KEI (USA) Power Management Inc.
423 Brunswick Avenue
Gardiner, ME 04345
Tel.: (207) 203-3025

February 15, 2022

VIA E-FILING

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

Additional Information Request Response
Lowell Tannery Hydroelectric Project (FERC No. 4202-025)

Dear Secretary Bose:

On September 28, 2021, KEI (Maine) Power Management (II) LLC (KEI Power) filed a license application for the relicensing of the Lowell Tannery Hydroelectric Project, Federal Energy Regulatory Commission (FERC) No. 4202 (Project). On November 17, 2021, FERC issued a Deficiency of License Application and Additional Information Request (AIR) pertaining to the license application. The FERC Deficiencies were associated with Section 16.8(f) Consultation requirements, Exhibits A, F, and G. FERC's AIR requests for additional information were associated with Coastal Zone Management Act (CSMA) consultation, Exhibit A, Exhibit E, Exhibit F, and Exhibit G.

FERC's Deficiencies Notice identified missing information related to the sizes, capacities, and construction materials of all Project facilities; including single-line diagrams and design drawings. Additionally, Section 16.8(f) consultation documentation was noted as deficient.

FERC's AIR included a request for CZMA consultation document, several questions surrounding environmental resources as discussed in Exhibit E, and clarifications regarding specifications of Project features.

Attached for the Commission's review, please find:

- Attachment A – Responses to Deficiency Notice
- Attachment B – Responses to Additional Information Request
- Attachment C – Consultation Documentation
- Attachment D – Single Line Diagram
- Attachment E – CZMA Consultation Documentation
- Attachment F – Revised Exhibit A
- Attachment G – Terrestrial and Wetlands Mapping and Monarch IPaC Data
- Appendix H – Revised Exhibit E – Geology and Soils

- Attachment I – Revised Exhibit F and Stability Analysis
- Attachment J – Revised Exhibit G

If there are any questions or comments related to this filing, please contact me at (207) 203-3027 or by email at Lewis.Loon@kruger.com.

Sincerely,

Lewis C. Loon, General Manager
Operations and Maintenance – USA/QC
Lewis.Loon@kruger.com
Telephone: (207) 203-3025

Attachments (see above list)

cc: Distribution List

ATTACHMENT A

RESPONSES TO DEFICIENCY NOTICE

On November 17, 2021, FERC commented on the Lowell Tannery License Application noting deficiencies in KEI Power's application for the Project. KEI Power has provided responses to specific deficiencies below.

Consultation

1. *Section 16.8(f) of the Commission's regulations requires the applicant to include documentation of all attempts to consult with resource agencies and Indian tribes, and any letters from resource agencies and Indian tribes containing comments, recommendations, and proposed terms and conditions. The license application references letters from the Maine State historic Preservation Office (SHPO) and the Penobscot Indian Nation that were filed on the Pre-Application Document but does not include these letters. Please file any letters from and documentation of consultation with the Maine SHPO, Tribal Historic Preservation Officers (THPO), and Indian tribes.*

KEI Power Response:

Letters from the Maine SHPO and Penobscot Indian Nation are included in Attachment C. The SHPO, Penobscot Indian Nation (PIN) and other tribes were included on distributions of the PAD, Draft and Final License Application, the Aroostook Band of Micmacs, the Houlton Band of Maliseet Indians, and the Passamaquoddy Tribe.

Exhibit A

2. *Exhibit A of the license application does not provide all the information required by section 4.61(c)(1)(viii) of FERC's regulations. Exhibit A of the application must be revised to include the sizes, capacities, and construction materials of all project features and facilities, including: (1) the dimensions (width and length) of the left and right abutments; (2) the number, type, and dimensions (width and height) of the intake gates; (3) the height of the dam's intake structure, tainter gate, and log sluice; (4) the dimensions (width, length, and depth) of the tailrace; (5) the number and specifications (capacity and length) of the generator leads[1]; (6) the depth of the plunge pool; (7) construction materials of the hand-carry boat access facility (e.g., dirt/grass, gravel, concrete); (8) the length and construction materials of the canoe portage route; and (9) the dimensions and construction materials of the parking lot that is used for recreation access and the number of cars the parking lot can accommodate.*

KEI Power Response:

(1) the dimensions (width and length) of the left and right abutments

- Based upon review of horizontal station measurements on Sheet F2 and scaling from the drawing and aerial imagery, the left abutment (looking from upstream to

[1] The October 31, 1983 license order includes 2.3-kilovolt generator leads as part of the project works. *See Pumpkin Hill Power Company*, 25 FERC ¶ 62,134 (1983) (1983 License Order).

downstream), adjacent retaining wall and right retaining walls have been dimensioned on a revised Sheet F2.

(2) *the number, type, and dimensions (width and height) of the intake gates*
- Each of the two intake gates is approximately 15.5 feet wide and 13.83 feet high. The gates are vertical slide gates.

(3) *the height of the dam's intake structure, tainter gate, and log sluice*
- The intake structure height is approximately 23.83 feet (top elevation of 190.0′ and bottom elevation of 167.83′ – see Section 2 – Sheet F5.
- The top elevation of the tainter gate is 189′ and the sill elevation is 170.0′ elevation for a height of 19 feet.
- The log sluice slide cate has a sill elevation of 178.5′, with the top spillway elevation of 184.0′ the log sluice slide gate opening is 14.5 feet high.

(4) *the dimensions (width, length, and depth) of the tailrace*
- The tailrace (powerhouse discharge proper) is approximately 26 feet, 8 inches wide (downstream width of powerhouse), 13.4 feet deep (NTW minus invert of powerhouse discharge – see Sheet F5) and extends downstream (length) approximately 60 feet.

(5) *the number and specifications (capacity and length) of the generator leads*[2]*;*
- The Project is equipped with a 1,000-kVA, 2.3/12.5-transformer and 2.3-kV transmission line/generator leads 125 feet long within the powerhouse and a 40 feet long buried section running from the powerhouse to the transformer, which is the point of interconnection with the local utility.

(6) *the depth of the plunge pool* – the plunge pool is approximately 13.4 feet deep (N.T.W. El. 169.5′ minus invert elevation of powerhouse discharge of 156.1′) – See Exhibit F Sheet 5 Section A.

(7) *construction materials of the hand-carry boat access facility (e.g., dirt/grass, gravel, concrete)*
- The hand-carry boat access consists of dirt and grass.

(8) *the length and construction materials of the canoe portage route*
- The canoe portage route is approximately 400 long, consisting of dirt and grass.

(9) *the dimensions and construction materials of the parking lot that is used for recreation access and the number of cars the parking lot can accommodate*.
- The parking area consists of grass and dirt, is approximately 30 feet by 60 feet and can accommodate 5-6 vehicles, depending on size.

3. Section 4.61(c)(8) of FERC's regulations requires a detailed single-line diagram that shows system transmission elements in relation to the project and other principal interconnected

[2] The October 31, 1983 license order includes 2.3-kilovolt generator leads as part of the project works. *See Pumpkin Hill Power Company*, 25 FERC ¶ 62,134 (1983) (1983 License Order).

system elements. The license application does not include this information and must be revised to comport with the regulations[3].

The Project single line diagram is provided in Appendix D.

Exhibit F

4. *Section 4.39(a) of FERC's regulations requires full-sized prints of drawings on sheets no smaller than 22 by 34 inches and no larger than 24 by 36 inches. The Exhibit F drawings filed as part of the license application do not meet the Commission's size requirements. The Exhibit F drawings must be revised to meet FERC's regulations.*

KEI (Maine) disagrees that this revision to the 11 by 17 format of the Exhibit F drawings as filed is necessary or required. The Commission's Managing Hydropower Project Exhibits Guidance Document (August 2014) contains discussion of Drawing Formats (page 5) and a Frequently Asked Questions (FAQ) specific to Exhibit drawings (Appendix 4). This guidance document states:

Drawing Formats (page 5):

> "Paper drawings are the most common format and usually consist of engineer drawings at 22" x 34" (ANSI D) or 24" x 36" (ARCH D size), but must not be smaller than 11 inches on their shorter side (see 18 CFR §4.39(d))."

The FAQ includes the following:

> "**Q.** When preparing exhibit drawings for license or exemption applications or amendment filings with the Commission, what format is acceptable?
>
> **A.** The most common drawing format for submitting exhibit drawings for FERC review is paper. Exhibit drawings should be a minimum of 22" x 34" and a maximum of 24" x 36". Also, drawings must be legible when reduced to a print that is 11" on its shortest (see 18 CFR §4.39(a) and (d)). Applicants may choose to file their exhibits as full size drawings or in a reduced format (i.e., 11" x 17")."

[3] Section 2.17 of the application states that the single-line diagram is considered Critical Energy Infrastructure Information. Section 4.332 of FERC's regulations requires an applicant to make the "complete application for license [...], together with all exhibits, appendices and any amendments" "reasonably available to the public for inspection and reproduction," with few exceptions. The single-line diagram is required under section 4.61(c)(8) of FERC's regulations, and does not fall within he purview of an exception.

5. *Section 4.41(g) of FERC's regulations requires a Supporting Design Document (SDR) demonstrating that the existing and proposed project structures are safe and adequate to fulfull their stated functions. The license application does not include an SDR. You must provide this information. Please ensure that SDR includes items required by sections 4.41(g)(3)(iv) and 4.41(g)(3)(v) of FERC's regulations, and also justification for the assumed foundation shear strength parameters based on the geologic conditions at the project site.*

The Lowell Tannery project is classified as a low-hazard facility relative to dam safety. Due to limited historical records possessed by KEI (Maine) information consistent with SDR requirements is unavailable. KEI (Maine) was able to obtain a stability analysis evaluation conducted by the original design engineer (Morrison-Knudsen) in 1986. Should FERC determine that this analysis needs additional information, KEI (Maine) will prepare an updated stability analysis.

6. *Section 4.41(g) of FERC's regulations requires that the Exhibit F drawings show all major project structures in sufficient detail to provide a full understanding of the project. However, the Exhibit F drawings do not show: (1) the height and elevations of the downstream fish bypass intake box and its log sluice; and (2) the generator leads. Exhibit F must be revised to include this information.*

The downstream fish passage intake box has a top elevation of 188.0' and a bottom elevation of 181.75'. The walls of the box (See F7 Section B) are 9 inches thick. This results in a total external height of the box of 7.75 feet and internal open height of the box of 6.25 feet. Exhibit F has been revised to provide these elevations.

The downstream fish passage does not have a log sluice. The opening to the intake box has a stop log slot to manage flow into the downstream bypass.

The transmission line/generator leads are 125 feet long within the powerhouse and a 40 feet long buried section running from the powerhouse to the transformer. Exhibit F has not been revised to illustrate location of generator leads within the powerhouse because that is a level of detail not normally provided in Exhibit F. However, KEI (Maine) has revised Exhibit F and Exhibit G to illustrate the location of the buried portion of the transmission lines outside of the powerhouse structure.

Exhibit G

7. *Section 4.41(h)(1) of FERC's regulations requires the Exhibit G maps to show the locations of principal project works described in Exhibit A. The Exhibit G maps do not show the hand-carry boat access facility on the north side of the dam; parking area for recreation access; canoe portage route that extends from the shoreline of the impoundment to the shoreline near the bridge for Fogg Brook Road (also known as Tannery Road); transmission line; or*

the interconnection point with the local distribution grid. Exhibit G must be revised to include these project facilities.

Exhibit G has been revised to include the project transmission line and recreation access.

8. *Section 4.39)a) of FERC's regulations requires full-sized prints of maps on sheets no smaller than 22 by 34 inches and no larger than 24 by 36 inches. The project boundary maps filed as part of the license application do not meet FERC's size requirements. The Exhibit G maps must be revised to meet FERC's regulations.*

   See response to Deficiency #4.

9. *Section 4.41(h)(4) of FERC's regulations requires an Exhibit G map that identifies, by legal subdivision, lands owned in fee by the applicant, lands that the applicant plans to acquire in fee, and lands over which the license applicant has acquired or plans to acquire rights by other than fee title, including rights acquired or to be acquired by easement or lease. The Exhibit G maps filed with the application do not include this information and must be revised to identify land within the project boundary by legal subdivision.*

   Exhibit G (Sheet 2) provides metes and bounds that define the project boundary for lands necessary for the operation and maintenance of the Project. All lands within the boundary as show are owned by KEI (Maine). KEI (Maine owns additional land adjacent but outside of the boundary, which are not included in the boundary because these lands are not needed for ownership and maintenance access. Sheet 2 has been modified to identify this land ownership. KEI (Maine) does not anticipate a need to acquire additional lands or usage rights.

ATTACHMENT B

RESPONSES TO ADDITIONAL INFORMATION REQUEST

On November 17, 2021, FERC commented on the Lowell Tannery License Application requesting additional information regarding KEI Power's application for the Project. Responses to specific requests are provided below.

Consultation

1. *Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), FERC cannot issue a license for a project within or affecting a state's coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA Program, or the agency's concurrence is conclusively presumed by its failure to act within 6 months of its receipt of the applicant's certification. The license application includes a statement that KEI Power will consult with the Maine Department of Marine Resources (Maine DMR) to confirm KEI's conclusion that the project is not in Maine's coastal zone and therefore, not subject to review under the CZMA. Please file documentation of consultation with Maine DMR, including proof of the date on which Maine DMR received KEI Power's request for review under the CZMA and any subsequent correspondence from Maine DMR.*

Due to the location of the project in the watershed, relative to head-of-tide and presence of downstream dams on the mainstem Penobscot River. KEI (Maine) determined that a CZMA consistency review is not necessary by MDMR. By email dated February 14, 2022, MDMR confirmed that a consistency review is not required (see Appendix E).

Exhibit A

2. *Section 2.1.1 of Exhibit A states that the project dam has a maximum height of 27 feet. However, Table 2.1 of Exhibit A indicates that the height of the project dam is 21.5 feet. Please revise Exhibit A to rectify the inconsistency and clarify the height of the project dam.*

Exhibit A has been corrected to clarify that the height of the dam is 21.5 feet.

Exhibit E – Aquatic Resources

3. *KEI Power proposes to repeat the 2021 upstream fish passage effectiveness study during the 2022 alewife passage season, after relocating the outflow of the downstream fish passage pipe so that it is adjacent to the upstream fishway entrance. Please file progress reports on the study by April 30, 2022 and July 31, 2022, and file the final study report no later than September 30, 2022.*

KEI will provide the requested progress reports. KEI also notes that fish passage discussions are ongoing with fisheries agencies to determine potential improvements to the upstream fish passage facilities to address effectiveness.

4. *In sections 2.4, 4.9.15, and 4.9.2.1 of Exhibit E, KEI Power states that it propose to install two "siphon style passage systems" to provide downstream passage for American eel. KEI Power states that the two siphon style passage systems would be similar to the passage systems implemented in KEI Power's American Tissue Project No. 2809. Please provide*

conceptual drawings or a narrative further describing the proposed passage systems, including at a minimum, the specific installation locations (including upstream and downstream of the dam), dimensions (length, diameter of each section), intake depths, and the elevations of the points of release for outflows. Please also provide information on the operation of the passage systems, including estimated attraction and conveyance flows, the seasonal dates when they would be operated, and the time of day they would be operated (if not 24 hour per day).

Because KEI (Maine) and fisheries agencies are in discussions about upstream and downstream fish passage measures, including American eel passage and any conceptual design would be developed in consultation with agencies, KEI (Maine) has not yet developed any design for the proposed siphon systems. KEI (Maine) designed and constructed a similar siphon system at the American Tissue Project, which was approved by agencies, however in consideration that such measures are a post license fish enhancement proposal to occur after new license implementation beginning in 2023 at the earliest, KEI (Maine) is providing a narrative description of the system. Details of location, length and diameter of sections, intake depths, release elevations, and conveyance flows would all need to be determined in consultation with agencies.

The siphon system installed at KEI (Maine)'s American is described as:

The passage intake is approximately 2-feet above the unit intake sill with a 14-inch diameter screen inlet. An 8-inch transport pipe extends downstream from the inlet to the east abutment and passes through the abutment at a surface pipe trench. The transport pipe is connected to a downstream holding/collection tank with the final buried transport pipe section exiting the tank to the river reach around 100-feet downstream of the dam toe. Siphon flow is controlled through a pinch valve located immediately upstream of the holding/collection tank. The transport pipe is supplied with cleaning ports for backflushing and air piping is supplied at the inlet to assist with screen cleaning.

The downstream eel system will generally begin annual operation a week before August 15th to reasonably ensure the system is operational prior to the start of the migration season. The full depth rack overlay system, previously installed as part of the downstream diadromous passage system, will be maintained. The system will be "primed" using a vacuum pump and be in continuous operation, except for maintenance, throughout the migration season. The pipe and tank will be drained during the non-passage season.

KEI (Maine) anticipates a similar system at Lowell Tannery, although site specific design considerations will result is refinements that will be determined through agency consultation and functional design. In addition, due to the "V" shaped intake to the powerhouse, KEI (Maine) anticipates that two siphon structures will be necessary to facilitate passage of eels that may approach either side of the intake racks. The below figure provides a plan view of the downstream eel passage at the American Tissue project. As previously noted, site specific design considerations will be necessary at Lowell Tannery, but the concept layout and operations will be similar to that constructed at American Tissue in 2021.

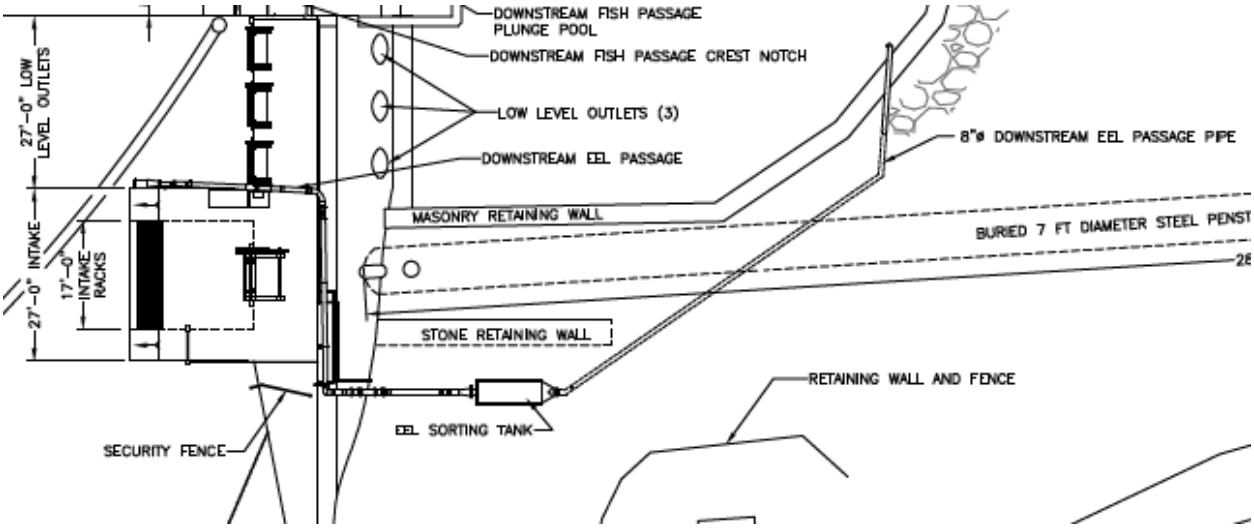


Figure. Plan View of Downstream Eel Passage (As-built) at the American Tissue Project (P-2809).

Exhibit E – Terrestrial Resources

5. *Section 4.10.1.1 of Exhibit E does not describe the acreage of vegetation types within the project boundary. Please estimate the acreage of each upland vegetation type present within the project boundary.*

KEI (Maine) developed GIS mapping to calculate acreage of upland vegetation types within the project boundary (Appendix G). Acreage is calculated to be:

Vegetation Types Within the Project Boundary	Area (Acres)
Deciduous Forest	0.14
Evergreen Forest	9.19
Mixed Forest	4.02
Herbaceous	4.62

SOURCE: National Land Cover Database 2019

6. *Section 4.10.1.3 of Exhibit E describes wetlands within the project boundary but does not provide the acreage of each wetland type. Please provide the acreage of each type of wetland located within the project boundary.*

KEI (Maine) developed GIS mapping to calculate acreage of wetland types within the project boundary (Appendix G). Acreage is calculated to be:

Wetland Type	Area (Acres)
Freshwater Emergent Wetland	21.48
Freshwater Forested/Shrub Wetland	114.39
Freshwater Pond	0.079
Riverine	124.92

SOURCE: NWI 2020

7. *Section 4.10 of Exhibit E does not describe any current or proposed vegetation management at the project. Please describe any current/proposed vegetation management activities (e.g., grass and tree trimming and cutting along access roads, around project facilities, etc.), including methods (e.g., mechanical, chemical), approximate dates when the activities typically occur, and specific plant species targeted.*

KEI (Maine) does not have any formal vegetation management program. Grass surrounding project structures and public access areas (i.e., access road, hand carry boat access and portage trail) is routinely cut during the growing season. No chemical vegetation management measures are employed by KEI (Maine). No tree trimming or cutting within the project boundary occurs unless specifically identified by FERC's NY Regional office, associated with dam safety maintenance.

8. *The monarch butterfly (Danus plexippus) is a candidate for federal listing under the Endangered Species Act in the project area[4]. In section 4.9 of Exhibit E, Rare, Threatened, Endangered, and Special Status Species, please provide a description of any known occurrences of this species at the project and a discussion of how/whether the proposed project could affect this species.*

KEI (Maine) conducted an informal review of the USFWS IPaC database (Appendix G) which identified the Monarch butterfly as potentially being affected by activity in the area, however, as noted above, vegetative management at the project is limited to grass cutting mowing around project structure and public access areas.

