Version 8/08rev

ENVIRONMENTAL ASSESSMENT WORKSHEET

Note to preparers: This form and EAW Guidelines are available at the Environmental Quality Board's website at: http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm. The Environmental Assessment Worksheet provides information about a project that may have the potential for significant environmental effects. The EAW is prepared by the Responsible Governmental Unit or its agents to determine whether an Environmental Impact Statement should be prepared. The project proposer must supply any reasonably accessible data for — but should not complete — the final worksheet. The complete question as well as the answer must be included if the EAW is prepared electronically.
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** Minnesota Falls Dam Removal

2. **Proposer** Northern States Power Company
   Contact person Bill Zawacki
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3. **RGU** Minnesota Department of Natural Resources
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4. **Reason for EAW preparation** (check one)
   ___EIS scoping _X__ Mandatory EAW ___Citizen petition ___ RGU discretion ___Proposer volunteered

   If EAW or EIS is mandatory give EQB rule category subpart number – Minnesota Rules, chapter 4410.4300, Subpart 27 and subpart name: Wetlands and public waters

5. **Project location** County: Yellow Medicine and Chippewa Counties
   City/Township: Granite Falls

   SW ¼ SW ¼ Section 1 Township 115N Range 39W

   GPS Coordinates N 44.70070 **W** 95.50000

   Tax Parcel Number Yellow Medicine County #13289, Chippewa County #04-001-3401

   Attach each of the following to the EAW:
   - County map showing the general location of the project;
     Figure 1 – Project Location Map
   - U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries

(photocopy acceptable);

Figure 2 – Property Location Map

- Site plan showing all significant project and natural features.
  - Figure 3 – Existing Conditions
  - Figure 4 – Water Control
  - Figure 5 – MN Falls Dam Removal Rendering
  - Figure 6 – Likely Channel Extent After Dam Removal
  - Figure 7 – Expected River Levels for 600 cfs (typical summertime flow)
  - Figure 8 – Minimum River Levels for 600 cfs (typical summertime flow)
  - Figure 9 – Expected River Levels for 100-year Flood
  - Figure 10 – Minimum River Levels for 100-year Flood
  - Figure 11 – Demolition Photographs
  - Figure 12 – Public Water Basins
  - Figure 13 – Inventoried Sites and HEC-RAS Model Cross-sections
  - Figure 14 – CWI and SWUDS Data

6. **Description**

a. Provide a project summary of 50 words or less to be published in the *EQB Monitor*.

Northern States Power Company (NSP) proposes to remove the Minnesota Falls Dam located on the Minnesota River within Yellow Medicine and Chippewa Counties, Minnesota. The dam is classified as a high hazard dam that no longer serves its original purpose. The dam has several potential structural deficiencies that would need to be repaired if the dam is not removed.

b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

NSP plans to remove the Minnesota Falls Dam which will re-establish the original profile and cross-section of the river. The dam, hydroelectric powerhouse, and substation were originally constructed in 1905. The powerhouse and substation were demolished in 1961 and 1999, respectively. The dam no longer serves its original purpose as a hydroelectric project or its purpose to impound water used for cooling in NSP's Minnesota Valley Generating Plant. The Minnesota Valley Generating Plant last burned coal in 2004, and the air permit was formally retired in 2009.

Recent inspections performed by Barr Engineering Company (Barr) and Minnesota Department of Natural Resources (MDNR) Dam Safety staff have identified several potential structural deficiencies within the aging structure including: stop log deterioration and leaking; major surface deterioration of the left concrete abutment; and cracks in the right auxiliary spillway. As a result of these deficiencies the MDNR required NSP to develop a long-term plan to remove, repair or otherwise modify the dam to ensure its safe operation. A feasibility study (Barr, 2011) evaluated several options and concluded that full dam removal was a viable option, and less than half the cost of repairing or modifying the dam. Preliminary cost estimates for repairing or modifying the dam ranged from over 5 million dollars to 7 million dollars, while the preliminary cost estimate for removal was below 3 million dollars.

<u>Dam Removal</u>

The proposed project will remove the dam and any remaining features that were originally part of the hydroelectric project. Removal will be phased and timed to minimize the potential for disruption of demolition activities by high river flows and likewise the activity's affect on river water quality due the discharge of sediment. Temporary placement of water control structures and some sediment removal immediately upstream of the dam and stoplog structure will be necessary for dam removal. Rubble from the granite/masonry dam demolition that is free of reinforcing steel will be re-used onsite as fill and/or bank protection. Sediment will be used to restore channel banks in the vicinity of the old tailrace

channel and will be re-vegetated with native vegetation. Sediment not used for onsite reclamation will be beneficially re-used or disposed of offsite. The specific site for beneficial re-use has not been identified, but a site will be identified as part of the Work in Public Waters permit application.

Sediment removal and demolition of the dam will be completed following isolation of the work area with water control structures and/or drawdown of the upstream pool and subsequent exposure of sediments. Demolition methods may include mechanical removal and/or blasting methods

Demolition and remediation is expected to occur during one construction season and is planned for July through December, when river flows are typically between 300 to 600 cfs, with the reservoir level at approximately 883' msl. Stoplogs will be incrementally removed to lower the upstream pool elevation to approximately 876.0' to 877.5' mean sea level (msl). The river bottom immediately upstream of the dam is approximately 872.0' to 873.0' msl. Pool depths will be 3 to 5.5' deep with 2 to 3.5' of water flowing through the stoplog structure for the anticipated flows.

The following is description of the current plan for demolition sequencing (see Figure 4). When the pool is lowered as much as feasible by removing stoplogs a rock access pad will be constructed across the abandoned head race canal on the North bank for equipment to access and remove sediment upstream of the stoplog structure as well as for removing the concrete sill of the structure to below 874' msl or to bedrock. This will draw water levels below the primary spillway elevation. Construction equipment will then access the South bank of the river through field roads that were previously used to place riprap along the right embankment of the dam. There may be a need to extend this field road in the area adjacent to the dam for suitable equipment access. A coffer dam will then be constructed from the South bank of the river below the dam extending out into the river and them up to the primary spillway. Another rock access path will be constructed within the behind the dewatered coffer dam area extending from the South bank to the downstream face of the dam. Equipment will use this access path to remove sediment upstream of the primary spillway and remove a portion of the primary spillway adjacent to the stoplog structure down to bedrock. With river flows concentrated in the stoplog and removed spillway areas, another coffer dam will then be placed above the dam tying into the South bank above the dam to dewater the remaining portion of the primary and secondary spillways. With flows isolated to the removed section of the primary spillway, the remaining portions of the dam will then be removed.

Alternative methods may be used for demolition if they are determined to be more feasible with equivalent water quality and natural resource protections. Modifications to dam removal will be submitted to permitting agencies for review as part of permit applications and will be implemented as approved by those agencies.

Post dam removal

Hydraulic modeling was used to evaluate the impacts of dam removal on upstream river. If the dam is removed, upstream river levels will be most affected during low-flow events and affected very little during large flood events (see Figures 7-10). The extent of upstream water level lowering will be determined by the elevation of bedrock below the dam. The assumed likely bedrock elevation of 865 is based on review of historical construction drawings of the dam which show the spillway constructed on bedrock at the approximate elevation. A 2007 MDNR survey shows downstream channel elevations in the range of 867 to 869, therefore an assumed elevation of 865 is reasonable and possibly conservative.

River levels under low-flow conditions are expected to be lowered by 14.5 feet at the dam, gradually decreasing to 0.3 feet at the Granite Falls pedestrian bridge. The levels will be less affected during larger floods. River levels downstream of the dam will have minimal changes, and the likely effects will be limited to sand deposition along the edges of the scour hole that is immediately downstream of the present dam. Figure 5 provides an artist's rendering of the dam site after dam removal. The hydraulic roller that exists below the dam will be eliminated. A more detailed discussion of the hydrological change is contained in response to EAW Item No. 12.

