: 5073, issued March 8, 1984, are revised as follows:

Article 27. Licensee shall, after consultation with the Maine Department of Environmental-Protection, and Maine Department of Inland Fisheries and Wildlife develop a study plan to assess the impact of project operation on the water quality of the Sebasticook River: Within 5 months from the date of issuance of this license, the Licensee shall file a description of the study plan with

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the Commission, for, approval along with comments from the above agencies on the adequacy of the study. The Commission reserves the right to require modification of the plan

Within 6 months from the date of completion of the study, the results of the study shall be submitted to the Commission. Further, if the results of the study indicate that changes in project structures or operations are necessary to maintain the State of Maine water quality standards, Licensee shall also file for Commission approval within 6 months from the date of completion of the study, a schedule for implementing the specific schanges in project structures or operations. At the same time, copies of the schedule shall be served upon the agencies consulted

Article 29. Licensee shall, in cooperation with the Maine Department of Environmental Protection and U.S. Fish and Wildlife Service develop a study plan to determine the minimum flow releases from the project dam that are necessary to protect and enhance fish and wildlife resources and water quality of the Sebasticook River. Within 5 months from the date of issuance of this license, the Licensee shall file the plan with the Commission for approval, along with comments from the above agencies on the adequacy of the plan. The Commission reserves the right to require modification to the plan.

Within 3 months from the date of completion of the study, the Licensee shall file, with copies to the agencies consulted, a report on the results of the study and, for Commission approval, recommendations for flow releases from the project dam. Copies of agencies' letters of comment on the adequacy of the recommended minimum flow shall be included in the filing.

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Authority to act on this matter is delegated to the Director, Office of Hydropower Licensing, under § 375.313 of the Commission's regulations, 18 C.F.R. § 375.313 (1984). This order may be appealed to the Commission by any party within 30 days of its issuance pursuant to Rule 1902, 18 C.F.R. § 385.1902 (1983). Filing an appeal and final Commission action on that appeal are prerequisites for filing an application for schearing, as provided in Section 313(a) of the Act. Filing an appeal does not operate bs a stay of the effective date of this order, except as specifically directed by the Commission.

3 Sec 26 FERC \$ 62,201.

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#### [1 02,123].

#### Benton Falls Hydro Associates, Project No. 5073-010

Order Amending License Requiring the Project to Be Operated in a Run-of-River Mode

#### (Footnote Continued)

with October 5, 1987; as the due date for motions to intervene.

Application amended for clarification purposes.

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<sup>2</sup> Application amended to change notice request from 10 days' notice to 5 days' notice due to additional clarifications required, mailing delays, and other time constraints.

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### (Issued May 3, 1988)

# J. Mark Robinson, Dir., Division of Project Compliance and Administration.

On May 8, 1987, Benton Falls Associates (licensee) filed a request to amend Article 29 of the license for the Benton Falls Project, as modified by the Order Approving Minimum Flow Releases dated February 11, '1987 [38 FERC [ 62,141]. The licensee requests that the requirement to release a minimum flow of 350. cubic feet per second and to file a plan to determine the maximum rate of change in river flow (ramping rate), be modified to require a run-of-river mode of operation. The licensee states that operating the project in a run-ofriver mode is preferred from a economical and environmental standpoint. Further, any temporary modification to this mode of operation would be done in accordance with criteria established by the resource agencies.

Operating the project in an instantaneous run-of-river mode, where discharge from the project approximates inflow to the project reservoir, would preclude the need for a minimum flow requirement. Further, operating the project in an instantaneous run-of-river mode would minimize the fluctuations of the water level elevations above the project dam and below the project tailrace. Therefore, the need to develop a ramping rate for the project is unnecessary. In addition, operating the project in an instantaneous run-of-river mode would protect fish and wildlife resources of the Sebasticook River. The license should be amended to require the project to be operated in an instantaneous run-of-river mode. To ensure the project is operated in an instantaneous run-ofriver mode, the licensee must develop a plan to monitor inflow to the project reservoir as well as outflow from the project.

#### The Director orders:

(A) Article 29 of the license for the Benton Falls Hydroelectric Project, as modified by the Order Approving Minimum Flow Releases, issued February 11, 1987, is superseded by the following:

Article 29. The licensee shall operate the Benton Falls Hydroëlectric Project in an instantaneous run-of-river mode for the protection of fish and wildlife resources of the Sebasticook River. In operating the project, the licensee shall at all times minimize the fluctuations of the reservoir surface elevation by . maintaining sufficient discharge from the project so that the flow, as measured immediately downstream from the project tailrace, approximates the instantaneous sum of inflow to the project reservoir. Instantaneous run-of-river operation may be modified if required by operating emergencies beyond the control of the licensee and for short periods of time upon mutual agreement between the licensee and the Maine Department of Environmental Protection.

(B) Ordering Paragraph (B) of the Order Approving Minimum Flow Release, issued February 11, 1987, requiring ramping rate plan, is superseded by the following:

The licensee, after consultation with the Maine Department of Environmental Protection (DEP), shall develop a plan to monitor inflow to and outflow from the Benton Falls project. The plan must be filed with the Commission for approval within 3 months from the date of issuance of this order. Included in this filing must be comments from the DEP on the plan or a letter dated no later than 45 days. from the date of this order requesting agency comments on the plan.

(C) This order is issued under the authority delegated to the Director and is final, unless appealed to the Commission under Rule 1902 within 30 days from the date of this order.

#### STATE OF MAINE

DEPARTMENT OF ENVIRONMENTAL PROTECTION STATE HOUSE STATION 17 AUGUSTA, MAINE 04333

#### STAFF ORDER IN THE MATTER OF

EVERETT E. WHITMAN Benton, Maine, Kennebec County BENTON FALLS HYDROELECTRIC PROJECT 02/49-7519-11040 WATER QUALITY CERTIFICATION

SUMMARY, FINDINGS OF FACT AND ORDER

After review of the request and related materials submitted by the applicant under the provisions of Section 401 of the Federal Water Pollution Control Act, the Department finds that:

- 1. The applicant proposes the construction and operation of a new hydroelectric generating facility to be located on the Sebasticook River in Benton, Maine.
- 2. The project is subject to the jurisdiction of the Federal Energy Regulatory Commission and the U.S. Army Corps of Engineers. The applicant has filed an application for license to develop and operate the Benton Falls Hydroelectric Project (FERC No. 5073). Water Quality Certification is, therefore, considered, pursuant to Section 401 of the Federal Water Pollution Control Act.
- 3. The project was approved by the Department of Inland Fisheries & Wildlife by permit #1847-11040 issued September 28, 1983, pursuant to the Stream Alteration Act, 12 M.R.S.A., Sections 7776-7780.
- 4. The project was approved by the Board of Environmental Protection by permit #02/49-7780-11040 issued September 28, 1983, pursuant to the Site Location of Development Act, 38, M.R.S.A., Sections 481-490.
- 5. Water Quality Standards will not be adversely affected by the project as approved to the point of requiring reclassification.

THEREFORE, the Department GRANTS that there is a reasonable assurance that the activity will not violate applicable Water Quality Standards, subject to the following conditions:

- 1. This certification is conditional upon the applicant's continual compliance with all terms and conditions of Stream Alteration Permit #1847-11040 and Great Ponds Alteration Permit #02/49-7780-11040.
- 2. This certification is enditional upon the Department's issuance of any Waste Discharge License and the applicant's compliance with the terms and conditions of any such license that may be required for the discharge of any pollutant from the project (e.g., bearing cooling water), pursuant to the Protection and Improvement of Waters, 38, M.R.S.A., Sections 361-452.

DONE AND DATED AT AUGUSTA, MAINE, THIS 29TH DAY OF SEPTEMBER, 1983.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: WARREN, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR APPEAL PROCEDURES ...

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STATE OF MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION STATE HOUSE STATION 17 AUGUSTA, MAINE 04333

DEPARTMENT ORDER

#### IN THE MATTER OF

BENTON FALLS ASSOCIATES Benton, Maine Kennebec County BENTON FALLS HYDRO PROJECT FISH PASSAGE CONSTRUCTION #L-07519-35-S-C (Approval) #L-22142-34-A-N (Approval)

#### MAINE WATERWAY DEVELOPMENT AND --CONSERVATION ACT AND WATER QUALITY CERTIFICATION

FINDINGS OF FACT AND ORDER CONDITION COMPLIANCE AND NEW PERMIT

Pursuant to the provisions of 38 MRSA Sections 464 et seq. and Sections 630 et seq., 06-096 CMR 450 (Administrative Rules for Hydropower Projects, effective date September 1, 1987), and Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act), the Department of Environmental Protection has considered the application of BENTON FALLS ASSOCIATES with its supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

#### 1. INTRODUCTION

The applicant proposes the construction and operation of a permanent upstream fish passage facility at the Benton Falls Hydro Project, located on the Sebasticook River in the Town of Benton, Kennebec County, Maine, in compliance with the terms of Department Order #L-7519-35-R-M dated July 31, 1998. The project is operated as a hydroelectric generating facility under the terms of FERC License No. 5073.

#### 2. PROCEDURAL HISTORY

By Order #02/49-7519-11040 dated September 29, 1983, the Board of Environmental Protection approved a permit and water quality certification for the proposed construction and licensing of the Benton Falls Hydro Project. In its approval, the Board found that adequate fish passage facilities would be needed at the project in the future to support the planned restoration of anadromous fish to the Kennebec River drainage.

On March 8, 1984, FERC issued an original license for the unconstructed Benton Falls Project that included provisions for future construction and maintenance of fish passage facilities, should they become necessary.

By Order #L-7519-35-L-M dated February 24, 1998, the Board modified the terms of its original approval for the Benton Falls Project to be consistent with the 1986 Agreement Between the State of Maine and Kennebec Hydro Developers Group ("1986 KHDG

BENTON FALLS ASSOCIATES BENTON FALLS HYDRO PROJECT #L-07519-35-S-C (Approval) L-22142-34-A-N (Approval)

#### MAINE WATERWAY DEVELOPMENT AND CONSERVATION ACT AND WATER QUALITY CERTIFICATION Page 2

Agreement), which became effective on January 23, 1987. Under the terms of the 1986 KHDG Agreement, the signatory dam owners, including Benton Falls Associates, agreed to provide funds over a 12-year period to facilitate anadromous fish restoration efforts and to provide permanent fish passage at their dams during the 1999-2001 period in accordance with a revised restoration plan.

)

)

On January 25, 1989, FERC amended the license for the Benton Falls Project to incorporate the fish passage provisions of the 1986 KHDG Agreement.

By Order #L-7519-35-R-M dated July 31, 1998, the Department modified its 1988 approval to be consistent with the Agreement Between Members of the Kennebec Hydro Developers Group, the Kennebec Coalition, the National Marine Fisheries Service, the State of Maine, and the US Fish and Wildlife Service ("KHDG Settlement Agreement"), dated May 26, 1998. The 1998 KHDG Settlement Agreement was intended to: achieve a comprehensive settlement governing fisheries restoration, for numerous anadromous and catadromous species, that will rapidly assist in the restoration of these species in the Kennebec River after the termination on December 31, 1998 of the 1986 KHDG Agreement; avoid extensive litigation over fish passage methodologies, timetables and funding; assist in the removal of the Edwards Dam; and fund the next phase of a fisheries restoration program for the Kennebec River. Benton Falls Associates was a signatory to the 1998 agreement.

On September 16, 1998, FERC amended the license for the Benton Falls Project to include the fish passage requirements set forth in the 1998 KHDG Settlement Agreement.

By letter dated May 29, 2003, the Department of Marine Resources notified Benton Falls Associates that all of the pre-conditions of the 1998 *KHDG Settlement Agreement* for the contruction of upstream fish passage at the Benton Falls Project were expected to be completed by June 1, 2003. As a result, to satisfy the terms of the *KHDG Settlement Agreement* and Condition 5(C) of the Department's July 31, 1998 Order, permanent upstream fish passage facilities would need to be operational at the Benton Falls Project on or about June 1, 2004.

By letter dated June 23, 2004, the Department of Marine Resources notified Benton Falls Associates that the conditions in the *KHDG Settlement Agreement* triggering upstream fish passage at the Benton Falls Project were completely met on June 13, 2003, as follows: temporary upstream passage at Fort Halifax became operational in 2000; an Alaskan steeppass fishway was installed at the outlet of Pleasant Pond in Stetson Stream in 1999; the Newport Darn was removed in August 2002; two Alaskan steeppass fishways were installed at the outlet of Plymouth Pond in the summer of 2002; and a pool-and-chute fishway became operational at the outlet of Sebasticook Lake on June 13, 2003. As a result, under the terms of the *KHDG Settlement Agreement* and Condition 5(C) of the Department's July 31, 1998 Order, permanent upstream fish passage facilities were required to be operational at the Benton Falls Project by June 13, 2004.

#### BENTON FALLS ASSOCIATES BENTON FALLS HYDRO PROJECT #L-07519-35-S-C (Approval) L-22142-34-A-N (Approval)

#### MAINE WATERWAY DEVELOPMENT AND CONSERVATION ACT AND WATER QUALITY CERTIFICATION Page 3

By letter dated July 27, 2004, the Department notified FERC that Benton Falls Associates was in violation of the terms of its water quality certification and FERC license with respect to the construction and operation of permanent upstream fish passage facilities at the project.

By letter dated September 28, 2004, FERC concluded that Benton Falls Associates had violated the license for the project as it relates to the DEP's water quality certification and the requirement to install permanent upstream fish passage facilities at the project by June 13, 2004. By this letter, FERC directed Benton Falls Associates to consult with appropriate state and federal agencies, including the DEP, and file a mitigation plan commensurate with the impacts associated with the violation. This plan was to take into consideration any expenses incurred by the Maine Department of Marine Resources (MDMR) due to the lack of fish passage at the Benton Falls Project and was to include a schedule for its implementation and completion.

By letter dated February 25, 2005, Benton Falls Associates filed the required mitigation plan with FERC. Pursuant to the plan, Benton Falls Associates agreed to 1) pay \$18,000 to the National Fish and Wildlife Foundation, for deposit in the Kennebec River Restoration Fund, for trap and truck expenses incurred by MDMR on the Sebasticook River for the 2005 migratory season if the upstream fish passage facility is not operational by May 1, 2005, and 2) complete construction and begin operation of the upstream fish passage facility at the Benton Falls Project by May 1, 2005, or as soon as possible thereafter, but in no event later than December 31, 2005. Benton Falls Associates also agreed that the upstream fish passage facility will include a trap and sort facility, the details of which will be worked out pursuant to a separate agreement between Benton Falls Associates, MDMR, and certain other Maine State Agencies. This plan was approved by all consulting agencies, including the DEP.

On March 22, 2005, FERC approved the mitigation plan as filed by Benton Falls Associates.

#### 3. FISH PASSAGE CONDITIONS

As modified by the July 31, 1998 Order, Condition 5 of the permit and water quality certification for the Benton Falls Hydro Project reads as follows:

#### "A. FISHERIES RESTORATION SUPPORT

The applicant shall provide funding, conduct studies, engage in consultation, install fish passage facilities, report on annual restoration activities, and comply with all additional duties and obligations as set forth in the Agreement Between Members of the Kennebec Hydro Developers Group, the Kennebec Coalition, the National Marine Fisheries Service, the State of Maine, and the US Fish and Wildlife Service ("KHDG Settlement Agreement"), dated May 26, 1998.

# Benton Falls Hydroelectric Project Water Quality Report 2016 Sebasticook River, Benton, Maine

**Prepared for:** 

Benton Falls Associates c/o Essex Hydro Associates 55 Union Street, 4<sup>th</sup> Floor Boston, MA 02108

**Prepared by:** 



December 2016

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Appendix A - Maine State Standards for Classification of Class C Waters

# Introduction

In the summer of 2016, Benton Falls Associates, through its consultant, TRC, collected environmental data related to the chemistry and biology at three locations on the segment of the Sebasticook River in Benton: 1.) immediately upstream and 2.) immediately downstream of its Benton Falls hydropower generation facility and 3.) immediately above the upper limits of the impoundment (see Map 1). The data is to be submitted to the Maine Department of Environmental Protection (Maine DEP) for confirmation that the Benton Falls Hydroelectric Project does not cause or contribute to violations of Maine Water Quality Standards. Such confirmation will be submitted to the Low Impact Hydropower Institute as a condition of the project's certification as a low impact facility. The Sebasticook River in the vicinity of the Benton Falls Project is a Class C water.

## Methodology

TRC conducted an impoundment trophic state study at Benton Falls Associates' Benton Falls Hydroelectric Project in Benton, Maine. One sampling occurred during the last week of June, and thereafter two monthly samplings occurred in July through October at the deepest location in the impoundment. Based on communications with Benton Falls Associates, the deepest location of the impoundment is just to the left of the intake about 25 yards upstream of the powerhouse. For safety reasons, TRC conducted impoundment sampling from the buoy string located just upstream of the powerhouse. Parameters sampled by epilimnetic core grab sampling included total phosphorus, chlorophyll *a*, color, pH, and alkalinity. In addition, temperature and dissolved oxygen were recorded from the surface to the bottom of the impoundment at 1 meter increments and Secchi depth was recorded. Monitoring was conducted in accordance with the Maine DEP Sampling Protocol for Hydropower Studies as modified in consultation with the Maine DEP. See Map 1 for the impoundment sampling location.

In addition, TRC conducted a temperature and dissolved oxygen study downstream of the dam and upstream of the impoundment. In consultation with the Maine DEP after reconnaissance investigations of the tailrace, the downstream sampling was conducted at the nearest downstream location where the depth was less than 10 feet (approximately 200 feet downstream of the tailrace). The upstream sampling location was determined by TRC staff paddling upstream from the impoundment, and noting changes from impoundment to riverine conditions (water flow and depth). Maine DEP concurred with the upstream sampling location via email on July 15, 2016. See Map 1 for the upstream and tailrace sampling locations. Water depth at the upstream and tailrace sampling locations was less than 10 feet, therefore data sondes in unattended mode were used to collect hourly temperature and dissolved oxygen data over the summer.

During the summer of 2016, flows were very low and temperatures were generally warm. The Benton Falls facility generated infrequently during the water quality sampling period.

### Water Quality Parameters

Dissolved oxygen (DO) and temperature vertical profile (1 meter intervals) sampling was conducted at the Benton Falls impoundment nine times between June 30<sup>th</sup> and October 19, 2016. Also included in the sampling was Secchi disk transparency, total phosphorus, chlorophyll *a*, color, pH, and total alkalinity parameters. During the 2016 sampling effort the Benton Falls impoundment did not stratify.

Dissolved oxygen and temperature data were also collected using data recording sondes at two locations: (1) immediately above the upper limits of the portion of the Sebasticook River impounded by the Benton Falls Hydroelectric Facility and (2) approximately 200 feet downstream of the tailrace (see Map 1 Sampling Locations). The sondes were placed mid-depth in the river channel.

The sondes at both sampling locations were deployed on July 12<sup>th</sup>. It was discovered on a later check that the tailrace (downstream) sonde was not properly functioning. The downstream sonde was replaced on July 29, 2016, but had subsequent issues which were repaired on August 13, 2016. The upstream sonde, deployed on July 12, 2016, functioned properly for the entire time of its deployment, except for four of the last five days of the monitoring period when the sonde recorded DO concentrations of 0 mg/L overnight. Both sondes functioned properly between August 13<sup>th</sup> and September 14<sup>th</sup>. Maine DEP concurred with the collection of one month of upstream and downstream DO and temperature data via email on September 9, 2016.



Map 1 – Water Quality Sampling Locations

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# Results

### Water Quality Parameters

A summary of the sonde temperature and DO data for the period August 13<sup>th</sup> through September 14<sup>th</sup> is presented in Table 1. Table 1 also contains impoundment temperature and DO data collected with a hand held DO meter. In addition, data for the period August 13<sup>th</sup> through September 14<sup>th</sup>, when both sondes were functional, are shown in graphic form in Figures 1 - 3. All temperature and dissolved oxygen sampling data from the data sondes, including the times when the sondes failed, and impoundment sampling data are presented in tabular form in Table 2 – Benton Falls Temperature and Dissolved Oxygen Data from Data Sondes (Upstream and Tailrace) and Profile Data from Hand Held Dissolved Oxygen Meter (Impoundment). Additional water quality data is presented in Table 3 – Additional Benton Falls Water Quality Data.

DO concentrations and percent saturation were generally higher in the tailrace than in the upstream sampling location (see Table 1 below). The higher DO levels at the tailrace sampling location are likely due in great part to the proximity of the sampling location to the Benton Falls Dam spillway where the outflow water becomes aerated as it pours over the dam.

There is a distinct diurnal pattern at the upstream sampling location with DO dipping in the afternoon to evening hours, then beginning to rebound in the early morning hours. The % saturation follows a similar pattern to the DO concentration. This pattern is likely correlated to biological production in the river with DO being highest during the daylight period and dropping during the hours of darkness or low light when respiration dominates.

|                         | Tailrace<br>(sonde) | Upstream<br>(sonde) | Impoundment<br>(hand held meter) |  |  |  |  |  |  |  |  |
|-------------------------|---------------------|---------------------|----------------------------------|--|--|--|--|--|--|--|--|
| Temperature (°C)        | 21.8 - 25.2         | 20.2 - 26.3         | 22.3 - 23.9                      |  |  |  |  |  |  |  |  |
| Dissolved oxygen (mg/L) | 8.0 - 10.3          | 7.6 - 10.0          | 7.0 - 7.9                        |  |  |  |  |  |  |  |  |
| % Saturation            | 93.9 - 118.4        | 85.6 - 114.7        | 81.0 - 91.0                      |  |  |  |  |  |  |  |  |

Table 1 – Range Summary of Temperature and DO Data for Tailrace, Upstream and<br/>Impoundment<br/>(August 13th through September 14th)

Water quality data collected from June through October of 2016 show that the Sebasticook River in the vicinity of the Benton Falls Hydroelectric Project is meeting Maine DEP Class C water quality standards. During the 2016 sampling season, the lowest recorded DO concentration and percent saturation were 5.00 mg/L and 58%, respectively, in the bottom of the impoundment (7.0 meters) on June 30, 2016. On that impoundment sampling date, at 6.0 meters, DO was 5.72 mg/L

and 65% saturation. At the surface of the impoundment on that sampling date, DO was 7.97 mg/L and 98% saturation. On subsequent impoundment sampling events the DO did not go below 6.10 mg/L and 73% saturation (July 26, 2016) at the deepest portion of the impoundment (see Table 2). The lowest DO concentration recorded by the data sonde for the upstream location was 7.4 mg/L on July 29, 2016<sup>1</sup> and the lowest DO saturation recorded by the data sonde for the upstream location was 85.6% on September 12, 2016. The lowest DO concentration recorded by the data sonde for the tailrace location was 8.0 mg/L on August 15, 2016 and 89.0% saturation on September 19,  $2016^2$ .

Table 3 presents data on the five parameters sampled during the impoundment sampling events from June 30<sup>th</sup> through October 19, 2016. Chlorophyll *a* ranged from 0.0014 to 0.0062 mg/L, total phosphorus ranged from 13 to 30 ug/L, color ranged from 16 to 29 PCU, pH ranged from 6.9 to 7.2 S.U., and total alkalinity ranged from 30 to 38 mg/L. Secchi depths ranged from 2.7 to 4.7 meters, while overall impoundment depth during the sampling period ranged from 6.8 to 7.2 meters. See Table 3 for detailed impoundment sampling parameter results.

### Point-Source Discharges in the Vicinity of the Benton Falls Hydroelectric Project Facility

The Maine DEP's Wastewater Facilities and Outfalls Google Earth kmz file was reviewed to determine point-source discharges in the vicinity of the Benton Falls Hydroelectric Facility to provide context for the facility's potential effects. No point-source discharges were identified in the immediate vicinity of the Benton Falls Hydroelectric Facility. The nearest upstream discharge is the Clinton Water District outfall, which is located approximately 7 river miles upstream of the portion of the Sebasticook River impounded by the Benton Falls Hydroelectric Facility. The upstream sonde sampling location is just above the upper limits of the impoundment and is depicted on Map 1.

<sup>&</sup>lt;sup>1</sup> Water quality data for the upstream data sonde is available for the period July 12<sup>th</sup> through September 19<sup>th</sup>. The lowest DO concentration listed is for a date which precedes the sampling period shown in Table 1, which is for the period August 13<sup>th</sup> through September 14<sup>th</sup>.

<sup>&</sup>lt;sup>2</sup> Water quality data for the tailrace data sonde is available for the period August 13<sup>th</sup> through September 19<sup>th</sup>. The lowest DO % saturation listed is for a date which is after the sampling period shown in Table 1, which is for the period August 13<sup>th</sup> through September 14<sup>th</sup>.



### **Figure 1 – Benton Falls Temperature**



### Figure 2 – Benton Falls Dissolved Oxygen Concentration



### Figure 3 – Benton Falls Dissolved Oxygen Percent Saturation

|              |            |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|--------------|------------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date         | Time       | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|              |            | Surf. |                     |                   |                         | Stn. #1 - 23.5      | Stn. #1 - 8.23        | Stn. #1 - 97            |                     |                   |                         |
|              |            | 1m    |                     |                   |                         | Stn. #1 - 23.5      | Stn. #1 - 8.16        | Stn. #1 - 96            |                     |                   |                         |
|              |            | 2m    |                     |                   |                         | Stn. #1 - 23.5      | Stn. #1 - 8.20        | Stn. #1 - 97            |                     |                   |                         |
|              | 10:00 AM   | 3m    |                     |                   |                         | Stn. #1 - 23.6      | Stn. #1 - 8.26        | Stn. #1 - 98            |                     |                   |                         |
|              |            | 4m    |                     |                   |                         | Stn. #1 - 23.5      | Stn. #1 - 8.23        | Stn. #1 - 97            |                     |                   |                         |
|              |            | 5m    |                     |                   |                         | Stn. #1 - 23.5      | Stn. #1 - 8.15        | Stn. #1 - 96            |                     |                   |                         |
|              |            | 6m    |                     |                   |                         | Stn. #1 - 23.5      | Stn. #1 - 8.24        | Stn. #1 - 97            |                     |                   |                         |
|              |            | Surf. |                     |                   |                         | Stn. #2 - 24.0      | Stn. #2 - 8.20        | Stn. #2 - 97            |                     |                   |                         |
|              | 11:00 AM   | 1m    |                     |                   |                         | Stn. #2 - 24.0      | Stn. #2 - 8.20        | Stn. #2 - 97            |                     |                   |                         |
| c /20 /201 c |            | 2m    |                     |                   |                         | Stn. #2 - 24.0      | Stn. #2 - 8.30        | Stn. #2 - 98            |                     |                   |                         |
| 6/30/2016    |            | Surf. |                     |                   |                         | Stn. #3 - 24.2      | Stn. #3 - 8.50        | Stn. #3 - 101           |                     |                   |                         |
|              | 11:15 AM   | 1m    |                     |                   |                         | Stn. #3 - 24.2      | Stn. #3 - 8.40        | Stn. #3 - 100           |                     |                   |                         |
|              |            | Surf. |                     |                   |                         |                     |                       |                         | 26.0                | 7.97              | 98                      |
|              |            | 1m    |                     |                   |                         |                     |                       |                         | 24.4                | 8.18              | 97                      |
|              |            | 2m    |                     |                   |                         |                     |                       |                         | 23.8                | 7.86              | 93                      |
|              | 12:00 DM   | 3m    |                     |                   |                         |                     |                       |                         | 23.7                | 7.49              | 88                      |
|              | 12.001101  | 4m    |                     |                   |                         |                     |                       |                         | 23.4                | 6.27              | 74                      |
|              |            | 5m    |                     |                   |                         |                     |                       |                         | 22.9                | 5.75              | 67                      |
|              |            | 6m    |                     |                   |                         |                     |                       |                         | 22.3                | 5.72              | 65                      |
|              |            | 7m    |                     |                   |                         |                     |                       |                         | 22.1                | 5.00              | 58                      |
|              |            | Surf. |                     |                   |                         |                     |                       |                         | 23.7                | 8.78              | 103                     |
| 7/12/2016    | 12:00 DM   | 1m    |                     |                   |                         |                     |                       |                         | 22.7                | 8.65              | 100                     |
| //12/2016    | 12:00 PIVI | 2m    |                     |                   |                         |                     |                       |                         | 22.4                | 8.60              | 98                      |
|              |            | 3m    |                     |                   |                         |                     |                       |                         | 22.0                | 7.35              | 83                      |

# Table 2 – Benton Falls Temperature and Dissolved Oxygen Data from Data Sondes (Upstream and Tailrace) and Hand Held Dissolved Oxygen Meter (Impoundment)

|           |           |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-----------|-----------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|           |           | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date      | Time Dept | n (°C)      | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|           | 4r        | 1           |          |                  |             |                       |                  | 21.5        | 7.50        | 84               |
|           | 5r        | ı           |          |                  |             |                       |                  | 21.4        | 7.40        | 83               |
|           | 6r        | ı           |          |                  |             |                       |                  | 21.1        | 7.54        | 83               |
|           | 7r        | ı           |          |                  |             |                       |                  | 20.8        | 7.40        | 81               |
|           | 3:00 PM   | 23.8        | 9.40     | 110.2            |             |                       |                  |             |             |                  |
|           | 4:00 PM   | 23.8        | 9.40     | 110.3            |             |                       |                  |             |             |                  |
|           | 5:00 PM   | 23.7        | 9.40     | 109.6            |             |                       |                  |             |             |                  |
|           | 6:00 PM   | 23.9        | 9.30     | 109.3            |             |                       |                  |             |             |                  |
|           | 7:00 PM   | 23.8        | 9.20     | 107.6            |             |                       |                  |             |             |                  |
|           | 8:00 PM   | 23.7        | 8.90     | 104.9            |             |                       |                  |             |             |                  |
|           | 9:00 PM   | 23.6        | 8.70     | 102.3            |             |                       |                  |             |             |                  |
|           | 10:00 PM  | 23.5        | 8.55     | 101.4            |             |                       |                  |             |             |                  |
|           | 11:00 PM  | 23.5        | 8.70     | 100.9            |             |                       |                  |             |             |                  |
|           | 12:00 AM  | 23.4        | 8.65     | 100.4            |             |                       |                  |             |             |                  |
|           | 1:00 AM   | 23.4        | 8.65     | 100.1            |             |                       |                  |             |             |                  |
|           | 2:00 AM   | 23.4        | 8.65     | 99.7             |             |                       |                  |             |             |                  |
|           | 3:00 AM   | 23.4        | 8.65     | 99.5             |             |                       |                  |             |             |                  |
|           | 4:00 AM   | 23.4        | 8.50     | 99.1             |             |                       |                  |             |             |                  |
|           | 5:00 AM   | 23.3        | 8.50     | 98.7             |             |                       |                  |             |             |                  |
| 7/13/2016 | 6:00 AM   | 23.3        | 8.50     | 98.9             |             |                       |                  |             |             |                  |
|           | 7:00 AM   | 23.4        | 8.70     | 101.1            |             |                       |                  |             |             |                  |
|           | 8:00 AM   | 23.6        | 8.85     | 104.4            |             |                       |                  |             |             |                  |
|           | 9:00 AM   | 24.0        | 9.10     | 106.9            |             |                       |                  |             |             |                  |
|           | 10:00 AM  | 24.4        | 9.30     | 109.0            |             |                       |                  |             |             |                  |
|           | 11:00 AM  | 24.8        | 9.30     | 111.3            |             |                       |                  |             |             |                  |
|           | 12:00 PM  | 25.3        | 9.50     | 113.1            |             |                       |                  |             |             |                  |

|           |          |       |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  | Impoundment |         |                  |
|-----------|----------|-------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|---------|------------------|
|           |          |       | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc | DO<br>Saturation |
| Date      | Time     | Depth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)  | (%)              |
|           | 1:00 PM  |       | 25.6        | 9.45     | 114.6            |             |                       |                  |             |         |                  |
|           | 2:00 PM  |       | 25.9        | 9.50     | 115.6            |             |                       |                  |             |         |                  |
|           | 3:00 PM  |       | 26.2        | 9.50     | 115.7            |             |                       |                  |             |         |                  |
|           | 4:00 PM  |       | 26.2        | 9.45     | 114.7            |             |                       |                  |             |         |                  |
|           | 5:00 PM  |       | 26.0        | 9.35     | 113.5            |             |                       |                  |             |         |                  |
|           | 6:00 PM  |       | 25.9        | 9.20     | 112.0            |             |                       |                  |             |         |                  |
|           | 7:00 PM  |       | 25.7        | 9.00     | 109.7            |             |                       |                  |             |         |                  |
|           | 8:00 PM  |       | 25.4        | 8.90     | 106.2            |             |                       |                  |             |         |                  |
|           | 9:00 PM  |       | 25.3        | 8.70     | 103.7            |             |                       |                  |             |         |                  |
|           | 10:00 PM |       | 25.2        | 8.50     | 102.1            |             |                       |                  |             |         |                  |
|           | 11:00 PM |       | 25.1        | 8.40     | 101.2            |             |                       |                  |             |         |                  |
|           | 12:00 AM |       | 25.0        | 8.40     | 100.5            |             |                       |                  |             |         |                  |
|           | 1:00 AM  |       | 24.9        | 8.35     | 99.5             |             |                       |                  |             |         |                  |
|           | 2:00 AM  |       | 24.8        | 8.25     | 99.1             |             |                       |                  |             |         |                  |
|           | 3:00 AM  |       | 24.8        | 8.15     | 98.4             |             |                       |                  |             |         |                  |
|           | 4:00 AM  |       | 24.7        | 8.15     | 97.7             |             |                       |                  |             |         |                  |
|           | 5:00 AM  |       | 24.6        | 8.10     | 97.2             |             |                       |                  |             |         |                  |
|           | 6:00 AM  |       | 24.6        | 8.10     | 97.2             |             |                       |                  |             |         |                  |
| 7/14/2016 | 7:00 AM  |       | 24.6        | 8.25     | 99.3             |             |                       |                  |             |         |                  |
|           | 8:00 AM  |       | 24.9        | 8.70     | 103.6            |             |                       |                  |             |         |                  |
|           | 9:00 AM  |       | 25.2        | 8.90     | 106.3            |             |                       |                  |             |         |                  |
|           | 10:00 AM |       | 25.5        | 8.95     | 108.7            |             |                       |                  |             |         |                  |
|           | 11:00 AM |       | 26.0        | 9.10     | 110.8            |             |                       |                  |             |         |                  |
|           | 12:00 PM |       | 26.5        | 9.10     | 112.7            |             |                       |                  |             |         |                  |
|           | 1:00 PM  |       | 26.7        | 9.10     | 112.8            |             |                       |                  |             |         |                  |
|           | 2:00 PM  |       | 26.7        | 9.10     | 113.1            |             |                       |                  |             |         |                  |

|           |          |       |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-----------|----------|-------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|           |          |       | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date      | Time     | Depth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|           | 3:00 PM  |       | 26.9        | 9.10     | 113.2            |             |                       |                  |             |             |                  |
|           | 4:00 PM  |       | 26.8        | 8.95     | 111.2            |             |                       |                  |             |             |                  |
|           | 5:00 PM  |       | 26.4        | 8.90     | 107.8            |             |                       |                  |             |             |                  |
|           | 6:00 PM  |       | 26.2        | 8.80     | 107.4            |             |                       |                  |             |             |                  |
|           | 7:00 PM  |       | 26.1        | 8.70     | 105.2            |             |                       |                  |             |             |                  |
|           | 8:00 PM  |       | 25.9        | 8.50     | 102.8            |             |                       |                  |             |             |                  |
|           | 9:00 PM  |       | 25.8        | 8.30     | 101.3            |             |                       |                  |             |             |                  |
|           | 10:00 PM |       | 25.7        | 8.20     | 100.2            |             |                       |                  |             |             |                  |
|           | 11:00 PM |       | 25.6        | 8.10     | 99.4             |             |                       |                  |             |             |                  |
|           | 12:00 AM |       | 25.6        | 8.10     | 98.9             |             |                       |                  |             |             |                  |
|           | 1:00 AM  |       | 25.6        | 8.10     | 98.5             |             |                       |                  |             |             |                  |
|           | 2:00 AM  |       | 25.7        | 8.00     | 98.1             |             |                       |                  |             |             |                  |
|           | 3:00 AM  |       | 25.7        | 8.00     | 97.5             |             |                       |                  |             |             |                  |
|           | 4:00 AM  |       | 25.7        | 7.95     | 96.7             |             |                       |                  |             |             |                  |
|           | 5:00 AM  |       | 25.8        | 7.90     | 95.7             |             |                       |                  |             |             |                  |
|           | 6:00 AM  |       | 25.7        | 7.80     | 95.3             |             |                       |                  |             |             |                  |
|           | 7:00 AM  |       | 25.7        | 7.95     | 96.9             |             |                       |                  |             |             |                  |
| 7/15/2016 | 8:00 AM  |       | 25.8        | 8.20     | 99.6             |             |                       |                  |             |             |                  |
|           | 9:00 AM  |       | 26.0        | 8.30     | 101.1            |             |                       |                  |             |             |                  |
|           | 10:00 AM |       | 26.1        | 8.50     | 102.5            |             |                       |                  |             |             |                  |
|           | 11:00 AM |       | 26.3        | 8.60     | 103.9            |             |                       |                  |             |             |                  |
|           | 12:00 PM |       | 26.3        | 8.60     | 103.8            |             |                       |                  |             |             |                  |
|           | 1:00 PM  |       | 26.5        | 8.55     | 105.9            |             |                       |                  |             |             |                  |
|           | 2:00 PM  |       | 26.7        | 8.60     | 107.1            |             |                       |                  |             |             |                  |
|           | 3:00 PM  |       | 27.0        | 8.70     | 108.3            |             |                       |                  |             |             |                  |
|           | 4:00 PM  |       | 26.9        | 8.70     | 107.9            |             |                       |                  |             |             |                  |

|           |          |       |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-----------|----------|-------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
| Data      |          | Devil | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date      | Time     | Depth | (*C)        | (mg/L)   | (%)              | (*C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|           | 5:00 PM  |       | 26.9        | 8.60     | 107.2            |             |                       |                  |             |             |                  |
|           | 6:00 PM  |       | 26.7        | 8.50     | 105.0            |             |                       |                  |             |             |                  |
|           | 7:00 PM  |       | 26.6        | 8.45     | 104.1            |             |                       |                  |             |             |                  |
|           | 8:00 PM  |       | 26.5        | 8.40     | 101.8            |             |                       |                  |             |             |                  |
|           | 9:00 PM  |       | 26.4        | 8.20     | 100.1            |             |                       |                  |             |             |                  |
|           | 10:00 PM |       | 26.3        | 8.10     | 99.3             |             |                       |                  |             |             |                  |
|           | 11:00 PM |       | 26.2        | 8.10     | 98.7             |             |                       |                  |             |             |                  |
|           | 12:00 AM |       | 26.1        | 8.00     | 98.2             |             |                       |                  |             |             |                  |
|           | 1:00 AM  |       | 26.0        | 8.00     | 97.9             |             |                       |                  |             |             |                  |
|           | 2:00 AM  |       | 26.0        | 7.95     | 97.4             |             |                       |                  |             |             |                  |
|           | 3:00 AM  |       | 26.0        | 7.95     | 96.8             |             |                       |                  |             |             |                  |
|           | 4:00 AM  |       | 25.9        | 7.90     | 96.2             |             |                       |                  |             |             |                  |
|           | 5:00 AM  |       | 25.9        | 7.90     | 95.5             |             |                       |                  |             |             |                  |
|           | 6:00 AM  |       | 25.8        | 7.80     | 95.2             |             |                       |                  |             |             |                  |
|           | 7:00 AM  |       | 25.9        | 7.95     | 97.0             |             |                       |                  |             |             |                  |
|           | 8:00 AM  |       | 26.1        | 8.20     | 99.7             |             |                       |                  |             |             |                  |
| 7/16/2016 | 9:00 AM  |       | 26.4        | 8.40     | 101.9            |             |                       |                  |             |             |                  |
|           | 10:00 AM |       | 26.6        | 8.45     | 103.6            |             |                       |                  |             |             |                  |
|           | 11:00 AM |       | 27.0        | 8.55     | 105.9            |             |                       |                  |             |             |                  |
|           | 12:00 PM |       | 27.4        | 8.70     | 107.5            |             |                       |                  |             |             |                  |
|           | 1:00 PM  |       | 27.5        | 8.40     | 106.4            |             |                       |                  |             |             |                  |
|           | 2:00 PM  |       | 27.7        | 8.55     | 108.1            |             |                       |                  |             |             |                  |
|           | 3:00 PM  |       | 27.8        | 8.55     | 108.3            |             |                       |                  |             |             |                  |
|           | 4:00 PM  |       | 27.7        | 8.55     | 107.5            |             |                       |                  |             |             |                  |
|           | 5:00 PM  |       | 27.4        | 8.60     | 106.5            |             |                       |                  |             |             |                  |
|           | 6:00 PM  |       | 27.3        | 8.50     | 105.2            |             |                       |                  |             |             |                  |

