

FEDERAL ENERGY REGULATORY COMMISSION  
WASHINGTON, D.C. 20426  
June 27, 2018

OFFICE OF ENERGY PROJECTS

Project No. 2533-061 – Minnesota  
Brainerd Hydroelectric Project  
Brainerd Public Utilities

Scott Magnuson, Superintendent  
Brainerd Public Utilities  
8027 Highland Scenic Road  
P.O. Box 273  
Brainerd, Minnesota 56401

**Reference: Comments on Preliminary Study Plans, Request for Studies, and  
Additional Information**

Dear Mr. Olson:

After reviewing the Brainerd Hydroelectric Project's Pre-Application Document, the transcripts of the scoping meetings held May 16 and 17, 2018, and participating in a project environmental site review on May 16, 2018, we have determined that additional information is needed to adequately assess potential project effects on environmental resources. We have three study requests (enclosed in Schedule A) for aquatic and botanical resources, and recommend that you consider our comments on your two preliminary study plans (enclosed in Schedule B). We also have additional information needs (enclosed in Schedule C). Please provide the requested additional information when you file your proposed study plan, which must be filed by August 12, 2018.<sup>1</sup>

Please include in your proposed study plan a master schedule that includes the estimated start and completion date of all field studies, when progress reports will be filed, who will receive the reports and in what format, and the filing date of the initial study report. All studies, including fieldwork, should be initiated and completed during

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<sup>1</sup> The Commission's Rules of Practice and Procedure provide that if a filing deadline falls on a Saturday, Sunday, holiday, or other day when the Commission is closed for business, the filing deadline does not end until the close of business on the next business day. 18 C.F.R. § 385.2007(a)(2) (2017). Because the deadline falls on a Sunday (i.e., August 12, 2018), the filing deadline is Monday, August 13, 2018. However, the process plan and schedule established in the scoping document 1, issued on April 26, 2018, is still valid.

the first study season, and the study reports should be filed as a complete package. If, based on the study results, you are likely to propose any plans for measures to address project effects, drafts of those plans should be filed with your Preliminary Licensing Proposal (or draft license application).

Please note that we may, upon receipt and review of scoping comments/study requests from other entities due June 28, 2018, as well as your proposed study plan, request additional studies or information at a later time.

If you have any questions, please contact Patrick Ely at (202) 502-8570, or via e-mail at [patrick.ely@ferc.gov](mailto:patrick.ely@ferc.gov).

Sincerely,

Janet Hutzal, Chief  
Midwest Branch  
Division of Hydropower Licensing

Enclosures: Schedule A  
Schedule B  
Schedule C

## **Schedule A**

### **Study Requests**

After reviewing the information in the Pre-Application Document (PAD), we have identified information that is needed to assess project effects. As required by section 5.9 of the Commission's regulations, we have addressed the seven study request criteria in the study requests that follow.

#### **Fish Entrainment and Impingement Study**

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of the study is to evaluate the potential for fish entrainment and impingement at the Brainerd Hydroelectric Project (Brainerd Project or project) and its potential effects on the health of the Upper Mississippi River fishery.

The objectives of the study are to:

1. describe the physical characteristics of the intake structures, including the location, dimensions, and the velocity distribution in front of each structure;
2. analyze fish species for factors that influence their vulnerability to impingement, entrainment, and turbine survival;
3. assess the potential for fish species impingement at the project;
4. estimate entrainment rates and turbine passage survival rates for fish species at the project; and
5. describe the likely effects of project-induced entrainment or impingement on fish resources, based on the physical characteristics of the project.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

Sections 4(e) and 10(a) of the Federal Power Act require that the Commission give equal consideration to all uses of the waterway on which a project is located. In making

its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values.

Fish populations in the reservoir support a sport fishery. The effect of project operation on this resource is relevant to the Commission's public interest determination.

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information.*

The PAD contains no information regarding: (1) the locations and dimensions of intakes; (2) the velocity distribution in front of the intakes; (3) the clear bar spacing between the trashrack bars; or (4) the likely effects of project-induced entrainment or impingement on fishery resources. This information is needed to identify any potential project effects of entrainment and impingement on fishery resources at the project.

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Fish that reside upstream of the project could be susceptible to impingement on project trashracks or entrainment through the turbines when the project is operating. Evaluation of the physical characteristics of each of the intake structure and estimating entrainment/survival rates would help inform a decision on the effects of project operation.