Following removal of the dam, exposed and unstable channel banks in the immediate vicinity of the dam removal will be stabilized with rock or vegetation. Unstable banks can result from removal of dam embankments that require excavation into the bank or construction activities that disturb the shoreline. An area near the tail race a new bank slope will be constructed to restore areas previously containing dam infrastructure. Restoration of the site will focus on providing stable banks that blend into the natural shoreline and to avoid large expanses of rip rap armored shoreline. Based on previous experiences with reservoir draw downs, it is anticipated that edge sediments exposed upstream of the dam will quickly re-vegetate without manual seeding or specific restoration efforts. A monitoring plan for the area will be developed and implemented as part of the MDNR Work in Public Waters Permit and Dam Safety Permit.

c. 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 purpose of the proposed project is to remove the Minnesota Falls Dam, the last remaining infrastructure from the demolished hydroelectric generation and transmission facility. The dam is categorized as a Class I, high hazard dam by the State of Minnesota. The dam has reached the end of its useful life for the owner and now exhibits signs of deterioration (see Figure 11). Removal of the dam will eliminate potentially dangerous recirculating currents immediately downstream of the structure, eliminate the potential flooding from an uncontrolled dam breach, and re-establish river connectivity for riverine species.

d. Are future stages of this development including development on any other property planned or likely to happen? __Yes _X_No
If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

e. Is this project a subsequent stage of an earlier project? _X_Yes __No
If yes, briefly describe the past development, timeline and any past environmental review.

Past development includes the original construction of the dam, hydroelectric generation facilities and sub-station in 1905. Past stages of the project also include the demolition of the hydroelectric facilities in 1961 and the substation in 1999. There has been no environmental review of these previous developments and activities associated with the dam. Besides past demolition work, significant maintenance projects have been conducted on the dam itself over the past 15 years, including post-1997 flood repairs and a 2007 earthen berm re-build and fortification project. The maintenance projects were conducted under DNR Work in Public Waters/Dam Safety Permits.

7. **Project magnitude data**
Total project acreage 6 acres
Number of residential units: N/A unattached N/A attached N/A maximum units per building
Commercial, industrial or institutional building area (gross floor space): total square feet N/A

Indicate areas of specific uses (in square feet):

Office	Manufacturing
Retail	Other industrial
Warehouse	Institutional
Light industrial	Agricultural
Other commercial (specify)	
Building height	If over 2 stories, compare to heights of nearby buildings

Hydraulic modeling was conducted to estimate the water surface profile before and after dam removal under various flow conditions. Water levels will be lowered from Minnesota Falls upstream to the

Granite Falls Dam. Under typical normal flow conditions, the upstream water surface area is expected to be reduced from 123.6 acres under current conditions to 86 acres with the dam removed, or a reduction of 36.6 acres. The affected area is expected to convert to other wetland types or shoreland. The anticipated water surface area following removal of the dam is shown in Figure 6.

8. **Permits and approvals required.** List all known local, state and federal permits, approvals 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	Clean Water Act 404 permit	Application to be completed
US Army Corps of Engineers	Section 10 Work in Navigable Waters/GPLOP 98	Application to be completed
MDNR	Work in Public Waters	Application to be completed
MDNR	Dam Safety Permit	Application to be completed
MPCA	NPDES Stormwater Permit for Construction	Application to be completed
MPCA	Clean Water Act Section 401 Water Quality Certification	Application to be completed
MPCA	State Disposal System Permit for dredged material disposal	Need for permit not yet determined
Yellow Medicine County LGU and/or Chippewa County LGU	Wetland Conservation Act	Need for permit not yet determined
Yellow Medicine County LGU and/or Chippewa County LGU	Shoreland Alteration Permit	Application to be completed

9. **Land use.** Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

   The property is currently used as the north and south embankments (North Bank and South Bank) for the Minnesota Falls dam at the Minnesota River. The dam and a hydroelectric plant with associated structures (powerhouse, substation, etc.) on the North Bank were constructed in 1905, A now defunct town, Minnesota Falls, was established on or near the South Bank in 1871, A saw mill was reportedly located in the town near the river but it is unknown if this mill was located on the Property.

   A search of the MPCA "What's in my Backyard" website identified five locations and associated potentials for environmental hazards, three of which are classified as inactive with two active. Locations classified as active are the Granite Falls Wastewater Treatment Plant and the NSP Minnesota Valley Plant. A Phase 1 Environmental Assessment conducted for the 6 acre dam site did not identify any Recognized Environmental Condition hazards present.

The South Bank is zoned Rural Preservation District – Non-tillable Farmland, by Yellow Medicine County, with wild and scenic river designation. The North Bank is zoned Wild and Scenic River by Chippewa County. Current uses of the properties adjacent to the dam and embankments are residential or undeveloped. At the furthest upstream area that may be affected is the City of Granite Falls where transportation, parks, residential and limited commercial uses are adjacent to the affected river reach.

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

	Before	**After**		**Before**	**After**
Types 1-8 wetlands	0.0	2.0	Lawn/landscaping	0	0
Wooded/forest	0.5	0.5	Impervious surfaces	0.2	0
Brush/Grassland	2.5	3.7	Stormwater Pond	0	0
Cropland	0.0	0.0	Other (describe)	3.0	0
TOTAL	**6.2**	**6.2**			

If **Before** and **After** totals are not equal, explain why:

The above areas are for the project site only, and do not include the upstream reservoir. The site will be changed from an artificially impounded condition to run of the river following dam removal. Edges of the reservoir will be converted to Type 1-8 wetlands and brush/grassland. Deepwater habitat associated with the reservoir acreage will diminish by approximately 30 percent while shoreland habitat acreage will increase. An estimated 36.6 acres of type L1Ubh (permanently flooded) and R2UBH (permanently flooded, diked-impounded) wetlands will no longer be permanently flooded and will likely change to a seasonally flooded wetlands similar to PSS1C and PEMC types already found in small areas upstream of the existing dam. The exact type of conversion will depend on specific site conditions and successful colonization of the areas by wetland plant species.

11. **Fish, wildlife and ecologically sensitive resources**
a. Identify fish and wildlife resources and habitats on or near the site and describe how they would be affected by the project. Describe any measures to be taken to minimize or avoid impacts.

The project site is located on the Minnesota River, within the Minnesota Prairie subsection of the Prairie Parkland Province of Minnesota (2006 Comprehensive Wildlife Action Plan, MDNR 2006).. Prior to settlement, this area was predominated by tallgrass prairie, wetlands and floodplain forest but now is predominated by row-crop agriculture. The Minnesota River corridor is a dominant feature of the project site. The Minnesota River is identified as very–large river system and is also identified as a key habitat within the Comprehensive Wildlife Action Plan due to the biodiversity within the river and the occurrences of Species of Greatest Conservation Need (SGCN).

MDNR has divided the Minnesota River into three reaches for purposes of fisheries and aquatic organism population survey. Reach 3 is upstream of the Minnesota Falls Dam and Reach 2 is downstream. Fish surveys conducted in 2004, 2005 and 2008 by MDNR indicate fisheries Index of Biotic Integrity (IBI) scores in Reach 3 to be generally lower than in Reach 2. IBI scores reflect biotic health of water bodies based on the score of species characteristics and abundance at a given site (Lyons, Piette, and Niermeyer. 2001. Development, validation, and application of a fish-based index of biotic integrity for Wisconsin's large warm water rivers. Transactions of the American Fisheries Society 130:1077-1094).

Lower scores in Reach 3 may reflect the presence of dams or other differences inherent in the river such as the contributing watershed and river discharge volumes. The 2004 Minnesota River population assessment identified 54 fish species found in Reach 2 and Reach 3. Only the brown bullhead was found exclusively upstream of the Minnesota Falls Dam. Fifteen species sampled - including the

shovelnose sturgeon, paddlefish, long-and shortnose gar, gizzard shad, creek and speckled chub, goldeye, mooneye, blue sucker, highfin carpsucker, river redhorse, black buffalo, river shiner, and sauger - were found only downstream of Minnesota Falls Dam. The Minnesota Falls Dam is identified as a barrier to fish movement, although the Granite Falls Dam upstream within the City of Granite Falls is a more significant barrier to fish movement. During high flows the Minnesota River connects via a side channel around the Minnesota Falls dam that allows limited fish passage. Even with this limited fish passage fisheries surveys show less diversity and species richness above the Minnesota Falls dam.

