December 2022 version

Environmental Assessment Worksheet

This most recent Environmental Assessment Worksheet (EAW) form and guidance documents are available at the Environmental Quality Board's website at: https://www.eqb.state.mn.us/ The EAW form provides information about a project that may have the potential for significant environmental effects. Guidance documents provide additional detail and links to resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item or can be addressed collectively under EAW Item 21.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. Project title: Lake Bronson Dam Rehabilitation

2. Proposer: MN DNR

Contact person: Ben Bergey
Title: Parks and Trails Regional Manager
Address: 2115 Birchmont Beach Road Northeast
City, State, ZIP: Bemidji, MN 56601
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3. RGU

Contact person: Becky Horton
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Address: 500 Lafayette Road North
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4. Reason for EAW Preparation: (check one)

Required:

Discretionary:

☐ EIS Scoping
☒ Mandatory EAW
☐ Citizen petition
☐ RGU discretion
☐ Proposer initiated

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s):
MN Rules 4410.4300, Subp. 27. Public waters, public waters wetlands, and wetlands; Subp. 31. Historical places.

5. Project Location:

- County: Kittson
- City/Township: Lake Bronson/Percy Township
- PLS Location (¼, ¼, Section, Township, Range):
  Subsection 42, NW of SE, Section 32; Township 161N; Range 46W

¼, ¼	Sec	Town	Range
NENW; NWNE; NWNW; NWSW; SENW; SWNW	5	160	46
NENE	6	160	46

¼, ¼	Sec	Town	Range
NESE; NESW; NWSE; NWSW; SENE; SENW; SESE; SESW; SWNE; SWNW; SWSE	32	161	46
NENE; NESE; NESW; NWNE; NWSE; NWSW; SENE; SENW; SESE; SESW; SWNE; SWSE; SWSW	33	161	46
NENW; NESW; NWSW; SENW; SWNW; SWSW	34	161	46

- Watershed (81 major watershed scale): Two Rivers
- GPS Coordinates: DD: 48.72300 -96.63410; UTM Zone 15: Easting 232745; Northing 5403037
- Tax Parcel Number: Parcels in project area: 160050460; 190322820;190322890; 190322920; 190322930; 190322960; 190332980; 190344700

At a minimum attach each of the following to the EAW:

- County map showing the general location of the project;
  Figure 1. County Map, Location
- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); and
  Figure 2. USGS Map
- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.
  Figure 3. State Park Visitor Map with Project Location
  Figure 4. LBD Existing Site Conditions *(Draft from 60% plans)*
  Figure 5. LBD Draft Design Concept and Proposed Modifications *(Draft from 90% plans)*
  Figure 6. Land Cover
  Figure 7. Soils Map
  Figure 8. Hydrological Features
  Figure 9. Cultural Resources
  Figure 10. Lake Bronson Dam Photos
  Figure 11. Post Construction Concept Rendering

- List of data sources, models, and other resources (from the Item-by-Item Guidance: *Climate Adaptation and Resilience* or other) used for information about current Minnesota climate trends and how climate change is anticipated to affect the general location of the project duringthe life of the project (as detailed below in item 7. Climate Adaptation and Resilience).
  - Minnesota Department of Natural Resources. Minnesota Climate Explorer.
  - Minnesota Department of Natural Resources, Climate Change and Minnesota.
  - US EPA Center for Corporate Climate Leadership, "GHG Emission Factors Hub":
    - Emission Factors for Greenhouse Gas Inventories, EPA CCCL. March, 2023.
      - MROW (MRO West) Subregion;
      - Tables 2, 4, 5, 6;
      - Table 9, Scope 3 Category 5: Waste Generated in Operations and Category 12: End-of-Life Treatment of Sold Products.
    - U.S EPA, National Overview: Facts and Figures on Materials, Wastes, and Recycling.
    - Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2020. Tables 6-44; 6-125.
  - South Coast Air Quality Management District, SCAQMD EMFACT 2007 (v2.3).

  - Minnesota Pollution Control. 2020 - 140 million estimated CO2e emissions in MN.
  - U.S Department of Energy, Renewables and Electricity: Energy Saver.

- DNR Operational Order #131, "Climate Adaptation and Mitigation in Natural Resource Management"; DNR Climate Change and Minnesota.

6. Project Description:

a. Provide the brief project summary to be published in the *EQB Monitor*, (approximately 50 words).

The Minnesota Department of Natural Resources is undertaking the replacement of a high hazard dam within Lake Bronson State Park. This project includes removal and replacement of the concrete spillway and associated bridge, which are located within areas of valuable natural and cultural resources, including a Works Progress Administration historic district.

b. Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.

The Minnesota Department of Natural Resources (DNR) is undertaking the replacement of a high hazard dam within Lake Bronson State Park. The proposed project includes removal of the concrete spillway and bridge and construction of a concrete labyrinth weir, a concrete spillway, a concrete bridge with bike lane, a seepage cutoff wall, and a new earthen embankment in place of the old concrete spillway. This project is located within a Works Progress Administration historic district and areas with valuable natural resources.

The proposed project area is primarily located within Lake Bronson State Park, which is owned by the State of Minnesota and managed by the DNR. Lake Bronson State Park, located in Kittson County, is approximately 20 miles east of the Red River of the North. The park is one mile east of State Highway 59 and the City of Lake Bronson and is less than 20 miles south of the U.S. - Canada border. (Figures 1, 2.) Lake Bronson State Park consists of 4,300 acres in its statutory boundary and annually welcomes over 100,000 visitors and 10,000 overnight visitors. (Figure 3.) Lake Bronson was created by the dam located on the South Branch Two Rivers as it flows from east to west.

The Lake Bronson Dam is an earthen embankment dam with a gated concrete outlet structure (spillway) owned by the State of Minnesota and managed by the DNR. County State Aid Highway (CSAH) 28 bridges the spillway with the bridge supported by the walls of the spillway. The dam is located approximately one mile east of the town of Lake Bronson, Minnesota, and within the boundary of Lake Bronson State Park.

In the 1930s, the towns of Hallock and Bronson advocated for creation of a reservoir to alleviate a water shortage. Construction of the Lake Bronson Dam and County Highway 28 Bridge began in 1936 as a Works Project Administration (WPA) project. In 1937, the state legislature transferred the responsibility of maintaining the dam and adjacent park from the county to the state and designated it as Lake Bronson State Park.

The project area is located within a National Register of Historic Places historic district. The dam has undergone several modifications over the past 80 years. These modifications include new gates, new gate operators, erosion protection crib walls on the downstream side of the spillway, a raise of dam embankment by construction of a bike trail on the upstream side, construction of emergency spillway

diversion embankments, riprap scour protection, and six relief wells on the downstream side. Instrumentation includes open pipe piezometers and vibrating wire piezometers that monitor internal pore water pressure and groundwater levels.

A "High Hazard" classification is assigned to the Lake Bronson Dam, meaning that failure or mis-operation of the dam could lead to loss of life downstream. A "High Hazard" dam is also known as a Class I dam, according to Minnesota Rules. The dam is listed as "Poor" condition in the National Inventory of Dams, meaning dam safety deficiencies are recognized and need to be addressed. One deficiency is the inadequate hydraulic capacity of the spillway. The spillway is not large enough to pass a major flood. Secondly, high pore water pressures within the dam embankment could lead to instability. Additionally, the 85-year-old concrete spillway is deteriorating as shown by numerous cracks, spalls, and exposure of steel reinforcement to the elements.

Barr Engineering is designing the reconstruction project. The proposed project includes:

- three-foot diameter gated low-level pipe;
- Labyrinth weir overflow structure;
- New concrete spillway measuring approximately 125 feet wide by 250 feet long;
- New vegetated channel measuring between 90 and 125 feet wide by 550 feet long;
- New concrete bridge measuring 45 feet wide by 125 feet long;
- Soil-bentonite seepage cutoff wall measuring 85 feet deep by 1,300 feet long;
- Buttress (400 foot long by 100 foot wide);
- Demolition of the existing concrete spillway and bridge; and
- Construction of an earthen embankment in place of the existing spillway and bridge.

(Note: all dimensions provided above are best estimates at this time and are subject to change as design details are finalized.) (See Figure 4, Existing site conditions and Figure 5, Proposed Site Modifications)

The new concrete spillway will be constructed to the south of the existing spillway. A new bridge will be constructed to pass traffic on County Highway 28 over the new spillway. The new spillway will include a labyrinth weir control section, rather than gates, to pass flood flows. Water will pass over the concrete labyrinth weir and flow under the new bridge via a concrete channel, spilling over energy dissipation features, through a rock riprap lined channel, into a 90 to 125 foot wide vegetated channel, and finally into the South Branch Two Rivers. The labyrinth weir of the proposed project will be able to pass approximately twice as much flow as the current spillway for a given lake elevation. Normal lake levels should be unchanged by the project because the lake runout elevation of the labyrinth weir will be at the same elevation as the current runout. It is necessary for the new spillway to be wider than the existing spillway to be able to safely pass flood flows. Most of the new spillway will be constructed on natural ground, creating a need to excavate soils for the spillway. Excavated material will be used to fill in the old spillway channel and to construct temporary cofferdams on the upstream and downstream sides of the spillway excavation, to lessen the risk to the construction area. Dewatering wells will also likely be required to keep groundwater from impacting the construction.

Water can also flow from the reservoir through a low-level outlet. The low-level outlet will consist of a three-foot diameter pipe whose inlet end will rest on the bottom of the reservoir. The pipe will outlet into a manhole with gates to control flow before the flow is discharged into the new spillway. The gates will be normally closed. The low-level will be used to lower the reservoir for maintenance or emergencies. It will also be used to release low oxygen water from the bottom of the reservoir to reduce the likelihood of fish kills in the winter and improve water quality in the reservoir. The maximum flow out of the new low level will be approximately 100 cubic feet per second, matching the flow rate out of the existing low level.

The new 550-foot long vegetated channel will consist of a 20 foot wide pilot channel with a depth of two feet deep, within the main channel that is 90 to 125 feet wide. The main channel will have side slopes of 3 horizontal to 1 vertical. The pilot channel bottom will vary from elevation 944 at the end of the spillway, sloping at a 0.5% grade to a point 550 feet downstream where it will match the existing South Branch Two Rivers channel bottom at elevation 941. Approximately 400 feet of the existing channel will be backfilled with soil. A 25-foot wide and 1-foot thick drainage blanket will be placed in the bed of the existing channel prior to backfill to allow seepage a safe path to exit. The existing channel has side slopes similar to the constructed channel and is approximately 100 feet wide.

Natural channel design of the vegetated channel was considered during design. Natural channel design is not feasible for the vegetated channel due to the volume and velocity of water flow expected during large flood events, which commonly occur each spring.

While construction of the new spillway is occurring, the South Branch Two Rivers will continue to flow through the existing spillway. A low-level gate in the existing spillway will allow for a drawdown of the Lake Bronson reservoir during construction. Construction is expected to last 18 months and would start no earlier than spring of 2024.

Demolition and construction equipment to be used for this project includes on- and off-road vehicles. Mobile, on-road vehicles will include medium to heavy-duty trucks, delivery trucks, and haul trucks. Mobile, off-road equipment includes construction machines such as excavators, graders, loaders, compressors, drill rig, generator sets, pressure washers, pumps, cement and mortar mixers, other construction equipment, and off-highway trucks.

Construction steps/phases including cofferdams outlined below:

Lower lake level using existing spillway and low-level gate:

DNR staff will start to lower the level of Lake Bronson approximately one month prior to the start of construction. The lake will be drawn down using the three, 20-foot-wide lift gates and a small two-foot square gate on the upstream side of the existing spillway. Drawdown will be controlled to reduce potential impacts including flooding downstream, embankment stability, and amphibians. Initial drawdown from elevation 975 (normal pool level) to 971 will be accomplished by opening the three large lift gates. Drawdown below elevation 971 will be accomplished by opening the two-foot square gate that is located near the bottom of the reservoir. Fully opening the small square gate with the lake level at elevation 971 and assuming no inflow would draw the lake down approximately six feet in one month.

The lower lake level will temporarily impact recreational facilities within Lake Bronson State Park. The fishing pier near the dam will be unusable during project construction. The public water access near the dam (near Lakeside Campground) will be closed during project construction. Motor boating activity may not be available or accessible during the draw down and construction. However, paddling may be available during the lake draw down and accessible from the public access near the west end of the lake, near the Two Rivers Campground.

Install cofferdams upstream:

Water control for the project construction will be finalized upon receiving the construction contractor's water control plan. Approval of the plan is required by DNR and the designer. We anticipate the contractor will install an earthen cofferdam on the upstream side of the new spillway location to approximate elevation 980 to keep water from Lake Bronson out of the excavated area should the reservoir rise due to a large flood event. An additional smaller cofferdam may be constructed on the downstream side of the new spillway location if the channel is fully excavated to keep the South Branch Two Rivers from backing up into the excavated area of the new spillway

channel.

Construct phase 1 of seepage cutoff wall:
Phase 1 of the seepage cutoff wall construction would occur prior to any excavation for the upper portion of the new spillway. The cutoff wall will be constructed by using special deep trenching equipment to excavate a trench up to 85 feet deep and several feet wide and mix the existing permeable material in the trench with a soil-cement-bentonite mixture that will stop any significant seepage from passing through or under the dam embankment. Phase 1 will start at the south end of the project up to the existing spillway.