|           |          |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-----------|----------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|           |          | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature |             | DO<br>Saturation |
| Date      | Time Dep | h (°C)      | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|           | 7:00 PM  | 27.2        | 8.35     | 102.8            |             |                       |                  |             |             |                  |
|           | 8:00 PM  | 27.1        | 8.20     | 101.1            |             |                       |                  |             |             |                  |
|           | 9:00 PM  | 26.9        | 8.00     | 98.7             |             |                       |                  |             |             |                  |
|           | 10:00 PM | 26.8        | 7.90     | 97.7             |             |                       |                  |             |             |                  |
|           | 11:00 PM | 26.7        | 7.80     | 97.2             |             |                       |                  |             |             |                  |
|           | 12:00 AM | 26.6        | 7.80     | 96.6             |             |                       |                  |             |             |                  |
|           | 1:00 AM  | 26.5        | 7.70     | 96.2             |             |                       |                  |             |             |                  |
|           | 2:00 AM  | 26.5        | 7.90     | 95.8             |             |                       |                  |             |             |                  |
|           | 3:00 AM  | 26.4        | 7.80     | 95.2             |             |                       |                  |             |             |                  |
|           | 4:00 AM  | 26.3        | 7.80     | 94.7             |             |                       |                  |             |             |                  |
|           | 5:00 AM  | 26.3        | 7.75     | 94.0             |             |                       |                  |             |             |                  |
|           | 6:00 AM  | 26.2        | 7.75     | 93.6             |             |                       |                  |             |             |                  |
|           | 7:00 AM  | 26.2        | 7.75     | 93.7             |             |                       |                  |             |             |                  |
|           | 8:00 AM  | 26.1        | 7.75     | 94.1             |             |                       |                  |             |             |                  |
|           | 9:00 AM  | 26.1        | 7.80     | 94.7             |             |                       |                  |             |             |                  |
| 7/17/2016 | 10:00 AM | 26.1        | 7.95     | 96.5             |             |                       |                  |             |             |                  |
|           | 11:00 AM | 26.0        | 7.95     | 96.9             |             |                       |                  |             |             |                  |
|           | 12:00 PM | 26.2        | 8.20     | 99.8             |             |                       |                  |             |             |                  |
|           | 1:00 PM  | 26.5        | 8.50     | 102.9            |             |                       |                  |             |             |                  |
|           | 2:00 PM  | 26.7        | 8.35     | 103.2            |             |                       |                  |             |             |                  |
|           | 3:00 PM  | 27.1        | 8.50     | 104.7            |             |                       |                  |             |             |                  |
|           | 4:00 PM  | 26.9        | 8.45     | 103.6            |             |                       |                  |             |             |                  |
|           | 5:00 PM  | 26.6        | 8.25     | 101.5            |             |                       |                  |             |             |                  |
|           | 6:00 PM  | 26.6        | 8.20     | 100.7            |             |                       |                  |             |             |                  |
|           | 7:00 PM  | 26.3        | 8.00     | 98.3             |             |                       |                  |             |             |                  |
|           | 8:00 PM  | 26.2        | 7.95     | 97.0             |             |                       |                  |             |             |                  |

|           |          |      |             | Upstream |       |             | Tailrace <sup>1</sup> |     |            | Impoundment |     |
|-----------|----------|------|-------------|----------|-------|-------------|-----------------------|-----|------------|-------------|-----|
|           |          |      | Tomporature | DO Cana  | DO    | Tomporature |                       | DO  | Tomasatura | DO Corro    | DO  |
| Date      | Time De  | epth | (°C)        | (mg/L)   | (%)   | (°C)        | (mg/L)                | (%) | (°C)       | (mg/L)      | (%) |
|           | 9:00 PM  |      | 26.1        | 7.80     | 95.4  |             |                       |     |            |             |     |
|           | 10:00 PM |      | 26.1        | 7.80     | 95.1  |             |                       |     |            |             |     |
|           | 11:00 PM |      | 26.0        | 7.80     | 95.1  |             |                       |     |            |             |     |
|           | 12:00 AM |      | 26.0        | 7.80     | 94.9  |             |                       |     |            |             |     |
|           | 1:00 AM  |      | 25.9        | 7.80     | 94.7  |             |                       |     |            |             |     |
|           | 2:00 AM  |      | 25.9        | 7.75     | 94.4  |             |                       |     |            |             |     |
|           | 3:00 AM  |      | 25.9        | 7.75     | 93.9  |             |                       |     |            |             |     |
|           | 4:00 AM  |      | 25.9        | 7.65     | 93.4  |             |                       |     |            |             |     |
|           | 5:00 AM  |      | 25.8        | 7.65     | 92.6  |             |                       |     |            |             |     |
|           | 6:00 AM  |      | 25.8        | 7.60     | 92.4  |             |                       |     |            |             |     |
|           | 7:00 AM  |      | 25.7        | 7.65     | 93.4  |             |                       |     |            |             |     |
|           | 8:00 AM  |      | 25.6        | 7.75     | 94.1  |             |                       |     |            |             |     |
|           | 9:00 AM  |      | 25.7        | 7.90     | 96.1  |             |                       |     |            |             |     |
|           | 10:00 AM |      | 26.0        | 8.10     | 99.1  |             |                       |     |            |             |     |
| 7/18/2016 | 11:00 AM |      | 26.3        | 8.30     | 100.7 |             |                       |     |            |             |     |
|           | 12:00 PM |      | 26.5        | 8.30     | 101.2 |             |                       |     |            |             |     |
|           | 1:00 PM  |      | 26.7        | 8.35     | 102.9 |             |                       |     |            |             |     |
|           | 2:00 PM  |      | 26.6        | 8.35     | 102.8 |             |                       |     |            |             |     |
|           | 3:00 PM  |      | 26.6        | 8.45     | 103.8 |             |                       |     |            |             |     |
|           | 4:00 PM  |      | 26.3        | 8.40     | 101.5 |             |                       |     |            |             |     |
|           | 5:00 PM  |      | 26.3        | 8.40     | 101.9 |             |                       |     |            |             |     |
|           | 6:00 PM  |      | 26.2        | 8.40     | 102.0 |             |                       |     |            |             |     |
|           | 7:00 PM  |      | 26.3        | 8.40     | 101.6 |             |                       |     |            |             |     |
|           | 8:00 PM  |      | 26.1        | 8.20     | 99.5  |             |                       |     |            |             |     |
|           | 9:00 PM  |      | 25.8        | 8.10     | 98.6  |             |                       |     |            |             |     |
|           | 10:00 PM |      | 25.9        | 8.00     | 98.2  |             |                       |     |            |             |     |

|           |          |       |                     | Upstream          |                   |                     | Tailrace <sup>1</sup> |                   |                     | Impoundment       |                   |
|-----------|----------|-------|---------------------|-------------------|-------------------|---------------------|-----------------------|-------------------|---------------------|-------------------|-------------------|
|           |          |       | _                   |                   | DO                |                     |                       | DO                | _                   |                   | DO                |
| Date      | Time De  | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | Saturation<br>(%) |
|           | 11:00 PM | -     | 25.9                | 8.00              | 97.8              |                     |                       |                   |                     |                   |                   |
|           | 12:00 AM |       | 25.8                | 7.95              | 97.4              |                     |                       |                   |                     |                   |                   |
|           | 1:00 AM  |       | 25.7                | 7.95              | 96.8              |                     |                       |                   |                     |                   |                   |
|           | 2:00 AM  |       | 25.7                | 7.90              | 96.0              |                     |                       |                   |                     |                   |                   |
|           | 3:00 AM  |       | 25.6                | 7.80              | 95.2              |                     |                       |                   |                     |                   |                   |
|           | 4:00 AM  |       | 25.5                | 7.80              | 94.4              |                     |                       |                   |                     |                   |                   |
|           | 5:00 AM  |       | 25.3                | 7.80              | 93.5              |                     |                       |                   |                     |                   |                   |
|           | 6:00 AM  |       | 25.2                | 7.75              | 93.1              |                     |                       |                   |                     |                   |                   |
|           | 7:00 AM  |       | 25.1                | 7.80              | 94.2              |                     |                       |                   |                     |                   |                   |
|           | 8:00 AM  |       | 25.2                | 8.10              | 96.6              |                     |                       |                   |                     |                   |                   |
|           | 9:00 AM  |       | 25.3                | 8.15              | 97.9              |                     |                       |                   |                     |                   |                   |
|           | 10:00 AM |       | 25.4                | 8.25              | 98.7              |                     |                       |                   |                     |                   |                   |
| 7/19/2016 | 11:00 AM |       | 25.4                | 8.25              | 99.3              |                     |                       |                   |                     |                   |                   |
| 771572010 | 12:00 PM |       | 25.6                | 8.30              | 100.9             |                     |                       |                   |                     |                   |                   |
|           | 1:00 PM  |       | 25.7                | 8.40              | 101.9             |                     |                       |                   |                     |                   |                   |
|           | 2:00 PM  |       | 26.1                | 8.60              | 103.8             |                     |                       |                   |                     |                   |                   |
|           | 3:00 PM  |       | 26.1                | 8.60              | 103.9             |                     |                       |                   |                     |                   |                   |
|           | 4:00 PM  |       | 26.1                | 8.60              | 103.8             |                     |                       |                   |                     |                   |                   |
|           | 5:00 PM  |       | 26.1                | 8.60              | 104.2             |                     |                       |                   |                     |                   |                   |
|           | 6:00 PM  |       | 25.9                | 8.50              | 103.2             |                     |                       |                   |                     |                   |                   |
|           | 7:00 PM  |       | 25.8                | 8.30              | 101.4             |                     |                       |                   |                     |                   |                   |
|           | 8:00 PM  |       | 25.6                | 8.20              | 100.2             |                     |                       |                   |                     |                   |                   |
|           | 9:00 PM  |       | 25.5                | 8.25              | 99.0              |                     |                       |                   |                     |                   |                   |
|           | 10:00 PM |       | 25.3                | 8.15              | 98.4              |                     |                       |                   |                     |                   |                   |
|           | 11:00 PM |       | 25.2                | 8.15              | 98.1              |                     |                       |                   |                     |                   |                   |

|           |          |       |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-----------|----------|-------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|           |          |       | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature |             | DO<br>Saturation |
| Date      | Time D   | Depth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|           | 12:00 AM |       | 25.0        | 8.15     | 97.6             |             |                       |                  |             |             |                  |
|           | 1:00 AM  |       | 24.9        | 8.10     | 97.1             |             |                       |                  |             |             |                  |
|           | 2:00 AM  |       | 24.8        | 8.10     | 96.5             |             |                       |                  |             |             |                  |
|           | 3:00 AM  |       | 24.6        | 7.95     | 95.9             |             |                       |                  |             |             |                  |
|           | 4:00 AM  |       | 24.5        | 7.90     | 95.3             |             |                       |                  |             |             |                  |
|           | 5:00 AM  |       | 24.4        | 8.05     | 94.5             |             |                       |                  |             |             |                  |
|           | 6:00 AM  |       | 24.2        | 8.00     | 94.2             |             |                       |                  |             |             |                  |
|           | 7:00 AM  |       | 24.1        | 8.05     | 95.3             |             |                       |                  |             |             |                  |
|           | 8:00 AM  |       | 24.2        | 8.20     | 96.9             |             |                       |                  |             |             |                  |
|           | 9:00 AM  |       | 24.2        | 8.25     | 97.5             |             |                       |                  |             |             |                  |
|           | 10:00 AM |       | 24.2        | 8.25     | 98.0             |             |                       |                  |             |             |                  |
| 7/20/2016 | 11:00 AM |       | 24.3        | 8.30     | 99.0             |             |                       |                  |             |             |                  |
| , , ,     | 12:00 PM |       | 24.5        | 8.55     | 100.7            |             |                       |                  |             |             |                  |
|           | 1:00 PM  |       | 24.7        | 8.50     | 102.2            |             |                       |                  |             |             |                  |
|           | 2:00 PM  |       | 25.0        | 8.70     | 103.8            |             |                       |                  |             |             |                  |
|           | 3:00 PM  |       | 25.2        | 8.80     | 105.1            |             |                       |                  |             |             |                  |
|           | 4:00 PM  |       | 25.3        | 8.90     | 106.0            |             |                       |                  |             |             |                  |
|           | 5:00 PM  |       | 25.2        | 9.00     | 106.5            |             |                       |                  |             |             |                  |
|           | 6:00 PM  |       | 25.2        | 8.90     | 106.1            |             |                       |                  |             |             |                  |
|           | 7:00 PM  |       | 25.1        | 8.80     | 105.1            |             |                       |                  |             |             |                  |
|           | 8:00 PM  |       | 25.1        | 8.70     | 104.0            |             |                       |                  |             |             |                  |
|           | 9:00 PM  |       | 25.0        | 8.60     | 102.9            |             |                       |                  |             |             |                  |
|           | 10:00 PM |       | 24.9        | 8.50     | 102.3            |             |                       |                  |             |             |                  |
|           | 11:00 PM |       | 24.8        | 8.40     | 101.4            |             |                       |                  |             |             |                  |
| 7/21/2016 | 12:00 AM |       | 24.7        | 8.40     | 100.7            |             |                       |                  |             |             |                  |
| ,, _010   | 1:00 AM  |       | 24.6        | 8.35     | 99.7             |             |                       |                  |             |             |                  |

|             |          |       |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-------------|----------|-------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|             |          |       | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date        | Time D   | Depth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|             | 2:00 AM  |       | 24.5        | 8.30     | 98.7             |             |                       |                  |             |             |                  |
|             | 3:00 AM  |       | 24.3        | 8.25     | 97.7             |             |                       |                  |             |             |                  |
|             | 4:00 AM  |       | 24.2        | 8.20     | 96.7             |             |                       |                  |             |             |                  |
|             | 5:00 AM  |       | 24.0        | 8.15     | 95.8             |             |                       |                  |             |             |                  |
|             | 6:00 AM  |       | 23.9        | 8.05     | 95.2             |             |                       |                  |             |             |                  |
|             | 7:00 AM  |       | 23.9        | 8.15     | 96.4             |             |                       |                  |             |             |                  |
|             | 8:00 AM  |       | 24.0        | 8.25     | 97.9             |             |                       |                  |             |             |                  |
|             | 9:00 AM  |       | 24.1        | 8.30     | 99.1             |             |                       |                  |             |             |                  |
|             | 10:00 AM |       | 24.4        | 8.40     | 100.1            |             |                       |                  |             |             |                  |
|             | 11:00 AM |       | 24.7        | 8.50     | 101.7            |             |                       |                  |             |             |                  |
|             | 12:00 PM |       | 25.0        | 8.60     | 103.1            |             |                       |                  |             |             |                  |
|             | 1:00 PM  |       | 25.2        | 8.80     | 104.8            |             |                       |                  |             |             |                  |
|             | 2:00 PM  |       | 25.5        | 8.90     | 106.3            |             |                       |                  |             |             |                  |
|             | 3:00 PM  |       | 25.5        | 9.00     | 106.9            |             |                       |                  |             |             |                  |
|             | 4:00 PM  |       | 25.5        | 9.10     | 107.8            |             |                       |                  |             |             |                  |
|             | 5:00 PM  |       | 25.4        | 9.10     | 108.2            |             |                       |                  |             |             |                  |
|             | 6:00 PM  |       | 25.4        | 9.10     | 107.8            |             |                       |                  |             |             |                  |
|             | 7:00 PM  |       | 25.3        | 8.90     | 106.2            |             |                       |                  |             |             |                  |
|             | 8:00 PM  |       | 25.3        | 8.80     | 104.7            |             |                       |                  |             |             |                  |
|             | 9:00 PM  |       | 25.2        | 8.60     | 103.4            |             |                       |                  |             |             |                  |
|             | 10:00 PM |       | 25.2        | 8.60     | 102.6            |             |                       |                  |             |             |                  |
|             | 11:00 PM |       | 25.1        | 8.50     | 101.8            |             |                       |                  |             |             |                  |
|             | 12:00 AM |       | 25.1        | 8.40     | 100.9            |             |                       |                  |             |             |                  |
| 7/22/2016   | 1:00 AM  |       | 25.0        | 8.35     | 99.9             |             |                       |                  |             |             |                  |
| ,, 22, 2010 | 2:00 AM  |       | 25.0        | 8.25     | 99.0             |             |                       |                  |             |             |                  |
|             | 3:00 AM  |       | 24.9        | 8.15     | 98.0             |             |                       |                  |             |             |                  |

|           |          |       |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |     |
|-----------|----------|-------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|-----|
|           |          |       | Tomporatura | DO Conc  | DO<br>Saturation | Tomporatura | DO Conc               | DO<br>Saturation | Tomporaturo | DO Conc     | DO  |
| Date      | Time     | Depth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%) |
|           | 4:00 AM  |       | 24.8        | 8.10     | 97.1             |             |                       |                  |             |             |     |
|           | 5:00 AM  |       | 24.7        | 7.95     | 96.2             |             |                       |                  |             |             |     |
|           | 6:00 AM  |       | 24.7        | 7.95     | 95.6             |             |                       |                  |             |             |     |
|           | 7:00 AM  |       | 24.7        | 7.95     | 95.9             |             |                       |                  |             |             |     |
|           | 8:00 AM  |       | 24.7        | 8.10     | 97.3             |             |                       |                  |             |             |     |
|           | 9:00 AM  |       | 24.8        | 8.15     | 98.4             |             |                       |                  |             |             |     |
|           | 10:00 AM |       | 25.1        | 8.40     | 101.3            |             |                       |                  |             |             |     |
|           | 11:00 AM |       | 25.5        | 8.50     | 103.1            |             |                       |                  |             |             |     |
|           | 12:00 PM |       | 25.9        | 8.70     | 104.8            |             |                       |                  |             |             |     |
|           | 1:00 PM  |       | 26.2        | 8.75     | 106.2            |             |                       |                  |             |             |     |
|           | 2:00 PM  |       | 26.5        | 8.80     | 107.1            |             |                       |                  |             |             |     |
|           | 3:00 PM  |       | 26.4        | 8.80     | 106.6            |             |                       |                  |             |             |     |
|           | 4:00 PM  |       | 26.4        | 8.75     | 106.1            |             |                       |                  |             |             |     |
|           | 5:00 PM  |       | 26.4        | 8.80     | 107.0            |             |                       |                  |             |             |     |
|           | 6:00 PM  |       | 26.3        | 8.75     | 105.8            |             |                       |                  |             |             |     |
|           | 7:00 PM  |       | 26.2        | 8.70     | 104.8            |             |                       |                  |             |             |     |
|           | 8:00 PM  |       | 26.0        | 8.50     | 102.8            |             |                       |                  |             |             |     |
|           | 9:00 PM  |       | 25.9        | 8.30     | 101.2            |             |                       |                  |             |             |     |
|           | 10:00 PM |       | 25.8        | 8.30     | 100.5            |             |                       |                  |             |             |     |
|           | 11:00 PM |       | 25.7        | 8.20     | 99.8             |             |                       |                  |             |             |     |
|           | 12:00 AM |       | 25.7        | 8.10     | 99.2             |             |                       |                  |             |             |     |
|           | 1:00 AM  |       | 25.6        | 8.10     | 98.6             |             |                       |                  |             |             |     |
| 7/23/2016 | 2:00 AM  |       | 25.6        | 8.00     | 98.0             |             |                       |                  |             |             |     |
| ,,10      | 3:00 AM  |       | 25.6        | 7.95     | 97.2             |             |                       |                  |             |             |     |
|           | 4:00 AM  |       | 25.6        | 7.90     | 96.4             |             |                       |                  |             |             |     |
|           | 5:00 AM  |       | 25.6        | 7.80     | 95.4             |             |                       |                  |             |             |     |

|           |          |       |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-----------|----------|-------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|           |          |       | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date      | Time     | Depth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|           | 6:00 AM  |       | 25.6        | 7.80     | 94.6             |             |                       |                  |             |             |                  |
|           | 7:00 AM  |       | 25.7        | 7.90     | 95.8             |             |                       |                  |             |             |                  |
|           | 8:00 AM  |       | 25.8        | 8.00     | 98.3             |             |                       |                  |             |             |                  |
|           | 9:00 AM  |       | 26.0        | 8.20     | 100.0            |             |                       |                  |             |             |                  |
|           | 10:00 AM |       | 26.2        | 8.40     | 101.7            |             |                       |                  |             |             |                  |
|           | 11:00 AM |       | 26.6        | 8.45     | 103.5            |             |                       |                  |             |             |                  |
|           | 12:00 PM |       | 26.8        | 8.45     | 104.4            |             |                       |                  |             |             |                  |
|           | 1:00 PM  |       | 27.0        | 8.50     | 105.4            |             |                       |                  |             |             |                  |
|           | 2:00 PM  |       | 27.3        | 8.55     | 106.4            |             |                       |                  |             |             |                  |
|           | 3:00 PM  |       | 27.3        | 8.55     | 106.3            |             |                       |                  |             |             |                  |
|           | 4:00 PM  |       | 27.0        | 8.55     | 105.5            |             |                       |                  |             |             |                  |
|           | 5:00 PM  |       | 26.9        | 8.50     | 105.0            |             |                       |                  |             |             |                  |
|           | 6:00 PM  |       | 26.8        | 8.45     | 104.1            |             |                       |                  |             |             |                  |
|           | 7:00 PM  |       | 26.8        | 8.35     | 103.3            |             |                       |                  |             |             |                  |
|           | 8:00 PM  |       | 26.7        | 8.25     | 102.2            |             |                       |                  |             |             |                  |
|           | 9:00 PM  |       | 26.6        | 8.20     | 100.6            |             |                       |                  |             |             |                  |
|           | 10:00 PM |       | 26.5        | 8.20     | 99.8             |             |                       |                  |             |             |                  |
|           | 11:00 PM |       | 26.4        | 8.10     | 99.0             |             |                       |                  |             |             |                  |
|           | 12:00 AM |       | 26.3        | 8.00     | 98.4             |             |                       |                  |             |             |                  |
|           | 1:00 AM  |       | 26.2        | 8.00     | 97.5             |             |                       |                  |             |             |                  |
|           | 2:00 AM  |       | 26.1        | 7.95     | 96.9             |             |                       |                  |             |             |                  |
| 7/24/2016 | 3:00 AM  |       | 26.0        | 7.90     | 96.2             |             |                       |                  |             |             |                  |
| , _ ,     | 4:00 AM  |       | 25.9        | 7.80     | 95.3             |             |                       |                  |             |             |                  |
|           | 5:00 AM  |       | 25.7        | 7.75     | 94.2             |             |                       |                  |             |             |                  |
|           | 6:00 AM  |       | 25.5        | 7.75     | 93.6             |             |                       |                  |             |             |                  |
|           | 7:00 AM  |       | 25.5        | 7.90     | 94.8             |             |                       |                  |             |             |                  |

|           |          |       |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-----------|----------|-------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|           |          |       | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date      | Time     | Depth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|           | 8:00 AM  |       | 25.6        | 7.95     | 96.7             |             |                       |                  |             |             |                  |
|           | 9:00 AM  |       | 25.7        | 8.00     | 97.9             |             |                       |                  |             |             |                  |
|           | 10:00 AM |       | 25.9        | 8.10     | 99.2             |             |                       |                  |             |             |                  |
|           | 11:00 AM |       | 26.2        | 8.30     | 100.8            |             |                       |                  |             |             |                  |
|           | 12:00 PM |       | 26.4        | 8.40     | 102.4            |             |                       |                  |             |             |                  |
|           | 1:00 PM  |       | 26.8        | 8.45     | 103.9            |             |                       |                  |             |             |                  |
|           | 2:00 PM  |       | 27.1        | 8.50     | 105.0            |             |                       |                  |             |             |                  |
|           | 3:00 PM  |       | 27.2        | 8.55     | 105.7            |             |                       |                  |             |             |                  |
|           | 4:00 PM  |       | 27.3        | 8.55     | 105.9            |             |                       |                  |             |             |                  |
|           | 5:00 PM  |       | 27.2        | 8.55     | 105.8            |             |                       |                  |             |             |                  |
|           | 6:00 PM  |       | 27.2        | 8.50     | 105.3            |             |                       |                  |             |             |                  |
|           | 7:00 PM  |       | 27.0        | 8.45     | 103.9            |             |                       |                  |             |             |                  |
|           | 8:00 PM  |       | 26.9        | 8.35     | 102.6            |             |                       |                  |             |             |                  |
|           | 9:00 PM  |       | 26.8        | 8.25     | 101.6            |             |                       |                  |             |             |                  |
|           | 10:00 PM |       | 26.7        | 8.20     | 101.0            |             |                       |                  |             |             |                  |
|           | 11:00 PM |       | 26.6        | 8.10     | 100.2            |             |                       |                  |             |             |                  |
|           | 12:00 AM |       | 26.5        | 8.10     | 99.5             |             |                       |                  |             |             |                  |
|           | 1:00 AM  |       | 26.4        | 8.10     | 98.6             |             |                       |                  |             |             |                  |
|           | 2:00 AM  |       | 26.3        | 8.00     | 97.7             |             |                       |                  |             |             |                  |
|           | 3:00 AM  |       | 26.2        | 7.95     | 96.9             |             |                       |                  |             |             |                  |
| 7/25/2016 | 4:00 AM  |       | 26.1        | 7.90     | 95.9             |             |                       |                  |             |             |                  |
|           | 5:00 AM  |       | 26.0        | 7.80     | 94.9             |             |                       |                  |             |             |                  |
|           | 6:00 AM  |       | 25.8        | 7.75     | 94.1             |             |                       |                  |             |             |                  |
|           | 7:00 AM  |       | 25.7        | 7.90     | 95.5             |             |                       |                  |             |             |                  |
|           | 8:00 AM  |       | 25.8        | 8.00     | 98.0             |             |                       |                  |             |             |                  |
|           | 9:00 AM  |       | 25.9        | 8.10     | 99.0             |             |                       |                  |             |             |                  |

|           |            |       |             | Upstream     |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-----------|------------|-------|-------------|--------------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
| Data      | Time       | Donth | Temperature | DO Conc      | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date      | 10:00 AM   | Depth | 26.1        | (mg/L)       | (%)<br>101.2     | (0)         | (mg/ L)               | (70)             | ( ( )       | (mg/L)      | (%)              |
|           | 11:00 AM   |       | 20.1        | 8.50         | 101.5            |             |                       |                  |             |             |                  |
|           | 12:00 DM   |       | 20.5        | 8.50<br>9 AE | 102.9            |             |                       |                  |             |             |                  |
|           | 12.00 PIVI |       | 20.7        | 0.45         | 104.5            |             |                       |                  |             |             |                  |
|           | 2:00 PM    |       | 27.0        | 0.55<br>8 60 | 107.1            |             |                       |                  |             |             |                  |
|           | 2.00 PM    |       | 27.2        | 8.00         | 107.1            |             |                       |                  |             |             |                  |
|           | 3:00 PIVI  |       | 27.4        | 8.70         | 107.0            |             |                       |                  |             |             |                  |
|           |            |       | 27.3        | 8.70         | 107.0            |             |                       |                  |             |             |                  |
|           | 5:00 Pivi  |       | 27.2        | 8.00         | 107.2            |             |                       |                  |             |             |                  |
|           | 6:00 PM    |       | 27.1        | 8.55         | 105.6            |             |                       |                  |             |             |                  |
|           | 7:00 PM    |       | 26.9        | 8.35         | 102.6            |             |                       |                  |             |             |                  |
|           | 8:00 PM    |       | 26.8        | 8.10         | 100.3            |             |                       |                  |             |             |                  |
|           | 9:00 PM    |       | 26.8        | 8.00         | 99.0             |             |                       |                  |             |             |                  |
|           | 10:00 PM   |       | 26.7        | 8.00         | 98.6             |             |                       |                  |             |             |                  |
|           | 11:00 PM   |       | 26.6        | 7.90         | 98.1             |             |                       |                  |             |             |                  |
|           | 12:00 AM   |       | 26.6        | 7.90         | 97.6             |             |                       |                  |             |             |                  |
|           | 1:00 AM    |       | 26.5        | 7.95         | 97.0             |             |                       |                  |             |             |                  |
|           | 2:00 AM    |       | 26.4        | 7.90         | 96.4             |             |                       |                  |             |             |                  |
|           | 3:00 AM    |       | 26.3        | 7.90         | 95.8             |             |                       |                  |             |             |                  |
|           | 4:00 AM    |       | 26.3        | 7.80         | 95.3             |             |                       |                  |             |             |                  |
| 7/26/2016 | 5:00 AM    |       | 26.3        | 7.80         | 94.5             |             |                       |                  |             |             |                  |
|           | 6:00 AM    |       | 26.3        | 7.75         | 94.1             |             |                       |                  |             |             |                  |
|           | 7:00 AM    |       | 26.3        | 7.80         | 95.1             |             |                       |                  |             |             |                  |
|           | 8:00 AM    |       | 26.4        | 8.00         | 98.4             |             |                       |                  |             |             |                  |
|           | 9:00 AM    |       | 26.7        | 8.20         | 101.2            |             |                       |                  |             |             |                  |
|           | 10:00 AM   |       | 27.0        | 8.35         | 103.2            |             |                       |                  |             |             |                  |
|           | 11:00 AM   |       | 27.3        | 8.55         | 105.6            |             |                       |                  |             |             |                  |

|           |           |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|-----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time      | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 12:00 PM  |       | 27.7                | 8.45              | 107.3                   |                     |                       |                         |                     |                   |                         |
|           |           | Surf. |                     |                   |                         |                     |                       |                         | 27.3                | 8.11              | 100                     |
|           |           | 1m    |                     |                   |                         |                     |                       |                         | 26.7                | 8.00              | 99                      |
|           |           | 2m    |                     |                   |                         |                     |                       |                         | 26.5                | 7.93              | 98                      |
|           | 12·07 PM  | 3m    |                     |                   |                         |                     |                       |                         | 26.4                | 7.75              | 94                      |
|           | 12.07 110 | 4m    |                     |                   |                         |                     |                       |                         | 26.0                | 6.87              | 83                      |
|           |           | 5m    |                     |                   |                         |                     |                       |                         | 25.9                | 6.75              | 82                      |
|           |           | 6m    |                     |                   |                         |                     |                       |                         | 25.7                | 6.40              | 77                      |
|           |           | 7m    |                     |                   |                         |                     |                       |                         | 25.4                | 6.10              | 73                      |
|           | 1:00 PM   |       | 27.9                | 8.55              | 107.6                   |                     |                       |                         |                     |                   |                         |
|           | 2:00 PM   |       | 28.2                | 8.55              | 108.4                   |                     |                       |                         |                     |                   |                         |
|           | 3:00 PM   |       | 28.2                | 8.55              | 108.2                   |                     |                       |                         |                     |                   |                         |
|           | 4:00 PM   |       | 28.1                | 8.40              | 106.3                   |                     |                       |                         |                     |                   |                         |
|           | 5:00 PM   |       | 27.8                | 8.35              | 105.4                   |                     |                       |                         |                     |                   |                         |
|           | 6:00 PM   |       | 27.6                | 8.30              | 104.3                   |                     |                       |                         |                     |                   |                         |
|           | 7:00 PM   |       | 27.4                | 8.25              | 102.4                   |                     |                       |                         |                     |                   |                         |
|           | 8:00 PM   |       | 27.3                | 8.20              | 101.0                   |                     |                       |                         |                     |                   |                         |
|           | 9:00 PM   |       | 27.2                | 8.10              | 99.7                    |                     |                       |                         |                     |                   |                         |
|           | 10:00 PM  |       | 27.1                | 8.00              | 99.4                    |                     |                       |                         |                     |                   |                         |
|           | 11:00 PM  |       | 27.1                | 8.00              | 99.2                    |                     |                       |                         |                     |                   |                         |
|           | 12:00 AM  |       | 27.1                | 8.00              | 99.0                    |                     |                       |                         |                     |                   |                         |
|           | 1:00 AM   |       | 27.1                | 8.00              | 98.6                    |                     |                       |                         |                     |                   |                         |
| 7/27/2016 | 2:00 AM   |       | 27.1                | 7.90              | 97.8                    |                     |                       |                         |                     |                   |                         |
|           | 3:00 AM   |       | 27.0                | 7.80              | 96.8                    |                     |                       |                         |                     |                   |                         |
|           | 4:00 AM   |       | 26.9                | 7.70              | 95.9                    |                     |                       |                         |                     |                   |                         |
|           | 5:00 AM   |       | 26.7                | 7.60              | 94.8                    |                     |                       |                         |                     |                   |                         |

|           |          |       |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-----------|----------|-------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|           |          |       | Tomporatura | DO Conc  | DO<br>Saturation | Tomporaturo | DO Conc               | DO<br>Saturation | Tomporaturo | DO Conc     | DO<br>Saturation |
| Date      | Time     | Depth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|           | 6:00 AM  |       | 26.6        | 7.50     | 94.2             |             |                       |                  |             |             |                  |
|           | 7:00 AM  |       | 26.5        | 7.80     | 95.0             |             |                       |                  |             |             |                  |
|           | 8:00 AM  |       | 26.5        | 7.80     | 96.9             |             |                       |                  |             |             |                  |
|           | 9:00 AM  |       | 26.6        | 7.90     | 98.4             |             |                       |                  |             |             |                  |
|           | 10:00 AM |       | 26.8        | 8.10     | 100.0            |             |                       |                  |             |             |                  |
|           | 11:00 AM |       | 27.1        | 8.25     | 101.7            |             |                       |                  |             |             |                  |
|           | 12:00 PM |       | 27.5        | 8.45     | 103.6            |             |                       |                  |             |             |                  |
|           | 1:00 PM  |       | 27.7        | 8.35     | 105.1            |             |                       |                  |             |             |                  |
|           | 2:00 PM  |       | 28.0        | 8.45     | 106.7            |             |                       |                  |             |             |                  |
|           | 3:00 PM  |       | 28.3        | 8.55     | 107.6            |             |                       |                  |             |             |                  |
|           | 4:00 PM  |       | 28.4        | 8.45     | 107.3            |             |                       |                  |             |             |                  |
|           | 5:00 PM  |       | 28.4        | 8.45     | 106.9            |             |                       |                  |             |             |                  |
|           | 6:00 PM  |       | 28.3        | 8.40     | 105.9            |             |                       |                  |             |             |                  |
|           | 7:00 PM  |       | 28.0        | 8.30     | 104.2            |             |                       |                  |             |             |                  |
|           | 8:00 PM  |       | 27.9        | 8.10     | 102.2            |             |                       |                  |             |             |                  |
|           | 9:00 PM  |       | 27.7        | 7.95     | 100.3            |             |                       |                  |             |             |                  |
|           | 10:00 PM |       | 27.6        | 7.95     | 99.6             |             |                       |                  |             |             |                  |
|           | 11:00 PM |       | 27.5        | 7.85     | 99.2             |             |                       |                  |             |             |                  |
|           | 12:00 AM |       | 27.5        | 8.00     | 98.7             |             |                       |                  |             |             |                  |
|           | 1:00 AM  |       | 27.5        | 7.90     | 98.4             |             |                       |                  |             |             |                  |
|           | 2:00 AM  |       | 27.4        | 7.90     | 97.8             |             |                       |                  |             |             |                  |
| 7/28/2016 | 3:00 AM  |       | 27.3        | 7.80     | 97.0             |             |                       |                  |             |             |                  |
| 7,20,2010 | 4:00 AM  |       | 27.3        | 7.70     | 96.1             |             |                       |                  |             |             |                  |
|           | 5:00 AM  |       | 27.3        | 7.60     | 95.1             |             |                       |                  |             |             |                  |
|           | 6:00 AM  |       | 27.2        | 7.50     | 94.4             |             |                       |                  |             |             |                  |
|           | 7:00 AM  |       | 27.2        | 7.70     | 95.6             |             |                       |                  |             |             |                  |

|           |          |       |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-----------|----------|-------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|           |          |       | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date      | Time     | Depth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|           | 8:00 AM  |       | 27.3        | 7.90     | 98.4             |             |                       |                  |             |             |                  |
|           | 9:00 AM  |       | 27.5        | 8.20     | 100.8            |             |                       |                  |             |             |                  |
|           | 10:00 AM |       | 27.7        | 8.20     | 103.0            |             |                       |                  |             |             |                  |
|           | 11:00 AM |       | 27.9        | 8.35     | 104.7            |             |                       |                  |             |             |                  |
|           | 12:00 PM |       | 28.3        | 8.45     | 106.7            |             |                       |                  |             |             |                  |
|           | 1:00 PM  |       | 28.6        | 8.50     | 107.9            |             |                       |                  |             |             |                  |
|           | 2:00 PM  |       | 28.6        | 8.50     | 107.5            |             |                       |                  |             |             |                  |
|           | 3:00 PM  |       | 28.7        | 8.50     | 107.9            |             |                       |                  |             |             |                  |
|           | 4:00 PM  |       | 28.3        | 8.20     | 103.2            |             |                       |                  |             |             |                  |
|           | 5:00 PM  |       | 28.0        | 8.00     | 101.2            |             |                       |                  |             |             |                  |
|           | 6:00 PM  |       | 27.8        | 8.00     | 101.4            |             |                       |                  |             |             |                  |
|           | 7:00 PM  |       | 27.8        | 8.00     | 100.8            |             |                       |                  |             |             |                  |
|           | 8:00 PM  |       | 27.7        | 7.85     | 99.1             |             |                       |                  |             |             |                  |
|           | 9:00 PM  |       | 27.7        | 7.75     | 97.4             |             |                       |                  |             |             |                  |
|           | 10:00 PM |       | 27.6        | 7.75     | 96.6             |             |                       |                  |             |             |                  |
|           | 11:00 PM |       | 27.5        | 7.70     | 96.1             |             |                       |                  |             |             |                  |
|           | 12:00 AM |       | 27.4        | 7.60     | 95.2             |             |                       |                  |             |             |                  |
|           | 1:00 AM  |       | 27.3        | 7.60     | 94.7             |             |                       |                  |             |             |                  |
|           | 2:00 AM  |       | 27.2        | 7.50     | 94.2             |             |                       |                  |             |             |                  |
|           | 3:00 AM  |       | 27.2        | 7.50     | 93.6             |             |                       |                  |             |             |                  |
| 7/29/2016 | 4:00 AM  |       | 27.1        | 7.40     | 93.0             |             |                       |                  |             |             |                  |
| , -,      | 5:00 AM  |       | 27.1        | 7.35     | 92.3             |             |                       |                  |             |             |                  |
|           | 6:00 AM  |       | 27.0        | 7.35     | 92.1             |             |                       |                  |             |             |                  |
|           | 7:00 AM  |       | 27.0        | 7.40     | 93.1             |             |                       |                  |             |             |                  |
|           | 8:00 AM  |       | 27.2        | 7.80     | 96.7             |             |                       |                  |             |             |                  |
|           | 9:00 AM  |       | 27.4        | 8.10     | 100.1            |             |                       |                  |             |             |                  |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 10:00 AM |       | 27.7                | 8.20              | 102.8                   |                     | (**8/-/               | <u></u>                 |                     | \ <b>0</b> / -/   |                         |
|           | 11:00 AM |       | 27.8                | 8.35              | 104.5                   |                     |                       |                         |                     |                   |                         |
|           | 12:00 PM |       | 28.0                | 8.40              | 106.1                   |                     |                       |                         |                     |                   |                         |
|           | 1:00 PM  |       | 28.2                | 8.55              | 107.5                   |                     |                       |                         |                     |                   |                         |
|           | 2:00 PM  |       | 28.2                | 8.45              | 107.0                   |                     |                       |                         |                     |                   |                         |
|           | 3:00 PM  |       | 28.1                | 8.45              | 106.9                   |                     |                       |                         |                     |                   |                         |
|           | 4:00 PM  |       | 28.1                | 8.40              | 106.1                   |                     |                       |                         |                     |                   |                         |
|           | 5:00 PM  |       | 28.1                | 8.40              | 105.7                   |                     |                       |                         |                     |                   |                         |
|           | 6:00 PM  |       | 28.1                | 8.40              | 105.5                   |                     |                       |                         |                     |                   |                         |
|           | 7:00 PM  |       | 27.9                | 8.20              | 103.0                   |                     |                       |                         |                     |                   |                         |
|           | 8:00 PM  |       | 27.5                | 7.85              | 99.3                    |                     |                       |                         |                     |                   |                         |
|           | 9:00 PM  |       | 27.3                | 7.80              | 96.8                    |                     |                       |                         |                     |                   |                         |
|           | 10:00 PM |       | 27.1                | 7.60              | 95.3                    |                     |                       |                         |                     |                   |                         |
|           | 11:00 PM |       | 26.9                | 7.60              | 94.5                    |                     |                       |                         |                     |                   |                         |
|           | 12:00 AM |       | 26.8                | 7.50              | 94.1                    |                     |                       |                         |                     |                   |                         |
|           | 1:00 AM  |       | 26.7                | 7.50              | 93.6                    |                     |                       |                         |                     |                   |                         |
|           | 2:00 AM  |       | 26.6                | 7.40              | 93.3                    |                     |                       |                         |                     |                   |                         |
|           | 3:00 AM  |       | 26.5                | 7.65              | 92.9                    |                     |                       |                         |                     |                   |                         |
|           | 4:00 AM  |       | 26.3                | 7.65              | 92.5                    |                     |                       |                         |                     |                   |                         |
| 7/30/2016 | 5:00 AM  |       | 26.2                | 7.60              | 92.0                    |                     |                       |                         |                     |                   |                         |
| ,,        | 6:00 AM  |       | 26.1                | 7.60              | 91.9                    |                     |                       |                         |                     |                   |                         |
|           | 7:00 AM  |       | 26.0                | 7.75              | 93.5                    |                     |                       |                         |                     |                   |                         |
|           | 8:00 AM  |       | 26.2                | 7.95              | 97.3                    |                     |                       |                         |                     |                   |                         |
|           | 9:00 AM  |       | 26.5                | 8.20              | 100.2                   |                     |                       |                         |                     |                   |                         |
|           | 10:00 AM |       | 26.8                | 8.35              | 102.7                   |                     |                       |                         |                     |                   |                         |
|           | 11:00 AM |       | 27.1                | 8.50              | 104.5                   |                     |                       |                         |                     |                   |                         |