The Minnesota Falls dam has altered the hydrology and hydraulics of the upstream river in the impounded reservoir. This reach of the Minnesota River is one of the steeper portions of the entire river, and unique, high quality habitat features would re-emerge following removal of the dam. Removal of the dam is anticipated to support the management objectives of the Minnesota Comprehensive Wildlife Strategies for very-large rivers for species of greatest conservation need by; 1) restoring river connectivity to approximately 3.25 miles of river upstream of the dam, 2) re-establishment of a more natural flow regime/water surface elevation upstream of the dam following removal 3) exposing cobble and gravel bed material that is conducive to fish spawning and 4) exposing cliff/bedrock habitat along the shoreline.

There is potential for temporary fish and wildlife disturbance during and shortly after dam demolition due to equipment operation and downstream sediment releases from work-in-water activities. These environmental effects are minimized by limiting the amount of in-water-work, sediment removal in the area above the dam, and using Best Management Practices during demolition to control erosion and sedimentation. See EAW Item No. 16 for more information on BMPs to control erosion and sedimentation.

Areas upstream of the dam that are currently inundated by the reservoir, but will be exposed after dam removal will initially be of limited habitat value until vegetation becomes established in these areas. Dewatering of these areas will stimulate vegetative growth. The encroachment of invasive plant species into these newly exposed areas could prevent these areas from developing into quality habitat. The establishment of vegetation within these areas is dependent on the seed bank present within the soil.

The Minnesota Falls dam is currently the geographic location that depicts a change in the fish consumption advisories for the Minnesota River. One species of fish has restricted consumption guidelines for the general population above Minnesota Falls, while there are seven fish species with restrictions below Minnesota Falls. Four species of fish have restricted consumption guidelines for women who are or may become pregnant and children under age 15 above Minnesota Falls, while there are eight fish species with restrictions below Minnesota Falls. Removal of the Minnesota Falls dam as a barrier to fish passage will likely result in reconsideration of Minnesota Falls as the geographic location for changes in Minnesota River fish consumption advisories. The Granite Falls dam approximately 3.25 mile upstream is the nearest barrier to fish passage that may be considered for the geographic location for changes in Minnesota River fish consumption advisories.

Removal of the Minnesota Falls Dam will provide a long-term environmental and ecological benefit to the Minnesota River between the Minnesota Falls Dam and the Granite Falls Dam, and to downstream reaches. The upstream reach will have a greater variety of habitat types and improved spawning areas, which will benefit the aquatic biota.

b. Are any state-listed (endangered, threatened or special concern) species, rare plant communities or other sensitive ecological resources on or near the site? _X_Yes __No
If yes, describe the resource and how it would be affected by the project. Describe any measures that will be taken to minimize or avoid adverse impacts. Provide the license agreement number (LA-501) and/or Division of Ecological Resources contact number (ERDB _____) from which the data were obtained and attach the response letter from the DNR Division of Ecological Resources . Indicate if any additional survey work has been conducted within the site and describe the results.

A Natural Heritage Information System database query conducted within one mile of the upstream pool in April 2011 indicated the presence of state listed species of plants and animals in the vicinity of the project site. Endangered (END), threatened (THR) and species of special concern (SPC) found in the vicinity of Minnesota Falls Dam and pool are listed in Table 1.

Table 1. Species identified by NHIS database query (April 2011).

Scientific Name	Common Name	Category	MN Status	Fed Status
Buellia nigra	A Species of Lichen	Fungus	END	None
Lampsilis teres	Yellow Sandshell	Invertebrate Animal	END	None
Lasmigona costata	Fluted-shell	Invertebrate Animal	SPC	None
Ligumia recta	Black Sandshell	Invertebrate Animal	SPC	None
Elliptio dilatata	Spike	Invertebrate Animal	SPC	None
Lasmigona compressa	Creek Heelsplitter	Invertebrate Animal	SPC	None
Actinonaias ligamentina	Mucket	Invertebrate Animal	THR	None
Pleurobema coccineum	Round Pigtoe	Invertebrate Animal	THR	None
Alasmidonta marginata	Elktoe	Invertebrate Animal	THR	None
Tritogonia verrucosa	Pistolgrip	Invertebrate Animal	THR	None
Venustaconcha ellipsiformis	Ellipse	Invertebrate Animal	THR	None
Simpsonaias ambigua	Salamander Mussel	Invertebrate Animal	THR	None
Opuntia macrorhiza	Plains Prickly Pear	Vascular Plant	SPC	None
Astragalus missouriensis	Missouri Milk-vetch	Vascular Plant	SPC	None
Orobanche fasciculata	Clustered Broomrape	Vascular Plant	SPC	None
Asclepias sullivantii	Sullivant's Milkweed	Vascular Plant	THR	None
Eumeces fasciatus	Common Five-lined Skink	Vertebrate Animal	SPC	None
Cycleptus elongatus	Blue Sucker	Vertebrate Animal	SPC	None
Acipenser fulvescens	Lake Sturgeon	Vertebrate Animal	SPC	None
Ictiobus niger	Black Buffalo	Vertebrate Animal	SPC	None
Polyodon spathula	Paddlefish	Vertebrate Animal	THR	None

Removal of the Minnesota Falls Dam may cause short-term adverse impacts to mussels as the water surface elevation of the pool upstream of the dam is lowered and the river returns to a pre-impoundment condition. The actual presence of listed mussel species in the area is uncertain as most the known occurrences are from the identification of dead specimens. The long-term benefits from re-connection of the river and improved sediment transport through the impounded river reach are expected to overshadow the potential short-term impacts to mussel population dynamics. For example, the creek heelsplitter and other riverine mussel species are typically found in swift current areas with sand, fine gravel and mud substrates downstream of riffles or pools. This type of habitat is expected to increase following removal of the dam and upstream impoundment.

Re-connection to the downstream reach will also allow fish movement now precluded by the dam. This will potentially allow increased diversity and numbers of fishes and other aquatic organisms in the 3.25 miles of river now in an impounded condition. IBI scores downstream of the Minnesota Falls Dam are now higher than in the impounded reach. Improved IBI scores in the now impounded reach are anticipated when the dam is removed and river connectivity is re-established.

The Minnesota County Biological Survey (MCBS) has identified two Sites of Biodiversity Significance adjacent to the proposed dam removal site on both sides of the Minnesota River. 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. The site the South bank is ranked as Moderate and contains occurrences of rare species and/or moderately disturbed native plant

communities, and/or landscapes that have a strong potential for recovery. The site on the North bank is ranked as High and contains very good quality occurrences of the rarest species, high quality examples of the rare native plant communities, and/or important functional landscapes. These two Sites contain Dry Hill Prairie and Rock Outcrop – Dry Prarie Complex native plant communities. These native plant communities are considered imperiled in Minnesota (state rank of 2), and provide habitat for several state-listed species. As such, any ground disturbance (including disturbance associated with access routes and staging areas) within the native plant communities will be avoided. Expansions or additions to the field road that will be used to access the right embankment of the dam will need to be evaluated for disturbance of native plant communities. If avoidance is not feasible, a botanical survey will be needed and the project proposer will need to coordinate with the DNR regarding potential surveyors and survey protocol.

12. **Physical impacts on water resources.** Will the project involve the physical or hydrologic alteration, dredging, filling, stream diversion, outfall structure, diking, and impoundment — of any surface waters such as a lake, pond, wetland, stream or drainage ditch? _X_Yes __No
If yes, identify water resource affected and give the DNR Public Waters Inventory number(s) if the water resources affected are on the PWI: Minnesota River PWI# 87001a and 12001a
Describe alternatives considered and proposed mitigation measures to minimize impacts.