§5.9(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Conduct a desktop analysis that evaluates the likelihood of entrainment and impingement based on the physical characteristics of the project. The study should include the following information: (1) a description of the physical layout of the trashrack bars; (2) turbine types and orientation; (3) turbine runner speed and diameter; (4) hydraulic capacity of the turbine units; (5) a description of normal operations; (6) information relative to the timing and magnitude of spill; and (7) the water velocity in front of the intake structures.

A number of different methodologies could be used to collect the water velocity profiles of the intake structure, such as acoustic Doppler technology. Existing literature should be available to describe life history characteristics, swimming speeds, and avoidance behaviors of the dominant fish species in the project area to assess the risk of

impingement and entrainment. Existing entrainment studies from the Electric Power Research Institute (EPRI) Entrainment and Survival Database (EPRI, 1997) should be used to identify sites that have similar physical characteristics (*e.g.*, head, turbine type, flow capacity, runner diameter, and runner speed) to find a set of applicable studies that can be used to evaluate entrainment rates and turbine passage survival at the project.

Entrainment rates should be estimated by species and/or guilds/groups, size, and season (*e.g.*, number of fish per million cubic feet of water in summer); these entrainment rates should then be applied to the average flow through the project to estimate potential entrainment on a monthly basis. Entrainment rates should be based on the relative abundance of species gathered from existing fisheries data (*e.g.*, Minnesota Department of Natural Resources' (Minnesota DNR) 2014 survey of the project reservoir)<sup>2</sup> and the influence of physical characteristics of the intake areas on each individual species and/or guilds/groups (*e.g.*, intake location in water column, near shore), as available.

Published turbine passage survival rates from the EPRI (1997) database should be used to estimate turbine passage survival for fish species and life stages. If applicable studies from the database cannot be found, blade strike models developed by Franke et al. (1997) should be used to assess turbine survival for fish species and life stages.

The results of Minnesota DNR's 2014 survey of the project reservoir would also help describe the health of the existing fishery and whether it might be affected by entrainment or impingement.

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The cost of this study would be in the range of \$8,000 to \$12,000 and may be completed in one study season. Fieldwork would be required to obtain the water velocity data; otherwise, the study would involve desktop review of the literature on entrainment and impingement at hydroelectric sites and the results of the Minnesota DNR's 2014 fish survey. The velocity data should be collected, at a minimum, at the maximum hydraulic capacity of the turbine units.

#### Literature Cited

Electric Power Research Institute (EPRI). 1997. Turbine entrainment and survival database – field test. Report TR-108630. Prepared by Alden Research Laboratory. October 1997.

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<sup>2</sup> <http://www.dnr.state.mn.us/lakefind/showreport.html?downum=18014500>

Franke, G.F., D.R. Webb, R.K. Fisher, D. Mathur, P.N Hopping, P.A. March, M.R. Headrick, I.T. Laczó, Y. Ventikos, and F. Sotiropoulos. 1997. Development of Environmentally Advanced Hydropower Turbine System Concepts. Prepared by DOE Contract No. DEAC07-96ID13382.

### **Baseline Dissolved Oxygen and Temperature Study**

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to evaluate the dissolved oxygen (DO) concentration and temperature of water entering the project intakes within the project reservoir, and then discharged immediately downstream of the dam into the Mississippi River during summer conditions. More specifically, the goal of this proposed study is to determine if DO and temperature at the project meets state water quality standards.

The objectives of the study are to:

1. identify the DO concentration and temperature of water entering the project intakes;
2. describe any temporal variations of DO concentration and temperature;
3. identify the DO and temperature profile within the project reservoir in the vicinity of the intakes; and
4. describe any changes of DO concentrations in the river downstream of the project.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values.

Water quality at project supports an aquatic ecosystem that provides public opportunities, including sport fisheries. Ensuring that the effects of project operation pertaining to water quality is considered in a reasoned way is relevant to the Commission's public interest determination.

*§5.9(b)(4) – Describe existing information concerning the subject of the study proposal, and the need for additional information.*

The PAD does not provide any data pertaining to DO concentration or water temperature in the project area. The PAD states that the Minnesota Pollution Control Agency (Minnesota PCA) assessed water quality in 2017 (Minnesota PCA, 2017) for a section of the Mississippi River that encompassed the project boundary; however, the referenced document does not include any site specific water quality data at or near the project. Therefore, we cannot determine potential project effects on water quality in the project area and additional information on DO and temperature is needed to establish baseline conditions at the project.

