July 2013 version

Environmental Assessment Worksheet

This Environmental Assessment Worksheet (EAW) form and EAW Guidelines are available at the Environmental Quality Board's website at:
http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm. The EAW form provides information about a project that may have the potential for significant environmental effects. The EAW Guidelines provide additional detail and resources for completing the EAW form.
Cumulative potential effects can either be addressed under each applicable EAW Item, or can be addresses collectively under EAW Item 19.
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: Lower Mound Lake Basin Restoration, Blue Mounds State Park

2. Proposer: MN DNR Parks and Trails Division
Contact person: Steve Hennessy
Title: Acquisition and Development Coordinator
Address: 500 Lafayette Road
City, State, ZIP: St. Paul, MN 55155
Phone: 651-259-5633
Email: steve.hennessy@state.mn.us

3.RGU: MN DNR, Ecological & Water Resources
Contact person: Kathy Metzker
Title: EAW Project Manager
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4. Reason for EAW Preparation: (check one)

Required:
☐ EIS Scoping
☑ Mandatory EAW

Discretionary:
☐ 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, Subpart 27A. Wetlands and Public Waters
(Federal EA – FEMA Region V, Disaster #DR-4182-MN, Project ID #1043)

5. Project Location:
County: Rock
City/Township: Luverne/Mound
PLS Location (¼, ¼, Section, Township, Range):
NENE; NWNE; SWNE; SENE; NENW Sec. 24, Town. 103, Range 45W

Watershed (81 major watershed scale): Rock River
GPS Coordinates: X: 727412.0358 Y: 4844004.5699
Tax Parcel Number: Multiple parcels in project area: 09-0119-000; 09-0119-100; 09-0116-000; 09-0177-100

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

- County map showing the general location of the project;
  Figure 1. Lower Mound Lake Basin Restoration Project, County Location

- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable);
  Figure 2. Lower Mound Lake Basin Restoration Project, USGS Map

- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.
  Figure 3. Lower Mound Lake Basin Restoration Project, Preliminary Design for Proposed Project
  Figure 4. Rock County Flood Hazard Boundary Map
  Figure 5. Lower Mound Lake Basin Restoration Project, NRCS Soil Data
  Figure 6. Lower Mound Lake Basin Restoration Project, National Wetland Inventory
  Figure 7. Lower Mound Lake Basin Restoration Project, Native Plant Communities and Land Cover

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 (MN DNR) proposes to address conditions left by natural disasters that occurred between June and July, 2014, which resulted in a failed dam and damages, including the drained basin that was known as Lower Mound Lake, located within Blue Mounds State Park near Luverne, in Rock County, Minnesota. The proposed project includes removal of the remaining structures of the failed dam and restoration of Lower Mound Lake Basin to a natural stream.

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.

MN DNR proposes to address conditions resulting from the area receiving more than 11 inches of rain from June 14-17, 2014, and additional heavy rains in July, 2014. Floodwaters and debris caused damage to various areas of the park, including roads, trails, bison fencing and the spillway connected to the Lower Dam on Lower Mound Lake. Floodwaters washed out a portion of the Lower Dam emergency spillway and drained Lower Mound Lake. The proposed project includes removal of the remaining structures of the failed dam and restoration of Lower Mound Lake Basin to a natural stream with several small oxbow wetlands adjacent to the natural stream.

The proposed project area is located entirely within Blue Mounds State Park, which is owned by the State of Minnesota and managed by the Department of Natural Resources. Blue Mounds State Park is located in Rock County, Minnesota, approximately 5 miles north of the City of Luverne. (See Figures 1 and 2) Blue Mounds State Park consists of 1,830 acres and had 64,789 annual visits and 8,052 overnight visits in 2016.

The proposed project area encompasses approximately 60 acres. However, the area of impact, or construction limits, covers 30 acres, including the entire drained basin along with what remains of the Lower Dam, immediately adjacent areas, a staging area for construction equipment and an access route. Proposed project elements are described below (also see Figure 3).

The project includes several distinct activities, described below.

Demolition of the existing dam

Removing the existing dam will include removal of the main spillway structure and its abutments, the emergency spillway and the diversion channel. The main spillway is a concrete and stone masonry structure; the spillway utilized locally sourced Sioux Quartzite in its construction. The Sioux Quartzite is supported by concrete piles, concrete abutment, and concrete face on the upstream side. The emergency spillway and diversion channel consist of grouted quartzite over a gravel subsurface with a clay core. Much of the grouted quartzite has been covered in concrete during previous repairs. The north embankment consists of granular fill with a riprap toe along the upstream side. The quartzite masonry from the main spillway will be salvaged and stockpiled to be reused in the park; the grouted quartzite riprap, concrete and other debris will be disposed of at an approved off-site facility. Much of the north embankment will remain in place and continue to be used as a pedestrian trail.

Construction of a pedestrian bridge

The washout of the emergency spillway has resulted in a severance in Mound Creek Trail (hiking) that travels around the upper and lower basins. A catwalk on the main spillway of the dam served as a pedestrian bridge over Mound Creek. To restore trail connectivity, a pedestrian bridge will be constructed where the current stream flows through the embankment. The bridge will be designed for a 100 year rain event. Additional details about the bridge will be determined as design progresses.

Restoration of Mound Creek

The restoration of Mound Creek through the basin is intended to create a natural, meandering stable stream channel and provide improved habitat for species native to southwestern Minnesota, including the Topeka Shiner and Plains Topminnow. Approximately 4,500 feet of stream channel will be created along with several wetland oxbows. The stream restoration will consist of a series of riffles and pools. A highly sinuous ‘E’ channel, as classified by the Rosgen classification system, will be restored throughout the drained basin. This is the reference stream type for the unconfined valley within the Blue Mounds State Park proposed project boundary. As the stream flows under the pedestrian bridge, a series of rock arch riffles will direct flow through a slightly steeper reach. Downstream of the former dam, the stream restoration is anticipated to include riparian vegetation management, grade control riffles, and slight alternations to the channel shape and/or dimensions to ensure adequate floodplain connectivity and stream stability.

The stream will be designed with the proper dimensions, pattern, and profile to enhance ecological functions, improve water quality, and improve habitat for aquatic life. The restoration design will incorporate detailed survey data from a reference reach channel to mimic natural channel conditions and be designed and implemented by a multidisciplinary team including experienced MN DNR stream practitioners and a licensed engineer. The width of the channel will be approximately 15 to 20 feet. The maximum depth of the pools will be approximately 5 feet at bankfull flows. The restored stream will be in connection with its floodplain at typical bankfull flows. (Bankfull flow is defined as the 1.5-2 year

return interval flow.) A diverse native prairie will be restored along the stream corridor and throughout the drained basin.

Restoration of vegetation within the basin

The previous footprint of Lower Mound Lake now consists of mudflats dominated by early successional hydrophilic vegetation, sandbar willow, rice cutgrass, native sedges, and native rushes. As these desirable plants mature, they are providing stabilization of the soils in this area. Non-native reed canary grass and undesirable woody species, including cottonwoods, are well established in parts of the basin. Vegetation best management practices will be used to establish native plant species throughout the former reservoir. The native seed mix/species selected will be designed to benefit state-listed species and pollinators as appropriate. It is expected that restoration of the vegetation will take several years of management effort, and the first step will be to remove undesirable woody species and plant native herbaceous species. Invasive species will continue to be controlled post-construction to ensure successful establishment of native species.

Construction of pedestrian trails

Pedestrian trails will connect the existing use areas with the restored stream. The trails will provide opportunities to view the stream and provide opportunities for educational and interpretive programming. One trail will lead from the day-use area to one or more locations along the stream and will be constructed to meet Americans with Disabilities Act (ADA) requirements. Another trail is planned to lead from the existing trail on the north side of the basin to the restored stream.