    The dam functions as a run-of-the-river structure and provides no water storage during flooding. The volume of water currently impounded behind the dam is small enough that removing the dam should not increase downstream flow rates or increase downstream river levels. Following project completion, the downstream reach will benefit from improved sediment transport. Dams tend to "starve" downstream receiving waters of sediment, leading to scouring of the riverbed and banks.

    Removal of the dam will lower river levels extending approximately 3.25 miles upstream from Minnesota Falls to the Granite Falls Dam. Hydraulic modeling was used to evaluate the impacts of dam removal on upstream river levels. A project specific model was constructed from two existing HEC-RAS models that were developed to show the impacts of large floods to develop Flood Insurance Rate Maps for the area. The project specific model focused on smaller events, since, if the dam is removed, river levels will be most affected during low-flow events and affected very little during large flood events. The review of impacts focused on an average low-flow rate of 600 cfs, which was estimated based on review of gaging records at Montevideo and Morton. The pool elevation for this flow rate is estimated to be 883.5 MSL.

    Following development of the existing-conditions model, two scenarios of dam removal were modeled with different assumptions of channel lowering and sediment removal upstream of the dam:

Expected Lowering:	Bedrock elevation 865 at dam, moderate upstream channel lowering
Maximum Lowering:	Bedrock elevation 865 at dam, significant upstream channel lowering

    The assumed likely bedrock elevation of 865 is based on review of historical construction drawings of the dam which show the spillway constructed on bedrock at the approximate elevation. Limited bathymetric information was collected both up and downstream of the dam in February 2007 that shows downstream channel elevations in the range of 867 to 869. The assumed elevation of 865 is a reasonable estimate for showing the potential water level and river channel changes.

    A comparison of water surface profiles for the two removal cases are shown in Figure 7 and Figure 8 for a typical summertime river flow of 600 cubic feet per second (cfs). Figure 9 and Figure 10 show predicted river levels for a 100-year recurrence flood (47,000 cfs at Minnesota Falls). The river levels would be most impacted under low flow conditions depending on the assumed channel lowering. The impact of the lowered water levels at various points of interest is summarized in Table 2.

Table 2. Estimated River Level Lowering for Removal of Minnesota Falls Dam

Location (cross-section)	600 cfs		47,000 cfs (100-year)	
	Expected Lowering (ft)	Potential Range[1] (ft)	Expected Lowering (ft)	Potential Range[1] (ft)
Minnesota Falls Dam (46)	**14.5**	7.1 to 14.5	**1.4**	0.1 to 1.4
GFE Intake (46.5)	**12.7**	6.9 to 14.4	**1.7**	0.0 to 1.7
Golf Course (50.5)	**7.8**	3.6 to 12.8	**1.5**	0.0 to 2.9
City Park (52.2)	**7.3**	3.1 to 8.1	**0.5**	0.0 to 1.6
US 212 Bridge D.S. (55.1)	**1.3**	1.3 to 3.6	**1.2**	0.2 to 1.4
Pedestrian Bridge D.S. (57)	**0.3**	0.3 to 2.0	**0.2**	0.0 to 1.5
Below Granite Falls Dam (59.5)	**0.3**	0.3 to 0.8	**0.1**	0.0 to 1.1

[1]Varies with bedrock elevation below the dam and erodibility of upstream sediments

Under typical normal flow conditions, the water surface area upstream of the dam is expected to be reduced from 123.6 acres under current conditions to 86 acres with the dam removed, or a reduction of 36.6 acres. The affected area is expected to convert to other wetland types.

National Wetland Inventory mapping identifies several wetland complexes near this reach of the Minnesota River that would be affected by the dam removal. The changes in hydrology would be greatest closer to the dam and in periods of low flow. Most wetlands associated with the river will still have the necessary hydrology during the growing season to be maintained as wetlands, although shifts in vegetation could occur. The wetlands that are most likely to be affected by the proposed dam removal are on the South river bank (Yellow Medicine County) within approximately one mile of the dam location. These wetlands are mostly forested or emergent wetlands with limited open water and scrub-shrub wetlands. At least a portion of the hydrology for these wetlands is likely to be supported by the reservoir created by the dam. Removing the dam may change the degree to which the river supports this wetland hydrology and result in change to wetland types and potentially loss of some wetland areas.

The following Public Waters Basins are adjacent or near the upstream reservoir (see Figure 12):

- 13 Acre Public Water Basin 87-38P (aka Memorial Park Pond)
- 15 Acre Public Water Basin 87-131P (aka Granite Run Golf Course Pond)
- 15 Acre Public Water Basin 87-37P (located upstream and west of the MN Falls Dam)
- 12 Acre Public Water Basin 87-132P (located just west of 87-37P)

Hydrographic information for these basins is unavailable.

Memorial Park is located within the City of Granite Falls a short distance downstream of the US 212 Bridge on the south side of the river. The park (location shown in Figure 13) contains Memorial Park Pond (87-38P) with nearby campsites. The pond is reportedly connected to the river by a culvert, but the culvert has not been located. Survey of the pond in November 2010 indicated that it was at approximately the same level as the river (885.0 MSL), implying either a groundwater connection or culvert connection. Depending on the nature of the connection, the pond may be lowered following removal of the Minnesota Falls dam.

The Granite Run Golf Course Pond (87-131P) is connected to the river via a culvert. Additional groundwater connection between the river and the pond is also possible. The culvert opening is managed by the Granite Run Golf Course to maximize flow into the pond during periods of high water flow and minimize the flow from the pond to the river during periods of low water flow. As shown in Table 2 high flows would not change as much as low flows. This will still allow flow from the culvert to the pond in high flows. The duration and amount of flow will however be decreased and any groundwater support that the pond receives now, will also be decreased. The pond may be lowered following removal of the Minnesota Falls dam.

Public Water Basins 87-37P and 87-132P are of similar elevation. 87-37P is connected to the river through a wetland complex and potentially a groundwater connection. 87-132P is connected to 87-37P through a similar wetland complex indicating that both basins have similar hydrologic connection to the river. Both of these ponds may be lowered following removal of the Minnesota Falls dam.

Five streams enter the Minnesota River within the 3.25 mile reach that would be affected by the dam removal. Only one of these streams is a public watercourse, which enters the river just below Granite Falls Dam where water level effects will be the least. The next downriver stream enters the river just downstream from the Highway 212 bridge and is part of a diversion channel that was constructed as flood protection project for the City of Granite Falls. The remaining three streams are small intermittent streams, one of which runs through the Minnesota Valley Generating Plant property with the lower portion within a culvert under an electrical substation before being discharged to the river. The remaining two intermittent streams would have increased gradients after dam removal. This increased gradient could result in channelization and headcutting within these streams. Potential increased sedimentation and channelization of the streams will be limited by the small watersheds and rock/cobble nature of these streams.

During dam removal, water control measures will be implemented to manage river flow. Once the upstream reservoir is lowered as much as possible via the existing stoplog structure and certain dam components have been partially demolished, inflows will be passed around the project site. High bedrock elevations will limit the ability to construct a bypass channel around the project site. A more likely option is to utilize the stoplog structure and potentially remove part of the left primary spillway to pass flows through the project site. A cofferdam system would be constructed upstream to direct flows towards the stop log structure and left spillway abutment. A cofferdam system would also be constructed downstream along the existing riffle located approximately 100-feet downstream of the dam. The cofferdam would extend from the right bank to the primary spillway near the left bank. The area enclosed by the two cofferdams would be pumped thereby providing safe access to the dam. Furthermore, the dam structure would be fully visible during removal operations. Upstream river flows would be continuously passed around the dam site through the stop log structure with removal of the logs as well as some structural elements and, if necessary, through a notch in the primary spillway.

Limited dredging of sediment will be conducted in the area immediately upstream of the dam and its spillway. Dredging will be targeted to areas that are likely to be the most susceptible to scour after dam removal with volumes anticipated to be less than 10,000 cubic yards.