Construct new spillway, new low-level drawdown structure, and bridge:
Once the cutoff wall is in place under the area of the new spillway, excavation will begin for the new spillway. The excavated area for the spillway will be approximately 300 feet wide and 300 feet long and the excavation for the channel downstream of the spillway will be approximately 125 feet wide (bottom) and 550 feet long. We anticipate that concrete footings and underdrains will be installed first, followed by construction of the floor of the concrete spillway, which is up to five feet thick. The spillway walls and labyrinth weir will be formed and concrete poured on site. The low-level drawdown and operating control house will be constructed, followed by bridge construction.

Route water through new low-level drawdown structure:
Once the new spillway is ready to accept water, the low-level gate will be fully opened to keep water drawn down to a safe level while the existing spillway is removed.

Removed cofferdams for the new spillway and construct cofferdams upstream and downstream of the old spillway:
The earthen cofferdams protecting the new spillway will be removed and used to construct new cofferdams to protect the demolition work on the existing spillway. We anticipate that the upstream cofferdam will be constructed to elevation 978 to protect the demolition area from a potentially rising lake level. Additionally, the downstream cofferdam will be much smaller as it only needs to protect the area from tailwater in the South Branch Two Rivers.

Demolish old spillway and bridge and construct embankment:
The existing spillway and bridge will be demolished and disposed of off-site. No blasting will be allowed. Some piling in the excavation may remain in place to limit the amount of deep excavation, ensuring a competent earthen embankment can be constructed in place of the existing spillway. A buttress will be added to the north old oxbow to increase the stability of that section of the dam embankment.

Construct phase 2 of seepage cutoff wall:
The north half of the seepage cutoff wall will be constructed and will tie into the south half.

Remove cofferdams:
Prior to letting the lake rise to its normal pool elevation, all cofferdams will be removed, and material disposed of off-site.

c. Project magnitude:

Description	Number
Total Project Acreage	Approximately 495 Acres (EAW Project Area)
Linear project length	N/A

Number and type of residential units	N/A
Residential building area (in square feet)	N/A
Commercial building area (in square feet)	N/A
Industrial building area (in square feet)	N/A
Institutional building area (in square feet)	N/A
Other uses – specify (in square feet)	N/A
Structure height(s)	N/A

d. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The replacement of the Lake Bronson Dam will be managed by the DNR and its consultants and contractors. The purpose of the project is to improve the safety of the dam. The replacement of the dam is necessary to mitigate the risks associated with a high hazard dam that is in poor condition. One deficiency is the inadequate hydraulic capacity of the outlet structure (spillway). The existing spillway is not large enough to pass a major flood, so a new spillway is needed. Secondly, high pore water pressures within the dam embankment could lead to instability, so a cutoff wall will be installed to reduce the pore water pressures. Additionally, the 85-year-old concrete spillway is deteriorating as shown by numerous cracks, spalls, and exposure of steel reinforcement to the elements.

To address the deficiencies, the decision-making process considered safety, ecological impact, recreation, infrastructure requirements, operations, costs and available funding, history, and technical feasibility. Over the past 15 years, several alternatives were evaluated by the DNR, including alternate spillway locations, alternate spillway types, complete dam removal, and partial dam removal with rock rapids. Ultimately, the project scope includes the construction of a new spillway and bridge as well as improving the stability of the earthen embankment. The new spillway and improved embankment will benefit the dam operator, riparian owners upstream, as well as individuals downstream of the dam along the South Branch Two Rivers by providing a safe dam that does not require gate operations that could artificially impact water levels.

The project will make the dam safer and less likely to fail, benefitting the safety and welfare of individuals downstream of the dam. Also, the new bridge will be wider than the existing bridge, making it safer to drive on County Highway 28, as well as safer to bike or walk on the trail over the spillway. The reservoir created by the dam (Lake Bronson) is a regional recreational attraction as it is the only lake suitable for motorized watercraft use in Kittson County, and it is the centerpiece of the state park. Lake Bronson is also one of the few tourist attractions in this part of the state as much of the surrounding land use is based in agricultural pursuits.

Construction of the project will ensure the reservoir can be maintained at current levels into the future, without having to implement risk reduction measures such as lowering the reservoir to reduce the probability of dam failure. Business owners and the local economy in the City of Lake Bronson will benefit from having a stable lake level and safe dam with recreational tourists visiting the park and spending money for food, gas, and supplies in the City of Lake Bronson.

e. Are future stages of this development including development on any other property planned or likely to happen? ☐ Yes ☒ No
If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

Once the dam and bridge are reconstructed, there are no other future developments planned for the

dam at this time.

Potential future state park maintenance and development projects include improvements and updates for accessibility (meeting Americans with Disabilities Act (ADA) requirements) and potential updates to the public water access, as needed during and/or post construction, and subject to funding availability.

Routine maintenance, management and operations of the state park will not require MEPA review. Environmental review needs will be assessed, as needed, when projects are proposed.

f. Is this project a subsequent stage of an earlier project? ☐ Yes ☒ No
If yes, briefly describe the past development, timeline and any past environmental review.

When the region was without lakes, the drought of the 1930s caused wells to dry up in the area. Unable to sink deeper wells because of a layer of salt, it was thought that the only solution for the future was to dam the South Branch Two Rivers and create a sizeable artificial lake. Dam construction began in 1936. Next, a combination water and observation tower, beach and bathhouse were developed. The park was briefly managed by Kittson County before being authorized as a state park in 1937. The dam and facilities were then turned over to the State of Minnesota, and in 1937, the area became Two Rivers State Park. In 1945, the park was renamed Lake Bronson State Park. Subsequent state park developments include the campgrounds, manager's residence, recreational trails, and a boat launch. (Figure 3.)

Past developments at Lake Bronson and Lake Bronson State Park predate and/or did not require MEPA (state) environmental review.

Subject to federal review, in 2015, a Federal EA was prepared to address the conversion of Land and Water Conservation Fund (LWCF/LAWCON) Lands within the Lakeside subdivision located within the statutory boundary of Lake Bronson State Park. This conversion of state-owned 2.15 acres to private ownership, among 21 lots, was necessary to improve the overall management of the park and its resources.

7. Climate Adaptation and Resilience:

a. Describe the climate trends in the general location of the project (see guidance: *Climate Adaptation and Resilience*) and how climate change is anticipated to affect that location during the life of the project.

The DNR aims to enhance ecosystem resiliency and reduce negative impacts of climate change by incorporating adaptation strategies, reducing or offsetting greenhouse gas emissions, cooperating with stakeholders, and developing employee knowledge. In accordance with Operational Order #131, "Climate Adaptation and Mitigation in Natural Resource Management," the DNR must use the best available science to develop and implement climate change adaptation strategies and use water and land management practices that sustain Minnesota's natural resources while helping to reduce future climate change by mitigating the environmental impacts of increased carbon emissions.

Climate change in Minnesota is evidenced by patterns such as increased temperatures and precipitation levels, more frequent extreme rain events, and cold weather warming. Between 1895 and 2017, Minnesota became 2.7 degrees Fahrenheit (F) warmer and 3.4 inches wetter. Rains that would historically be considered within the largest 2% of rainfalls are becoming more common, and precipitation in Minnesota is projected to increase by more than 15% by mid-century. In northwest Minnesota, the average temperature in the 21st century has been more than 2.2 degrees F higher

than the average between 1895 and 1999.

Changes in climate are observed at Lake Bronson State Park: annual temperature has increased at an average rate of 0.4 degrees F per decade since 1895, and at an average rate of 0.57 degrees F per decade since 1990. Annual precipitation has increased at an average rate of 0.02" per decade since 1895 and has increased at an average rate of 0.04" per decade between 1990 and 2020.

With the precipitation patterns bringing fewer, but heavier rain events, it is important to down-steam communities that the reservoir and dam have the ability to hold back surges on the South Branch Two Rivers.

b. For each Resource Category in the table below: Describe how the project's proposed activities and how the project's design will interact with those climate trends. Describe proposed adaptations to address the project effects identified.

Resource Category	**Climate Considerations (as identified above in 7a)**	**Project Information**	**Adaptations**
Project Design	Consideration for sizing the spillway based on changing precipitation and flood event intensity.	Climate change risks and vulnerabilities identified include: Warmer (Increasing) annual temperatures; and fewer, but heavier, more intense rain events.	Project will increase the spillway capacity to be able to safely pass large flood events through the dam without overtopping County Highway 28.
Land Use	No changes in land use are expected in the future, at least not to the degree that would impact the magnitude or frequency of flood flows.	Climate change risks and vulnerabilities identified include: Warmer (Increasing) annual temperatures; and fewer, but heavier, more intense rain events.	Project will increase the spillway capacity to be able to safely pass large flood events through the dam without overtopping County Highway 28.
Water Resources	Address in item 12	Address in item 12	Address in item 12

Contamination/ Hazardous Materials/Wastes		Climate change risks and vulnerabilities identified include:	N/A

Resource Category	**Climate Considerations** **(example text provided below is to be replaced with project- specific information)**	**Project Information**	**Adaptations**
Fish, wildlife, plant communities, andsensitive ecological resources (rare features)	Address in item 14.	Address in item 14.	Address in item 14.

8. Cover types: Estimate the acreage of the site with each of the following cover types before and after development:

Cover Types	Before (acres)	After (acres)
Wetlands and shallow lakes (<2 meters deep)	53.9	51.9
Deep lakes (>2 meters deep) (Lake Bronson)	298	299.7
Wooded/forest	39.8	37.8
Rivers /streams	10	10
Brush/Grassland	8.9	8.9
Cropland	0	0
Livestock rangeland/pastureland	0	0
Lawn/landscaping	*	*
Green infrastructure TOTAL (from table below*)		
Impervious surface	*	*
Stormwater Pond (wet sedimentation basin)	0	0
Other (describe): **Non-natural systems (Developed)* ***Facilities System and Use Areas (Developed)*	 51.8 32.5	 52.1 34.5
TOTAL	**495**	**495**

*"Non-natural systems" cover type includes previously disturbed lands, such as old field, savanna, prairie and young forest restoration areas.

**"Facilities Systems and Use Areas" cover type includes facilities and use areas such as various structures, buildings, landscaped areas, campgrounds, picnic areas, and impervious surfaces, such as parking lots, roads and trails.
(See Figure 6.)

Green Infrastructure*	Before (acreage)	After (acreage)
Constructed infiltration systems (infiltration basins/infiltration trenches/ rainwater gardens/bioretention areas without underdrains/swales with impermeable check dams)		
Constructed tree trenches and tree boxes		
Constructed wetlands		*0.9*
Constructed green roofs		
Constructed permeable pavements		
Other (describe)		
TOTAL*		

Trees	Percent	Number
Percent tree canopy removed or number of mature trees removed during development		*Approx. 2 acres will be removed*
Number of new trees planted		

9. **Permits and approvals required:** List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. *All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.*

Unit of Government	Type of Application	Status
US Army Corps of Engineers (USACE)	Section 10 Permit	To be obtained
USACE	Section 404 Permit	To be obtained
DNR	Public Waters Work Permit	To be obtained
DNR	Water Appropriation Permit	To be obtained, if required
DNR	Wetland Conservation Act (WCA) Permit	To be obtained, if required
DNR	Dam safety permit	To be obtained
DNR	Endangered Species Taking Permit	To be obtained, if required
Minnesota Pollution Control Agency (MPCA)	National Pollution Discharge Elimination System (NPDES) Construction Stormwater (CSW) Permit	To be obtained
MPCA	401 Water Quality Certification	To be obtained

	Anti-degradation assessment	
MPCA	Notification to Manage Dredged Material Without a Permit	To be obtained, if required
Kittson County	Right of Way Permit	To be obtained if necessary
Federal Emergency Management Agency	Floodplain mapping revisions	To be obtained if necessary

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 10-20, or the RGU can address all cumulative potential effects in response to EAW Item No.22. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 21.

10. Land use:

a. Describe:

i. Existing land use of the site as well as areas adjacent to and near the site, including parks and open space, cemeteries, trails, prime or unique farmlands.

The proposed project area is primarily located within Lake Bronson State Park, which is owned by the State of Minnesota and managed by the DNR, Parks and Trails Division. The origin of Lake Bronson State Park can be attributed primarily to the decision to construct a dam on the South Branch Two Rivers. The towns of Hallock and Bronson advocated for creation of a reservoir to alleviate a water shortage in the 1930s. Work on the dam began in 1936 and construction of the combination observation and water tower, beach and bathhouse followed. These structures were completed by the Works Progress Administration (WPA), and they are part of the Lake Bronson State Park WPA/Rustic Style Historic District, listed on the National Register of Historic Places.

Lake Bronson offers visitors a number of water recreation activities, including fishing, swimming, boating, paddling, birding and wildlife viewing. Two public water accesses are located within the state park, one located near the Two Rivers Campground along South Branch Two Rivers on the east end of the lake, and the second public water access is located just west of the Lakeside and Lakeside Extension Campgrounds. Two fishing piers, hiking trails, restrooms, picnic areas and shelters are also available along the shoreline of Lake Bronson.