The monarch butterfly is a federally listed candidate species insect that has the potential to occur within the vicinity of the Lowell Tannery Project Monarch butterflies breed by laying eggs on milkweed plants and larvae emerge after two to five days. Larvae develop through five phases over nine to eighteen days feeding on milkweed. Larvae then pupate into a chrysalis before emerging into an adult butterfly. Adult butterflies live approximately two to five weeks, and overwintering adults will enter a reproductive diapause and live six to nine months. Many

[4] See the U.S. Fish and Wildlife Service's Information for Planning and Consultation website-generated species list, located at https://ecos.fws.gov/ipac/.

monarchs will undergo a long-distance generational migration of distances over 3,000 kilometers [5].

Typical Project area maintenance activities are limited to mowing and no milkweed stands exist in these areas, therefore, routine maintenance of project and public access areas are unlikely to potentially affect monarch habitat at the project.

Exhibit E – Recreation Resources

9. *Section 4.12 of Exhibit E describes the hand-carry boat access facility, parking area for recreation access, and canoe portage route. Please describe the maintenance activities associated with these project facilities, including any mowing, vegetation trimming/cutting, grading, herbicide/pesticide application, etc.*

As previously discussed, public access areas (i.e., hand carry boat access and the portage trail) consist of grass and dirt. Maintenance activities are limited to grass mowing, as well as maintaining public safety signage as needed. No herbicide or pesticide management practices are employed by KEI (Maine) at the project.

Exhibit E – Cultural Resources

10. *Section 4.14.1.1 of Exhibit E states that KEI Power is in the process of conducting an architectural evaluation of the project structures and a Phase I Archeological survey. Please provide an update on the status of the studies or file the completed studies. Additionally, please provide copies of any consultation records with the Maine SHPO and federally recognized tribes on the studies.*

KEI (Maine) has obtained consultant bids for evaluation of projects structures and Phase I archaeological surveys. KEI (Maine) anticipates contracting with a consultant (qualified with the Maine SHPO) to conduct these evaluations as soon as field conditions allow, likely in the May-June 2022 timeframe, such that reporting can be filed with the Commission by September 1, 2022.

Exhibit E – Geology and Soil Resources

11. *Section 4.7.2 of Exhibit E states that soils along the riverbank are moderately susceptible to erosion but concludes that project operation is not expected to have significant adverse effects on the local geology and soils. With regard to the potential for shoreline erosion within the project boundary, please revise Exhibit E to describe any known shoreline erosion around the impoundment or immediately downstream of the project, including photos or other documentation.*

[5] USFWS Monarch Butterfly (Danus Plexippus). Available Online. https://ecos.fws.gov/ecp/species/9743.

Although soils along the riverbank in the project area are considered moderately susceptible to erosion, no specific studies have been conducted to document erosion at the project because no erosion related issues were identified by resource agencies and the project is operated in a run-of-river mode. Representative photos of the shoreline in the impoundment and immediately downstream of the project are included in a revised Geology and Soil Resources section of Exhibit E (Appendix H). KEI (Maine) is submitting only the revised Geology and Soils section of Exhibit E rather than Exhibit E in its entirety because AIR #11 is the only AIR specifically requiring revisions to Exhibit E.

Exhibit F

12. *Section 2.1.1 of Exhibit A indicates that the length of the primary spillway is 30 feet. However, the stations shown on sheets 2 and 3 of Exhibit F indicate that the primary spillway is 27.2 feet long. Please revise the application to rectify the inconsistency and clarify the length of the primary spillway.*

The primary spillway should be described as 27.2 feet long. Exhibit A has been revised to correct this length and has been corrected to reflect that the entire spillway length is 116.2 feet (primary plus auxiliary).

13. *Exhibits A and E indicate that the diameter of the downstream fish bypass pipe is 18 inches. However, sheet 7 of Exhibit F indicates that the diameter of the pipe is 24 inches. Please revise the application to rectify the inconsistency and clarify the diameter of the downstream fish bypass pipe.*

Exhibit F is correct indicating that the pipe diameter is 24 inches. Exhibit A has been revised to reflect this clarification.

14. *The Exhibit F drawings provide elevation data for several project features, including typical water surface elevations. However, the Exhibit F drawings do not specify the vertical datum (e.g., NAVD 88) used to determine the elevations. Please revise the Exhibit F drawings to include a note that identifies the vertical datum.*

The Project has historically presented structure and water surface elevations in Mean Sea Level (msl). The datum for Project drawings and documentation has been revised to the National Geodetic Vertical Datum of 1929 (NGVD29). There was no elevation adjustment necessary for this datum conversion.

Exhibit G

15. *Please explain whether KEI Power is proposing any changes to the current project boundary.*

KEI (Maine) has revised the project boundary because the previously defined boundary did not extend to the upstream point of impounding effects of the dam. Topographic mapping, aerial photography, and bathymetry data collected during the relicensing (Figure 4 in the 2020 Study

Report) indicates that the backwater effect extends approximately four miles upstream of the dam. KEI (Maine) has proposed a revised project boundary to reflect this condition.

ATTACHMENT C

CONSULTATION DOCUMENTATION

PENOBSCOT NATION

DEPARTMENT OF
NATURAL RESOURCES

JOHN S. BANKS, DIRECTOR

12 WABANAKI WAY
INDIAN ISLAND, ME 04468
TEL: 207/827/7776
FAX: 207/817/7466

4/9/2019

Kimberly D. Bose, Secretary
Nathaniel J. Davis, Sr., Deputy Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

RE: Lowell Tannery Hydroelectric Project (FERC # 4202)

Dear Secretary Bose,

The Penobscot Indian Nation (PIN) has inhabited the Penobscot River watershed since time immemorial. The PIN continues to be unable to exercise its Treaty Reserved Sustenance Fishing rights on the Penobscot River because of the low abundances of 13 species of sea-run fish. These culturally significant species are at historic low levels because of the hydroelectric development of the river, and the lack of efficient fishways. (Saunders et al, 2006)

The Passadumkeag River offers significant diverse habitats for multiple sea-run fish species, and the transparency of the Lowell Tannery project to those fishes is paramount to their recovery.

The Penobscot Indian Nation has taken the opportunity to review the Pre-Application document (PAD) and the Notice of Intent to File (NOI) filed November 23, 2018. The PIN has also has consulted with our federal partners at the National Marine Fisheries Service (NMFS) and reviewed their comments and study requests, filed with the FERC on March 9, 2019.

The PIN would like to express its complete support and concurrence for the comments and study requests filed by the NMFS on March 9th, 2019.

If the Secretary has any questions, please reach out at your nearest convenience.

Sincerely,

4/9/19

Daniel McCaw

Penobscot Indian Nation

Fisheries Program Manager

1) Saunders, R., M. A. Hachey, and C. W. Fay. 2006. Maine's diadromous fish community: past, present, and implications for Atlantic salmon recovery. *Fisheries* 31(11):537-547. http://dx.doi.org/10.1577/1548-8446(2006)31[537:MDFC]2.0.CO;2

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

JANET T. MILLS
GOVERNOR

KIRK F. MOHNEY
DIRECTOR

June 29, 2021

Ms. Kayla A. Hopkins
Kleinschmidt
PO Box 650
Pittsfield, ME 04967

Project: MHPC #1094-21 (CR 1357-18) Lowell Tannery Hydroelectric Project; FERC #4202 Draft License Application

Town: Lowell, ME

Dear Ms. Hopkins:

In response to your recent request, I have reviewed the information received June 21, 2021 to continue consultation on the above referenced project in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended.

Information concerning above-ground/architectural properties in the draft license application is incorrect. Our office sent a letter requesting architectural survey for the impoundment area in October 2018. Please see enclosed.

Information about the presence of archaeological sites and need for archaeological survey associated with this project dam and impoundment is misrepresented on pp 4-98 and 4-99 of the [filing]. There is one known prehistoric archaeological site associated with the impoundment shore, and one historic archaeological site. Phase I and possibly other archaeological survey work is necessary on this project to avoid possible adverse effect, as we pointed out in letter dated October 10, 2018.

Both architectural and archaeological survey is necessary in order for our office to continue Section 106 consultation.

Please contact Megan M. Rideout of our staff at 287-2992 or megan.m.rideout@maine.gov if you have any questions regarding above ground resources.

Sincerely,

Kirk F. Mohney

Kirk F. Mohney
State Historic Preservation Officer

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

PAUL R. LEPAGE
GOVERNOR

KIRK F. MOHNEY
DIRECTOR

October 10, 2018

Mr. Lewis C. Loon
Kruger Energy
KEI (USA) Power Management Inc
423 Brunswick Ave
Gardiner, ME 04345

Project: MHPC #1357-18 KEI Maine Power Management; FERC 4202; Lowell Tannery Project
Filing of Notice of Intent and Pre-Application Document

Town: Lowell, ME

Dear Mr. Loon:

In response to your recent request, I have reviewed the information received October 1, 2018 to initiate consultation on the above referenced project in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended.

An architectural survey is recommended to identify and record information on all resources within the area of potential effect (APE) that are at least 50 years old. Survey must be completed according to our "Revised Above Ground Cultural Resource Survey Manual Project Review Specific." All surveys must be submitted electronically via our on-line CARMA database. See our website for more information: http://www.maine.gov/mhpc/architectural_survey/survey-guidelines.html.

A list of historic preservation consultants who are qualified to conduct architectural survey and have been trained in the use of the CARMA database may be found at the following page of our website: http://www.maine.gov/mhpc/project_review/consultants/carma_trained_consultants.shtml

With regards to archaeological resources, a Phase I archaeological survey for potentially significant historic and prehistoric archaeological sites is recommended for the impoundment margin of the Lowell Tannery project. A sawmill was present on what is now the project location, as well as other structures, shown on the 1859 county map. Prehistoric archaeological survey should focus on a 30 m wide area around the impoundment margin.

A list of qualified prehistoric archaeologists has been can be found on our website: http://www.maine.gov/mhpc/project_review/consultants/prehistoric_archaeology.shtml.

If you have any questions regarding archaeology, please contact Dr. Arthur Spiess of this office at Arthur.Spiess@maine.gov.

Please contact Megan M. Hopkin of our staff at 287-2992 or megan.m.hopkin@maine.gov if you have any questions regarding above ground resources.

Sincerely,

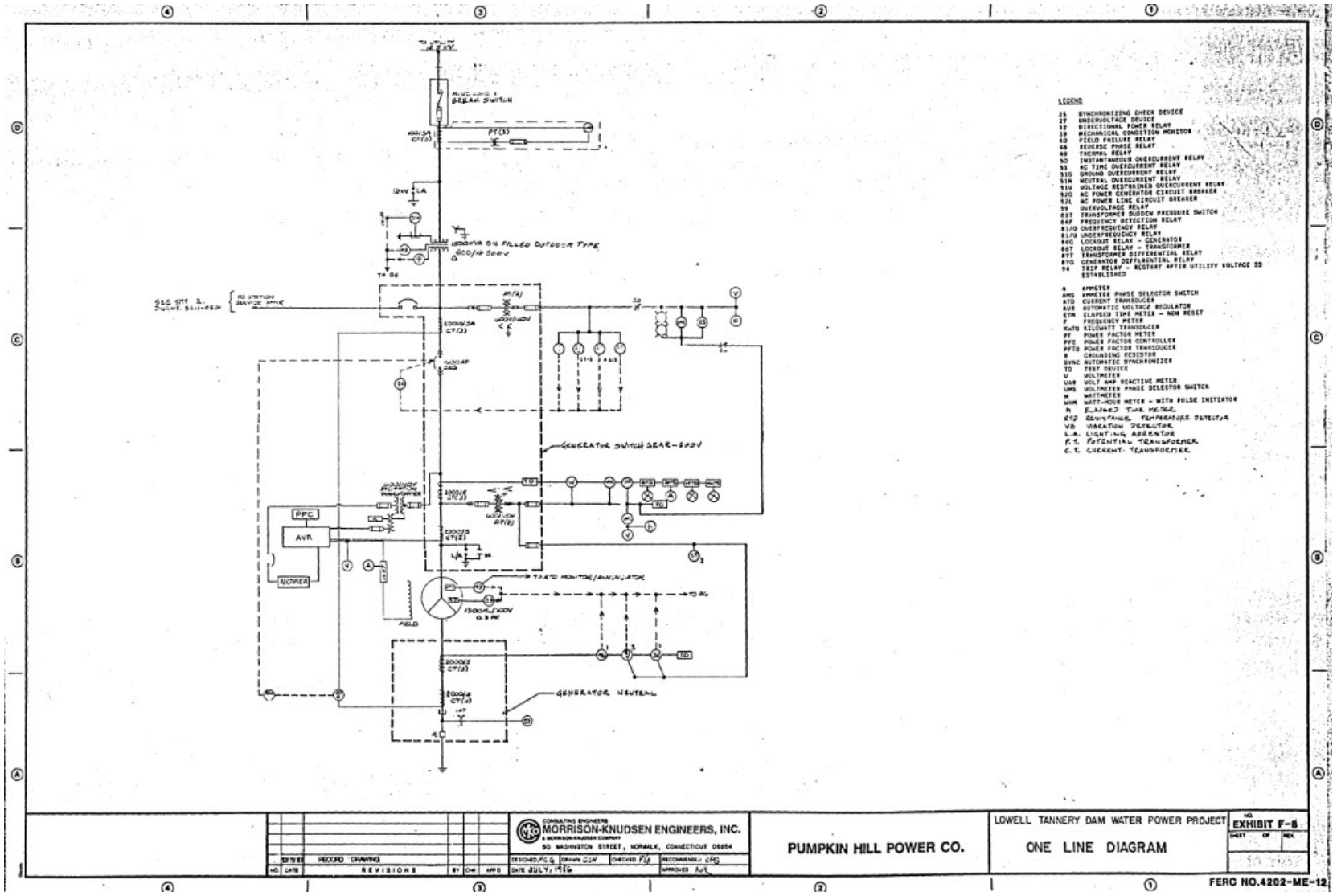
Kirk F. Mohney

Kirk F. Mohney
State Historic Preservation Officer

ATTACHMENT D

SINGLE LINE DIAGRAM

ATTACHMENT D – SINGLE LINE DIAGRAM
LOWELL TANNERY HYDROELECTRIC PROJECT (FERC NO. 4202)



ATTACHMENT E

CZMA CONSULTATION DOCUMENTATION

From: Burrowes, Todd
To: Kayla Hopkins
Cc: Howatt, Kathy
Subject: RE: CZMA Lowell Tannery Hydroelectric Project FERC No. P-4202-025
Date: Monday, February 14, 2022 2:54:05 PM
Attachments: image001.png

Hi, Kayla. Thanks for providing that information. The project is located outside of Maine's designated coastal zone and CZMA consistency review is not required.
Please let me know if you have questions or need additional information.
- Todd

From: Kayla Hopkins <Kayla.Hopkins@KleinschmidtGroup.com>
Sent: Tuesday, February 08, 2022 7:47 AM
To: Burrowes, Todd <Todd.Burrowes@maine.gov>
Subject: Re: CZMA Lowell Tannery Hydroelectric Project FERC No. P-4202-025

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.
Yes, of course. The project is located in Lowell, Burlington and Grand Falls Twp, Maine. Lowell is approximately 15 mins from Enfield Maine.

Get Outlook for iOS

From: Burrowes, Todd <Todd.Burrowes@maine.gov>
Sent: Monday, February 7, 2022 4:02:06 PM
To: Kayla Hopkins <Kayla.Hopkins@KleinschmidtGroup.com>
Subject: RE: CZMA Lowell Tannery Hydroelectric Project FERC No. P-4202-025

Hi, Kayla. For purposes of response to your e-mail, would you please clarify the town(s) or unorganized place(s) in the project, including all lands within the project boundaries, is located?
- Todd

From: Kayla Hopkins <Kayla.Hopkins@KleinschmidtGroup.com>
Sent: Monday, February 07, 2022 11:11 AM
To: Burrowes, Todd <Todd.Burrowes@maine.gov>
Cc: Sherri.Loon@kruger.com; lewisc.loon <lewisc.loon@kruger.com>; Andy Qua <Andy.Qua@KleinschmidtGroup.com>
Subject: CZMA Lowell Tannery Hydroelectric Project FERC No. P-4202-025

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.
Good morning, Todd,

On behalf of KEI Maine, attached is a letter requesting confirmation that the Lowell Tannery Hydroelectric Project (FERC No. P-4202) is not within the jurisdiction of the designated coastal area and that KEI Maine does not need to apply for a CZMA Consistency Certification from your office. We would appreciate receipt of confirmation verifying that our understanding is correct or

alternative guidance if further action is necessary to comply with Maine's Coastal Program. If it is more convenient for you and your office, an email response is adequate for KEI Maine's documentation.

Thank you,

Kayla A. Hopkins
Regulatory Coordinator
Kleinschmidt
Direct: (207) 416-1271
www.KleinschmidtGroup.com
*Providing **practical** solutions for **complex** problems affecting energy, water, and the environment*

ATTACHMENT F

REVISED EXHIBIT A

EXHIBIT A

PROJECT DESCRIPTION

TABLE OF CONTENTS

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1.0 PROJECT LOCATION

The single-development Lowell Tannery Hydroelectric Project is located on the Passadumkeag River within Penobscot County, near the community of Lowell, in east-central Maine. The Project is approximately 13 river miles upstream of the confluence with the Penobscot River. Project works consists of a concrete gravity dam with spillway sections, topped with 3.5-foot-high flashboards, and outlet gate, and a log sluice section, a powerhouse with a single turbine-generator with a total rated capacity of 1,000 kW, upstream and downstream fishway passage facilities, generator leads of 125 feet long within the powerhouse and a 40 foot buried section from the powerhouse to the transformer that is the point of interconnection (see Exhibit G), , and appurtenant facilities. Table 2.1 provides the specifications for the Project. The Project was developed in 1986. As a run-of-river dam, the project has no useable storage capacity. The project reservoir is approximately 341 acres at elevation 187.5 feet mean sea level (FERC 2014). The Project boundary includes the dam, powerhouse, 4 miles upstream, and approximately 250 feet downstream of the powerhouse. The Lowell Tannery Project operates as a run-of-river facility. The project has an overall minimum flow requirement of 150 cfs (or inflow if less). KEI (USA) Power Management Inc. (KEI (USA)) provides 40 cfs of attraction and conveyance water through the fishway from May 15 through November 10 annually; the fishway attraction flow is discharged near the base of the powerhouse. KEI (USA) provides a fishway flow of 20 cfs through the downstream bypass, which is provided through the stop log slot at the entrance. When river flow exceeds the powerhouse capacity, fish may pass with spill over the dam. KEI (USA) operates the downstream fish passage in the spring from ice-out through early June. Downstream passage for kelts is provided through the downstream fishway from November 1 to ice-in.

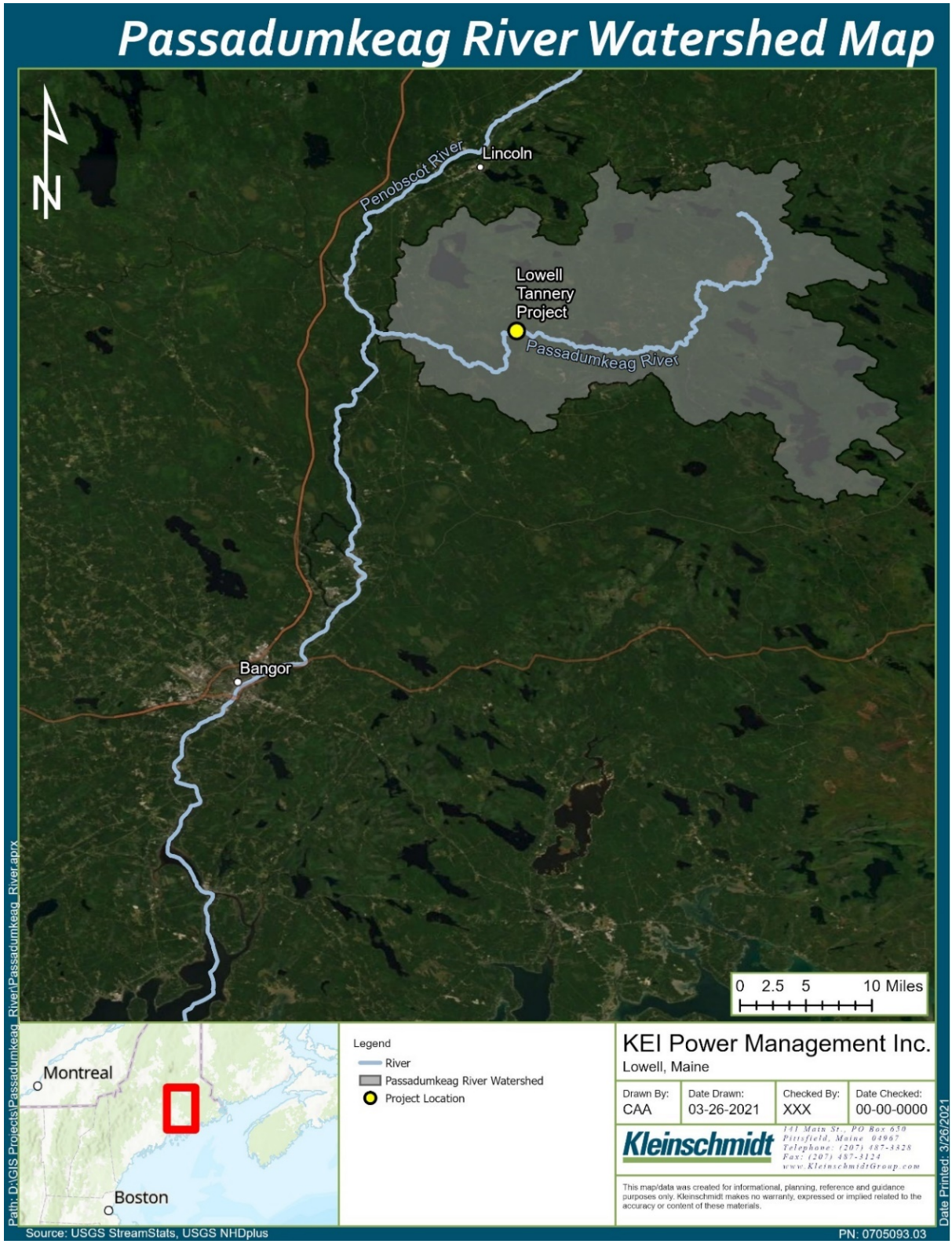


Figure 1.1 Watershed and Project Location

2.0 DESCRIPTION OF PROJECT

2.1 Project Facilities

2.1.1 Project Dam

Lowell Tannery Dam is a concrete structure with a total length of 116.2 feet (Photo 2.1) and is 21.5 feet high. The principal spillway, which accounts for 27.2 feet of the 116.2-foot length, has a permanent crest at elevation 184.05 feet. The top of flashboards height (normal pond) is at elevation 187.5 feet. There is an auxiliary spillway that is 89-feet-long with crest elevation of 184.05 feet. There is also a seven-foot-wide log sluice and a ten-foot-wide Tainter gate used to bypass flows and draw the impoundment down.