Once the dam is removed and the area within the cofferdam restored, the cofferdam would be removed and flows would be transferred to the newly removed area since it would be at a lower elevation than the stop log structure. The stop log structure and remaining components along the left dam abutment would be removed while safely passing flows in the restored area.

During the review of historic flows at the project site, it was determined the most favorable time to perform the demolition would be from July to December. Late winter through early summer is less conducive to removal activities; ice and snowmelt runoff followed by spring rains typically increase river flows to unmanageable levels. Historic flow data indicates it takes several months for flows to decline and stabilize.

Best Management Practice's (BMPs) as identified in MNDNR "Best Management Practices for

Meeting DNR General Public Waters Work Permit GP 2004-0001" (MNDNR 2010) will be used to protect the Minnesota River from demolition and construction related activities. Isolation berms/cofferdams, temporary water settling or filtering devices/approaches will be used as needed for pumped water from de-watering activities, erosion control barriers will be placed as needed for areas of disturbed ground and other measures as required will be installed to isolate the construction area and prevent discharge of water that is not incompliance with NPDES general construction stormwater permit standards. A project-specific Stormwater Pollution Prevention Plan (SWPPP) will be prepared that includes appropriate, site-specific BMPs for the project.

13. **Water use.** Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)? _X_Yes __No
If yes, as applicable, give location and purpose of any new wells; public supply affected, changes to be made, and water quantities to be used; the source, duration, quantity and purpose of any appropriations; and unique well numbers and DNR appropriation permit numbers, if known. Identify any existing and new wells on the site map. If there are no wells known on site, explain methodology used to determine.

Removal of the Minnesota Falls Dam will result in lower river levels extending upstream to the Granite Falls dam, as described in Item 12. County Well Index (CWI) listings of area wells were reviewed to determine the vulnerability of nearby wells by comparing the bottom elevation of wells within approximately one mile of the upstream pool to the expected river elevation following dam removal. The review of CWI listings did not reveal any wells that appear likely to be significantly impacted by lowered river levels. Several wells were identified that were at or near existing river elevations, but they were located one mile or further from the river. The effect of lowered river levels at such a distance is difficult to predict, especially given the strong presence of granite bedrock in the area. See Figure 12 for locations of wells located near the site of the project and those wells that could potentially be impacted.

Granite Falls Energy (GFE) produces ethanol at a plant located approximately 4,000 feet northeast of the Minnesota Falls Dam. GFE original source of water was from a deep well (MDNR permit 2004-4115), but doing so resulted in lowered groundwater levels in the surrounding area. GFE later obtained an appropriations permit (MDNR permit 2007-0016) to pump and pipe surface water from the Minnesota River, subject to minimum flow conditions and installed a river intake and pumping station in November 2006. Under GFE's permit 2007-0016, the MDNR may require suspension of appropriation during periods of low water in order to maintain minimum water levels within the Minnesota River Watershed.

GFE installed the river intake approximately 1,200 feet upstream of the Minnesota Falls Dam. Construction drawings show the intake screen in approximately 7.3 feet of water, with the top of screen approximately 5.8 feet below the present normal water surface. The lowered pool levels may affect GFE's ability to withdraw water from the river, particularly during winter months when the river is subject to freezing. GFE may need to modify its intake following removal of the Minnesota Falls Dam.

Granite Run Golf Course has two appropriations permits (MDNR Permits 76-4298 and 98-4019) in place to use river water for irrigation. Subject to minimum flow conditions, one permit allows the golf course to pump river water to an inland pond and the second permit allows it to pump water from the inland pond to a holding pond. From there the water is used for irrigation. Both permits provide that the MDNR may suspend appropriation during periods of low water in order to maintain minimum water levels within the Minnesota River. Although the golf course is permitted to pump water from the river to the inland pond, under current conditions when river flows are elevated the pond fills with water via an 18-inch culvert (estimated size), which allows river water to enter the pond at approximate elevation 886.0. Lowering of the river level will reduce the frequency that this happens, thereby requiring more frequent pumping from the river. A survey performed in November 2010 indicated that the water level within the pond was four feet higher than the river elevation (889.5

versus 885.4). Discussions with the golf course owner have indicated that as water levels recede in the river he closes off the culvert to minimize water flowing from the pond to the river via the culvert.

Demolition of the dam may necessitate temporary dewatering activity, including pumping of surface, ground, or stormwater accumulations within isolated areas. A small appropriation of river water may be needed for dust suppression if and as necessary.

14. **Water-related land use management district.** Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? _X_Yes __No
If yes, identify the district and discuss project compatibility with district land use restrictions.

Minnesota Falls lies on a portion of the Minnesota River that has been classified as Wild and Scenic by the State of Minnesota, within a reach that is designated as Recreational. Recreational rivers are those rivers that may have undergone some impoundment or diversion in the past and that may have adjacent lands which are considerably developed, but that are still capable of being managed so as to further the purposes of the Wild and Scenic Rivers Act. Minnesota's Wild and Scenic River Act is administered by the Commissioner of Natural Resources. Local government units with jurisdiction over a segment of the system implement the Act by adopting or amending ordinances and land use maps to the extent necessary to comply with the standards and criteria of the Commissioner and applicable management plan. Removal of the Minnesota Falls dam will not prevent the management of this portion of the district for recreational purposes.

The South Bank is zoned Rural Preservation District – Non-tillable Farmland, by Yellow Medicine County, with wild and scenic river designation. The North Bank is zoned Wild and Scenic River by Chippewa County.

The entire project site is designated 100-year floodplain, as shown in the following Flood Insurance Rate Map (FIRM) Map Panels:

- Chippewa County Unincorporated: 270066 0170B, Effective 6-17-86
- Yellow Medicine County Unincorporated: 270544 0175B, Effective 11-15-78

Removal of the Minnesota Falls Dam will be compatible with the adjacent land and river designations. Removal of the dam will improve connectivity of the river and lower 100-year flood levels by approximately two feet immediately upstream of the dam and therefore reduce the extent of the adjacent flood hazard area. The lowering will lessen as one proceeds upstream, and will be minimal upstream of the US 212 bridge. Removal of the dam would have no impact on downstream water levels; neither normal nor flood levels will be impacted downstream of the dam.

15. **Water surface use.** Will the project change the number or type of watercraft on any water body? _X_Yes __No
If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses.

A small amount of motorized boat traffic now uses the impounded reach of the river upstream of the dam. The most recent creel survey conducted in 1998 by the MDNR for the river reach beginning at a point upstream of the Minnesota Falls Dam downstream to the confluence with the Cottonwood River (110 river miles) suggests that most anglers using this reach of river are shore anglers. Access for shore anglers will not change substantially following removal of the dam.

Canoe use of the river may increase following removal of the dam. A portage may be beneficial at the site of the bedrock outcrop (with potential for future rapids) located beneath the existing dam. There is a potential that canoe and/or kayak trips could begin in Granite Falls where canoe and/or kayak users now seek to launch at the Kinney site downstream of the Minnesota Falls Dam to avoid the portage at the dam.

Private docks located in the river between Minnesota Falls and Granite Falls would also be impacted by removal of the dam, depending on their location. It may be difficult to use lake-type boats (e.g. pontoon boats) in this area following removal of the dam.

Removal of the dam would likely affect snowmobile activity from Minnesota Falls upstream to the US 212 Bridge. Currently, snowmobiles are able to operate on the reservoir when ice is sufficiently thick. The ice thickness is expected to be much less predictable following removal of the dam.

16. **Erosion and sedimentation.** Give the acreage to be graded or excavated and the cubic yards of soil to be moved:
acres 4.5; cubic yards 6,200 above-water, 10,000 below-water.
Describe any steep slopes or highly erodible soils and identify them on the site map. Describe any erosion and sedimentation control measures to be used during and after project construction.

Steep slopes are present on both sides of the river channel where work will be performed. Erosion and sedimentation control measures will be used for below-water and above-water activities. Detailed discussion of water control during construction activity is contained in EAW Item 6b. For above-water grading activities, erosion control measures will be utilized, including but not limited to silt fence, erosion control blanket, and biologs.