Construction Equipment, Staging and Sequencing

Construction will involve a combination of heavy equipment including: excavators, bull-dozers, front-end loaders, dump trucks, cranes, and pile-driving equipment.

A staging area has been chosen at a location east of the north embankment of the dam. This area is an old field now dominated by bromegrass and used as a hay source for the Blue Mounds State Park bison herd. Access to the staging area and primary construction access will be from County Road 8 located to the east of the project area. A stabilized construction access will be constructed at the highway access point to prevent mud from being tracked onto the highway. Construction access will also be provided through the day-use area on the south side of the basin. The day-use parking lot will provide additional staging area for construction if needed.

The expected major steps to complete the project are listed below. However, the sequence of construction activity will be determined in consultation with the selected construction firm.

1) Installation of erosion control measures as identified on the Storm Water Pollution Prevention Plan (SWPPP).
2) Creation of the staging area.
3) Creation of a diversion channel to allow for demolition of the main spillway and construction of the restored natural stream channel and completing construction of the pedestrian bridge.
4) Construction of the restored natural stream channel northerly of the current stream location through the basin.
5) The site will be graded to allow proper flood flows.
6) Establishing vegetation along the newly constructed stream channel.

7) Plugging the existing stream channel so the stream is directed into the newly constructed channel.
8) Filling the current stream channel with the spoils of the new channel.
9) Seeding of all disturbed areas with native species, planting of plugs, or use of native sod mats. Temporary cover crops will be used in accordance with established erosion prevention Best Management Practices (BMPs) throughout the project.
10) Restoration of native plants within the former reservoir.

Construction is anticipated to begin in 2018 with completion expected in 2019. A more specific timeframe has not yet been set because the timing is highly dependent on the pace of mandated reviews, public comment periods, and other required actions. However, no in-channel or near-channel project activity will be conducted between May 15 and July 31 to avoid accidental disturbances or impacts during Topeka Shiner spawning times. It is anticipated that construction and planting will take approximately one year, with active construction taking approximately 3 to 6 months. The new channel will not be connected to the existing channel until vegetation has been established. The length of time needed to establish vegetation is dependent on growing conditions and the season in which the vegetation is first planted. As previously noted, restoration of native plant species is expected to take several years to complete.

c. Project magnitude:

Project Element	Size/Quantity
Total Project Acreage	59.5 acres
Linear project length	N/A
Number and type of residential units	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)	
Structure height(s)	

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 purpose of this project is to address conditions left by the natural disasters (heavy rainfall) that occurred between June 11 and July 11, 2014, resulting in a failed dam and resulting damage, including the drained basin; the downstream reach of Mound Creek; and the loss of recreational facilities within Blue Mounds State Park. The project is needed to address the loss of recreational facilities, restore aquatic and terrestrial habitat in the area of the failed dam, drained basin, and downstream reach of Mound Creek, and improve water quality while protecting state and federally endangered species.

The channel restoration will restore the creek to a natural condition and will remove floodplain impediments, which would have a beneficial impact to the floodplain, enhance wetland functions and reduce impacts for future flood events. This would be beneficial to fisheries and aquatic organisms as habitat is restored. The project will also include the creation of small oxbow wetlands and restoration of native vegetation in the floodplain in order to enhance ecological functions. The enhanced aquatic resources would improve water quality and habitat for aquatic and terrestrial species, including the

federally endangered Topeka Shiner and state threatened Plains Topminnow, and potentially Blanding's Turtle and Blanchard's Cricket Frog.

The proposed project would benefit park users by replacing the pedestrian trail across Mound Creek and creating a loop trail within the park. The trails would provide opportunities to view the stream and provide opportunities for educational and interpretive programming. One trail will lead from the day-use area to one or more locations along the stream; this trail will meet Americans with Disabilities Act (ADA) requirements. Another trail is planned to lead from the existing trail on the north side of the basin to the restored stream.

The project also has potential for sustainable economic benefits to the community as a whole by supporting recreational tourism (both for the local community and out-of-state individuals and communities), increasing employment opportunities, and adding positive environmental value, which would be a boost to the overall economy.

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

Blue Mounds State Park does not have a potable water supply at this time. The state park is not currently connected to a municipal water supply, but is anticipated to be connected to Rock County Rural Water in 2018. The connection will occur near the shop building, which is located outside the proposed project area. Many of the existing waterlines within the park are expected to be replaced at the same time. No impacts would occur within the proposed project area.

Blue Mounds State Park is considering adding Prairie and Bison tours by vehicle through the bison range area. Tours may begin as soon as spring 2018. No impacts would occur within the proposed project area.

No other projects are currently proposed or planned within the proposed project area. It is possible that other improvements to park infrastructure and facilities may occur within the state park, depending upon funding availability and needs.

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

f. 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.

In 1934, citizens of Rock County asked the federal government for a Works Progress Administration (WPA) project in the Blue Mound area. In 1937, the Minnesota Legislature authorized the establishment of a 195-acre park, and the first phase of the project was completed and included development of two dams on Mound Creek, forming two lakes (Upper Mound and Lower Mound) in the park.

Additional park development occurred during the 1950s, including tree plantings around the picnic areas near the lakes and the campground area, which was known as Mound Springs Recreation Area until 1961 when the park name was changed to Blue Mounds State Park.

In 2016, USFWS restored an oxbow, east of the Lower Dam, as part of a larger project where they restored old or installed new oxbows at many sites in Southwest Minnesota to improve Topeka Shiner

habitat. The site was an existing, natural oxbow that had silted in over the years and was no longer connected to the stream. USFWS (Windom office) removed silt from the oxbow itself and from the point where it connects to the stream. The site now fills with water during high water periods, and provides breeding habitat for Topeka Shiners. Subsequent biological surveys have shown that shiners and other species are using the oxbows as the restoration project intended.

No environmental review was required for the prior developments in this state park.

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

Cover Type	Before	After	Cover Type	Before	After
Wetlands (types 2/3/6)	15.2	15.2	Lawn/landscaping	1.8	1.8
Deep water/streams	5.1	4.8	Impervious surface	2.5	2.5
Wooded/forest	0	0	Stormwater Pond	0	0
Brush/Grassland	34.5	34.5	Other (describe)		
Cropland	0.0	0.0	Lower Mound Lake Basin*	19.0	
			Oxbows	0.4	0.7
			TOTAL	**59.5**	**59.5**

*Note: Prior to flood, 19 acres was open water, Lower Mound Lake. After flood, but prior to project start, area was in other cover types as noted above.

For above wetlands, the following are grouped together:
Seeps (Type 3) = 0.8; wet meadow (Types 1 & 2) = 6.2 acres.

Specific differences between wetlands, deep water, and grassland would depend on hydrology at the site. Since this project involves restoring the natural hydrology at the site, it is difficult to estimate what future community types would persist. These are best estimates; however, wetter or drier conditions may determine resulting community types.