Photo 2.1 Lowell Tannery project looking up from Fogg Brook road bridge

2.1.2 Powerhouse

The Project powerhouse is located near the north dam abutment and contains a single vertical Kaplan turbine-generator unit with a rated capacity of 1,000 kW. The maximum

hydraulic capacity of the turbine is 905 cfs with a 90 cfs minimum capacity. The intake is "V" shaped with a 3-foot by 3-foot pier to support the 15-foot, 6-inch wide, 12-foot high trashracks which have 1.5 inch clear spacing (Photo 2.2). The rated net head is 18 feet.

Photo 2.2 Aerial Imagery Showing Location of Upstream and Downstream Fishways and Angled Intake Racks at the Lowell Tannery Project.

2.1.3 Fishway Facilities

Upstream passage for diadromous fish is provided by a Denil ladder that is located at the dam (Photo 2.2). The fishway is approximately 3 feet wide with 8-inch thick walls and consists of three runs and two switchbacks. Detailed dimensions will be included in the Final License Application. KEI (USA) provides 40 cfs of attraction and conveyance water through the fishway from May 15 through November 10 annually; the fishway attraction flow is discharged near the base of the powerhouse.

Downstream fish passage is provided through a dedicated fish bypass (Photo 2.2). Adjacent to the eastern side of the intake racks, there is a downstream surface bypass gate that leads to a 24-inch bypass pipe, which discharges into a plunge pool next to the tailrace. When river flow exceeds the powerhouse capacity, fish may pass with spill over the dam. KEI (USA) operates the downstream fish passage in the spring from ice-out

through early June. Downstream passage for kelts (i.e., post-spawned adults) is provided through the downstream fishway from November 1 to ice-in.

2.1.4 Turbine/Generator

The Project contains a single vertical turbine-generator unit with a rated capacity of 1,000 kW. that can generate up to 905 cfs and a minimum capacity of 90 cfs. The project head of generation is approximately 18 feet.

2.1.5 Project Impoundment

The project reservoir is approximately 341 acres (Photo 2.3). Normal pond elevation for the Project is 187.5 feet. Because the Project is run-of-river, there is no useable storage behind the dam.

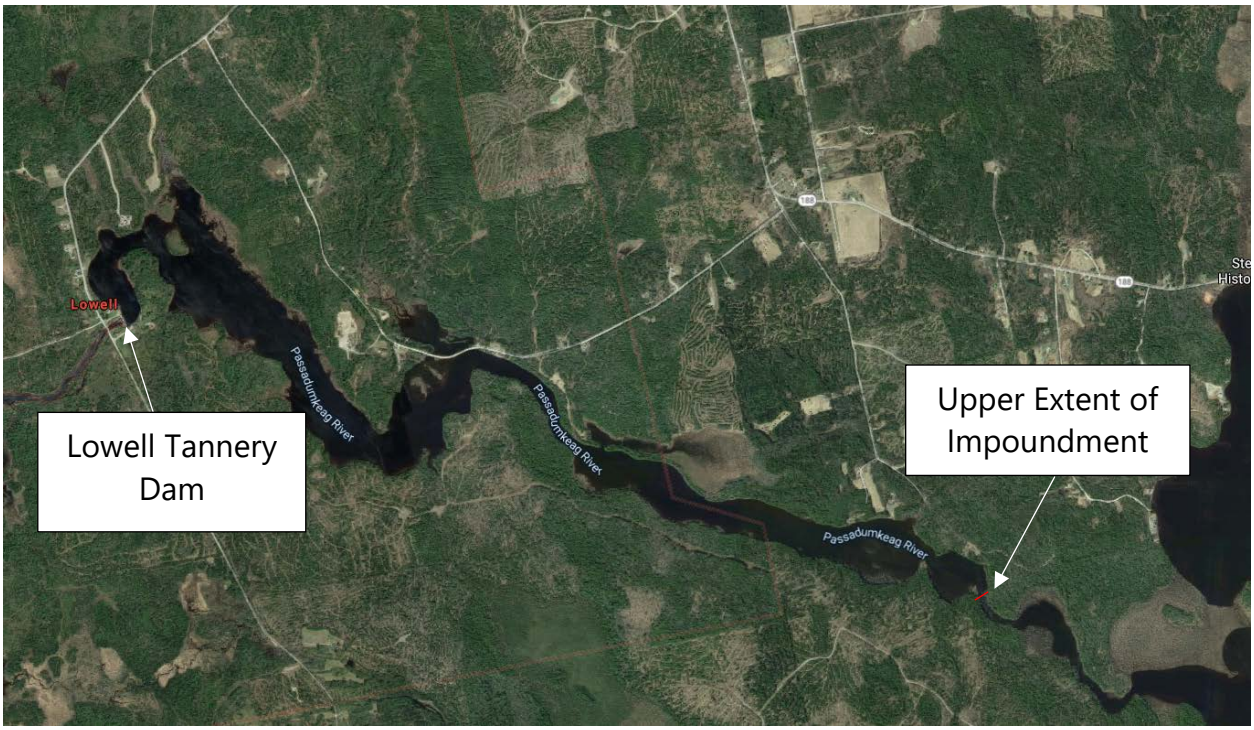


Photo 2.3 Lowell Tannery Impoundment

2.1.6 Tailrace

The Project has a normal tailwater elevation of 169.5 feet at a maximum unit discharge of 905 cfs. The tailrace extends approximately 250 feet downstream from the powerhouse to the bridge on Tannery Road (Fogg Brook Road).

2.1.7 Appurtenant Facilities and Equipment

The Project is equipped with a 1,000-kVA, 2.3/12.5-transformer and 2.3-kV transmission line/generator leads 125 feet long within the powerhouse and 40 feet buried running from the powerhouse to the transformer, which is the point of interconnection with the local utility. The single line diagram for the Project considered CEII and is provided in Volume 2.

Table 2.1 Lowell Tannery Project Facilities and Descriptions

Lowell Tannery Project – FERC No. 4202	
Description	Number or Fact
General Information	
FERC Number	P-4202
License Issued	October 31, 1983
License Expiration Date	September 30, 2023
Licensed Capacity	1,000 kW
Project Location	On Passadumkeag River in Penobscot County, Maine.
Reservoir	
Surface Area of Reservoir	341 acres
Reservoir Elevation Normal Maximum	187.5 feet
Reservoir Storage Useable	0
Dam	
Dam Type	Concrete Gravity
Year Dam Constructed	1920s
Height	21.5 feet
Length of Dam	116.2 feet
Tainter Gate	10-feet-wide
Log Sluice	7-feet-wide
Flashboard type	Wooden
Flashboard height	3.5 feet
Elevation of Top of Flashboards	187.5 feet

Lowell Tannery Project – FERC No. 4202	
Spillway	Two spillways, one 27.2-foot-long section and one 89-foot-long section
Spillway permanent crest elevation	Spillway Crest 184.05 feet Emergency Spillway Crest 184.05 feet
Trashracks	1.5 inches clear spacing
Top of Trashrack Elevation	183 feet
Intake Structure	An integral, 22-foot, 2-inch concrete intake structure. The two intake openings are 15 feet 10 inches high, and two 15 feet 6 inches wide.
Powerhouse	
Length (Superstructure)	69-feet, 4 inches (not including the intake structure)
Width (Superstructure)	26-feet, 8 inches
Height (upstream)	32 feet 2 inches
Height (downstream)	43 feet 3 inches
Turbines/Generators	
Authorized Generation Capacity	1,000 kW
Number of units	1 vertical Kaplan unit
Rated Net Head	18 feet
Total Hydraulic Capacity	90 cfs minimum; 905 cfs maximum
Average Annual Generation	4,144 MWH
Fish Passage	
Upstream Passage	Denil Ladder
Downstream Passage	24-inch bypass pipe
Transmission Lines	
Type	2.3-kV
Length (Generator Leads to Transformer)	125 feet within the powerhouse and 40 feet buried running from the powerhouse to the transformer, which is the point of interconnection with the local utility
Transformer	1,000 kVA, 2.3/12.5

2.1.8 Proposed Facilities

KEI is not proposing any changes to the existing Project facilities.

2.1.9 Provisions for Future Units

There are no plans for additions or modifications for future units.

2.2 Project Operation

2.2.1 Current Project Operation

In accordance with the FERC Order 147 FERC ¶ 62,222, issued June 23, 2014, Ordering Paragraph (B)(2), Article 19, and the revised WQC for the Project (issued December 5, 2012), KEI (USA) is authorized to operate in run-of-river mode such that inflow to the reservoir is equal to outflow for the purpose of protecting and enhancing aquatic resources in the Passadumkeag River while maintaining the headpond within one foot of elevation 187.5 feet. These flows may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods for fishery management purposes upon mutual agreement between the licensee and the Maine Department of Inland Fisheries and Wildlife. The project has an overall minimum flow requirement of 150 cfs (or inflow if less).

Upstream passage for diadromous fish is provided by a Denil ladder that is located at the dam (Photo 2.2). KEI (USA) provides 40 cfs of attraction and conveyance water through the fishway from May 15 through November 10 annually; the fishway attraction flow is discharged near the base of the powerhouse (Photo 2.2).

Downstream fish passage is provided through a dedicated fish bypass (Photo 2.2). Adjacent to the eastern side of the intake racks, there is a downstream surface bypass gate that leads to a 24-inch bypass pipe, which discharges into a plunge pool next to the tailrace. KEI (USA) provides a fishway flow of 20 cfs through the downstream bypass, which is provided through the stop log slot at the entrance. When river flow exceeds the powerhouse capacity, fish may pass with spill over the dam. KEI (USA) operates the downstream fish passage in the spring from ice-out through early June. Downstream passage for kelts is provided through the downstream fishway from November 1 to ice-in.

The Lowell Tannery Project is remotely monitored and operated 24 hours a day, 7 days a week. In addition, plant staff visit the site daily. A telephone paging system notifies project personnel of operational problems via cellular telephones. Plant staff are generally within 30 minutes of the Project at all times. Lowell Tannery is classified as a low hazard dam.

Due to the low hazard classification of this dam, no Potential Failure Mode Analysis has been conducted at this site, and therefore, no Potential Failure Modes have been identified. The Dam Safety Surveillance and Monitoring Program and Report (DSSMP) defines the appropriate monitoring for the water retaining project works. The DSSMP for the Project was filed with the FERC in March 23, 2018.

In addition, Section 10(c) of the Federal Power Act (FPA) authorizes FERC to establish regulations requiring licensees to operate and properly maintain their Projects for the protection of life, health, and property. FERC Part 12 regulations include such safety measures as signage and exclusion devices.

KEI (USA) maintains a public safety plan for the Project, which depicts the public safety devices installed at the Project and their location.

2.2.2 Proposed Project Operation

KEI (USA) is proposing to continue operating the Lowell Tannery Project in a run-of-river mode. Therefore, KEI (USA) is proposing to eliminate the overall downstream minimum flow requirement of 150 cfs (or inflow if less) that is part of the current license. Operating in run-of-river requires that inflows and out flows from that project should be equal and maintaining aquatic habitat conditions downstream. All existing fishway passage flow requirements will be maintained as discussed in Section 2.2.1.

2.2.3 Proposed Environmental Measures

As discussed in Section 2.2.2, KEI (USA) does not propose any changes to the existing Project operations. Effects of the current operations on environmental resources are discussed in Exhibit E.

No additional environmental measures are proposed at this time.

2.3 Average Annual Generation

Project generation for the past five years (2016-2020) averaged 4,144 MWH; the monthly and yearly MWH totals are as follows:

Table 2.2 Monthly and Yearly Generation (MWH) for the Lowell Tannery Project

	January	February	March	April	May	June	July	August	September	October	November	December	Total
2016	650	595	736	689	428	157	0	0	0	0	73	391	3,719
2017	490	365	520	641	450	363	25	0	0	61	210	323	3,448
2018	554	574	402	726	628	212	137	0	0	13	569	585	4,400
2019	548	474	431	669	702	448	297	192	265	427	510	690	5,653
2020	556	331	475	670	593	54	0	0	0	38	110	673	3,500
Average	559.6	467.8	512.8	679	560.2	246.8	91.8	38.4	53	107.8	294.4	532.4	4,144

2.4 Estimated Average Head

The Project is operated as run-of-river. The normal operating head for the Project is 18 feet.

2.5 Flow Data

2.5.1 Hydraulic Capacity of the Project

The total maximum hydraulic capacity of the Lowell Tannery Project generating unit is 905 cfs, at an operating head of approximately 18 feet. The minimum hydraulic capacity of the unit is 90 cfs.

2.5.2 River Flow Data

The Passadumkeag River is not currently gaged by the USGS. Monthly and annual mean flow and flow duration statistics at the Lowell Tannery dam were generated using the USGS StreamStats tool (USGS 2021). StreamStats estimates flow statistics for ungaged streams in Maine using regression equations from Dudley (2015). The annual mean flow at the Lowell Tannery Project is estimated to be 562 cfs (Table 2.3). The highest monthly mean flows are in April (1,170 cfs) and May (1,270 cfs). The lowest monthly mean flows are in August (153 cfs) and September (135 cfs) (Table 2.3). Annual and monthly flow duration curves are included in Appendix A.

Table 2.3 Monthly and Annual Average Flow at the Lowell Tannery Project

Month	Average Flow (cfs)
January	412
February	368
March	500
April	1,170
May	1,270
June	488
July	236
August	153
September	135
October	364
November	656
December	657
Annual	562

Source: USGS 2021

2.6 Dependable Capacity

Due to the absence of useable storage associated run-of-river operations, the Project is entirely dependent upon available inflows for generation. The dependable capacity ratings as identified in the ISO New England 2021 Capacity, Energy, Loads, and Transmission (CELT) Report are 0.795 MW for the winter seasonal claimed capacity (SCC) and 0.308 MW for the "expected" summer peak.

2.7 Estimated Cost of the Project

KEI (USA) proposes to install upstream and downstream eel passage measures and relocation of the downstream fish passage discharge at the project. The capital costs associated with these measures is estimated to be $100,000 with no appreciable change to annual operation and maintenance costs or loss in generation.

3.0 PURPOSE OF THE PROJECT

The Lowell Tannery Project is operated for the production of hydroelectric power. The power generated by this Project is integrated into KEI (USA), and sold to Versant Power, formerly Emera Maine. Versant Power provides reliable high voltage electric power to approximately 159,000 people within the state of Maine.

4.0 ESTIMATED COST OF RELICENSING

KEI (USA) estimates that the cost of relicensing the Lowell Tannery Hydroelectric Project is approximately $400,000. This cost includes both internal administrative costs and external expenses (e.g., consultant costs) over the course of the traditional licensing process (TLP), but does not include costs for proposed protection, mitigation, and enhancement measures (i.e., fish passage facilities and minimum flows).

5.0 VALUE OF PROJECT POWER

The Lowell Tannery Hydroelectric Project is operated in run-of-river mode and is part of KEI's (USA) portfolio of generation supply options. Power generated from the Lowell Tannery Hydroelectric Project has an average value of $276,600.

6.0 ESTIMATED CHANGE IN PROJECT GENERATION

The Project will continue to operate in a run-of-river mode.

7.0 UNDEPRECIATED NET INVESTMENT (BOOK VALUE) OF THE PROJECT

The undepreciated net investment for the Lowell Tannery project is approximately $978,000 as of April 30, 2021. The annual operation and maintenance costs of running the Lowell Tannery Hydroelectric Project facility $85,135 with the annual administrative expenses being approximately $42,886.

8.0 ESTIMATED ANNUAL COST OF THE PROJECT

The total annual cost to operate the project, including administrative costs, insurance, operations and maintenance, general and other expenses is as follows:

- Administrative costs $42,886
- Insurance $17,039
- Operations and maintenance $68,096
- General and other expenses (Included in the above)

9.0 PROJECT SAFETY PROGRAM

Lowell Tannery is classified as a low hazard dam. Due to the low hazard classification of this dam, no Potential Failure Mode Analysis has been conducted at this site, and therefore, no Potential Failure Modes have been identified. The Lowell Tannery Project is remotely monitored and operated 24 hours a day, 7 days a week. In addition, plant staff visit the site daily. A telephone paging system notifies project personnel of operational problems via cellular telephones. Plant staff are generally within 30 minutes of the Project at all times. The Dam Safety Surveillance and Monitoring Program and Report (DSSMP) defines the appropriate monitoring for the water retaining project works. The DSSMP for the Project was filed with the FERC on March 23, 2018.

In addition, Section 10(c) of the Federal Power Act (FPA) authorizes FERC to establish regulations requiring licensees to operate and properly maintain their Projects for the protection of life, health, and property. FERC Part 12 regulations include such safety measures as signage and exclusion devices.

KEI (USA) maintains a public safety plan for the Project, which depicts the public safety devices installed at the Project and their location.

10.0 REFERENCES

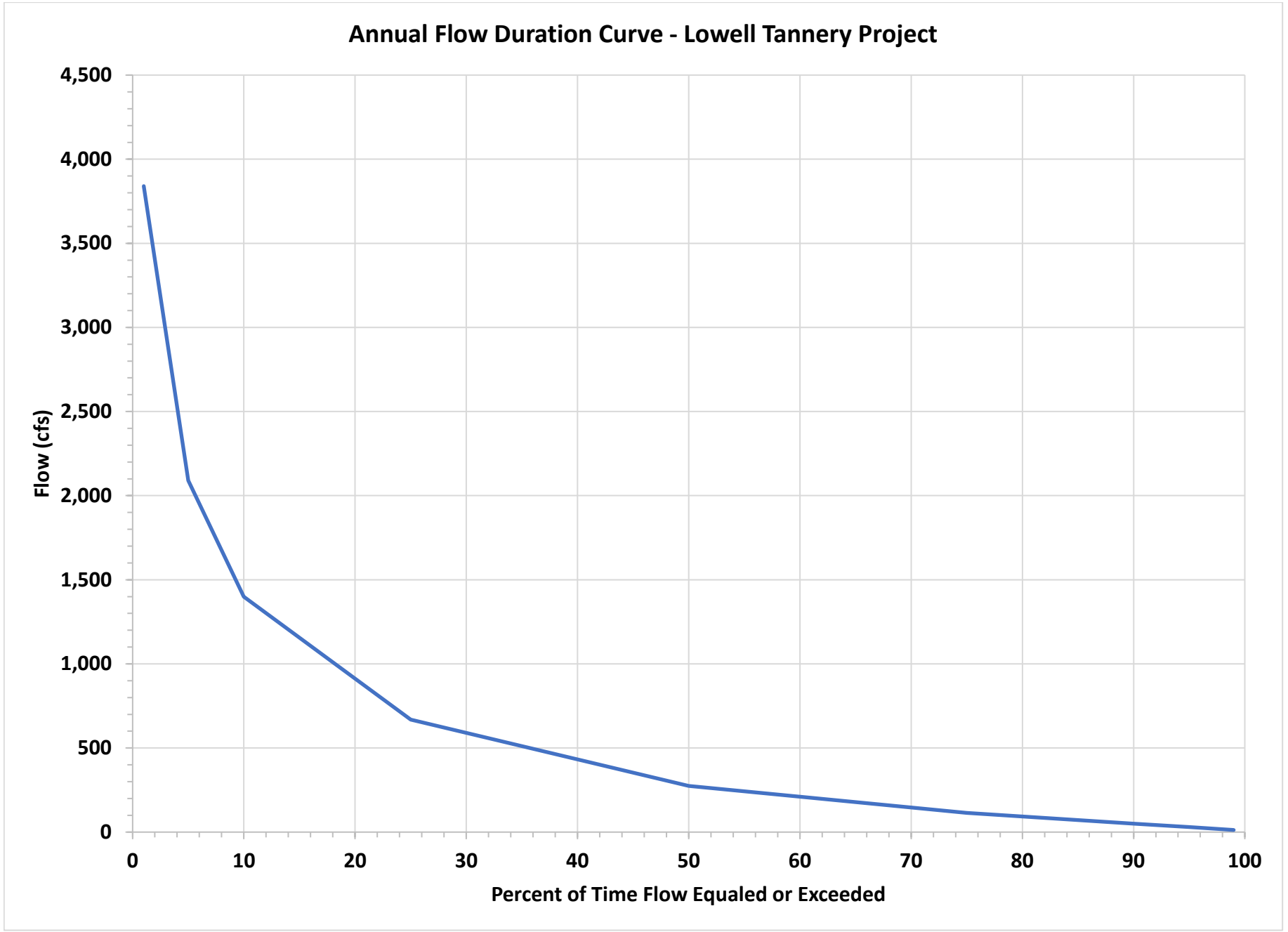
Federal Energy Regulatory Commission (FERC). 1983. Order Issuing License for Lowell Tannery Hydroelectric Project (FERC No. 4202). 25 FERC ¶62,134. Issued October 31, 1983.