Work in water as part of dam removal has the potential for temporarily increasing sedimentation in the Minnesota River. The Work in Public Waters permit and MPCA-approved Stormwater Pollution Prevention Plan (SWPPP) will include details that identifiy specific Best Management Practices (BMPs) to prevent and minimize downstream sedimentation. The selected practices will be specifically tailored to 1) manage pumped de-watering sites, 2) place temporary cofferdams to isolate work areas, 3) place erosion control barriers for disturbed soil/construction haul routes, 4) guide operation of construction machinery in and around water, 5) manage demolition processes and debris and, 6) manage stormwater.

There are approximately 35.8 acres within the affected reach above the dam that have accumulated sediments (see Figure 6). Removal of the dam will allow the river to scour these sediment deposits under the new flow regime. This scour will temporarily increase sedimentation of the Minnesota River. The river channel will naturally stabilize to the new flow regime and come into sediment erosion and deposition equilibrium.

As Identified in EAW Item 12 there are five streams that enter the Minnesota River within the reach potentially affected by the dam removal. Lowering the water within this reach would result in these streams adjusting to new gradient, which could result in additional sedimentation from these channels. The change in water level at the stream just below Granite Falls dam and the flood diversion channel will have a smaller change in water level and thus smaller potential for sedimentation from these streams. A third stream that is routed through NSP's Minnesota Valley Generating Plant property could also contribute sediment to the Minnesota River. NSP is in the process of re-routing this small stream and is implementing stabilization measures where the stream enters the river channel. The two remaining intermittent streams would experience the largest changes in water level with the resulting largest potential for channelization and sedimentation. As part of the Work in Public Waters permit all five of these stream channels would be monitored after dam removal to identify and implement any needed stabilization efforts.

17. **Water quality: surface water runoff**
a. Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any stormwater pollution prevention plans.

The proposed dam removal would result is a small reduction of impervious surface associated with removal of dam infrastructure. After dam removal some additional shoreline areas would initially not have any vegetative cover which could result a temporary increases of sediment in runoff. Areas within

the channel that have sediment deposits will be subject to scour that would also temporarily increase sediment within the Minnesota River. Natural re-vegetation of shoreline areas and eventual stabilization of the channel will remove these sediment sources.

b. Identify routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact runoff on the quality of receiving waters.

The Minnesota River is the water body that will receive all runoff from the project area. The Minnesota River from Minnesota Falls dam to Hazel Creek is impaired for aquatic consumption due to PCBs in fish tissue and is also impaired for aquatic life due to turbidity. The proposed project would temporarily increase turbidity within this river reach during dam removal and for some period of time after the dam is removed. When the newly exposed shoreline become established with vegetation and river channel becomes established by scouring the sediment deposited in the reservoir, the sedimentation contribution from the project area will return to pre-project conditions.

18. **Water quality: wastewaters**
a. Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.

N/A

b. Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies (identifying any impaired waters), and estimate the discharge impact on the quality of receiving waters. If the project involves on-site sewage systems, discuss the suitability of site conditions for such systems.

N/A

c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretreatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary.

N/A

19. **Geologic hazards and soil conditions**
a. Approximate depth (in feet) to ground water: 0 minimum, 0 average;
to bedrock: 10' from water surface at dam site, minimum
11' from water surface at dam site, average.

Describe any of the following geologic site hazards to ground water and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.

Groundwater elevation at the site is assumed to be approximately equivalent to the normal river level.

A Geophysical evaluation was performed by Zonge GeoSciences, Inc. in August 2009 in order to map the approximate bedrock depth within the river channel from the Minnesota Falls Dam approximately 2 miles upstream.

The results indicate that bedrock is relatively shallow throughout the river channel in the area where the survey was performed. Results of the survey also help to confirm the assumption that a natural bedrock ledge existed at the current location of the dam prior to construction of the dam. When comparing the results of the bedrock mapping with the results of the bathymetric survey, it appears that relatively little sediment has built up in the river channel in the surveyed area.

There are no known geologic site hazards with the project area.

b. Describe the soils on the site, giving NRCS (SCS) classifications, if known. Discuss soil texture and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.

The Custom Soil Resource Report for Chippewa County, Minnesota, and Yellow Medicine County, Minnesota (NRCS, 2010), classified soils at the site as Storden loam, Swanlake loam, Doland-Swanlake complex, and Copaston Rock outcrop complex. These soils are well-drained with high to moderately-high ability to transmit water. Groundwater contamination from spills is possible but movement from the location of the spill would be slow due to slope and slow water movement through the soil based on NRCS information. Appropriate temporary spill containment for fuel and response equipment will be provided during construction work to preclude fuel or chemical contact with soils.

Barr Engineering collected sediment samples at five locations upstream of the Minnesota Falls Dam on August 28, 2009. The samples were analyzed for physical and chemical composition by Braun-Intertec to better understand the nature of sediment that may be scoured or may need to be removed via dredging, and to understand potential sediment handling and beneficial re-use or disposal options. The non-sand samples were recommended for chemical analysis for metals, general chemistry, organochlorine pesticides and PCBs, and Polycyclic Aromatic Hydrocarbons (PAHs).

The sediment analysis was reviewed by the MPCA and summarized in a document dated December 28, 2009. MPCA's evaluation consisted of simple comparisons of the sediment analytical results with guidelines, quality targets, and reference values developed by the Ontario Ministry of the Environment (Ontario) and by the MPCA.

Ontario's Sediment Quality Guidelines (Guidelines) are for in-water disposal of sediment. The purpose of the Guidelines is to protect the aquatic environment by setting safe levels for nutrients, metals, and organic compounds. The MPCA's Sediment Quality Targets (SQTs) are similar in that the intent is to protect the aquatic environment. The SQTs were developed for the St. Louis River Area of Concern, but, according to the MPCA, they can be used in other areas of Minnesota to assess sediment quality.

Generally, the MPCA applied the Ontario Guidelines and MPCA SQTs to what will be the newly uncovered layer of sediment after dredging or scour. Where both Ontario and the MPCA have developed a level of concern, MPCA generally used the more restrictive value of the two. In some cases, neither Ontario nor the MPCA have developed a level of concern for a parameter.

The MPCA's Soil Reference Values (SRV) were also referenced. SRVs were originally developed to evaluate risk to human health and the environment posed at a Voluntary Investigation and Cleanup (VIC) or Superfund site. They are screening levels for contaminated sites, and were not designed to allow contamination up to a specified level. However, in the absence of other guidelines or target levels, the use of SRVs to evaluate the risks of upland placement of dredged material is the only measure currently in place.

Based on the results of the sediment characterization, the dredged material is categorized into one or more management levels, which determines the appropriate disposal method for the material. The three management levels are as follows:

- Level 1 – suitable for use or re-use on properties with a residential or recreational use category
- Level 2 – suitable for use or reuse on properties with an industrial use category
- Level 3 – landfill disposal determined based on nature of material

Several metals were above Ontario Lowest Effect Level (LEL) criteria, including Arsenic, Copper, and

Nickel. Total Kjeldahl Nitrogen, Phosphorous and Total Organic Carbon also exceeded the LEL levels. None of the tested metals were above the most protective (lowest or Level 1) SRV guideline criteria which determines beneficial re-use or disposal options.

Organochorine Pesticides, PCBs, and PAHs all tested below Level 1 SRV criteria; however, several of those that were reported as "non-detect" had Method Reporting Limits (MRLs) that were greater than the Level 1 SQT and/or Ontario LEL values. The proposed project may need a State Disposal System Permit for dredged material disposal from the MPCA. The sediment test results and whether additional testing is needed will be evaluated as part of that permitting process.