Lake Bronson State Park straddles the divide between the prairies to the west and the aspen-parkland to the east. Farming, the predominant prior land use before government acquisition, continues today on private land adjacent to the park. It was identified as a “core” prairie area in the 2014 Minnesota Prairie Conservation Plan (Chaplin, S.J.1 and H. Van Vleck2 (editors). 2014. Implementing the Minnesota Prairie Conservation Plan in Landscapes of Western Minnesota. The Nature Conservancy, Minneapolis, MN.) This designation, reserved for important remnant prairies, spotlights the critical ecological role this state park holds. Some rare plants, animals, and plant assemblages carry federal protection under the Endangered Species Act. Almost half of the remnant prairies and savannas are globally significant (G-rank). Over 82 Species of Greatest Conservation Need (SGCN), as identified by Minnesota’s State Wildlife Action Plan 2015-2025 (MN DNR, 2016.), are found at the park. Lake Bronson State Park offers visitors a unique opportunity to explore some of the state’s most rare plant and animal assemblages. *(Details in Item 14.)*

Soils identified as “prime farmland” are in the vicinity of Lake Bronson State Park and a small portion are located within the park and project area boundaries (based on soil survey). No impacts to prime

farmland are anticipated. No areas within the park boundary are currently used for agricultural purposes. (See more below in Item 11.b.; and Figure 7.)

ii. Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

The proposed project area is primarily located within Lake Bronson State Park, which is owned by the State of Minnesota and managed by the DNR, Parks and Trails Division. The park was briefly managed by the county before being authorized as a state park in 1937. Subsequent state park developments include the campgrounds, manager's residence, and boat launch.

In 1978, the Lake Bronson State Park Management Plan was approved by the DNR and included management goals and recommendations for park management, balancing resource protections and recreational opportunities, with the primary focus of the park being the artificial lake. This original management plan included water recreation – fishing, paddling, swimming, camping, hiking, biking, snowmobiling, wildlife viewing, and other outdoor activities. The campground currently includes 158 sites, 67 of which are electric sites.

In 2015, an amendment to the Lake Bronson State Park Management Plan was approved to address the addition of equestrian use. The amendment allows for horseback riding and development of a horse trail system using existing park trails and allows development of support facilities such as horse trailer parking and a staging area in existing recreational use areas of the park.

Lake Bronson State Park currently includes 14 miles of hiking trails, 2 miles of surfaced bike trails and 5 miles of mountain bike trails available during spring, summer and fall. The Park also has 8 miles of equestrian trails. During winter months, there are 3 miles of groomed snowmobile trails, and snowshoeing is permitted on non-groomed ski trails. Cross country ski trails are being groomed by a volunteer sponsored by the Friends of Lake Bronson State Park in partnership with the Lake Bronson Cabin Owners Association. The visitor center serves as a warming shelter during the winter season.

iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

The proposed project is primarily located within Lake Bronson State Park. No special districts or zones occur within the proposed project area. The WPA historic district is described in Item 15.

The project area is within FEMA floodplain Zone A. The 1% chance flood elevation is 979.9 feet above mean sea level on the upstream side of County Road 28 in the lake and 959.4 feet on the downstream side.

Lake Bronson is classified as Recreational Development in the DNR Shoreland Classification mapping application. The South Branch Two Rivers on the downstream side of County Highway 28 is classified as Agriculture, with a public waters category of Public Waters Natural.

iv. If any critical facilities (i.e. facilities necessary for public health and safety, those storing hazardous materials, or those with housing occupants who may be insufficiently mobile) are proposed in floodplain areas and other areas identified as at risk for localized flooding, describe the risk potential considering changing precipitation and event intensity.

The purpose of the project is to improve the safety of the dam. The replacement of the dam is necessary to mitigate the risks associated with a high hazard dam that is in poor condition. One deficiency is the inadequate hydraulic capacity of the outlet structure (spillway). The existing spillway is not large enough to pass a major flood, so a new spillway is needed. The project will reduce the risk in floodplain areas downstream of the dam by allowing the dam to safely pass large floods, rather than overtopping and failing.

b. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

The proposed project will have no effect on zoning; the project area will remain within the state park boundary.

c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 10b above and any risk potential.

No incompatibilities with land use, plans, zoning requirements, or effects on zoning have been identified.

11. Geology, soils and topography/land forms:

a. Geology - Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

Lake Bronson State Park lies at the juncture of western prairies and eastern tallgrass aspen parkland, on landforms formed by Glacial Lake Agassiz. West of Lake Bronson, deeper water in the glacial lake basin left behind the flat topography of the Red River Valley, characterized by poorly drained silty and clayey soils and is dominated by prairie today.

About 8,000 years ago, a beach ridge (McCauleyville) formed on the east shore of the deep-water basin of Glacial Lake Agassiz. This beach ridge blocked glacial meltwater in a shallower glacial lake basin. Today, the South Branch Two Rivers crosses the McCauleyville beach ridge where the Lake Bronson Dam is located. Thus, Lake Bronson State Park lies almost entirely in the shallower glacial lake basin within the Tallgrass Aspen Parkland. The Tallgrass Aspen Parkland consists of mostly poorly drained soils, with a gradient change of 6-inches per mile. Glacial Lake Agassiz's retreat, left sandy deposits that characterize Lake Bronson's soils, along with some areas of loamy till deposited by glacial ice and then worked by wave action.

Two areas in the eastern area of the park, bisected by the South Branch Two Rivers, have stabilized sand dunes, a relic of wind re-worked sands. The dune area north of the river is very visible while dunes south of the river are less evident. Soils in both areas are excessively drained fine sand Serden soils of the Serden-Aylmer-Bantry complex.

The project will address high pore water pressures within the dam embankment. The silty sand embankment and foundation conditions, as well as a sand and gravel lens/layer in the foundation, could lead to instability through seepage and piping, so a cutoff wall will be installed through the dam

embankment and into the foundation to reduce the pore water pressures. Bedrock is estimated to be 200 to 400 feet below the ground surface.

b. Soils and topography - Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 12.b.ii.

- NOTE: For silica sand projects, the EAW must include a hydrogeologic investigation assessing the potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water. Descriptions of water resources and potential effects from the project in EAW Item 12 must be consistent with the geology, soils and topography/land forms and potential effects described in EAW Item 11.

The project area is on the edge of the Red River Valley. The region is flat with a gentle slope to the west. The project area is within the South Branch Two Rivers valley, where the river channel is approximately 20 to 30 feet below the surrounding topography.

Barr Engineering is designing the reconstruction project, including an erosion control plan. The project includes a labyrinth weir overflow structure, a new concrete spillway measuring approximately 125 feet wide by 250 feet long, a new vegetated channel measuring between 90 and 125 feet wide by 550 feet long, a new concrete bridge measuring 45 feet wide by 125 feet long, a soil-bentonite seepage cutoff wall measuring 85 feet deep by 1,300 feet long, a buttress measuring 400 feet long by 100 feet wide, demolition of the existing concrete spillway and bridge, and construction of an earthen embankment in place of the existing spillway and bridge. *(Note: all dimensions provided above are best estimates at this time and are subject to change as design details are finalized.)*

The new concrete spillway will be constructed to the south of the existing spillway. Most of the new spillway will be constructed on natural ground, creating a need to excavate soils for the spillway. Excavated material will be used to fill in the old spillway channel and to construct temporary cofferdams on the upstream and downstream sides of the spillway excavation to lessen the risk to the construction area. Dewatering wells will also likely be required to keep groundwater from impacting the construction.

Soil textures in Lake Bronson State Park are generally either sandy loams or loamy fine sands except for the alluvial soils associated with the South Branch/Two Rivers floodplain. Most of the soils in the park were deposited by wind and formed a micro-relief of low dunes and hollows. The sand dunes are sensitive features and protected resources within the park. The proposed project will not impact these sensitive areas and are located well outside of the construction limits.

Most of the other soils have generally moderate to severe limitations for all uses because of poor drainage, slope or surface texture. (Figure 7.)

Table 11.1. Soil Units within the Lake Bronson Dam Rehabilitation Project Area.

Map Unit Symbol	Map Unit Name	Depth to Restrictive feature (inches)	K Factor, Rock Free*	T Factor**	Drainage class
I16F	Fluvaquents, frequently flooded-Hapludolls complex, 0 to 30 percent slopes (Hydric)	>80	0.15	2	Very poorly drained
I40B	Maddock loamy fine sand, 2 to 6 percent slopes	>80	0.20	5	Well drained
I47A	Poppleton fine sand, 0 to 2 percent slopes	>80	0.02	5	Moderately well drained
I48A	Radium loamy sand, 0 to 2 percent slopes	>80	0.20	5	Moderately well drained
I91A	Rosewood fine sandy loam, dense till, 0 to 1 percent slopes (Hydric)	67-79	0.20	2	Poorly drained
I96D	Serden-Aylmer-Bantry complex, 0 to 9 percent slopes	>80	0.05	5	Excessively drained
I97A	Cormant loamy fine sand, dense till, 0 to 2 percent slopes (Hydric)	>80	0.17	5	Poorly drained
I100A	Cormant and Rosewood soils, very poorly drained, 0 to 1 percent slopes	>80	0.20	5	Very poorly drained
I106A	Enstrom loamy fine sand, dense till, 0 to 2 percent slopes	31-39	0.28	3	Moderately well drained
I114A	Foldahl fine sandy loam, dense till, 0 to 2 percent slopes *Note: Prime farmland soil, if drained*	20-33	0.20	3	Moderately well drained
I118A	Poppleton fine sand, dense till, 0 to 2 percent slopes (Non-Hydric)	>80	0.02	5	Moderately well drained
IWa	Water	-	N/A	N/A	-

*"Erosion factor Kf (rock free)" indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.
** The T factor is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.
Data Source: *NRCS Web Soil Survey online tool. Retrieved data 11/21/2022, based upon DNR defined project area.*

12. Water resources:

a. Describe surface water and groundwater features on or near the site in a.i. and a.ii. below.

i. Surface water - lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, shoreland classification and floodway/floodplain, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include the presence of aquatic invasive speciesand the water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

Surface waters designated as public waters within the project area include the following (also see Figure 8.):

Lake Bronson (PWI ID 35000300): surface water area of 312.09 acres, with maximum depth of 29 feet. Lake Bronson is listed as a Recreational Development Lake according to the Minnesota DNR Shoreland Classification system. A Recreational Development Lake is generally medium-sized, with varying depths and shapes and moderate levels of recreation use and existing development.

South Branch Two Rivers (H-026-009): a tributary of the Red River. The Two Rivers River empties into the Red River downstream of Hallock, approximately 25 miles west of Lake Bronson State Park. Approximately five river-miles of the South Branch Two Rivers are within the boundary of Lake Bronson State Park. Two Rivers consists of three branches: North, Middle and South.

Wetlands: A wetland delineation has been completed for the currently proposed construction area surrounding the existing dam. This delineation identified 11 wetlands, one tributary (Two Rivers) and one lake (Lake Bronson) for the project area surrounding the dam. (Details provided in part iv.a. below.) As design plans get closer to being finalized, additional or expanded delineations may be conducted, as needed, prior to construction activities.

There are no designated trout streams, trout lakes, or wildlife lakes in or near the project area.

No aquatic invasive species known or identified in these public waters (Lake Bronson, South Branch Two Rivers).

The watershed upstream of the Lake Bronson Dam is approximately 547 square miles, consisting of primarily agricultural land and flat terrain. A peak flow of 5,410 cubic feet per second was recorded in 1966, at the United States Geological Survey River Gauge 05094000, approximately 1.7 miles downstream of the dam. This was the largest flow on record for this location. Drought conditions can reduce the flow on the river at this location to nearly zero.

Nearly 71% of the Two Rivers Watershed has been hydrologically altered (channelized, ditched, or impounded). Hydrological alteration, coupled with significant agricultural land use (65% of the watershed is row crop agriculture), resulted in stream health monitors recording poor biotic integrity.

Minnesota Pollution Control Agency (MPCA) 303d Impaired Waters List:

In 2017, the Minnesota Pollution Control Agency (MPCA) designated several stretches of the Two Rivers as Biologically Impaired, including the following:

- **South Branch Two Rivers**, both above and below the Lake Bronson impoundment for Escherichia coli (E. coli), Benthic macroinvertebrate bioassessments, and fish bioassessments. Total Maximum Daily Load (TMDL) has been approved for E. coli.
- **Lake Bronson** is listed as impaired for Mercury in fish tissue (Hg-F)

ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

There are no mapped springs or seeps in the Minnesota Spring Inventory in the project area. There are several known seeps along the dam embankment that have been located and monitored by DNR Parks and Trails Division staff. These seeps are a result of the reservoir and the artificially high groundwater table adjacent to the dam.

1) The elevation of the water table in the project area is approximately 960-980 MSL, with depth to water table at 0-10 feet, and some areas near the western boundary of the project area having a range of 10-20 feet depth to water table. This information is derived from the well log information from the County Well Index. Pollution sensitivity of the bedrock surface has not been mapped for Kittson

County. Near surface pollution sensitivity ranges from Low to Very Low directly downstream of the dam and is not mapped in surface water areas.

2) No Wellhead Protection Areas are located within the proposed project area as defined. North Kittson Rural West Wellhead Protection Site is located within one mile of the defined project area to the north and partially overlaps with Lake Bronson State Park boundary. North Kittson Rural Water East is over one mile outside of the proposed project area.

3) The use of ArcMap GIS tools and County Well Index data was used to determine wells within the project area as well as within 1 mile of the project area (Tables 12.1 and 12.2 below). Within the project area, the County Well Index includes six verified wells, all of which exist within a quarter mile of Lake Bronson Dam. Four of the six are relief wells (RW) that were constructed in 1991 and are listed in the County Well Index as "Lake Bronson Dam." The remaining two wells include one for scientific investigation and one for monitoring.