*§5.9(b)(5) – Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Typically, lower dissolved oxygen concentrations are most likely to exist during summer months when water temperatures are increased. Collecting water temperature and dissolved oxygen data upstream and downstream of the project during the summer months would help determine if project operation is negatively affecting water quality at the project. Therefore, establishing baseline water quality conditions would inform the need for, and the development of, potential license conditions to protect aquatic resources at the project.

*§5.9(b)(6) – Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Using generally accepted practices in the scientific community:

1. Monitor and record dissolved oxygen concentration and water temperature at the approximate location (within a radius of 10 meters) of two of the project intakes within the reservoir with operating turbines at the time of the measurements, as applicable. Temperature and DO measurements should begin one meter below the surface of the reservoir, with subsequent measurements taken every meter, terminating at the approximate depth (within 1 meter) of the intake structures.

Sampling should take place at least once a week, beginning on June 1st and ending on September 30th. During each sampling event, reservoir surface elevation should be recorded.

2. Monitor and record the concentration of dissolved oxygen at a minimum of three sites downstream from the project, in the Mississippi River. Timing of river sampling should coincide with reservoir sampling efforts. The first sampling site should be located approximately 150 feet downstream of the dam. Each subsequent sampling site should be located longitudinally downstream from the first sampling site, and at approximately equidistant intervals. Exact sampling locations within the specified framework should be chosen at random, using a scientifically accepted method. The habitat type of each sampling location should be identified and recorded (i.e., pool, run, riffle, etc.), including GPS coordinates for each sampling location. During each sampling event, discharge (cubic feet per second) from USGS stream gage #05242300 located at the project should be recorded.
3. Prepare a report that includes an analytical summary and graphical representations of the data, including average temperature and DO concentration with associated measures of confidence. The report should include a histogram of depth, temperature, and DO within the reservoir and a graphical representation of any changes of these components over time. Similarly, the report should include a histogram of river distance, DO, and temperature content, and a graphical representation of any changes of this component over time. All data points used to develop the report (including date and time of collection) should be included as an appendix to the report.

§5.9(b)(7) – *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately \$20,000. The dissolved oxygen and temperature monitoring survey may be completed within one study season.

#### Literature Cited

Minnesota PCA, 2017. Our Upper Mississippi River: What to protect, what to fix. Monitoring and Assessment Study. [Online]  
<https://www.pca.state.mn.us/sites/default/files/wq-iw8-08ab.pdf>.

## **Botanical Resources Study**

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of the study is to develop additional information necessary to address the potential effects of project operation and maintenance activities on botanical resources within the project boundary. The results of this study would be used to determine how potential effects can be avoided, minimized, or otherwise mitigated.

The objectives of the botanical resources study are as follows:

1. map and/or confirm vegetation types within the project boundary, including age-class and composition of forested areas;
2. identify and map any rare, threatened, or endangered plant species or potential habitats; and
3. document the presence, abundance, and location of invasive plant species.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

Sections 4(e) and 10(a) of the FPA require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values.

The Brainerd Project provides habitat for a variety of plants and animals. An understanding of the botanical resources within the project boundary would provide information on the type, abundance, and location of habitat potentially affected by continued operation and maintenance of the project. Understanding the project's effects on botanical resources is relevant to the Commission's public interest determination.

§5.9(b)(4) – *Describe existing information concerning the subject of the study proposal, and the need for additional information.*

In the PAD, Brainerd Public Utilities provides a general discussion of vegetation types common to the ecoregion, but omits a substantive discussion of botanical resources at the project. Brainerd Public Utilities also references a Minnesota Biological Survey<sup>3</sup> site which overlaps much of the project boundary, but does not provide additional information regarding the plants or animals that make use of this habitat. Therefore, we cannot determine the potential project effects on botanical resources in the project boundary.

§5.9(b)(5) – *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Project operation and maintenance activities have the potential to disturb botanical resources in the project boundary. This study would assist in identifying plant species and their habitats within the project and provide baseline information from which to evaluate the effects of continued operation and maintenance of the Brainerd Project on those resources.