20. **Solid wastes, hazardous wastes, storage tanks**

a. Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

The proposed project will remove the dam and any remaining features that were originally part of the hydroelectric project. Removal will be phased and timed to minimize the potential for disruption of demolition activities by high river flows and to minimize the discharge of sediment. Temporary placement of water control structures will be necessary for dam removal. Limited sediment removal (estimated 10,000 cubic yards) will be performed immediately upstream of the dam and stoplog structure. Rubble from the granite/masonry dam demolition that is free of reinforcing steel will be re-used onsite as fill below soil cover and/or bank protection (rock masonry). Sediment will be used to restore channel banks in the vicinity of the old tailrace channel and will be re-vegetated with native grasses. Sediment not used for onsite reclamation will be beneficially re-used or disposed of offsite. Excess concrete and/or steel will be recycled or disposed of off-site. An estimated 800 cubic yards of concrete and 1700 cubic yards of rock masonry will be generated by the dam removal.

b. Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.

No toxic or hazardous materials will be used for the dam removal project. NSP has standard practices for measures to be taken when operating construction machinery near water bodies. The Construction Stormwater Pollution Prevention Plan administered by MPCA will also require safeguards for operating machinery near water.

c. Indicate the number, location, size and use of any above or below ground tanks to store petroleum products or other materials, except water. Describe any emergency response containment plans.

No above- or below-ground storage tanks for petroleum or other products will be used for the dam removal project. The contractor will be required to utilize pickup-mounted fuel tanks for fuel delivery.

21. **Traffic.** Parking spaces added: None
Existing spaces (if project involves expansion): None
Estimated total average daily traffic generated: 50-80 haul trucks/day
Estimated maximum peak hour traffic generated and time of occurrence: estimated maximum 10 trips per hour from 7am to 5pm.
Indicate source of trip generation rates used in the estimates. Project proposer's estimate based on past experience with haul truck loading and transport.
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. Using the format and procedures described in the Minnesota Department of Transportation's Traffic Impact Study Guidance *(available at: http://www.oim.dot.state.mn.us/access/pdfs/Chapter%205.pdf)* or a similar local guidance, provide an

estimate of the impact 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.

Average annual daily traffic (AADT) volume shown by MNDOT for 2008 on Hwy 212 from the junction of Hwy 23 to ¼ mile east of the junction with Hwy 40 is 7100 vehicles. 2008 AADT for Hwy 212 from ¼ mile east of Hwy 40 to ¼ SE of the Minnesota Falls Dam is estimated at 4800 vehicles. AADT for Pete's Point Road (CR40) from the junction of Hwy 212 to ¼ SE of the Minnesota Falls Dam is 185 vehicles per day. The addition of 80 haul trucks per day to the estimated traffic on Pete's Point Road would be a 43% increase in ADT but would be of short duration (one month +/-). Appropriate signage will be required of the contractor to alert the traveling public to the fact that haul trucks will be operating on the roadway(s). No long-term impact to the regional transportation system is expected. Project timeline is anticipated to be 4 months for substantial completion, with final grading and planting likely to happen the following spring.

22. **Vehicle-related air emissions.** Estimate the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts.

    No long-term changes in traffic are anticipated as a result of the project. Temporary impacts may occur as a result of sediment transport off site. Based on 10,000 CY of sediment removal and use of trucks that have a capacity of 8 CY, 1250 loads will be hauled.

23. **Stationary source air emissions.** Describe the type, sources, quantities and compositions of any emissions from stationary sources of air emissions such as boilers, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult *EAW Guidelines* for a listing) and any greenhouse gases (such as carbon dioxide, methane, nitrous oxide) and ozone-depleting chemicals (chloro-fluorocarbons, hydrofluorocarbons, perfluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

    Fugitive dust related to demolition of the dam structure, sediment or rock transport may occur; however, no hazardous air pollutants will be released. Sediments are anticipated to be wet or damp at the time of removal and transport. Rock used for riprap will be clean field or quarry stone. If necessary, dust suppression will be performed by sprinkling the affected area with river water. Greenhouse gases will be increased temporarily during demolition and removal of the dam structure due to engine operation from vehicles and heavy earth moving machines. These impacts will be temporary. One or more generators may be used for dewatering purposes during construction. The size of the generator and amount it is used depends on the construction method and on precipitation that occurs during construction.

24. **Odors, noise and dust.** Will the project generate odors, noise or dust during construction or during operation? _X_Yes __No
    If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

    Noise levels will temporarily increase during the removal of the dam structure, during site restoration, and from haul traffic as sediment is removed and hauled for disposal. These impacts are short-term and are typical at construction sites. Noise may be generated during removal activities. Mechanical and/or blasting methods may be used for removal. Blasting may be utilized if it can reduce the duration of noise and/or dust generation.

    Odor from decomposing organic materials may be a short-term issue as the reservoir is lowered and this material is exposed to oxygen. These odors are expected to quickly diminish as the exposed soils dewater and become consolidated.

25. **Nearby resources.** Are any of the following resources on or in proximity to the site?
Archaeological, historical or architectural resources? _X_Yes __No
Prime or unique farmlands or land within an agricultural preserve? __Yes _X_No
Designated parks, recreation areas or trails? _X_Yes __No
Scenic views and vistas? _X_Yes __No
Other unique resources? _X_Yes __No
If yes, describe the resource and identify any project-related impacts on the resource. Describe any measures to minimize or avoid adverse impacts.

A preliminary historical and archeological investigation was performed by Hess, Roise and Company (Hess Roise) and Archaeological Research Services (ARS), respectively. The goal of the preliminary investigation was to identify any potential archeological or cultural impacts created from the removal of the dam and identify a scope of future work required as part of the state and federal review process. A Cultural Resources Scoping Memorandum was prepared in January 2010. The Scoping Memorandum indicates the Minnesota Falls Dam site has a long history of use including a saw mill with the development of a small town in the 1800's until a devastating flood wiped out the town. Later, in the early 1900's, a hydroelectric dam plant and the current dam were constructed. The dam site generated power until the 1960's when the power generation facilities were removed or abandoned.

A 1996 study concluded the prior demolition of all the hydroelectric generating facilities has sufficiently impaired the site's integrity to eliminate it from consideration for the National Register of Historic Places. The State Historic Preservation Office concurred with these findings.

The Scoping Memorandum recommended that additional investigations of other properties may be in order since the river elevation will be lowered. An archaeological investigation was performed in November 2010, consisting of inspection of the upstream shoreline areas and collection of sediment samples from underwater areas that would be exposed following removal of the dam. Both banks upstream of the dam were inspected from a boat, and sediment samples were collected from selected sites with a ponar dredge. The samples were sieved to determine the presence of artifacts. Preliminary conclusions about what areas have or lack archaeological potential are as follows:

- The stretch from the boat landing at the City Park to just upstream of the US 212 Bridge has archaeological potential along both banks. The south bank is mostly city-owned, while the opposite side is mostly residential. If permissible, both sides could be investigated by shovel testing along the bank as an alternative to drawing the river down to expose bank erosion.
- From the boat landing downstream as far as the bend just above the islands (located about 5,000 feet upstream of Minnesota Falls), both banks lack archaeological potential as they are either very rocky or near the old Minnesota Valley generating plant, and therefore disturbed.
- The islands were indicated as culturally and spiritually significant to the Upper Sioux Community but were not tested as impacts due to dam removal are expected to be minimal.
- Ponar sampling was unsuccessful in the shallow area immediately upstream from the islands due to hard- packed sediments.
- Ponar sampling worked well along the shallow area approximately 2,000 feet downstream from the island (~3,000 feet upstream from the dam); sediments were very silty and easily passed through a 4 mm mesh sieve (all negative findings).
- The entire south side between these two ponar sampled areas features significant bank erosion that would be easy to inspect by walking the shore if permission was obtained from the owner(s). This is also true of some cultivated fields on the north side. The inspection would be visual only and would not involve any testing.

- The remaining 3,000 foot stretch above the dam has considerable archaeological potential but could not be inspected without a drawdown. There is some accumulation of silt at various locations on either side of the river. Historic remnants of the old Minnesota Falls community probably exist on the banks, but any evidence on the south side are likely protected from erosion by the natural and man-made levees that exist on much of the overbank.