Table 12.1. County Well Index Verified wells within the project area.

Unique Number	Well Name	Elevation (ft)	Use	Depth (ft)
219852	USGS C-29	978	SI	151
495611	LAKE BRONSON DAM	980	RW	46
495612	LAKE BRONSON DAM	980	RW	50
495613	LAKE BRONSON DAM	980	RW	47
495615	LAKE BRONSON DAM	980	RW	52
866776	LAKE BRONSON STATE PARK MN DNR	977.7	MW	112

An additional 49 wells are located within one mile of the project area, listed below, Table 12.2. Well uses include Domestic (DO); Monitoring Well (MW); Public Supply/community (PC); Public Supply/non-community – transient (PN); Public Supply/Non-community (PS); Scientific Investigation (SI), and Test Well (TW).

Table 12.2. County Well Index Verified wells within 1 mile of the project area.

Unique Number	Well Name	Elevation (ft)	Use	Drill Depth (ft)
00111816	BAPTIST BIBLE CAMP	995.00	PS	75
00153707	JOHNSON, OSCAR	962.00	DO	80
00173258	GALILEE BIBLE CAMP	987.00	PN	55
00181832	LEO LOCKEN	981.00	DO	54
00215249	LAKE BRONSON #2	957.00	TW	96
00215250	LIND, LAWRENCE	965.00	DO	72
00215268	HAZELTON, HARALD	1003.00	DO	132
00215269	LAKE BRONSON CAMPSITE NO	995.00	DO	101
00215270	LAKE BRONSON NO. 1	965.00	PS	94
00219673	HAZELTON, WESTLEY	1004.00	DO	117
00219836	USGS C-12	988.00	SI	161
00219837	USGS C-13	987.00	SI	44
00219838	USGS C-14	985.00	SI	137
00219839	USGS C-15	984.00	SI	160
00219840	USGS C-16	986.00	SI	150
00219841	USGS C-17	977.00	SI	150
00219842	USGS C-18	983.00	SI	168
00219843	USGS C-19	990.00	SI	226
00219844	USGS C-20	984.00	SI	225
00219846	USGS C-22	984.00	SI	60
00219847	USGS C-24	984.00	SI	165
00219853	USGS C-30	986.00	SI	211

Unique Number	Well Name	Elevation (ft)	Use	Drill Depth (ft)
00219961	BH-04	987.00	TW	157
00219962	BH-05	987.00	TW	152
00219963	BH-TW2	987.00	TW	182
00219964	BH-06	987.00	TW	145
00219966	BH-TW2A	987.00	TW	167
00219967	BH-1	1005.00	TW	183
00219968	BH-2	988.00	TW	260
00219970	BH-4	976.00	TW	139
00219971	BH-5	987.00	TW	169
00219977	USGS BH-11	972.00	TW	136
00219978	USGS BH-12	1005.00	TW	109
00219989	USGS BH-23	978.00	TW	152
00219992		983.00	TW	421
00240759	NORTH KITTSON 1	975.90	PC	130
00240760	NORTH KITTSON 2	976.80	PC	130
00240761	NORTH KITTSON 3	978.80	PC	130
00243947	DNR OB 35003 DALE R BRONSON	983.00	DO	8
00263888	LAKE BRONSON BAPTIST BIB	983.00	PN	0
00264643	LAKE BRONSON STATE PARK	993.00	PN	0
00264644	LAKE BRONSON STATE PARK	984.00	PN	0
00430130	DANIELSON,DAVID	976.00	PN	220
00443077	JOHNSON, FREDRICK	978.00	DO	88
00502830	JOHNSON, ANGIE	980.00	DO	65
00508519	MCFARLANE, ROCKY	985.00	DO	80
00508596	HAUSON, MELVIN	980.00	DO	77
00645585	MILLER, STEVE	980.00	DO	75
00849890	LAKE BRONSON STATE PARK	988.50	PN	59

b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.

i. Wastewater - For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.

1) If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.

2) If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system. If septic systems are part of the project, describe the availability of septage disposal options within the region to handle the ongoing amounts generated as a result of the project. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity and amount with this discussion.

3) If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the

effects.

No wastewater would be produced or treated within the proposed project area. No wastewater discharge to surface waters is proposed or anticipated as a result of this project.

ii. Stormwater - Describe changes in surface hydrology resulting from change of land cover. Describe the routes and receiving water bodies for runoff from the project site (major downstream water bodies as well as the immediate receiving waters). Discuss environmental effects from stormwater discharges on receiving waters post construction including how the project will affect runoff volume, discharge rate and change in pollutants. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity and amount with this discussion. For projects requiring NPDES/SDS Construction Stormwater permit coverage, state the total number of acres that will be disturbed by the project and describe the stormwater pollution prevention plan (SWPPP), including specific best management practices to address soil erosion and sedimentation during and after project construction. Discuss permanent stormwater management plans, including methods of achieving volume reduction to restore or maintain the natural hydrology of the site using green infrastructure practices or other stormwater management practices. Identify any receiving waters that have construction-related water impairments or are classified as special as defined in the Construction Stormwater permit. Describe additional requirements for special and/or impaired waters.

Sandy soils in the area limit stormwater runoff. An erosion control plan will be prepared with final design plans. Current stormwater runoff at the site consists of runoff from the ditches of County Highway 28, the gravel parking area, the stream banks to the north and south, and the dam embankment into the South Branch Two Rivers and Lake Bronson. Post construction stormwater runoff will not change in quantity, but may change in location due to the change in location of the spillway. The new spillway will be larger than the existing spillway so that the dam can safely pass extreme flood events without overtopping the earthen embankment and causing failure of the dam.

The total disturbed area from the project is approximately 20 acres. The disturbed area includes the county highway, construction staging areas, lake, stream channel, wetlands, forest, and grasslands.

Removal of the existing spillway and construction of the new spillway could cause a short-term introduction of sediment-laden runoff into the South Branch Two Rivers below the project site prior to completion of the project. Also, construction of the seepage cutoff wall could cause sediment to enter the Lake Bronson reservoir. The water control plan will be submitted by the contractor and will likely include the drawdown of Lake Bronson during construction. Once the lake is lowered, cofferdams and erosion control measures will be implemented. The project SWPPP developed in accordance with the NPDES permit requirements includes BMPs such as the use of erosion control blankets, silt fencing, silt curtain, sediment logs, and rock checks. Exposed areas of sediment will be stabilized immediately once construction activities have temporarily or permanently stopped and will not resume for seven days.

To prevent equipment from tracking sediment into Lake Bronson or the South Branch Two Rivers during construction, the work activity site would be protected from the flow with the use of a cofferdam. A silt curtain will trap any material from entering the reservoir and river.

Areas below the Ordinary High Water Level (OHWL) are subject to DNR's Public Water Permit conditions and those areas above the OHWL are subject to MPCA's NPDES/SDS General Construction Stormwater Permit (CSW Permit). The OHWL is the approximate normal summer pool, elevation 975 feet in North American Vertical Datum 1988. Work will be done both below and above the OHWL. An example of a construction BMP is the use of the cofferdam to divert the stream around the work area.

No receiving waters have construction-related water impairments or are classified as special, as defined in the Construction Stormwater permit.

iii. Water appropriation - Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Discuss how the proposed water use is resilient in the event of changes in total precipitation, large precipitation events, drought, increased temperatures, variable surface water flows and elevations, and longer growing seasons. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation. Describe contingency plans should the appropriation volume increase beyond infrastructure capacity or water supply for the project diminish in quantity or quality, such as reuse of water, connections with another water source, or emergency connections.

The project may require an appropriation of water. This appropriation would be related to project dewatering so that construction can take place in dry conditions. The quantity of groundwater entering the excavation will depend on the drawdown level of the reservoir during construction, as well as climatic conditions. Pumping is anticipated to be less than 10,000 gallons per day, or 1 million gallons per year, but could exceed those thresholds if the reservoir is unable to be kept low during construction. Duration of groundwater pumping could be throughout the project construction period. No surface water appropriation is expected as any bypass flow would not go beyond the bounds of the river channel. (A water appropriations permit will be obtained, if required.)

Pressure relief wells and observation wells exist in and near the embankment of the dam. These wells will either be extended vertically to match the elevated soil grade due to construction or they will be abandoned according to the Minnesota Department of Health requirements.

A cofferdam will divert water from the construction area to the current spillway. Water will not leave the site. Pumping for construction dewatering will be minimal for construction of the new spillway with the anticipated draw down of the Lake Bronson reservoir during construction. Demolition of the existing spillway and construction of the new spillway requires upstream and downstream cofferdams and associated pumping to maintain a worksite free of standing water. Groundwater from natural ground and direct precipitation may enter the two excavations. Adjacent surface water flow will be directed around the excavations.

Requirements for the water control plan may include lowering the reservoir through use of the existing low-level gate, cofferdams, and passing flood flows through the existing spillway. The seepage cutoff wall is not anticipated to require any pumping of water. The contractor is required

to submit a water control plan to the DNR Ecological and Water Resources regulatory staff for approval prior to the start of construction that must keep the work activity area dry under reasonably expected conditions to keep Lake Bronson and the South Branch Two Rivers from disturbing the work area.

iv. Surface Waters

a) Wetlands - Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed and identify those probable locations.

Approximately 53.9 acres of wetlands are located within the defined project area, including emergent wetlands (36 acres; seasonally flooded or saturated emergent wetland, shallow marsh), forested wetlands (17.1 acres; hardwood wetland) and shrub wetlands (0.80 acre).

A wetland delineation has been completed for the proposed construction area surrounding the existing dam. The delineation identified 11 wetland areas, one tributary (Two Rivers) and one lake (Lake Bronson) for the project area surrounding the dam. Wetlands north of the reservoir and on the far west end of the project area are not anticipated to be directly impacted by the project. Direct impacts will occur to wetland areas identified near the dam, tributary and the lake. Some of the impacts from the project will be temporary, while other impacts will be permanent, including changes in the wetland type. Construction of a new outlet channel will create new wetlands.

Reservoir drawdown will directly temporarily impact Lake Bronson and wetlands adjacent to the lake. The lake will be temporarily drained during construction and will be refilled upon completion of construction. The wetlands adjacent to the lake may have temporarily reduced water levels during the drawdown period. Maintaining a full reservoir with no drawdown during construction is a safety risk. The drawdown is intended to reduce the risk.

Construction activities in the lake will impact the lake and a wetland area adjacent to the new labyrinth weir. Permanent impacts include grading of the lake bottom to accommodate construction of the low-level outlet and permanent inundation of parts of the wetland due to construction of the labyrinth weir. Temporary impacts in the lake include construction of cofferdams.

The new spillway outlet channel will create a new 0.2 acre tributary (channel) and approximately 0.9 acres of new wetlands. Filling of the existing tributary and adjacent wetlands will permanently affect those wetlands. In addition, adding a buttress in the oxbow on the north end of the dam will permanently affect some wetlands, as will the new spillway construction.

The project will permanently impact approximately three acres of wetlands. Overall, the wetlands created are expected to help offset the wetlands impacted for a potential loss of approximately 2 acres. However, the project proposer will either seek credit for recently created wetlands in the Two Rivers watershed completed by DNR, or purchase wetland credits to reach no net loss of

wetlands, if necessary.

The proposed project will follow the procedures and processes of state and federal wetlands laws, including permitting processes according to Section 404 of the Clean Water Act and the Minnesota Wetlands Conservation Act (WCA).

Potential changes to wetlands are not expected to affect the host watershed when considering climatic changes.

b) Other surface waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

Physical Effects or Alterations: (reference Figure 5)

- The project will temporarily partially drain Lake Bronson. We anticipate dropping the water level of the lake one month prior to construction. The contractor will be responsible for controlling the level of the lake during construction. The lake could potentially be drawn down approximately 22 feet below normal pool, from elevation 975 to elevation 953. Construction is expected to last 18 months.
- Once the project is completed, the project will restore the normal water level of Lake Bronson. The reservoir storage is relatively small for the size of the watershed, so it is anticipated that the refill of Lake Bronson would occur during spring runoff or possibly sooner with a large rainfall event. Refill of the reservoir will not cut off all flow downstream. A minimum amount of flow will be sent downstream during the refill of the reservoir. The amount of flow released from the dam will depend on the amount of inflow and the time of year.
- Earthen cofferdams will be constructed in the reservoir and in the downstream channel to keep water out of the work area.
- Water will continue to flow through the existing spillway for most of the construction period. The new spillway must be finished before any water is allowed to flow through it.
- Water passing through the new labyrinth spillway will flow in a channel that is approximately 400 feet south of the current spillway. Moving the spillway will create a new river channel approximately 550 feet long before it joins the existing river channel. The new river channel will be excavated through native soils and sloped to be stable during normal flow and flood flow events.
- Approximately 550 feet of river channel downstream of the current spillway will be filled with soil from the excavation of the new spillway river channel. This is necessary to stabilize the embankment and lengthen the seepage path to prevent internal erosion.
- The shoreline will be altered in the vicinity of the new labyrinth spillway to ensure that water can flow unrestricted into the spillway.