8. **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**
U.S. Army Corps of Engineers (USACE)	Section 10 Permit	To be obtained
U.S. Army Corps of Engineers (USACE)	Section 404	To be obtained
Federal Emergency Management Agency (FEMA)	Environmental Assessment	In progress

Unit of Government	Type of Application	Status
Federal Emergency Management Agency (FEMA)	FEMA Public Assistance Grant Program	Applied for, Pending EA and FONSI. Reimbursement is anticipated to be the actual cost or $1.8m, whichever is less.
Minnesota Department of Natural Resources (MN DNR)	Work in Public Waters Permit	To be obtained
Minnesota Department of Natural Resources (MN DNR)	Wetland Conservation Act Permit	To be obtained
Minnesota Department of Natural Resources (MN DNR)	Endangered Species Takings Permit	Will apply if required
Minnesota Pollution Control Agency (MPCA)	National Pollution Discharge Elimination System (NPDES) Construction Stormwater permit	To be obtained
Minnesota Pollution Control Agency (MPCA)	MPCA 401 water quality certification	To be obtained
Minnesota Pollution Control Agency (MPCA)	antidegradation determination	To be obtained if necessary
Minnesota Pollution Control Agency (MPCA)	Notification to Manage Dredged Material without a Permit	To be obtained if necessary
MN State Legislature	2015 Bond Appropriation	1.4m-1.7m to be allocated after all approvals/permits are obtained
MN State Legislature	LSOHC	$500,000 to be allocated after all approvals/permits are obtained

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 9-18, or the RGU can address all cumulative potential effects in response to EAW Item No. 19. If addressing cumulative effects under individual items, make sure to include information requested in EAW Item No. 19

9. Land use:

a. Describe:
   i. Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.

The project area is located entirely within Blue Mounds State Park, which is owned by the State of Minnesota and managed by the Department of Natural Resources. Blue Mounds State Park consists of 1,830 acres and had 64,789 annual visits and 8,052 overnight visits in 2016. The failed dam and former Lower Mound Lake is downstream of Upper Mound Lake, located in the northern part of the park. Mound Creek continues to flow easterly beyond the park boundary to its confluence with Rock River.

Blue Mounds State Park is one of the largest prairie parks in Minnesota, preserving approximately 1,500 acres of prairie and grassland, with a wide variety of rare and common plants and wildlife. Bison have been managed within the state park system since 1961 when three animals from Fort Niobrara National Wildlife Refuge (Nebraska) were reintroduced to Blue Mounds State Park. Over the next 30 years, the bison herd grew and the bison range within the park was occasionally expanded to meet the needs of the growing number of bison. During that time, Blue Mounds State Park remained the only state park unit with bison. Most of the park's prairie and bison range is on top of a massive rock outcrop of Sioux Quartzite. The rock outcrop cliff is approximately 1.5 miles long and rises up to 90 feet, providing a panoramic view of the countryside.

The land within the park was never cultivated due to the shallow soils and rock outcrops. However, heavy grazing by domestic livestock diminished the native grasses and wildflowers while introducing exotic weedy plants. Special park management programs are underway to restore the native prairie while managing the bison herd. The native prairie and bison range area of Blue Mounds State Park would not be affected by the proposed project.

The park is also managed for recreational use, including camping, hiking, biking, snowmobiling, wildlife viewing, rock climbing and other outdoor activities. The park includes a campground with 73 drive-in campsites, 14 cart-in campsites, 3 tipis, and a primitive group camp; approximately 15 miles of trails for hiking, biking and snowmobiling; picnic areas and a shelter, and a playground. Rock climbing, wildlife viewing and bird watching are also popular activities within the park.

In 2013, approximately 91,000 people (including 16,000 overnight campers) visited the park and used these resources. Prior to flooding in June, 2014, the park maintained a recreational area on and around Lower Mound Lake and the Lower Mound Lake Dam (Lower Dam). The WPA dam created a 20-acre impoundment, known as Lower Mound Lake, for recreational purposes. As visitors approached the lake via the park road, they could take in the viewshed of the impoundment and exposed quartzite bluff on the opposite shore. Visitors parked in a large parking area, where a picnic area sat between the parking lot and the lake. The picnic area provided picnic tables and fire rings for camp/cooking fires. In the picnic grounds, visitors had access to a sand volleyball court, horseshoe pits, and a swing set.

On the edge of the picnic grounds, the lake's shoreline had a fishing pier where anglers tried for panfish, catfish, and bass. The park also stored row boats, canoes, and kayaks in this area, which could be rented and used to paddle on the impoundment. A trail from the picnic grounds led to the beach area, where a sand beach aligned with an area ringed by buoys that provided a swimming area on the beach. A small building at the beach provided changing facilities; the building had been slated for demolition prior to the flood and has since been removed. Water quality testing of Mound Creek has been conducted since 2010, and in September 2014 these data resulted in the MPCA classifying Mound Creek as impaired for aquatic recreation use (Missouri River Basin Monitoring and Assessment Report, MPCA, September 2014).

The Mound Creek Trail (hiking) could be accessed at the picnic grounds. The trail crossed over a walkway on the Lower Dam structure, then traveled along the opposite (northern) shore of Lower

Mound Lake before looping around the Upper Mound Lake and returning to the picnic grounds along the southern shore of the lower lake, creating a 3 mile hiking loop.

The basin area was part of a larger nationally designated historic district. The district included the upper and lower dams and impoundments, as well as a WPA bath-house which currently serves a small rustic campground on a bluff above the southwest corner of the impoundment.

The storm and flood events in June of 2014 resulted in a failure or breach to Lower Dam on Mound Creek. The breach led to a complete draining of the former impoundment and also caused a breach in a Mound Creek Trail (hiking) that crossed Mound Creek on top of the dam.

Since the flood events in 2014, soil erosion and sedimentation has occurred and will continue to impact Mound Creek and degrade water quality through increased turbidity and considerable head-cutting that has been occurring within the channel. The creek is currently unstable and will continue to incise the banks until it can stabilize. In the long term, future flood events could potentially exacerbate the soil loss.

Mound Creek was surveyed and observed during 2015, 2016, and 2017 at base flow conditions. Currently the creek is flowing through a self-forming erosive channel in the southern half of Lower Mound Lake Basin. Mound Creek flows from the west to the east through the project area. There are two distinct areas of incision within the channel as head cuts or nick points migrate upstream through unconsolidated reservoir sediment. As the stream reaches the failed dam, it flows south around the structure where the emergency spillway was previously located. Downstream from the dam, Mound Creek is routed back into its naturally meandering channel and flows approximately two miles southeast to its confluence with the Rock River.

The riparian corridor adjacent to Mound Creek, and the majority of the drained reservoir, currently exhibits wetland characteristics typical of a seasonally flooded basin. Groundwater-fed springs discharge into the basin on the west side of the project area. The majority of the watershed and project area are within close proximity to Sioux Quartzite bedrock, resulting in increased groundwater/surface water connection.

Prime farmland is characterized by the U.S. Department of Agriculture as land with the best physical and chemical characteristics for the production of food, feed, forage, fiber and oilseed crops. This land is either used for food or fiber crops or is available for those crops, but is not urban, built-up land, or water areas. According to the Natural Resources Conservation Service (NRCS), prime farmland is located in the vicinity of the state park as well as within the state park boundary. The land within the project area was previously a man-made reservoir and was not used as farmland. The proposed project would not impact agricultural lands or farmlands within or surrounding the state park.

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.

In 1979, the Blue Mounds State Park Management Plan was approved by the MN DNR and includes management goals and recommendations for park management, balancing resource protections and recreational opportunities including: prairie restoration where possible; bison management; camping; hiking; biking; snowmobiling; wildlife viewing; rock climbing; and other outdoor activities.

A Strategic Plan for Bison Management is under development with the draft plan completed in March 2016. This strategic plan includes evaluation of how the bison is managed and the role bison play as a natural resource, as part of the prairie ecosystem. The MN DNR has partnered with the Minnesota Zoo to raise and manage a herd of bison with the healthiest genetics possible, called the Minnesota Bison Conservation Herd. Today, herds in Minnesota are located at Blue Mounds State Park, Minneopa State Park and the Minnesota Zoo.