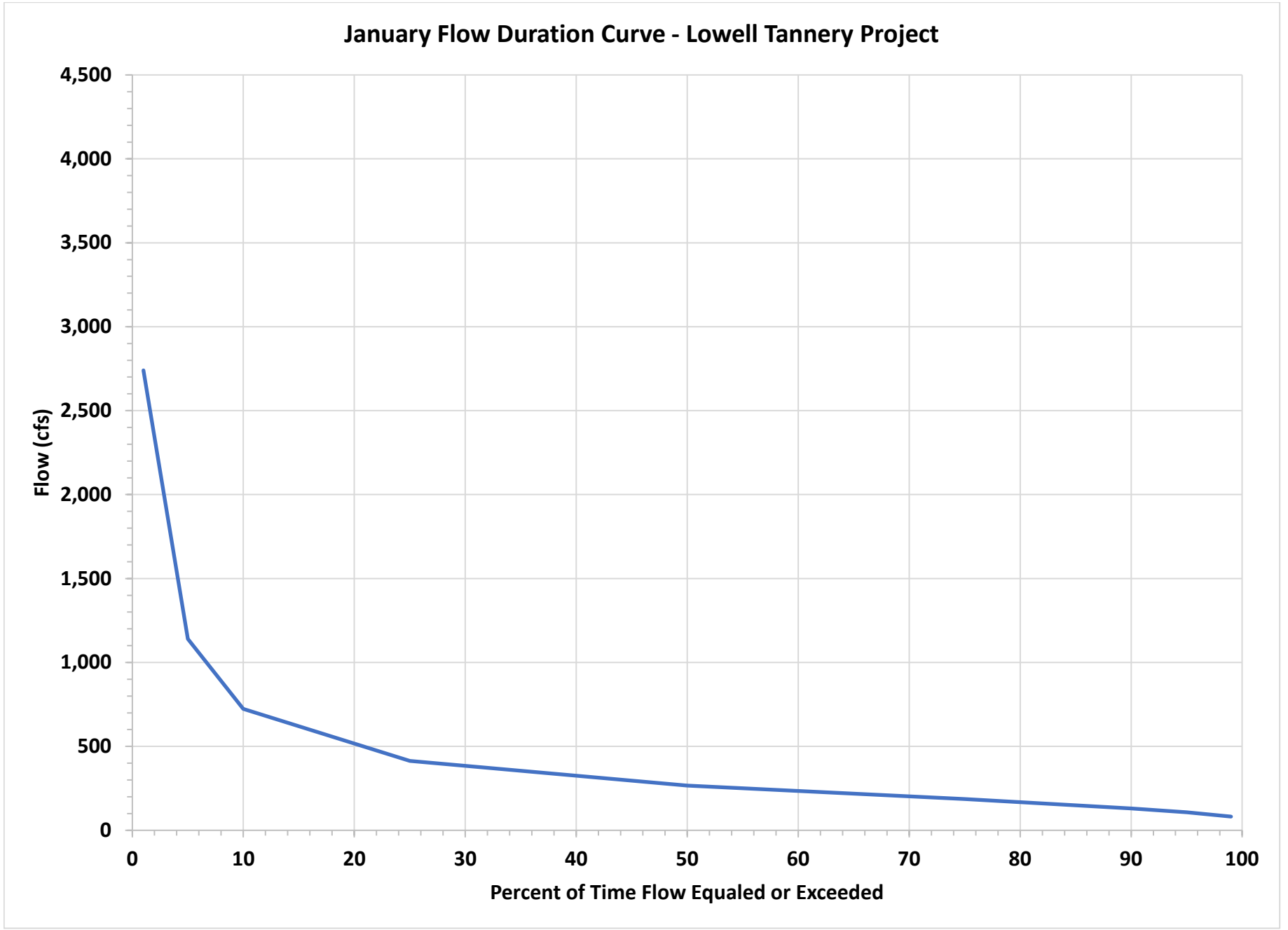
Federal Energy Regulatory Commission (FERC). 2014. Order Amending Licenses. [Online] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13577660. Accessed August 28, 2018.

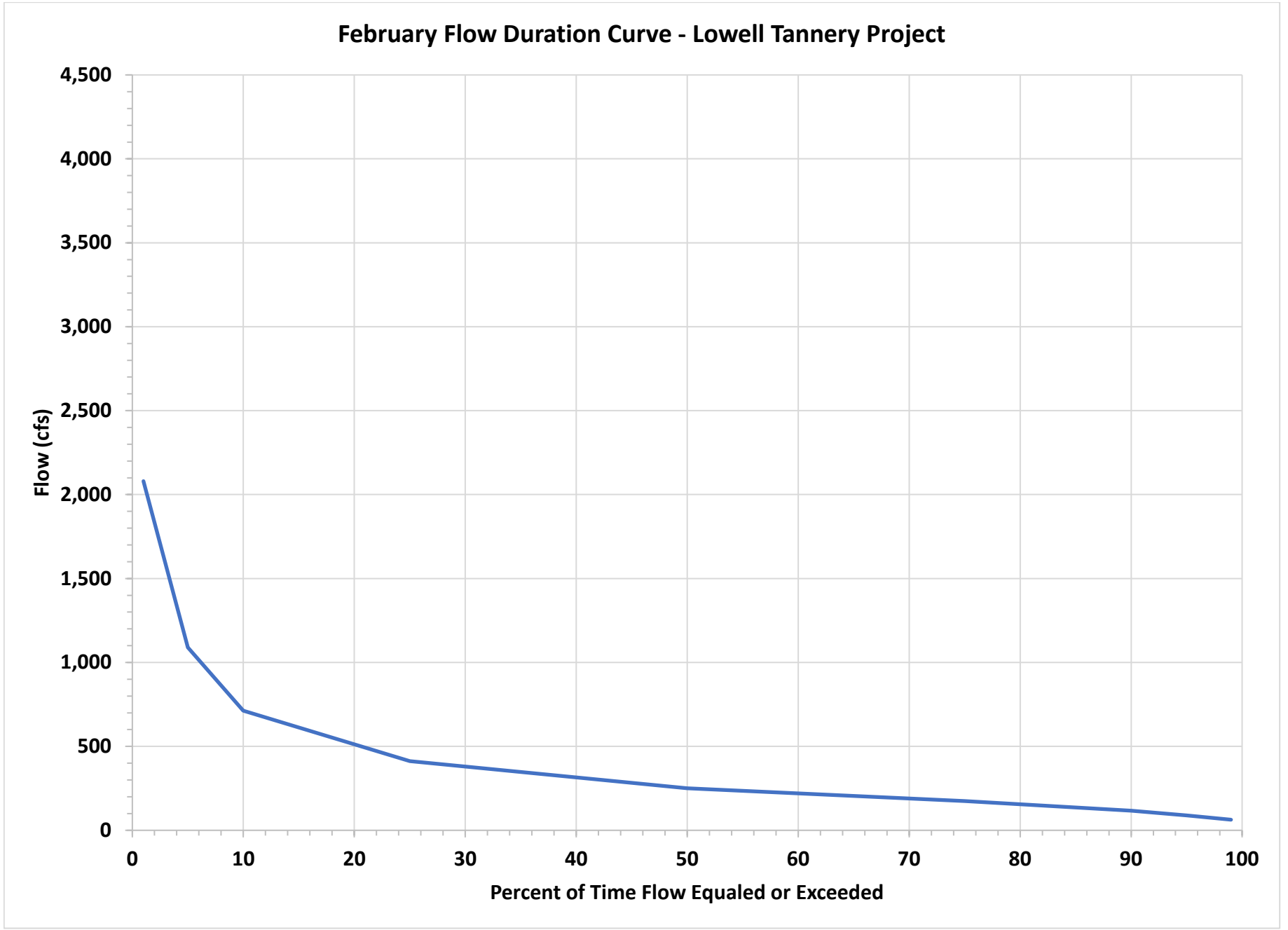
United States Geological Survey (USGS). 2021. StreamStats. [Online] URL: https://streamstats.usgs.gov/ss/. Accessed April 5, 2021.

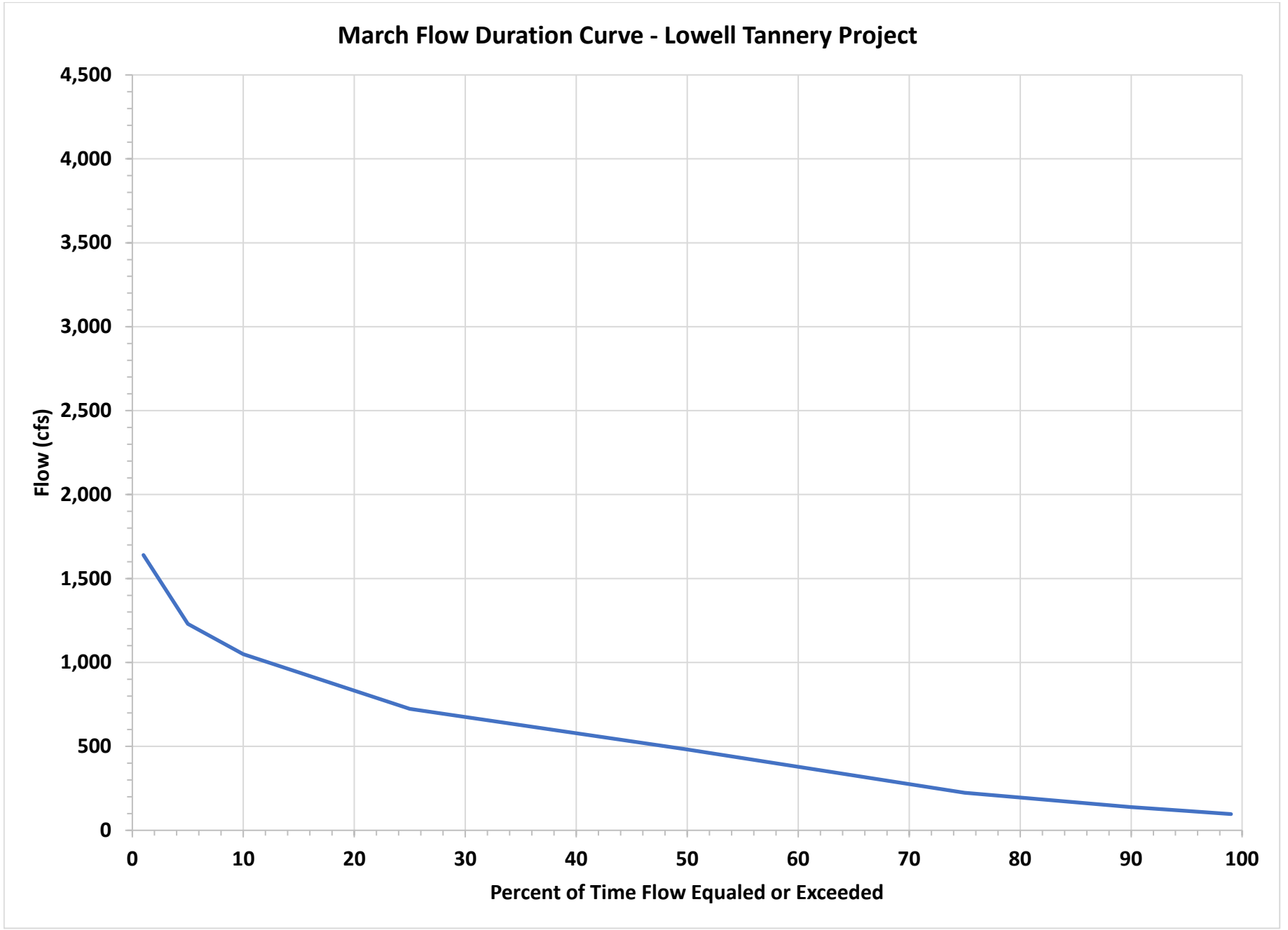
APPENDIX A

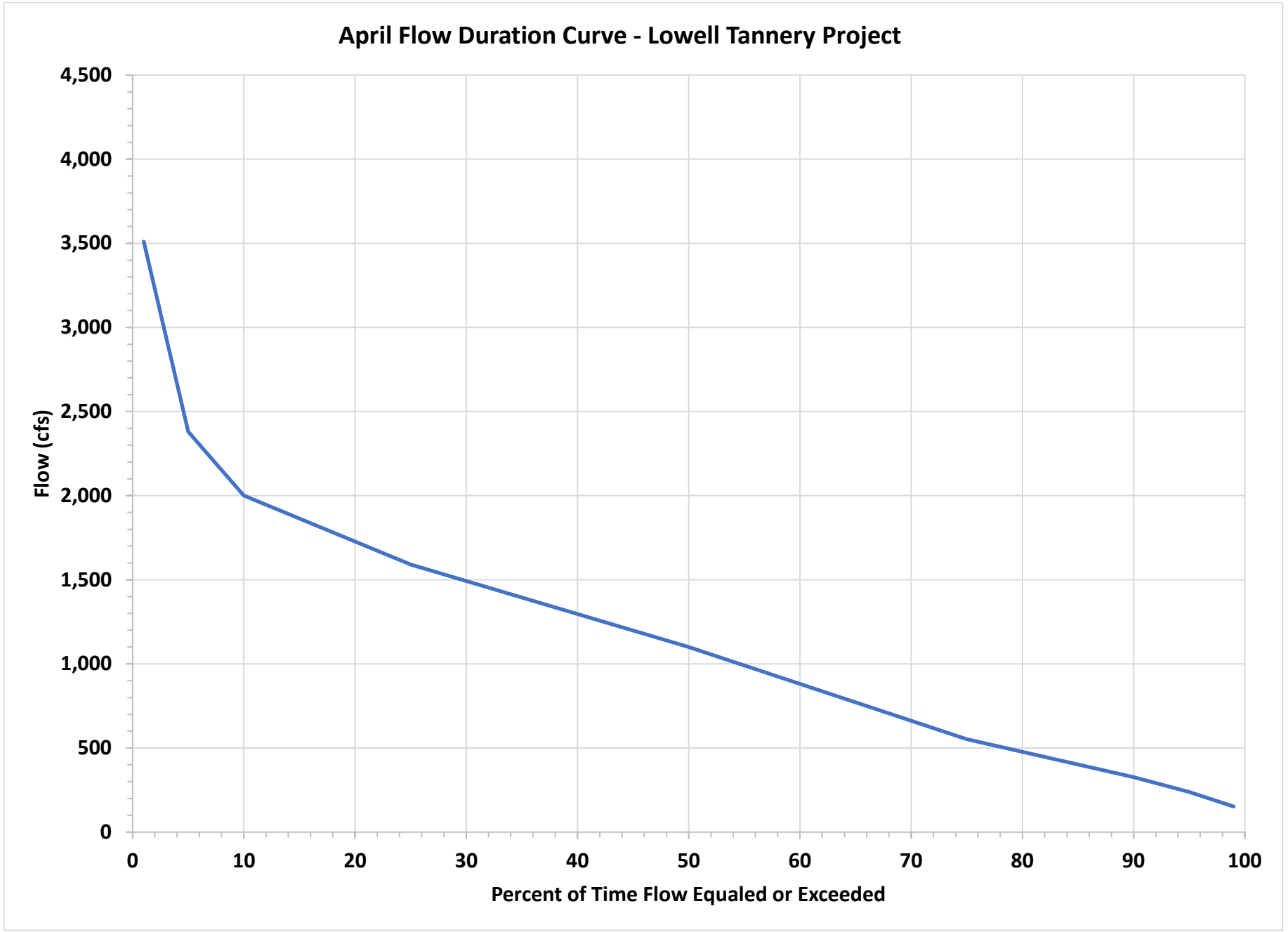
FLOW DURATION CURVES

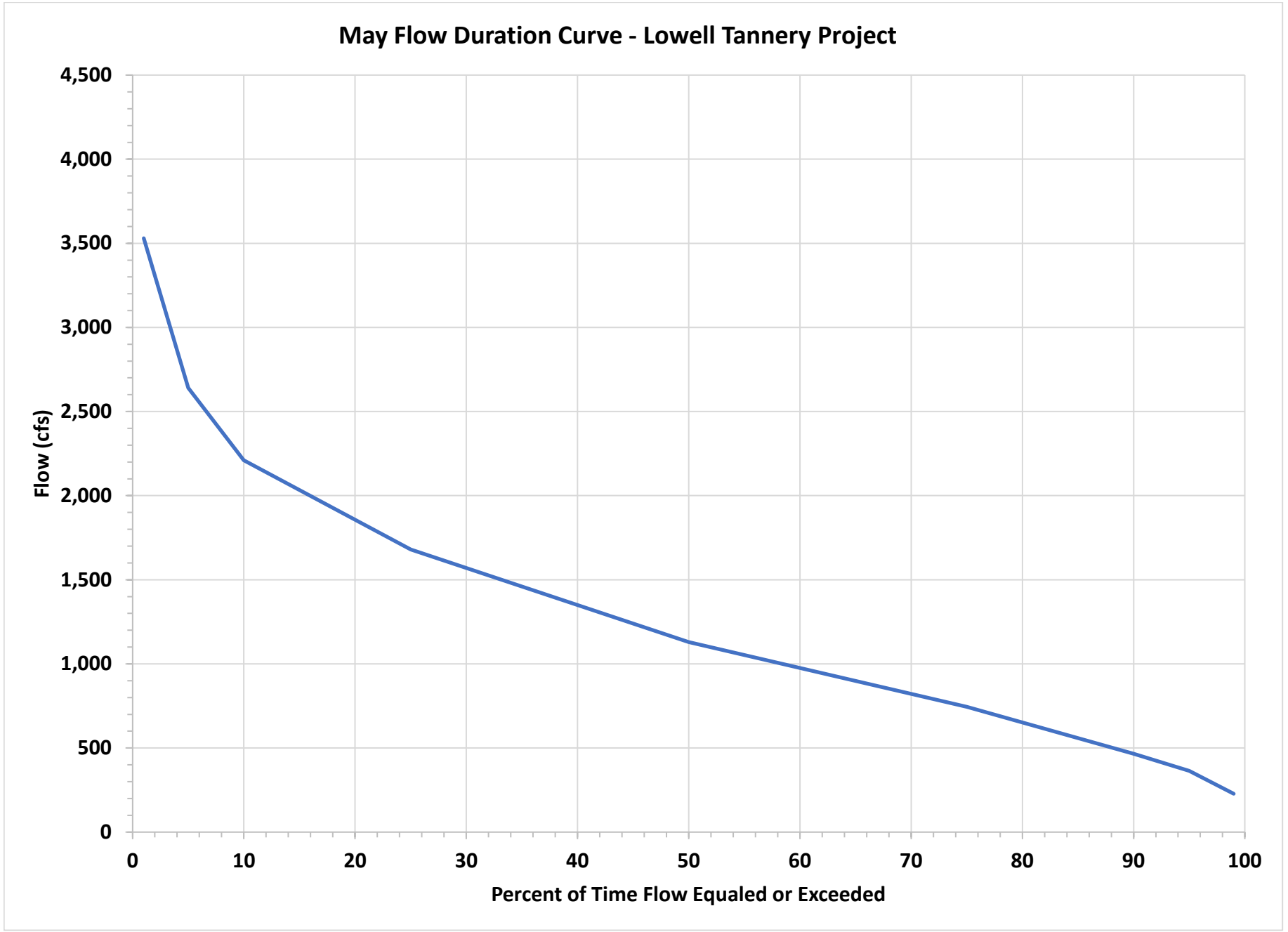

Annual Flow Duration Curve - Lowell Tannery Project
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