- The shoreland area of the reservoir is defined as the area within 1,000 feet of the water basin, and the shoreland area of the river is defined as the area within 300 feet of the watercourse. Nearly all of the project area would be defined as shoreland area due to its proximity to the South Branch Two Rivers and Lake Bronson.
- Remove approximately two acres of Old Growth trees from the dam embankment to enhance stability and remove trees on the north side of the river for construction of the containment embankment.
- The labyrinth weir of the proposed project will be able to pass approximately twice as much flow as the current spillway for a given lake elevation. With water at the top of the road, the current spillway can pass approximately 5,000 cubic feet per second (cfs) and the proposed spillway can pass approximately 10,000 cfs. For a typical spring flood, water in the reservoir will not rise as much as it currently does with the proposed larger spillway. For example, the reservoir level from the 1% chance flood event (often called the 100-year flood) will be approximately two feet lower with the proposed project.
- Normal lake levels should be unchanged by the project because the lake runout elevation of the labyrinth weir will be at the same elevation as the current runout.
- The existing dam has a low-level outlet that allows for the release of water from the bottom of the reservoir. The release of this low oxygen water allows for improved water quality in the lake and reduces the likelihood of a fish kill. The proposed project will incorporate a similar low-level outlet. A 36-inch diameter pipe will convey water from the bottom of the reservoir to a manhole. The manhole will have gates to control the flow into the spillway. Up to 100 cubic feet per second can be released through this system, similar to the current system.
- In addition, the portion of the labyrinth weir will be one to two inches lower than the rest of the weir. This configuration will meter the flow out of the reservoir during low flow conditions, allowing the lake to remain above the runout for longer periods of time and keeping flow going downstream for longer periods of time during dry conditions which will help the downstream fish community. Should dry conditions persist long enough for water to go below the entire weir, the only release of water would have to occur through the low-level outlet, which is water with lower oxygen than the rest of the water column. The existing dam has the ability to release "top" water during dry conditions if needed, though in practice this does not occur as the reservoir is not used to supplement the river downstream.
- Current and future operations of the dam are intended to act as "run of river", meaning whatever flows into the reservoir flows out of the reservoir. If nothing is flowing in, then nothing is flowing out.

Direct and indirect environmental effects include the following:

- Temporary drawdown of the reservoir will affect fish/invertebrates/amphibians. The reservoir may fluctuate more since in the drawdown condition, a moderate flood will cause the reservoir to rise quickly. Drawdown will be slow as the low level can only pass approximately 100 cubic feet per second. Cofferdams constructed on the bed of the reservoir have the potential to contribute sediment.
- In-channel work includes the removal of the stilling basin and filling in portions of the river channel with excavated material from the new spillway channel. It is not feasible to keep the spillway in the same location as doing so would create safety, stability, and seepage cutoff wall concerns.
- The geographic extent of these effects is within 600 feet of the existing dam. Many effects will be short term (temporary), only occurring during construction. Water level fluctuations will be temporary.

Measures to avoid, minimize or mitigate environmental effects:

- A cofferdam with silt curtains will be installed prior to construction, which will minimize excessive flow and sediment release.
- Best management practices, in accordance with the project SWPPP, will be used to reduce erosion impacts.
- Project boundary is minimized to limit the impact on Old Growth.

Change in number and type of watercraft:

- Watercraft usage during construction will be limited and likely reduced from normal activity levels during the draw-down and construction duration. Once the project is complete, the number and type of watercraft will be able to return to its normal (pre-project) levels. The proposed project will not change the current or projected number or type of watercraft.

13. Contamination/Hazardous Materials/Wastes:

a. Pre-project site conditions - Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

Based on MPCA's *What's in my Neighborhood* (WIMN) database and DNR Lake Bronson State Park operations information, there are no known contaminations in close proximity to the project area. The following sites are located within the state park boundary, but outside of the proposed project area.

- RV campground – active wastewater permits include Municipal NPDES/SDS Permits
- Two active storage tanks, one aboveground (TS0007621) and one underground (TS0007621). The above ground tank is used to store petroleum products (unleaded gasoline) for park maintenance equipment. The underground tank is used for the campground dump station.
- Two inactive dumps are located within the state park boundary, but outside the project area.
    - The Percy Township/Lake Bronson City Dump site was closed on 8/31/1998.
    - The Lake Bronson State Park Dump is considered inactive, with the site closed on 1/1/1997. This site listing includes records for a State Assessment, which is a place MPCA has investigated due to suspected contamination. The site was assessed to determine if it posed a risk to human or environmental health. The site was listed from 1/1/1987 to 11/9/2005 in the federal Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS). This means that the site is or was suspected of being contaminated. After CERCLIS sites are investigated, they may be elevated to state or federal Superfund lists, or it may be determined that no action is necessary. The site was not elevated as a state or federal superfund site, no further action was necessary.

Currently, there are no known contamination sites located in close proximity of the project area.

b. Project related generation/storage of solid wastes - Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

The project will generate waste from the removal of the dam structure. Project-generated solid wastes include concrete, steel sheet piling, steel gates with appurtenances, and other metal. Debris from the dam will be carried off-site by the contractor. All waste materials including garbage (such as plastic wrap and packaging) will be collected by the contractor in dumpsters and disposed of off-site at an approved facility.

To prevent solid wastes from entering the South Branch Two Rivers during construction, the work activity site would be protected from the South Branch Two Rivers flow with the use of a cofferdam. A silt curtain will trap any material from entering the river.

c. Project related use/storage of hazardous materials - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any new above or below ground tanks to store petroleum or other materials. Indicate the number, location, size and age of existing tanks on the property that the project will use. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

During project construction, fuels, oils, lubricants, and other materials typical for use by heavy equipment will be used on site. The contractor will be required to prepare a Spill Prevention and Response Plan to address accidental spills or the release of any hazardous material or petroleum products. The plan will be required to include the following measures to avoid and/or minimize spills during construction activities:

- Fueling, equipment maintenance, and temporary fuel storage will be located lot, above elevation 976 feet.
- The contractor shall maintain fuel spill containment kits and trained spill response personnel on the site, at all times.
- Any spill or release of a hazardous material or petroleum products will be reported to the project site supervisor who will take immediate action to minimize the potential for groundwater or surface water pollution.
- In the event of a significant spill or release of a hazardous material or a petroleum product, the project site supervisor will immediately deploy on-site supplies and equipment to contain the spill and contact the MN DNR, MPCA and the Minnesota Duty Officer, according to emergency procedures identified in Minnesota Rules, part 7045.0574.
- Below ground storage tanks will not be allowed.

No hazardous materials related to the proposed project will be used or stored on site.

d. Project related generation/storage of hazardous wastes - Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling

The project will not generate or require the storage of hazardous wastes during demolition.

14. Fish, wildlife, plant communities, and sensitive ecological resources (rare features):

a. Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.

The Lake Bronson reservoir is a locally important recreational fishing resource, providing excellent opportunities to target walleye, black crappie, north pike, largemouth bass, and sunfish in an area that has no other recreational fishing lakes. Ice fishing pressure on Lake Bronson is approximately 5,000 angling hours, while summer fishing accounts for approximately 6,600 angling hours. These fisheries resources are primarily supported by natural reproduction, both in Lake Bronson proper and upstream in the South Branch Two Rivers. Fry stocking of walleye also contributes to this resource. Evidence of natural reproduction of walleyes contributing to the Lake Bronson walleye fisheries has been found during both DNR fisheries surveys on Lake Bronson and during a stream survey of the South Branch Two Rivers.

In addition to the habitat in Lake Bronson, multiple critical habitat types for the fish community residing in the South Branch Two Rivers exist (e.g., oxbows, riffle complexes, deep pools), both upstream (to Pelan) and downstream (to Hallock) of Lake Bronson. During DNR Fisheries stream surveys between Pelan and Lake Bronson, 21 fish species were observed upstream of Lake Bronson, including notable catches such at young-of-year walleye. During DNR fisheries stream survey between Hallock and Lake Bronson, 28 fish (individuals) were observed downstream of Lake Bronson, including notable species such as channel catfish and burbot. Additionally, a variety of macroinvertebrates were also observed in these reaches.

Detailed descriptions of the recreational fishery at Lake Bronson, the status of the recreational fishery in Lake Bronson, and descriptions of the biology, hydrology, water quality, geomorphology, and connectivity in the Two Rivers watershed can be found in a variety of reports published by the Minnesota Department of Natural Resources and the Minnesota Pollution Control Agency.

The Aspen Parklands Subsection, located in northwestern Minnesota, is a mix of lacustrine plain and shoreline (beach) ridges formed by Glacial Lake Agassiz, with extensive forested peatlands to the east and tallgrass prairie to the west. The subsection is the southern end of a much larger province that stretches north and west into Canada and serves as the transition zone between the prairie and forest areas. The large Roseau and Red rivers are in this subsection, and flooding is common due to the level topography. Deep lakes are rare. This subsection contains large complexes of wetlands, aspen and brush prairie with dry prairie on beach ridges. Well over 60 percent of this subsection is in agriculture, mostly in the southern half. In the northern half, extensive areas have recently been cleared for farming. Still, some remnants of large contiguous patches of native plant communities, including wetlands, remain. Wild rice cultivation is common in the eastern edge of this area.

Species of Greatest Conservation Need (SGCN) are species identified as rare, declining, or vulnerable in Minnesota and their available habitats are declining in quality or extent. The Aspen Parklands

subsection contains 85 SGCN according to *Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife, Comprehensive Wildlife Conservation Strategy* (DNR 2006). These SGCN include 30 species that are federal or state endangered, threatened, or of special concern. Gray wolves, sharp-tailed grouse, sandhill cranes, eared grebes, northern harriers, marbled godwits, American bitterns, Franklin's gulls, Assiniboia skipper, great gray owls and moose make this subsection unique. It is also a major migratory stopover and breeding area for waterfowl.

Wildlife

Remnant landscapes can hold fauna lost in much of Minnesota. Prairies are amongst the most altered habitats in Minnesota and contain more species of greatest conservation need than any other habitat identified in *Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife, Comprehensive Wildlife Conservation Strategy* (DNR 2006). Rare animal species found at Lake Bronson State Park includes: two butterflies species listed as federally threatened or endangered; four other prairie obligate butterflies uncommon in Minnesota; the monarch butterfly, currently under discussion for federal protection listing; creek heelsplitter (MN special concern) is known to be at Lake Bronson; 15 mammals; and 63 bird species whose populations are tracked and either noted as a Species of Greatest Conservation Need (SGCN), Minnesota endangered (END), Minnesota Threatened (THR), Minnesota special concern (SPC), or on the watchlist.

Critical Habitat

The Poweshiek skipperling was once Minnesota's most abundant prairie-obligate skipper, and Dakota skippers were also abundant prior to the 2000's. The past two decades saw the virtual disappearance of both the Poweshiek skipperling and Dakota skipper across most of its range, including at Lake Bronson State Park. The Dakota skipper was last found at Lake Bronson in 2009 (USFWS) and the most recent Poweshiek skipperling record was prior to 2000. Dakota Skipper (threatened) and Poweshiek skipperling (endangered) were listed under the federal Endangered Species Act in October, 2014.

In 2015, as part of the Minnesota Recovery Plan for these two prairie butterflies, 263 acres of critical habitat was designated at Lake Bronson State Park under the Endangered Species Act (ESA). ESA defines critical habitat as an "…area that contains habitat features essential for the survival and recovery of a listed species, which may require special management considerations or protections." Because 263 acres of prairie habitat on the south side of the South Branch Two Rivers is protected as critical habitat, no activity that negatively impacts the resource value is allowed under federal law.

b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-____) and/or correspondence number (MCE: 2023-00227) from which the data were obtained and attach the Natural Heritage Review letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

The Natural Heritage Review letter identified potential impacts to the following rare features: Minnesota Biological Survey (MBS) Site of Biodiversity Significance and several rare native plant communities, a Lake of Biological Significance, and native bats.

Sites of Biodiversity Significance

Sites of Biodiversity Significance have varying levels of native biodiversity and are ranked based on the relative significance of this biodiversity at a statewide level. Sites ranked as *Outstanding* such as

Lake Bronson and Lake Bronson State Park, contain the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities, and/or largest, most intact functional landscapes present in the state.

Bats

The Natural Heritage Information System (NHIS) tracks bat roost trees and hibernacula plus some acoustic data, but this information is not exhaustive. Even if there are no bat records listed nearby, all seven of Minnesota's bats, including the federally endangered northern long-eared bat (*Myotis septentrionalis)*, can be found throughout Minnesota. During the active season (approximately April-November) bats roost underneath bark, in cavities, or crevices of both live and dead trees, as well as crevices under bridges and in culverts. The dam has a bridge above it and needs to be checked for bat presence. A bat survey will be conducted by DNR Parks and Trails resource staff prior to construction activities to satisfy the bat habitat conservation plan and the Endangered Species Act rules related to northern long eared bats.

Rare Plants

Lake Bronson State Park contains 17 rare plant species; of which two are state listed endangered, three are state threatened and 12 are state special concern. Each of these rare plant species have strong affinity for prairie or wet prairie settings. Impacts to these native plant communities, and the species within them, are not expected.

The DNR contracted a botanist to survey for the following state-listed species of special concern: northern androsace, spike oat, blunt sedge, dry sedge, small white lady's slipper, and long-stalked chickweed. Only the small white lady's slipper was found in the survey area.

Native Plant Communities Statewide and Global Significance (S-Ranks and G-Ranks)

Lake Bronson State Park includes 1,931 acres of native plant communities (NPC). All NPCs found at Lake Bronson State Park are of statewide significance and nearly half are also of global significance using the NatureServe classification system. NatureServe and its network of natural heritage programs and conservation data centers are the leading source for information about rare and endangered species and threatened ecosystems.