|           |          |      |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-----------|----------|------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|           | _        |      | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date      | Time De  | epth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|           | 12:00 PM |      | 27.4        | 8.60     | 106.6            |             |                       |                  |             |             |                  |
|           | 1:00 PM  |      | 27.4        | 8.70     | 107.7            |             |                       |                  |             |             |                  |
|           | 2:00 PM  |      | 27.8        | 8.75     | 109.7            |             |                       |                  |             |             |                  |
|           | 3:00 PM  |      | 28.1        | 8.80     | 110.9            |             |                       |                  |             |             |                  |
|           | 4:00 PM  |      | 28.2        | 8.75     | 110.1            |             |                       |                  |             |             |                  |
|           | 5:00 PM  |      | 28.2        | 8.65     | 109.3            |             |                       |                  |             |             |                  |
|           | 6:00 PM  |      | 28.1        | 8.55     | 107.7            |             |                       |                  |             |             |                  |
|           | 7:00 PM  |      | 27.7        | 8.30     | 104.2            |             |                       |                  |             |             |                  |
|           | 8:00 PM  |      | 27.3        | 8.20     | 101.1            |             |                       |                  |             |             |                  |
|           | 9:00 PM  |      | 27.0        | 7.90     | 98.2             |             |                       |                  |             |             |                  |
|           | 10:00 PM |      | 26.8        | 7.80     | 96.5             |             |                       |                  |             |             |                  |
|           | 11:00 PM |      | 26.6        | 7.70     | 95.5             |             |                       |                  |             |             |                  |
|           | 12:00 AM |      | 26.4        | 7.80     | 94.7             |             |                       |                  |             |             |                  |
|           | 1:00 AM  |      | 26.3        | 7.75     | 93.9             |             |                       |                  |             |             |                  |
|           | 2:00 AM  |      | 26.1        | 7.65     | 93.3             |             |                       |                  |             |             |                  |
|           | 3:00 AM  |      | 25.9        | 7.65     | 92.8             |             |                       |                  |             |             |                  |
|           | 4:00 AM  |      | 25.8        | 7.60     | 92.4             |             |                       |                  |             |             |                  |
|           | 5:00 AM  |      | 25.7        | 7.60     | 91.7             |             |                       |                  |             |             |                  |
| 7/21/2016 | 6:00 AM  |      | 25.6        | 7.60     | 91.8             |             |                       |                  |             |             |                  |
| //31/2010 | 7:00 AM  |      | 25.5        | 7.75     | 93.5             |             |                       |                  |             |             |                  |
|           | 8:00 AM  |      | 25.6        | 7.95     | 96.8             |             |                       |                  |             |             |                  |
|           | 9:00 AM  |      | 25.7        | 8.10     | 99.2             |             |                       |                  |             |             |                  |
|           | 10:00 AM |      | 25.9        | 8.40     | 101.6            |             |                       |                  |             |             |                  |
|           | 11:00 AM |      | 26.1        | 8.60     | 104.3            |             |                       |                  |             |             |                  |
|           | 12:00 PM |      | 26.3        | 8.75     | 106.4            |             |                       |                  |             |             |                  |
|           | 1:00 PM  |      | 26.6        | 8.70     | 108.3            |             |                       |                  |             |             |                  |

|          |          |       | Upstream    |         |                  | Tailrace <sup>1</sup> |         |                  | Impoundment |         |                  |
|----------|----------|-------|-------------|---------|------------------|-----------------------|---------|------------------|-------------|---------|------------------|
|          |          |       | Temperature | DO Conc | DO<br>Saturation | Temperature           | DO Conc | DO<br>Saturation | Temperature | DO Conc | DO<br>Saturation |
| Date     | Time     | Depth | (°C)        | (mg/L)  | (%)              | (°C)                  | (mg/L)  | (%)              | (°C)        | (mg/L)  | (%)              |
|          | 2:00 PM  |       | 27.0        | 8.90    | 109.9            |                       |         |                  |             |         |                  |
|          | 3:00 PM  |       | 27.0        | 8.90    | 109.7            |                       |         |                  |             |         |                  |
|          | 4:00 PM  |       | 26.9        | 8.80    | 109.0            |                       |         |                  |             |         |                  |
|          | 5:00 PM  |       | 26.8        | 8.60    | 107.4            |                       |         |                  |             |         |                  |
|          | 6:00 PM  |       | 26.6        | 8.50    | 105.1            |                       |         |                  |             |         |                  |
|          | 7:00 PM  |       | 26.5        | 8.35    | 103.3            |                       |         |                  |             |         |                  |
|          | 8:00 PM  |       | 26.3        | 8.20    | 100.2            |                       |         |                  |             |         |                  |
|          | 9:00 PM  |       | 26.0        | 7.95    | 97.4             |                       |         |                  |             |         |                  |
|          | 10:00 PM |       | 25.8        | 7.90    | 95.8             |                       |         |                  |             |         |                  |
|          | 11:00 PM |       | 25.7        | 7.80    | 94.7             |                       |         |                  |             |         |                  |
| 8/1/2016 | 12:00 AM |       | 25.6        | 7.75    | 94.2             |                       |         |                  |             |         |                  |
|          | 1:00 AM  |       | 25.4        | 7.80    | 93.5             |                       |         |                  |             |         |                  |
|          | 2:00 AM  |       | 25.3        | 7.75    | 93.1             |                       |         |                  |             |         |                  |
|          | 3:00 AM  |       | 25.2        | 7.75    | 92.6             |                       |         |                  |             |         |                  |
|          | 4:00 AM  |       | 25.1        | 7.70    | 92.2             |                       |         |                  |             |         |                  |
|          | 5:00 AM  |       | 25.0        | 7.70    | 91.6             |                       |         |                  |             |         |                  |
|          | 6:00 AM  |       | 24.9        | 7.60    | 91.3             |                       |         |                  |             |         |                  |
|          | 7:00 AM  |       | 24.9        | 7.75    | 93.2             |                       |         |                  |             |         |                  |
|          | 8:00 AM  |       | 24.9        | 7.95    | 96.0             |                       |         |                  |             |         |                  |
|          | 9:00 AM  |       | 25.1        | 8.25    | 99.4             |                       |         |                  |             |         |                  |
|          | 10:00 AM |       | 25.4        | 8.60    | 102.7            |                       |         |                  |             |         |                  |
|          | 11:00 AM |       | 26.0        | 8.75    | 105.9            |                       |         |                  |             |         |                  |
|          | 12:00 PM |       | 26.3        | 8.90    | 107.8            |                       |         |                  |             |         |                  |
|          | 1:00 PM  |       | 26.3        | 8.80    | 107.3            |                       |         |                  |             |         |                  |
|          | 2:00 PM  |       | 26.4        | 8.95    | 108.6            |                       |         |                  |             |         |                  |
|          | 3:00 PM  |       | 26.3        | 8.90    | 107.6            |                       |         |                  |             |         |                  |

|          |          |       |             | Upstream |                  | Tailra      |         |                  | Impoundment |         |                  |
|----------|----------|-------|-------------|----------|------------------|-------------|---------|------------------|-------------|---------|------------------|
|          |          |       | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc | DO<br>Saturation | Temperature | DO Conc | DO<br>Saturation |
| Date     | Time     | Depth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)  | (%)              | (°C)        | (mg/L)  | (%)              |
|          | 4:00 PM  |       | 26.1        | 8.80     | 107.1            |             |         |                  |             |         |                  |
|          | 5:00 PM  |       | 26.0        | 8.75     | 105.9            |             |         |                  |             |         |                  |
|          | 6:00 PM  |       | 25.8        | 8.50     | 102.5            |             |         |                  |             |         |                  |
|          | 7:00 PM  |       | 25.6        | 8.20     | 99.6             |             |         |                  |             |         |                  |
|          | 8:00 PM  |       | 25.4        | 8.15     | 97.7             |             |         |                  |             |         |                  |
|          | 9:00 PM  |       | 25.3        | 7.95     | 96.3             |             |         |                  |             |         |                  |
|          | 10:00 PM |       | 25.2        | 7.90     | 95.4             |             |         |                  |             |         |                  |
|          | 11:00 PM |       | 25.1        | 7.90     | 94.7             |             |         |                  |             |         |                  |
| 8/2/2016 | 12:00 AM |       | 25.0        | 7.80     | 94.2             |             |         |                  |             |         |                  |
|          | 1:00 AM  |       | 25.0        | 7.80     | 93.7             |             |         |                  |             |         |                  |
|          | 2:00 AM  |       | 24.9        | 7.75     | 93.3             |             |         |                  |             |         |                  |
|          | 3:00 AM  |       | 24.8        | 7.75     | 92.9             |             |         |                  |             |         |                  |
|          | 4:00 AM  |       | 24.7        | 7.70     | 92.3             |             |         |                  |             |         |                  |
|          | 5:00 AM  |       | 24.6        | 7.60     | 91.4             |             |         |                  |             |         |                  |
|          | 6:00 AM  |       | 24.5        | 7.75     | 91.3             |             |         |                  |             |         |                  |
|          | 7:00 AM  |       | 24.4        | 7.95     | 92.8             |             |         |                  |             |         |                  |
|          | 8:00 AM  |       | 24.6        | 8.10     | 96.5             |             |         |                  |             |         |                  |
|          | 9:00 AM  |       | 24.8        | 8.35     | 99.6             |             |         |                  |             |         |                  |
|          | 10:00 AM |       | 25.2        | 8.50     | 102.2            |             |         |                  |             |         |                  |
|          | 11:00 AM |       | 25.6        | 8.70     | 104.5            |             |         |                  |             |         |                  |
|          | 12:00 PM |       | 26.0        | 8.80     | 106.9            |             |         |                  |             |         |                  |
|          | 1:00 PM  |       | 26.1        | 8.90     | 107.8            |             |         |                  |             |         |                  |
|          | 2:00 PM  |       | 26.2        | 8.90     | 108.3            |             |         |                  |             |         |                  |
|          | 3:00 PM  |       | 26.2        | 8.90     | 107.6            |             |         |                  |             |         |                  |
|          | 4:00 PM  |       | 26.2        | 8.90     | 107.6            |             |         |                  |             |         |                  |
|          | 5:00 PM  |       | 26.3        | 8.80     | 107.4            |             |         |                  |             |         |                  |
|          |          |       |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|----------|----------|-------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|          |          |       | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date     | Time     | Depth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|          | 6:00 PM  |       | 26.2        | 8.75     | 106.4            |             |                       |                  |             |             |                  |
|          | 7:00 PM  |       | 26.0        | 8.70     | 104.5            |             |                       |                  |             |             |                  |
|          | 8:00 PM  |       | 25.7        | 8.30     | 101.1            |             |                       |                  |             |             |                  |
|          | 9:00 PM  |       | 25.4        | 8.15     | 98.2             |             |                       |                  |             |             |                  |
|          | 10:00 PM |       | 25.2        | 8.10     | 96.9             |             |                       |                  |             |             |                  |
|          | 11:00 PM |       | 25.0        | 7.95     | 95.8             |             |                       |                  |             |             |                  |
|          | 12:00 AM |       | 24.8        | 7.90     | 95.0             |             |                       |                  |             |             |                  |
|          | 1:00 AM  |       | 24.7        | 7.80     | 94.3             |             |                       |                  |             |             |                  |
|          | 2:00 AM  |       | 24.5        | 7.80     | 93.8             |             |                       |                  |             |             |                  |
|          | 3:00 AM  |       | 24.4        | 7.95     | 93.4             |             |                       |                  |             |             |                  |
|          | 4:00 AM  |       | 24.3        | 7.95     | 92.8             |             |                       |                  |             |             |                  |
|          | 5:00 AM  |       | 24.1        | 7.80     | 92.4             |             |                       |                  |             |             |                  |
|          | 6:00 AM  |       | 24.0        | 7.80     | 92.3             |             |                       |                  |             |             |                  |
|          | 7:00 AM  |       | 24.0        | 8.00     | 93.9             |             |                       |                  |             |             |                  |
|          | 8:00 AM  |       | 24.2        | 8.25     | 97.5             |             |                       |                  |             |             |                  |
| 8/3/2016 | 9:00 AM  |       | 24.5        | 8.40     | 100.8            |             |                       |                  |             |             |                  |
| -,-,     | 10:00 AM |       | 25.0        | 8.60     | 103.3            |             |                       |                  |             |             |                  |
|          | 11:00 AM |       | 25.4        | 8.90     | 105.6            |             |                       |                  |             |             |                  |
|          | 12:00 PM |       | 26.0        | 8.90     | 108.0            |             |                       |                  |             |             |                  |
|          | 1:00 PM  |       | 26.5        | 8.90     | 110.3            |             |                       |                  |             |             |                  |
|          | 2:00 PM  |       | 27.0        | 9.00     | 111.7            |             |                       |                  |             |             |                  |
|          | 3:00 PM  |       | 27.2        | 9.00     | 112.2            |             |                       |                  |             |             |                  |
|          | 4:00 PM  |       | 27.2        | 8.95     | 111.1            |             |                       |                  |             |             |                  |
|          | 5:00 PM  |       | 27.0        | 8.90     | 109.8            |             |                       |                  |             |             |                  |
|          | 6:00 PM  |       | 26.8        | 8.70     | 108.3            |             |                       |                  |             |             |                  |
|          | 7:00 PM  |       | 26.5        | 8.55     | 106.1            |             |                       |                  |             |             |                  |

|           |          |             | Upstream |       |             | Tailrace <sup>1</sup> |     |             | Impoundment |     |
|-----------|----------|-------------|----------|-------|-------------|-----------------------|-----|-------------|-------------|-----|
|           |          | Tommorphuso | DO Cono  | DO    | Tommoroturo |                       | DO  | Tomporature | DO Corre    | DO  |
| Date      | Time Dep | h (°C)      | (mg/L)   | (%)   | (°C)        | (mg/L)                | (%) | (°C)        | (mg/L)      | (%) |
|           | 8:00 PM  | 26.1        | 8.40     | 102.4 |             |                       |     |             |             |     |
|           | 9:00 PM  | 25.8        | 8.20     | 99.8  |             |                       |     |             |             |     |
|           | 10:00 PM | 25.7        | 8.00     | 98.3  |             |                       |     |             |             |     |
|           | 11:00 PM | 25.5        | 8.10     | 97.4  |             |                       |     |             |             |     |
|           | 12:00 AM | 25.3        | 8.10     | 96.7  |             |                       |     |             |             |     |
|           | 1:00 AM  | 25.2        | 7.95     | 96.2  |             |                       |     |             |             |     |
|           | 2:00 AM  | 25.1        | 7.95     | 95.7  |             |                       |     |             |             |     |
|           | 3:00 AM  | 24.9        | 7.90     | 95.1  |             |                       |     |             |             |     |
|           | 4:00 AM  | 24.8        | 7.90     | 94.6  |             |                       |     |             |             |     |
|           | 5:00 AM  | 24.6        | 7.80     | 94.0  |             |                       |     |             |             |     |
|           | 6:00 AM  | 24.5        | 7.80     | 93.8  |             |                       |     |             |             |     |
|           | 7:00 AM  | 24.4        | 8.05     | 95.1  |             |                       |     |             |             |     |
|           | 8:00 AM  | 24.6        | 8.25     | 98.6  |             |                       |     |             |             |     |
|           | 9:00 AM  | 24.9        | 8.50     | 101.6 |             |                       |     |             |             |     |
| 8/4/2016  | 10:00 AM | 25.3        | 8.70     | 104.0 |             |                       |     |             |             |     |
| 0, 1,2010 | 11:00 AM | 25.7        | 8.75     | 106.2 |             |                       |     |             |             |     |
|           | 12:00 PM | 26.2        | 8.95     | 108.7 |             |                       |     |             |             |     |
|           | 1:00 PM  | 26.7        | 8.95     | 110.7 |             |                       |     |             |             |     |
|           | 2:00 PM  | 27.0        | 9.00     | 112.0 |             |                       |     |             |             |     |
|           | 3:00 PM  | 27.1        | 9.00     | 112.2 |             |                       |     |             |             |     |
|           | 4:00 PM  | 27.1        | 8.95     | 110.7 |             |                       |     |             |             |     |
|           | 5:00 PM  | 27.0        | 8.80     | 109.4 |             |                       |     |             |             |     |
|           | 6:00 PM  | 26.8        | 8.70     | 107.8 |             |                       |     |             |             |     |
|           | 7:00 PM  | 26.5        | 8.75     | 105.7 |             |                       |     |             |             |     |
|           | 8:00 PM  | 26.1        | 8.40     | 102.1 |             |                       |     |             |             |     |
|           | 9:00 PM  | 25.9        | 8.10     | 99.3  |             |                       |     |             |             |     |

|          |            |           | Upstream       |                |          | Tailrace <sup>1</sup> |                |           | Impoundment    |                |
|----------|------------|-----------|----------------|----------------|----------|-----------------------|----------------|-----------|----------------|----------------|
|          |            | Townshine | <b>DO</b> Cara | DO             | <b>T</b> | <b>DO</b> Como        | DO             | Townstein | <b>DO</b> Cara | DO             |
| Date     | Time Deptl | i (°C)    | (mg/L)         | Saturation (%) | (°C)     | (mg/L)                | Saturation (%) | (°C)      | (mg/L)         | Saturation (%) |
|          | 10:00 PM   | 25.7      | 8.00           | 97.8           |          |                       |                |           |                |                |
|          | 11:00 PM   | 25.6      | 7.95           | 97.2           |          |                       |                |           |                |                |
|          | 12:00 AM   | 25.4      | 8.10           | 96.5           |          |                       |                |           |                |                |
|          | 1:00 AM    | 25.4      | 7.95           | 96.0           |          |                       |                |           |                |                |
|          | 2:00 AM    | 25.3      | 7.90           | 95.4           |          |                       |                |           |                |                |
|          | 3:00 AM    | 25.2      | 7.90           | 94.7           |          |                       |                |           |                |                |
|          | 4:00 AM    | 25.1      | 7.80           | 94.3           |          |                       |                |           |                |                |
|          | 5:00 AM    | 25.0      | 7.80           | 93.7           |          |                       |                |           |                |                |
|          | 6:00 AM    | 24.9      | 7.80           | 93.6           |          |                       |                |           |                |                |
|          | 7:00 AM    | 24.9      | 7.90           | 94.9           |          |                       |                |           |                |                |
|          | 8:00 AM    | 25.0      | 8.15           | 98.4           |          |                       |                |           |                |                |
|          | 9:00 AM    | 25.3      | 8.50           | 101.8          |          |                       |                |           |                |                |
|          | 10:00 AM   | 25.6      | 8.60           | 103.9          |          |                       |                |           |                |                |
| 8/5/2016 | 11:00 AM   | 25.9      | 8.75           | 105.9          |          |                       |                |           |                |                |
| 0/3/2010 | 12:00 PM   | 26.4      | 8.90           | 108.1          |          |                       |                |           |                |                |
|          | 1:00 PM    | 26.8      | 8.90           | 109.9          |          |                       |                |           |                |                |
|          | 2:00 PM    | 27.1      | 8.95           | 111.2          |          |                       |                |           |                |                |
|          | 3:00 PM    | 27.3      | 8.95           | 111.4          |          |                       |                |           |                |                |
|          | 4:00 PM    | 27.3      | 8.90           | 109.7          |          |                       |                |           |                |                |
|          | 5:00 PM    | 27.2      | 8.70           | 108.2          |          |                       |                |           |                |                |
|          | 6:00 PM    | 27.0      | 8.60           | 106.6          |          |                       |                |           |                |                |
|          | 7:00 PM    | 26.7      | 8.45           | 104.3          |          |                       |                |           |                |                |
|          | 8:00 PM    | 26.3      | 8.30           | 100.8          |          |                       |                |           |                |                |
|          | 9:00 PM    | 26.1      | 8.00           | 98.3           |          |                       |                |           |                |                |
|          | 10:00 PM   | 25.9      | 7.95           | 97.2           |          |                       |                |           |                |                |
|          | 11:00 PM   | 25.8      | 7.95           | 96.5           |          |                       |                |           |                |                |

|          |          |     |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|----------|----------|-----|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|          |          | ,   | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date     | Time De  | pth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|          | 12:00 AM |     | 25.7        | 7.90     | 95.8             |             |                       |                  |             |             |                  |
|          | 1:00 AM  |     | 25.6        | 7.80     | 95.2             |             |                       |                  |             |             |                  |
|          | 2:00 AM  |     | 25.5        | 7.80     | 94.7             |             |                       |                  |             |             |                  |
|          | 3:00 AM  |     | 25.4        | 7.80     | 94.1             |             |                       |                  |             |             |                  |
|          | 4:00 AM  |     | 25.4        | 7.80     | 93.5             |             |                       |                  |             |             |                  |
|          | 5:00 AM  |     | 25.3        | 7.75     | 93.1             |             |                       |                  |             |             |                  |
|          | 6:00 AM  |     | 25.2        | 7.75     | 92.9             |             |                       |                  |             |             |                  |
|          | 7:00 AM  |     | 25.2        | 7.80     | 93.5             |             |                       |                  |             |             |                  |
|          | 8:00 AM  |     | 25.2        | 7.95     | 95.5             |             |                       |                  |             |             |                  |
|          | 9:00 AM  |     | 25.4        | 8.25     | 99.3             |             |                       |                  |             |             |                  |
|          | 10:00 AM |     | 25.8        | 8.50     | 102.9            |             |                       |                  |             |             |                  |
| 8/6/2016 | 11:00 AM |     | 26.3        | 8.75     | 105.5            |             |                       |                  |             |             |                  |
| -, -,    | 12:00 PM |     | 26.7        | 8.60     | 107.2            |             |                       |                  |             |             |                  |
|          | 1:00 PM  |     | 27.0        | 8.70     | 107.7            |             |                       |                  |             |             |                  |
|          | 2:00 PM  |     | 27.2        | 8.80     | 108.6            |             |                       |                  |             |             |                  |
|          | 3:00 PM  |     | 27.5        | 8.90     | 109.6            |             |                       |                  |             |             |                  |
|          | 4:00 PM  |     | 27.6        | 8.75     | 109.5            |             |                       |                  |             |             |                  |
|          | 5:00 PM  |     | 27.4        | 8.60     | 106.9            |             |                       |                  |             |             |                  |
|          | 6:00 PM  |     | 27.2        | 8.55     | 105.5            |             |                       |                  |             |             |                  |
|          | 7:00 PM  |     | 27.0        | 8.35     | 103.1            |             |                       |                  |             |             |                  |
|          | 8:00 PM  |     | 26.8        | 8.10     | 99.8             |             |                       |                  |             |             |                  |
|          | 9:00 PM  |     | 26.6        | 7.80     | 97.2             |             |                       |                  |             |             |                  |
|          | 10:00 PM |     | 26.4        | 7.90     | 95.8             |             |                       |                  |             |             |                  |
|          | 11:00 PM |     | 26.2        | 7.80     | 94.9             |             |                       |                  |             |             |                  |
| 8/7/2016 | 12:00 AM |     | 26.1        | 7.80     | 94.5             |             |                       |                  |             |             |                  |
| 0,7,2010 | 1:00 AM  |     | 25.9        | 7.75     | 93.9             |             |                       |                  |             |             |                  |

|          |          |      |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|----------|----------|------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|          |          |      | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date     | Time De  | epth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|          | 2:00 AM  |      | 25.7        | 7.65     | 93.4             |             |                       |                  |             |             |                  |
|          | 3:00 AM  |      | 25.6        | 7.65     | 92.8             |             |                       |                  |             |             |                  |
|          | 4:00 AM  |      | 25.4        | 7.70     | 92.2             |             |                       |                  |             |             |                  |
|          | 5:00 AM  |      | 25.2        | 7.70     | 91.9             |             |                       |                  |             |             |                  |
|          | 6:00 AM  |      | 25.0        | 7.70     | 91.7             |             |                       |                  |             |             |                  |
|          | 7:00 AM  |      | 24.9        | 7.75     | 92.8             |             |                       |                  |             |             |                  |
|          | 8:00 AM  |      | 25.1        | 7.95     | 96.4             |             |                       |                  |             |             |                  |
|          | 9:00 AM  |      | 25.4        | 8.35     | 99.5             |             |                       |                  |             |             |                  |
|          | 10:00 AM |      | 25.7        | 8.40     | 101.8            |             |                       |                  |             |             |                  |
|          | 11:00 AM |      | 26.0        | 8.60     | 103.8            |             |                       |                  |             |             |                  |
|          | 12:00 PM |      | 26.5        | 8.75     | 106.1            |             |                       |                  |             |             |                  |
|          | 1:00 PM  |      | 26.9        | 8.70     | 108.0            |             |                       |                  |             |             |                  |
|          | 2:00 PM  |      | 27.2        | 8.90     | 109.5            |             |                       |                  |             |             |                  |
|          | 3:00 PM  |      | 27.2        | 8.70     | 108.3            |             |                       |                  |             |             |                  |
|          | 4:00 PM  |      | 27.2        | 8.60     | 107.4            |             |                       |                  |             |             |                  |
|          | 5:00 PM  |      | 27.1        | 8.60     | 106.6            |             |                       |                  |             |             |                  |
|          | 6:00 PM  |      | 26.9        | 8.50     | 104.5            |             |                       |                  |             |             |                  |
|          | 7:00 PM  |      | 26.7        | 8.35     | 102.6            |             |                       |                  |             |             |                  |
|          | 8:00 PM  |      | 26.3        | 8.20     | 99.6             |             |                       |                  |             |             |                  |
|          | 9:00 PM  |      | 26.1        | 7.95     | 97.1             |             |                       |                  |             |             |                  |
|          | 10:00 PM |      | 25.9        | 7.90     | 95.8             |             |                       |                  |             |             |                  |
|          | 11:00 PM |      | 25.7        | 7.80     | 95.0             |             |                       |                  |             |             |                  |
|          | 12:00 AM |      | 25.5        | 7.80     | 94.5             |             |                       |                  |             |             |                  |
| 8/8/2016 | 1:00 AM  |      | 25.4        | 7.80     | 94.0             |             |                       |                  |             |             |                  |
| 0,0,2020 | 2:00 AM  |      | 25.2        | 7.80     | 93.7             |             |                       |                  |             |             |                  |
|          | 3:00 AM  |      | 25.1        | 7.80     | 93.5             |             |                       |                  |             |             |                  |

|      |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|      | 4:00 AM  | •     | 25.0                | 7.75              | 92.9                    |                     |                       |                         |                     |                   |                         |
|      | 5:00 AM  |       | 24.8                | 7.75              | 92.5                    |                     |                       |                         |                     |                   |                         |
|      | 6:00 AM  |       | 24.7                | 7.70              | 92.2                    |                     |                       |                         |                     |                   |                         |
|      | 7:00 AM  |       | 24.6                | 7.75              | 93.0                    |                     |                       |                         |                     |                   |                         |
|      | 8:00 AM  |       | 24.7                | 7.95              | 96.1                    |                     |                       |                         |                     |                   |                         |
|      | 9:00 AM  |       | 25.0                | 8.25              | 98.5                    |                     |                       |                         |                     |                   |                         |
|      | 10:00 AM |       | 25.2                | 8.40              | 100.6                   |                     |                       |                         |                     |                   |                         |
|      | 11:00 AM |       | 25.6                | 8.50              | 102.5                   |                     |                       |                         |                     |                   |                         |
|      | 12:00 PM |       | 25.9                | 8.60              | 104.2                   |                     |                       |                         |                     |                   |                         |
|      |          | Surf. |                     |                   |                         |                     |                       |                         | 26.3                | 8.50              | 103                     |
|      |          | 1m    |                     |                   |                         |                     |                       |                         | 25.9                | 8.20              | 100                     |
|      |          | 2m    |                     |                   |                         |                     |                       |                         | 25.8                | 8.30              | 101                     |
|      | 12:27 PM | 3m    |                     |                   |                         |                     |                       |                         | 25.7                | 8.05              | 99                      |
|      |          | 4m    |                     |                   |                         |                     |                       |                         | 25.7                | 7.93              | 96                      |
|      |          | 5m    |                     |                   |                         |                     |                       |                         | 25.6                | 7.93              | 96                      |
|      |          | 6m    |                     |                   |                         |                     |                       |                         | 25.5                | 7.50              | 90                      |
|      | 1:00 PM  |       | 26.3                | 8.75              | 106.4                   |                     |                       |                         |                     |                   |                         |
|      | 2:00 PM  |       | 26.5                | 8.90              | 107.5                   |                     |                       |                         |                     |                   |                         |
|      | 3:00 PM  |       | 21.8                | 9.30              | 104.9                   |                     |                       |                         |                     |                   |                         |
|      | 4:00 PM  |       | 26.5                | 8.80              | 106.6                   |                     |                       |                         |                     |                   |                         |
|      | 5:00 PM  |       | 26.4                | 8.75              | 106.3                   |                     |                       |                         |                     |                   |                         |
|      | 6:00 PM  |       | 25.7                | 8.60              | 103.5                   |                     |                       |                         |                     |                   |                         |
|      | 7:00 PM  |       | 25.7                | 8.40              | 102.4                   |                     |                       |                         |                     |                   |                         |
|      | 8:00 PM  |       | 25.3                | 8.35              | 99.6                    |                     |                       |                         |                     |                   |                         |
|      | 9:00 PM  |       | 25.2                | 8.15              | 97.5                    |                     |                       |                         |                     |                   |                         |
|      | 10:00 PM |       | 25.1                | 7.95              | 96.2                    |                     |                       |                         |                     |                   |                         |

|          |          |      |                      | Upstream          |                   |                     | Tailrace <sup>1</sup> |                   |      | Impoundment       |                   |
|----------|----------|------|----------------------|-------------------|-------------------|---------------------|-----------------------|-------------------|------|-------------------|-------------------|
|          |          |      |                      |                   | DO                | -                   |                       | DO                |      | <b>DO C U</b>     | DO                |
| Date     | Time De  | epth | l'emperature<br>(°C) | DO Conc<br>(mg/L) | Saturation<br>(%) | lemperature<br>(°C) | DO Conc<br>(mg/L)     | Saturation<br>(%) | (°C) | DO Conc<br>(mg/L) | Saturation<br>(%) |
|          | 11:00 PM |      | 24.9                 | 7.95              | 95.7              |                     |                       |                   |      |                   |                   |
|          | 12:00 AM |      | 24.8                 | 7.90              | 95.1              |                     |                       |                   |      |                   |                   |
|          | 1:00 AM  |      | 24.6                 | 7.90              | 94.8              |                     |                       |                   |      |                   |                   |
|          | 2:00 AM  |      | 24.4                 | 8.00              | 94.3              |                     |                       |                   |      |                   |                   |
|          | 3:00 AM  |      | 24.2                 | 8.00              | 93.8              |                     |                       |                   |      |                   |                   |
|          | 4:00 AM  |      | 24.0                 | 7.95              | 93.3              |                     |                       |                   |      |                   |                   |
|          | 5:00 AM  |      | 23.8                 | 7.95              | 92.7              |                     |                       |                   |      |                   |                   |
|          | 6:00 AM  |      | 23.7                 | 7.80              | 92.4              |                     |                       |                   |      |                   |                   |
|          | 7:00 AM  |      | 23.5                 | 7.95              | 93.3              |                     |                       |                   |      |                   |                   |
|          | 8:00 AM  |      | 23.7                 | 8.15              | 96.3              |                     |                       |                   |      |                   |                   |
|          | 9:00 AM  |      | 24.0                 | 8.30              | 99.1              |                     |                       |                   |      |                   |                   |
|          | 10:00 AM |      | 24.3                 | 8.60              | 101.6             |                     |                       |                   |      |                   |                   |
| 8/9/2016 | 11:00 AM |      | 24.7                 | 8.70              | 103.8             |                     |                       |                   |      |                   |                   |
| -,-,     | 12:00 PM |      | 25.2                 | 8.90              | 106.1             |                     |                       |                   |      |                   |                   |
|          | 1:00 PM  |      | 25.6                 | 8.90              | 108.1             |                     |                       |                   |      |                   |                   |
|          | 2:00 PM  |      | 26.0                 | 9.00              | 109.6             |                     |                       |                   |      |                   |                   |
|          | 3:00 PM  |      | 26.1                 | 9.00              | 109.9             |                     |                       |                   |      |                   |                   |
|          | 4:00 PM  |      | 25.9                 | 8.95              | 108.8             |                     |                       |                   |      |                   |                   |
|          | 5:00 PM  |      | 25.9                 | 8.95              | 108.6             |                     |                       |                   |      |                   |                   |
|          | 6:00 PM  |      | 25.6                 | 8.80              | 106.7             |                     |                       |                   |      |                   |                   |
|          | 7:00 PM  |      | 25.4                 | 8.80              | 104.8             |                     |                       |                   |      |                   |                   |
|          | 8:00 PM  |      | 25.2                 | 8.50              | 101.8             |                     |                       |                   |      |                   |                   |
|          | 9:00 PM  |      | 24.9                 | 8.25              | 99.2              |                     |                       |                   |      |                   |                   |
|          | 10:00 PM |      | 24.7                 | 8.15              | 98.0              |                     |                       |                   |      |                   |                   |
|          | 11:00 PM |      | 24.5                 | 8.25              | 97.5              |                     |                       |                   |      |                   |                   |

|             |          |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-------------|----------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|             |          | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date        | Time Dep | th (°C)     | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|             | 12:00 AM | 24.3        | 8.20     | 96.9             |             |                       |                  |             |             |                  |
|             | 1:00 AM  | 24.1        | 8.15     | 96.1             |             |                       |                  |             |             |                  |
|             | 2:00 AM  | 24.0        | 8.15     | 95.7             |             |                       |                  |             |             |                  |
|             | 3:00 AM  | 23.8        | 8.05     | 95.4             |             |                       |                  |             |             |                  |
|             | 4:00 AM  | 23.7        | 8.05     | 95.0             |             |                       |                  |             |             |                  |
|             | 5:00 AM  | 23.5        | 8.00     | 94.3             |             |                       |                  |             |             |                  |
|             | 6:00 AM  | 23.4        | 8.10     | 93.8             |             |                       |                  |             |             |                  |
|             | 7:00 AM  | 23.3        | 8.20     | 95.1             |             |                       |                  |             |             |                  |
|             | 8:00 AM  | 23.4        | 8.40     | 98.0             |             |                       |                  |             |             |                  |
|             | 9:00 AM  | 23.7        | 8.55     | 100.9            |             |                       |                  |             |             |                  |
|             | 10:00 AM | 23.9        | 8.60     | 101.7            |             |                       |                  |             |             |                  |
| 8/10/2016   | 11:00 AM | 23.9        | 8.70     | 102.0            |             |                       |                  |             |             |                  |
| -, -,       | 12:00 PM | 24.0        | 8.75     | 103.3            |             |                       |                  |             |             |                  |
|             | 1:00 PM  | 24.2        | 8.90     | 105.1            |             |                       |                  |             |             |                  |
|             | 2:00 PM  | 24.1        | 8.75     | 102.6            |             |                       |                  |             |             |                  |
|             | 3:00 PM  | 24.0        | 8.70     | 102.1            |             |                       |                  |             |             |                  |
|             | 4:00 PM  | 24.0        | 8.75     | 102.7            |             |                       |                  |             |             |                  |
|             | 5:00 PM  | 24.0        | 8.60     | 101.5            |             |                       |                  |             |             |                  |
|             | 6:00 PM  | 23.9        | 8.40     | 100.0            |             |                       |                  |             |             |                  |
|             | 7:00 PM  | 23.8        | 8.30     | 98.5             |             |                       |                  |             |             |                  |
|             | 8:00 PM  | 23.7        | 8.20     | 96.6             |             |                       |                  |             |             |                  |
|             | 9:00 PM  | 23.6        | 8.05     | 95.3             |             |                       |                  |             |             |                  |
|             | 10:00 PM | 23.6        | 8.05     | 94.8             |             |                       |                  |             |             |                  |
|             | 11:00 PM | 23.6        | 8.00     | 94.3             |             |                       |                  |             |             |                  |
| 8/11/2016   | 12:00 AM | 23.6        | 8.00     | 93.9             |             |                       |                  |             |             |                  |
| 5, 11, 2010 | 1:00 AM  | 23.5        | 8.00     | 93.7             |             |                       |                  |             |             |                  |