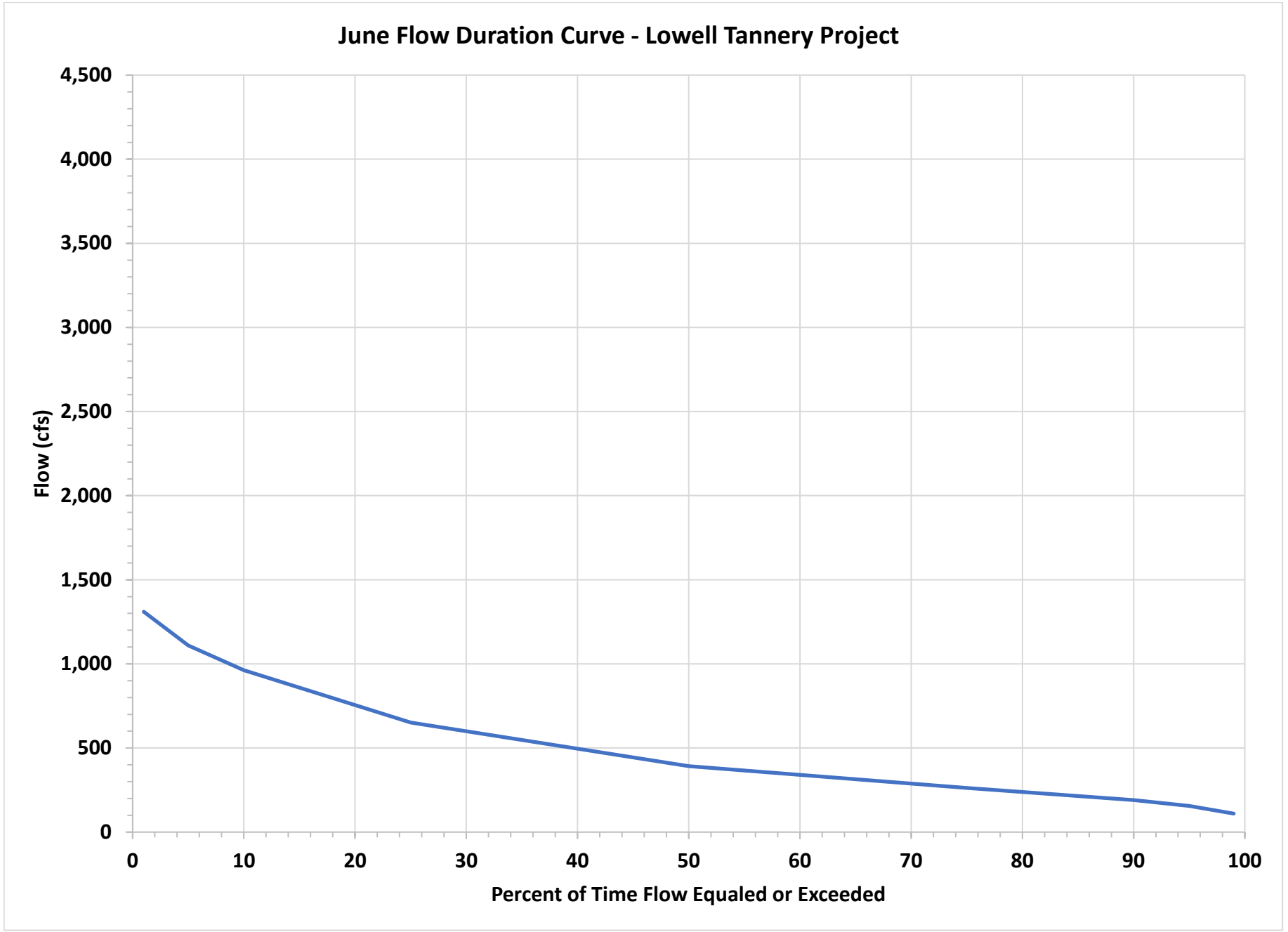

January Flow Duration Curve - Lowell Tannery Project
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

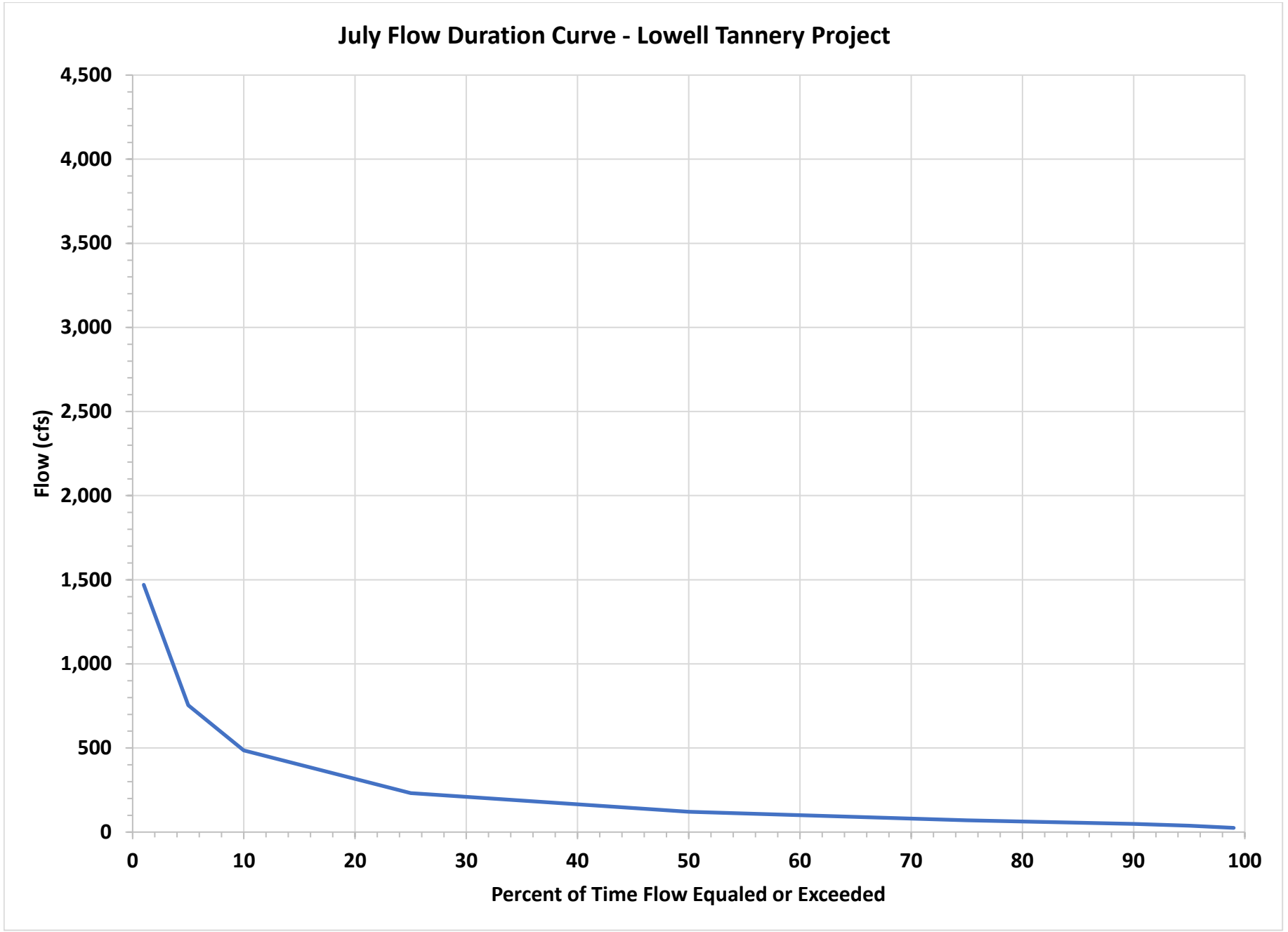

February Flow Duration Curve - Lowell Tannery Project
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

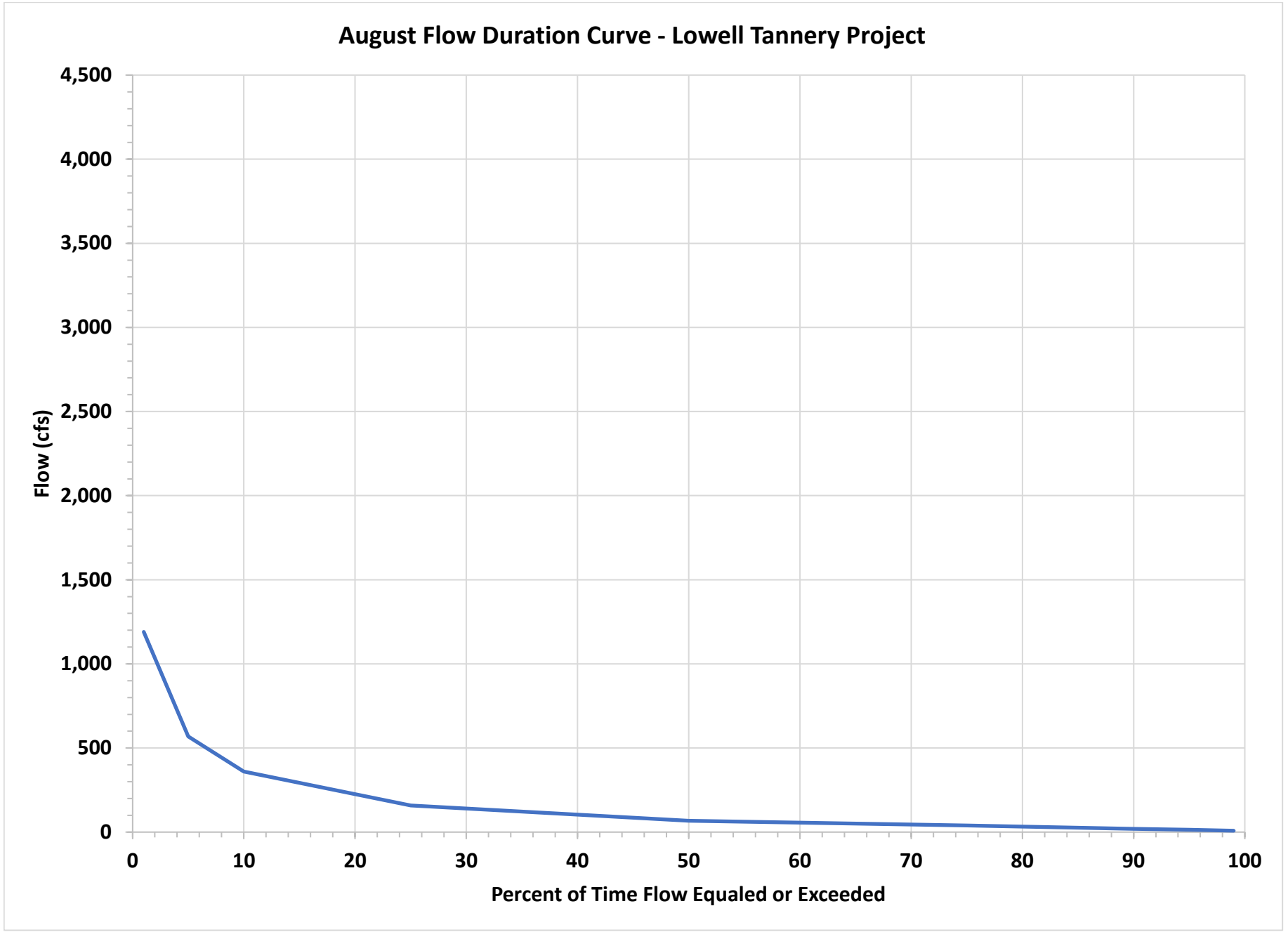

March Flow Duration Curve - Lowell Tannery Project
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

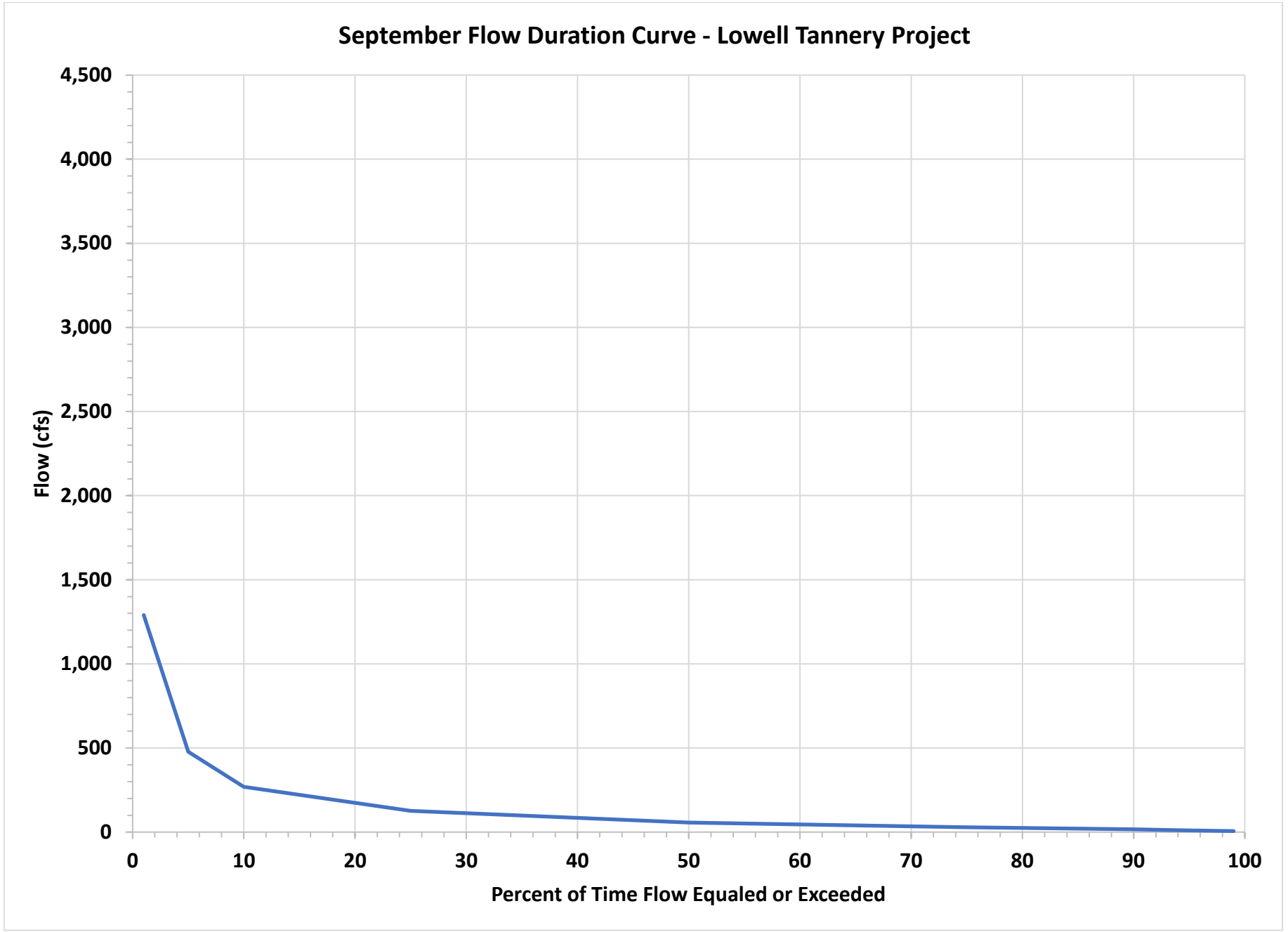

April Flow Duration Curve - Lowell Tannery Project
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

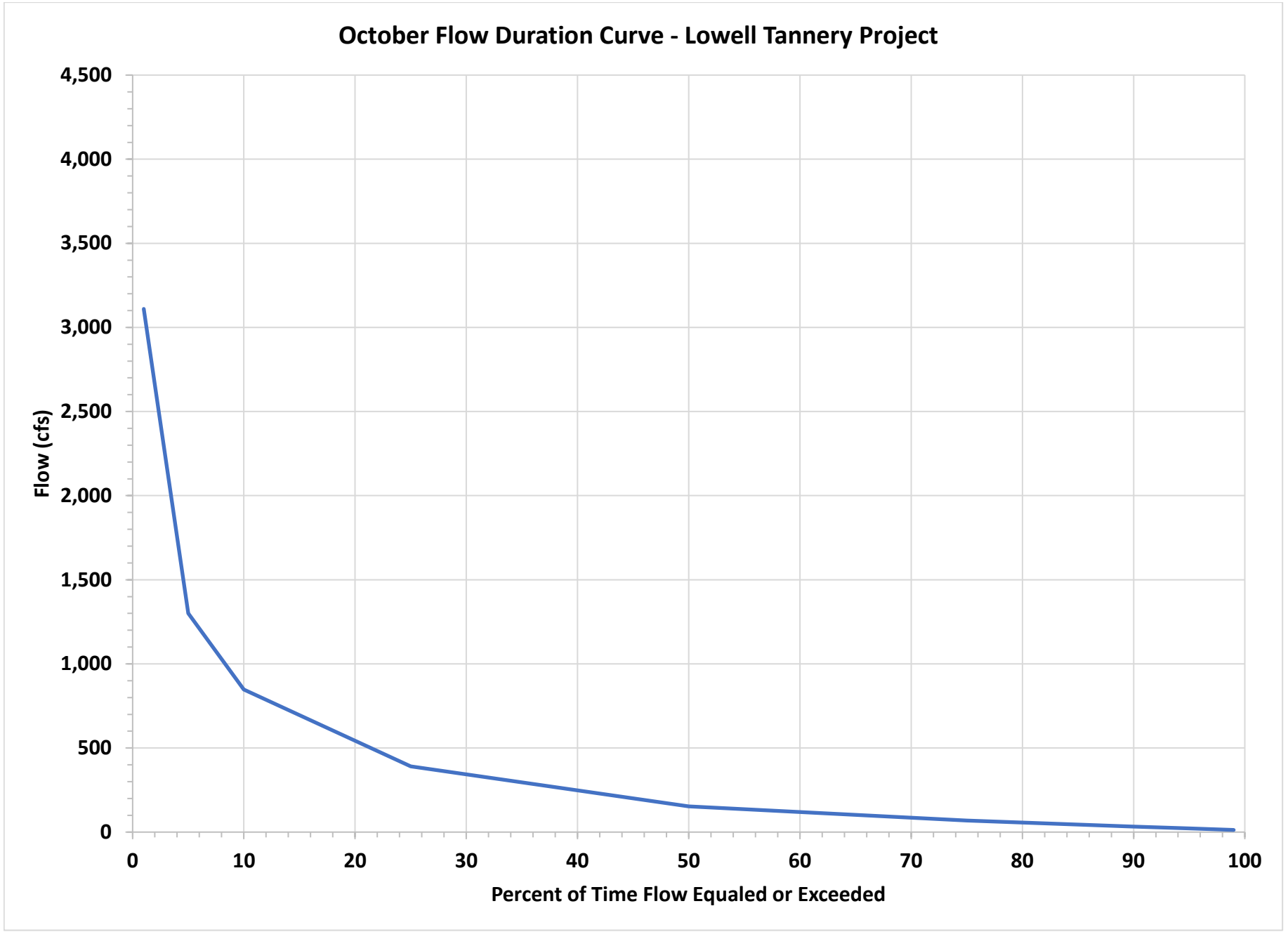

May Flow Duration Curve - Lowell Tannery Project
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

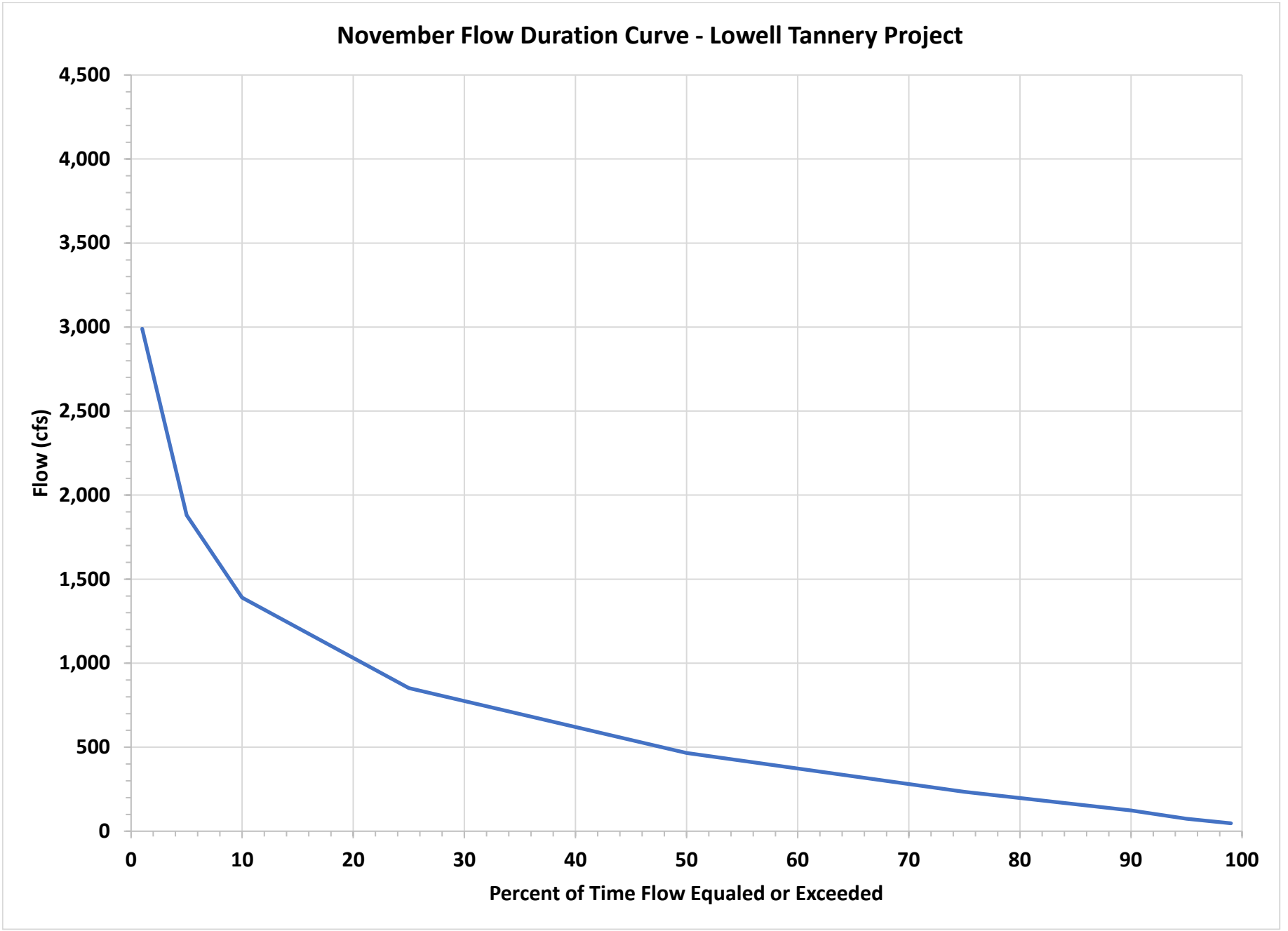

June Flow Duration Curve - Lowell Tannery Project
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