The statewide and global significance status (S-rank), (G-rank) of Lake Bronson's NPC's is shown in Table 14.4 below. All of Lake Bronson State Park's native plant communities are S1, S2 or S3 communities. S1 communities are critically imperiled in Minnesota; S2 communities are imperiled; S3 communities are vulnerable to extirpation. Seven of Lake Bronson State Park's thirteen native plant communities are also globally significant G2 and G3 (843 acres). G2 are imperiled and at high risk of extinction; G3 are vulnerable and at moderate risk of extinction; G4 are apparently secure, uncommon but not rare; G5 are secure, common, widespread and abundant.

In addition to the NatureServe ranks, the Minnesota Biological Survey classified 2,835 acres of Lake Bronson State Park as a site with Outstanding biodiversity significance.

Old growth forests are the later stages of forest succession in forested ecosystems. They are home to trees reaching their oldest growth stages and contain many biological features that have developed over hundreds of years. Old growth forests serve an ecologically important role in Minnesota's forested landscapes. They provide unique ecosystem services, habitat for many special species, and serve as genetic reservoirs for future old growth forests.

Old growth forests are protected from harvest and represent new values in modern forest

management. Minnesota's remaining old growth forests are important for their ecological, scientific, educational, aesthetic, and spiritual values. The DNR protects the highest quality remaining old growth forests in order to preserve and perpetuate these ecosystems and their multiple values.

Table 14.1. Species and native plant communities located within the proposed project area and could potentially be impacted by the project.

Scientific Name	Common Name	Type	Status	Habitat	Potential Impacts from proposed project
Androsace septentrionalis	Northern Androsace	Vascular Plant	SPC	Dry, sunny, sandy soils, beach ridges, river banks, abandon gravel pits and gravelly roadsides.	No impacts expected. Negative survey results in 2022.
Avenula hookeri	Spike Oat	Vascular Plant	SPC	Dry prairies, hills, bluffs and beach ridges.	No impacts expected. Negative survey results in 2022.
Carex obtusata	Blunt Sedge	Vascular Plant	SPC	Dry, sandy, gravelly soil. Alluvial terraces, sandy outwash plains or beach ridges.	No impacts expected. Negative survey results in 2022.
Carex xerantica	Dry Sedge	Vascular Plant	SPC	Dry, sand-gravelly prairies and beach ridges.	No impacts expected. Negative survey results in 2022.
Cypripedium candidum	Small White Lady's Slipper	Vascular Plant	SPC	Deep-soil mesic prairies, wet prairies, sedge meadows, calcareous fens.	Impacts to individuals not expected. Some suitable habitat may be lost during construction.
Stellaria longipes ssp. Longipes	Long-stalked Chickweed	Vascular Plant	SPC	Brush prairies, sandy river banks and lake shores, moist to wet, sometimes slightly dryish.	No impacts expected. Negative survey results in 2022.
Sterna forsteri	Forster's Tern	Bird	SPC	Marshes with emergent vegetation and open water. Floating platforms of vegetation or muskrat houses. Water level is a crucial factor is selecting suitable nesting habitat and success. If water levels are unsuitable when the birds return in the spring, nesting sites are quickly abandoned.	Potential for temporary loss of nesting habitat.
	Old Growth Hardwoods	NPC	S3	Floodplain Forest System	Some habitat loss will occur as a result of this project (~2 acres).

c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project including how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

The project has the potential to negatively affect the recreational fishery resources, at least temporarily. The proposed drawdown of the reservoir during construction will impact the fishery due to low water levels and potential reduced dissolved oxygen, both during the warmest parts of the

summer and during the winter. The low water levels are anticipated to last for up to two years. The initial drawdown will be done in a slow, controlled manner to increase the chance for fish to out-migrate upstream. The extent to which fish will migrate upstream is unknown, but there is likely to be large mortality events due to stranding. Fish naturally migrate in a downstream direction in response to falling water levels, but this will not be possible due to the barrier created by the existing dam. These impacts on the fishery will be temporary, as the proposed project will maintain the same water level in the reservoir as the existing dam, when completed.

Following reconstruction (rehabilitation), DNR Fisheries will sample the fishery to determine the extent of the impacts from the project. Fishing regulations will remain in place and no promiscuous fishing will occur during the project. Upon refilling of the reservoir, if impacts from the project were detrimental to the fishery, DNR Fisheries is committed to implementing an aggressive plan to rebuild the fishery in the reservoir. The plan may include stocking, natural migration from upstream, and monitoring to assess recovery objectives, with the possible inclusion of other management actions to further promote the recovery.

Construction activities could also negatively affect downstream fish communities if minimum flows are not maintained in the South Branch Two Rivers. For this reason, run-of-the-river flows will be allowed to pass during the construction phase to limit the potential for detrimental effects to the downstream fish community. Additionally, the slow drawdown of the reservoir should limit damage to habitat that a sudden spike in flows could cause. Additionally, because the new dam will not be operational, there is a potential for channel drying during very dry years if the lake level falls below the crest of the new dam and there is no outflow.

A rare features screen of the construction area at Lake Bronson State Park showed likely impacts to the following rare features: creek heelsplitter, northern androsace, spike oat, blunt sedge, dry sedge, small white lady's slipper, long-stalked chickweed, Forster's tern, and a high-quality old growth forest stand (also an S3 NPC). Potential impacts to rare features include habitat loss and fatalities. The remaining features identified in the screening process are not anticipated to be affected by the project.

Threats to the small white lady's slipper include destruction of habitat and loss of individuals.

Threats to the old growth forest, which is also a S-3 NPC, include permanent take.

A weathered shell of a creek heelsplitter, state-listed as special concern, was documented in the South Branch Two Rivers in 2000. It is unknown whether this species is currently present in the project area. Measures to minimize the impacts to native mussels are included below.

Threats to the Forster's tern include temporary nesting habitat loss. The nesting site is greater than 1 mile from the project site, but could be affected by the lower than normal water levels during the drawdown period.

Invasive Species Prevention: The Minnesota DNR Operation Order 113 requires preventing or limiting the introduction, establishment, and spread of invasive species during activities on public waters and DNR-administered lands. The Contractors shall prevent invasive species from entering into or spreading within a project site by cleaning equipment and clothing prior to arriving at the project site.

If the equipment or clothing arrives at the project site with soil, aggregate material, mulch, vegetation (including seeds) or animals, it shall be cleaned by Contractor furnished tool or equipment

(brush/broom, compressed air or pressure washer) at the staging area. Cleaning using a heated pressure washer is the recommended cleaning method. The Contractor shall dispose of material cleaned from equipment and clothing at a location determined by the Project Supervisor. If the material cannot be disposed of onsite, secure material prior to transport (sealed container, covered truck, or wrap with tarp) and legally dispose of off-site.

If the Project Supervisor has determined that invasive species are within the project limits, the Contractor shall meet the following requirements.

- The Project Supervisor shall identify the known infested sites to be avoided.
- The parking and staging areas and travel routes shall not be within the invasive species area.
- The Contractor shall clean equipment and clothing and dispose of material as noted above, prior to leaving the project limits
- Where there are multiple sites and at least one contains invasive species, the intent is to start work at the site with the fewest number of invasive plants, leaving the most heavily infested sites to last.
- The Contractor shall make every effort to schedule operations and site visits to avoid the spread of invasive species.
- If the Project Supervisor or Contractor discovers additional invasive species infestation areas during construction, the Contractor is to stop operations in the newly discovered infested area until a resolution can be accepted by the Project Supervisor.

d. Identify measures that will be taken to avoid, minimize, or mitigate the adverse effects to fish, wildlife, plant communities, ecosystems, and sensitive ecological resources.

Small white lady's slipper: Due to the possible presence of small white lady's slipper in the project area, a contract botanist surveyed the area in 2022 and located a population of the plant. As engineering and design plans are developed, potential impacts to wet prairie will continue to be reviewed and surveyed for the small white lady's slipper. Impacts to the plant population (based on draft design plans) are to be avoided by moving the contraction limits at least 600 feet from the population. Small white lady's slipper habitat at Lake Bronson State Park consists of deep-soil mesic prairie. The current project design draft minimized the square feet of construction limits within the habitat.

Forster's tern In 2001, NHIS documented an observation of Forster's tern. Expert survey completed in 2022 did not find any Forster's terns. The area will be surveyed again in summer of 2023 and appropriate recommendations will be based on survey findings prior to development activity.

Native Mussels may be present in the Lake Bronson Dam project area. These mussels may be stranded by the reservoir drawdown. State park staff will attend the drawdown, walking the newly exposed shallow water areas looking for mussels. If found, they will be re-located into deeper water, adjacent to the newly exposed lake bottom, to limit fatalities caused by the dam construction.

Bats: To minimize potential impacts to roosting bats, DNR will follow guidance from US Fish and Wildlife and the Endangered Species Act, avoiding tree removal from June 1 through August 15.

Old Growth Forest: Permanent taking of designated old growth forest was deemed unavoidable by the project engineers. Approximately two acres of old growth forest will be removed.

15. Historic properties:

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

1) **Historic Designations**

The dam removal and replacement project is located within the boundary of the Lake Bronson State Park WPA/Rustic Style Historic Resources historic district (Figure 9). The 358-acre historic district was listed in the National Register of Historic Places (NRHP) in 1989 with areas of significance listed as architecture, landscape architecture, recreation, and government. The period of significance for the district is 1936-1940. The historic district includes five contributing buildings, four contributing structures, and three contributing objects for a total of 12 contributing resources. The district boundary is generally defined by Lake Bronson Dam to the west, the entrance point of the South Branch Two River to the east, and the shoreline of Lake Bronson to the north and south, including the Group Camp Mess Hall and concentrated use areas.

Bridge 7498, which carries County State Aid Highway (CSAH) 28 over the Lake Bronson Dam, is considered eligible for listing in the NRHP.

Table 15.1. Historic Resources

Resource	Inventory Number	Date of Construction	NRHP Status
Lake Bronson State Park WPA/Rustic Style Historic Resources historic district	KT-PCY-001	1936-1940	NRHP-listed
Bath House	KT-PCY-012	1938	NRHP-listed, contributing
Latrine	KT-PCY-013	1938	NRHP-listed, contributing
Garage & Office	KT-PCY-014	1939	NRHP-listed, contributing
Drinking Fountains (3)	KT-PCY-015	1940	NRHP-listed, contributing
Stone Curbing in Parking Lots	KT-PCY-016	1939	NRHP-listed, contributing
Water Tower	KT-PCY-017	1939	NRHP-listed, contributing
Lake Bronson Dam	KT-PCY-018	1936-37	NRHP-listed, contributing
Group Camp Mess Hall	KT-PCY-019	1940	NRHP-listed, contributing
Kitchen/Picnic Shelter	KT-PCY-020	1940	NRHP-listed, contributing
Lake Bronson	KT-PCY-021	1936-37	NRHP-listed, contributing
Bridge 7498	KT-PCY-021	1936-37	NRHP eligible

2) **Known Artifact Areas**

Two previously known archaeological sites are within the proposed project area: 21KT0019, a CCC Camp, and 21KT0052, a Native American artifact scatter. A cultural resources survey is ongoing and will be completed prior to construction activity to evaluate direct and indirect impacts on cultural resources. Archaeological monitoring is planned during the partial drawdown of the Lake Bronson reservoir to identify, document, protect, and/or recover potential archaeological resources during

construction.

3) **Architectural Features**

The project area is located within the Lake Bronson State Park WPA/Rustic Style Historic Resources historic district, which contains 12 identified historic resources. The historic bridge over the dam is not included as a contributing resource to the historic district, though it is an integral component of the dam and is located within the boundary of the district. A brief description of each contributing resource is listed below, beginning with the resources that will be directly, physically impacted by the project. This includes the dam, Lake Bronson, and the historic bridge over the dam. The additional contributing historic resources may be impacted by the project, though not by physical alteration.

Lake Bronson Dam (1936-37)

The dam was constructed by the Works Progress Administration, beginning in 1936. The structure features a large concrete spillway, about 32 feet high and 65 feet long. The spillway is divided into three sections by two concrete piers. Three, four-feet high by 20-feet long lift gates are located at the top of the spillway. The structure has concrete abutment and wing walls on the north and south end with stone rip rap held by cribbing on the downstream end. A concrete post and metal pipe railing is located along the bridge on the top of the dam as well as on top of the abutment and wing walls. A bike trail, accessible from the north and south, is located adjacent to the east railing of the bridge, on a metal catwalk structure that was added in the 1980s. The lift gate control valves are accessible from the catwalk. The dam also includes an earthen embankment approximately 1,400-feet long.

Lake Bronson (1936-37)

Classified as a structure in the NRHP nomination, Lake Bronson is a man-made lake about 327 acres in size and irregular in shape. It was created by impounding the South Branch Two Rivers. Though it does not exhibit architectural features, the impoundment is considered an architecture/history resource for the purposes of cultural resources review.

Bridge 7498 (1936-37)

The bridge is located on top of Lake Bronson Dam and carries the CSAH 28 roadway over the structure. The bridge was also constructed by the WPA from 1936-1937. Bridge 7498 is a three-span, cast-in-place concrete girder bridge 68 feet long and 23 feet wide. The bridge abutments are the concrete abutment walls of the dam, and the bridge piers consist of the dam's two concrete spillway piers. The bridge is completely integrated into the dam structure. Railings consist of concrete posts with horizontal pipe rails. A concrete knee wall was added between the concrete posts on the east railing during the 1980s rehabilitation of the dam.