The proposed project is compatible with the goals of the Minnesota State Wildlife Action Plan (MN SWAP), Minnesota Prairie Conservation Plan, and the MN DNR Ecological and Water Resources' (EWR's) vision of healthy watersheds. Any restoration of native prairie vegetation will follow the Minnesota Prairie Conservation Plan goals.

It also supports the goals of the USFWS Topeka Shiner Recovery Initiative for southwest Minnesota. Loss of the reservoir reduced the risk of introduction of aquatic invasive species and presence of predatory fish, which especially benefited the Topeka Shiner as they are susceptible to predation. Restoration of a natural prairie stream and offchannel oxbows would enhance appropriate habitat for the shiner.

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

The proposed project is located entirely within Blue Mounds State Park in Mound Township, Rock County, Minnesota. The land surrounding the State Park is zoned for limited agriculture.

The Blue Mounds dam is located on Panel 11 of the Rock County Flood Hazard Boundary Map (See Figure 4). Blue Mound Creek is currently mapped as an approximate Zone A. If the project results in a decrease in water surface elevation during the 1-percent-annual-chance event a Letter of Map Revision (LOMR) or Conditional Letter of Map Revision (CLOMR) will not be required. A Public Waters Permit will still be required, and any work will be conducted in accordance with Rock County's shoreland and floodplain ordinances. Blue Mound Creek is currently being modeled by FEMA and the new model will reflect the proposed stream restoration.

The proposed project will restore the creek to a natural condition and remove floodplain impediments. This project would have a beneficial impact to the floodplain by lowering these floodplain levels, utilizing rock riffles as grade control, and reducing impacts for future flood events. The proposed project avoids direct and indirect development of the floodplain and reduces the risk of flood loss. No adverse impacts to the floodplain are expected.

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 would have no effect on zoning; the project area will remain a State Park. This project is consistent with the Blue Mounds State Park Management Plan.

c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.

No incompatibilities with zoning requirements or effects on zoning have been identified.

10. 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.

The project is located at Mound Creek within Blue Mounds State Park, 5 miles north of Luverne, Minnesota, Rock County. Mound Creek is a prairie stream with riffle/pool sequences on a meandering channel. Elevations range from 1,477 to 1,502 feet within the project area.

The geology of Blue Mounds State Park is dominated by rock outcrops that rise above the shallow prairie soils as part of the Sioux Quartzite formation and lie within the Pipestone basin. These outcrops form long, narrow ridges that project a few feet to several tens of feet about the surrounding prairie.

Bedrock is covered by up to 800 feet of glacial till through most of the subsection. There are exposures of bedrock in Rock County, including a massive outcrop of red Upper Precambrian quartzite, within Blue Mounds State Park. The Sioux Quartzite rock was formed on the bottom of an ancient sea. Vast quantities of sand were deposited on this ancient sea floor. Ripple marks from this sandy, watery origin have been preserved and can be seen along many of the park's rock outcrops. Sandstone was formed from the further accumulation and weight of sand and water. Through time, heat and chemical reactions transformed the sandstone into a very hard quartzite. The pink to purplish color in the quartzite is due to the presence of iron oxide.

Glaciers have been the most recent geological event to shape the landscape in the last two million years. Glacial striations and scratches gouged into rock when loose rocks were dragged across the bedrock can be seen along the rock outcrops near the cliff line. Retreating glaciers buried the surrounding bedrock with a "glacial drift" of rock, sand, and gravel 200-300 feet deep.

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 and 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 11.b.ii.

The soils within Blue Mounds State Park generally tend to be well-drained, silty-clay-loams with very fine textures. They lie in thin layers over the bedrock. Most of these soils have moderate limitations for recreational development and severe limitations for both sewage lagoons and septic tank filter fields.

Prime farmland is characterized as land with the best physical and chemical characteristics for the production of food, feed, forage, fiber and oilseed crops. This land is either used for food or fiber crops or is available for those crops, but is not urban, built-up land, or water areas. According to

NRCS, prime farmland is located in the vicinity of the state park as well as within the state park boundary (See Figure 5).

The proposed project will be designed to reconnect the stream with the floodplain. Stabilization of the stream channel using natural channel restoration principles will prevent further head cutting and contributing sedimentation downstream. Revegetation of the stream slopes with native vegetation will provide long-term stabilization to the site.

Excavation depths within the stream channel will be no greater than 5 feet. The existing embankments will be excavated and sloped down no more than 10 feet. The total excavated area is estimated to be 2.7 acres, and the total grading area estimated at 5.54 acres.

During construction, excavated soils will be stored on-site. The excavated material will be used on-site to create channel plugs, repair scoured areas, and slope shorelines and berms. It is anticipated that all of the material excavated will be used on the project. Additional materials will need to be brought in for bridge and trail construction, since the soils in the basin are not appropriate for these features.

The new channel and associated oxbows will be excavated and graded before they are connected with the existing main channel. By doing so, many of the potential soil erosion problems during construction will be mitigated because they will have greatly reduced opportunity to run off into the creek. The project engineer will develop a SWPPP using soil erosion and surface water runoff BMPs and on site staff will ensure that erosion control practices are properly installed before excavation and grading commence, and are maintained throughout construction. These measures may include: floating silt curtain within the channel, silt fencing, bio rolls and hay bales, wildlife friendly erosion control blankets, and immediately revegetating areas using onsite vegetation and cover crops. These practices will also be employed to minimize and control runoff from piles of excavated soils. The specific practices used will depend on conditions prevailing at the site during construction, and the practices most appropriate to those conditions will be chosen.

The total excavated area is estimated to be 2.7 acres, and the total graded area 5.54 acres. In addition, the downstream boundary of the project site is more than one mile from Mound Creek's confluence with Rock River. Because these totals are greater than one acre, the project will require a NPDES/SDS permit from MPCA. Because they are less than 50 acres and the project is more than one mile from Rock River, the project will not require that the SWPPP be submitted to MPCA prior to obtaining coverage. Nevertheless, The SWPPP will be prepared in accordance with NPDES permit requirements and in consultation with MPCA prior to submitting the permit application.

The land within the project area was previously a man-made reservoir and was not used as farmland. This alternative would not impact agricultural lands/farmlands surrounding the state park.

There is no anticipated impact to geology from this project. Only the rock outcrop areas on the bluff south of the work area (Map Unit P18C) have a steep slope, with much of the site having flat to slight slopes. This also limits the severity of runoff from construction activities. Silt loams and silty clay loams typically have low to moderate permeability.

Table X. NRCS Map Units within Project Area, Lower Mound Basin Restoration

Map Unit	Description	Slopes	Depth to restrictive feature	Limitations – Picnic Areas	Limitations – Paths and Trails
P06A	Colo silty clay loam, occasionally flooded	0 - 2 percent	Very deep	Very Limited	Very Limited
P11A	Dempster silt loam	0 – 2 percent	Very deep	Not limited	Not limited
P16A	Graceville silty clay loam	0 – 2 percent	Very deep	Not limited	Not limited
P17A	Ihlen silty clay loam	0 – 2 percent	20-40 inches	Not limited	Not limited
P17B	Ihlen silty clay loam	2 - 6 percent	20-40	Not limited	Not limited
P18B	Ihlen-Rock outcrop complex	0 – 4 percent	20 - 40	Not limited	Not limited
P18C	Ihlen-Rock outcrop complex	4 – 38 percent	20 - 40	Somewhat limited	Not limited
P19A	Judson silty clay loam	1- 3 percent	Very deep	Not limited	Somewhat limited
P24B	Moody silty clay loam	2 – 5 percent	Very deep	Not limited	Not limited
P33A	Spillco silt loam, Occasionally flooded	0 – 2 percent	Very deep	Somewhat limited	Somewhat limited
P40A	Bluemound silt loam	0 – 3 percent	10 -20 inches	Very limited	Not limited
W	Water	N/A	-	Not rated	Not rated

Source: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed [10/11/2016].