§5.9(b)(6) – *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

#### Field Survey

There would be one field survey with multiple components. The spatial boundaries of the field study area would consist of the project facilities and the riparian corridor upstream and northeast of the project to County Road 3. A general inventory of plants, including any state listed rare, threatened, or endangered botanical species, should be conducted within the study area. Age class, species composition and relative density of any forested understory should be recorded, as well as the presence of snags or old-growth hardwoods with sloughing bark. The invasive species portion of the survey should focus on non-native species, examining disturbed habitats (including areas adjacent to infrastructure and roadside ditches) and natural terrestrial habitats (woodlands, meadows, Brainerd Project shoreline) where invasive species are observed or likely to occur in the project boundary. The survey should be conducted during the

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<sup>3</sup> The Minnesota Biological Survey, through the Minnesota DNR, systematically collects, interprets, monitors, and delivers data on plant and animal distribution, including rare, threatened, and endangered species.

spring and summer months when diagnostic features are most identifiable. Each invasive species occurrence should be mapped with a handheld GPS unit and depicted on an aerial photograph. Data should be recorded for each invasive species occurrence, including species name, GPS location, approximate density, and area of coverage. Representative photos should be taken and general observations should be noted regarding habitat and site conditions, including type and quality.

The methods described above are consistent with accepted methods for conducting botanical resources surveys.

#### Report Preparation

Brainerd Public Utilities would prepare a report that summarizes the botanical resources encountered within the project boundary. The report should include species occurrence data, high-resolution land cover maps, approximate land cover by type and acreage, age class and composition of any forested habitat, and mapping of invasive species. Captioned photographs of typical and/or significant habitat conditions should be included in the report. Documentation of rare, threatened, or endangered species occurrence should be filed with the Commission as privileged.

*§5.9(b)(7) – Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of a reconnaissance-level botanical resources survey and the preparation of a report containing the above criteria is approximately \$5,000.

## **Schedule B**

### **Comments on Preliminary Study Plans**

Based on our review of your preliminary study plans outlined in your Pre-Application Document (PAD), we request the following modifications. Please address our requests in your proposed study plans.

#### **Recreation and Land Use**

##### *Recreation Inventory and Planning Assessment*

In section 5.2 of the PAD, *Proposed Studies by Resources*, you propose to conduct a Recreation Inventory and Planning Assessment. However, you do not provide information on how recreation would be measured or what would be assessed (e.g., condition of existing sites, current and future recreation use, facility capacity, etc). Also, the PAD provides a discussion of existing recreation facilities and sites within and adjacent to the project boundary. However, the PAD does not include a detailed description of the condition of each recreation site and facility. Further, it is unclear how much use each site and or facility receives because recreation use data was not included in the PAD. Understanding the condition of the existing project recreation sites and facilities, the amount of current and projected future use, and how these sites and facilities are managed is essential in determining the adequacy of project recreation facilities to meet current and future recreation needs; and therefore, is relevant to the Commission's public interest determination.

In the absence of recreational use data and facility conditions, we cannot determine that the existing information is adequate for us to assess the adequacy of existing recreation facilities to meet current and future demand. So that we may fully understand and evaluate the effects of continued project operation and maintenance on recreation use, please provide recreational use data collected over the past 5 years, as required by Article 408 of the current license,<sup>4</sup> a description of the methodology used to collect recreational use data, and a discussion of the condition and adequacy of existing recreational facilities to meet current and future recreational demand at the project. Additionally, please include photographs of each recreation site and facility and any other relevant documentation of recreation at the project. Please file the information when you file your proposed study plan.

If you cannot provide the information requested above, please include the following in your study proposal for recreation resources:

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<sup>4</sup>62 FERC ¶ 62,143 (1993).

1. identify the condition of all informal and formal recreation sites and facilities, and identify if they are located within, outside, or partially within the project boundary;
2. determine the current and projected capacity at each recreation site and/or facility;
3. identify who owns, operates, and maintains each recreation site and/or facility; and
4. conduct visitor surveys during the recreation season to determine the adequacy of project recreation facilities and if changes or upgrades to the sites would be needed to meet current or future recreation needs.

#### Recreation Use Surveys

A schedule should be developed for the distribution of the recreation use surveys. All sampling days should be randomly selected and survey routes should be completed on a rotating basis and at different times of day to account for time-of-day use patterns. These counts should last for at least two hours per site on each day and should be conducted on four (4) days per month which should include two (2) randomly selected weekdays and two (2) randomly selected weekend days. If a month contains a three-day holiday weekend, one (1) day per holiday weekend should be included in addition to the standard survey days. The recreation use survey should occur during the recreation season to capture recreational use occurring while the various project facilities are open to the public.

The recreation use survey should be administered to users to gain user opinions with regard to the existing project recreation facilities and opportunities. The survey should record the number of people in a party, their primary reason (recreational activity) for visiting the project, their perception of level of use, and their opinions with regard to the amount and types of recreation opportunities offered within the project boundary.