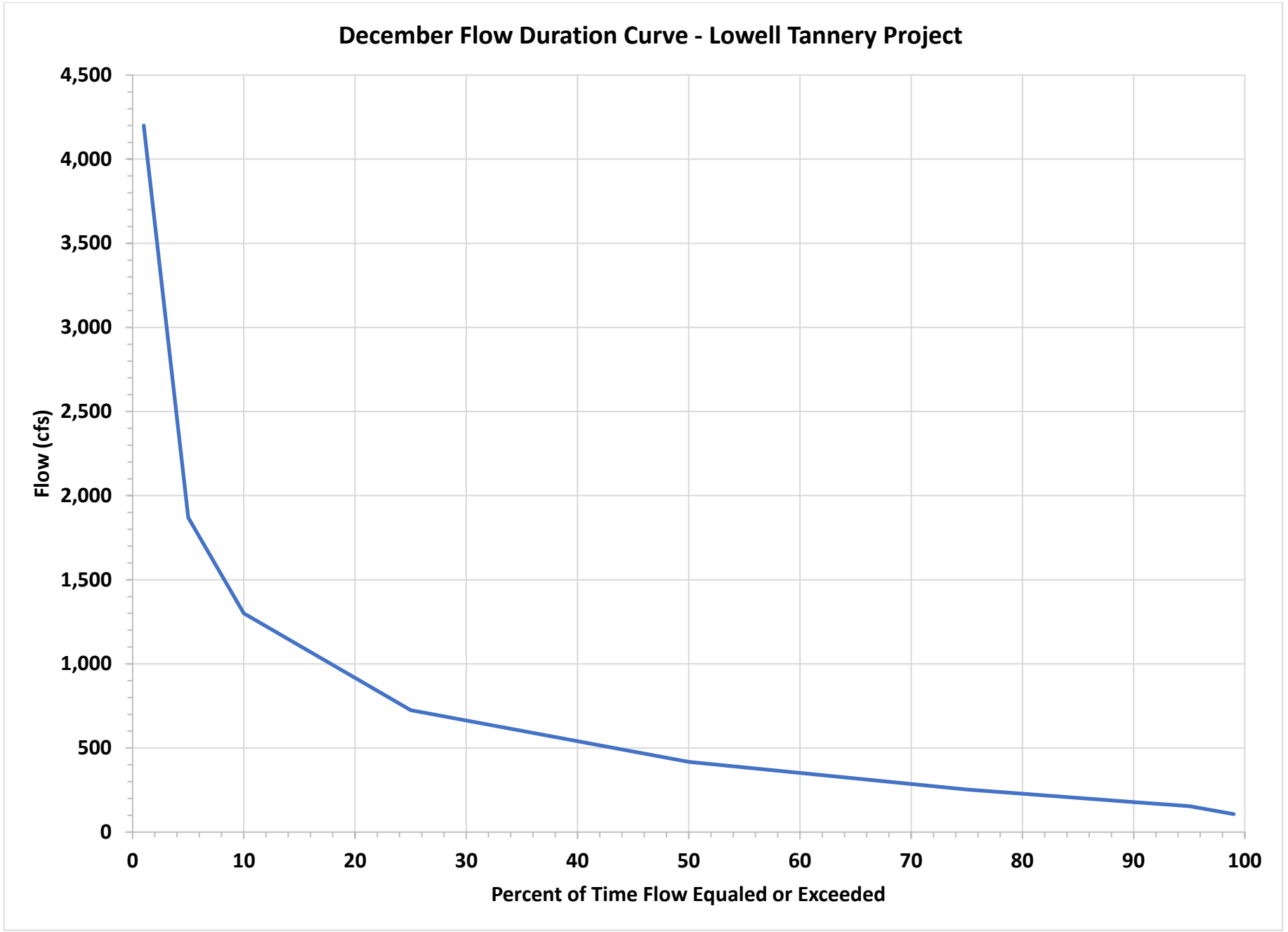

July Flow Duration Curve - Lowell Tannery Project
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


August Flow Duration Curve - Lowell Tannery Project
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


September Flow Duration Curve - Lowell Tannery Project
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


October Flow Duration Curve - Lowell Tannery Project
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


November Flow Duration Curve - Lowell Tannery Project
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


December Flow Duration Curve - Lowell Tannery Project
Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

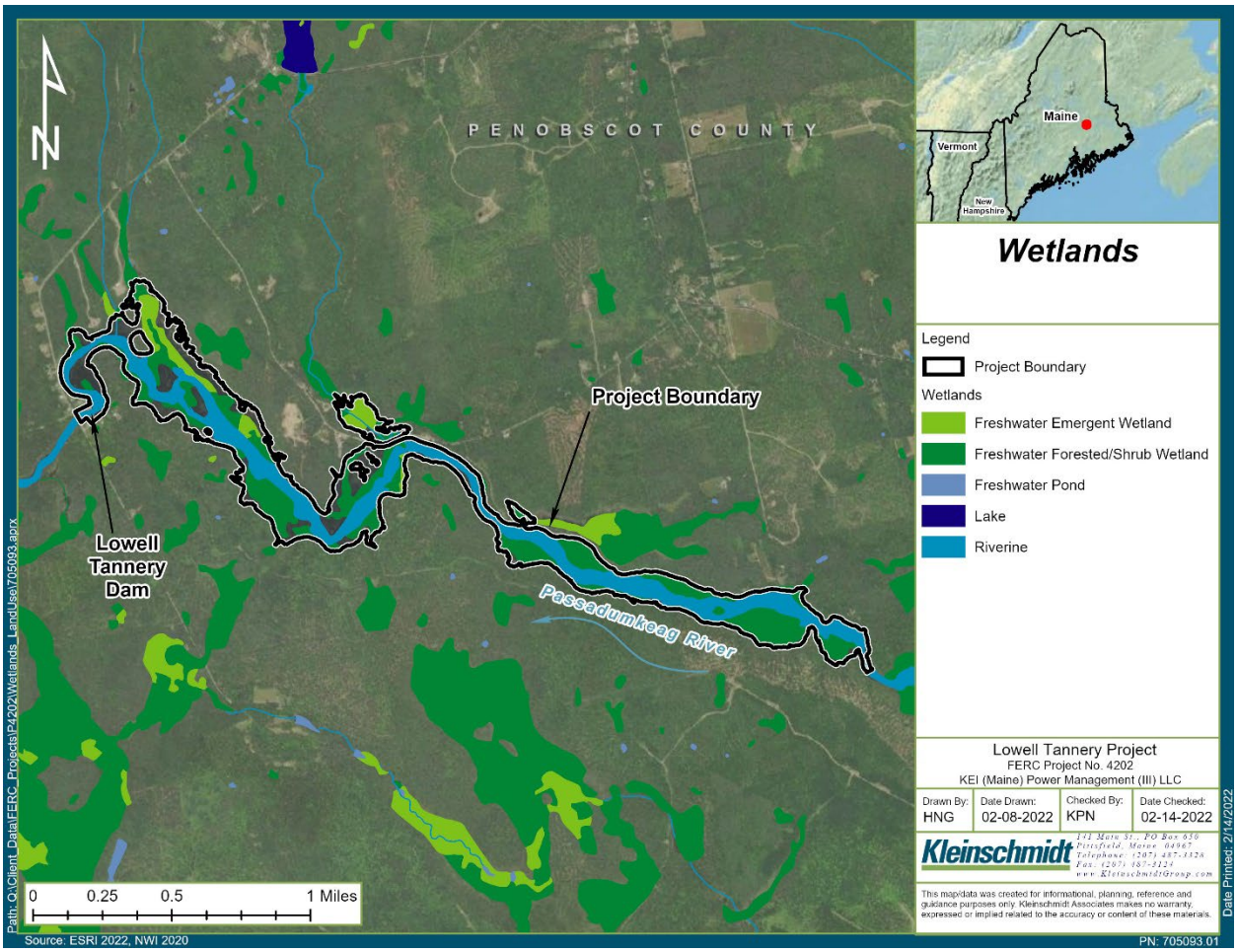
APPENDIX B

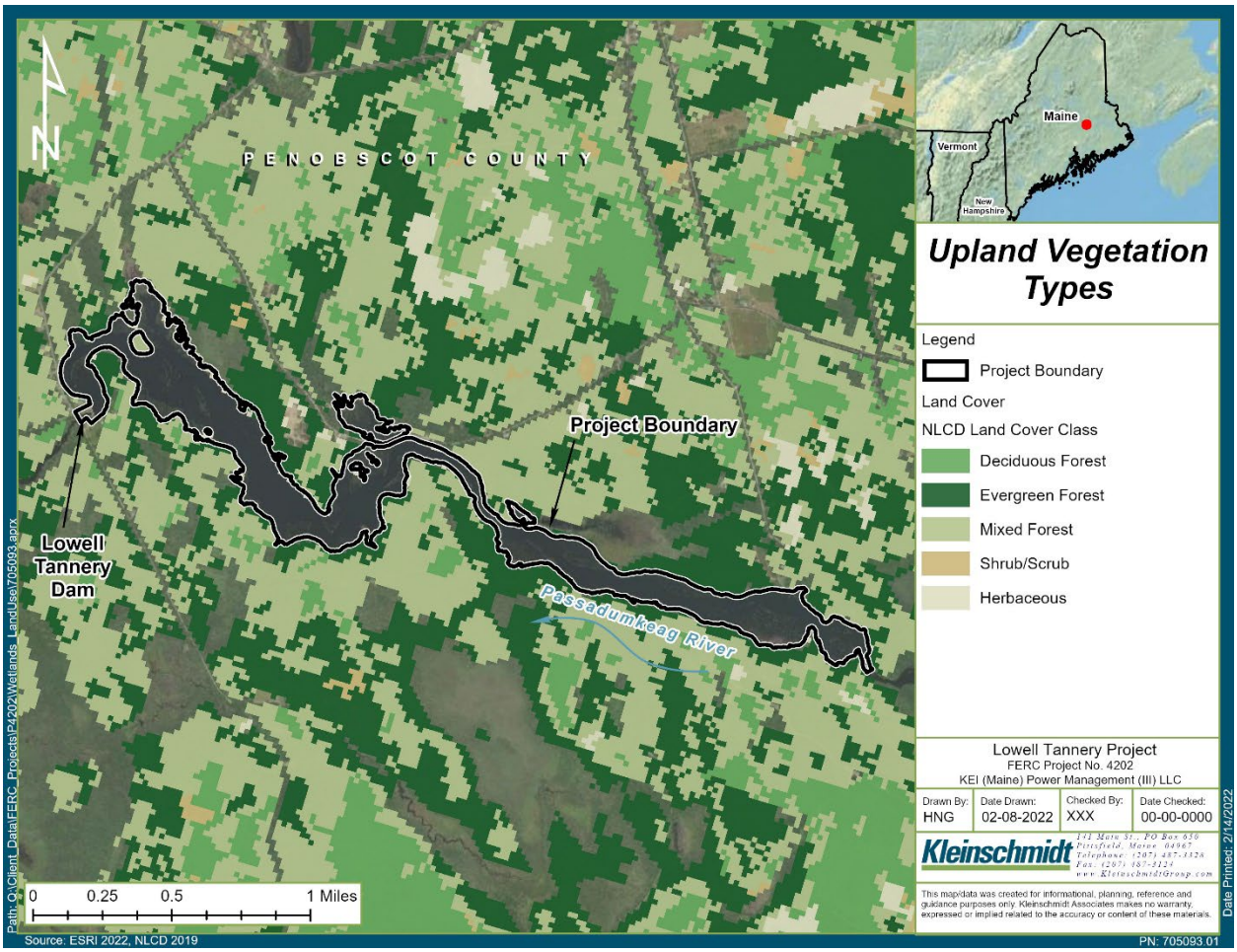
SINGLE LINE DIAGRAM

FILED SEPARATELY AS CEII

ATTACHMENT G

TERRESTRIAL AND WETLANDS MAPPING AND MONARCH DATA


N
PENOBSCOT COUNTY
Project Boundary
Lowell Tannery Dam
Passadumkeag River
0 0.25 0.5 1 Miles
Source: ESRI 2022, NWI 2020
Path: Q:\Client_Data\FERC_Projects\P4202\Wetlands_LandUse\705093.aprx
Maine
Vermont
New Hampshire
Wetlands
Legend
Project Boundary
Wetlands
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Riverine
Lowell Tannery Project
FERC Project No. 4202
KEI (Maine) Power Management (III) LLC
Drawn By: HNG
Date Drawn: 02-08-2022
Checked By: KPN
Date Checked: 02-14-2022
Kleinschmidt
This mapdata was created for informational, planning, reference and guidance purposes only. Kleinschmidt Associates makes no warranty, expressed or implied related to the accuracy or content of these materials.
PN: 705093.01
Date Printed: 2/14/2022


N
PENOBSCOT COUNTY
Project Boundary
Lowell Tannery Dam
Passadumkeag River
0 0.25 0.5 1 Miles
Source: ESRI 2022, NLCD 2019
Maine
Vermont
New Hampshire
Upland Vegetation Types
Legend
Project Boundary
Land Cover
NLCD Land Cover Class
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Herbaceous
Lowell Tannery Project
FERC Project No. 4202
KEI (Maine) Power Management (III) LLC
Drawn By: HNG
Date Drawn: 02-08-2022
Checked By: XXX
Date Checked: 00-00-0000
Kleinschmidt
This mapdata was created for informational, planning, reference and guidance purposes only. Kleinschmidt Associates makes no warranty, expressed or implied related to the accuracy or content of these materials.
PN: 705093.01
Path: Q:\Client_Data\FERC_Projects\P4202\Wetlands_LandUse\705093.aprx
Date Printed: 2/14/2022

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

Penobscot 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

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[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

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

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page 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 Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Atlantic Salmon Salmo salar There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/2097	Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

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

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 below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

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

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (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 below. 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 E-bird data mapping tool (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 below.

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.)
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. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31

Evening Grosbeak Coccothraustes vespertinus — Breeds May 15 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

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.

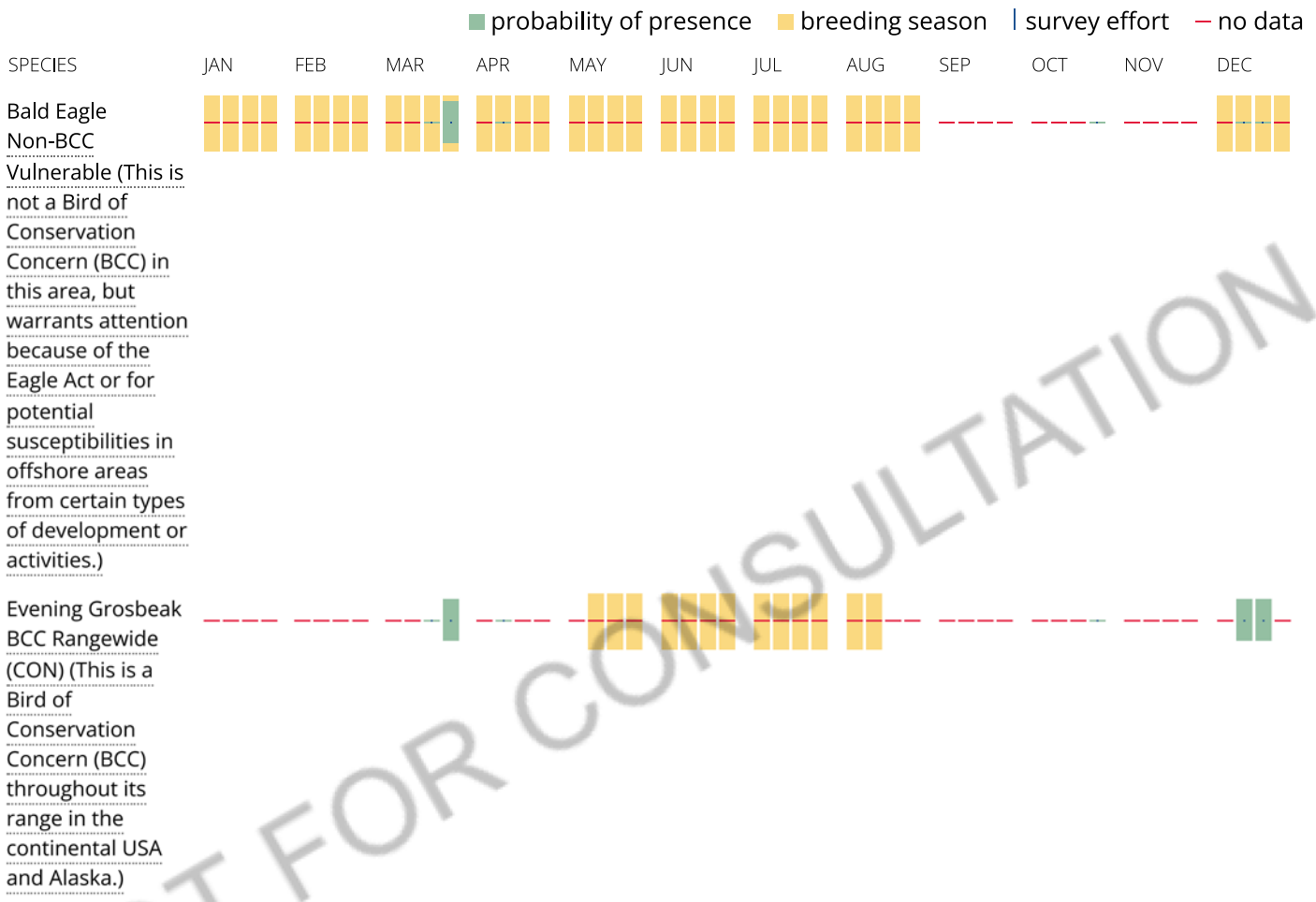
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

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.



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 Birds of Conservation Concern (BCC) 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 Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets 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 (Eagle Act 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 AKN Phenology Tool.

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 Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

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: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. 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 Birds of Conservation Concern (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 Eagle Act 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 Northeast Ocean Data Portal. 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 NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf 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 Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit 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 National Wildlife Refuge 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 NWI wetlands 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.S. Army Corps of Engineers District.

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:

RIVERINE

R2UBH

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

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.

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.

ATTACHMENT H

REVISED EXHIBIT E – GEOLOGY AND SOILS ONLY

4.7 Geology and Soils

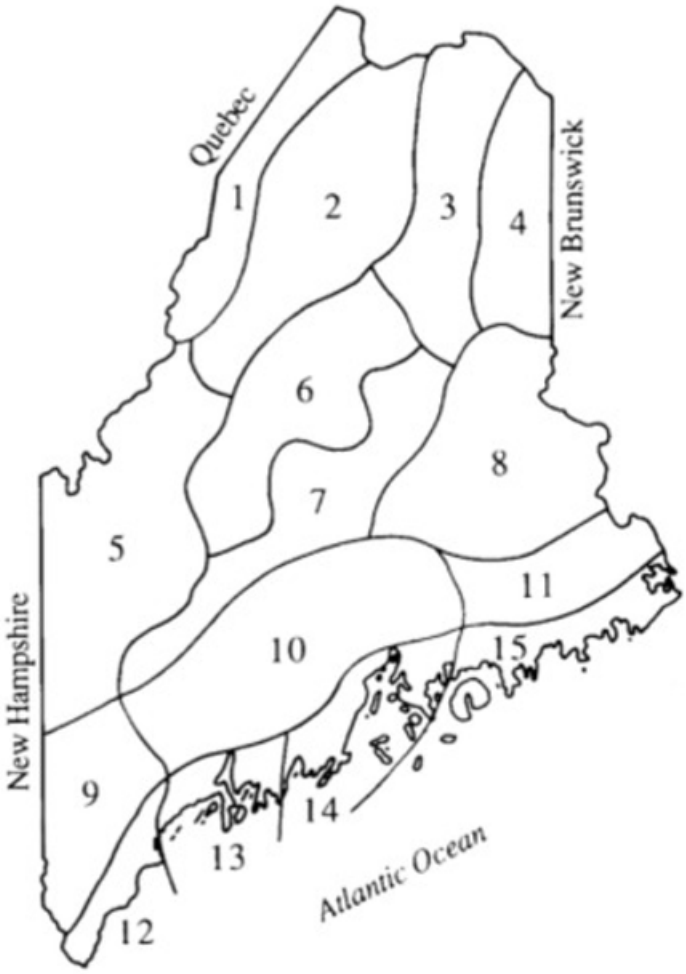
4.7.1 Affected Environment

Historically, Maine has been divided into two or three ecoregions, however more recently, the state has been delineated into 15 biophysical regions, which are based on climate variables, topography and soil characteristics (Figure 4.4). The Project is located in the Eastern Interior Biophysical Region of Maine. This region is part of the Northeastern Mixed Forest Province and the Fundy Coastal and Interior Ecoregion Section (MFIGP 2016). The Eastern Interior Biophysical Region is 98 percent forested, with 44 percent of those acres categorized as spruce-fir forest type and also include intolerant communities to semi-rich hardwoods (MFIGP 2016 and MDC 2009).