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 11 must be consistent with the geology, soils and topography/land forms and potential effects described in EAW Item 10.

11. 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, trout streams/lakes, wildlife lakes, migratory waterfowl feeding/resting lakes, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include MN DNR Public Waters Inventory number(s), if any.

Surface water features in or near the project location include the following:

- North Mound Springs (AKA Upper Mound Lake) ID # 67000100
- South Mound Springs (AKA Lower Mound Lake) ID # 67000200 (drained due to failed dam)
- Mound Creek (Kittle Number I-052-025, MN DNR Hydro ID 103487), in the Rock River Watershed
- Rock River (Kittle Number I-052)

Mound Creek is a perennial, prairie stream with riffle/pool sequences on a meandering channel. The upstream contributing watershed is 16.97 square miles. Mound Creek (MN DNR-catchment 8302900) is a tributary to the Rock River in Rock County, Minnesota.

During 2015, 2016, and 2017, Mound Creek was surveyed and observed at base flow conditions. Currently, the creek is flowing through a self-forming erosive channel in the southern half of Lower

Mound Lake Basin. Mound Creek flows from the west to the east through the project area. There are two distinct areas of incision within the channel as head cuts or nick points migrate upstream through unconsolidated reservoir sediment. As the stream reaches the failed dam, it flows south around the structure where the emergency spillway was previously located. Downstream from the dam, Mound Creek is routed back into its naturally meandering channel and flows approximately one and a half to two miles southeast to its confluence with the Rock River.

The riparian corridor adjacent to Mound Creek, and the majority of the drained reservoir, currently exhibits wetland characteristics typical of a seasonally flooded basin. Groundwater fed springs discharge into the basin on the west side of the project area. The majority of the watershed and project area are within close proximity to Sioux Quartzite bedrock, resulting in increased groundwater/surface water connection.

Stormwater runoff comes from the restored native prairie, grasslands mixed with native trees and shrubs, bison pasture, bedrock outcrops, roads/trails/parking lots, and camping and recreational areas adjacent to the project area. According to the 2011 National Land Cover Dataset (NLCD), the Mound Creek watershed is 83.7% row crop agriculture, 7.3% developed, 7.4% shrub and herbaceous cover, and the remaining land cover includes water, wetland, and forest. Livestock are common in the watershed. Upstream there are 22 registered feedlots and 29 building sites. A small portion of the town of Hardwick is also included in the watershed.

The project area is located within the Sioux Quartzite aquifer, according to Minnesota Department of Health well boring records. Exposed outcrops and fractures in the Precambrian bedrock are common. Drinking water sources are susceptible to contamination due to the unique geologic conditions. No wells are located within the project area. Well logs indicate three wells within the state park boundary. Two active wells (*i.e.* unique IDs 804457 and 222773) are 261 and 335 feet deep, respectively. The well utilized for the park's water source tested positive for Escherichia coli (*E. coli*) bacteria in 2015. A third well (unique ID 222772) located in the park was sealed in 2014 and was 138 feet deep.

According to the MPCA 303(d) impaired waters list, Mound Creek (HUC sub-watershed 101702040109) is non-supporting for aquatic recreation and exceeds the standards for *E. coli*. The 4 mile segment (*i.e.* AUID 10170204-551) of Mound Creek was added to the impaired waters list in 2014, including the segment through Blue Mounds State Park. It is listed as a 2C use class. The MPCA has deferred the aquatic life assessment for Mound Creek until the second cycle of the state of Minnesota's watershed approach in the Missouri Basin. At that time, the Tiered Aquatic Life Use (TALU) process will be utilized to assess predominately (*i.e.* >50%) channelized streams.

ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a Minnesota Department of Health (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.

1) The depth to groundwater in the vicinity of the project area is estimated at 8-30 inches overall, although depth is 0 where the springs discharge.

2) The proposed project is not located within a MDH wellhead protection area.

3) The MDH Minnesota Well Index indicates two wells are located within or in close proximity to the project area. Two active wells (*i.e.* unique IDs 804457 and 222773) are 261 and 335 feet

deep, respectively. The well utilized for the park's water source tested positive for Escherichia coli (*E. coli*) bacteria in 2015. A third well (unique ID 222772) located in the park was sealed in 2014 and was 138 feet deep.

4) Several springs are in the project area (see Figure 3). They are located at a higher elevation than the basin and construction area, and therefore are not expected to receive runoff from construction activities. They will be protected by fencing during construction.

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 system (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system.
   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.

No wastewater will be produced or treated within the project area. No wastewater discharge to surface waters is proposed.

ii. Stormwater - Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.

The proposed project would reduce excess erosion and related nutrient and bacteria loading downstream to Mound Creek and the Rock River. Currently, the area is highly disturbed and the present course of the creek is unstable, displaying head-cutting and bank slumping, and causing sedimentation downstream. The channel restoration would create a functional, meandering, stable stream with off channel wetlands and a connected floodplain, increasing the stream's capacity to store floodwater, slow floodwater flow velocities, and filter out sediment and nutrients. As a consequence, stormwater runoff would be reduced from this area post construction.

Short term effects during construction could potentially include sediment-laden runoff into Mound Creek from channel creation and land alteration activities, disturbance in Mound Creek itself, and the loss of native vegetation. These would be minimized by employing the appropriate BMPs listed in the project SWPPP. A SWPPP will be developed in accordance with the NPDES permit requirements. The SWPPP will include applicable best management practices (BMPs) to control and minimize erosion and

stormwater management, including measures to prevent or mitigate soil erosion and sedimentation entering Mound Creek and flowing downstream during the construction phase. BMPs will include the use of wildlife friendly, natural fiber, erosion control blankets, silt fencing, hydro-mulch, and rock checks. In addition, construction equipment will be staged in designated area(s) to regulate equipment traffic and confine such traffic as much as possible to areas where it will not generate runoff into the creek, and to confine runoff from working construction equipment and equipment washing activities. Where removal of streamside vegetation is necessary, native vegetation will be saved and restored wherever possible.

Perimeter sediment and runoff control BMPs, such as hay bales and silt fences, will be installed prior to commencement of construction activities and will be maintained throughout the project. All exposed soil areas will be stabilized as soon as possible. The specific stormwater runoff BMPs that are employed, as well as their locations, will be determined by ambient site conditions during construction and will be carried out in accordance with the SWPPP.

Short term impacts during construction will also be minimized by constructing the majority of the stream restoration away from the active channel. This would allow for native vegetation to establish and erosion control measures to be in place before connecting the new stream restoration with Mound Creek. Construction will also be sequential and a cover crop used to quickly re-vegetate areas. The timeframe for the project will be adjusted as necessary to make sure that the stream is shifted to the new channel only when conditions are right- after vegetation has become established and during low stream flow. Silt fencing, hay bales, or other barriers will be deployed downstream of the construction activities to trap any sediment that might enter into Mound Creek.

To reduce disturbance of the active stream bed, the contractor will be required to use temporary bridges above bankfull width or a constructed low water crossing to cross the active stream channel.

No groundwater withdrawal or discharge is associated with project.

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 MN 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. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.

The project will not appropriate any surface or groundwater.

A search through the MDH County Online well index indicated one sealed well within Blue Mounds State Park, near the project area. No abandoned wells are located within the park 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. 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.