|             |          |       |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-------------|----------|-------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|             |          |       | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date        | Time [   | Depth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|             | 2:00 AM  |       | 23.5        | 8.00     | 93.5             |             |                       |                  |             |             |                  |
|             | 3:00 AM  |       | 23.5        | 7.95     | 93.2             |             |                       |                  |             |             |                  |
|             | 4:00 AM  |       | 23.5        | 8.00     | 92.9             |             |                       |                  |             |             |                  |
|             | 5:00 AM  |       | 23.5        | 8.00     | 92.5             |             |                       |                  |             |             |                  |
|             | 6:00 AM  |       | 23.5        | 7.95     | 92.3             |             |                       |                  |             |             |                  |
|             | 7:00 AM  |       | 23.4        | 8.00     | 92.9             |             |                       |                  |             |             |                  |
|             | 8:00 AM  |       | 23.5        | 8.05     | 95.1             |             |                       |                  |             |             |                  |
|             | 9:00 AM  |       | 23.8        | 8.30     | 99.1             |             |                       |                  |             |             |                  |
|             | 10:00 AM |       | 24.2        | 8.70     | 102.1            |             |                       |                  |             |             |                  |
|             | 11:00 AM |       | 24.7        | 8.70     | 104.4            |             |                       |                  |             |             |                  |
|             | 12:00 PM |       | 25.2        | 8.90     | 106.3            |             |                       |                  |             |             |                  |
|             | 1:00 PM  |       | 25.7        | 8.90     | 108.4            |             |                       |                  |             |             |                  |
|             | 2:00 PM  |       | 25.8        | 8.80     | 107.0            |             |                       |                  |             |             |                  |
|             | 3:00 PM  |       | 25.9        | 8.90     | 107.6            |             |                       |                  |             |             |                  |
|             | 4:00 PM  |       | 26.1        | 8.90     | 108.0            |             |                       |                  |             |             |                  |
|             | 5:00 PM  |       | 26.1        | 8.80     | 107.3            |             |                       |                  |             |             |                  |
|             | 6:00 PM  |       | 26.1        | 8.75     | 106.1            |             |                       |                  |             |             |                  |
|             | 7:00 PM  |       | 25.8        | 8.60     | 103.9            |             |                       |                  |             |             |                  |
|             | 8:00 PM  |       | 25.6        | 8.30     | 100.7            |             |                       |                  |             |             |                  |
|             | 9:00 PM  |       | 25.4        | 8.25     | 98.7             |             |                       |                  |             |             |                  |
|             | 10:00 PM |       | 25.3        | 8.15     | 97.7             |             |                       |                  |             |             |                  |
|             | 11:00 PM |       | 25.2        | 8.10     | 97.0             |             |                       |                  |             |             |                  |
|             | 12:00 AM |       | 25.1        | 8.10     | 96.6             |             |                       |                  |             |             |                  |
| 8/12/2016   | 1:00 AM  |       | 25.0        | 8.10     | 96.5             |             |                       |                  |             |             |                  |
| 5, 12, 2010 | 2:00 AM  |       | 24.9        | 7.95     | 96.0             |             |                       |                  |             |             |                  |
|             | 3:00 AM  |       | 24.8        | 7.95     | 95.7             |             |                       |                  |             |             |                  |

|             |          |       |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-------------|----------|-------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|             |          |       | Tomporatura | DO Conc  | DO<br>Saturation | Tomporatura | DO Conc               | DO<br>Saturation | Tomporaturo | DO Conc     | DO<br>Saturation |
| Date        | Time     | Depth | (°C)        | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|             | 4:00 AM  |       | 24.7        | 7.90     | 95.2             |             |                       |                  |             |             |                  |
|             | 5:00 AM  |       | 24.6        | 7.90     | 94.9             |             |                       |                  |             |             |                  |
|             | 6:00 AM  |       | 24.5        | 7.90     | 94.6             |             |                       |                  |             |             |                  |
|             | 7:00 AM  |       | 24.5        | 8.15     | 95.5             |             |                       |                  |             |             |                  |
|             | 8:00 AM  |       | 24.6        | 8.25     | 98.8             |             |                       |                  |             |             |                  |
|             | 9:00 AM  |       | 24.9        | 8.50     | 102.0            |             |                       |                  |             |             |                  |
|             | 10:00 AM |       | 25.3        | 8.80     | 104.7            |             |                       |                  |             |             |                  |
|             | 11:00 AM |       | 25.4        | 8.80     | 104.6            |             |                       |                  |             |             |                  |
|             | 12:00 PM |       | 25.3        | 8.60     | 103.0            |             |                       |                  |             |             |                  |
|             | 1:00 PM  |       | 25.1        | 8.50     | 101.8            |             |                       |                  |             |             |                  |
|             | 2:00 PM  |       | 25.1        | 8.60     | 103.1            |             |                       |                  |             |             |                  |
|             | 3:00 PM  |       | 25.2        | 8.80     | 104.7            |             |                       |                  |             |             |                  |
|             | 4:00 PM  |       | 25.3        | 8.80     | 105.0            |             |                       |                  |             |             |                  |
|             | 5:00 PM  |       | 25.3        | 8.70     | 104.3            |             |                       |                  |             |             |                  |
|             | 6:00 PM  |       | 25.2        | 8.60     | 103.1            |             |                       |                  |             |             |                  |
|             | 7:00 PM  |       | 25.2        | 8.50     | 101.8            |             |                       |                  |             |             |                  |
|             | 8:00 PM  |       | 25.1        | 8.25     | 99.2             |             |                       |                  |             |             |                  |
|             | 9:00 PM  |       | 24.9        | 8.10     | 97.2             |             |                       |                  |             |             |                  |
|             | 10:00 PM |       | 24.8        | 7.95     | 96.1             |             |                       |                  |             |             |                  |
|             | 11:00 PM |       | 24.7        | 7.90     | 95.3             |             |                       |                  |             |             |                  |
|             | 12:00 AM |       | 24.6        | 7.90     | 95.1             |             |                       |                  |             |             |                  |
|             | 1:00 AM  |       | 24.5        | 7.90     | 94.7             |             |                       |                  |             |             |                  |
| 8/13/2016   | 2:00 AM  |       | 24.4        | 8.00     | 94.4             |             |                       |                  |             |             |                  |
| 5, 10, 2010 | 3:00 AM  |       | 24.4        | 8.00     | 94.0             |             |                       |                  |             |             |                  |
|             | 4:00 AM  |       | 24.3        | 8.00     | 93.7             |             |                       |                  |             |             |                  |
|             | 5:00 AM  |       | 24.2        | 7.95     | 93.1             |             |                       |                  |             |             |                  |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 6:00 AM  | •     | 24.1                | 7.95              | 92.9                    |                     |                       |                         |                     | ,                 |                         |
|           | 7:00 AM  |       | 24.0                | 7.95              | 93.0                    |                     |                       |                         |                     |                   |                         |
|           | 8:00 AM  |       | 24.0                | 8.00              | 94.1                    |                     |                       |                         |                     |                   |                         |
|           | 9:00 AM  |       | 24.0                | 8.20              | 96.7                    |                     |                       |                         |                     |                   |                         |
|           | 10:00 AM |       | 24.0                | 8.20              | 97.1                    |                     |                       |                         |                     |                   |                         |
|           | 11:00 AM |       | 23.9                | 8.25              | 98.0                    |                     |                       |                         |                     |                   |                         |
|           | 12:00 PM |       | 23.9                | 8.40              | 99.7                    |                     |                       |                         |                     |                   |                         |
|           | 1:00 PM  |       | 24.0                | 8.55              | 100.5                   |                     |                       |                         |                     |                   |                         |
|           | 2:00 PM  |       | 24.0                | 8.40              | 100.1                   |                     |                       |                         |                     |                   |                         |
|           | 3:00 PM  |       | 24.0                | 8.40              | 99.8                    | 24.4                | 9.20                  | 107.7                   |                     |                   |                         |
|           | 4:00 PM  |       | 23.9                | 8.40              | 99.9                    | 24.4                | 9.30                  | 108.8                   |                     |                   |                         |
|           | 5:00 PM  |       | 23.9                | 8.30              | 99.2                    | 24.4                | 9.20                  | 108.2                   |                     |                   |                         |
|           | 6:00 PM  |       | 23.8                | 8.20              | 97.3                    | 24.4                | 9.20                  | 107.9                   |                     |                   |                         |
|           | 7:00 PM  |       | 23.7                | 8.05              | 95.2                    | 24.3                | 9.20                  | 107.5                   |                     |                   |                         |
|           | 8:00 PM  |       | 23.6                | 8.00              | 93.8                    | 24.3                | 9.20                  | 107.5                   |                     |                   |                         |
|           | 9:00 PM  |       | 23.5                | 7.95              | 92.9                    | 24.3                | 9.10                  | 107.3                   |                     |                   |                         |
|           | 10:00 PM |       | 23.5                | 8.00              | 92.7                    | 24.3                | 9.10                  | 107.4                   |                     |                   |                         |
|           | 11:00 PM |       | 23.4                | 7.95              | 92.3                    | 24.2                | 9.20                  | 107.6                   |                     |                   |                         |
|           | 12:00 AM |       | 23.4                | 7.95              | 92.2                    | 24.2                | 9.10                  | 107.0                   |                     |                   |                         |
|           | 1:00 AM  |       | 23.3                | 7.95              | 92.0                    | 24.2                | 9.10                  | 107.3                   |                     |                   |                         |
|           | 2:00 AM  |       | 23.3                | 7.95              | 91.8                    | 24.2                | 9.20                  | 107.5                   |                     |                   |                         |
| 8/14/2016 | 3:00 AM  |       | 23.2                | 7.95              | 91.6                    | 24.1                | 9.10                  | 107.4                   |                     |                   |                         |
| -,,       | 4:00 AM  |       | 23.1                | 7.90              | 91.1                    | 24.1                | 9.10                  | 107.1                   |                     |                   |                         |
|           | 5:00 AM  |       | 23.1                | 7.90              | 90.6                    | 24.1                | 9.10                  | 107.4                   |                     |                   |                         |
|           | 6:00 AM  |       | 23.0                | 7.85              | 90.2                    | 24.1                | 9.10                  | 107.4                   |                     |                   |                         |
|           | 7:00 AM  |       | 22.9                | 7.90              | 90.5                    | 24.1                | 9.20                  | 107.8                   |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 8:00 AM  |       | 22.9                | 7.95              | 92.0                    | 24.1                | 9.20                  | 108.1                   |                     |                   |                         |
|           | 9:00 AM  |       | 22.9                | 8.10              | 94.0                    | 24.1                | 9.20                  | 108.3                   |                     |                   |                         |
|           | 10:00 AM |       | 23.0                | 8.20              | 95.4                    | 24.1                | 9.20                  | 108.4                   |                     |                   |                         |
|           | 11:00 AM |       | 23.2                | 8.40              | 97.9                    | 24.1                | 9.30                  | 108.7                   |                     |                   |                         |
|           | 12:00 PM |       | 23.5                | 8.40              | 100.0                   | 24.2                | 9.30                  | 108.6                   |                     |                   |                         |
|           | 1:00 PM  |       | 24.1                | 8.70              | 102.1                   | 24.2                | 9.30                  | 108.5                   |                     |                   |                         |
|           | 2:00 PM  |       | 24.4                | 8.85              | 103.5                   | 24.2                | 9.30                  | 108.8                   |                     |                   |                         |
|           | 3:00 PM  |       | 24.4                | 8.85              | 103.5                   | 24.2                | 9.30                  | 108.8                   |                     |                   |                         |
|           | 4:00 PM  |       | 24.3                | 8.85              | 103.9                   | 24.2                | 9.30                  | 108.9                   |                     |                   |                         |
|           | 5:00 PM  |       | 24.3                | 8.85              | 103.6                   | 24.1                | 9.30                  | 109.0                   |                     |                   |                         |
|           | 6:00 PM  |       | 24.4                | 8.85              | 103.5                   | 24.1                | 9.30                  | 109.0                   |                     |                   |                         |
|           | 7:00 PM  |       | 24.1                | 8.70              | 102.2                   | 24.3                | 9.30                  | 109.3                   |                     |                   |                         |
|           | 8:00 PM  |       | 24.0                | 8.40              | 100.3                   | 24.3                | 9.40                  | 109.5                   |                     |                   |                         |
|           | 9:00 PM  |       | 23.9                | 8.30              | 99.0                    | 24.3                | 9.40                  | 109.6                   |                     |                   |                         |
|           | 10:00 PM |       | 23.9                | 8.30              | 98.5                    | 24.3                | 9.40                  | 109.8                   |                     |                   |                         |
|           | 11:00 PM |       | 23.8                | 8.25              | 98.3                    | 24.3                | 9.40                  | 109.9                   |                     |                   |                         |
|           | 12:00 AM |       | 23.8                | 8.25              | 98.0                    | 24.3                | 9.40                  | 110.1                   |                     |                   |                         |
|           | 1:00 AM  |       | 23.7                | 8.25              | 97.7                    | 24.3                | 9.40                  | 110.2                   |                     |                   |                         |
|           | 2:00 AM  |       | 23.7                | 8.20              | 97.3                    | 24.2                | 9.40                  | 110.3                   |                     |                   |                         |
|           | 3:00 AM  |       | 23.7                | 8.20              | 96.9                    | 24.2                | 9.40                  | 110.3                   |                     |                   |                         |
| 8/15/2016 | 4:00 AM  |       | 23.7                | 8.20              | 96.6                    | 24.2                | 9.40                  | 110.4                   |                     |                   |                         |
|           | 5:00 AM  |       | 23.7                | 8.15              | 96.4                    | 24.2                | 9.45                  | 110.5                   |                     |                   |                         |
|           | 6:00 AM  |       | 23.7                | 8.15              | 96.4                    | 24.1                | 9.45                  | 110.6                   |                     |                   |                         |
|           | 7:00 AM  |       | 23.7                | 8.20              | 97.1                    | 24.1                | 9.45                  | 110.7                   |                     |                   |                         |
|           | 8:00 AM  |       | 23.9                | 8.40              | 99.7                    | 23.8                | 8.00                  | 93.9                    |                     |                   |                         |
|           | 9:00 AM  |       | 24.1                | 8.70              | 102.3                   | 23.8                | 8.10                  | 94.8                    |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 10:00 AM |       | 24.5                | 8.80              | 104.6                   | 24.2                | 9.40                  | 110.0                   |                     |                   |                         |
|           | 11:00 AM |       | 24.9                | 8.90              | 106.2                   | 24.5                | 9.45                  | 110.8                   |                     |                   |                         |
|           | 12:00 PM |       | 25.4                | 9.10              | 108.2                   | 24.8                | 9.45                  | 111.0                   |                     |                   |                         |
|           | 1:00 PM  |       | 25.7                | 8.95              | 109.2                   | 25.0                | 9.45                  | 110.9                   |                     |                   |                         |
|           | 2:00 PM  |       | 26.1                | 9.00              | 110.2                   | 25.0                | 9.45                  | 110.7                   |                     |                   |                         |
|           | 3:00 PM  |       | 26.2                | 9.00              | 110.1                   | 25.2                | 9.45                  | 111.1                   |                     |                   |                         |
|           | 4:00 PM  |       | 26.3                | 8.95              | 109.2                   | 24.5                | 8.90                  | 105.8                   |                     |                   |                         |
|           | 5:00 PM  |       | 26.2                | 8.90              | 108.4                   | 24.4                | 8.85                  | 104.0                   |                     |                   |                         |
|           | 6:00 PM  |       | 26.1                | 8.80              | 107.4                   | 24.4                | 8.85                  | 104.4                   |                     |                   |                         |
|           | 7:00 PM  |       | 25.8                | 8.75              | 105.9                   | 24.5                | 9.05                  | 106.1                   |                     |                   |                         |
|           | 8:00 PM  |       | 25.5                | 8.70              | 103.5                   | 24.4                | 9.05                  | 106.3                   |                     |                   |                         |
|           | 9:00 PM  |       | 25.3                | 8.50              | 102.0                   | 24.4                | 9.05                  | 106.3                   |                     |                   |                         |
|           | 10:00 PM |       | 25.1                | 8.40              | 101.0                   | 24.4                | 9.05                  | 106.3                   |                     |                   |                         |
|           | 11:00 PM |       | 24.9                | 8.35              | 100.3                   | 24.3                | 9.10                  | 106.5                   |                     |                   |                         |
|           | 12:00 AM |       | 24.8                | 8.35              | 99.8                    | 24.3                | 9.10                  | 106.6                   |                     |                   |                         |
|           | 1:00 AM  |       | 24.7                | 8.25              | 99.3                    | 24.3                | 9.10                  | 106.6                   |                     |                   |                         |
|           | 2:00 AM  |       | 24.6                | 8.25              | 99.0                    | 24.6                | 9.40                  | 109.8                   |                     |                   |                         |
|           | 3:00 AM  |       | 24.5                | 8.25              | 98.3                    | 24.6                | 9.45                  | 110.8                   |                     |                   |                         |
|           | 4:00 AM  |       | 24.3                | 8.25              | 97.7                    | 24.6                | 9.45                  | 110.6                   |                     |                   |                         |
| 8/16/2016 | 5:00 AM  |       | 24.2                | 8.20              | 97.0                    | 24.5                | 9.45                  | 110.6                   |                     |                   |                         |
|           | 6:00 AM  |       | 24.1                | 8.20              | 96.8                    | 24.4                | 9.45                  | 110.6                   |                     |                   |                         |
|           | 7:00 AM  |       | 24.1                | 8.25              | 98.0                    | 24.4                | 9.45                  | 110.9                   |                     |                   |                         |
|           | 8:00 AM  |       | 24.2                | 8.40              | 100.4                   | 24.1                | 9.10                  | 107.1                   |                     |                   |                         |
|           | 9:00 AM  |       | 24.5                | 8.60              | 103.1                   | 24.1                | 9.10                  | 107.1                   |                     |                   |                         |
|           | 10:00 AM |       | 24.8                | 8.80              | 105.2                   | 24.1                | 9.10                  | 107.2                   |                     |                   |                         |
|           | 11:00 AM |       | 25.0                | 9.00              | 107.0                   | 24.1                | 9.10                  | 107.1                   |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time De  | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 12:00 PM |       | 25.3                | 9.10              | 108.4                   | 24.2                | 9.10                  | 107.0                   |                     |                   |                         |
|           | 1:00 PM  |       | 25.6                | 9.00              | 110.1                   | 24.3                | 9.30                  | 109.2                   |                     |                   |                         |
|           | 2:00 PM  |       | 25.7                | 9.00              | 110.3                   | 24.1                | 9.20                  | 107.5                   |                     |                   |                         |
|           | 3:00 PM  |       | 25.6                | 8.95              | 109.0                   | 24.0                | 9.20                  | 107.5                   |                     |                   |                         |
|           | 4:00 PM  |       | 25.5                | 8.90              | 108.3                   | 24.0                | 9.10                  | 107.1                   |                     |                   |                         |
|           | 5:00 PM  |       | 25.4                | 9.00              | 106.5                   | 24.0                | 9.20                  | 107.8                   |                     |                   |                         |
|           | 6:00 PM  |       | 25.2                | 8.80              | 104.8                   | 24.1                | 9.45                  | 110.9                   |                     |                   |                         |
|           | 7:00 PM  |       | 25.1                | 8.50              | 102.3                   | 24.2                | 9.45                  | 111.1                   |                     |                   |                         |
|           | 8:00 PM  |       | 25.0                | 8.35              | 100.1                   | 24.2                | 9.45                  | 111.1                   |                     |                   |                         |
|           | 9:00 PM  |       | 24.8                | 8.25              | 99.4                    | 24.2                | 9.45                  | 111.0                   |                     |                   |                         |
|           | 10:00 PM |       | 24.7                | 8.25              | 99.1                    | 24.2                | 9.45                  | 111.1                   |                     |                   |                         |
|           | 11:00 PM |       | 24.6                | 8.25              | 98.5                    | 24.2                | 9.45                  | 110.7                   |                     |                   |                         |
|           | 12:00 AM |       | 24.6                | 8.15              | 98.1                    | 24.2                | 9.45                  | 110.8                   |                     |                   |                         |
|           | 1:00 AM  |       | 24.5                | 8.15              | 97.7                    | 24.2                | 9.45                  | 110.7                   |                     |                   |                         |
|           | 2:00 AM  |       | 24.5                | 8.20              | 97.2                    | 24.2                | 9.45                  | 110.5                   |                     |                   |                         |
|           | 3:00 AM  |       | 24.4                | 8.20              | 96.8                    | 24.2                | 9.45                  | 110.5                   |                     |                   |                         |
|           | 4:00 AM  |       | 24.4                | 8.15              | 96.1                    | 24.2                | 9.40                  | 110.4                   |                     |                   |                         |
|           | 5:00 AM  |       | 24.3                | 8.15              | 95.5                    | 24.2                | 9.40                  | 110.0                   |                     |                   |                         |
| 8/17/2016 | 6:00 AM  |       | 24.1                | 8.05              | 94.7                    | 24.1                | 9.40                  | 109.8                   |                     |                   |                         |
|           | 7:00 AM  |       | 24.1                | 8.15              | 95.5                    | 24.1                | 9.40                  | 109.7                   |                     |                   |                         |
|           | 8:00 AM  |       | 24.1                | 8.20              | 96.8                    | 24.1                | 9.40                  | 110.4                   |                     |                   |                         |
|           | 9:00 AM  |       | 24.2                | 8.30              | 99.2                    | 24.2                | 9.45                  | 110.7                   |                     |                   |                         |
|           | 10:00 AM |       | 24.4                | 8.60              | 101.6                   | 24.3                | 9.45                  | 110.8                   |                     |                   |                         |
|           | 11:00 AM |       | 24.5                | 8.60              | 101.6                   | 24.5                | 9.45                  | 110.7                   |                     |                   |                         |
|           | 12:00 PM |       | 24.4                | 8.55              | 100.9                   | 24.5                | 9.45                  | 111.1                   |                     |                   |                         |
|           | 1:00 PM  |       | 24.3                | 8.55              | 100.9                   | 24.4                | 9.45                  | 111.1                   |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 2:00 PM  |       | 24.4                | 8.75              | 103.0                   | 24.4                | 9.50                  | 111.6                   |                     |                   |                         |
|           | 3:00 PM  |       | 24.5                | 8.80              | 104.6                   | 24.4                | 9.50                  | 112.1                   |                     |                   |                         |
|           | 4:00 PM  |       | 24.7                | 8.80              | 104.9                   | 24.4                | 9.50                  | 112.3                   |                     |                   |                         |
|           | 5:00 PM  |       | 24.9                | 8.80              | 105.0                   | 24.4                | 9.50                  | 112.0                   |                     |                   |                         |
|           | 6:00 PM  |       | 24.9                | 8.70              | 104.1                   | 24.4                | 9.50                  | 112.1                   |                     |                   |                         |
|           | 7:00 PM  |       | 24.6                | 8.50              | 102.2                   | 24.4                | 9.50                  | 112.1                   |                     |                   |                         |
|           | 8:00 PM  |       | 24.4                | 8.40              | 99.7                    | 24.4                | 9.50                  | 111.9                   |                     |                   |                         |
|           | 9:00 PM  |       | 24.3                | 8.25              | 97.9                    | 24.3                | 9.50                  | 112.1                   |                     |                   |                         |
|           | 10:00 PM |       | 24.1                | 8.20              | 97.1                    | 24.3                | 9.50                  | 111.9                   |                     |                   |                         |
|           | 11:00 PM |       | 24.0                | 8.15              | 96.4                    | 24.2                | 9.50                  | 112.1                   |                     |                   |                         |
|           | 12:00 AM |       | 23.8                | 8.15              | 95.7                    | 24.2                | 9.50                  | 111.9                   |                     |                   |                         |
|           | 1:00 AM  |       | 23.7                | 8.05              | 95.3                    | 24.2                | 9.50                  | 112.0                   |                     |                   |                         |
|           | 2:00 AM  |       | 23.6                | 8.05              | 94.7                    | 24.1                | 9.50                  | 111.5                   |                     |                   |                         |
|           | 3:00 AM  |       | 23.5                | 8.00              | 94.4                    | 24.1                | 9.50                  | 111.5                   |                     |                   |                         |
|           | 4:00 AM  |       | 23.4                | 8.10              | 94.1                    | 24.0                | 9.50                  | 111.5                   |                     |                   |                         |
|           | 5:00 AM  |       | 23.3                | 8.10              | 93.7                    | 24.0                | 9.50                  | 111.8                   |                     |                   |                         |
|           | 6:00 AM  |       | 23.3                | 8.10              | 93.5                    | 24.0                | 9.50                  | 112.0                   |                     |                   |                         |
| 8/18/2016 | 7:00 AM  |       | 23.2                | 8.10              | 94.1                    | 24.0                | 9.20                  | 108.1                   |                     |                   |                         |
| -, -,     | 8:00 AM  |       | 23.3                | 8.20              | 95.3                    | 24.0                | 9.30                  | 108.7                   |                     |                   |                         |
|           | 9:00 AM  |       | 23.4                | 8.35              | 96.8                    | 24.1                | 9.40                  | 110.0                   |                     |                   |                         |
|           | 10:00 AM |       | 23.5                | 8.40              | 99.7                    | 24.1                | 9.45                  | 110.7                   |                     |                   |                         |
|           | 11:00 AM |       | 24.1                | 8.75              | 102.7                   | 24.2                | 9.45                  | 110.8                   |                     |                   |                         |
|           | 12:00 PM |       | 24.7                | 8.80              | 105.0                   | 24.3                | 9.40                  | 110.1                   |                     |                   |                         |
|           | 1:00 PM  |       | 25.1                | 8.90              | 106.0                   | 24.2                | 9.20                  | 107.6                   |                     |                   |                         |
|           | 2:00 PM  |       | 25.1                | 8.90              | 105.8                   | 24.1                | 9.30                  | 109.0                   |                     |                   |                         |
|           | 3:00 PM  |       | 25.2                | 9.00              | 106.6                   | 24.1                | 9.40                  | 109.6                   |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 4:00 PM  |       | 25.3                | 8.90              | 106.0                   | 24.1                | 9.40                  | 109.7                   |                     |                   |                         |
|           | 5:00 PM  |       | 25.4                | 8.90              | 105.6                   | 24.1                | 9.40                  | 109.8                   |                     |                   |                         |
|           | 6:00 PM  |       | 25.3                | 8.80              | 105.2                   | 24.1                | 9.40                  | 110.4                   |                     |                   |                         |
|           | 7:00 PM  |       | 25.1                | 8.70              | 103.9                   | 24.1                | 9.40                  | 110.4                   |                     |                   |                         |
|           | 8:00 PM  |       | 24.8                | 8.50              | 101.5                   | 24.2                | 9.60                  | 112.8                   |                     |                   |                         |
|           | 9:00 PM  |       | 24.6                | 8.40              | 99.7                    | 24.2                | 9.60                  | 113.4                   |                     |                   |                         |
|           | 10:00 PM |       | 24.5                | 8.30              | 99.0                    | 24.1                | 9.70                  | 113.5                   |                     |                   |                         |
|           | 11:00 PM |       | 24.3                | 8.30              | 98.4                    | 24.1                | 9.70                  | 113.6                   |                     |                   |                         |
|           | 12:00 AM |       | 24.2                | 8.30              | 97.8                    | 24.1                | 9.70                  | 113.7                   |                     |                   |                         |
|           | 1:00 AM  |       | 24.0                | 8.30              | 97.7                    | 24.1                | 9.70                  | 113.7                   |                     |                   |                         |
|           | 2:00 AM  |       | 23.8                | 8.20              | 97.1                    | 24.0                | 9.70                  | 113.9                   |                     |                   |                         |
|           | 3:00 AM  |       | 23.7                | 8.20              | 96.6                    | 24.0                | 9.70                  | 113.8                   |                     |                   |                         |
|           | 4:00 AM  |       | 23.5                | 8.20              | 96.2                    | 23.9                | 9.70                  | 113.8                   |                     |                   |                         |
|           | 5:00 AM  |       | 23.4                | 8.30              | 95.6                    | 23.9                | 9.70                  | 113.6                   |                     |                   |                         |
|           | 6:00 AM  |       | 23.2                | 8.20              | 95.2                    | 23.9                | 9.70                  | 113.8                   |                     |                   |                         |
|           | 7:00 AM  |       | 23.1                | 8.30              | 95.7                    | 23.8                | 9.70                  | 113.7                   |                     |                   |                         |
| 8/19/2016 | 8:00 AM  |       | 23.3                | 8.40              | 98.4                    | 23.9                | 9.70                  | 114.1                   |                     |                   |                         |
|           | 9:00 AM  |       | 23.6                | 8.60              | 100.9                   | 23.9                | 9.80                  | 114.7                   |                     |                   |                         |
|           | 10:00 AM |       | 23.9                | 8.80              | 102.7                   | 24.0                | 9.80                  | 114.7                   |                     |                   |                         |
|           | 11:00 AM |       | 24.3                | 8.90              | 104.5                   | 24.2                | 9.80                  | 115.0                   |                     |                   |                         |
|           | 12:00 PM |       | 24.7                | 8.90              | 106.4                   | 24.4                | 9.80                  | 115.2                   |                     |                   |                         |
|           | 1:00 PM  |       | 25.2                | 9.10              | 108.3                   | 24.8                | 9.70                  | 115.7                   |                     |                   |                         |
|           | 2:00 PM  |       | 25.6                | 9.00              | 109.7                   | 24.9                | 9.70                  | 115.5                   |                     |                   |                         |
|           | 3:00 PM  |       | 25.9                | 9.00              | 110.3                   | 25.0                | 9.60                  | 115.4                   |                     |                   |                         |
|           | 4:00 PM  |       | 26.0                | 9.00              | 109.0                   | 25.1                | 9.60                  | 114.9                   |                     |                   |                         |
|           | 5:00 PM  |       | 26.0                | 8.90              | 108.2                   | 25.2                | 9.60                  | 114.2                   |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 6:00 PM  |       | 25.9                | 8.80              | 107.2                   | 25.2                | 9.60                  | 114.3                   |                     |                   |                         |
|           | 7:00 PM  |       | 25.7                | 8.80              | 105.6                   | 25.2                | 9.60                  | 114.3                   |                     |                   |                         |
|           | 8:00 PM  |       | 25.3                | 8.60              | 102.9                   | 25.1                | 9.60                  | 114.2                   |                     |                   |                         |
|           | 9:00 PM  |       | 25.0                | 8.40              | 100.9                   | 25.0                | 9.60                  | 114.4                   |                     |                   |                         |
|           | 10:00 PM |       | 24.8                | 8.40              | 100.1                   | 24.9                | 9.60                  | 114.2                   |                     |                   |                         |
|           | 11:00 PM |       | 24.7                | 8.40              | 99.7                    | 24.8                | 9.60                  | 114.3                   |                     |                   |                         |
|           | 12:00 AM |       | 24.5                | 8.10              | 99.1                    | 24.7                | 9.60                  | 114.4                   |                     |                   |                         |
|           | 1:00 AM  |       | 24.3                | 8.30              | 98.9                    | 24.6                | 9.60                  | 114.3                   |                     |                   |                         |
|           | 2:00 AM  |       | 24.1                | 8.30              | 98.4                    | 24.5                | 9.60                  | 114.1                   |                     |                   |                         |
|           | 3:00 AM  |       | 24.0                | 8.30              | 98.2                    | 24.4                | 9.70                  | 114.2                   |                     |                   |                         |
|           | 4:00 AM  |       | 23.8                | 8.30              | 97.7                    | 24.3                | 9.70                  | 114.2                   |                     |                   |                         |
|           | 5:00 AM  |       | 23.7                | 8.20              | 97.1                    | 24.2                | 9.70                  | 114.4                   |                     |                   |                         |
|           | 6:00 AM  |       | 23.5                | 8.20              | 96.5                    | 24.2                | 9.70                  | 114.3                   |                     |                   |                         |
|           | 7:00 AM  |       | 23.4                | 8.40              | 96.9                    | 24.1                | 9.80                  | 114.7                   |                     |                   |                         |
|           | 8:00 AM  |       | 23.5                | 8.30              | 99.0                    | 24.1                | 9.80                  | 114.8                   |                     |                   |                         |
| 8/20/2016 | 9:00 AM  |       | 23.7                | 8.60              | 100.9                   | 24.2                | 9.80                  | 115.1                   |                     |                   |                         |
| 0,20,2010 | 10:00 AM |       | 24.0                | 8.80              | 102.6                   | 24.3                | 9.80                  | 115.2                   |                     |                   |                         |
|           | 11:00 AM |       | 24.5                | 8.70              | 104.4                   | 24.4                | 9.80                  | 115.4                   |                     |                   |                         |
|           | 12:00 PM |       | 24.9                | 8.90              | 106.3                   | 24.7                | 9.60                  | 115.2                   |                     |                   |                         |
|           | 1:00 PM  |       | 25.3                | 9.00              | 107.3                   | 24.8                | 9.60                  | 115.0                   |                     |                   |                         |
|           | 2:00 PM  |       | 25.7                | 9.00              | 108.7                   | 24.7                | 9.60                  | 115.3                   |                     |                   |                         |
|           | 3:00 PM  |       | 25.9                | 9.00              | 109.1                   | 24.5                | 9.60                  | 115.3                   |                     |                   |                         |
|           | 4:00 PM  |       | 26.0                | 9.00              | 109.5                   | 24.3                | 9.80                  | 114.8                   |                     |                   |                         |
|           | 5:00 PM  |       | 25.9                | 9.00              | 109.0                   | 24.2                | 9.70                  | 114.4                   |                     |                   |                         |
|           | 6:00 PM  |       | 25.5                | 8.80              | 107.2                   | 24.1                | 9.70                  | 114.4                   |                     |                   |                         |
|           | 7:00 PM  |       | 25.2                | 8.80              | 105.1                   | 24.1                | 9.80                  | 114.6                   |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 8:00 PM  |       | 24.9                | 8.50              | 102.4                   | 24.1                | 9.70                  | 114.3                   |                     |                   |                         |
|           | 9:00 PM  |       | 24.7                | 8.40              | 100.6                   | 24.1                | 9.70                  | 114.4                   |                     |                   |                         |
|           | 10:00 PM |       | 24.5                | 8.40              | 99.6                    | 24.0                | 9.70                  | 114.4                   |                     |                   |                         |
|           | 11:00 PM |       | 24.4                | 8.30              | 98.9                    | 24.0                | 9.70                  | 114.2                   |                     |                   |                         |
|           | 12:00 AM |       | 24.3                | 8.30              | 98.4                    | 24.0                | 9.80                  | 114.8                   |                     |                   |                         |
|           | 1:00 AM  |       | 24.2                | 8.30              | 97.7                    | 24.0                | 9.80                  | 115.1                   |                     |                   |                         |
|           | 2:00 AM  |       | 24.0                | 8.20              | 97.4                    | 24.0                | 9.80                  | 114.7                   |                     |                   |                         |
|           | 3:00 AM  |       | 23.9                | 8.20              | 96.8                    | 24.0                | 9.80                  | 114.7                   |                     |                   |                         |
|           | 4:00 AM  |       | 23.8                | 8.20              | 96.4                    | 23.9                | 9.80                  | 114.7                   |                     |                   |                         |
|           | 5:00 AM  |       | 23.7                | 8.20              | 95.9                    | 23.9                | 9.80                  | 114.8                   |                     |                   |                         |
|           | 6:00 AM  |       | 23.6                | 8.20              | 95.5                    | 23.9                | 9.80                  | 114.9                   |                     |                   |                         |
|           | 7:00 AM  |       | 23.6                | 8.20              | 95.9                    | 23.9                | 9.80                  | 115.2                   |                     |                   |                         |
|           | 8:00 AM  |       | 23.6                | 8.30              | 97.6                    | 23.9                | 9.80                  | 114.9                   |                     |                   |                         |
|           | 9:00 AM  |       | 23.9                | 8.60              | 100.7                   | 24.0                | 9.90                  | 115.5                   |                     |                   |                         |
| 8/21/2016 | 10:00 AM |       | 24.3                | 8.80              | 103.3                   | 24.0                | 9.90                  | 115.8                   |                     |                   |                         |
| 0/21/2010 | 11:00 AM |       | 24.6                | 8.80              | 105.2                   | 24.1                | 9.90                  | 115.5                   |                     |                   |                         |
|           | 12:00 PM |       | 25.0                | 9.00              | 106.7                   | 24.2                | 9.90                  | 115.6                   |                     |                   |                         |
|           | 1:00 PM  |       | 25.5                | 8.90              | 108.4                   | 24.2                | 9.90                  | 115.5                   |                     |                   |                         |
|           | 2:00 PM  |       | 25.8                | 9.00              | 109.6                   | 24.2                | 9.80                  | 115.2                   |                     |                   |                         |
|           | 3:00 PM  |       | 26.0                | 9.00              | 109.9                   | 24.2                | 9.80                  | 115.2                   |                     |                   |                         |
|           | 4:00 PM  |       | 25.9                | 8.90              | 108.4                   | 24.2                | 9.80                  | 114.8                   |                     |                   |                         |
|           | 5:00 PM  |       | 25.8                | 8.80              | 107.3                   | 24.2                | 9.70                  | 114.4                   |                     |                   |                         |
|           | 6:00 PM  |       | 25.6                | 8.80              | 105.6                   | 24.2                | 9.70                  | 114.4                   |                     |                   |                         |
|           | 7:00 PM  |       | 25.3                | 8.70              | 103.6                   | 24.2                | 9.70                  | 114.2                   |                     |                   |                         |
|           | 8:00 PM  |       | 24.9                | 8.40              | 100.8                   | 24.1                | 9.70                  | 114.4                   |                     |                   |                         |
|           | 9:00 PM  |       | 24.6                | 8.30              | 98.8                    | 24.2                | 9.80                  | 114.6                   |                     |                   |                         |

|           |          |                       | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-----------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time Dep | Temperature<br>h (°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 10:00 PM | 24.5                  | 8.20              | 98.0                    | 24.2                | 9.70                  | 114.2                   |                     |                   |                         |
|           | 11:00 PM | 24.5                  | 8.20              | 97.8                    | 24.2                | 9.80                  | 114.5                   |                     |                   |                         |
|           | 12:00 AM | 24.4                  | 8.20              | 97.4                    | 24.2                | 9.70                  | 114.4                   |                     |                   |                         |
|           | 1:00 AM  | 24.3                  | 8.20              | 97.0                    | 24.1                | 9.80                  | 114.5                   |                     |                   |                         |
|           | 2:00 AM  | 24.3                  | 8.20              | 96.6                    | 24.2                | 9.80                  | 114.6                   |                     |                   |                         |
|           | 3:00 AM  | 24.3                  | 8.20              | 96.3                    | 24.2                | 9.70                  | 114.4                   |                     |                   |                         |
|           | 4:00 AM  | 24.3                  | 8.20              | 95.9                    | 24.2                | 9.70                  | 114.3                   |                     |                   |                         |
|           | 5:00 AM  | 24.3                  | 8.20              | 95.7                    | 24.2                | 9.70                  | 114.4                   |                     |                   |                         |
|           | 6:00 AM  | 24.2                  | 8.20              | 95.5                    | 24.2                | 9.70                  | 114.3                   |                     |                   |                         |
|           | 7:00 AM  | 24.1                  | 8.10              | 95.4                    | 24.2                | 9.70                  | 114.4                   |                     |                   |                         |
|           | 8:00 AM  | 24.0                  | 8.20              | 95.9                    | 24.1                | 9.70                  | 114.3                   |                     |                   |                         |
|           | 9:00 AM  | 23.9                  | 8.20              | 97.1                    | 24.1                | 9.80                  | 114.5                   |                     |                   |                         |
|           | 10:00 AM | 24.2                  | 8.60              | 101.0                   | 24.2                | 9.80                  | 114.9                   |                     |                   |                         |
| 8/22/2016 | 11:00 AM | 24.5                  | 8.70              | 103.6                   | 24.2                | 9.80                  | 114.8                   |                     |                   |                         |
| 8/22/2010 | 12:00 PM | 24.7                  | 8.80              | 104.7                   | 24.3                | 9.60                  | 113.1                   |                     |                   |                         |
|           | 1:00 PM  | 25.1                  | 9.00              | 107.1                   | 24.2                | 8.90                  | 105.0                   |                     |                   |                         |
|           | 2:00 PM  | 25.2                  | 9.10              | 107.5                   | 24.3                | 9.80                  | 114.9                   |                     |                   |                         |
|           | 3:00 PM  | 25.1                  | 9.00              | 107.1                   | 24.4                | 9.90                  | 115.5                   |                     |                   |                         |
|           | 4:00 PM  | 24.9                  | 9.00              | 106.8                   | 24.4                | 9.80                  | 115.4                   |                     |                   |                         |
|           | 5:00 PM  | 24.6                  | 8.80              | 105.4                   | 24.5                | 9.60                  | 115.4                   |                     |                   |                         |
|           | 6:00 PM  | 24.3                  | 8.90              | 103.7                   | 24.5                | 9.70                  | 115.5                   |                     |                   |                         |
|           | 7:00 PM  | 24.0                  | 8.60              | 101.5                   | 24.4                | 9.90                  | 115.8                   |                     |                   |                         |
|           | 8:00 PM  | 23.7                  | 8.30              | 98.9                    | 24.3                | 9.90                  | 115.6                   |                     |                   |                         |
|           | 9:00 PM  | 23.5                  | 8.20              | 97.3                    | 24.3                | 9.90                  | 115.7                   |                     |                   |                         |
|           | 10:00 PM | 23.4                  | 8.40              | 96.5                    | 24.2                | 9.90                  | 116.0                   |                     |                   |                         |
|           | 11:00 PM | 23.3                  | 8.30              | 96.0                    | 24.1                | 9.90                  | 115.6                   |                     |                   |                         |