This area is identified by its low relief sections with elevations ranging from 200 to 600 feet – except for a few taller hills. The region contains the largest concentration of peatlands, marshes, and swamps in Maine and its many lakes, rivers and associated wetlands (MDC 2009).

The general topography of the state is presented in Figure 4.5. The highest mountains in Maine are Mount Katahdin, at an elevation of 5,267 feet, followed by Sugarloaf Mountain, at 4,237 feet (MDACF, 2018). The tallest peak in Penobscot County is East Turner Mountain in Maine Transit 4 Region 8 (T4 R8 WELS). East Turner Mountain is 2,455 feet high and is located approximately 54 miles north of the Project (Peakbagger, 2018). The topography of the project vicinity, Penobscot County, is heavily forested with low, rolling hills. Penobscot County contains or boards 3,605 lakes and ponds as well as approximately 5,180 miles of rivers and streams (USGS, 2007).

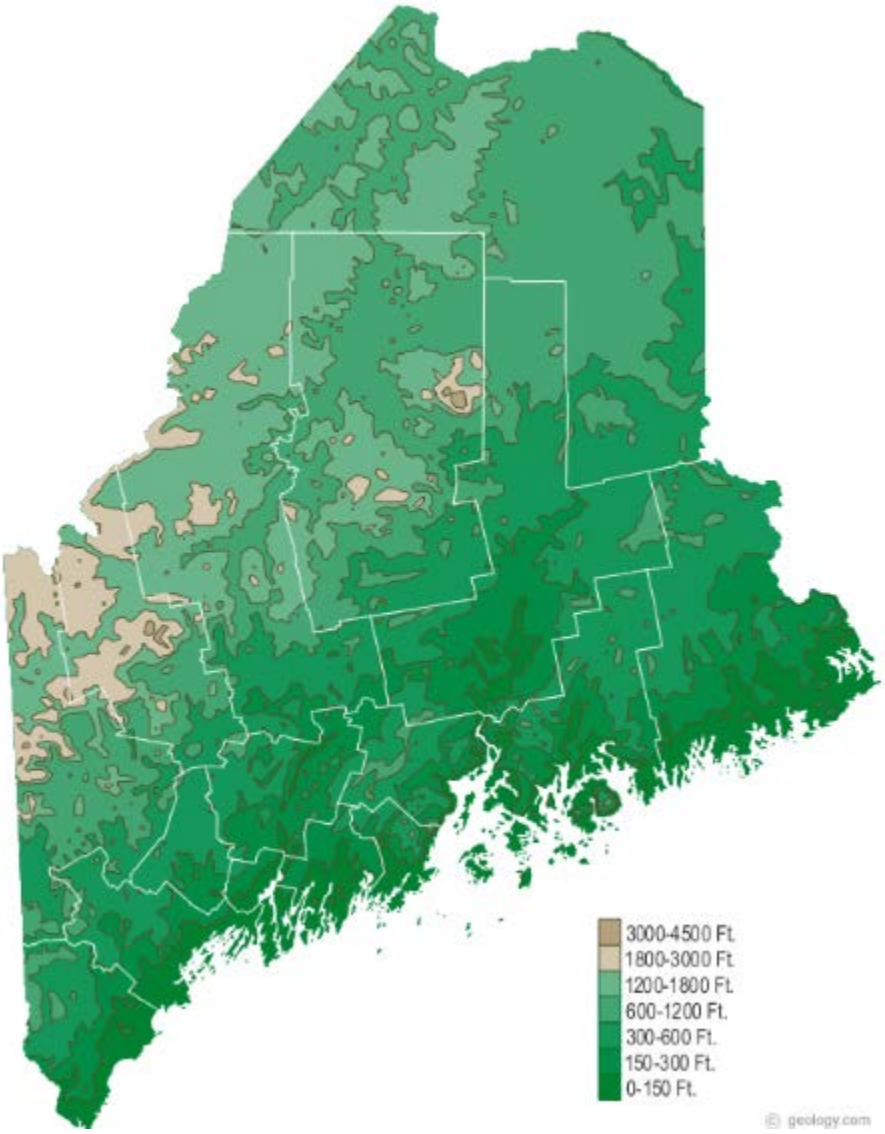
Figure 4.1 Geographical Provinces of Maine



1. Boundary Plateau
2. Saint John Uplands
3. Aroostook Hills
4. Aroostook Lowlands
5. Western Mountains
6. Central Mountains
7. West Foothills
8. Eastern Lowlands
9. Southwest Interior
10. Central Interior
11. Eastern Interior
12. South Coastal Region
13. Midcoast Region
14. Penobscot Bay Region
15. East Coastal Region

Source: Wilson 2017, modified

Figure 4.2 General Topography of Maine



Source: GNI 2018

4.7.1.1 Bedrock Geology and Physiography

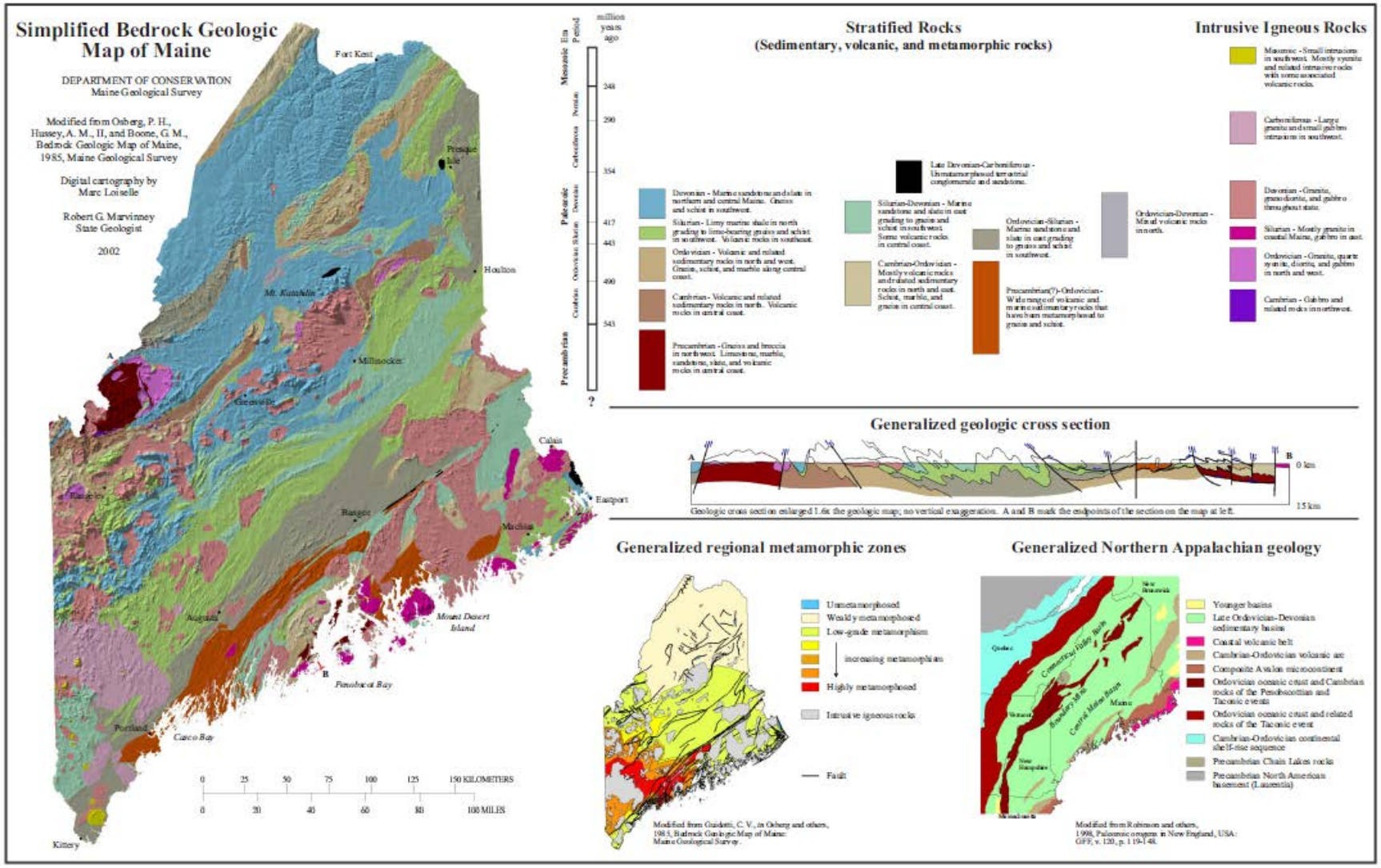
Scouring of thick glacial ice is responsible for rounding hills and carving lake basins throughout the region. Soils in the region are heavily influenced by this glacial history and tend to be coarse, and well drained. Waterbodies within the region drain to the Downeast rivers, including the St. Croix, Machias, and Penobscot Rivers (MDC 2009). Obscuring the bedrock geology throughout the region is a thick sequence of glacial units, deposited during both the advance and melting of the last great ice sheet. Much of the landscape is covered in till dating from this time. Other glacial features include eskers which were formed by water flowing through tunnels in the glacier, depositing coarse sediment (MDC 2009).

Bedrock near the Project is composed of two stratified rock formations, Silurian and Ordovician-Silurian (MDACF 2018) (Figure 4.6).

Stratified Rocks	Definition
Silurian	Limy marine shale in north grading to lime-bearing gneiss and schist in southwest, volcanic rocks in southeast.
Ordovician-Silurian	Marine sandstone and slate in east grading to gneiss and schist in southwest.

Source: MDACF 2018

Figure 4.3 Bedrock geology of Maine



Source: MDACF 2018

4.7.1.2 Soils and Rock Types

Maine soils were formed when the last glacier in Maine melted approximately 12,500 years ago and moved across the state in a northwest to southeasterly direction. Rock fragments and soil material were deposited as till, or as water-sorted sediments in streams, rivers, lake and the ocean (Figure 4.7). Land, depressed by the glacier, rebounded slowly, creating a complex pattern of soils derived from till, sediments, sands, and gravel (Ferwerda et. al, 1997).

Penobscot County is composed of mainly loamy soils formed in till derived mainly from slate, phyllite, metasandstone, and schist. Soil types within Penobscot County are included in Table 4.2) (Ferwerda et. al, 1997). Specifically, within the project vicinity, there is a wide array of soil types, as depicted in Figure 4.7.

Table 4.1 Soils Types in Penobscot County, Maine

Soil Type	Composition	Percentage in Maine
Telos-Monarda-Monson-Elliotsville	Loamy soils formed in till derived mainly from slate, phyllite, metasandstone, and schist.	18%
Danforth-Masardis-Shirley	Loamy and sandy soils formed in loose till or gravel deposits derived mainly from fine grained metasandstone and lesser amounts of granite, gneiss and schist	1%
Dixfield-Colonel-Lyman-Brayton	Loamy soils are formed in till derived mainly from schist, granite, phyllite and gneiss	23%
Dixmont-Thorndike-Monarda-Burnham	Loamy soils formed in till derived mainly from slate, phyllite, and metasandstone	3%
Hermon-Brayton-Dixfield	Sandy and loamy soils formed in till derived mainly from granite, gneiss, schist, and phyllite	4%

Soil Type	Composition	Percentage in Maine
Masardis-Stentson-Adams	Sandy soils formed in sandy or gravelly glaciofluvial materials derived mainly from slate, shale, phyllite and some granite, gneiss and limestone	2%
Swanville-Boothbay-Biddeford	Loamy and clayey soils formed in glaciolacustrine or glaciomarine sediments	4%
Vassalboro-Sebago-Wonsqueak	Organic material	1%

Source: Ferwerda et. al, 1997

Figure 4.4 Soils Surrounding the Project

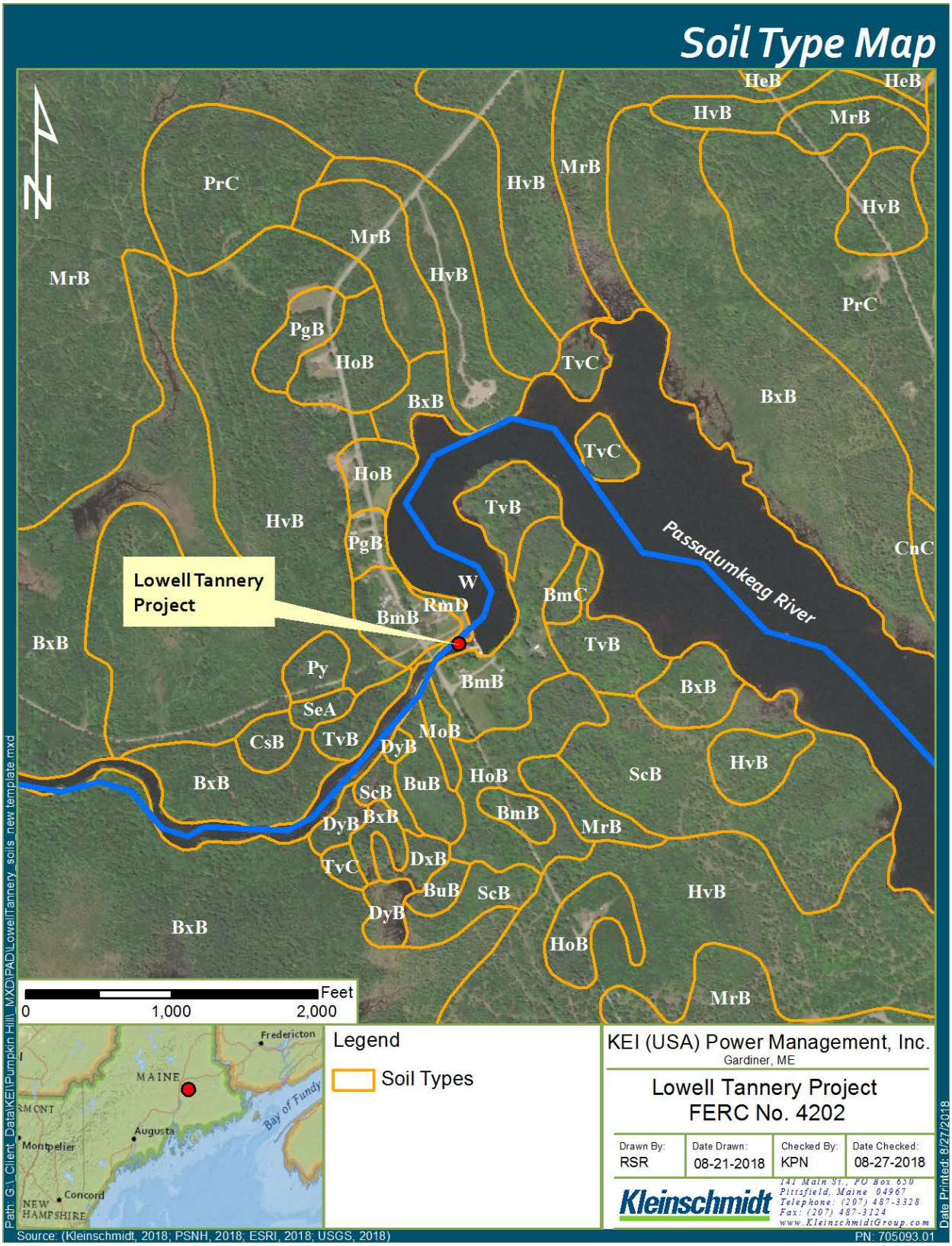


Table 4.2 List of Soils by Type, Size (Acres), and Percent within a 1-mile Radius of the Project

Soil Name	Soil Type	Area (acre)	Percent of Area (%)
AgA	Allagash fine sandy loam, 0 to 2 percent slopes	7	0.4
AgB	Allagash fine sandy loam, 2 to 8 percent slopes	7	0.3
BmB	Bangor silt loam, moderately deep, 2 to 8 percent slopes	25	1.2
BmC	Bangor silt loam, moderately deep, 8 to 15 percent slopes	2	0.1
BoA	Biddeford silt loam, 0 to 3 percent slopes	14	0.7
BuB	Buxton silt loam, 2 to 8 percent slopes	13	0.7
BxB	Buxton, Scantic, and Biddeford stony silt loams, 0 to 8 percent slopes	479	23.9
CnA	Colton gravelly sandy loam, dark materials, 0 to 2 percent slopes	22	1.1
CnB	Colton gravelly sandy loam, dark materials, 2 to 8 percent slopes	14	0.7
CnC	Colton gravelly sandy loam, dark materials, 8 to 15 percent slopes	38	1.9
CsB	Colton loamy fine sand, dark materials, 2 to 8 percent slopes	3	0.2
DxB	Dixmont silt loam, 2 to 8 percent slopes	3	0.1
DyB	Dixmont very stony silt loam, 2 to 8 percent slopes	6	0.3
HeB	Hermon very stony sandy loam, 2 to 8 percent slopes	21	1.1
HoB	Howland gravelly loam, 0 to 8 percent slopes	45	2.2
HvB	Howland very stony loam, 0 to 8 percent slopes	392	19.5
Lk	Limerick silt loam	25	1.2
Mn	Mixed alluvial land	15	0.8
MoB	Monarda silt loam, 0 to 8 percent slopes	2	0.1
MrB	Monarda and Burnham very stony silt loams, 0 to 8 percent slopes	329	16.4
PgB	Plaisted gravelly loam, 2 to 8 percent slopes	9	0.5
PrC	Plaisted very stony loam, 5 to 15 percent slopes	119	5.9
PrE	Plaisted very stony loam, 15 to 45 percent slopes	26	1.3
Py	Podunk fine sandy loam	20	1.0
RaB	Red Hook and Atherton silt loams, 0 to 8 percent slopes	13	0.7
RdB	Red Hook and Atherton fine sandy loams, 0 to 8 percent slopes	42	2.1
RmD	Rockland, thorndike material, strongly sloping	1	0.1
ScB	Scantic silt loam, 0 to 8 percent slopes	69	3.4
SeA	Stetson fine sandy loam, 0 to 2 percent slopes	2	0.1
SeB	Stetson fine sandy loam, 2 to 8 percent slopes	3	0.1
TkC	Thorndike very rocky silt loam, 8 to 15 percent slopes	30	1.5
TvB	Thorndike very stony silt loam, 2 to 8 percent slopes	19	0.9
TvC	Thorndike very stony silt loam, 8 to 15 percent slopes	8	0.4
W	Water bodies	185	9.2
	Total	2009	100

Source: USDA NRCS 2018

The dominant soil types within a 1-mile radius of the Lowell Tannery Project are Buxton, Scantic, and Biddeford stony silt loams (23.9 percent), Howland very stony loam (19.5 percent), and Monarda and Burnham very stony silt loams (16.4 percent) (Table 4.3) all with 0 to eight percent slopes (Table 4.3, Figure 4.7).

4.7.1.3 Reservoir Shoreline and Streambank Conditions

Just upstream of the dam, soils along the immediate shoreline are composed of Thorndike very stony silt loam, with 2-15 percent slopes (TvB, TvC); Howland gravelly and very stony loam with 0-8 percent slopes (HoB, HvB); Bangor silt loam with 2-8 percent slopes (BmB); Plaisted gravelly loam with 2-8 percent slopes (PgB); and Rockland, thorndike material, strongly sloping (RmD) (Table 4.3, Figure 4.7). These soils range from being poorly drained (BxB) to moderately well drained (HoB, HvB), to well drained (BmB, PgB, TvB, TvC), and to somewhat excessively drained (RmD).

The immediate shoreline downstream of the dam consists of Bangor silt loam (2-8 percent slope, BmB); Buxton silt loam (2-8 percent slope, BuB); Buxton, Scantic, and Biddeford stony silt loams (0-8 percent BxB); Thorndike very stony silt loam (2-8 percent slope, TvB), Dixmont very stony silt loam (2-8 percent slope, DyB), Rockland, thorndike material, strongly sloping (RmD), Scantic silt loam (0-8 percent slope, ScB), and Monarda silt loam (0-8 percent slope, MoB). Soils downstream of the dam range from poorly drained (BxB, MoB, ScB), to somewhat poorly drained (DyB, BuB), to well drained (BmB, TvB), to somewhat excessively drained (RmD).

4.7.1.4 Erosion

According to the 2013 State Hazard Mitigation Plan, all areas in Maine are susceptible to erosion, due to farming and crop cultivation throughout the state. Erosion can also occur in the area because of hurricanes, flooding, and wildfires, among other reasons (MDDVEM, 2013).

The Natural Resources Conservation Service has assessed the susceptibility of the soils surrounding the Project to erosion (i.e., the K Factor) caused by water including rainfall and stormwater run-off. K Factor estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity with values ranging from 0.02 to 0.69; larger values indicate greater susceptibility to sheet and rill erosion by water (USDA NRCS 2018). The K Factor values for the soils surrounding the

Lowell Tannery Project range from 0.20 (Howland gravelly loam) to 0.37 (Dixmont and Bangor silt loams), indicating a moderate susceptibility to erosion from water (USDA NRCS 2018).