#### Spot Counts

Spot counts should also be conducted on survey days. The spot counts represent short-term counts (approximately 5 minutes per site) and should record the number of vehicles parked at a site/facility and the number of users observed. This information should be statistically analyzed to develop the recreational use figures for the project. Final recreation use for the recreation facilities and sites within the project should be summarized by season and activity type for each site.

#### Facility Inventory

The inventory of project recreation facilities and sites should include the following:

1. the location of facilities in relation to the project boundary;
2. the types and number of amenities provided at each site and facility;
3. the condition of the facility/amenities;
4. the entities responsible for the operation and maintenance of each facility;
5. hours/seasons of operation; and
6. accompanying photographs.

#### Report Preparation

Brainerd Public Utilities would prepare a report that includes information on the number of recreation days spent at project recreation sites, average number of persons per party, and a determination of the percent of the each facility's capacity that is currently being utilized. The above information should be entered into spreadsheets for statistical analysis. The collected information should be used to project changes to project recreation demand over the term of any new license, if issued.

The report should also include a facility inventory including the following:

1. the location of facilities in relation to the project boundary, including facilities/amenities that may straddle the project boundary;
2. the types and number of amenities provided at each facility;
3. an inventory of all informal and formal project recreation facilities and sites and the condition of the facility/amenities;
4. identification of entities responsible for the ownership, operation, and maintenance of the facilities;
5. hours/seasons of operation;
6. photographs of the facilities;
7. recreation use figures for each recreation site, overall recreational use figures, and projected use figures; and
8. a compilation of responses to the recreation use survey.

## **Cultural Resources**

### *Cultural Resources Inventory Plan*

Section 5.2, *Proposed Studies by Resources*, of the PAD proposes a Cultural Resources Inventory Plan to assess cultural resources survey needs. However, you do not provide information on what would be assessed and any surveys that would be conducted. The PAD provides information on known archaeological and historic resources within the project vicinity; however, there is no indication if a recent Phase I survey was conducted to identify cultural resources or to reassess known cultural resources at the project to determine if they are still eligible for, or listed on, the National Register of Historic Places (National Register or historic properties). In addition, there is no description and map depicting the Area of Potential Effects (APE). This information is necessary for use to determine the effects of project operation on historic properties. Therefore, a Phase I archaeological survey of the project Area of Potential Effects (APE) should be conducted. Also, as part of your proposed study, and prior to any surveys conducted, you should consult with the Minnesota State Historic Preservation Officer (Minnesota SHPO), federally-recognized Tribes who have an active interest in the project, and any interested parties.

If you have existing information, studies, surveys, or other data that would satisfy the proposed items listed below, please state this in your proposed study plan and file this information when the proposed study plan is filed.<sup>5</sup> If you cannot provide the information, please include the following in your study proposal for cultural resources:

1. a defined APE for the project that would include all lands and waters enclosed by the project boundary and any other lands or properties outside the project boundary where project operation may affect historic properties. Also include:
  - (a) a detailed map showing all aspects of the APE in relation to the project boundary;<sup>6</sup>
  - (b) a background section on previous work in and around the APE; and
  - (c) a cultural history of the research area;

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<sup>5</sup> Please file any cultural resource surveys or reports as privileged.

<sup>6</sup> The APE should be developed after consultation with the Minnesota SHPO, federally-recognized Tribes who have an active interest in the project, and any interested parties. Once you have defined your APE, please send your APE definition and APE map to the Minnesota SHPO and seek their concurrence.

2. survey methodology, including: (a) areas to survey for archaeological and/or historic resources relative to the defined APE;<sup>7</sup> and (b) an evaluation of cultural resources, including known archaeological sites within the APE for National Register-eligibility; and (c) site- or resource-specific descriptions of existing and potential project-related effects on historic properties;
3. re-evaluate the pocket grinders located in the Brainerd powerhouse to determine if they are still eligible for listing on the National Register, and identify any existing and potential project-related effects.
4. survey results and concurrence from the Minnesota SHPO, any interested federally-recognized Tribes, and any interested parties on the results of the survey; and
5. a record of consultation with the Missouri SHPO, interested federally-recognized Tribes, and other interested parties regarding the proposed study, results and APE, and related concurrence letters.

In the event that any historic properties would be adversely affected by project operation or maintenance, you would need to develop a draft Historic Properties Management Plan (HPMP) to avoid, lessen, or mitigate for any project-related adverse effect on National Register-eligible properties. A draft HPMP should be developed after consultation with the Minnesota SHPO, the federally-recognized Tribes who have an active interest in the project, and interested parties, and filed with your Preliminary Licensing Proposal (or draft license application).