Exposed sediments will be inspected during removal of the dam in order to identify artifacts that may be exposed by the lowered water level. The level of participation in this effort will be determined during the Corps of Engineers permitting process.

The Minnesota River is part of the Minnesota State Water Trails system. The project site is located near the upstream boundary of the Granite Falls to State Hwy 4 segment. This reach of the water trails system receives canoe use and has developed canoe ingress/egress points. No long-term impacts to the water trail system are anticipated although short-term interruptions will occur during removal of the dam. Removal of the dam will improve canoe passage through the area.

A scenic overlook is located on US 212 and overlooks the river valley at approximately 3,000 feet upstream of Minnesota Falls. The dam itself is not visible from the overlook and the proposed change in water level would cause limited changes to the view from the outlook.

Two State Natural Areas (SNAs) are located in the vicinity of the project site: Gneiss Outcrop SNA and Blue Devil Valley SNA. The Gneiss Outcrop is a 234 acre parcel located, from the Minnesota Falls Dam, South on County Road 40 (Pete's Point Road) for 1.3 miles, then west 0.5 miles on an unnamed gravel road (Township 115N, Range 39W, Section 11). The Blue Devil Valley SNA is a 27 acre parcel located, from the Minnesota Falls Dam, North on County Road 40 1.5 miles, west on US 212 1.5 miles, south on Hwy 23 0.2 miles, south on Co Hwy 39 0.3 miles (Township 115N, Range 39W, Section 4). No impacts to the two SNAs are anticipated.

26. **Visual impacts.** Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks? __Yes _X_No
If yes, explain.

27. **Compatibility with plans and land use regulations.** Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency? _X_Yes __No.
If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.

Yellow Medicine County (south and west of the Minnesota River) has a comprehensive plan that includes zoning of the land in a variety of categories adjacent to the Minnesota River at or near the project site. Zoning categories include floodplain, rural preservation, farmland, and mineral resources. Lands in Yellow Medicine County adjacent to the Minnesota River are primarily zoned as floodplain and non-tillable farmlands.

Chippewa County (north and east of the river) has multiple layers of zoning classes applicable to the lands adjacent to the river and project site including floodplain, shoreland, and Minnesota River management districts.

Removal of the Minnesota Falls Dam is compatible with the zoning classifications of Yellow-Medicine and Chippewa Counties.

Yellow Medicine County and Chippewa County both have comprehensive water management plans. The Yellow Medicine County Comprehensive Local Water Plan lists four priority issues:

- Groundwater Protection
- Erosion and Sediment Control

- Reducing Priority Pollutants
- Surface Water, Drainage Management and Flooding

The Chippewa County 2003-2012 Water Plan lists six priority issues:

- Groundwater Protection
- Storm Water Management
- Reducing Priority Pollutants
- Drainage
- Flooding
- Public Education & Outreach

The proposed removal of the Minnesota Falls Dam does not work against the goals outlined in either county water plan.

There are two approved and two in-progress Total Maximum Daily Loads (TMDLs) established for the Minnesota River in the vicinity of Minnesota Falls:

- 8th Avenue and Baldwin Street bridge to Minnesota Falls Dam, Mercury (Hg), plan approved 2008 (07020004-613)
- Minnesota Falls Dam to Hazel Creek, Mercury (Hg), plan approved 2008
- Minnesota Falls Dam to Hazel Creek, PCB in fish tissue, target completion 2011
- Minnesota Falls Dam to Hazel Creek, Turbidity, target completion 2014

Removal of the Minnesota Falls Dam does not work against the goals of the TMDL process. Although removal of the dam may have short-term impacts on downstream turbidity levels, the project will restore sediment transport continuity to this reach of the river. The channel upstream of the dam will be less likely to store sediment during low-flow periods and re-suspend the accumulated sediment during high-flow periods.

28. **Impact on infrastructure and public services.** Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project? _X_Yes __No.
If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)

The City of Granite Falls owns a 1.2 MW hydropower dam located on the Minnesota River within the City limits, approximately 3.1 miles upstream of the Minnesota Falls Dam. The City expressed concern that lowered water levels at the draft tubes could create operating problems for the hydropower turbines. According to City staff, their facility experienced problems following the 1997 flood, which apparently scoured the channel downstream of the Granite Falls dam and resulted in lower tailwater levels at the dam, which created some problems with their turbine draft tubes. The proposed changes in water level at this location are likely to be less the one-half of a foot.

The wastewater treatment plant (WWTP) for the City of Granite Falls has a two effluent discharge pipes to the Minnesota River. The most upstream pipe extends into the river channel at such distance and location that it will not be affected by the water level change. The downstream effluent pipe extends approximately 10 feet into the current channel. Removal of the dam and lowering of the reservoir pool may require that the downstream pipe outlet be protected or lowered.

The boat launch located on the river near the Memorial Park in the City of Granite Falls will likely be impacted. The river is currently shallow in front of the launch and this area may be completely exposed following removal of the dam.

The construction drawings for the US 212 bridge were reviewed to determine whether the bridge would likely be impacted by the lowered water levels. The plans indicate that the bridge is founded on deep pilings that will withstand potential water lowering at the bridge.

A temporary haul road will be utilized to access the dam from the south side (Yellow Medicine County). The haul road has been utilized for previous construction activities, including repair of a dike in 2007.

Presently, a canoe portage exists across the earthen embankment portion of the dam. Following dam removal, a canoe portage may be created on either side of the channel if necessary to provide safe passage to canoers. NSP does not anticipate owning the adjacent property long-term; therefore, the canoe portage, if developed, would be owned by the subsequent/next property owner.

29. **Cumulative potential effects.** Minnesota Rule part 4410.1700, subpart 7, item B requires that the RGU consider the "cumulative potential effects of related or anticipated future projects" when determining the need for an environmental impact statement.
Identify any past, present or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative potential effects. (Such future projects would be those that are actually planned or for which a basis of expectation has been laid.)
Describe 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 *(or discuss each cumulative potential effect under appropriate item(s) elsewhere on this form).*

The proposed removal of the Minnesota Falls Dam may have the following environmental effects that could combine with other projects to for cumulative potential effects:

- Changes in water level in the reservoir area between Granite Falls dam and the existing Minnesota Falls dam.
- Increased turbidity within the Minnesota River downstream of the dam during dam demolition and while the river and shoreline re-establish to the new water level conditions.

Contact was made with Yellow Medicine County, Chippewa County, MnDOT, and City of Granite Falls. None of these contacts indicated any projects along the Minnesota River corridor that would be likely to have impacts within the same geographic area and time period that would contribute to the water level changes or downstream turbidity that would result in cumulative potential effects.

NSP's CAPX transmission line project includes a proposed new line crossing near the Minnesota Valley Generating Plant, located approximately 1.7 miles upstream of the Minnesota Falls Dam. The new towers will be located outside of the channel, which is tentatively scheduled for 2012-2013. If construction of the transmission line coincides with demolition of the dam, erosion and sedimentation from both projects could combine to create the cumulative potential effect of turbidity in the Minnesota River. Both of these projects are subject to ongoing public regulatory authority under the MPCA Construction Stormwater General Permit that requires preparation of stormwater pollution prevention plans and the use of best management practices to prevent erosion and sedimentation.

30. **Other potential environmental impacts.** If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

31. **Summary of issues.** *Do not complete this section if the EAW is being done for EIS scoping; instead, address relevant issues in the draft Scoping Decision document, which must accompany the EAW.*
List any impacts and issues identified above that may require further investigation before the project is begun. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

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 9b and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature _____ Date 6/28/2011

Title Environmental Planning Director

Environmental Assessment Worksheet was prepared by the staff of the Environmental Quality Board at the Minnesota Department of Administration, Office of Geographic and Demographic Analysis. For additional information, worksheets or for *EAW Guidelines*, contact: Environmental Quality Board, 658 Cedar St., St. Paul, MN 55155, 651-201-2492, or http://www.eqb.state.mn.us