|           |          |                       | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-----------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time Dep | Temperature<br>h (°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 12:00 AM | 23.3                  | 8.30              | 95.6                    | 24.1                | 9.90                  | 115.6                   |                     |                   |                         |
|           | 1:00 AM  | 23.2                  | 8.20              | 95.1                    | 24.0                | 9.90                  | 115.6                   |                     |                   |                         |
|           | 2:00 AM  | 23.1                  | 8.20              | 94.6                    | 24.0                | 9.90                  | 115.7                   |                     |                   |                         |
|           | 3:00 AM  | 22.9                  | 8.10              | 94.4                    | 23.9                | 9.80                  | 115.3                   |                     |                   |                         |
|           | 4:00 AM  | 22.8                  | 8.10              | 94.1                    | 23.9                | 9.80                  | 115.4                   |                     |                   |                         |
|           | 5:00 AM  | 22.7                  | 8.10              | 93.6                    | 23.9                | 9.90                  | 116.1                   |                     |                   |                         |
|           | 6:00 AM  | 22.6                  | 8.00              | 93.2                    | 23.8                | 9.90                  | 116.3                   |                     |                   |                         |
|           | 7:00 AM  | 22.5                  | 8.10              | 93.6                    | 23.8                | 10.00                 | 116.9                   |                     |                   |                         |
|           | 8:00 AM  | 22.6                  | 8.30              | 96.0                    | 23.8                | 10.10                 | 117.5                   |                     |                   |                         |
|           | 9:00 AM  | 22.9                  | 8.50              | 98.5                    | 23.8                | 10.10                 | 117.8                   |                     |                   |                         |
|           | 10:00 AM | 23.2                  | 8.70              | 100.6                   | 23.9                | 10.10                 | 118.0                   |                     |                   |                         |
| 8/23/2016 | 11:00 AM | 23.6                  | 8.80              | 102.5                   | 23.9                | 10.10                 | 118.1                   |                     |                   |                         |
| -,,       | 12:00 PM | 24.0                  | 8.90              | 104.6                   | 23.9                | 10.10                 | 118.1                   |                     |                   |                         |
|           | 1:00 PM  | 24.3                  | 9.10              | 105.8                   | 23.8                | 10.10                 | 117.8                   |                     |                   |                         |
|           | 2:00 PM  | 24.4                  | 9.10              | 106.1                   | 23.9                | 10.10                 | 118.2                   |                     |                   |                         |
|           | 3:00 PM  | 24.5                  | 9.00              | 106.5                   | 23.9                | 10.10                 | 118.3                   |                     |                   |                         |
|           | 4:00 PM  | 24.5                  | 8.90              | 106.0                   | 23.9                | 10.10                 | 117.8                   |                     |                   |                         |
|           | 5:00 PM  | 24.5                  | 8.90              | 105.5                   | 23.8                | 10.10                 | 117.5                   |                     |                   |                         |
|           | 6:00 PM  | 24.3                  | 8.90              | 104.5                   | 23.8                | 10.00                 | 117.3                   |                     |                   |                         |
|           | 7:00 PM  | 24.0                  | 8.80              | 102.9                   | 23.8                | 10.00                 | 117.1                   |                     |                   |                         |
|           | 8:00 PM  | 23.7                  | 8.40              | 100.1                   | 23.8                | 10.00                 | 117.1                   |                     |                   |                         |
|           | 9:00 PM  | 23.5                  | 8.30              | 98.3                    | 23.7                | 10.00                 | 117.0                   |                     |                   |                         |
|           | 10:00 PM | 23.4                  | 8.40              | 97.8                    | 23.7                | 10.00                 | 116.8                   |                     |                   |                         |
|           | 11:00 PM | 23.2                  | 8.40              | 97.4                    | 23.6                | 10.00                 | 116.5                   |                     |                   |                         |
| 8/24/2016 | 12:00 AM | 23.1                  | 8.40              | 96.9                    | 23.6                | 10.00                 | 116.9                   |                     |                   |                         |
| -,, =010  | 1:00 AM  | 23.0                  | 8.40              | 96.7                    | 23.6                | 10.00                 | 116.9                   |                     |                   |                         |

|      |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|      | 2:00 AM  |       | 22.9                | 8.30              | 96.4                    | 23.6                | 10.00                 | 117.3                   |                     |                   |                         |
|      | 3:00 AM  |       | 22.8                | 8.30              | 96.0                    | 23.6                | 10.00                 | 117.1                   |                     |                   |                         |
|      | 4:00 AM  |       | 22.6                | 8.30              | 95.6                    | 23.5                | 10.00                 | 117.0                   |                     |                   |                         |
|      | 5:00 AM  |       | 22.5                | 8.20              | 95.2                    | 23.5                | 10.00                 | 116.8                   |                     |                   |                         |
|      | 6:00 AM  |       | 22.4                | 8.40              | 94.6                    | 23.5                | 10.00                 | 117.0                   |                     |                   |                         |
|      | 7:00 AM  |       | 22.4                | 8.40              | 95.5                    | 23.4                | 10.20                 | 117.4                   |                     |                   |                         |
|      | 8:00 AM  |       | 22.5                | 8.40              | 98.2                    | 23.4                | 10.30                 | 118.1                   |                     |                   |                         |
|      | 9:00 AM  |       | 22.7                | 8.70              | 101.4                   | 23.5                | 10.10                 | 118.4                   |                     |                   |                         |
|      |          | Surf. |                     |                   |                         |                     |                       |                         | 23.9                | 7.76              | 91                      |
|      |          | 1m    |                     |                   |                         |                     |                       |                         | 23.7                | 7.68              | 90                      |
|      |          | 2m    |                     |                   |                         |                     |                       |                         | 23.7                | 7.66              | 90                      |
|      | 9:50 AM  | 3m    |                     |                   |                         |                     |                       |                         | 23.6                | 7.64              | 89                      |
|      |          | 4m    |                     |                   |                         |                     |                       |                         | 23.6                | 7.61              | 89                      |
|      |          | 5m    |                     |                   |                         |                     |                       |                         | 23.6                | 7.60              | 89                      |
|      |          | 6m    |                     |                   |                         |                     |                       |                         | 23.6                | 7.55              | 88                      |
|      | 10:00 AM |       | 23.1                | 9.10              | 103.9                   | 23.6                | 8.80                  | 103.1                   |                     |                   |                         |
|      | 11:00 AM |       | 23.5                | 9.10              | 106.1                   | 23.7                | 8.80                  | 102.6                   |                     |                   |                         |
|      | 12:00 PM |       | 24.0                | 9.20              | 108.3                   | 23.7                | 8.80                  | 103.3                   |                     |                   |                         |
|      | 1:00 PM  |       | 24.5                | 9.20              | 110.0                   | 23.8                | 8.90                  | 103.5                   |                     |                   |                         |
|      | 2:00 PM  |       | 24.8                | 9.30              | 111.2                   | 23.8                | 8.90                  | 103.5                   |                     |                   |                         |
|      | 3:00 PM  |       | 25.0                | 9.40              | 111.5                   | 23.8                | 8.80                  | 102.7                   |                     |                   |                         |
|      | 4:00 PM  |       | 25.0                | 9.30              | 110.8                   | 23.8                | 8.80                  | 102.7                   |                     |                   |                         |
|      | 5:00 PM  |       | 25.0                | 9.20              | 110.4                   | 23.8                | 8.80                  | 102.6                   |                     |                   |                         |
|      | 6:00 PM  |       | 24.8                | 9.20              | 108.9                   | 23.7                | 8.80                  | 102.5                   |                     |                   |                         |
|      | 7:00 PM  |       | 24.6                | 9.00              | 107.0                   | 23.7                | 8.70                  | 102.3                   |                     |                   |                         |
|      | 8:00 PM  |       | 24.4                | 8.90              | 104.0                   | 23.6                | 8.60                  | 101.4                   |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 9:00 PM  | -     | 24.2                | 8.70              | 101.5                   | 23.6                | 8.70                  | 101.7                   |                     |                   |                         |
|           | 10:00 PM |       | 24.1                | 8.40              | 100.4                   | 23.5                | 8.60                  | 101.0                   |                     |                   |                         |
|           | 11:00 PM |       | 23.9                | 8.40              | 99.8                    | 23.5                | 8.60                  | 101.0                   |                     |                   |                         |
|           | 12:00 AM |       | 23.8                | 8.30              | 99.4                    | 23.5                | 8.40                  | 100.3                   |                     |                   |                         |
|           | 1:00 AM  |       | 23.7                | 8.30              | 99.2                    | 23.5                | 8.60                  | 100.5                   |                     |                   |                         |
|           | 2:00 AM  |       | 23.6                | 8.30              | 98.8                    | 23.4                | 8.70                  | 100.1                   |                     |                   |                         |
|           | 3:00 AM  |       | 23.4                | 8.40              | 98.3                    | 23.4                | 8.70                  | 99.6                    |                     |                   |                         |
|           | 4:00 AM  |       | 23.3                | 8.40              | 97.8                    | 23.4                | 8.70                  | 100.1                   |                     |                   |                         |
|           | 5:00 AM  |       | 23.2                | 8.40              | 97.5                    | 23.4                | 8.70                  | 99.7                    |                     |                   |                         |
|           | 6:00 AM  |       | 23.1                | 8.40              | 97.1                    | 23.4                | 8.70                  | 99.5                    |                     |                   |                         |
|           | 7:00 AM  |       | 23.0                | 8.40              | 97.5                    | 23.4                | 8.70                  | 100.1                   |                     |                   |                         |
|           | 8:00 AM  |       | 23.1                | 8.70              | 100.2                   | 23.4                | 8.70                  | 101.0                   |                     |                   |                         |
|           | 9:00 AM  |       | 23.4                | 9.10              | 104.1                   | 23.4                | 8.70                  | 100.8                   |                     |                   |                         |
|           | 10:00 AM |       | 23.6                | 9.10              | 106.0                   | 23.5                | 8.60                  | 101.4                   |                     |                   |                         |
| 8/25/2016 | 11:00 AM |       | 23.8                | 9.20              | 108.2                   | 23.5                | 8.60                  | 100.8                   |                     |                   |                         |
|           | 12:00 PM |       | 24.1                | 9.40              | 109.9                   | 23.6                | 8.60                  | 100.7                   |                     |                   |                         |
|           | 1:00 PM  |       | 24.5                | 9.30              | 111.4                   | 23.7                | 8.60                  | 100.7                   |                     |                   |                         |
|           | 2:00 PM  |       | 24.9                | 9.50              | 112.6                   | 23.6                | 8.60                  | 101.0                   |                     |                   |                         |
|           | 3:00 PM  |       | 25.0                | 9.40              | 112.2                   | 23.6                | 8.60                  | 100.8                   |                     |                   |                         |
|           | 4:00 PM  |       | 25.1                | 9.40              | 111.9                   | 23.6                | 8.40                  | 99.9                    |                     |                   |                         |
|           | 5:00 PM  |       | 24.9                | 9.30              | 110.6                   | 23.6                | 8.40                  | 100.3                   |                     |                   |                         |
|           | 6:00 PM  |       | 24.7                | 9.10              | 108.1                   | 23.6                | 8.40                  | 99.6                    |                     |                   |                         |
|           | 7:00 PM  |       | 24.5                | 8.90              | 105.5                   | 23.7                | 8.30                  | 99.4                    |                     |                   |                         |
|           | 8:00 PM  |       | 24.4                | 8.70              | 102.1                   | 23.7                | 8.40                  | 99.8                    |                     |                   |                         |
|           | 9:00 PM  |       | 24.3                | 8.40              | 100.2                   | 23.7                | 8.30                  | 99.4                    |                     |                   |                         |
|           | 10:00 PM |       | 24.2                | 8.30              | 99.3                    | 23.7                | 9.10                  | 106.5                   |                     |                   |                         |

|           |           |             | Upstream |                  |             | Tailrace <sup>1</sup> |                  |             | Impoundment |                  |
|-----------|-----------|-------------|----------|------------------|-------------|-----------------------|------------------|-------------|-------------|------------------|
|           |           | Temperature | DO Conc  | DO<br>Saturation | Temperature | DO Conc               | DO<br>Saturation | Temperature | DO Conc     | DO<br>Saturation |
| Date      | Time Dept | h (°C)      | (mg/L)   | (%)              | (°C)        | (mg/L)                | (%)              | (°C)        | (mg/L)      | (%)              |
|           | 11:00 PM  | 24.1        | 8.30     | 98.9             | 23.7        | 9.10                  | 107.2            |             |             |                  |
|           | 12:00 AM  | 24.1        | 8.30     | 98.6             | 23.7        | 9.10                  | 107.0            |             |             |                  |
|           | 1:00 AM   | 24.1        | 8.30     | 98.3             | 23.7        | 9.10                  | 107.1            |             |             |                  |
|           | 2:00 AM   | 24.0        | 8.30     | 98.0             | 23.7        | 9.10                  | 107.0            |             |             |                  |
|           | 3:00 AM   | 23.9        | 8.30     | 97.6             | 23.6        | 9.10                  | 106.7            |             |             |                  |
|           | 4:00 AM   | 23.9        | 8.20     | 97.3             | 23.6        | 9.10                  | 107.0            |             |             |                  |
|           | 5:00 AM   | 23.8        | 8.20     | 97.0             | 23.6        | 9.10                  | 106.5            |             |             |                  |
|           | 6:00 AM   | 23.7        | 8.20     | 96.5             | 23.6        | 9.10                  | 106.3            |             |             |                  |
|           | 7:00 AM   | 23.6        | 8.20     | 97.4             | 23.6        | 9.10                  | 106.9            |             |             |                  |
|           | 8:00 AM   | 23.8        | 8.40     | 100.1            | 23.6        | 9.10                  | 106.5            |             |             |                  |
|           | 9:00 AM   | 24.0        | 8.80     | 103.4            | 23.7        | 9.10                  | 107.4            |             |             |                  |
|           | 10:00 AM  | 24.1        | 8.90     | 104.1            | 23.7        | 9.20                  | 107.5            |             |             |                  |
| 8/26/2016 | 11:00 AM  | 24.2        | 9.10     | 105.6            | 23.7        | 9.20                  | 107.7            |             |             |                  |
| 0/20/2010 | 12:00 PM  | 24.4        | 9.20     | 107.6            | 23.8        | 9.10                  | 107.0            |             |             |                  |
|           | 1:00 PM   | 24.8        | 9.20     | 109.7            | 23.8        | 9.10                  | 107.4            |             |             |                  |
|           | 2:00 PM   | 25.2        | 9.30     | 111.3            | 23.9        | 9.20                  | 107.8            |             |             |                  |
|           | 3:00 PM   | 25.5        | 9.20     | 111.7            | 24.0        | 9.20                  | 107.8            |             |             |                  |
|           | 4:00 PM   | 25.7        | 9.00     | 110.3            | 24.0        | 9.10                  | 107.2            |             |             |                  |
|           | 5:00 PM   | 25.7        | 9.00     | 108.8            | 24.0        | 9.10                  | 106.1            |             |             |                  |
|           | 6:00 PM   | 25.6        | 8.80     | 107.4            | 24.0        | 9.10                  | 106.5            |             |             |                  |
|           | 7:00 PM   | 25.3        | 8.80     | 105.1            | 24.1        | 9.10                  | 106.4            |             |             |                  |
|           | 8:00 PM   | 24.9        | 8.40     | 101.4            | 24.1        | 9.10                  | 106.1            |             |             |                  |
|           | 9:00 PM   | 24.7        | 8.30     | 99.3             | 24.1        | 9.10                  | 106.5            |             |             |                  |
|           | 10:00 PM  | 24.6        | 8.20     | 98.3             | 24.0        | 9.10                  | 106.5            |             |             |                  |
|           | 11:00 PM  | 24.4        | 8.30     | 97.8             | 24.0        | 9.10                  | 106.6            |             |             |                  |
| 8/27/2016 | 12:00 AM  | 24.3        | 8.30     | 97.5             | 24.0        | 9.10                  | 106.5            |             |             |                  |

|           |          |      |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time De  | epth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 1:00 AM  |      | 24.2                | 8.20              | 97.2                    | 24.0                | 9.10                  | 107.0                   |                     |                   |                         |
|           | 2:00 AM  |      | 24.1                | 8.20              | 96.9                    | 23.9                | 9.10                  | 107.4                   |                     |                   |                         |
|           | 3:00 AM  |      | 23.9                | 8.20              | 96.5                    | 23.9                | 9.10                  | 107.3                   |                     |                   |                         |
|           | 4:00 AM  |      | 23.8                | 8.20              | 96.1                    | 23.8                | 9.10                  | 107.3                   |                     |                   |                         |
|           | 5:00 AM  |      | 23.7                | 8.20              | 95.8                    | 23.8                | 9.10                  | 107.3                   |                     |                   |                         |
|           | 6:00 AM  |      | 23.6                | 8.20              | 95.5                    | 23.8                | 9.20                  | 107.5                   |                     |                   |                         |
|           | 7:00 AM  |      | 23.5                | 8.20              | 95.9                    | 23.7                | 9.10                  | 107.1                   |                     |                   |                         |
|           | 8:00 AM  |      | 23.6                | 8.30              | 98.6                    | 23.7                | 9.20                  | 107.7                   |                     |                   |                         |
|           | 9:00 AM  |      | 23.8                | 8.70              | 101.7                   | 23.8                | 9.20                  | 108.1                   |                     |                   |                         |
|           | 10:00 AM |      | 24.2                | 8.90              | 104.5                   | 23.9                | 9.20                  | 108.3                   |                     |                   |                         |
|           | 11:00 AM |      | 24.6                | 9.00              | 107.0                   | 24.1                | 9.30                  | 108.7                   |                     |                   |                         |
|           | 12:00 PM |      | 25.0                | 9.20              | 109.1                   | 24.3                | 9.30                  | 109.1                   |                     |                   |                         |
|           | 1:00 PM  |      | 25.4                | 9.30              | 111.2                   | 24.4                | 9.20                  | 108.4                   |                     |                   |                         |
|           | 2:00 PM  |      | 25.6                | 9.10              | 111.1                   | 24.8                | 9.10                  | 108.3                   |                     |                   |                         |
|           | 3:00 PM  |      | 25.7                | 9.10              | 110.9                   | 24.8                | 9.10                  | 108.4                   |                     |                   |                         |
|           | 4:00 PM  |      | 25.6                | 9.00              | 108.6                   | 25.2                | 9.10                  | 107.6                   |                     |                   |                         |
|           | 5:00 PM  |      | 25.5                | 8.90              | 107.5                   | 25.2                | 9.10                  | 107.5                   |                     |                   |                         |
|           | 6:00 PM  |      | 25.6                | 8.80              | 107.0                   | 25.2                | 9.10                  | 107.7                   |                     |                   |                         |
|           | 7:00 PM  |      | 25.4                | 8.80              | 105.3                   | 25.1                | 9.00                  | 107.4                   |                     |                   |                         |
|           | 8:00 PM  |      | 25.1                | 8.50              | 102.1                   | 25.0                | 9.10                  | 107.7                   |                     |                   |                         |
|           | 9:00 PM  |      | 24.8                | 8.40              | 99.9                    | 24.9                | 9.10                  | 107.7                   |                     |                   |                         |
|           | 10:00 PM |      | 24.6                | 8.30              | 98.9                    | 24.8                | 9.00                  | 107.4                   |                     |                   |                         |
|           | 11:00 PM |      | 24.4                | 8.30              | 98.0                    | 24.7                | 9.00                  | 107.4                   |                     |                   |                         |
|           | 12:00 AM |      | 24.2                | 8.20              | 97.4                    | 24.6                | 9.10                  | 107.5                   |                     |                   |                         |
| 8/28/2016 | 1:00 AM  |      | 24.0                | 8.20              | 96.8                    | 24.5                | 9.00                  | 107.4                   |                     |                   |                         |
|           | 2:00 AM  |      | 23.8                | 8.20              | 96.4                    | 24.4                | 9.20                  | 107.5                   |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 3:00 AM  |       | 23.7                | 8.20              | 96.0                    | 24.4                | 9.10                  | 107.2                   |                     |                   |                         |
|           | 4:00 AM  |       | 23.5                | 8.20              | 95.6                    | 24.3                | 9.10                  | 106.9                   |                     |                   |                         |
|           | 5:00 AM  |       | 23.4                | 8.20              | 95.3                    | 24.2                | 9.10                  | 106.9                   |                     |                   |                         |
|           | 6:00 AM  |       | 23.2                | 8.20              | 94.9                    | 24.1                | 9.10                  | 107.0                   |                     |                   |                         |
|           | 7:00 AM  |       | 23.1                | 8.30              | 95.5                    | 24.1                | 9.20                  | 107.7                   |                     |                   |                         |
|           | 8:00 AM  |       | 23.2                | 8.40              | 98.3                    | 24.0                | 9.20                  | 107.7                   |                     |                   |                         |
|           | 9:00 AM  |       | 23.3                | 8.90              | 101.5                   | 24.1                | 9.20                  | 108.3                   |                     |                   |                         |
|           | 10:00 AM |       | 23.7                | 8.90              | 105.3                   | 24.1                | 9.20                  | 108.1                   |                     |                   |                         |
|           | 11:00 AM |       | 24.2                | 9.30              | 108.5                   | 24.2                | 9.20                  | 108.1                   |                     |                   |                         |
|           | 12:00 PM |       | 24.4                | 9.40              | 110.3                   | 24.2                | 9.20                  | 107.9                   |                     |                   |                         |
|           | 1:00 PM  |       | 24.6                | 9.40              | 111.5                   | 24.2                | 9.20                  | 108.2                   |                     |                   |                         |
|           | 2:00 PM  |       | 24.7                | 9.40              | 112.1                   | 24.1                | 9.20                  | 108.2                   |                     |                   |                         |
|           | 3:00 PM  |       | 24.9                | 9.50              | 112.8                   | 24.1                | 9.20                  | 108.2                   |                     |                   |                         |
|           | 4:00 PM  |       | 24.9                | 9.50              | 112.5                   | 24.0                | 9.20                  | 107.9                   |                     |                   |                         |
|           | 5:00 PM  |       | 24.7                | 9.20              | 110.0                   | 23.9                | 9.20                  | 107.5                   |                     |                   |                         |
|           | 6:00 PM  |       | 24.5                | 9.10              | 108.0                   | 23.9                | 9.10                  | 106.4                   |                     |                   |                         |
|           | 7:00 PM  |       | 24.3                | 8.90              | 105.0                   | 23.9                | 9.10                  | 106.6                   |                     |                   |                         |
|           | 8:00 PM  |       | 24.0                | 8.60              | 101.3                   | 23.9                | 9.10                  | 106.6                   |                     |                   |                         |
|           | 9:00 PM  |       | 23.8                | 8.30              | 98.0                    | 23.8                | 9.10                  | 106.7                   |                     |                   |                         |
|           | 10:00 PM |       | 23.7                | 8.20              | 96.8                    | 23.8                | 9.10                  | 106.7                   |                     |                   |                         |
|           | 11:00 PM |       | 23.6                | 8.20              | 96.2                    | 23.8                | 9.10                  | 106.1                   |                     |                   |                         |
|           | 12:00 AM |       | 23.5                | 8.10              | 95.4                    | 23.8                | 9.10                  | 106.6                   |                     |                   |                         |
|           | 1:00 AM  |       | 23.5                | 8.10              | 95.2                    | 23.8                | 9.10                  | 106.5                   |                     |                   |                         |
| 8/29/2016 | 2:00 AM  |       | 23.4                | 8.20              | 95.1                    | 23.8                | 9.10                  | 106.9                   |                     |                   |                         |
|           | 3:00 AM  |       | 23.4                | 8.20              | 94.8                    | 23.8                | 9.10                  | 107.1                   |                     |                   |                         |
|           | 4:00 AM  |       | 23.3                | 8.20              | 94.7                    | 23.8                | 9.10                  | 106.6                   |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 5:00 AM  |       | 23.2                | 8.20              | 94.5                    | 23.8                | 9.10                  | 107.0                   |                     |                   |                         |
|           | 6:00 AM  |       | 23.2                | 8.10              | 94.4                    | 23.7                | 9.10                  | 106.7                   |                     |                   |                         |
|           | 7:00 AM  |       | 23.2                | 8.30              | 95.8                    | 23.7                | 9.10                  | 107.0                   |                     |                   |                         |
|           | 8:00 AM  |       | 23.3                | 8.50              | 98.9                    | 23.7                | 9.10                  | 107.2                   |                     |                   |                         |
|           | 9:00 AM  |       | 23.5                | 8.70              | 102.2                   | 23.8                | 9.20                  | 107.8                   |                     |                   |                         |
|           | 10:00 AM |       | 24.0                | 9.10              | 105.8                   | 23.9                | 9.10                  | 107.4                   |                     |                   |                         |
|           | 11:00 AM |       | 24.3                | 9.20              | 107.5                   | 23.9                | 9.20                  | 107.9                   |                     |                   |                         |
|           | 12:00 PM |       | 24.4                | 9.20              | 108.3                   | 24.0                | 9.30                  | 108.6                   |                     |                   |                         |
|           | 1:00 PM  |       | 24.9                | 9.20              | 110.4                   | 24.0                | 9.20                  | 108.4                   |                     |                   |                         |
|           | 2:00 PM  |       | 25.3                | 9.50              | 112.5                   | 24.1                | 9.20                  | 108.2                   |                     |                   |                         |
|           | 3:00 PM  |       | 25.2                | 9.30              | 111.3                   | 24.5                | 9.10                  | 108.1                   |                     |                   |                         |
|           | 4:00 PM  |       | 25.0                | 9.20              | 109.5                   | 24.5                | 9.10                  | 107.9                   |                     |                   |                         |
|           | 5:00 PM  |       | 24.9                | 9.10              | 108.2                   | 24.6                | 9.10                  | 107.7                   |                     |                   |                         |
|           | 6:00 PM  |       | 24.6                | 9.10              | 107.6                   | 24.5                | 9.10                  | 108.3                   |                     |                   |                         |
|           | 7:00 PM  |       | 24.3                | 8.90              | 104.9                   | 24.4                | 9.30                  | 108.7                   |                     |                   |                         |
|           | 8:00 PM  |       | 24.0                | 8.60              | 101.4                   | 24.3                | 9.30                  | 108.7                   |                     |                   |                         |
|           | 9:00 PM  |       | 23.8                | 8.40              | 100.3                   | 24.2                | 9.30                  | 108.8                   |                     |                   |                         |
|           | 10:00 PM |       | 23.7                | 8.40              | 99.9                    | 24.1                | 9.30                  | 108.7                   |                     |                   |                         |
|           | 11:00 PM |       | 23.5                | 8.40              | 99.6                    | 24.1                | 9.30                  | 108.9                   |                     |                   |                         |
|           | 12:00 AM |       | 23.4                | 8.50              | 99.3                    | 24.0                | 9.30                  | 109.1                   |                     |                   |                         |
|           | 1:00 AM  |       | 23.3                | 8.50              | 99.0                    | 24.0                | 9.30                  | 108.5                   |                     |                   |                         |
|           | 2:00 AM  |       | 23.1                | 8.50              | 98.5                    | 23.9                | 9.20                  | 108.1                   |                     |                   |                         |
| 8/30/2016 | 3:00 AM  |       | 23.0                | 8.40              | 97.9                    | 23.8                | 9.20                  | 107.5                   |                     |                   |                         |
|           | 4:00 AM  |       | 22.9                | 8.40              | 97.4                    | 23.7                | 9.20                  | 107.8                   |                     |                   |                         |
|           | 5:00 AM  |       | 22.7                | 8.40              | 96.8                    | 23.7                | 9.20                  | 108.0                   |                     |                   |                         |
|           | 6:00 AM  |       | 22.6                | 8.30              | 96.0                    | 23.6                | 9.20                  | 108.4                   |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 7:00 AM  |       | 22.5                | 8.40              | 96.5                    | 23.6                | 9.30                  | 108.8                   |                     |                   |                         |
|           | 8:00 AM  |       | 22.6                | 8.50              | 98.8                    | 23.6                | 9.30                  | 108.9                   |                     |                   |                         |
|           | 9:00 AM  |       | 22.8                | 8.70              | 101.4                   | 23.7                | 9.30                  | 108.7                   |                     |                   |                         |
|           | 10:00 AM |       | 22.9                | 9.00              | 103.0                   | 23.7                | 9.30                  | 109.2                   |                     |                   |                         |
|           | 11:00 AM |       | 23.3                | 9.20              | 104.7                   | 23.8                | 9.40                  | 109.5                   |                     |                   |                         |
|           | 12:00 PM |       | 23.8                | 9.10              | 106.8                   | 23.9                | 9.40                  | 109.8                   |                     |                   |                         |
|           | 1:00 PM  |       | 24.2                | 9.20              | 108.3                   | 23.8                | 9.40                  | 110.4                   |                     |                   |                         |
|           | 2:00 PM  |       | 24.5                | 9.20              | 109.7                   | 23.9                | 9.40                  | 110.0                   |                     |                   |                         |
|           | 3:00 PM  |       | 24.6                | 9.20              | 109.9                   | 23.8                | 9.40                  | 110.3                   |                     |                   |                         |
|           | 4:00 PM  |       | 24.4                | 9.30              | 109.4                   | 23.7                | 9.50                  | 110.7                   |                     |                   |                         |
|           | 5:00 PM  |       | 24.3                | 9.30              | 109.1                   | 23.7                | 9.50                  | 111.0                   |                     |                   |                         |
|           | 6:00 PM  |       | 24.1                | 9.10              | 107.2                   | 23.6                | 9.50                  | 111.3                   |                     |                   |                         |
|           | 7:00 PM  |       | 23.8                | 8.90              | 104.5                   | 23.6                | 9.40                  | 110.2                   |                     |                   |                         |
|           | 8:00 PM  |       | 23.6                | 8.70              | 101.6                   | 23.5                | 9.80                  | 115.1                   |                     |                   |                         |
|           | 9:00 PM  |       | 23.4                | 8.70              | 99.8                    | 23.5                | 9.40                  | 110.2                   |                     |                   |                         |
|           | 10:00 PM |       | 23.2                | 8.50              | 99.1                    | 23.4                | 9.60                  | 110.2                   |                     |                   |                         |
|           | 11:00 PM |       | 23.1                | 8.50              | 98.6                    | 23.4                | 9.70                  | 110.8                   |                     |                   |                         |
|           | 12:00 AM |       | 23.0                | 8.40              | 98.2                    | 23.4                | 9.70                  | 111.0                   |                     |                   |                         |
|           | 1:00 AM  |       | 22.9                | 8.40              | 97.9                    | 23.4                | 9.70                  | 111.1                   |                     |                   |                         |
|           | 2:00 AM  |       | 22.9                | 8.40              | 97.3                    | 23.4                | 9.70                  | 111.1                   |                     |                   |                         |
|           | 3:00 AM  |       | 22.8                | 8.40              | 97.0                    | 23.4                | 9.70                  | 111.1                   |                     |                   |                         |
| 8/31/2016 | 4:00 AM  |       | 22.8                | 8.40              | 96.6                    | 23.4                | 9.60                  | 109.9                   |                     |                   |                         |
|           | 5:00 AM  |       | 22.7                | 8.30              | 96.1                    | 23.3                | 9.60                  | 110.1                   |                     |                   |                         |
|           | 6:00 AM  |       | 22.6                | 8.30              | 95.7                    | 23.3                | 9.60                  | 109.5                   |                     |                   |                         |
|           | 7:00 AM  |       | 22.6                | 8.30              | 95.8                    | 23.3                | 9.60                  | 110.4                   |                     |                   |                         |
|           | 8:00 AM  |       | 22.6                | 8.40              | 97.4                    | 23.3                | 9.60                  | 109.8                   |                     |                   |                         |

|          |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date     | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|          | 9:00 AM  |       | 22.8                | 8.70              | 101.4                   | 23.3                | 10.00                 | 113.8                   |                     |                   |                         |
|          | 10:00 AM |       | 22.9                | 9.10              | 104.2                   | 23.3                | 9.60                  | 110.2                   |                     |                   |                         |
|          | 11:00 AM |       | 23.0                | 9.20              | 105.0                   | 23.4                | 9.70                  | 110.7                   |                     |                   |                         |
|          | 12:00 PM |       | 23.2                | 9.40              | 107.3                   | 23.4                | 9.70                  | 111.1                   |                     |                   |                         |
|          | 1:00 PM  |       | 23.5                | 9.30              | 109.3                   | 23.4                | 9.80                  | 111.5                   |                     |                   |                         |
|          | 2:00 PM  |       | 23.6                | 9.40              | 110.1                   | 23.5                | 9.50                  | 110.7                   |                     |                   |                         |
|          | 3:00 PM  |       | 23.7                | 9.40              | 110.3                   | 23.5                | 9.50                  | 110.9                   |                     |                   |                         |
|          | 4:00 PM  |       | 23.7                | 9.40              | 110.0                   | 23.5                | 9.40                  | 110.0                   |                     |                   |                         |
|          | 5:00 PM  |       | 23.7                | 9.30              | 108.5                   | 23.5                | 9.40                  | 110.3                   |                     |                   |                         |
|          | 6:00 PM  |       | 23.7                | 9.10              | 106.4                   | 23.5                | 9.40                  | 109.8                   |                     |                   |                         |
|          | 7:00 PM  |       | 23.6                | 8.90              | 104.2                   | 23.5                | 9.30                  | 109.4                   |                     |                   |                         |
|          | 8:00 PM  |       | 23.5                | 8.70              | 101.5                   | 23.5                | 9.40                  | 110.3                   |                     |                   |                         |
|          | 9:00 PM  |       | 23.4                | 8.70              | 99.5                    | 23.5                | 9.40                  | 110.4                   |                     |                   |                         |
|          | 10:00 PM |       | 23.3                | 8.40              | 98.4                    | 23.5                | 9.50                  | 110.5                   |                     |                   |                         |
|          | 11:00 PM |       | 23.2                | 8.40              | 97.7                    | 23.4                | 9.70                  | 110.5                   |                     |                   |                         |
|          | 12:00 AM |       | 23.1                | 8.40              | 97.4                    | 23.4                | 9.70                  | 111.1                   |                     |                   |                         |
|          | 1:00 AM  |       | 23.1                | 8.40              | 96.9                    | 23.4                | 9.70                  | 110.7                   |                     |                   |                         |
|          | 2:00 AM  |       | 23.0                | 8.30              | 96.4                    | 23.4                | 9.70                  | 110.8                   |                     |                   |                         |
|          | 3:00 AM  |       | 22.9                | 8.30              | 96.1                    | 23.4                | 9.50                  | 108.8                   |                     |                   |                         |
|          | 4:00 AM  |       | 22.9                | 8.30              | 95.7                    | 23.3                | 9.50                  | 108.6                   |                     |                   |                         |
| 9/1/2016 | 5:00 AM  |       | 22.8                | 8.20              | 95.3                    | 23.3                | 9.50                  | 108.1                   |                     |                   |                         |
|          | 6:00 AM  |       | 22.7                | 8.20              | 95.0                    | 23.3                | 9.50                  | 108.9                   |                     |                   |                         |
|          | 7:00 AM  |       | 22.7                | 8.30              | 95.7                    | 23.3                | 9.60                  | 109.6                   |                     |                   |                         |
|          | 8:00 AM  |       | 22.6                | 8.40              | 97.3                    | 23.3                | 9.50                  | 109.4                   |                     |                   |                         |
|          | 9:00 AM  |       | 22.9                | 8.70              | 101.4                   | 23.3                | 9.60                  | 110.4                   |                     |                   |                         |
|          | 10:00 AM |       | 23.3                | 9.20              | 105.0                   | 23.5                | 9.50                  | 111.2                   |                     |                   |                         |

|          |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date     | Time [   | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|          | 11:00 AM | -     | 23.6                | 9.10              | 107.2                   | 23.7                | 9.50                  | 111.1                   |                     |                   |                         |
|          | 12:00 PM |       | 23.8                | 9.30              | 108.7                   | 23.8                | 9.50                  | 111.2                   |                     |                   |                         |
|          | 1:00 PM  |       | 24.1                | 9.50              | 110.6                   | 23.9                | 9.50                  | 110.9                   |                     |                   |                         |
|          | 2:00 PM  |       | 24.4                | 9.50              | 111.8                   | 24.1                | 9.50                  | 111.7                   |                     |                   |                         |
|          | 3:00 PM  |       | 24.6                | 9.40              | 112.3                   | 24.1                | 9.50                  | 111.5                   |                     |                   |                         |
|          | 4:00 PM  |       | 24.6                | 9.30              | 111.4                   | 24.1                | 9.50                  | 111.2                   |                     |                   |                         |
|          | 5:00 PM  |       | 24.6                | 9.20              | 109.9                   | 24.1                | 9.50                  | 110.7                   |                     |                   |                         |
|          | 6:00 PM  |       | 24.5                | 9.10              | 108.0                   | 24.1                | 9.50                  | 110.6                   |                     |                   |                         |
|          | 7:00 PM  |       | 24.2                | 9.10              | 105.7                   | 24.1                | 9.50                  | 111.2                   |                     |                   |                         |
|          | 8:00 PM  |       | 23.9                | 8.70              | 102.2                   | 24.0                | 9.40                  | 109.8                   |                     |                   |                         |
|          | 9:00 PM  |       | 23.7                | 8.40              | 99.7                    | 23.9                | 9.40                  | 110.0                   |                     |                   |                         |
|          | 10:00 PM |       | 23.4                | 8.40              | 98.4                    | 23.8                | 9.50                  | 111.8                   |                     |                   |                         |
|          | 11:00 PM |       | 23.3                | 8.40              | 97.7                    | 23.8                | 9.40                  | 110.0                   |                     |                   |                         |
|          | 12:00 AM |       | 23.1                | 8.40              | 97.1                    | 23.7                | 9.40                  | 109.6                   |                     |                   |                         |
|          | 1:00 AM  |       | 22.9                | 8.40              | 96.5                    | 23.6                | 9.40                  | 109.7                   |                     |                   |                         |
|          | 2:00 AM  |       | 22.8                | 8.30              | 96.1                    | 23.5                | 9.40                  | 110.4                   |                     |                   |                         |
|          | 3:00 AM  |       | 22.6                | 8.30              | 95.6                    | 23.4                | 9.70                  | 110.6                   |                     |                   |                         |
|          | 4:00 AM  |       | 22.5                | 8.30              | 95.5                    | 23.4                | 9.50                  | 109.4                   |                     |                   |                         |
|          | 5:00 AM  |       | 22.3                | 8.40              | 95.0                    | 23.3                | 9.50                  | 109.1                   |                     |                   |                         |
| 9/2/2016 | 6:00 AM  |       | 22.2                | 8.40              | 94.8                    | 23.3                | 9.50                  | 109.1                   |                     |                   |                         |
|          | 7:00 AM  |       | 22.1                | 8.40              | 95.2                    | 23.3                | 9.60                  | 109.9                   |                     |                   |                         |
|          | 8:00 AM  |       | 22.1                | 8.50              | 97.2                    | 23.3                | 9.60                  | 110.0                   |                     |                   |                         |
|          | 9:00 AM  |       | 22.2                | 8.80              | 100.2                   | 23.3                | 9.70                  | 111.1                   |                     |                   |                         |
|          | 10:00 AM |       | 22.3                | 9.00              | 102.3                   | 23.3                | 9.80                  | 111.6                   |                     |                   |                         |
|          | 11:00 AM |       | 22.5                | 9.10              | 104.2                   | 23.3                | 9.80                  | 112.0                   |                     |                   |                         |
|          | 12:00 PM |       | 22.8                | 9.40              | 107.4                   | 23.4                | 9.90                  | 112.5                   |                     |                   |                         |