Although soils along the riverbank in the project area are considered moderately susceptible to erosion, no specific studies have been conducted to document erosion at the project because no erosion related issues were identified by resource agencies and the project is operated in a run-of-river mode. Limited drone footage of the impoundment provided in Figures 4.8 through 4.10 does not indicate active erosion in these areas.

Figure 4.8 Lower Impoundment (East Shoreline)

Figure 4.9 Lower Impoundment (West Shoreline)

Figure 4.10 Tailrace/Tailwater Shoreline

4.7.2 Environmental Effects

4.7.2.1 Proposed Action

KEI (USA) proposes to continue operating the Lowell Tannery Hydroelectric Project as a run-of river facility. Run-of-river operations minimize large fluctuations of flow in downstream reaches and provide stable flows. Such stability will minimize the potential for erosion within the Project boundary.

Infrequent, short duration impoundment drawdowns, associated with maintenance or emergency operations, are unlikely to contribute to erosion within the Project boundary, because these events occur only on a very rare basis. Soils present along the riverbank is moderately susceptible to erosion. Recreational use at the project is limited, providing access to the impoundment from a hand carry boat access area on the north side of the dam, a parking area, and a canoe portage from the impoundment access area to a location near the bridge on Fogg Brook Road. Recreation that may occasionally occur near the Project is not expected to have significant adverse effects on soil stability within the Project boundary. Project and public access maintenance will occur only in areas where the soil is already disturbed or areas of grass; these activities would not likely contribute to additional erosion.

4.7.2.2 No-Action Alternative

Under the no-action alternative, the Project would operate in the same manner as under the previous license. The Lowell Tannery Hydroelectric Project would continue to operate as a run-of river facility, with all inflow to the project being passed downstream. This mode of operation will minimize large fluctuations of flow in downstream reaches and provide stable flows. Such stability minimizes the potential for erosion within the Project boundary. Periodic impoundment drawdowns associated with maintenance or emergency operations or natural flood events may have the potential to contribute to erosion within the Project boundary. These events, though, occur on very rare occasions. By continuing run-of-river operations at the Lowell Tannery Hydroelectric Project, Project operations are not expected to have significant adverse effects on the local soil and geology.

4.7.2.3 Unavoidable Adverse Effects

Unavoidable adverse effects are those effects that may still occur after implementation of protection, mitigation, and enhancement (PME) measures. Some small amounts of

erosion and sedimentation do have the potential to occur within the Project boundary if flooding events were to occur. Such events would contribute to erosion or scouring downstream of the Project. However, operation of the Project has a limited effect, if any, on geological resources and soil; therefore, additional PME measures are not warranted.

4.7.3 References

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ATTACHMENT I

REVISED EXHIBIT F AND STABILITY ANALYSIS

(FILED SEPARATELY WITH FERC AS CUI/CEII)

ATTACHMENT J

REVISED EXHIBIT G

(UPLOADED AS SEPARATE FILES)

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False Northing: 0.0000
Scale Factor: 0.9999
Central Meridian: -68.5000
Latitude of Origin: 0.0000
Linear Unit: Foot US

Geographic Coordinate System: GCS_North_American_1983
Datum: North American Datum of 1983
Prime Meridian: 0
Angular Unit: Degree

Reference Point Coordinates

Point	Northing	Easting
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1	2555848.9633	996607.142
1	3551699.1573	994215.269
2	1555040.1313	996850.7321
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2	3550956.858	998888.7748
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Latitude of Origin: 0.0000
Linear Unit: Foot US

Geographic Coordinate System: GCS_North_American_1983
Datum: North American Datum of 1983
Prime Meridian: 0
Angular Unit: Degree

Reference Point Coordinates

Point	Northing	Easting
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1	2555848.9633	996607.142
1	3551699.1573	994215.269
2	1555040.1313	996850.7321
2	2554746.18121	002983.423
2	3550956.858	998888.7748
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Projected coordinate system name:
NAD_1983_2011_StatePlane_Maine_East_1801_Feet
Projection: Transverse_Mercator
False Easting: 984250.0000
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3	2553441.25511	009194.139
3	3547191.71091	007791.654

Document Accession #: 20220216-5020 Filed Date: 02/16/2022

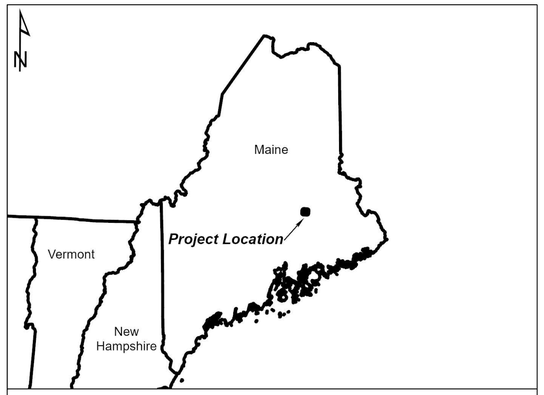
Penobscot County

Sheet 1

Sheet 2

Sheet 3

OLD MAIN RD
WOODBURY WAY
VIEW DR
HURD RD
BACK RD
AUSTIN DR
PUG LN
MAIN RD
LOBOS PL
MOORES RD
SHOREY RD
SIBLEY RD
PHILBRICK RD
PLEASANT VW
RIPS RD
TANNERY RD
WOODMAN MILL RD
ROCKY RIPS RD
FOGG BROOK RD
KELLY LN
Davis Brook
Eskutassis Stream
Unnamed Stream
Passadumkeag River
Fogg Brook
Town of Burlington
Town of Lowell
Town of Burlington
Grand Falls Twp
Town of Lowell
Summit Twp
Grand Falls Twp
Summit Twp



15.93°W
4/9/2021

- Project Boundary
- Roads
- Streams
- Waterbody
- Features
- Municipal Boundary

Map notes:

1. The Lowell Tannery Project is located in the State of Maine in Penobscot County.
2. Reference Point coordinates are shown in NAD 1983 2011 StatePlane Maine East FIPS 1801 Ft US.
3. Elevations shown are referenced to NAVD 88, where MSL = NAVD88 + 0 ft. Conversion factor was determined from NOAA tidal benchmark at Pettegrove Point, Dochet Island ME, Station ID 8410834.
4. Licensee has acquired all flowage rights and title in fee or the right to use in perpetuity all lands necessary or appropriate for the construction, maintenance, and operation of the Project. All property records are kept on file with the licensee.
5. There are no federal lands within the Project boundary.
6. The Project boundary description, as required by 18 CFR 4.41, is represented here by a grid of Northings and Eastings around, and graticules within, the map frame. Any position in Northings and Eastings along the Project boundary can be determined using these references.
7. The Project boundary, in part, was digitized from contour elevations derived from USGS ME LiDAR data (USGS 2017, USGS 2019).

SURVEYORS STATEMENT

I HEREBY CERTIFY TO THE FEDERAL ENERGY REGULATORY COMMISSION (FERC) THAT THIS PLAN MEETS THE CONDITIONS SET FORTH BY FERC FOR ITS EXPRESSED PURPOSE. THE PURPOSE OF THIS MAP IS TO PROVIDE A GEOREFERENCED VISUAL DEPICTION OF THE LOCATION OF PROJECT FEATURES AND BOUNDARIES BASED ON THE BEST AVAILABLE HISTORICAL DRAWINGS AND DIGITAL REFERENCE SOURCES INCORPORATED INTO THE GEOGRAPHIC INFORMATION SYSTEM (GIS). LOCATIONS HAVE NOT BEEN VERIFIED BY PHYSICAL FIELD SURVEYS AND THIS DRAWING SHOULD NOT BE USED FOR PURPOSES OF DEVELOPING PROPERTY BOUNDARY DESCRIPTIONS.

STATE OF MAINE
STEPHEN W. EVERETT 2161
PROFESSIONAL LAND SURVEYOR

KEI (USA) POWER MANAGEMENT INC.

LOWELL TANNERY HYDROELECTRIC PROJECT FERC NO. 4202

PROJECT BOUNDARY MAP

EXHIBIT G SCALE: 1" = 720' SHEET NO. 0 OF 3

0 500 1,000 2,000 3,000 4,000 Feet

FERC DWG. NO. 4202-

Document Accession #: 20220216-5020 Filed Date: 02/16/2022

Metes and Bounds
Point 1 (554238.62 N, 993276.69 E)

Course	Bearing	Distance (ft)
1-2	S63-21-50W	92.20
2-3	S25-44-08E	46.64
3-4	S64-12-35W	215.53
4-5	S46-58-04W	15.15
5-6	S30-27-41E	185.88
6-7	N48-54-28E	132.75
7-8	S42-03-20E	141.47
8-9	N49-05-30E	259.12
9-10	N'ly along Passadumkeag River Normal Maximum Pond	27781.28
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ReferencePoint1-2
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ReferencePoint1-3
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Project Boundary
(187' Contour Elevation)

Project Boundary
(187' Contour Elevation)

Davis Brook

Unnamed Stream

Eskuassis Stream

Passadumkeag River

Town of Burlington
Town of Lowell

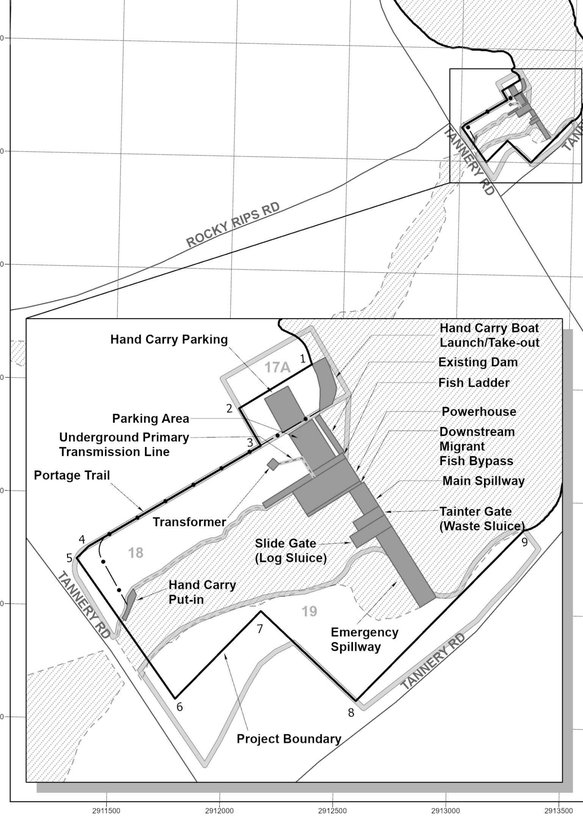
TANNERY RD

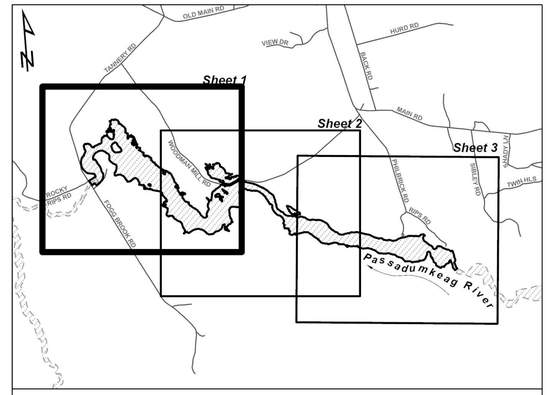
WOODMAN MILL RD

ROCKY RIPS RD

FOGG BROOK RD

MATCH LINE SHEET 2





15.93°W
4/9/2021

Project Boundary
Roads
Streams
Waterbody
Features
Municipal Boundary
Reference Points
Match Line
KEI-Owned Parcels
Portage Trail
Transmission Line

Map notes:
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STATE OF MAINE — STEPHEN W. EVERETT 2161 — REGISTERED PROFESSIONAL ENGINEER AND SURVEYOR

KEI (USA) POWER MANAGEMENT INC.

LOWELL TANNERY HYDROELECTRIC PROJECT
FERC NO. 4202

PROJECT BOUNDARY MAP

EXHIBIT G SCALE: 1" = 333' SHEET NO. 1 OF 3

0 250 500 1,000 1,500 2,000 Feet

FERC DWG. NO. 4202-

Document Accession #: 20220216-5020 Filed Date: 02/16/2022

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Eskutassis Stream

WOODMAN MILL RD

Project Boundary
(187' Contour Elevation)

Town of Burlington
Town of Lowell

MATCH LINE SHEET 1

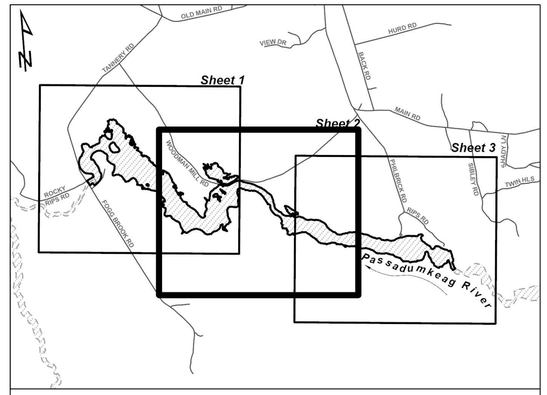
MATCH LINE SHEET 3

Passadumkeag River

Town of Lowell
Summit Twp

Metes and Bounds
Point 6 (554041.36 N, 993491.16 E)

Course	Bearing	Distance (ft)
9-10	N'ly along Passadumkeag River Normal Maximum Pond	27781.28
11-1	S'ly along Passadumkeag River Normal Maximum Pond	32498.57



15.93°W
4/9/2021

- Project Boundary
- Roads
- Streams
- Waterbody
- Features
- Municipal Boundary
- Reference Points
- Match Line
- KEI-Owned Parcels
- Portage Trail
- Transmission Line

Map notes:
1. The Lowell Tannery Project is located in the State of Maine in Penobscot County.
2. Reference Point coordinates are shown in NAD 1983 2011 StatePlane Maine East FIPS 1801 Ft US.
3. Elevations shown are referenced to NAVD 88, where MSL = NAVD88 + 0 ft. Conversion factor was determined from NOAA tidal benchmark at Pettegrove Point, Dochet Island ME, Station ID 8410834.
4. Licensee has acquired all flowage rights and title in fee or the right to use in perpetuity all lands necessary or appropriate for the construction, maintenance, and operation of the Project. All property records are kept on file with the licensee.
5. There are no federal lands within the Project boundary.
6. The Project boundary description, as required by 18 CFR 4.41, is represented here by a grid of Northings and Eastings around, and graticules within, the map frame. Any position in Northings and Eastings along the Project boundary can be determined using these references.
7. The Project boundary, in part, was digitized from contour elevations derived from USGS ME LiDAR data (USGS 2017, USGS 2019).

SURVEYORS STATEMENT

I HEREBY CERTIFY TO THE FEDERAL ENERGY REGULATORY COMMISSION (FERC) THAT THIS PLAN MEETS THE CONDITIONS SET FORTH BY FERC FOR ITS EXPRESSED PURPOSE. THE PURPOSE OF THIS MAP IS TO PROVIDE A GEOREFERENCED VISUAL DEPICTION OF THE LOCATION OF PROJECT FEATURES AND BOUNDARIES BASED ON THE BEST AVAILABLE HISTORICAL DRAWINGS AND DIGITAL REFERENCE SOURCES INCORPORATED INTO THE GEOGRAPHIC INFORMATION SYSTEM (GIS). LOCATIONS HAVE NOT BEEN VERIFIED BY PHYSICAL FIELD SURVEYS AND THIS DRAWING SHOULD NOT BE USED FOR PURPOSES OF DEVELOPING PROPERTY BOUNDARY DESCRIPTIONS.

STATE OF MAINE
STEPHEN W. EVERETT
2161
PROFESSIONAL
LAND SURVEYOR

KEI (USA) POWER MANAGEMENT INC.

LOWELL TANNERY HYDROELECTRIC PROJECT
FERC NO. 4202

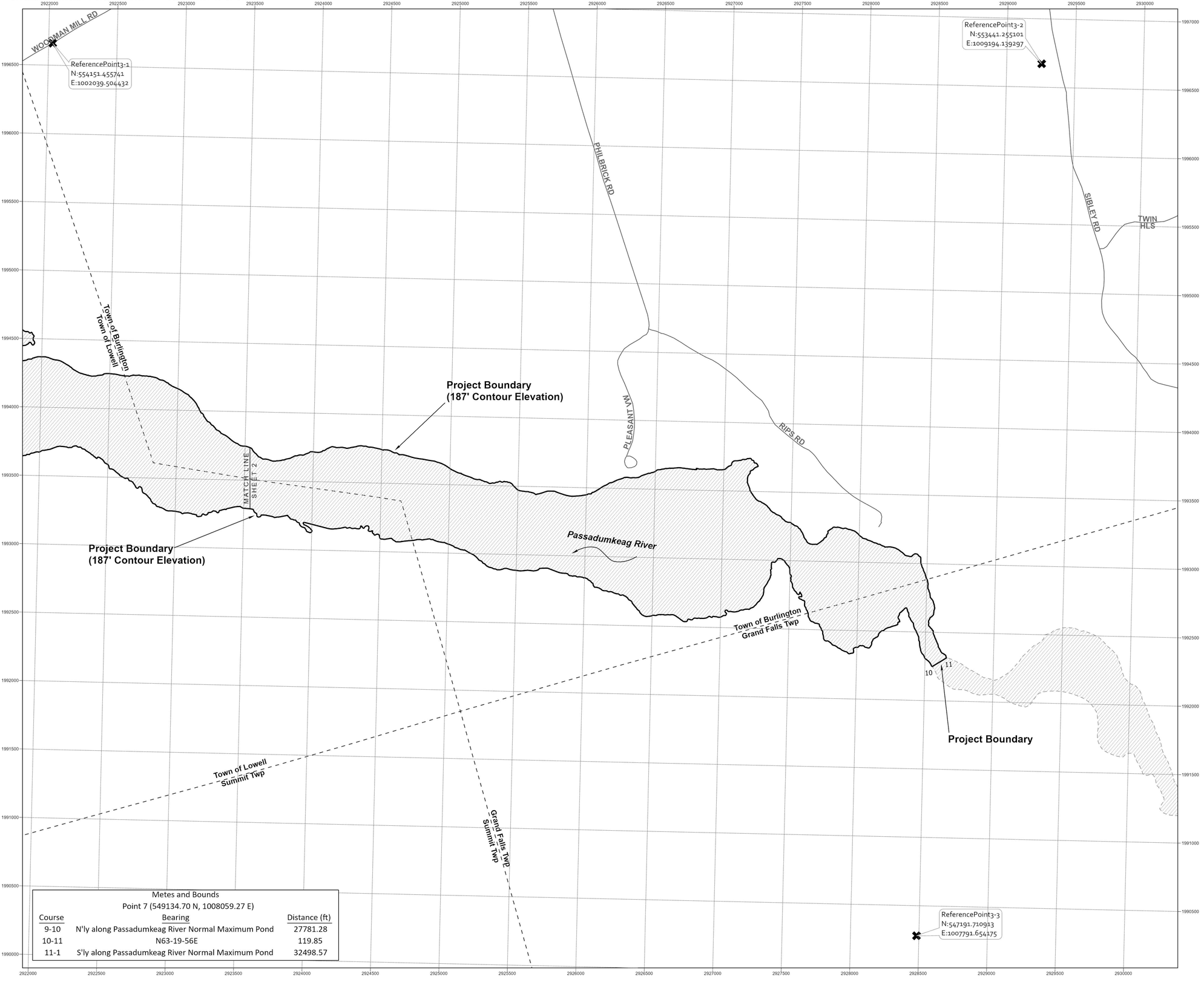
PROJECT BOUNDARY MAP

EXHIBIT G SCALE: 1" = 333' SHEET NO. 2 OF 3

0 250 500 1,000 1,500 2,000 Feet

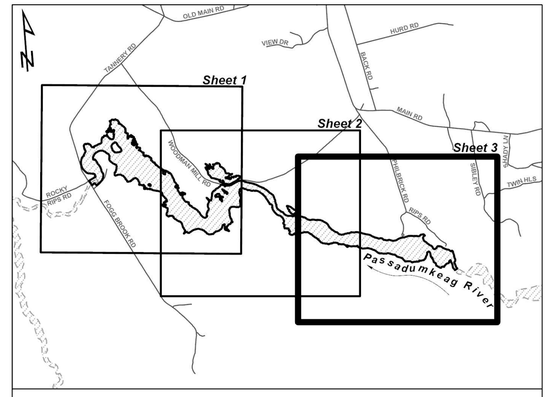
FERC DWG. NO. 4202-

Document Accession #: 20220216-5020 Filed Date: 02/16/2022



Metes and Bounds
Point 7 (549134.70 N, 1008059.27 E)

Course	Bearing	Distance (ft)
9-10	N'ly along Passadumkeag River Normal Maximum Pond	27781.28
10-11	N63-19-56E	119.85
11-1	S'ly along Passadumkeag River Normal Maximum Pond	32498.57



15.93°W
4/9/2021

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- Roads
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STATE OF MAINE
STEPHEN W. EVERETT 2161
PROFESSIONAL LAND SURVEYOR

KEI (USA) POWER MANAGEMENT INC.

LOWELL TANNERY HYDROELECTRIC PROJECT FERC NO. 4202

PROJECT BOUNDARY MAP

EXHIBIT G SCALE: 1" = 333' SHEET NO. 3 OF 3

0 250 500 1,000 1,500 2,000 Feet

FERC DWG. NO. 4202-

Document Content(s)