Water Tower (1939)

The hexagonal water tower features split stone, battered walls which corbel out near the top to support a timber, partially enclosed observation deck. The entrance at the base of the tower is flanked by heavy timber posts which support a gable roof with exposed joist and rafter ends. Narrow openings covered with wooden grills act as windows in the stone walls. The observation deck features exposed joist ends, horizontal and vertical wood siding, and open upper walls. The structure is capped with a hipped roof which features exposed rafter ends.

Stone Curbing (1939)

Two areas of stone curbing were installed by the WPA within the park. One defines the parking area near the water tower. The other is near the Picnic Shelter. The parking areas are separated from roadways by a stone-edged oval median. The stone was originally to have an 8" exposure.

Drinking Fountains (1940)

Three battered stone drinking fountains are located within the park: next to the Water Tower, Picnic Shelter, and Bath House. All three rest upon a stone base and have a stone step on one side.

Office and Garage (1939)

The garage and office building is a split stone structure with rough board siding above the sill and in the gable end. The building features a two-stall garage with corbeled stone piers. The office wing features 4" x 8" timber lookouts. The building is fenestrated with six-over-six double-hung sash and six-light casements. The roof is gabled over the garage and hipped over the office wing.

Picnic Shelter (1940)

The Picnic Shelter is a rectangular building that contains a kitchen and shelter. The building features split stone walls and openings on two elevations of the shelter that are divided into three bays with paired 12" x 12" rough hewn posts. An additional opening is located on the kitchen end. Each end wall of the shelter features a stone fireplace with built-in benches on the interior. Narrow openings covered with wood grills are adjacent to the fireplaces.

Latrine (1938)

The Latrine is a rectangular building with split stone entrance screens, and stone walls to the sill level with clapboard siding above. Board and batten siding is located in the gable ends. The building is fenestrated with three-over-three light casement windows and single-leaf pedestrian doors. The gable roof is covered with asphalt shingles and contains non-original skylights.

Bath House (1938)

The Bath House originally featured a central section of native split stone covered by a gable roof, flanking loggias, and partially enclosed changing wings on either side. The changing wings have been removed, with the exception of their stone knee walls. A concession addition has been constructed on the beach facing façade. The addition is frame construction with board and batten siding and a shed roof; it is considered non-contributing.

Mess Hall (1940)

The Mess Hall is a T-shaped building that rests upon a concrete foundation and has a cross gabled roof. Walls are clad with horizontal siding on the lower portion with board and batten above. A stone chimney is located along the interior of the ridgeline. Fenestration consists of nine-light casement windows and pedestrian doors.

Landscape

The landscape within the historic district has not been previously evaluated as an historic cultural landscape but will be as part of the proposed project. Landscape features such as views and vistas, circulation, vegetation, small-scale features, and spatial organization are among some of the types of

characteristics of a cultural landscape. As a designed recreation area, Lake Bronson State Park has the potential to contain elements of a cultural landscape. In addition, the NRHP nomination for the historic district in the park lists Landscape Architecture as an area of significance, though did not identify or evaluate any landscape elements.

The proposed project includes complete removal of the existing Lake Bronson Dam spillway and Bridge 7498. Removal of the NRHP-listed dam spillway and the NRHP-eligible bridge will result in an adverse effect. As a contributing resource to an historic district, the removal of the spillway will not only impact the individual property, but, the district as a whole. The removal of the bridge, though not contributing to the historic district, is an integral component of the dam and should have been evaluated accordingly. Despite its eligible but not listed status, its removal will result in an adverse effect to an identified historic property.

The removal of the spillway and bridge are necessary because the dam is in poor condition. The dam is experiencing seepage and will therefore require a substantial structural component to prevent this from occurring with the new spillway. As a result, rehabilitating the current spillway is not feasible and complete avoidance of an adverse effect is not realistic. As an integral component of the dam, avoidance of removing Bridge 7498 is also not feasible.

Mitigation measures will be determined when the scope of work is finalized and with consultation between the DNR, U.S. Army Corps of Engineers, and SHPO. One mitigation component will likely include archival level documentation of the dam and bridge prior to removal. Another component of mitigation includes minimization of impacts caused by a new structure. In this case, the new spillway and bridge will be designed to be compatible with, but not matching, the character-defining features of the resources within the historic district. Again, once the scope of work and design are determined, consultation will occur between the DNR, the U.S. Army Corps of Engineers, and the SHPO.

The proposed location of the new spillway and bridge will be slightly south of the existing location. Currently, the spillway and bridge are visible from various points within the historic district boundary though, due to vegetation, visibility is mostly limited to those areas along the shoreline of Lake Bronson. The new location may be slightly less visible from the historic resources due to its placement further from the core of the district. Additional information of the impact to individual contributing resources will not be known until field survey occurs and the full scope of work is determined.

During the project, Lake Bronson will be at least partially drawn down to facilitate construction. The drawdown of the lake temporarily is not anticipated to result in an adverse effect to the lake itself or to any additional historic resources, but there is the potential for previously unidentified cultural resources to be revealed during the drawdown. Should that occur, the resource or resources will be evaluated appropriately.

16. Visual:

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

No scenic views/vistas are located on or near the project. No vapor fumes or intense lights are anticipated.

This project will not permanently alter the view of the Lake Bronson reservoir. The proposed drawdown of the lake during construction will temporarily alter the view of the reservoir. The

drawdown is necessary to complete construction safely.

The view of the spillway will change from that of a gated concrete structure to an ungated labyrinth weir. The labyrinth weir will be visible from the County Highway 28 passing over the dam. The outlet channel will be constructed on the south side of the dam. This outlet channel will be viewable from the county road and a few places along the lakeshore on the west end of the lake. However, the outlet channel will not be viewable from the lake, the pedestrian path, and parts of the Lakeside Campground.

Potential temporary visual effects may include: increased traffic from construction vehicles and equipment, increased construction equipment used in the demolition and construction, temporary structures used by the construction company in the staging area, and exposed lakebed throughout the reservoir basin. These visual impacts will also occur to a handful of residences in the surrounding area, to the traffic along County Road 10 and from recreational traffic on the trails near the reservoir.

In addition to the daytime visual impacts, nighttime visual impacts will include an increased use of artificial lighting by the dam during construction both for use in construction activities and construction safety and security. The main permanent change to the view shed would be the location of the new spillway, however, that view from the lake and parts of the campground and a few recreational trails would be mitigated with the new spillway. Permanent lighting will be added for safety and security including two LED streetlights over the bridge.

17. Air:

a. Stationary source emissions - Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

No stationary source emissions would be created by the proposed project.

b. Vehicle emissions - Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

Fuel exhaust emissions contain pollutants including carbon monoxide, nitrogen oxides, reactive organic gases, sulfur dioxide, and suspended particulate matter, all of which carry some associated health risks. Construction-related emissions will be exempt as de minimus and will meet the conformity requirements under Section 176 (c) of the Clean Air Act, and 40 CFR 93.153.

Emissions will be minor and temporary in nature, arising from the use of powered equipment during construction. Equipment used will include excavators, loaders, and trucks. A standard DNR specification would be included, titled "Protection and Safety of the Public." During the preconstruction meeting for any project, this section is highlighted and discussed. Specifically, given the close proximity to park, suggestions for noise mitigation such as functioning mufflers and limited work hours will be recommended. DNR will recommend that the specifications for project construction include requirements for muffler use on all trucks and applicable equipment.

c. Dust and odors - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 17a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

The proposed project may create some temporary dust during demolition and excavation activities. Construction is expected to last for approximately 18 months. Fugitive dust could arise during hauling and grading of earthen materials and concrete debris. The primary entrance to the site will be from the south, farther away from sensitive receptors. No material hauling will be allowed through the park except for the staging areas. Effects associated with fugitive dust and offensive odors will be limited to the construction site.

All roads leading to the construction site are paved. The reservoir and dam site are a several hundred feet from the nearest sensitive receptors located in park. The nearest resident is approximately 0.5 miles from the edge of the project site. Approximately 10 other residences are within 1 mile of the project site. No health care facilities or nursing homes are in the vicinity of the project. Dust should be minimal and should not have an impact on quality of life at this distance.

18. Greenhouse Gas (GHG) Emissions/Carbon Footprint

a. GHG Quantification: For all proposed projects, provide quantification and discussion of project GHG emissions. Include additional rows in the tables as necessary to provide project-specific emission sources. Describe the methods used to quantify emissions. If calculation methods are not readily available to quantify GHG emissions for a source, describe the process used to come to that conclusion and any GHG emission sources not included in the total calculation.

The proposed project is the removal and replacement of the concrete dam and associated bridge. The replacement includes the construction of a concrete spillway, a riprap lined channel, a concrete bridge, and a seepage cutoff wall. Greenhouse gas emissions are expected during the removal and replacement of the concrete dam and associated bridge from mobile equipment, land use conversion, and off-site waste management.

Demolition and construction GHG emissions include:

- Mobile, On-road vehicles: Medium to heavy-duty truck, delivery trucks, and haul trucks
- Mobile, Off-road equipment: Construction equipment that includes excavators, graders, loaders, compressors, drill rig, generator sets, pressure washers, pumps, cement and mortar mixers, other construction equipment, and off-highway trucks
- Land use conversion: Approximately 4 acres of land will change uses
- Off-site waste management: Disposal of concrete from the dam and bridge and general municipal solid waste

On road vehicle emissions include those generated by the supervisors monitoring progress of the project in pickup trucks, delivery trucks to bring equipment and supplies to the project site, as well as passenger vehicles for workers commuting to the site. Haul trucks will be used to remove soil, steel, and concrete waste. The number of haul trucks was estimated based on the potential number of trips for the contractor to remove the soil and haul to an approved location, as well as the contractor taking the steel to an approved recycling facility. The construction mobile on-road emissions but may be adjusted depending upon the contractor and the equipment used. Emissions estimates for on road

emissions are included in Table 18-1, with a total estimate of 4.27 tons of CO_2e.

Off road mobile equipment includes heavy construction equipment (listed above), diesel trucks, and pick-up trucks. For a conservative estimation of emissions, 18 months of total construction time was assumed. Emissions estimates for off road emissions are included in Table 18-1 with a total estimate of 16,216 tons of CO_2e.

There is a land use change from wooded areas to the new dam and emergency spillway areas where approximately 2 acres of trees will be removed to construct the spillways. An additional 2 acres are expected to be converted from wetland to grassland. The overall land cover of the project area will remain the same. These estimated emissions are approximately 80.46 tons of CO_2e and found in Table 18-1.

Emissions from the removal of the dam and bridge are considered in the Off-site Waste Management category in Table 18-1. It is estimated that 4,600 cubic yards of concrete will be landfilled. Emissions from placing waste from packaging materials and other municipal solid waste into a landfill are also considered and included with the Off-site Waste Management category. These emissions are summarized in Table 18-1.

Table 18-1: GHG Emissions Summary – Dam Reconstruction

Emission Source	Emission Sub-Type	CO2 (tons)	CH4 (tons)	N2O (tons)	CO2e (tons) [1]	Calculation Method (s)
Scope 1 – On-Road Equipment	Mobile	4.16	1.48E-04	3.56E-04	4.27	[4] [5] [6]
Scope 1 – Off-Road Equipment	Mobile	9.06	14.22	53.19	16,215.81	[4] [5] [6]
Scope 2 – Land Use Conversion [2]	Conversion	N/A	N/A	N/A	80.46	[7]
Scope 3 – Off-Site Waste Management [3]	Area	N/A	N/A	N/A	228.45	[8]
	TOTAL	**13.22**	**14.22**	**53.19**	**16,528.99**	

[1] CO_2e calculated by equation A-1 of 40 CFR 98.2, which states the total CO_2e is equal to the GWP factor multiplied by the potential emissions.

[2] Land-Use Change emissions are excluded from the total CO_2, CH_4, and N_2O and only included in CO_2e due to the emission factor in tons/CO_2e.

[3] Off-site Waste emissions are excluded from the total CO_2, CH_4, and N_2O and only included in CO_2e due to the emission factor in tons/CO_2e.

[4] CO2 and CH4 mission factors based on South Coast Air Quality Management District, SCAQMD EMFACT 2007 (v2.3)

[5] N2O emissions calculated using the EPA CCCL emission factors, Table 4: Mobile Combustion CH4 and N2O for On-Road Diesel and Alternative Fuel Vehicles.

[6] N2O emission factors calculated using the EPA CCCL emission factors for construction/mining equipment, Table 5: Mobile Combustion CH4 and N2O for Non-Road Vehicles

[7] Tables 6-5, 6-44, and 6-125 from Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2020

[8] Table 9, Scope 3 Category 5: Waste Generated in Operations and Category 12: End-of-Life Treatment of Sold Products. Emission Factors for Greenhouse Gas Inventories, EPA CCCL. March, 2023.

Estimated operational emissions are found in Table 18-2. On-road vehicle emissions include those generated by park staff that monitor the area. These emissions are expected to remain the same because there will not be an increase in park staff to monitor the area post-construction. Post project,

the site will be maintained similarly to the surrounding lawn and landscaped area of the park, and with a similar footprint as before the construction project. Therefore, there is not an increase in emissions from off-road equipment, such as lawn mowers, used to maintain the site during operations. The lighting will be replaced with more efficient lighting that will account for a slight decrease in operation emissions from the use of electricity.