|          |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date     | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|          | 1:00 PM  | -     | 23.4                | 9.60              | 110.3                   | 23.5                | 9.50                  | 112.2                   |                     |                   |                         |
|          | 2:00 PM  |       | 23.9                | 9.50              | 111.8                   | 23.7                | 9.50                  | 111.7                   |                     |                   |                         |
|          | 3:00 PM  |       | 24.1                | 9.50              | 112.3                   | 23.8                | 9.50                  | 111.6                   |                     |                   |                         |
|          | 4:00 PM  |       | 24.0                | 9.40              | 110.4                   | 23.8                | 9.50                  | 110.7                   |                     |                   |                         |
|          | 5:00 PM  |       | 23.8                | 9.30              | 108.7                   | 23.8                | 9.50                  | 110.8                   |                     |                   |                         |
|          | 6:00 PM  |       | 23.8                | 9.20              | 108.2                   | 23.8                | 9.40                  | 110.4                   |                     |                   |                         |
|          | 7:00 PM  |       | 23.5                | 8.90              | 104.9                   | 23.7                | 9.40                  | 110.2                   |                     |                   |                         |
|          | 8:00 PM  |       | 23.2                | 8.90              | 101.6                   | 23.6                | 9.50                  | 110.5                   |                     |                   |                         |
|          | 9:00 PM  |       | 23.0                | 8.50              | 98.8                    | 23.6                | 9.40                  | 110.1                   |                     |                   |                         |
|          | 10:00 PM |       | 22.8                | 8.40              | 97.2                    | 23.5                | 9.50                  | 110.5                   |                     |                   |                         |
|          | 11:00 PM |       | 22.6                | 8.40              | 96.6                    | 23.4                | 9.60                  | 110.1                   |                     |                   |                         |
|          | 12:00 AM |       | 22.4                | 8.40              | 95.8                    | 23.4                | 9.60                  | 109.6                   |                     |                   |                         |
|          | 1:00 AM  |       | 22.2                | 8.40              | 95.3                    | 23.3                | 9.60                  | 109.8                   |                     |                   |                         |
|          | 2:00 AM  |       | 22.0                | 8.40              | 94.9                    | 23.2                | 9.50                  | 109.4                   |                     |                   |                         |
|          | 3:00 AM  |       | 21.8                | 8.40              | 94.5                    | 23.2                | 9.60                  | 110.0                   |                     |                   |                         |
|          | 4:00 AM  |       | 21.6                | 8.30              | 94.2                    | 23.1                | 9.60                  | 110.1                   |                     |                   |                         |
|          | 5:00 AM  |       | 21.4                | 8.50              | 93.8                    | 23.1                | 9.60                  | 110.2                   |                     |                   |                         |
|          | 6:00 AM  |       | 21.3                | 8.40              | 93.1                    | 23.0                | 9.60                  | 109.6                   |                     |                   |                         |
| 9/3/2016 | 7:00 AM  |       | 21.2                | 8.50              | 93.9                    | 23.0                | 9.60                  | 109.9                   |                     |                   |                         |
|          | 8:00 AM  |       | 21.2                | 8.60              | 96.3                    | 23.0                | 9.70                  | 110.6                   |                     |                   |                         |
|          | 9:00 AM  |       | 21.5                | 8.80              | 100.1                   | 23.1                | 9.70                  | 110.6                   |                     |                   |                         |
|          | 10:00 AM |       | 21.9                | 9.10              | 103.3                   | 23.1                | 8.70                  | 99.8                    |                     |                   |                         |
|          | 11:00 AM |       | 22.3                | 9.40              | 106.3                   | 23.2                | 8.70                  | 99.6                    |                     |                   |                         |
|          | 12:00 PM |       | 22.8                | 9.50              | 108.9                   | 23.4                | 8.70                  | 100.0                   |                     |                   |                         |
|          | 1:00 PM  |       | 23.3                | 9.70              | 111.1                   | 23.4                | 8.70                  | 100.2                   |                     |                   |                         |
|          | 2:00 PM  |       | 23.7                | 9.60              | 113.1                   | 23.5                | 8.60                  | 100.5                   |                     |                   |                         |

|          |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date     | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|          | 3:00 PM  |       | 24.0                | 9.70              | 113.5                   | 23.7                | 8.40                  | 99.7                    |                     |                   |                         |
|          | 4:00 PM  |       | 23.9                | 9.50              | 112.3                   | 23.7                | 8.40                  | 99.9                    |                     |                   |                         |
|          | 5:00 PM  |       | 23.9                | 9.50              | 111.3                   | 23.8                | 8.40                  | 99.8                    |                     |                   |                         |
|          | 6:00 PM  |       | 23.8                | 9.40              | 109.6                   | 23.8                | 8.40                  | 99.9                    |                     |                   |                         |
|          | 7:00 PM  |       | 23.5                | 9.10              | 106.6                   | 23.7                | 8.40                  | 100.1                   |                     |                   |                         |
|          | 8:00 PM  |       | 23.1                | 9.00              | 102.7                   | 23.5                | 8.40                  | 99.5                    |                     |                   |                         |
|          | 9:00 PM  |       | 22.8                | 8.70              | 100.0                   | 23.4                | 8.50                  | 99.2                    |                     |                   |                         |
|          | 10:00 PM |       | 22.5                | 8.40              | 98.4                    | 23.3                | 8.50                  | 99.3                    |                     |                   |                         |
|          | 11:00 PM |       | 22.3                | 8.50              | 97.4                    | 23.2                | 8.70                  | 99.7                    |                     |                   |                         |
|          | 12:00 AM |       | 22.1                | 8.50              | 96.9                    | 23.1                | 8.70                  | 100.1                   |                     |                   |                         |
|          | 1:00 AM  |       | 21.8                | 8.40              | 96.3                    | 23.0                | 8.70                  | 99.5                    |                     |                   |                         |
|          | 2:00 AM  |       | 21.6                | 8.40              | 96.1                    | 22.9                | 8.70                  | 99.6                    |                     |                   |                         |
|          | 3:00 AM  |       | 21.4                | 8.60              | 95.6                    | 22.9                | 8.70                  | 100.1                   |                     |                   |                         |
|          | 4:00 AM  |       | 21.3                | 8.50              | 95.1                    | 22.8                | 8.70                  | 99.5                    |                     |                   |                         |
|          | 5:00 AM  |       | 21.1                | 8.50              | 94.8                    | 22.7                | 8.70                  | 100.0                   |                     |                   |                         |
|          | 6:00 AM  |       | 21.0                | 8.50              | 94.5                    | 22.7                | 8.50                  | 99.3                    |                     |                   |                         |
|          | 7:00 AM  |       | 20.9                | 8.50              | 95.0                    | 22.6                | 8.70                  | 99.6                    |                     |                   |                         |
| 9/4/2016 | 8:00 AM  |       | 20.9                | 8.70              | 97.4                    | 22.6                | 8.70                  | 100.4                   |                     |                   |                         |
|          | 9:00 AM  |       | 21.2                | 9.10              | 101.1                   | 22.7                | 8.70                  | 100.8                   |                     |                   |                         |
|          | 10:00 AM |       | 21.6                | 9.30              | 104.8                   | 22.8                | 8.70                  | 101.0                   |                     |                   |                         |
|          | 11:00 AM |       | 22.1                | 9.60              | 107.8                   | 22.9                | 8.90                  | 101.5                   |                     |                   |                         |
|          | 12:00 PM |       | 22.7                | 9.60              | 110.1                   | 23.0                | 8.70                  | 100.6                   |                     |                   |                         |
|          | 1:00 PM  |       | 23.2                | 9.90              | 112.5                   | 23.2                | 8.70                  | 100.4                   |                     |                   |                         |
|          | 2:00 PM  |       | 23.7                | 9.70              | 114.1                   | 23.3                | 8.70                  | 100.9                   |                     |                   |                         |
|          | 3:00 PM  |       | 24.0                | 9.80              | 114.7                   | 23.3                | 8.70                  | 100.4                   |                     |                   |                         |
|          | 4:00 PM  |       | 24.0                | 9.70              | 113.6                   | 23.1                | 8.70                  | 99.6                    |                     |                   |                         |

|          |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date     | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|          | 5:00 PM  | •     | 24.0                | 9.50              | 112.0                   | 22.9                | 8.70                  | 99.7                    |                     |                   |                         |
|          | 6:00 PM  |       | 23.8                | 9.40              | 110.1                   | 22.8                | 8.50                  | 99.3                    |                     |                   |                         |
|          | 7:00 PM  |       | 23.4                | 9.40              | 107.1                   | 22.7                | 8.50                  | 99.1                    |                     |                   |                         |
|          | 8:00 PM  |       | 22.9                | 9.10              | 103.6                   | 22.6                | 8.70                  | 99.9                    |                     |                   |                         |
|          | 9:00 PM  |       | 22.6                | 8.70              | 101.0                   | 22.5                | 8.70                  | 100.4                   |                     |                   |                         |
|          | 10:00 PM |       | 22.3                | 8.80              | 99.6                    | 22.5                | 8.70                  | 101.2                   |                     |                   |                         |
|          | 11:00 PM |       | 22.1                | 8.70              | 98.6                    | 22.5                | 8.70                  | 100.7                   |                     |                   |                         |
|          | 12:00 AM |       | 21.9                | 8.60              | 97.9                    | 22.5                | 8.70                  | 100.6                   |                     |                   |                         |
|          | 1:00 AM  |       | 21.7                | 8.50              | 97.3                    | 22.4                | 8.90                  | 101.1                   |                     |                   |                         |
|          | 2:00 AM  |       | 21.4                | 8.70              | 96.9                    | 22.4                | 9.00                  | 101.6                   |                     |                   |                         |
|          | 3:00 AM  |       | 21.3                | 8.70              | 96.5                    | 22.4                | 9.00                  | 101.6                   |                     |                   |                         |
|          | 4:00 AM  |       | 21.1                | 8.60              | 96.0                    | 22.3                | 8.90                  | 101.0                   |                     |                   |                         |
|          | 5:00 AM  |       | 20.9                | 8.60              | 95.7                    | 22.3                | 9.00                  | 101.5                   |                     |                   |                         |
|          | 6:00 AM  |       | 20.8                | 8.60              | 95.5                    | 22.2                | 8.90                  | 101.1                   |                     |                   |                         |
|          | 7:00 AM  |       | 20.7                | 8.70              | 96.5                    | 22.2                | 8.90                  | 100.9                   |                     |                   |                         |
|          | 8:00 AM  |       | 20.7                | 8.90              | 98.7                    | 22.2                | 9.00                  | 101.5                   |                     |                   |                         |
| 9/5/2016 | 9:00 AM  |       | 20.9                | 9.20              | 101.6                   | 22.2                | 9.00                  | 101.5                   |                     |                   |                         |
|          | 10:00 AM |       | 21.2                | 9.50              | 105.0                   | 22.2                | 9.00                  | 101.8                   |                     |                   |                         |
|          | 11:00 AM |       | 21.7                | 9.60              | 108.2                   | 22.3                | 9.00                  | 102.3                   |                     |                   |                         |
|          | 12:00 PM |       | 22.2                | 9.90              | 110.8                   | 22.5                | 8.90                  | 102.0                   |                     |                   |                         |
|          | 1:00 PM  |       | 22.6                | 9.90              | 112.5                   | 22.6                | 8.90                  | 102.2                   |                     |                   |                         |
|          | 2:00 PM  |       | 23.0                | 10.00             | 113.9                   | 22.8                | 8.90                  | 102.3                   |                     |                   |                         |
|          | 3:00 PM  |       | 23.1                | 10.00             | 114.1                   | 22.8                | 9.00                  | 102.5                   |                     |                   |                         |
|          | 4:00 PM  |       | 23.2                | 10.00             | 113.8                   | 22.8                | 8.70                  | 101.4                   |                     |                   |                         |
|          | 5:00 PM  |       | 23.3                | 9.90              | 112.8                   | 22.8                | 8.70                  | 100.8                   |                     |                   |                         |
|          | 6:00 PM  |       | 23.1                | 9.60              | 109.9                   | 22.9                | 8.70                  | 100.6                   |                     |                   |                         |

|          |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date     | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|          | 7:00 PM  | -     | 22.9                | 9.40              | 107.4                   | 22.8                | 8.70                  | 100.3                   |                     |                   |                         |
|          | 8:00 PM  |       | 22.5                | 9.00              | 103.2                   | 22.8                | 8.70                  | 100.1                   |                     |                   |                         |
|          | 9:00 PM  |       | 22.3                | 8.90              | 100.6                   | 22.7                | 8.70                  | 100.5                   |                     |                   |                         |
|          | 10:00 PM |       | 22.0                | 8.70              | 99.1                    | 22.7                | 8.70                  | 100.0                   |                     |                   |                         |
|          | 11:00 PM |       | 21.8                | 8.60              | 98.1                    | 22.6                | 8.70                  | 100.0                   |                     |                   |                         |
|          | 12:00 AM |       | 21.7                | 8.60              | 97.6                    | 22.6                | 8.70                  | 99.9                    |                     |                   |                         |
|          | 1:00 AM  |       | 21.6                | 8.50              | 97.2                    | 22.5                | 8.70                  | 99.8                    |                     |                   |                         |
|          | 2:00 AM  |       | 21.6                | 8.50              | 96.9                    | 22.5                | 8.70                  | 100.2                   |                     |                   |                         |
|          | 3:00 AM  |       | 21.5                | 8.50              | 96.6                    | 22.4                | 8.80                  | 100.4                   |                     |                   |                         |
|          | 4:00 AM  |       | 21.4                | 8.60              | 96.3                    | 22.4                | 8.90                  | 100.6                   |                     |                   |                         |
|          | 5:00 AM  |       | 21.4                | 8.60              | 96.1                    | 22.4                | 8.90                  | 100.6                   |                     |                   |                         |
|          | 6:00 AM  |       | 21.3                | 8.60              | 96.0                    | 22.4                | 8.80                  | 100.0                   |                     |                   |                         |
|          | 7:00 AM  |       | 21.3                | 8.70              | 96.5                    | 22.3                | 8.80                  | 100.0                   |                     |                   |                         |
|          | 8:00 AM  |       | 21.3                | 8.80              | 97.5                    | 22.3                | 8.80                  | 100.4                   |                     |                   |                         |
|          | 9:00 AM  |       | 21.4                | 9.00              | 100.4                   | 22.3                | 8.80                  | 100.1                   |                     |                   |                         |
| 9/6/2016 | 10:00 AM |       | 21.4                | 9.30              | 102.5                   | 22.3                | 8.80                  | 100.3                   |                     |                   |                         |
|          | 11:00 AM |       | 21.7                | 9.30              | 105.4                   | 22.3                | 8.80                  | 100.3                   |                     |                   |                         |
|          | 12:00 PM |       | 21.9                | 9.60              | 107.5                   | 22.3                | 8.90                  | 100.7                   |                     |                   |                         |
|          | 1:00 PM  |       | 22.3                | 9.80              | 110.2                   | 22.5                | 8.70                  | 101.0                   |                     |                   |                         |
|          | 2:00 PM  |       | 22.7                | 9.90              | 112.7                   | 22.7                | 8.70                  | 100.9                   |                     |                   |                         |
|          | 3:00 PM  |       | 23.1                | 9.90              | 113.3                   | 23.0                | 8.70                  | 101.1                   |                     |                   |                         |
|          | 4:00 PM  |       | 23.3                | 9.90              | 113.3                   | 22.9                | 8.70                  | 100.1                   |                     |                   |                         |
|          | 5:00 PM  |       | 23.2                | 9.70              | 111.0                   | 22.9                | 8.70                  | 99.9                    |                     |                   |                         |
|          | 6:00 PM  |       | 23.3                | 9.60              | 109.8                   | 22.9                | 8.70                  | 99.5                    |                     |                   |                         |
|          | 7:00 PM  |       | 23.1                | 9.40              | 107.2                   | 22.7                | 8.70                  | 99.9                    |                     |                   |                         |
|          | 8:00 PM  |       | 22.8                | 9.00              | 103.2                   | 22.6                | 8.70                  | 99.5                    |                     |                   |                         |

|          |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date     | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|          | 9:00 PM  |       | 22.5                | 8.70              | 100.2                   | 22.5                | 8.70                  | 99.8                    |                     |                   |                         |
|          | 10:00 PM |       | 22.3                | 8.70              | 98.7                    | 22.5                | 8.50                  | 99.2                    |                     |                   |                         |
|          | 11:00 PM |       | 22.2                | 8.60              | 97.7                    | 22.5                | 8.50                  | 99.2                    |                     |                   |                         |
|          | 12:00 AM |       | 22.1                | 8.50              | 97.2                    | 22.4                | 8.70                  | 99.4                    |                     |                   |                         |
|          | 1:00 AM  |       | 22.0                | 8.50              | 97.0                    | 22.4                | 8.70                  | 99.3                    |                     |                   |                         |
|          | 2:00 AM  |       | 22.0                | 8.50              | 96.7                    | 22.4                | 8.70                  | 98.9                    |                     |                   |                         |
|          | 3:00 AM  |       | 22.0                | 8.50              | 96.5                    | 22.4                | 8.80                  | 99.6                    |                     |                   |                         |
|          | 4:00 AM  |       | 22.0                | 8.40              | 96.3                    | 22.4                | 8.70                  | 99.3                    |                     |                   |                         |
|          | 5:00 AM  |       | 21.9                | 8.40              | 95.9                    | 22.4                | 8.70                  | 99.2                    |                     |                   |                         |
|          | 6:00 AM  |       | 21.9                | 8.40              | 95.7                    | 22.3                | 8.70                  | 99.4                    |                     |                   |                         |
|          | 7:00 AM  |       | 21.9                | 8.40              | 96.3                    | 22.3                | 8.80                  | 99.7                    |                     |                   |                         |
|          | 8:00 AM  |       | 22.0                | 8.60              | 97.5                    | 22.3                | 8.70                  | 98.8                    |                     |                   |                         |
|          | 9:00 AM  |       | 22.0                | 8.80              | 99.7                    | 22.3                | 8.84                  | 101.6                   |                     |                   |                         |
|          |          | Surf. |                     |                   |                         |                     |                       |                         | 22.5                | 7.93              | 91                      |
| 9/7/2016 |          | 1m    |                     |                   |                         |                     |                       |                         | 22.5                | 7.92              | 91                      |
|          |          | 2m    |                     |                   |                         |                     |                       |                         | 22.4                | 7.56              | 88                      |
|          | 9:16 AM  | 3m    |                     |                   |                         |                     |                       |                         | 22.4                | 7.43              | 85                      |
|          |          | 4m    |                     |                   |                         |                     |                       |                         | 22.3                | 7.39              | 85                      |
|          |          | 5m    |                     |                   |                         |                     |                       |                         | 22.3                | 7.08              | 82                      |
|          |          | 6m    |                     |                   |                         |                     |                       |                         | 22.3                | 6.95              | 81                      |
|          | 10:00 AM |       | 22.1                | 8.90              | 101.1                   | 22.3                | 8.78                  | 101.0                   |                     |                   |                         |
|          | 11:00 AM |       | 22.4                | 9.40              | 106.0                   | 22.4                | 8.79                  | 101.2                   |                     |                   |                         |
|          | 12:00 PM |       | 23.0                | 9.08              | 105.7                   | 22.4                | 8.81                  | 101.6                   |                     |                   |                         |
|          | 1:00 PM  |       | 23.4                | 9.22              | 108.2                   | 22.5                | 8.83                  | 102.0                   |                     |                   |                         |
|          | 2:00 PM  |       | 24.0                | 9.27              | 110.1                   | 22.6                | 8.78                  | 101.6                   |                     |                   |                         |
|          | 3:00 PM  |       | 24.2                | 9.24              | 110.1                   | 22.6                | 8.79                  | 101.6                   |                     |                   |                         |
|          | 4:00 PM  |       | 24.2                | 9.12              | 108.6                   | 22.5                | 8.77                  | 101.2                   |                     |                   |                         |

|          |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date     | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|          | 5:00 PM  |       | 23.8                | 8.91              | 105.4                   | 22.4                | 8.76                  | 100.9                   |                     |                   |                         |
|          | 6:00 PM  |       | 23.4                | 8.60              | 101.0                   | 22.4                | 8.77                  | 101.0                   |                     |                   |                         |
|          | 7:00 PM  |       | 23.2                | 8.51              | 99.6                    | 22.3                | 8.78                  | 101.0                   |                     |                   |                         |
|          | 8:00 PM  |       | 23.0                | 8.30              | 96.7                    | 22.3                | 8.72                  | 100.4                   |                     |                   |                         |
|          | 9:00 PM  |       | 22.8                | 8.11              | 94.2                    | 22.4                | 8.69                  | 100.0                   |                     |                   |                         |
|          | 10:00 PM |       | 22.8                | 8.01              | 92.9                    | 22.4                | 8.74                  | 100.7                   |                     |                   |                         |
|          | 11:00 PM |       | 22.7                | 7.96              | 92.2                    | 22.4                | 8.74                  | 100.8                   |                     |                   |                         |
|          | 12:00 AM |       | 22.6                | 7.91              | 91.5                    | 22.4                | 8.72                  | 100.5                   |                     |                   |                         |
|          | 1:00 AM  |       | 22.5                | 7.91              | 91.3                    | 22.4                | 8.71                  | 100.4                   |                     |                   |                         |
|          | 2:00 AM  |       | 22.4                | 7.90              | 91.0                    | 22.4                | 8.72                  | 100.5                   |                     |                   |                         |
|          | 3:00 AM  |       | 22.4                | 7.89              | 90.9                    | 22.4                | 8.71                  | 100.4                   |                     |                   |                         |
|          | 4:00 AM  |       | 22.4                | 7.88              | 90.8                    | 22.4                | 8.74                  | 100.7                   |                     |                   |                         |
|          | 5:00 AM  |       | 22.4                | 7.87              | 90.7                    | 22.4                | 8.72                  | 100.4                   |                     |                   |                         |
|          | 6:00 AM  |       | 22.4                | 7.85              | 90.5                    | 22.4                | 8.76                  | 100.9                   |                     |                   |                         |
|          | 7:00 AM  |       | 22.4                | 7.87              | 90.7                    | 22.4                | 8.73                  | 100.6                   |                     |                   |                         |
|          | 8:00 AM  |       | 22.5                | 7.96              | 91.8                    | 22.4                | 8.64                  | 99.6                    |                     |                   |                         |
| 9/8/2016 | 9:00 AM  |       | 22.6                | 8.21              | 94.9                    | 22.4                | 8.74                  | 100.7                   |                     |                   |                         |
|          | 10:00 AM |       | 22.7                | 8.41              | 97.4                    | 22.4                | 8.69                  | 100.2                   |                     |                   |                         |
|          | 11:00 AM |       | 22.9                | 8.65              | 100.6                   | 22.5                | 8.70                  | 100.4                   |                     |                   |                         |
|          | 12:00 PM |       | 23.1                | 8.81              | 102.9                   | 22.6                | 8.78                  | 101.5                   |                     |                   |                         |
|          | 1:00 PM  |       | 23.4                | 8.99              | 105.6                   | 22.6                | 8.74                  | 101.1                   |                     |                   |                         |
|          | 2:00 PM  |       | 24.0                | 9.11              | 108.1                   | 22.7                | 8.70                  | 100.8                   |                     |                   |                         |
|          | 3:00 PM  |       | 24.1                | 9.11              | 108.4                   | 22.7                | 8.70                  | 100.8                   |                     |                   |                         |
|          | 4:00 PM  |       | 24.1                | 9.05              | 107.6                   | 22.7                | 8.65                  | 100.1                   |                     |                   |                         |
|          | 5:00 PM  |       | 24.0                | 8.95              | 106.4                   | 22.6                | 8.67                  | 100.3                   |                     |                   |                         |
|          | 6:00 PM  |       | 23.8                | 8.74              | 103.4                   | 22.6                | 8.67                  | 100.2                   |                     |                   |                         |

|          |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date     | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|          | 7:00 PM  |       | 23.6                | 8.50              | 100.2                   | 22.5                | 8.67                  | 100.2                   |                     |                   |                         |
|          | 8:00 PM  |       | 23.4                | 8.21              | 96.4                    | 22.5                | 8.62                  | 99.5                    |                     |                   |                         |
|          | 9:00 PM  |       | 23.2                | 8.00              | 93.7                    | 22.5                | 8.64                  | 99.7                    |                     |                   |                         |
|          | 10:00 PM |       | 23.2                | 7.87              | 92.0                    | 22.5                | 8.67                  | 100.0                   |                     |                   |                         |
|          | 11:00 PM |       | 23.1                | 7.78              | 90.8                    | 22.5                | 8.61                  | 99.3                    |                     |                   |                         |
|          | 12:00 AM |       | 23.0                | 7.75              | 90.3                    | 22.5                | 8.61                  | 99.3                    |                     |                   |                         |
|          | 1:00 AM  |       | 23.0                | 7.73              | 90.0                    | 22.4                | 8.64                  | 99.6                    |                     |                   |                         |
|          | 2:00 AM  |       | 22.9                | 7.72              | 89.9                    | 22.4                | 8.59                  | 99.0                    |                     |                   |                         |
|          | 3:00 AM  |       | 22.9                | 7.69              | 89.5                    | 22.4                | 8.58                  | 98.9                    |                     |                   |                         |
|          | 4:00 AM  |       | 22.9                | 7.68              | 89.3                    | 22.4                | 8.59                  | 99.0                    |                     |                   |                         |
|          | 5:00 AM  |       | 22.9                | 7.68              | 89.3                    | 22.4                | 8.60                  | 99.1                    |                     |                   |                         |
|          | 6:00 AM  |       | 22.8                | 7.67              | 89.1                    | 22.4                | 8.62                  | 99.3                    |                     |                   |                         |
|          | 7:00 AM  |       | 22.8                | 7.75              | 90.0                    | 22.4                | 8.58                  | 98.9                    |                     |                   |                         |
|          | 8:00 AM  |       | 22.9                | 7.90              | 91.8                    | 22.4                | 8.52                  | 98.2                    |                     |                   |                         |
|          | 9:00 AM  |       | 23.0                | 8.18              | 95.3                    | 22.4                | 8.58                  | 98.9                    |                     |                   |                         |
| 9/9/2016 | 10:00 AM |       | 23.6                | 8.52              | 100.4                   | 22.5                | 8.62                  | 99.5                    |                     |                   |                         |
|          | 11:00 AM |       | 24.2                | 8.72              | 103.9                   | 22.6                | 8.60                  | 99.5                    |                     |                   |                         |
|          | 12:00 PM |       | 24.6                | 8.83              | 106.1                   | 22.7                | 8.57                  | 99.3                    |                     |                   |                         |
|          | 1:00 PM  |       | 25.0                | 8.93              | 108.1                   | 22.8                | 8.60                  | 99.8                    |                     |                   |                         |
|          | 2:00 PM  |       | 25.4                | 8.99              | 109.7                   | 22.9                | 8.53                  | 99.2                    |                     |                   |                         |
|          | 3:00 PM  |       | 25.6                | 8.98              | 109.9                   | 23.0                | 8.56                  | 99.8                    |                     |                   |                         |
|          | 4:00 PM  |       | 25.7                | 8.87              | 108.7                   | 23.0                | 8.48                  | 98.9                    |                     |                   |                         |
|          | 5:00 PM  |       | 25.5                | 8.75              | 106.9                   | 23.0                | 8.47                  | 98.8                    |                     |                   |                         |
|          | 6:00 PM  |       | 25.2                | 8.60              | 104.5                   | 23.0                | 8.45                  | 98.6                    |                     |                   |                         |
|          | 7:00 PM  |       | 24.8                | 8.35              | 100.7                   | 23.0                | 8.50                  | 99.1                    |                     |                   |                         |
|          | 8:00 PM  |       | 24.5                | 8.06              | 96.6                    | 23.0                | 8.53                  | 99.4                    |                     |                   |                         |
|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time Do  | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 9:00 PM  |       | 24.2                | 7.85              | 93.7                    | 23.0                | 8.54                  | 99.5                    |                     |                   |                         |
|           | 10:00 PM |       | 24.1                | 7.76              | 92.3                    | 23.0                | 8.57                  | 99.8                    |                     |                   |                         |
|           | 11:00 PM |       | 24.0                | 7.69              | 91.2                    | 22.9                | 8.52                  | 99.2                    |                     |                   |                         |
|           | 12:00 AM |       | 23.8                | 7.65              | 90.6                    | 22.9                | 8.52                  | 99.1                    |                     |                   |                         |
|           | 1:00 AM  |       | 23.7                | 7.65              | 90.3                    | 22.9                | 8.56                  | 99.6                    |                     |                   |                         |
|           | 2:00 AM  |       | 23.5                | 7.65              | 90.0                    | 22.9                | 8.57                  | 99.6                    |                     |                   |                         |
|           | 3:00 AM  |       | 23.3                | 7.67              | 90.0                    | 22.8                | 8.57                  | 99.5                    |                     |                   |                         |
|           | 4:00 AM  |       | 23.2                | 7.68              | 89.8                    | 22.8                | 8.54                  | 99.2                    |                     |                   |                         |
|           | 5:00 AM  |       | 23.0                | 7.68              | 89.6                    | 22.8                | 8.48                  | 98.4                    |                     |                   |                         |
|           | 6:00 AM  |       | 22.8                | 7.68              | 89.3                    | 22.7                | 8.56                  | 99.2                    |                     |                   |                         |
|           | 7:00 AM  |       | 22.7                | 7.75              | 89.8                    | 22.7                | 8.58                  | 99.4                    |                     |                   |                         |
|           | 8:00 AM  |       | 22.7                | 7.97              | 92.4                    | 22.7                | 8.57                  | 99.3                    |                     |                   |                         |
|           | 9:00 AM  |       | 23.0                | 8.22              | 95.8                    | 22.7                | 8.53                  | 98.9                    |                     |                   |                         |
|           | 10:00 AM |       | 23.3                | 8.51              | 99.7                    | 22.9                | 8.55                  | 99.5                    |                     |                   |                         |
| 9/10/2016 | 11:00 AM |       | 23.8                | 8.74              | 103.5                   | 23.1                | 8.56                  | 100.0                   |                     |                   |                         |
|           | 12:00 PM |       | 24.2                | 8.90              | 106.0                   | 23.4                | 8.50                  | 99.7                    |                     |                   |                         |
|           | 1:00 PM  |       | 24.6                | 9.00              | 108.1                   | 23.5                | 8.53                  | 100.3                   |                     |                   |                         |
|           | 2:00 PM  |       | 24.9                | 9.06              | 109.5                   | 23.5                | 8.47                  | 99.6                    |                     |                   |                         |
|           | 3:00 PM  |       | 25.1                | 9.05              | 109.7                   | 23.4                | 8.49                  | 99.7                    |                     |                   |                         |
|           | 4:00 PM  |       | 25.0                | 9.00              | 108.9                   | 23.2                | 8.42                  | 98.5                    |                     |                   |                         |
|           | 5:00 PM  |       | 24.9                | 8.79              | 106.1                   | 23.0                | 8.48                  | 98.9                    |                     |                   |                         |
|           | 6:00 PM  |       | 24.5                | 8.47              | 101.6                   | 22.9                | 8.50                  | 99.0                    |                     |                   |                         |
|           | 7:00 PM  |       | 24.3                | 8.19              | 97.7                    | 22.9                | 8.50                  | 98.9                    |                     |                   |                         |
|           | 8:00 PM  |       | 24.1                | 7.99              | 95.1                    | 22.9                | 8.52                  | 99.1                    |                     |                   |                         |
|           | 9:00 PM  |       | 24.0                | 7.83              | 92.9                    | 22.9                | 8.48                  | 98.6                    |                     |                   |                         |
|           | 10:00 PM |       | 23.8                | 7.75              | 91.8                    | 22.9                | 8.46                  | 98.5                    |                     |                   |                         |

|           |            |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|------------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 11:00 PM   | 23.7                | 7.70              | 91.0                    | 22.9                | 8.42                  | 98.0                    | (-/                 | (8/ -/            |                         |
|           | 12:00 AM   | 23.6                | 7.68              | 90.6                    | 22.9                | 8.45                  | 98.3                    |                     |                   |                         |
|           | 1:00 AM    | 23.6                | 7.66              | 90.2                    | 22.9                | 8.42                  | 97.9                    |                     |                   |                         |
|           | 2:00 AM    | 23.5                | 7.64              | 89.9                    | 22.9                | 8.42                  | 97.9                    |                     |                   |                         |
|           | 3:00 AM    | 23.4                | 7.63              | 89.7                    | 22.9                | 8.41                  | 97.8                    |                     |                   |                         |
|           | 4:00 AM    | 23.4                | 7.62              | 89.5                    | 22.9                | 8.38                  | 97.4                    |                     |                   |                         |
|           | 5:00 AM    | 23.4                | 7.61              | 89.3                    | 22.9                | 8.42                  | 97.9                    |                     |                   |                         |
|           | 6:00 AM    | 23.4                | 7.60              | 89.2                    | 22.9                | 8.39                  | 97.5                    |                     |                   |                         |
|           | 7:00 AM    | 23.3                | 7.60              | 89.1                    | 22.9                | 8.39                  | 97.5                    |                     |                   |                         |
|           | 8:00 AM    | 23.3                | 7.66              | 89.8                    | 22.9                | 8.40                  | 97.7                    |                     |                   |                         |
|           | 9:00 AM    | 23.4                | 7.74              | 90.8                    | 22.9                | 8.37                  | 97.3                    |                     |                   |                         |
|           | 10:00 AM   | 23.4                | 7.89              | 92.6                    | 22.9                | 8.40                  | 97.6                    |                     |                   |                         |
| 0/11/2016 | 11:00 AM   | 23.3                | 7.93              | 93.0                    | 22.8                | 8.33                  | 96.7                    |                     |                   |                         |
| 9/11/2010 | 12:00 PM   | 23.2                | 7.96              | 93.1                    | 22.7                | 8.33                  | 96.6                    |                     |                   |                         |
|           | 1:00 PM    | 23.2                | 8.20              | 96.0                    | 22.8                | 8.39                  | 97.3                    |                     |                   |                         |
|           | 2:00 PM    | 23.5                | 8.46              | 99.6                    | 22.8                | 8.37                  | 97.3                    |                     |                   |                         |
|           | 3:00 PM    | 23.9                | 8.70              | 103.1                   | 22.9                | 8.44                  | 98.3                    |                     |                   |                         |
|           | 4:00 PM    | 24.1                | 8.69              | 103.4                   | 22.9                | 8.40                  | 97.7                    |                     |                   |                         |
|           | 5:00 PM    | 24.0                | 8.61              | 102.2                   | 22.9                | 8.40                  | 97.6                    |                     |                   |                         |
|           | 6:00 PM    | 23.6                | 8.55              | 100.9                   | 22.8                | 8.41                  | 97.7                    |                     |                   |                         |
|           | 7:00 PM    | 23.2                | 8.38              | 98.0                    | 22.8                | 8.38                  | 97.3                    |                     |                   |                         |
|           | 8:00 PM    | 22.8                | 8.08              | 93.7                    | 22.7                | 8.42                  | 97.7                    |                     |                   |                         |
|           | 9:00 PM    | 22.4                | 7.87              | 90.7                    | 22.7                | 8.45                  | 98.0                    |                     |                   |                         |
|           | 10:00 PM   | 22.2                | 7.78              | 89.2                    | 22.7                | 8.40                  | 97.3                    |                     |                   |                         |
|           | 11:00 PM   | 22.0                | 7.71              | 88.1                    | 22.6                | 8.42                  | 97.4                    |                     |                   |                         |

|           |            |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|------------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 12:00 AM   | 21.8                | 7.68              | 87.5                    | 22.6                | 8.43                  | 97.5                    |                     | (6/ -/            |                         |
|           | 1:00 AM    | 21.6                | 7.67              | 87.1                    | 22.6                | 8.45                  | 97.7                    |                     |                   |                         |
|           | 2:00 AM    | 21.4                | 7.66              | 86.6                    | 22.5                | 8.42                  | 97.2                    |                     |                   |                         |
|           | 3:00 AM    | 21.3                | 7.66              | 86.4                    | 22.5                | 8.43                  | 97.2                    |                     |                   |                         |
|           | 4:00 AM    | 21.1                | 7.66              | 86.1                    | 22.4                | 8.44                  | 97.3                    |                     |                   |                         |
|           | 5:00 AM    | 21.0                | 7.65              | 85.8                    | 22.4                | 8.42                  | 97.0                    |                     |                   |                         |
|           | 6:00 AM    | 20.8                | 7.66              | 85.6                    | 22.3                | 8.38                  | 96.5                    |                     |                   |                         |
|           | 7:00 AM    | 20.7                | 7.71              | 86.0                    | 22.3                | 8.48                  | 97.5                    |                     |                   |                         |
|           | 8:00 AM    | 20.8                | 7.89              | 88.1                    | 22.3                | 8.43                  | 97.0                    |                     |                   |                         |
|           | 9:00 AM    | 21.1                | 8.13              | 91.4                    | 22.3                | 8.61                  | 99.1                    |                     |                   |                         |
|           | 10:00 AM   | 21.5                | 8.38              | 94.9                    | 22.4                | 8.70                  | 100.2                   |                     |                   |                         |
| 0/12/2016 | 11:00 AM   | 22.0                | 8.61              | 98.5                    | 22.5                | 8.68                  | 100.2                   |                     |                   |                         |
| 9/12/2010 | 12:00 PM   | 22.5                | 8.77              | 101.2                   | 22.5                | 8.69                  | 100.4                   |                     |                   |                         |
|           | 1:00 PM    | 22.9                | 8.90              | 103.6                   | 22.6                | 8.59                  | 99.3                    |                     |                   |                         |
|           | 2:00 PM    | 23.3                | 8.98              | 105.2                   | 22.5                | 8.54                  | 98.6                    |                     |                   |                         |
|           | 3:00 PM    | 23.3                | 8.96              | 105.1                   | 22.5                | 8.58                  | 99.1                    |                     |                   |                         |
|           | 4:00 PM    | 23.4                | 8.90              | 104.5                   | 22.5                | 8.58                  | 99.0                    |                     |                   |                         |
|           | 5:00 PM    | 23.3                | 8.86              | 103.9                   | 22.4                | 8.57                  | 98.8                    |                     |                   |                         |
|           | 6:00 PM    | 23.1                | 8.73              | 101.9                   | 22.4                | 8.58                  | 98.9                    |                     |                   |                         |
|           | 7:00 PM    | 22.7                | 8.48              | 98.3                    | 22.4                | 8.57                  | 98.8                    |                     |                   |                         |
|           | 8:00 PM    | 22.3                | 8.18              | 94.1                    | 22.4                | 8.57                  | 98.8                    |                     |                   |                         |
|           | 9:00 PM    | 22.0                | 7.98              | 91.3                    | 22.4                | 8.52                  | 98.2                    |                     |                   |                         |
|           | 10:00 PM   | 21.8                | 7.86              | 89.6                    | 22.3                | 8.57                  | 98.6                    |                     |                   |                         |
|           | 11:00 PM   | 21.6                | 7.82              | 88.7                    | 22.3                | 8.59                  | 98.8                    |                     |                   |                         |
| 9/13/2016 | 12:00 AM   | 21.4                | 7.80              | 88.2                    | 22.3                | 8.57                  | 98.5                    |                     |                   |                         |
| 5,15,2010 | 1:00 AM    | 21.2                | 7.81              | 87.9                    | 22.2                | 8.53                  | 98.0                    |                     |                   |                         |