The USFWS National Wetland Inventory (NWI) identifies wetlands in the project area (See Figure 6). The map identifies a seasonally flooded basin (Type 1) and shallow, open water community (Type 5) wetlands within the proposed project area. The NWI map reflects conditions prior to the dam being breached; the open water community represented on the map is now the drained basin.

Vegetation and hydrology conditions have been changing in the basin since the natural disaster occurred in 2014. The vegetation is currently transitioning from early successional vegetation, such as smartweed, amaranth, ragweed, reed canary grass, and other herbaceous species, to shrubby areas of cottonwood, willow, and false indigo, and open areas of rice cutgrass and native sedges and rushes. Groundwater fed springs outletting into the basin have been documented on the west side of the project area during field surveys and are surrounded by high quality native vegetation. This vegetation will be fenced off or otherwise marked during construction activities so that it is not accidentally harmed.

A wetland delineation was completed in the summer of 2017 to assess current conditions. The report met the standards and criteria described in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual and the Midwest Regional Supplement. It was distributed to the Technical Evaluation Panel (TEP), which includes representatives from MN DNR, Rock County Soil and Water Conservation District (SWCD), BWSR and USACE, in November 2017 for review and comment; no comments were received.

Approximately two thirds of the project area was classified as wetland or stream, and as a result the proposed project will need to be permitted according to Section 404 of the Clean Waters Act and the Minnesota Wetlands Conservation Act (WCA). Since the proposed project is designed to enhance wetlands it is expected to be self-mitigating and therefore will not require wetland mitigation.

The goal of the proposed stream restoration is to restore wetland functions and values typical of the conditions that existed before the dam was constructed approximately 80 years ago. The riparian wetlands will be designed to flood during high water events but will maintain shallow marsh features during periods of low flow. This would restore connectivity to the creek's floodplain and enhance the capability of the area to store and retain floodwaters, reducing flashiness of flooding events in the watershed.

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. 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.

The goal of the proposed stream restoration is to enhance wetland functions and values typical of the conditions that existed before the dam was constructed approximately 80 years ago. In addition, off channel oxbow wetlands, wet prairie and seasonally flooded depressions will be seeded and/or planted with native wetland vegetation. The riparian wetlands will be designed to flood during high water events but would maintain shallow marsh features during periods of low flow. The enhanced aquatic resources would improve water quality and habitat for aquatic and terrestrial species, including Topeka Shiner, Plains Topminnow, Pond Mussel, Blanding's Turtle, and potentially Blanchard's Cricket Frog. During construction, grading will be necessary to accurately shape the channel and floodplain to create a stable stream.

After project completion, surface water features will be more varied and complex, and ecological functions would be enhanced as compared with present conditions, as described above. During construction, the potential exists for sediment-laden runoff to enter Mound Creek. This potential will be minimized by utilizing BMPs specified in the SWPP. Further discussion of these measures can be found in 11(b)ii above.

Ultimately, the current path of Mound Creek through the project area will be diverted into a more highly meandered channel constructed immediately north of the present channel.

The project would have no effect on watercraft or watercraft usage.

12. 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.

Following construction in 1937, sediment began to accumulate in the basin behind the dam. This sediment has never been dredged. A composite sample of the sediment from three separate locations and depths was gathered on Oct. 26, 2015 and brought to Minnesota Valley Testing Lab in New Ulm, Minnesota for analysis. The sample was tested based on criteria from Managing dredge materials in the State of Minnesota (Minnesota Pollution Control Agency 2014, available online at https://www.pca.state.mn.us/sites/default/files/wq-gen2-01.pdf). The sample from the Lower Mound Lake Basin was determined to be a Level 1 material, which is suitable for use on residential or recreational properties and does not need to be removed from the site.

A search of the MPCA's "What's in My Neighborhood?" (WIMN) database found no Superfund sites within the project area.

The WIMN data also shows that Blue Mounds State Park currently has an active, 560-gallon above ground diesel storage tank onsite. There are two underground leak sites identified within the park. Both leak sites are in the park's service area, located approximately 2,000 feet outside of the project area.

One leak was Fuel Oil 1 & 2, reported in 2004 and closed in 2006; the other leak was a gasoline leak reported in 1997 and closed in 2000.

Although subsurface hazardous materials are not anticipated to be present, excavation activities could expose or otherwise affect subsurface hazardous wastes or materials; any hazardous materials discovered, generated, or used during implementation of the proposed project shall be disposed of and handled by the project applicant in accordance with applicable local, state and federal regulations.

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.

Sludge, animal waste, or ash materials will not be generated during construction or operation of the proposed project. General municipal waste will be disposed of using a local garbage hauler. Recycling containers will be provided at the RV dump station/recycling center and the materials will be collected by a local waste management company. Signage will be used to encourage recycling of acceptable types of food and beverage containers throughout the park.

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 above or below ground tanks to store petroleum or other materials. 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.

No hazardous materials are proposed to be used or stored on site as part of the project.

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.

No hazardous materials are proposed to be used or stored on site as part of the project.

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

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

The proposed project area is located in the northeast corner of Blue Mounds State Park, in Rock County, Minnesota. The 1,830 acre state park is located in the Prairie Coteau and is characterized by tallgrass prairie and abundant rock outcrops and shallow soils. Sioux Quartzite rock cliffs and formations are unique to the area. Blue Mounds State Park is considered an important area of biodiversity in an agriculturally dominated landscape due to the intact native plant communities and high number of rare features.

Mound Creek is a perennial prairie stream with riffle/pool sequences on a meandering channel. The watershed is 16.9 square miles with 83% of that in row crops. Considerable watershed health and water

quality issues are present. Mound Creek is listed as a potential severe impairment, exceeds the criteria for bacteria, and was listed as impaired for aquatic recreation use by the Minnesota Pollution Control Agency. The Upper and Lower Dams located within the park create a barrier for the migration of aquatic species through Mound Creek and disconnect about 5 miles of the stream from the lower reach and the Rock River. The bedrock at the surface of the basin, the braided channel, and the 0.9 acre natural pool below the Upper Dam are unique features to Mound Creek.

The project area is highly disturbed, due to the severe flood event, which resulted in the failure of the Lower Dam. In this event, Mound Creek was washed out below the dam and sustained extreme damage and scouring of the channel. The lake created by the dam was drained and large areas scoured. Since the dam failure in 2014, Mound Creek has remained unstable and continues to head-cut in the channel and slump on the banks, causing sedimentation downstream.

The previous footprint of Lower Mound Lake now consists of mudflats dominated by early successional hydrophilic vegetation. The wetland is primarily vegetated with reed canary grass (*Phalaris arundinacea*), hybrid cattail (*Typha angustifolia*), quaking aspen saplings (*Populus tremuloided*) and sandbar willow (*Salix interior*). The upland buffer surrounding the wetland is primarily vegetated with reed canary grass (*Phalaris arundinacea*), sawtooth sunflower (*Helieanthus grosseserratus*), and smooth brome (*Bromus inermis*). The transition between the upland and the wetland is composed of moderate slopes.

b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County 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 (**ERDB #20170133**) from which the data were obtained and attach the Natural Heritage letter from the MN DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

The entire park is ranked as a Minnesota Biological Survey (MBS) site with outstanding biodiversity significance, resulting in designation as a conservation focus area for the MN SWAP and the Minnesota Prairie Conservation Plan. "Outstanding" sites contain the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities, and/or the largest, most ecologically intact or functional landscapes. Several rare native plant communities have been documented within the park and within these native plant communities are several known occurrences of state-listed plants. Based on the site plan and discussions with park staff, the proposed project will occur in previously disturbed areas and will avoid all known occurrences of native plant communities and state-listed plants. An onsite reconnaissance will also verify this prior to construction activities.