Table 18-2: GHG Emissions Summary – Operational

Emission Source	Emission Sub-Type	CO2 (tons)	CH4 (tons)	N2O (tons)	CO2e (tons) [1]	Calculation Method (s)
Scope 1 – On-Road Equipment [2]	Mobile	28.87	1.03E-03	2.47E-03	29.63	[4] [5]
Scope 1 – Off-Road Equipment [3]	Mobile	0.05	1.78E-05	8.87E-06	0.06	[6] [7]
Scope 2 – Off-Site Electricity	Grid-Based	0.05	5.86E-06	8.21E-07	0.05	[8]
	TOTAL	**28.97**	**0.00**	**0.00**	**29.74**	

[1] CO_2e calculated by equation A-1 of 40 CFR 98.2, which states the total CO_2e is equal to the GWP factor multiplied by the potential emissions.

[2] Mobile On-Road emissions are expected to remain the same as pre-project operational emissions because the park staff is expected to remain the same.

[3] Mobile Off-Road emissions are expected to remain the same as pre-project operational emissions because the grassland area is not expected to change significantly.

[4] CO2 and CH4 mission factors based on South Coast Air Quality Management District, SCAQMD EMFACT 2007 (v2.3)

[5] N2O emissions calculated using the EPA CCCL emission factors, Table 4: Mobile Combustion CH4 and N2O for On-Road Diesel and Alternative Fuel Vehicles.

[6] CO_2 calculated using the EPA CCCL emission factors, Table 2: Mobile Combustion CO2

[7] CH4 and N_2O emissions calculated using the EPA CCCL emission factors, Table 5: Mobile Combustion CH_4 and N_2O for Non-Road Vehicles.

[8] Table 6, Electricity. MROW (MRO West) Subregion. Emission Factors for Greenhouse Gas Inventories, EPA CCCL. March, 2023.

b. GHG Assessment

i. Describe any mitigation considered to reduce the project's GHG emissions.

The proposed project will remove the existing concrete dam, spillway and associated bridge and replace it with a new dam, spillway, bridge, and cutoff wall. The new structures will be constructed south of the current structures, so there will be a change in land cover because trees will have to be removed for the construction. The overall land usage will remain consistent because vegetation will be placed where the current dam and flow channel is located, upon their removal. During demolition and construction, the following mitigative measures will be considered to minimize CO2e emissions:

- Minimize clearing and grubbing to the extent possible
- Maintain tree canopy where feasible
- Practice vehicle and equipment maintenance
- Turn off equipment when not in use
- Revegetate the former dam, spillway, and flow channel
- Energy efficient lighting for operations

ii. Describe and quantify reductions from selected mitigation, if proposed to reduce the

project's GHG emissions. Explain why the selected mitigation was preferred.

The mitigation measures listed are primarily for construction activities as opposed to ongoing operational activities. The operational activities emissions reductions will provide a 75% decrease in annual operations CO_2e emissions compared with the current operations CO_2e emissions. It is estimated that current electrical lighting operational emissions are 0.22 tons of CO_2e/year. Upon project completion, the electrical lighting operational emissions are estimated to be 0.05 tons of CO_2e/year. The decrease in emissions is a result of more efficient lighting replacing the current lighting at the dam.

iii. Quantify the proposed projects predicted net lifetime GHG emissions (total tons/#of years) and how those predicted emissions may affect achievement of the Minnesota Next Generation Energy Act goals and/or other more stringent state or local GHG reduction goals.

Table 18-3: GHG Assessment

Description	CO2e (tons)
Project First Year Total Emissions	16,559
2020 MN Emissions and Next Generation Act (NGA) Goal*	140,000,000
Project's First Year % of NGA Goal	0.01%
Project Annual Emissions/50 Year Dam Lifetime	361
Project's Annual Lifetime % of NGA Goal	0.0003%

*140 million estimated CO2e emissions in MN https://www.pca.state.mn.us/sites/default/files/lraq-2sy23.pdf

The project's predicted net lifetime GHG emissions are negligible at 360.91 tons of CO_2e emissions/50 years of dam operation. This accounts for 0.0003% of the state of Minnesota's 2020 emissions and the Next Generation Act (NGA) goals. By converting to more efficient LED lighting, there will be a reduction in operational emissions upon project completion. According to the Department of Energy, LED lights use 75% less energy. This will assist in achieving the Next Generation Energy Act goals outlined by the state of Minnesota and other national and international goals. Emissions from electricity usage are also expected to decrease throughout the lifetime of the new dam because Minnesota has enacted the "100 Percent by 2040" energy bill into law which requires utilities to offer carbon-free electricity to consumers by 2040.

19. Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

Existing noise levels in the project area are influenced by the waterfall created by the dam, along with traffic on nearby roads. Nearby sensitive receptors include the Lake Bronson State Park and residences that are approximately 0.5 miles away. During demolition of the spillway and construction, noise levels will temporarily increase due to construction equipment engines, pounding on concrete and rock, and loading/hauling of concrete and metal debris.

Activity associated with this project will be generally limited to daytime hours and will be in

conformance with state and local noise standards. Work on the cutoff wall may be 24 hours a day. A standard DNR specification would be included titled Protection and Safety of the Public. During the preconstruction meeting for any project, this section is highlighted and discussed. Specifically given the close proximity to the State Park, suggestions for noise mitigation such as functioning mufflers and limited work hours will be recommended. DNR will recommend that the specifications for project construction include requirements for muffler use on all trucks and applicable equipment. Following construction, noise levels in the project area are expected to be less than or equal to pre-construction levels.

20. Transportation

a. Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

County Highway 28/375th Avenue sits atop the dam embankment and has an average daily traffic volume of 140 vehicles per day, according to the Minnesota Traffic Mapping Application (2017). Other nearby roads include East Main Street leading into the City of Lake Bronson (200 vehicles per day) and County Road 10/220th Street running east-west on the south side of the reservoir (415 vehicles per day).

County Highway 28/375th Avenue will be closed during the project construction. The four mile long detour will route traffic through the City of Lake Bronson on US Highway 59.

Existing parking in the area consists of a small three car gravel space/pull-off along County Highway 28 near just south of the future spillway and a paved lot at the corner of the State Park Road and County Highway 28 that can accommodate approximately 20 vehicles. These parking lots will be unchanged by the proposed project. New traffic generated by the proposed project will be temporary for workers and construction equipment. Availability of transit of alternative transportation modes is limited due to the small size of the community.

The primary entrance to the site will be from the north side of the project, from County Highway 28. No material hauling will be allowed through the park.

b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system. *If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW.* Use the format and procedures
described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 *(available at: http://www.dot.state.mn.us/accessmanagement/resources.html)* or a similar local guidance,

Construction equipment, specifically dump trucks, hauling materials to and from the construction site will increase traffic to County Highway 28, however it is believed that fewer than 100 trucks per day will be added. It is believed that the additional traffic will not create traffic congesting in the community.

c. Identify measures that will be taken to minimize or mitigate project related transportation effects.

Traffic control devices meeting Minnesota Department of Transportation requirements will be installed to guide traffic around the project and through the detour due to the closure of County Highway 28 during construction. Closure of the County Highway 28 will require a four-mile detour for vehicles traveling from the east on County Road 10 who are going to Lake Bronson State Park.

21. Cumulative potential effects: (Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)

a. Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.

The proposed project impact area includes the 312-acre Lake Bronson, its surrounding wetlands, the South Branch Two Rivers downstream of the dam, as well as and the area immediately surrounding the dam and access routes for construction equipment, including County Highway 28. The proposed project timeframe includes drawdown of Lake Bronson (which is expected to take about one month) and project construction and demolition, which is expected to take 18 months.

Geographic scale and timeframes of project related environmental effects that could combine with other effects are described below.

Wetlands: The geographic scale for wetlands includes impacts to those near the dam. Some impacts to wetlands are expected to be temporary and some are expected to be permanent. The wetlands adjacent to the lake may have temporarily reduced water levels during the drawdown period. Three acres of permanent wetland impact is expected due to construction. Construction of a new outlet channel will likely create new wetlands. Drawdown of Lake Bronson will temporarily impact Lake Bronson. The lake will be temporarily drained during construction and will be refilled upon completion of construction.

Water quality: Removal of the existing spillway and construction of the new spillway could cause a short-term introduction of sediment-laden runoff into the South Branch Two Rivers below the project site prior to completion of the project. Also, construction of the seepage cutoff wall could cause sediment to enter the Lake Bronson reservoir.

Rare species/features:
State-listed species have been identified as having the potential to be impacted by the proposed project.

- Small white lady's slipper: The geographic extent to where impacts to the small white lady's slipper would be expected to lie within the wet prairie habitat in the project area and could include loss of habitat or direct impacts to individuals during construction.
- Forster's tern: The geographic extent to where impacts to the Forster's tern would be expected to occur within a formerly known nesting site used by the terns, and other areas that could be used as nesting habitat by the tern. Nesting sites could be affected by lower water levels during drawdown and construction.
- State-listed mussel species: The geographic extent to which impacts to state-listed mussels would be expected to occur within the areas of Lake Bronson that would be affected by the drawdown. Mussels may be stranded during drawdown.
- State-listed bat species, such as the northern long-eared bat: The geographic extent of impacts

to state-listed bat species would be expected to occur within the wooded areas adjacent to the dam that would require tree removal for project construction.

- Old growth forest: The geographic extent to which impacts to old growth forest would be expected to occur are within the two acres of old growth forest adjacent to the project.

Traffic:

County Highway 28/375th Avenue sits atop the dam embankment and has an average daily traffic volume of 140 vehicles per day, according to the Minnesota Traffic Mapping Application (2017). Other nearby roads include East Main Street, leading into the City of Lake Bronson (200 vehicles per day) and County Road 10/220th Street running east-west on the south side of the reservoir (415 vehicles per day).

County Highway 28/375th Avenue will be closed during the project construction. A four-mile-long detour will route traffic through the City of Lake Bronson on US Highway 59.

b. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

Several agencies and units of government were contacted to inquire about current or planned projects in the area that might have impacts that could contribute to cumulative potential effects from this project. These include the DNR Parks and Trails staff, the Minnesota Department of Transportation, and the Two Rivers Watershed District. Based on information obtained, DNR Parks and Trails staff have stated that potential future state park projects may include improvements and updates for accessibility within the park in order to meet requirements of the Americans with Disabilities Act. Updates to the public water access may also occur during and/or post project construction as needed. Funding has not been made available for these potential projects. As no project timeframe or funding is identified, these potential projects are not included in the analysis.

The Minnesota Department of Transportation has identified one road project that will pass through the City of Lake Bronson and will stop at the junction of TH175 North of Lake Bronson. This project would be within the same geographic scale as the proposed project, however, it is expected to begin after the proposed project would be completed; therefore, this project is not included in the analysis below.

The Two Rivers Watershed District has identified that the Klondike Clean Water Retention Project (KCWRP) would be located within the same geographic scale of the proposed project. The KCWRP would be located approximately 11 miles upstream of the proposed project, in Roseau and Kittson Counties, within the Two Rivers and Red River watersheds. Portions of the project would drain into the South Branch Two Rivers, up river of Lake Bronson. The KCWRP is a multi-purpose public project that aims to reduce flooding, improve water quality, improve aquatic habitat, protect and enhance a prairie rich fen, and provide an adequate drainage outlet primarily for lateral 1 of State Ditch 95 and secondarily for State Ditch 72. An EAW and record of decision were completed for this project in early 2023. Exact timeframe for this project is unknown, though it has potential to occur within the same timeframe as the proposed project and is included in the analysis below.

c. Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

Wetlands: Both the proposed project and the KCWRP would have permanent impacts on wetlands within the watershed and would require state and federal permits for wetland impacts and would

require mitigation for these wetland impacts. No net loss to wetlands within the watershed district would be expected as a result of either of the projects. The KCWRP would likely result in an overall gain in wetland area and would also improve wetland quality.

Water quality: Portions of the KCWRP would drain into the South Branch Two Rivers, and ultimately into Lake Bronson. It is possible that sediment may enter the river during construction of the KCWRP, and reach Lake Bronson, adding more sediment to the system downstream within Lake Bronson and behind the dam. Both the KCWRP and the proposed project would be required to have construction stormwater permits which should mitigate sedimentation impacts during construction. Long term, the KCWRP is expected to improve water quality while reducing sediment, nitrogen and phosphorus, while increasing dissolved oxygen within the system.

Rare species/features: Both projects contain potential habitat for state-listed bat species, such as the northern long-eared bat. The proposed project is expected to require tree clearing. To minimize potential impacts to roosting bats, the project proposer will follow guidance from US Fish and Wildlife Service (USFWS) and the Federal Endangered Species Act, avoiding tree removal from June 1 through August 15. It is unknown if the KCWRP would require tree clearing. If tree clearing is required and the KCWRP follows tree clearing guidelines from the USFWS, impacts would be minimized, and cumulative impacts to bats would not be expected.

Traffic: Should the proposed project and the KCWRP occur within the same timeframe, it is possible that construction vehicles coming and going from the KCWRP project could be impacted by the traffic reroute along Highway 28/375th Avenue due to the proposed project. However, it is not expected that this would result in increased traffic to the area, or cause traffic congestion within the area.

22. **Other potential environmental effects:** If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

RGU CERTIFICATION. *(The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.)*

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature: /s/Rebecca Horton Date: September 5, 2023