|             |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-------------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date        | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|             | 2:00 AM  | -     | 21.0                | 7.80              | 87.5                    | 22.2                | 8.58                  | 98.5                    |                     |                   |                         |
|             | 3:00 AM  |       | 20.8                | 7.80              | 87.2                    | 22.2                | 8.60                  | 98.7                    |                     |                   |                         |
|             | 4:00 AM  |       | 20.7                | 7.81              | 87.0                    | 22.1                | 8.56                  | 98.1                    |                     |                   |                         |
|             | 5:00 AM  |       | 20.5                | 7.82              | 86.8                    | 22.1                | 8.64                  | 99.0                    |                     |                   |                         |
|             | 6:00 AM  |       | 20.4                | 7.82              | 86.6                    | 22.1                | 8.59                  | 98.3                    |                     |                   |                         |
|             | 7:00 AM  |       | 20.2                | 7.88              | 87.1                    | 22.0                | 8.51                  | 97.3                    |                     |                   |                         |
|             | 8:00 AM  |       | 20.3                | 8.04              | 88.9                    | 22.0                | 8.64                  | 98.8                    |                     |                   |                         |
|             | 9:00 AM  |       | 20.6                | 8.30              | 92.3                    | 22.0                | 8.70                  | 99.6                    |                     |                   |                         |
|             | 10:00 AM |       | 21.0                | 8.53              | 95.6                    | 22.1                | 8.73                  | 100.1                   |                     |                   |                         |
|             | 11:00 AM |       | 21.6                | 8.77              | 99.4                    | 22.3                | 8.69                  | 99.9                    |                     |                   |                         |
|             | 12:00 PM |       | 22.2                | 8.93              | 102.4                   | 22.3                | 8.72                  | 100.4                   |                     |                   |                         |
|             | 1:00 PM  |       | 22.6                | 9.04              | 104.6                   | 22.4                | 8.74                  | 100.6                   |                     |                   |                         |
|             | 2:00 PM  |       | 23.0                | 9.14              | 106.5                   | 22.4                | 8.75                  | 100.8                   |                     |                   |                         |
|             | 3:00 PM  |       | 23.1                | 9.12              | 106.5                   | 22.3                | 8.73                  | 100.5                   |                     |                   |                         |
|             | 4:00 PM  |       | 23.1                | 9.06              | 105.7                   | 22.3                | 8.70                  | 100.0                   |                     |                   |                         |
|             | 5:00 PM  |       | 23.0                | 8.98              | 104.7                   | 22.2                | 8.60                  | 98.7                    |                     |                   |                         |
|             | 6:00 PM  |       | 22.8                | 8.88              | 103.2                   | 22.1                | 8.65                  | 99.1                    |                     |                   |                         |
|             | 7:00 PM  |       | 22.5                | 8.64              | 99.7                    | 22.1                | 8.63                  | 98.8                    |                     |                   |                         |
|             | 8:00 PM  |       | 22.0                | 8.35              | 95.6                    | 22.1                | 8.62                  | 98.7                    |                     |                   |                         |
|             | 9:00 PM  |       | 21.7                | 8.15              | 92.7                    | 22.0                | 8.64                  | 98.9                    |                     |                   |                         |
|             | 10:00 PM |       | 21.5                | 8.05              | 91.2                    | 22.1                | 8.64                  | 98.9                    |                     |                   |                         |
|             | 11:00 PM |       | 21.3                | 7.98              | 90.1                    | 22.0                | 8.64                  | 98.9                    |                     |                   |                         |
|             | 12:00 AM |       | 21.2                | 7.95              | 89.4                    | 22.0                | 8.66                  | 99.0                    |                     |                   |                         |
| 9/14/2016   | 1:00 AM  |       | 21.0                | 7.93              | 89.0                    | 22.0                | 8.57                  | 98.0                    |                     |                   |                         |
| , , , ====3 | 2:00 AM  |       | 20.9                | 7.93              | 88.7                    | 22.0                | 8.57                  | 97.9                    |                     |                   |                         |
|             | 3:00 AM  |       | 20.7                | 7.93              | 88.5                    | 22.0                | 8.58                  | 98.0                    |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 4:00 AM  |       | 20.6                | 7.94              | 88.4                    | 21.9                | 8.56                  | 97.7                    |                     |                   |                         |
|           | 5:00 AM  |       | 20.5                | 7.94              | 88.2                    | 21.9                | 8.62                  | 98.4                    |                     |                   |                         |
|           | 6:00 AM  |       | 20.4                | 7.93              | 87.9                    | 21.9                | 8.56                  | 97.7                    |                     |                   |                         |
|           | 7:00 AM  |       | 20.3                | 8.02              | 88.8                    | 21.9                | 8.51                  | 97.1                    |                     |                   |                         |
|           | 8:00 AM  |       | 20.4                | 8.19              | 90.8                    | 21.9                | 8.57                  | 97.7                    |                     |                   |                         |
|           | 9:00 AM  |       | 20.7                | 8.49              | 94.6                    | 21.9                | 8.64                  | 98.6                    |                     |                   |                         |
|           | 10:00 AM |       | 21.1                | 8.83              | 99.1                    | 22.0                | 8.60                  | 98.2                    |                     |                   |                         |
|           | 11:00 AM |       | 21.3                | 9.10              | 102.7                   | 22.0                | 8.56                  | 97.9                    |                     |                   |                         |
|           | 12:00 PM |       | 21.5                | 9.20              | 104.1                   | 22.0                | 8.60                  | 98.4                    |                     |                   |                         |
|           | 1:00 PM  |       | 21.6                | 9.21              | 104.5                   | 22.0                | 8.51                  | 97.3                    |                     |                   |                         |
|           | 2:00 PM  |       | 21.6                | 9.07              | 102.9                   | 22.0                | 8.52                  | 97.4                    |                     |                   |                         |
|           | 3:00 PM  |       | 21.6                | 8.92              | 101.1                   | 22.0                | 8.48                  | 97.0                    |                     |                   |                         |
|           | 4:00 PM  |       | 21.5                | 8.82              | 100.0                   | 22.0                | 8.47                  | 96.9                    |                     |                   |                         |
|           | 5:00 PM  |       | 21.5                | 8.71              | 98.5                    | 22.0                | 8.46                  | 96.7                    |                     |                   |                         |
|           | 6:00 PM  |       | 21.3                | 8.68              | 97.9                    | 22.0                | 8.46                  | 96.6                    |                     |                   |                         |
|           | 7:00 PM  |       | 21.1                | 8.48              | 95.3                    | 21.9                | 8.45                  | 96.5                    |                     |                   |                         |
|           | 8:00 PM  |       | 20.8                | 8.35              | 93.3                    | 21.9                | 8.48                  | 96.8                    |                     |                   |                         |
|           | 9:00 PM  |       | 20.6                | 8.22              | 91.5                    | 21.9                | 8.50                  | 97.0                    |                     |                   |                         |
|           | 10:00 PM |       | 20.4                | 8.15              | 90.3                    | 21.9                | 8.52                  | 97.2                    |                     |                   |                         |
|           | 11:00 PM |       | 20.2                | 8.10              | 89.5                    | 21.8                | 8.49                  | 96.8                    |                     |                   |                         |
|           | 12:00 AM |       | 20.1                | 8.09              | 89.1                    | 21.8                | 8.47                  | 96.5                    |                     |                   |                         |
|           | 1:00 AM  |       | 19.9                | 8.08              | 88.7                    | 21.8                | 8.54                  | 97.2                    |                     |                   |                         |
| 9/15/2016 | 2:00 AM  |       | 19.9                | 8.06              | 88.4                    | 21.7                | 8.55                  | 97.3                    |                     |                   |                         |
| ,,,       | 3:00 AM  |       | 19.7                | 0.00              | 0.0                     | 21.7                | 8.52                  | 96.8                    |                     |                   |                         |
|           | 4:00 AM  |       | 19.6                | 0.00              | 0.0                     | 21.6                | 8.54                  | 97.0                    |                     |                   |                         |
|           | 5:00 AM  |       | 19.4                | 0.00              | 0.0                     | 21.6                | 8.52                  | 96.6                    |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 6:00 AM  |       | 19.3                | 0.00              | 0.0                     | 21.5                | 8.58                  | 97.3                    |                     |                   |                         |
|           | 7:00 AM  |       | 19.2                | 0.00              | 0.0                     | 21.5                | 8.56                  | 97.0                    |                     |                   |                         |
|           | 8:00 AM  |       | 19.2                | 0.00              | 0.0                     | 21.5                | 8.59                  | 97.2                    |                     |                   |                         |
|           | 9:00 AM  |       | 19.5                | 0.00              | 0.0                     | 21.5                | 8.59                  | 97.3                    |                     |                   |                         |
|           | 10:00 AM |       | 19.8                | 8.74              | 95.7                    | 21.5                | 8.60                  | 97.4                    |                     |                   |                         |
|           | 11:00 AM |       | 20.0                | 8.94              | 98.3                    | 21.6                | 8.56                  | 97.2                    |                     |                   |                         |
|           | 12:00 PM |       | 20.2                | 9.04              | 99.8                    | 21.7                | 8.54                  | 97.0                    |                     |                   |                         |
|           | 1:00 PM  |       | 20.9                | 9.21              | 103.1                   | 21.8                | 8.50                  | 96.8                    |                     |                   |                         |
|           | 2:00 PM  |       | 21.6                | 9.38              | 106.3                   | 22.0                | 8.44                  | 96.4                    |                     |                   |                         |
|           | 3:00 PM  |       | 21.5                | 9.34              | 105.8                   | 22.0                | 8.50                  | 97.2                    |                     |                   |                         |
|           | 4:00 PM  |       | 21.4                | 9.20              | 104.1                   | 22.0                | 8.46                  | 96.7                    |                     |                   |                         |
|           | 5:00 PM  |       | 21.4                | 9.15              | 103.5                   | 22.0                | 8.44                  | 96.5                    |                     |                   |                         |
|           | 6:00 PM  |       | 21.2                | 9.04              | 101.8                   | 22.0                | 8.47                  | 96.8                    |                     |                   |                         |
|           | 7:00 PM  |       | 20.9                | 8.77              | 98.2                    | 21.9                | 8.45                  | 96.5                    |                     |                   |                         |
|           | 8:00 PM  |       | 20.5                | 8.49              | 94.3                    | 21.8                | 8.39                  | 95.6                    |                     |                   |                         |
|           | 9:00 PM  |       | 20.2                | 8.32              | 91.9                    | 21.7                | 8.42                  | 95.7                    |                     |                   |                         |
|           | 10:00 PM |       | 19.9                | 8.27              | 90.8                    | 21.6                | 8.37                  | 95.0                    |                     |                   |                         |
|           | 11:00 PM |       | 19.7                | 8.25              | 90.2                    | 21.5                | 8.45                  | 95.7                    |                     |                   |                         |
|           | 12:00 AM |       | 19.5                | 0.00              | 0.0                     | 21.4                | 8.50                  | 96.1                    |                     |                   |                         |
|           | 1:00 AM  |       | 19.3                | 0.00              | 0.0                     | 21.4                | 8.46                  | 95.5                    |                     |                   |                         |
|           | 2:00 AM  |       | 19.1                | 0.00              | 0.0                     | 21.3                | 8.48                  | 95.7                    |                     |                   |                         |
| 9/16/2016 | 3:00 AM  |       | 18.9                | 0.00              | 0.0                     | 21.3                | 8.50                  | 95.8                    |                     |                   |                         |
|           | 4:00 AM  |       | 18.8                | 0.00              | 0.0                     | 21.2                | 8.48                  | 95.5                    |                     |                   |                         |
|           | 5:00 AM  |       | 18.6                | 0.00              | 0.0                     | 21.2                | 8.48                  | 95.5                    |                     |                   |                         |
|           | 6:00 AM  |       | 18.5                | 0.00              | 0.0                     | 21.2                | 8.47                  | 95.3                    |                     |                   |                         |
|           | 7:00 AM  |       | 18.5                | 0.00              | 0.0                     | 21.1                | 8.43                  | 94.8                    |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 8:00 AM  |       | 18.5                | 0.00              | 0.0                     | 21.1                | 8.52                  | 95.8                    |                     |                   |                         |
|           | 9:00 AM  |       | 18.7                | 0.00              | 0.0                     | 21.1                | 8.58                  | 96.4                    |                     |                   |                         |
|           | 10:00 AM |       | 19.2                | 0.00              | 0.0                     | 21.1                | 8.55                  | 96.1                    |                     |                   |                         |
|           | 11:00 AM |       | 19.7                | 9.23              | 100.9                   | 21.2                | 8.54                  | 96.2                    |                     |                   |                         |
|           | 12:00 PM |       | 20.2                | 9.33              | 103.0                   | 21.3                | 8.59                  | 96.8                    |                     |                   |                         |
|           | 1:00 PM  |       | 20.6                | 9.40              | 104.6                   | 21.3                | 8.62                  | 97.3                    |                     |                   |                         |
|           | 2:00 PM  |       | 20.9                | 9.45              | 105.8                   | 21.3                | 8.55                  | 96.5                    |                     |                   |                         |
|           | 3:00 PM  |       | 21.0                | 9.40              | 105.5                   | 21.2                | 8.54                  | 96.2                    |                     |                   |                         |
|           | 4:00 PM  |       | 21.0                | 9.39              | 105.4                   | 21.1                | 8.56                  | 96.2                    |                     |                   |                         |
|           | 5:00 PM  |       | 21.0                | 9.38              | 105.1                   | 21.0                | 8.52                  | 95.6                    |                     |                   |                         |
|           | 6:00 PM  |       | 20.6                | 9.24              | 102.9                   | 21.0                | 8.53                  | 95.6                    |                     |                   |                         |
|           | 7:00 PM  |       | 20.3                | 9.05              | 100.1                   | 20.9                | 8.51                  | 95.3                    |                     |                   |                         |
|           | 8:00 PM  |       | 19.9                | 8.78              | 96.4                    | 20.8                | 8.54                  | 95.5                    |                     |                   |                         |
|           | 9:00 PM  |       | 19.6                | 8.59              | 93.8                    | 20.8                | 8.55                  | 95.5                    |                     |                   |                         |
|           | 10:00 PM |       | 19.5                | 0.00              | 0.0                     | 20.7                | 8.43                  | 94.1                    |                     |                   |                         |
|           | 11:00 PM |       | 19.3                | 0.00              | 0.0                     | 20.7                | 8.42                  | 93.9                    |                     |                   |                         |
|           | 12:00 AM |       | 19.2                | 0.00              | 0.0                     | 20.7                | 8.47                  | 94.5                    |                     |                   |                         |
|           | 1:00 AM  |       | 19.0                | 0.00              | 0.0                     | 20.7                | 8.32                  | 92.7                    |                     |                   |                         |
|           | 2:00 AM  |       | 18.9                | 0.00              | 0.0                     | 20.7                | 8.47                  | 94.4                    |                     |                   |                         |
|           | 3:00 AM  |       | 18.7                | 0.00              | 0.0                     | 20.6                | 8.45                  | 94.1                    |                     |                   |                         |
| 9/17/2016 | 4:00 AM  |       | 18.6                | 0.00              | 0.0                     | 20.6                | 8.41                  | 93.5                    |                     |                   |                         |
| -, ,      | 5:00 AM  |       | 18.5                | 0.00              | 0.0                     | 20.5                | 8.39                  | 93.3                    |                     |                   |                         |
|           | 6:00 AM  |       | 18.4                | 0.00              | 0.0                     | 20.5                | 8.52                  | 94.6                    |                     |                   |                         |
|           | 7:00 AM  |       | 18.3                | 0.00              | 0.0                     | 20.5                | 8.36                  | 92.8                    |                     |                   |                         |
|           | 8:00 AM  |       | 18.4                | 0.00              | 0.0                     | 20.4                | 8.36                  | 92.7                    |                     |                   |                         |
|           | 9:00 AM  |       | 18.8                | 0.00              | 0.0                     | 20.5                | 8.51                  | 94.5                    |                     |                   |                         |

|           |          |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-----------|----------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date      | Time     | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|           | 10:00 AM |       | 19.1                | 0.00              | 0.0                     | 20.5                | 8.50                  | 94.5                    |                     |                   |                         |
|           | 11:00 AM |       | 19.7                | 0.00              | 0.0                     | 20.6                | 8.49                  | 94.5                    |                     |                   |                         |
|           | 12:00 PM |       | 20.3                | 9.48              | 104.8                   | 20.7                | 8.33                  | 92.9                    |                     |                   |                         |
|           | 1:00 PM  |       | 20.7                | 9.56              | 106.5                   | 20.7                | 8.55                  | 95.4                    |                     |                   |                         |
|           | 2:00 PM  |       | 20.8                | 9.59              | 107.1                   | 20.7                | 8.51                  | 94.9                    |                     |                   |                         |
|           | 3:00 PM  |       | 20.8                | 9.59              | 107.0                   | 20.7                | 8.51                  | 94.8                    |                     |                   |                         |
|           | 4:00 PM  |       | 20.8                | 9.65              | 107.8                   | 20.5                | 8.48                  | 94.3                    |                     |                   |                         |
|           | 5:00 PM  |       | 20.6                | 9.57              | 106.5                   | 20.5                | 8.50                  | 94.4                    |                     |                   |                         |
|           | 6:00 PM  |       | 20.3                | 9.43              | 104.3                   | 20.5                | 8.43                  | 93.5                    |                     |                   |                         |
|           | 7:00 PM  |       | 20.0                | 9.22              | 101.4                   | 20.5                | 8.39                  | 93.1                    |                     |                   |                         |
|           | 8:00 PM  |       | 19.7                | 8.94              | 97.8                    | 20.5                | 8.35                  | 92.7                    |                     |                   |                         |
|           | 9:00 PM  |       | 19.5                | 8.74              | 95.2                    | 20.5                | 8.20                  | 91.0                    |                     |                   |                         |
|           | 10:00 PM |       | 19.4                | 0.00              | 0.0                     | 20.5                | 8.35                  | 92.7                    |                     |                   |                         |
|           | 11:00 PM |       | 19.3                | 0.00              | 0.0                     | 20.4                | 8.28                  | 91.8                    |                     |                   |                         |
|           | 12:00 AM |       | 19.3                | 0.00              | 0.0                     | 20.4                | 8.35                  | 92.6                    |                     |                   |                         |
|           | 1:00 AM  |       | 19.2                | 0.00              | 0.0                     | 20.4                | 8.24                  | 91.4                    |                     |                   |                         |
|           | 2:00 AM  |       | 19.2                | 0.00              | 0.0                     | 20.4                | 8.24                  | 91.4                    |                     |                   |                         |
|           | 3:00 AM  |       | 19.2                | 0.00              | 0.0                     | 20.4                | 8.20                  | 91.0                    |                     |                   |                         |
|           | 4:00 AM  |       | 19.2                | 0.00              | 0.0                     | 20.4                | 8.22                  | 91.2                    |                     |                   |                         |
| 9/18/2016 | 5:00 AM  |       | 19.2                | 0.00              | 0.0                     | 20.4                | 8.30                  | 92.0                    |                     |                   |                         |
|           | 6:00 AM  |       | 19.2                | 0.00              | 0.0                     | 20.4                | 8.28                  | 91.8                    |                     |                   |                         |
|           | 7:00 AM  |       | 19.2                | 0.00              | 0.0                     | 20.4                | 8.27                  | 91.7                    |                     |                   |                         |
|           | 8:00 AM  |       | 19.2                | 0.00              | 0.0                     | 20.4                | 8.33                  | 92.3                    |                     |                   |                         |
|           | 9:00 AM  |       | 19.3                | 0.00              | 0.0                     | 20.4                | 8.28                  | 91.8                    |                     |                   |                         |
|           | 10:00 AM |       | 19.4                | 0.00              | 0.0                     | 20.4                | 8.34                  | 92.5                    |                     |                   |                         |
|           | 11:00 AM |       | 19.7                | 0.00              | 0.0                     | 20.4                | 8.30                  | 92.1                    |                     |                   |                         |

|             |                     |       |                     | Upstream          |                         |                     | Tailrace <sup>1</sup> |                         |                     | Impoundment       |                         |
|-------------|---------------------|-------|---------------------|-------------------|-------------------------|---------------------|-----------------------|-------------------------|---------------------|-------------------|-------------------------|
| Date        | Time                | Depth | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | DO<br>Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | DO<br>Saturation<br>(%) |
|             | 12:00 PM            |       | 20.2                | 9.40              | 103.9                   | 20.5                | 8.34                  | 92.6                    |                     |                   |                         |
|             | 1:00 PM             |       | 20.7                | 9.60              | 106.9                   | 20.5                | 8.34                  | 92.7                    |                     |                   |                         |
|             | 2:00 PM             |       | 21.1                | 9.69              | 108.8                   | 20.6                | 8.29                  | 92.2                    |                     |                   |                         |
|             | 3:00 PM             |       | 21.2                | 9.65              | 108.6                   | 20.7                | 8.24                  | 91.8                    |                     |                   |                         |
|             | 4:00 PM             |       | 21.4                | 9.65              | 109.1                   | 20.7                | 8.30                  | 92.5                    |                     |                   |                         |
|             | 5:00 PM             |       | 21.4                | 9.53              | 107.7                   | 20.6                | 8.28                  | 92.2                    |                     |                   |                         |
|             | 6:00 PM             |       | 21.2                | 9.38              | 105.6                   | 20.6                | 8.23                  | 91.6                    |                     |                   |                         |
|             | 7:00 PM             |       | 20.9                | 9.08              | 101.6                   | 20.6                | 8.20                  | 91.3                    |                     |                   |                         |
|             | 8:00 PM             |       | 20.6                | 8.80              | 97.9                    | 20.6                | 8.23                  | 91.5                    |                     |                   |                         |
|             | 9:00 PM<br>10:00 PM |       | 20.4<br>20.3        | 8.58<br>8.47      | 95.1<br>93.6            | 20.6<br>20.6        | 8.12<br>8.17          | 90.3<br>90.8            |                     |                   |                         |
|             | 11:00 PM            |       | 20.2                | 8.39              | 92.6                    | 20.6                | 8.23                  | 91.5                    |                     |                   |                         |
|             | 12:00 AM            |       | 20.1                | 8.35              | 92.0                    | 20.6                | 8.27                  | 91.9                    |                     |                   |                         |
|             | 1:00 AM             |       | 20.1                | 8.33              | 91.7                    | 20.5                | 8.13                  | 90.4                    |                     |                   |                         |
|             | 2:00 AM             |       | 20.0                | 8.32              | 91.5                    | 20.5                | 8.10                  | 90.0                    |                     |                   |                         |
|             | 3:00 AM             |       | 20.0                | 8.31              | 91.4                    | 20.5                | 8.14                  | 90.5                    |                     |                   |                         |
|             | 4:00 AM             |       | 20.0                | 8.29              | 91.2                    | 20.5                | 8.14                  | 90.4                    |                     |                   |                         |
| 9/19/2016   | 5:00 AM             |       | 20.0                | 8.28              | 91.1                    | 20.5                | 8.03                  | 89.2                    |                     |                   |                         |
| 5/ 25/ 2020 | 6:00 AM             |       | 20.0                | 8.28              | 91.1                    | 20.5                | 8.04                  | 89.3                    |                     |                   |                         |
|             | 7:00 AM             |       | 20.1                | 8.28              | 91.2                    | 20.5                | 8.01                  | 89.0                    |                     |                   |                         |
|             | 8:00 AM             |       | 20.1                | 8.32              | 91.7                    | 20.5                | 8.01                  | 89.0                    |                     |                   |                         |
|             | 9:00 AM             |       | 20.1                | 8.44              | 93.1                    | 20.5                | 8.06                  | 89.5                    |                     |                   |                         |
|             | 10:00 AM            |       | 20.3                | 8.63              | 95.4                    |                     |                       |                         |                     |                   |                         |
|             | 11:00 AM            |       | 21.2                | 8.72              | 98.2                    |                     |                       |                         |                     |                   |                         |
|             |                     | Surf. |                     |                   |                         |                     |                       |                         | 21.2                | 8.25              | 93                      |
| 9/23/2016   | 10:12 AM            | 1m    |                     |                   |                         |                     |                       |                         | 21.3                | 8.23              | 92                      |
|             |                     | 2m    |                     |                   |                         |                     |                       |                         | 21.3                | 8.26              | 94                      |

|            |          |          |                     | Upstream          |                   |                     | Tailrace <sup>1</sup> |                   |                     | Impoundment       |                   |
|------------|----------|----------|---------------------|-------------------|-------------------|---------------------|-----------------------|-------------------|---------------------|-------------------|-------------------|
|            |          |          |                     |                   | DO                |                     |                       | DO                |                     | •                 | DO                |
| Date       | Time     | Depth    | Temperature<br>(°C) | DO Conc<br>(mg/L) | Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L)     | Saturation<br>(%) | Temperature<br>(°C) | DO Conc<br>(mg/L) | Saturation<br>(%) |
|            |          | 3m       |                     |                   |                   |                     |                       |                   | 21.2                | 8.14              | 91                |
|            |          | 4m       |                     |                   |                   |                     |                       |                   | 21.1                | 7.86              | 89                |
|            |          | 5m       |                     |                   |                   |                     |                       |                   | 21.0                | 7.52              | 84                |
|            |          | 6m       |                     |                   |                   |                     |                       |                   | 20.8                | 7.06              | 79                |
|            |          | Surf.    |                     |                   |                   |                     |                       |                   | 16.7                | 8.80              | 90                |
|            |          | 1m       |                     |                   |                   |                     |                       |                   | 15.8                | 8.81              | 89                |
|            |          | 2m       |                     |                   |                   |                     |                       |                   | 15.6                | 8.72              | 87                |
| 10/7/2016  | 11:28 AM | <br>3m   |                     |                   |                   |                     |                       |                   | 15.5                | 8.69              | 87                |
|            |          | 4m       |                     |                   |                   |                     |                       |                   | 15 5                | 8.67              | 87                |
|            |          | <br>5 m  |                     |                   |                   |                     |                       |                   | 15.5                | 8.67              | 87                |
|            |          | 5m<br>6m |                     |                   |                   |                     |                       |                   | 15.4                | 0.07              | 07<br>07          |
|            |          | 0        |                     |                   |                   |                     |                       |                   | 15.4                | 0.00              | 87                |
|            |          | Surt.    |                     |                   |                   |                     |                       |                   | 13.5                | 9.44              | 90                |
|            |          | 1m       |                     |                   |                   |                     |                       |                   | 13.3                | 9.35              | 90                |
|            |          | 2m       |                     |                   |                   |                     |                       |                   | 13.3                | 9.26              | 89                |
| 10/19/2016 | 10:09 AM | 3m       |                     |                   |                   |                     |                       |                   | 13.2                | 9.06              | 87                |
|            |          | 4m       |                     |                   |                   |                     |                       |                   | 13.1                | 9.06              | 87                |
|            |          | 5m       |                     |                   |                   |                     |                       |                   | 13.0                | 8.90              | 84                |
|            |          | 6m       |                     |                   |                   |                     |                       |                   | 13.0                | 8.91              | 84                |

<sup>1</sup> Stn. #1 - Tailrace discharge, Stn. #2 - 200 feet downstream of tailrace, Stn. #3 1,000 feet downstream of tailrace

|            |                  |                  | Hydroelectric | Facility Impour | ndment           |              |             |
|------------|------------------|------------------|---------------|-----------------|------------------|--------------|-------------|
| Date       | Chlorophyll a    | Total phosphorus | Color         | рН              | Total alkalinity | Secchi Depth | Total Depth |
| 6/30/2016  | 0.0062 mg/L      | 23 ug/L          | 29 PCU        | 7.1 S.U.        | 30 mg/L          | 2.7 m        | 7.2 m       |
| 7/12/2016  | 0.0062 mg/L      | 30 ug/L          | 25 PCU        | 6.9 S.U.        | 32 mg/L          | 3.0 m        | 7.2 m       |
| 7/26/2016  | 0.0030 mg/L      | 20 ug/L          | 24 PCU        | 7.2 S.U.        | 35 mg/L          | 4.2 m        | 7.2 m       |
| 0/0/2016   | #1 - 0.0014 mg/L | #1 - 16 ug/L     | #1 - 21 PCU   | #1 - 7.1 S.U.   | #1 - 34 mg/L     | 4.4 m        | 7.0 m       |
| 0/0/2010   | #2 - 0.0022 mg/L | #2 - 17 ug/L     | #2 - 20 PCU   | #2 - 7.1 S.U.   | #2 - 34 mg/L     | 4.4 111      | 7.0 m       |
| 8/24/2016  | 0.0033 mg/L      | 18 ug/L          | 18 PCU        | 7.0 S.U.        | 33 mg/L          | 4.7 m        | 6.8 m       |
| 9/7/2016   | 0.0040 mg/L      | 17 ug/L          | 18 PCU        | 7.1 S.U.        | 35 mg/L          | 4.2 m        | 6.8 m       |
| 9/23/2016  | 0.0045 mg/L      | 14 ug/L          | 18 PCU        | 7.0 S.U.        | 36 mg/L          | 4.3 m        | 7.0 m       |
| 10/7/2016  | 0.0026 mg/L      | 13 ug/L          | 16 PCU        | 7.0 S.U.        | 37 mg/L          | 4.0 m        | 6.9 m       |
| 10/19/2016 | 0.0032 mg/L      | 13 ug/L          | 19 PCU        | 7.0 S.U.        | 38 mg/L          | 4.0 m        | 7.0 m       |

#### Table 3 – Additional Benton Falls Impoundment Water Quality Data

## Appendix A Maine State Standards for Classification of Class C Waters

#### Class C waters. Class C shall be the 4<sup>th</sup> highest classification.

- A. Class C waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as a habitat for fish and other aquatic life.
- B. The dissolved oxygen content of Class C water may be not less than 5 parts per million or 60% of saturation, whichever is higher, except that in identified salmonid spawning areas where water quality is sufficient to ensure spawning, egg incubation and survival of early life stages, that water quality sufficient for these purposes must be maintained. In order to provide additional protection for the growth of indigenous fish, the following standards apply.

(1) The 30-day average dissolved oxygen criterion of a Class C water is 6.5 parts per million using a temperature of 22 degrees centigrade or the ambient temperature of the water body, whichever is less, if:

(a) A license or water quality certificate other than a general permit was issued prior to March 16, 2004 for the Class C water and was not based on a 6.5 parts per million 30-day average dissolved oxygen criterion; or

(b) A discharge or a hydropower project was in existence on March 16, 2005 and required but did not have a license or water quality certificate other than a general permit for the Class C water.

This criterion for the water body applies to licenses and water quality certificates issued on or after March 16, 2004.

(2) In Class C waters not governed by subparagraph (1), dissolved oxygen may not be less than 6.5 parts per million as a 30-day average based upon a temperature of 24 degrees centigrade or the ambient temperature of the water body, whichever is less. This criterion for the water body applies to licenses and water quality certificates issued on or after March 16, 2004.

The department may negotiate and enter into agreements with licensees and water quality certificate holders in order to provide further protection for the growth of indigenous fish. Agreements entered into under this paragraph are enforceable as department orders according to the provisions of sections 347-A to 349.

Between May 15th and September 30th, the number of Escherichia coli bacteria of human and domestic animal origin in Class C waters may not exceed a geometric mean of 126 per 100 milliliters or an instantaneous level of 236 per 100 milliliters. In determining human and domestic animal origin, the department shall assess licensed and unlicensed sources using available diagnostic procedures. The board shall adopt rules governing the procedure for designation of spawning areas. Those rules must include provision for periodic review of designated spawning areas and consultation with affected persons prior to designation of a stretch of water as a spawning area.

C. Discharges to Class C waters may cause some changes to aquatic life, except that the receiving waters must be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community. This paragraph does not apply to aquatic pesticide or chemical discharges approved by the department and conducted by the department, the Department of Inland Fisheries and Wildlife or an agent of either agency for the purpose of restoring biological communities affected by an invasive species.

## 2020 FISH AND EEL PASSAGE FACILITY OPERATING REPORT

## AND

# 2021 PROPOSED OPERATING PLAN

# BENTON FALLS HYDROELECTRIC PROJECT FERC NO. 5073-ME



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## 1. Introduction

Benton Falls Associates (Benton Falls or Licensee) is the licensee for the Benton Falls Hydro Project, FERC No. 5073-ME (Project), located in the town of Benton, Maine. Benton Falls submits this *2020 Fish And Eel Passage Facility Operating Report and 2021 Proposed Operating Plan* (the Report) in accordance with the terms of its FERC license, the water quality certification for the Project, and the terms of the 1998 Agreement Between Members of the Kennebec Hydro Developers Group, the Kennebec Coalition, the National Marine Fisheries Services, the State of Maine, and the US Fish and Wildlife Service (the KHDG Agreement).

All operating plans and schedules in this Report are subject to alternations based on consultation with U.S Fish and Wildlife Service (USFWS), NOAA - National Marine Fisheries Service (NMFS), Maine Department of Environmental Protection (MDEP), Maine Department of Marine Resources (MDMR) and the Maine Department of Inland Fisheries and Wildlife (MDIFW) during the year.

## 2. <u>Project Fish Passage Structures</u>

#### 2.1 Upstream and Downstream Anadromous Fish Passage Facilities

Licensee's upstream fish passage facilities consist of a fish lift designed to pass American Shad, Alewife and Atlantic salmon. Construction of the permanent fish lift facility at the Project commenced in July 2005 and the facility became operational May 1, 2006.

The fish lift contains a 600-gallon hopper that operates on a minimum cycle time of approximately seven minutes. The fish passage system is designed to pass an annual population of:

- 50,408 American Shad
- 767,267 Alewives
- 260 Salmon

The fish passage system consists of an automatically adjusted entrance gate, a horizontally moving crowder system, a separation screen, a single hopper, an adjustable exit flume trip gate system, an elevated exit flume to the impoundment equipped with a viewing window,

fish counter and blockage screens, a downstream migrant bypass pipe to the tailrace, attraction flow piping, and a video monitoring system.

A total attraction flow of up to 60 cubic feet per second (cfs) can be provided at the entrance gate with 30 cfs through the exit flume and 30 cfs through gravity flow piping from the impoundment. The fish lift has an operational passage range up to 4,500 cfs. A dedicated automated programmable logic controller (PLC) normally controls the fish lift. The PLC is located in the Project's powerhouse building, but also can be operated remotely.

The downstream fish passage facility is designed to pass all species and consists of a surface bypass system (two 3-foot wide intakes leading to transition chamber and then a 24 inch bypass pipe with a total capacity of 30 cfs that discharges to the project tailrace of the project's smaller turbine).

#### 2.2 Upstream and Downstream Eel Passage Facilities

Upstream eel passage consists of a ramp located at the eastern side of the concrete spillway at the dam. The ramp includes an entrance chute 14- inches wide by 62-inches long, a 36-inch by 48-inch wide turn rest pool, a 14-inch wide by 36.5 foot long main ramp, a 14 inch by approximately 12 foot exit ramp and a water pump with associated piping. The ramp entrance is located at the eastern spillway toe at around elevation 63.0' with the entrance facing north (upstream). The main ramp and exit ramp portions are constructed using standard aluminum electrical cable tray sections. All portions of the ramp have enkamat substrate. Attraction and transport water is supplied from an approximately 15 gallon per minute pump discharging through a spray bar located at the extreme upstream end of the ramp. Eels exiting the ramp either can drop directly into the head pond or into a MDMR installed floating trap box.

Downstream eel passage is available through the downstream fish passage, over the spillway or through any of the project's gates. A hinged overlay is installed over the intake for Unit #1 by September 1 and is raised for storage on December 1. The overlay is made of grating bars with one inch clear spacing. Unit #2 has permanent trash racks

with one inch clear spacing.

## 3. Operational Procedures – Fish Lift

### 3.1 Fish Lift Schedule

#### Schedule

The Licensee operates the fish lift according to the following schedule:

#### <u>Start up</u>

 April 15 to April 30 - Conduct a visual inspection of all fish lift mechanical, electrical and structural components for signs of winter damage and repair as necessary. Energize and operate all fish lift mechanical and electrical systems. Repair and calibrate, as necessary. The final timing of the trial operation of the system will be dependent upon the presence of ice within the flume and collection chamber.

The general lift operation follows the schedule below:

#### Seasonal Operations

- May 1 to June 1 Fish lifts made as often as necessary to provide upstream passage of alewife without undue delay. This may require additional operational changes that increase the fish lift cycle to sufficiently move a large number of alewife herring (over 2 million), such as suspending the use of the V-trap crowder and separation gate operations.
- June 1 to July 1 Fish lifts made hourly and operated according to specifications (full attraction flow and operation of the V-trap crowder).
- July 1 until Water Temperature Exceeds 24 degrees Celsius Fish lifts made hourly and operated according to specifications. Fewer lifts or operational changes may be required based on the results of camera and observation monitoring at the fishway entrance.
- Water Temperature Exceeds 24 degrees Celsius Fish lift operations are discontinued.
- Water Temperature below 24 degrees Celsius (late summer or early fall) to November 1 – Fish lifts made hourly or operated according to on-site observations and specifications. Fewer lifts or operational changes may be considered based on the results of camera monitoring at the fishway entrance.

#### Winter Shutdown

- De-energize all mechanical and electrical systems and tag out for winter.
- Shut off the attraction flow valve and tag out for winter.
- Lower the entrance gate to full down position and tag out for winter.
- Dewater the exit flume by closing the gate. Open the drain valves to pass leakage if conditions warrant, and open the flume attraction flow shutoff valve.
- Place the hopper in the storage position and secure.
- Install Styrofoam or similar product in collection chamber to prevent ice damage.
- Notify the resource agencies of any problems encountered during the annual startup of the fish lift facility that would potentially cause a delay in commencement of operations the following year.

#### 3.2 2020 Fish Passage Counts

The fish lift was put into operation on May 7, 2020. Lifts were discontinued on June 30. The fish counts recorded are supported by visual and video observations. The fish lift was not operated on May 9 and 10 due to snow and rain. In addition it was taken offline on May 29 and half the day on May 30 for maintenance.

The electronic counters were removed on several occasions after estimates of bucket density were determined for the day. This process was required to reduce overcrowding in the flume and to move the herring through the system as rapidly as possible.

#### River Herring Passage Results

The fish lift passed approximately 2,847,171 river herring, primarily alewives. Figure 1 shows the daily river herring count during the 2020 upstream run.



The peak daily count occurred on May 25 when approximately 253,500 river herring were passed upstream.

## Salmon, American Shad and Non-Target Species Passage Results

From May 25 until July 16, 10 American Shad passed upstream. No Atlantic Salmon passed upstream. A summary of all species observed in the fish lift is shown below.

Table 1 2020 Upstream Fish Species Count

| Fish Species                                | Count     |
|---|-----------|
| River Herring - (Alewife & Blueback)        | 2,847,171 |
| White Sucker                                | 374       |
| Smallmouth Bass                             | 255       |
| Pumpkinseed Sunfish                         | 129       |
| White Perch                                 | 86        |
| Striped Bass                                | 22        |
| American Eel (via Fishway Upstream passage) | 21        |
| Redbreast Sunfish                           | 14        |
| Sea Lamprey                                 | 12        |
| Large Mouth Bass                            | 12        |
| American Shad                               | 10        |

#### 3.3 2021 Proposed Operating Schedule

No changes are planned to the operation schedule referenced in Section 3.1 for 2021.

#### 3.4 Downstream Effectiveness Testing

Benton Falls is required to conduct effectiveness studies of downstream passage facilities at the project for Alewives, Atlantic salmon (Salmon) and American Shad.

#### <u>Alewife</u>

A successful alewife effectiveness test was conducted as part of the fish facility commissioning. The alewife effectiveness is demonstrated by the dramatic increase in alewife population that has been passed upstream by the Benton Falls facility in recent years.

#### Atlantic salmon

To date there has been no attempt to conduct efficiency tests for Atlantic salmon given the lack of a large enough population to test. Four Atlantic salmon were passed in 2009 and one in 2013. In all the other years, including 2020, no Atlantic salmon were passed upstream by the fish lift.

Based on the possibility of Atlantic salmon passing upstream at the project in the future, Benton staff met with representatives from NOAA National Marine Fisheries Service (NMFS) in June of 2017 to discuss and outline the process for Benton to obtain a take permit for Atlantic salmon under Section 7 of the Endangered Species Act (ESA). NMFS advised that given the extremely low population of Atlantic salmon present at the dam, they will not be recommending salmon passage efficiency testing as part of the Section 7 process. Instead, they requested that Benton prepare a desktop survival estimate of salmon entrainment through the project. In December 2017, Benton prepared a draft Biological Assessment (BA) and Species Protection Plan (SPP) that contained the requested survival estimates and submitted these to NMFS for review. NMFS provided feedback on both documents in 2018 and in June of 2019. This feedback led to changes to the draft documents. Upon agreement between Benton staff and NMFS on the final versions of the BA and SPP, they will be filed with FERC.

#### American Shad

In 2016, Benton, MDMR, NMFS and USFWS agreed to suspend testing of Shad downstream passage effectiveness testing with the condition that Benton consults with each agency annually to determine if Shad passage effectiveness testing should be restarted. Due to the drop off from 114 Shad passed upstream in 2019 to 10 in 2020, Benton recommends delaying Shad downstream passage effectiveness testing in 2021.

#### Table 2 Number of Shad Passed by Year

| Year | Number of Shad Passed |
|------|-----------------------|
| 2015 | 47                    |
| 2016 | 19                    |
| 2017 | 64                    |
| 2018 | 38                    |
| 2019 | 114                   |
| 2020 | 10                    |

## 4. Operational Procedures – Upstream Eel Passage

### 4.1 Upstream Eel Passage Schedule

#### Annual Schedule

The Licensee operates the upstream eel ramp passage according to the following annual schedule:

### May 1 to May 31: Start up

- Conduct a visual inspection of ramp structure and components for signs of winter damage. Repair as necessary.
- Install the lower entrance ramp and pumping system.
- Operate all ramp mechanical and electrical systems. Repair and calibrate, as necessary.