The draft HPMP should, at a minimum, address the following elements:

1. identification of the APE for the project and inclusion of a map or maps that clearly show the APE in relation to the existing and proposed project boundary;
2. completion, if necessary, of identification of historic properties within the project's APE; continued use and maintenance of historic properties;
3. treatment of historic properties threatened by project-induced shoreline erosion,<sup>8</sup> other project-related ground-disturbing activities, and vandalism;

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<sup>7</sup> Lands that are highly disturbed are less likely to contain cultural resources, and may not need to be surveyed.

<sup>8</sup> Project-induced shoreline erosion does not include shoreline erosion attributable to flood flows or phenomena, such as wind driven wave action, erodible soils, and loss of vegetation due to natural causes.

4. consideration and implementation of appropriate treatment that would minimize or mitigate unavoidable adverse effects on historic properties;
5. treatment and disposition of human remains that may be discovered, taking into account any applicable State laws and the Advisory Council's "Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects," February 23, 2007;
6. discovery of previously unidentified properties during project operation;
7. public interpretation of the historic and archaeological properties at the project;
8. a list of activities (i.e., routine repair, maintenance, and replacement in kind at the project) not requiring consultation with the Minnesota SHPO because these activities would have little or no potential effect on historic properties;
9. a procedure to address effects on historic properties in the event of a project emergency; and
10. a review of the HPMP by the licensee, the Minnesota SHPO and consulting parties to ensure that the information continues to assist the licensee in managing historic properties and updating the HPMP based on agency and tribal consultations.

## **Schedule C**

### **Additional Information**

#### **Aquatic Resources**

1. During the environmental site review on May 16, 2018, it was mentioned that zebra mussels were detected during a dive inspection at the Brainerd Hydroelectric Project (project). However, the Pre-Application Document (PAD) does not include a discussion of zebra mussels. Therefore, please describe the known abundance of zebra mussels at the project, including any monitoring and/or control measures that are currently being implemented.

#### **Terrestrial Resources**

2. Section 4.4.2, *General Wildlife Resources*, of the PAD (page 24) references two bald eagle nests in the project area. Additionally, a bald eagle was observed in the vicinity of the project during the environmental site review. Please provide information regarding: (1) the locations of any active or inactive bald eagle nests in the project area; and (2) any historical observations of bald eagles and their project usage. Please file this information as privileged.

#### **Recreation and Land Use**

3. Section 4.7, *Recreation and Land Use*, of the PAD provides a description of all existing recreation sites and facilities within the project boundary. However, the PAD does not include the Little Rabbit Lake Site boat launch facility, which is listed as an existing project recreation facility in the Recreation Monitoring Report, filed on November 25, 2009. Please provide a description of this recreation facility and its location in relation to the existing project boundary.

#### **Cultural Resources**

4. Section 4.9, *Cultural Resources*, of the PAD (page 28) states that Phase I cultural resource inventories were completed in 1989 and 1991. Also, a Phase II National Register of Historic Places (National Register) evaluation for cultural resources was completed, which included a more detailed assessment site identified in the Phase I effort. Finally, the Brainerd Dam was evaluated in 1991 for its National Register-eligibility. However, the PAD does not contain these reports. Please file these reports as privileged.

#### **Developmental Resources**

5. Please provide a detailed description of existing facilities to include the composition and dimensions for - the height and width of the powerhouse, slide gate

section, bascule gate section, tainter gates, right embankment, and tailrace section. Also, provide a detailed description to include the composition, dimensions, and configuration of the dam.

6. For all six turbine units employed, please provide their respective minimum and maximum hydraulic capacities.

7. The PAD references a previously approved sixth turbine to be installed in the 2018/2019 timeframe, please describe any potential or anticipated changes to plant operation due to the installation and operation of the new unit.

8. In the PAD, the length and voltage is provided for the overhead portion of the project's transmission line, but it does not provide the same for the underground line from the pad-mounted transformer to the distribution grid. Also, the PAD does not identify/provide the point of interconnection information, i.e., the name and owner of the point of interconnection and any other pertinent information. Please provide this information.

9. Please provide an estimate of the dependable capacity for the project.

10. Please include an Exhibit G that includes a map or series of maps that sufficiently, clearly, and legibly show the location of the project; the relative locations and physical interrelationships of the principal project features such as dam, tailrace, powerhouse, intake, transmission line, substation/switchyard, and interconnection point; and a project boundary that encloses all of the principal project features. Please label all principal project features on the exhibit.