The land cover of the action area is comprised of three native plant communities. The majority of the area is Ups23a (Southern Mesic Prairie), a small section of habitat is classified as MHs38b (Southern Mesic Oak-Basswood Forest), and a marsh system is near the Upper Dam. The remaining surrounding land cover is old field and day-use areas (beach, picnic area, parking lot). (See Figure 7.)

Mound Creek is identified by the USFWS as critical habitat for the Topeka Shiner.

The Minnesota Natural Heritage Information System (NHIS) database was reviewed to determine whether any rare, threatened, or endangered plant or animal species or other significant natural features are known to occur within or near the project area. This query identified multiple rare features within the state park, including federal and state listed species, as identified below and discussed in Item 13c.

Federally listed species
In accordance with Section 7 of the Endangered Species Act (ESA) of 1973, the project area was evaluated for the potential occurrences of federally listed threatened and endangered species. The ESA requires any federal agency that funds, authorizes or carries out an action to ensure that their action is not likely to jeopardize the continued existence of any endangered or threatened species (including plant species) or result in the destruction or adverse modification of designated critical habitats

The list of species that may occur within Rock County was constructed by consulting the USFWS list of *County Distribution of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species.*

State listed species
Minnesota's Endangered Species Statute (Minnesota Statutes, Section 84.0895) requires the MN DNR to adopt rules designating species meeting the statutory definitions of endangered, threatened, or species of special concern. The resulting List of Endangered, Threatened, and Special Concern Species is codified as Minnesota Rules, Chapter 6134. The Endangered Species Statute also authorizes the MN DNR to adopt rules that regulate treatment of species designated as endangered and threatened. These regulations are codified as Minnesota Rules, Parts 6212.1800 to 6212.2300.

Minnesota's Endangered Species Statute and the associated Rules impose a variety of restrictions, a permit program, and several exemptions pertaining to species designated as endangered or threatened. A person may not take, import, transport, or sell any portion of an endangered or threatened species. However, these acts may be allowed by permit issued by the MN DNR; plants on certain agricultural lands and plants destroyed in consequence of certain agricultural practices are exempt; and the accidental, unknowing destruction of designated plants is exempt. Species of special concern are not protected by Minnesota's Endangered Species Statute or the associated Rules. Persons are advised to read the full text of the Statute and Rules in order to understand all regulations pertaining to species that are designated as endangered, threatened, or species of special concern.

MN DNR maintains *The Rare Species Guide*, the state's authoritative reference for Minnesota's endangered, threatened, and special concern species. Minnesota's Rare Species Guide was also used to identify rare features within Rock County and within the proposed project area.

The following state or federally listed species may occur within the project area:
- **Northern Long-Eared Bat** (*Myotis septentrionalis)*, Federal Status: Endangered, Minnesota Status: Special Concern.
- **Topeka Shiner** (*Notropis Topeka*), Federal Status: Endangered, Minnesota Status: Special Concern
- **Prairie Bush Clover** (*Lespedeza leptostachya*), Federal Status: Threatened, Minnesota Status: Threatened
- **Western Prairie Fringed Orchid** (*Platanthera praeclara*), Federal Status: Threatened, Minnesota Status: Endangered
- **Plains Topminnow** (*Fundulus sciadicus*), Federal Status: Not Listed, Minnesota Status: Threatened
- **Pond Mussel** (*Ligumia subrostrata*), Federal Status: Not Listed, Minnesota Status: Threatened
- **Devil's Tongue** (*Opuntia macrorhiza*), Federal Status: Not Listed, Minnesota Status: Special Concern
- **Regal Fritillary** (*Speyeria idalia*), Federal Status: Under Review - Not Listed, Minnesota Status: Special Concern
- A species of **lichen** (*Buellia nigra*), Federal Status: Not Listed, Minnesota Status: Special Concern
- **Western Harvest Mouse** (*Reithrodontomys megalotis*), Federal Status: Not Listed, Minnesota Status: Special Concern

- **Lined Snake** (*Tropidoclonion lineatum*), Federal Status: Not Listed, Minnesota Status: Special Concern
- **Western Foxsnake** (Pantherophis ramspotti), Federal Status: Not Listed, Minnesota Status: Species of Greatest Conservation Need
- **Blanchard's Cricket Frog** (*Acris crepitans blanchardi*), Federal Status: Not Listed, Minnesota Status: Endangered historic record, new records found in Rock County, 2017.
- **Blanding's Turtle** (*Emydoidea blandinii*), Federal Status: Not Listed, Minnesota Status: Threatened, no known recent records

c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. 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 proposed action would provide additional stream habitat and increased connectivity for aquatic species; in particular, the federally endangered Topeka Shiner, the Minnesota threatened Plains Topminnow, and the Pond Mussel. The new stream channel and off channel wetlands and oxbows will provide additional habitat for these species.

The proposed action aligns with the goals of MN SWAP, MN Prairie Conservation Plan, and the MN DNR Ecological and Water Resources division's vision of healthy watersheds. It also supports the goals of the USFWS Topeka Shiner Recovery Initiative for southwest Minnesota. The proposed project with natural stream restoration and connected oxbow habitat provides optimal habitat for Topeka Shiner. In the past, the dam and impoundment created reservoir conditions that favored predatory game fish and the introduction of non-native species, and restoration of natural hydrologic conditions would eliminate these conditions. The proposed project benefits the Topeka Shiner as they are susceptible to predation.

Restoration of the upland and shoreline areas with native vegetation would enhance the habitat for nearby species.

Federally listed species:
A Biological Assessment was completed to assess the effects of the proposed action on federally listed endangered, threatened, proposed and candidate species which may be present in the project area. In a letter dated February 14, 2017, the USFWS concurred that the proposed activities may affect, but are not likely to adversely affect Topeka Shiner, Prairie Brush Clover, and Western Prairie Fringed Orchid (See Attachment, Biological Assessment USFWS Concurrence Letter).

Topeka Shiner *(Notropis topeka)*
The Topeka Shiner (*Notropis topeka*) is a federally endangered small fish found in prairie streams. It has been extirpated from approximately 80% of its historical range (Dahle 2001, Baker 2015). Topeka Shiners are most commonly found in low-order tributaries or headwater reaches of larger streams, and abundance is greater in off-channel habitats (Dahle, 2001). The Topeka Shiner population is currently in decline in both occurrence and abundance throughout its range (USFWS, 2009). The Minnesota portion of the Topeka Shiner population, which is considered one of the most critical to the overall representation of the species, has experienced a dramatic decline since 2010 (Nagle and Larson 2013, Nagle 2014). This decline is attributed to altered hydrology, increased predation by piscivorous fish, loss of off-channel habitat, and decreased water quality (Baker 2015 and USFWS 2014).

Mound Creek is designated critical habitat for Topeka Shiners and both the species and critical habitat are present in the project area. They were first recorded in Blue Mounds State Park in 1942, with 12 individuals found in Upper Mound Springs Lake. Shiners were historically found above the Upper Dam in 1942 and 1947. In 1947, an unknown quantity of Topeka Shiners were found in both the Upper and Lower Lakes. This means the population was persisting above and between the dams after dam construction and creation of the impoundments in 1937. Mound Creek was not surveyed every year, but records of Topeka Shiners between 1988 and 2000 indicate the area below the Lower Dam consistently contained a healthy Topeka Shiner population. In 2000, the braided channel upstream from Lower Mound Lake was sampled and no individuals were found. In 2007, an unconfirmed record of one Topeka Shiner was found in Lower Mound Springs Lake just downstream of the Upper Dam. It is unclear how this fish travelled above the dam, but was likely introduced via a bait bucket. In 2010, both the Upper and Lower lakes were again sampled and no Topeka Shiners were found (Tranel-Nelson and Quinn, 2015).