## June 1 to September 15: Daily operation

- Check the ramp on a regular basis and correct deficiencies as necessary.
- Contact MDMR staff if any problems may cause an interruption in daily operations. Record interruptions to operations for future reference.

MDMR annually installs a floating trap box in the head pond at the top of the ramp to record upstream migrants. MDMR tends the floating trap box as needed depending on volume collected during the migration season. The trap is capable of holding several thousand eels in good health for several days. Once counted and measured, the eels are released into the Benton Falls head pond.

## 4.2 2020 Upstream Eel Passage Counts

The ramp was monitored on a regular basis from July 2 through September 17. Trapped eels were counted twelve times through the period. Results of the counts are shown in the table below along with historical figures from 2001 through 2020.

### Table 3: 2020 Upstream Eel Passage Results

| Date      | Count |
|-----------|-------|
| 7/2/2020  | 4     |
| 7/10/2020 | 185   |
| 7/17/2020 | 574   |
| 7/28/2020 | 224   |
| 7/31/2020 | 47    |
| 8/6/2020  | 85    |
| 8/12/2020 | 64    |
| 8/19/2020 | 73    |
| 8/27/2020 | 0     |
| 9/3/2020  | 9     |
| 9/11/2020 | 20    |
| 9/14/2020 | 19    |
| Total     | 1,304 |

## Table 4 Approximate Number of Upstream Migrating Eels Passed

| Year | Startup Date | Shutdown<br>Date | Eels Passed |
|------|--------------|------------------|-------------|
| 2001 | 6/6          | 8/24             | 229,536     |
| 2002 | 6/18         | 9/13             | 22,437      |
| 2003 | 6/26         | 9/2              | 6,421       |
| 2004 | 7/15         | 8/12             | 2,409       |
| 2005 | 7/13         | 8/29             | 469         |
| 2006 | 6/30         | 8/30             | 522         |
| 2007 | 7/13         | 8/31             | 546         |
| 2008 | 6/11         | 9/8              | 18,395      |
| 2009 | 7/21         | 9/30             | 12,288      |
| 2010 | 5/31         | 10/10            | 11,828      |
| 2011 | 5/10         | 8/26             | 34,980      |
| 2012 | 6/14         | 8/25             | 206,040     |
| 2013 | 6/4          | 7/11             | 97,481      |
| 2014 | 6/19         | 9/9              | 33,554      |
| 2015 | 7/21         | 9/23             | 13,263      |
| 2016 | 6/24         | 10/5             | 5,271       |
| 2017 | 7/7          | 8/30             | 7,282       |
| 2018 | 6/14         | 10/7             | 758         |
| 2019 | 6/24         | 9/11             | 3,037       |
| 2020 | 7/2          | 9/17             | 1,304       |

## 4.3 2021 Upstream Eel Modifications

MDMR has reported that a portion of the ledge along the base of the spillway has been altered, which makes it difficult for eels to climb from the tailrace to the eastern part of the spillway where the upstream eel passage is located. Benton Falls will consult with MDMR and USFWS to improve the passage route along the ledge.

#### 4.4 2021 Proposed Operating Schedule

No changes are planned to the operation schedule referenced in Section 4.1 for 2021.

#### 5. <u>Operational Procedures – Downstream Eel Passage</u>

#### 5.1 Downstream Eel Passage Schedule

#### Annual Schedule

The Licensee operates the downstream eel screen on an annual basis according to the following schedule:

#### August 15 to August 31: Start up

- Conduct a visual inspection of the Unit #1 eel screen and components for signs of damage. Repair as necessary.
- Operate all eel screen mechanical and electrical systems to ensure the Unit #1 screen can be lowered into place. Repair and calibrate, as necessary.
- Lower the screen to ensure proper operation.

#### September 1 to November 30: Daily operation

- Maintain the Unit #1 eel screen in its lowered position. If the Unit #1 eel screen is raised, limit operation of Unit #1 to daytime hours.
- Operate the trash rake as trash conditions dictate to ensure regular removal of trash from the trash racks and to determine if any eels have been entrained on either of the eel screens.
- If eel entrainment is detected, reduce Unit #1 and Unit # 2 output during nighttime operation and contact MDMR staff to report eel entrainment.
- Record eel entrainment and modification of operations.

#### November 30: Shutdown

- Raise the Unit #1 eel screen into the winter storage position.
- Perform any required maintenance and equipment repair. Licensee will notify MDMR staff of any problems encountered during the annual installation of the eel screen that would potentially cause a delay in commencement of operations.

## 5.2 2020 Downstream Eel Passage Results

Unit #2 was offline for maintenance the entire downstream season. The racks were raked on a regular basis during the eel migration season. No impinged eels were discovered on the racks during this period.

## 5.3 Future Downstream Eel Passage Modifications

No modifications are planned for the downstream overlay screens on Unit #1 or Unit #2.

## 5.4 2021 Proposed Operating Schedule

No changes are planned to the operation schedule referenced in Section 5.1 for 2021.

For the 2021 downstream passage season, Benton Falls will collaborate with MDMR to monitor the movement of eel downstream from September 1 through October 31.

A DIDSON Sonar will be installed above the downstream surface passage.

The DIDSON will be operated nightly to 1) record eel movement though the surface passage and 2) to identify if eels are passing through or becoming impinged on the trash racks.

Following the downstream passage season, the video recordings will be reviewed by Benton and MDMR staff to determine if further downstream eel passage effectiveness testing is warranted.

#### 6. Agency Consultation

During the creation of this Report, Benton Falls consulted with the following agencies for feedback on 2020 results and the 2021 operations plan.

- U.S Fish and Wildlife Service (USFWS) Corbin Hilling
- NOAA National Marine Fisheries Service (NMFS) Christopher Boelke
- Maine Department of Environmental Protection (MDEP) Kathy Howatt
- Maine Department of Marine Resources (MDMR) Gail Witherspoon
- Maine Department of Inland Fisheries & Wildlife (MDIFW) Mike Brown

#### Correspondence

USFWS replied with questions that resulted in edits to the draft to correct typographical errors, additional information being provided about upstream eel modifications in 2021, clarification of upstream eel counting data and background information on the history of the project being shared with USFWS. No other comments were received.

USFWS, NMFS, MDMR, MDIFW and MDEP supported not performing downstream shad passage effectiveness passage testing in 2021.

Copies of email correspondence with each agency is attached in the following pages.

#### **Andrew Locke**

| From:    | Hilling, Corbin D <corbin_hilling@fws.gov> on behalf of Hilling, Corbin D</corbin_hilling@fws.gov> |
|----------|--|
| Sent:    | Wednesday, April 14, 2021 3:08 PM  |
| То:      | Andrew Locke   |
| Cc:      | Andrew Locke; Robert Thornton; Andrew Hughes; Wippelhauser, Gail; Howatt, Kathy;                   |
|          | Nate Gray; Brown, Michael; christopher.boelke  |
| Subject: | RE: [EXTERNAL] Benton Falls Draft 2020 Fish and Eel Passage Facility Report and 2021               |
|          | Proposed Operating Plan  |

Thank you, Andrew.

The U.S. Fish and Wildlife Service supports not performing downstream American shad passage effectiveness testing at the Benton Falls Project in 2021.

Have a nice afternoon,

#### Corbin D. Hilling, PhD

Fish and Wildlife Biologist U.S. Fish and Wildlife Service, Maine Field Office 306 Hatchery Road, East Orland, ME 04431 Cell: 207-401-0995 fws.gov/mainefieldoffice/

From: Andrew Locke <alocke@essexhydro.com>
Sent: Wednesday, April 14, 2021 1:20 PM
To: Hilling, Corbin D <corbin\_hilling@fws.gov>
Cc: Andrew Locke <al@essexhydro.com>; Robert Thornton <rthornton@essexhydro.com>; Andrew Hughes
<ahughes@essexhydro.com>; Wippelhauser, Gail <gail.wippelhauser@maine.gov>; Howatt, Kathy
<Kathy.Howatt@maine.gov>; Nate Gray <Nate.Gray@maine.gov>; Brown, Michael <michael.brown@maine.gov>; christopher.boelke <christopher.boelke@noaa.gov>
Subject: RE: [EXTERNAL] Benton Falls -- Draft 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan

Corbin – following our conversation this morning, please find our responses to your March 29 comments below in red text.

In addition, could you please confirm that USFW supports <u>not</u> performing upstream shad passage effectiveness testing in 2021.

Thank you,

Andrew

From: Hilling, Corbin D <<u>corbin\_hilling@fws.gov</u>>

Sent: Monday, March 29, 2021 4:15 PM

**To:** Andrew Locke <<u>alocke@essexhydro.com</u>>; Wippelhauser, Gail <<u>gail.wippelhauser@maine.gov</u>>; Howatt, Kathy <<u>Kathy.Howatt@maine.gov</u>>; Nate Gray <<u>Nate.Gray@maine.gov</u>>; Brown, Michael <<u>michael.brown@maine.gov</u>>; christopher.boelke <<u>christopher.boelke@noaa.gov</u>>

**Cc:** Andrew Locke <<u>al@essexhydro.com</u>>; Robert Thornton <<u>rthornton@essexhydro.com</u>>; Andrew Hughes

#### <ahughes@essexhydro.com>

**Subject:** RE: [EXTERNAL] Benton Falls -- Draft 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan

#### Andrew,

This is the United States Fish and Wildlife Service's (Service) response to the submission of the Benton Falls 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan which was emailed to the resource agencies on March 15, 2021. Our comments on the document are presented below. Benton Falls Associates (Licensee) also requested consultation to determine if it is appropriate to restart downstream American shad effectiveness testing given that 10 American shad passed upstream in 2020. The Service does not oppose delaying the downstream American shad passage effectiveness testing in 2021.

Have a nice afternoon,

**Corbin D. Hilling, PhD** Fish and Wildlife Biologist U.S. Fish and Wildlife Service, Maine Field Office 306 Hatchery Road, East Orland, ME 04431 Cell: 207-401-0995 <u>fws.gov/mainefieldoffice/</u>

#### Service Comments on the Benton Falls 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan

#### Section 3.2 Fish Passage Counts

The Licensee notes some instances in which the fish lift was not operated, but does not provide details on the amount of time the lift was non-operational. Please provide how long the lift was not operational in the noted cases.

# In the cases noted in the report, May 9, 10 and 29 the lift was offline the entire day. The lift was not operational on May 30 from sunrise to noon sunrise to noon.

The Licensee also notes that oxygen levels were monitored during the peak of the passage season, but does not provide data on dissolved oxygen concentrations. Please provide the range of dissolved oxygen levels observed during monitoring.

This statement was incorrect. Monitoring of oxygen levels in the flume was not done in 2020. That sentence will be removed from the final report. If the operator believes the passage flume is too crowded, he or she will temporarily slow the frequency of the lifts, reduce the attraction flow and adjust the entry gate and/or exit gate to reduce the number of fish in the flume.

#### **River Herring Passage Results**

The Licensee provides estimates of river herring passage, noting passed river herring are primarily alewives. Please provide an estimate of the proportion that were blueback herring if data exist.

#### Blueback herring estimates were not recorded.

#### Section 3.4 Downstream Effectiveness Testing (Alewife)

The Licensee notes that a successful alewife effectiveness test was conducted as part of the fish facility commissioning. Please provide a brief summary of the key results of that study and applicable reference information to help readers find the study report (or provide as an appendix).

Downstream alewife passage was certified as part of the KHDG agreement in the late 1990s. The project had different owners at the time and we do not have any records documenting the tests. We have reached out to MDMR to see if they have any of the requested information in their files.

#### The following was included in the 1996 KHDG report submitted to FERC

<u>https://elibrary.ferc.gov/eLibrary/docinfo?document\_id=186329</u> (on page 52 of 86 in the PDF file) During the 1990-1993 seasons, KHDG conducted downstream passage studies at Benton Falls using VHS cameras to count fish passing through the facilities. The successful study work in 1990 led to the continuation of the study in 1991 and 1992. In 1993 and 1994, Benton Falls Associates continued the study work to collect additional data on downstream fish passage efficiency. VHS cameras were placed over the weir intakes located over both turbines and the camera at the large turbine weir intake recorded fish passage throughout the season. The large turbine weir intake is open throughout the migration period and the small turbine weir intake is typically closed.

#### Section 3.4 Downstream Effectiveness Testing (Atlantic salmon)

In this section of the report the Licensee states "Instead, they requested that Benton prepare a desktop survival estimate of salmon entrainment through the project." Please briefly outline the results of the desktop study and provide applicable reference information (or provide as an appendix).

The report found a high probability of Atlantic salmon passage survival through all routes (i.e. turbines, fishway, and spill gates) based on the configuration of the Kaplan turbine unit. Whole station survival at the project was predicted to range from 90.3 to 96.5 percent, depending on operations and river flow conditions. A copy of the report in included with this email.

#### Section 3.4 Downstream Effectiveness Testing (American shad)

-In this section of the report, the Licensee states *"As in past years, the specific trigger for testing should be tied to more than at least 100 Shad passing in 2021."* This suggests that testing should have been conducted in 2019. If testing was conducted in 2019, please provide details on those results. If not, please explain why testing was not triggered.

No testing was performed in 2019. The draft report was worded incorrectly and should not have stated "As in past years". In 2019 we recommend that testing should begin if more than 100 Shad passed in 2020 (which would have meant two successive year of 100+ Shad passing upstream). Because of the precipitous drop in 2020, we recommend that testing not be performed in 2021. The language in the report will be correct to read as follows:

"In 2016, Benton, MDMR, NMFS and USFW agreed to suspend testing of Shad downstream passage effectiveness testing with the condition that Benton consults with each agency annually to determine if Shad passage effectiveness testing should be restarted. Due to the drop off from 114 Shad passed upstream in 2019 to 10 in 2020, Benton recommends delaying Shad downstream passage effectiveness testing in 2021."

-There is a typographical error in the list of agency names as the U.S. Fish and Wildlife Service is listed as "USFW"

This error has been corrected to read USFWS in the final report.

#### Section 4.3 2020 Upstream Eel Passage Counts

-In this section of the report, the Licensee states "*The ramp was monitored on a regular basis from July 2 through September 17.*" Please provide additional details on how monitoring dates were selected (i.e., weekly, semi-weekly, etc.).

Monitoring was done at the direction of MDMR. Benton operators would check the trap at the top of the ramp approximately once a week and more frequently during high flows. At MDMR's direction eels would be counted, weighed, and released upstream.

-Table 3 – Please provide additional details for what each count represents temporally in the caption or as an additional column in the table. For example, are these values the number of eels collected in 24 hours of trap time or is trapping effort variable? This will help resource agencies understand comparability of monitoring results by clarifying trap effort across dates.

#### All counts represent the number of eels trapped since the prior date.

-Table 4 - It would be helpful to assess differences through time by understanding how many days the trap was in place, how many monitoring events there were, and the duration of trapping events. Please clarify the trapping effort applied through time in the table or caption. Also, it is unclear from the caption how "passed" and "sampled" eels differ. Please clarify this difference in the caption.

Historically the report has only included the total number of eels passed as reported by MDMR. Dates and counts were first added to the report in 2019. To eliminate confusion, the "sampled" label will be removed and we will continue, as has been done historically, to describe the amounts in Table 4 as "passed".

For further clarity, we have also updated the language in section 4.3 to read as follows:

"The ramp was monitored on a regular basis from July 2 through September 17. Trapped eels were counted twelve times through the period. Results of the counts are shown in the table below along with historical figures from 2001 through 2020."

Finally, we have added the following new paragraph that describes planned repairs to the ledge at the base of the upstream eel passage.

#### 4.3 2021 Upstream Eel Modifications

MDMR has reported that a portion of the ledge along the base of the spillway has been altered, which makes it difficult for eels to climb from the tailrace to the eastern part of the spillway where the upstream eel passage is located.

Benton Falls will consult with MDMR and USFWS to improve the passage route along the ledge.

#### Section 5.2 2020 Downstream Eel Passage Results

-It appears "entrained" should be "impinged" based on the context of the sentence No entrained eels were discovered on the racks during this period.

This error has been corrected and the final report reads "No impinged eels were discovered on the racks during this period."

From: Andrew Locke <alocke@essexhydro.com>

Sent: Monday, March 15, 2021 3:00 PM

To: Wippelhauser, Gail <gail.wippelhauser@maine.gov>; Howatt, Kathy <Kathy.Howatt@maine.gov>; Nate Gray <Nate.Gray@maine.gov>; Brown, Michael <michael.brown@maine.gov>; Hilling, Corbin D <corbin hilling@fws.gov>; christopher.boelke <christopher.boelke@noaa.gov>

Cc: Andrew Locke <<u>al@essexhydro.com</u>>; Robert Thornton <<u>rthornton@essexhydro.com</u>>; Andrew Hughes <<u>ahughes@essexhydro.com</u>> Subject: [EXTERNAL] Benton Falls -- Draft 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Dear Benton Falls Stakeholder,

Please find attached a draft copy of the Benton Falls 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan. Prior to submitting a final report to FERC, we would appreciate any comments you have regarding the report.

As a reminder, Benton requests consultation during the annual Benton Fish Report review period to determine if it is appropriate to restart downstream American shad effectiveness testing. 2020 saw only 10 Shad pass upstream. Based on this low number, we feel it is premature to restart downstream effectiveness testing. We would welcome any feedback or differing opinion in order to best determine our next steps surrounding this question. Please notify us if you agree or disagree with this recommendation. We are also happy to set up a call to discuss the issue in more detail.

In addition you'll also see in the report (Section 5.4) that we are planning to install a DIDSON sonar in collaboration with MDMR to examine downstream eel passage more closely. If you have any questions or comments about this plan please let us know.

If you do have comments or questions please let me know no later than March 31, 2020, so they can be included in the final version of the report.

Thank you,

#### **Andrew Locke**

| From:    | Wippelhauser, Gail <gail.wippelhauser@maine.gov> on behalf of Wippelhauser, Gail</gail.wippelhauser@maine.gov> |
|----------|--|
| Sent:    | Wednesday, April 14, 2021 3:55 PM  |
| То:      | Andrew Locke   |
| Subject: | RE: Benton Falls Draft 2020 Fish and Eel Passage Facility Report and 2021 Proposed                             |
| -        | Operating Plan   |

I had no additional comments and agree that shad testing is not required in 2021.

Gail Wippelhauser, Ph. D. Marine Resources Scientist Maine Department of Marine Resources #21 State House Station Augusta, ME 04333

Cell: 207-904-7962 (teleworking during COVID) Phone: 207-624-6349 email: gail.wippelhauser@maine.gov

From: Andrew Locke <alocke@essexhydro.com>
Sent: Wednesday, April 14, 2021 3:00 PM
To: Wippelhauser, Gail <Gail.Wippelhauser@maine.gov>
Subject: RE: Benton Falls -- Draft 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan

# EXTERNAL: This email originated from outside of the State of Maine Mail System. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Gail – Following our phone call earlier this week I wanted to confirm that you had no additional comments to provide on our 2020 Fish report. In addition, do you concur with our opinion that downstream shad testing is NOT required in 2021?

Thank you,

Andrew

From: Andrew Locke <<u>alocke@essexhydro.com</u>>
Sent: Monday, March 15, 2021 3:00 PM
To: Wippelhauser, Gail <<u>gail.wippelhauser@maine.gov</u>>; Howatt, Kathy <<u>Kathy.Howatt@maine.gov</u>>; Nate Gray
<<u>Nate.Gray@maine.gov</u>>; Brown, Michael <<u>Michael.Brown@maine.gov</u>>; Corbin D. Hilling, PhD
<<u>corbin hilling@fws.gov</u>>; Christopher Boelke - NOAA Federal <<u>christopher.boelke@noaa.gov</u>>
Cc: Andrew Locke <<u>al@essexhydro.com</u>>; Robert Thornton <<u>rthornton@essexhydro.com</u>>; Andrew Hughes
<<u>ahughes@essexhydro.com</u>>

Subject: Benton Falls -- Draft 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan

Dear Benton Falls Stakeholder,

Please find attached a draft copy of the Benton Falls 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan. Prior to submitting a final report to FERC, we would appreciate any comments you have regarding the report.

As a reminder, Benton requests consultation during the annual Benton Fish Report review period to determine if it is appropriate to restart downstream American shad effectiveness testing. 2020 saw only 10 Shad pass upstream. Based on this low number, we feel it is premature to restart downstream effectiveness testing. We would welcome any feedback or differing opinion in order to best determine our next steps surrounding this question. Please notify us if you agree or disagree with this recommendation. We are also happy to set up a call to discuss the issue in more detail.

In addition you'll also see in the report (Section 5.4) that we are planning to install a DIDSON sonar in collaboration with MDMR to examine downstream eel passage more closely. If you have any questions or comments about this plan please let us know.

If you do have comments or questions please let me know no later than March 31, 2020, so they can be included in the final version of the report.

Thank you,

Andrew Locke

Benton Falls Associates c/o Essex Hydro Associates, L.L.C. 55 Union Street, 4th Floor Boston, MA 02108 Tel: (617) 367-0032

#### **Andrew Locke**

| From:    | Christopher Boelke - NOAA Federal <christopher.boelke@noaa.gov> on behalf of</christopher.boelke@noaa.gov> |
|----------|--|
|          | Christopher Boelke - NOAA Federal  |
| Sent:    | Thursday, April 15, 2021 12:56 PM  |
| То:      | Hilling, Corbin D  |
| Cc:      | Andrew Locke; Andrew Locke; Robert Thornton; Andrew Hughes; Wippelhauser, Gail;                            |
|          | Howatt, Kathy; Nate Gray; Brown, Michael   |
| Subject: | Re: [EXTERNAL] Benton Falls Draft 2020 Fish and Eel Passage Facility Report and 2021                       |
| -        | Proposed Operating Plan  |

Good Afternoon. NMFS concurs with FWS and supports not performing downstream effectiveness testing in 2021.

Thanks, Chris

On Wed, Apr 14, 2021 at 3:07 PM Hilling, Corbin D <<u>corbin hilling@fws.gov</u>> wrote:

Thank you, Andrew.

The U.S. Fish and Wildlife Service supports not performing downstream American shad passage effectiveness testing at the Benton Falls Project in 2021.

Have a nice afternoon,

Corbin D. Hilling, PhD

Fish and Wildlife Biologist

U.S. Fish and Wildlife Service, Maine Field Office

306 Hatchery Road, East Orland, ME 04431

Cell: 207-401-0995

fws.gov/mainefieldoffice/

From: Andrew Locke <<u>alocke@essexhydro.com</u>>
Sent: Wednesday, April 14, 2021 1:20 PM
To: Hilling, Corbin D <<u>corbin\_hilling@fws.gov</u>>
Cc: Andrew Locke <<u>al@essexhydro.com</u>>; Robert Thornton <<u>rthornton@essexhydro.com</u>>; Andrew Hughes

#### **Andrew Locke**

| From:    | Brown, Michael <michael.brown@maine.gov> on behalf of Brown, Michael</michael.brown@maine.gov> |
|----------|--|
| Sent:    | Wednesday, April 14, 2021 3:01 PM  |
| То:      | Andrew Locke   |
| Subject: | RE: Benton Falls Draft 2020 Fish and Eel Passage Facility Report and 2021 Proposed             |
|          | Operating Plan   |

Andrew,

I have no comments on the Eel Report and concur that downstream testing for American shad is not needed in 2021.

Thanks, Mike

From: Andrew Locke <alocke@essexhydro.com>
Sent: Wednesday, April 14, 2021 2:58 PM
To: Brown, Michael <Michael.Brown@maine.gov>
Subject: FW: Benton Falls -- Draft 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan

EXTERNAL: This email originated from outside of the State of Maine Mail System. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Mike - Good afternoon. I'm following up on the draft Benton 2020Fish report that I sent you on 3/15. Are there any comments you wish to provide? In addition, do you concur with our opinion that downstream shad testing is NOT required in 2021?

If you could please get back to me by this Thursday, I would greatly appreciate it as we wish to file the report with FERC this Friday.

Thank you,

Andrew

From: Andrew Locke <<u>alocke@essexhydro.com</u>>

Sent: Monday, March 15, 2021 3:00 PM

To: Wippelhauser, Gail <<u>gail.wippelhauser@maine.gov</u>>; Howatt, Kathy <<u>Kathy.Howatt@maine.gov</u>>; Nate Gray <<u>Nate.Gray@maine.gov</u>>; Brown, Michael <<u>Michael.Brown@maine.gov</u>>; Corbin D. Hilling, PhD <<u>corbin\_hilling@fws.gov</u>>; Christopher Boelke - NOAA Federal <<u>christopher.boelke@noaa.gov</u>> Cc: Andrew Locke <<u>al@essexhydro.com</u>>; Robert Thornton <<u>rthornton@essexhydro.com</u>>; Andrew Hughes <<u>ahughes@essexhydro.com</u>>

Subject: Benton Falls -- Draft 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan

Dear Benton Falls Stakeholder,

Please find attached a draft copy of the Benton Falls 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan. Prior to submitting a final report to FERC, we would appreciate any comments you have regarding the report.
As a reminder, Benton requests consultation during the annual Benton Fish Report review period to determine if it is appropriate to restart downstream American shad effectiveness testing. 2020 saw only 10 Shad pass upstream. Based on this low number, we feel it is premature to restart downstream effectiveness testing. We would welcome any feedback or differing opinion in order to best determine our next steps surrounding this question. Please notify us if you agree or disagree with this recommendation. We are also happy to set up a call to discuss the issue in more detail.

In addition you'll also see in the report (Section 5.4) that we are planning to install a DIDSON sonar in collaboration with MDMR to examine downstream eel passage more closely. If you have any questions or comments about this plan please let us know.

If you do have comments or questions please let me know no later than March 31, 2020, so they can be included in the final version of the report.

Thank you,

Andrew Locke

Benton Falls Associates c/o Essex Hydro Associates, L.L.C. 55 Union Street, 4th Floor Boston, MA 02108 Tel: (617) 367-0032

#### **Andrew Locke**

| From:    | Howatt, Kathy <kathy.howatt@maine.gov> on behalf of Howatt, Kathy</kathy.howatt@maine.gov> |
|----------|--|
| Sent:    | Thursday, April 15, 2021 10:33 AM  |
| То:      | 'Andrew Locke'   |
| Subject: | RE: Benton Falls Draft 2020 Fish and Eel Passage Facility Report and 2021 Proposed         |
|          | Operating Plan   |

Thank you. DEP has no comments to add and concurs with MDMR's assessment regarding the need for shad testing in 2021. Thank you for the opportunity to comment. Kathy

Kathy Davis Howatt Hydropower Coordinator, Bureau of Land Resources Maine Department of Environmental Protection Phone: 207-446-2642 www.maine.gov/dep

Correspondence to and from this office is considered a public record and may be subject to a request under the Maine Freedom of Access Act. Information that you wish to keep confidential should not be included in email correspondence.

From: Andrew Locke <alocke@essexhydro.com>
Sent: Wednesday, April 14, 2021 4:22 PM
To: Howatt, Kathy <Kathy.Howatt@maine.gov>
Subject: Fwd: Benton Falls -- Draft 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan

## EXTERNAL: This email originated from outside of the State of Maine Mail System. Do not click links or open attachments unless you recognize the sender and know the content is safe.

I just received this from Gail.

------ Forwarded message ------From: **Wippelhauser, Gail** <<u>Gail.Wippelhauser@maine.gov</u>> Date: Wed, Apr 14, 2021 at 3:55 PM Subject: RE: Benton Falls -- Draft 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan To: Andrew Locke <<u>alocke@essexhydro.com</u>>

I had no additional comments and agree that shad testing is not required in 2021.

Gail Wippelhauser, Ph. D. Marine Resources Scientist Maine Department of Marine Resources #21 State House Station Augusta, ME 04333

Cell: 207-904-7962 (teleworking during COVID)

email: gail.wippelhauser@maine.gov

From: Andrew Locke <a locke@essexhydro.com</li>
Sent: Wednesday, April 14, 2021 3:00 PM
To: Wippelhauser, Gail <<u>Gail.Wippelhauser@maine.gov</u>
Subject: RE: Benton Falls -- Draft 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan

EXTERNAL: This email originated from outside of the State of Maine Mail System. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Gail – Following our phone call earlier this week I wanted to confirm that you had no additional comments to provide on our 2020 Fish report. In addition, do you concur with our opinion that downstream shad testing is NOT required in 2021?

Thank you,

Andrew

From: Andrew Locke <<u>alocke@essexhydro.com</u>> Sent: Monday, March 15, 2021 3:00 PM To: Wippelhauser, Gail <<u>gail.wippelhauser@maine.gov</u>>; Howatt, Kathy <<u>Kathy.Howatt@maine.gov</u>>; Nate Gray <<u>Nate.Gray@maine.gov</u>>; Brown, Michael <<u>Michael.Brown@maine.gov</u>>; Corbin D. Hilling, PhD <<u>corbin\_hilling@fws.gov</u>>; Christopher Boelke - NOAA Federal <<u>christopher.boelke@noaa.gov</u>> Cc: Andrew Locke <<u>al@essexhydro.com</u>>; Robert Thornton <<u>rthornton@essexhydro.com</u>>; Andrew Hughes <<u>ahughes@essexhydro.com</u>>

Subject: Benton Falls -- Draft 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan

Dear Benton Falls Stakeholder,

Please find attached a draft copy of the Benton Falls 2020 Fish and Eel Passage Facility Report and 2021 Proposed Operating Plan. Prior to submitting a final report to FERC, we would appreciate any comments you have regarding the report.

As a reminder, Benton requests consultation during the annual Benton Fish Report review period to determine if it is appropriate to restart downstream American shad effectiveness testing. 2020 saw only 10 Shad pass upstream. Based on this low number, we feel it is premature to restart downstream effectiveness

testing. We would welcome any feedback or differing opinion in order to best determine our next steps surrounding this question. Please notify us if you agree or disagree with this recommendation. We are also happy to set up a call to discuss the issue in more detail.

In addition you'll also see in the report (Section 5.4) that we are planning to install a DIDSON sonar in collaboration with MDMR to examine downstream eel passage more closely. If you have any questions or comments about this plan please let us know.

If you do have comments or questions please let me know no later than March 31, 2020, so they can be included in the final version of the report.

Thank you,

Andrew Locke

Benton Falls Associates c/o Essex Hydro Associates, L.L.C. 55 Union Street, 4th Floor Boston, MA 02108 Tel: (617) 367-0032

### IPaC

#### U.S. Fish & Wildlife Service

# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

### Location

#### Kennebec County, Maine



### Local office

Maine Ecological Services Field Office

**\$** (207) 469-7300

(207) 902-1588

MAILING ADDRESS P. O. Box A East Orland, ME 04431

PHYSICAL ADDRESS 306 Hatchery Road East Orland, ME 04431

http://www.fws.gov/mainefieldoffice/index.html

NOTFORCONSULTATION

# Endangered species

# This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

- 1. Draw the project location and click CONTINUE.
- 2. Click DEFINE PROJECT.
- 3. Log in (if directed to do so).
- 4. Provide a name and description for your project.
- 5. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the <u>Ecological Services Program</u> of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact <u>NOAA Fisheries</u> for <u>species under their jurisdiction</u>.

- Species listed under the <u>Endangered Species Act</u> are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the <u>listing status</u> <u>page</u> for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
- 2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an

office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

## Mammals

| NAME   | STATUS     |
|--|------------|
| Northern Long-eared Bat Myotis septentrionalis<br>Wherever found<br>No critical habitat has been designated for this species.<br><u>https://ecos.fws.gov/ecp/species/9045</u>              | Threatened |
| Fishes<br>NAME   | STATUS     |
| Atlantic Salmon Salmo salar<br>There is final critical habitat for this species. The location of<br>the critical habitat is not available.<br><u>https://ecos.fws.gov/ecp/species/2097</u> | Endangered |

## Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

U

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

# Migratory birds

Certain birds are protected under the Migratory Bird Treaty  $Act^{1}$  and the Bald and Golden Eagle Protection  $Act^{2}$ .

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described <u>below</u>.

<sup>1.</sup> The <u>Migratory Birds Treaty Act</u> of 1918.

<sup>2.</sup> The <u>Bald and Golden Eagle Protection Act</u> of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <u>http://www.fws.gov/birds/management/managed-species/</u> birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds <u>http://www.fws.gov/birds</u> /management/project-assessment-tools-and-guidance/ conservation-measures.php
- Nationwide conservation measures for birds <u>http://www.fws.gov/migratorybirds</u> /pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the <u>USFWS Birds of Conservation Concern</u> (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ <u>below</u>. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the <u>E-bird data mapping tool</u> (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found <u>below</u>.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Breeds Dec 1 to Aug 31

Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. <u>https://ecos.fws.gov/ecp/species/1626</u>

Black-billed Cuckoo Coccyzus erythropthalmus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <u>https://ecos.fws.gov/ecp/species/9399</u>

Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. Breeds May 15 to Oct 10

Breeds May 20 to Jul 31

Rusty BlackbirdEuphagus carolinusBreeds May 10 to Jul 20This is a Bird of Conservation Concern (BCC) throughout its<br/>range in the continental USA and Alaska.Breeds May 10 to Jul 20

Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. Breeds May 10 to Aug 31

## **Probability of Presence Summary**

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

#### Probability of Presence (

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events

in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

- 2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
- 3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

#### Breeding Season (=)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

#### Survey Effort ()

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

#### No Data (–)

A week is marked as having no data if there were no survey events for that week.

#### Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

|         |     |     | prol | oability | of prese | ence 📕 | breedir | ng seaso | n İsu | rvey effo | ort — r | o data |
|---------|-----|-----|------|----------|----------|--------|---------|----------|-------|-----------|---------|--------|
| SPECIES | JAN | FEB | MAR  | APR      | MAY      | JUN    | JUL     | AUG      | SEP   | OCT       | NOV     | DEC    |

| Bald Eagle<br>Non-BCC<br>Vulnerable<br>(This is not a<br>Bird of<br>Conservation<br>Concern (BCC)<br>in this area,<br>but warrants<br>attention<br>because of<br>the Eagle Act<br>or for |   |
|--|---|
| susceptibilitie  |   |
| areas from   | 1 and |
| certain types  |   |
| development  | 1   |
| or activities.)  |   |
| Black-billed<br>Cuckoo<br>BCC<br>Rangewide<br>(CON) (This is<br>a Bird of<br>Conservation<br>Concern (BCC)<br>throughout its<br>range in the   | RCONSUL   |
| continental<br>USA and<br>Alaska.)   | FOI   |
| Bobolink<br>BCC<br>Rangewide<br>(CON) (This is<br>a Bird of<br>Conservation<br>Concern (BCC)<br>throughout its<br>range in the<br>continental<br>USA and<br>Alaska.)                     | -+++- +++++ +++++ -+ <mark>+00 000000000000000</mark>   |

| Rusty   |            |
|---|------------|
| Blackbird   |            |
| BCC   |            |
| Rangewide   |            |
| (CON) (This is  |            |
| a Bird of   |            |
| Conservation  |            |
| Concern (BCC)   |            |
| throughout its  |            |
| range in the  |            |
| continental   |            |
| USA and   |            |
| Alaska.)  |            |
|   |            |
| Wood Thrush   |            |
| Wood Thrush<br>BCC  |            |
| Wood Thrush<br>BCC<br>Rangewide   |            |
| Wood Thrush<br>BCC<br>Rangewide<br>(CON) (This is   |            |
| Wood Thrush<br>BCC<br>Rangewide<br>(CON) (This is<br>a Bird of  |            |
| Wood Thrush<br>BCC<br>Rangewide<br>(CON) (This is<br>a Bird of<br>Conservation  | 101        |
| Wood Thrush<br>BCC<br>Rangewide<br>(CON) (This is<br>a Bird of<br>Conservation<br>Concern (BCC)   | 11         |
| Wood Thrush<br>BCC<br>Rangewide<br>(CON) (This is<br>a Bird of<br>Conservation<br>Concern (BCC)<br>throughout its   | TATION     |
| Wood Thrush<br>BCC<br>Rangewide<br>(CON) (This is<br>a Bird of<br>Conservation<br>Concern (BCC)<br>throughout its<br>range in the                                       | TATION     |
| Wood Thrush<br>BCC<br>Rangewide<br>(CON) (This is<br>a Bird of<br>Conservation<br>Concern (BCC)<br>throughout its<br>range in the<br>continental                        | TATION     |
| Wood Thrush<br>BCC<br>Rangewide<br>(CON) (This is<br>a Bird of<br>Conservation<br>Concern (BCC)<br>throughout its<br>range in the<br>continental<br>USA and             | III TATION |
| Wood Thrush<br>BCC<br>Rangewide<br>(CON) (This is<br>a Bird of<br>Conservation<br>Concern (BCC)<br>throughout its<br>range in the<br>continental<br>USA and<br>Alaska.) | SULTATION  |

## Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

#### What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS <u>Birds of Conservation Concern (BCC)</u> and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the <u>Avian Knowledge</u> <u>Network (AKN)</u>. The AKN data is based on a growing collection of <u>survey</u>, <u>banding</u>, <u>and citizen science</u> <u>datasets</u> and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (<u>Eagle Act</u> requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds

potentially present in your project area, please visit the <u>AKN Phenology Tool</u>.

## What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the <u>Avian Knowledge Network (AKN</u>). This data is derived from a growing collection of <u>survey</u>, <u>banding</u>, <u>and citizen science datasets</u>.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

#### How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: <u>The Cornell Lab of Ornithology All</u> <u>About Birds Bird Guide</u>, or (if you are unsuccessful in locating the bird of interest there), the <u>Cornell Lab</u> <u>of Ornithology Neotropical Birds guide</u>. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

#### What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

- 1. "BCC Rangewide" birds are <u>Birds of Conservation Concern</u> (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
- 2. "BCC BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
- 3. "Non-BCC Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the <u>Eagle Act</u> requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

#### Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the <u>Northeast Ocean</u> <u>Data Portal</u>. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files

underlying the portal maps through the <u>NOAA NCCOS Integrative Statistical Modeling and Predictive</u> <u>Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf</u> project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the <u>Diving Bird Study</u> and the <u>nanotag studies</u> or contact <u>Caleb Spiegel</u> or <u>Pam Loring</u>.

#### What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to <u>obtain a permit</u> to avoid violating the Eagle Act should such impacts occur.

#### Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

## Facilities

## National Wildlife Refuge lands

Any activity proposed on lands managed by the <u>National Wildlife Refuge</u> system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

## Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

# Wetlands in the National Wetlands Inventory

Impacts to <u>NWI wetlands</u> and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local <u>U.S. Army Corps</u> of <u>Engineers District</u>.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

| LAKE          |                   |
|---------------|-------------------|
| <u>L1UBHh</u> |                   |
| RIVERINE      | - 1               |
| R2UBH         | . 6               |
| R4SBC         | $\langle \rangle$ |
| <u>R5UBH</u>  | 1                 |
|               |                   |

A full description for each wetland code can be found at the <u>National Wetlands Inventory</u> <u>website</u>

#### **Data limitations**

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source

imagery used and any mapping problems.

NOTFOR

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

#### Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

#### Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.



JOHN ELIAS BALDACCI GOVERNOR MAINE HISTORIC PRESERVATION COMMISSION 55 CAPITOL STREET 65 STATE HOUSE STATION AUGUSTA, MAINE 04333

EARLE G. SHETTLEWORTH, JR. DIRECTOR

November 22, 2010

Mr. Stephen Hickey Benton Falls Associates c/o Essex Hydro Associates LLC 55 Union Street, 4<sup>th</sup> Floor Boston, MA 02108

Re: Benton Falls project (FERC 5073), archaeological sites

Dear Mr. Hickey:

In answer to your email of November 16<sup>th</sup>, Benton Falls Associates and its predecessors have discharged all responsibilities concerning archaeological sites around the Benton Falls impoundment stemming from the Benton Falls FERC license.

To be specific, in 1988 the only remaining archaeological issue was long-term monitoring of erosion at archaeological site 53.34. That obligation was discharged by a 20 year monitoring contract with the Maine Archaeological Society, Inc. The monitoring ended in 2008, without detecting significant erosional damage to the archaeological site.

Sincerely,

Dr. Arthur Spiess Senior Archaeologist

arthur.spiess@maine.gov