In 2013, a stretch of Mound Creek 3.4 miles upstream of the Upper Dam was sampled and no Topeka Shiners found, although the stream was channelized in this stretch. Mound Creek below the dam was sampled one year after the flood (2014) and no shiners were found. In the winter of 2015-16, MN DNR Parks and Trails and the USFWS coordinated a project to improve Topeka Shiner habitat by creating an oxbow off the channel of Mound Creek downstream of the former dam and washout area. In summer of 2016 Topeka Shiners were found in this oxbow just downstream of the project area as well as the main channel of Mound Creek within the park. This early success suggests that the larger restoration project would provide excellent Topeka Shiner habitat.

The resiliency ranking for the Topeka Shiner in Mound Creek was ranked as “very low” due to impact of the Upper and Lower Dams at Blue Mounds. This project has been designed to provide important off channel habitat for Topeka Shiners and restore connectivity to an additional 4,500 feet of stream. Restoration of Mound Creek through this project may improve the ranking for the stretch of stream below the Upper Dam. There was significant damage to the Topeka Shiner habitat below the Lower Dam (sedimentation, channel degradation, etc.) and restoration of that habitat would allow Topeka Shiners to return to an area that has generally supported significant numbers of individuals in the recent past (Utrup, 2015).

MN DNR concluded and USFWS concurred that this project may affect, but was not likely to adversely affect Topeka Shiners due to creation of off channel habitat, which they prefer, restoration of in channel habitat, and stabilization of the shoreline with native vegetation. Water quality benefits may be seen after the completion of this project, which would further benefit the Topeka Shiner.

Prairie Bush Clover *(Lespedeza leptostachya)*

Prairie Bush Clover is a perennial legume that is presently confirmed extant in Rock County. The only known Rock County population is believed to be an introduction (Sather and Anderson, 2015) that is over 4.5 miles from the project area. Prairie Bush Clover has never been documented within the park. There is no likely response and no likely exposure of prairie bush clover to the project. Since the project area was previously underwater for 80 years, and is currently severely degraded, species and suitable habitat are not present in the action area. MN DNR concluded and USFWS concurred that this project would have no effect on Prairie Bush Clover.

Western Prairie Fringed Orchid *(Platanthera praeclara)*
Western Prairie Fringed Orchid is found in wet prairies and sedge meadows. Based on 20 populations consistently monitored in Minnesota for the last 23 years the population has declined by over half (Sather and Anderson, 2014). The project area is located within one mile of a known population.

The park's population has been carefully monitored since 1985 and shows severe declines from population highs in 1987. Recent demography monitoring data for the Blue Mounds population show a balance between vegetative and flowering plants, suggesting that population is currently stable (Anderson and Sather, 2014). For that reason, species or suitable habitat may be present in the project area. The spatial distribution map of Western Prairie Fringed Orchid at the park was updated in 2015 and no orchids are known to occur within the project area. Since the project area was previously underwater for 80 years, and is currently severely degraded, it likely does not currently contain suitable habitat for the orchid. There is no likely response and no likely exposure of Western Prairie Fringed Orchid to the project. MN DNR concluded and USFWS concurred that this project may affect, but not likely to adversely affect the orchids. If restoration efforts are successful, this project could benefit the Western Prairie Fringed Orchid by providing wet meadow habitat in the future.

Northern Long-Eared Bat *(Myotis septentrionalis)*
Rock County is not known to contain Northern Long-Eared bat hibernacula. Northern Long-Eared Bats have never been documented within the park. The nearest known roost tree/hibernaculum is 145 miles away in Nicollet County. Trees that will be removed are saplings and do not exhibit Northern Long-Eared Bat roost characteristics. No known occupied maternity roost trees will be removed and the project is not within 150 feet of a known occupied maternity roost tree nor within 0.25 mile of a hibernaculum. There is no evidence that this project would have any effect on Northern Long-Eared Bats.

The USFWS requested that the Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form be completed for the proposed action. This framework allows federal agencies to rely upon the U.S. Fish and Wildlife Service's (USFWS) January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule for the Northern Long-Eared Bat for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the project with sufficient detail to support the required determination; and (3) enabling the USFWS to track effects and determine if initiation of consultation is required per 50 CFR 402.16. (See Attachment, Northern Long-eared Bat 4(d) Rule Streamlined Consultation Form.)

State listed species:
Plains Topminnow *(Fundulus sciadicus)*
In Minnesota, Plains Topminnow exists only within the Rock River and its tributaries (USFWS 2013). Although this species was first documented in the state in 1973, experts think it has been in Minnesota for a very long time (Hatch, pers. comm.). Other populations exist in the Rock River south of the park. It is unknown whether historically they may have occurred farther upstream. A careful analysis of various museum collections would be needed in order to develop a map of the historic distribution. Experts consider Plains Topminnow, without question, to be considerably rarer in Minnesota than Topeka Shiners (Hatch, pers. comm.).

As a state listed species, the Plains Topminnow is automatically included as a Species of Greatest Conservation Need (SGCN). The State Wildlife Action Plan provides the following reasoning for listing the Plains Topminnow: "*Extensive survey efforts have confirmed that the Plains Topminnow is one of the rarest inhabitants of Minnesota's southwestern prairie streams. Declining water quality, potential*

stocking of mosquito fish, specialized habitat requirements, sensitivity to stream degradation, limited distribution and overall rarity contribute to this species being listed".

Preferred habitat is generally clear water streams, isolated pools, backwater areas, sloughs and overflow pools of larger streams. This species inhabits areas with minimal current, muddy to sandy substrate and dense aquatic vegetation (USFWS, 2013).

Populations of Plains Topminnow persist by being able to move throughout a drainage in order to recolonize sites where the species was extirpated due to drought or other causes. Dams, impassable highway culverts and dry reaches prevent stream connectivity critical for survival of the species in a particular watershed (Rahel and Thel, 2004). No studies or information was uncovered to indicate whether Plains Topminnow can traverse fish passages (Hatch, 2000).

Some studies indicate that predation by piscivorous fish impacts local populations of Plains Topminnow, but other studies have documented the species coexisting with sport fish (Schumann 2012, Pasbrig et al 2012). Hatch (2000) did not positively identify any Plains Topminnow in a sample of 148 predatory fish stomachs.

Plains Topminnows were not discovered in Mound Creek until 1973, so there are no records of them above the Upper or Lower Dams in earlier years. All known records of Plains Topminnow in Blue Mounds State Park are from below the former Lower Dam. Records in the NHIS database document occurrences from 1997-2011. The park naturalist is recorded as finding one in the creek below the Lower Dam in 1978. From 1996-2000 they were found in low numbers every year between the Lower Dam and Highway 8. In 2006, 15 individuals were found. The last record is for one fish found between the Lower Dam and Highway 8 in 2011. No Plains Topminnows were found in the 2015 sampling effort. However, two Plains Topminnows were found downstream of the Lower Dam in the summer 2016 sampling effort.

This project is designed to benefit the Plains Topminnow by removing the dam barrier and creating off channel habitat.

Pond Mussel *(Ligumia subrostrata)*

In the summer of 2015, a population of Pond Mussels was discovered in Mound Creek within Blue Mounds State Park; one older female was collected in the pool below the Upper Dam, an adult female and 2 year old juvenile were found south of the dam, and 1 juvenile was found near the Highway 8 Bridge. At this point the Lower Dam was already washed out. The species may have been present for a considerable amount of time but only recently documented. A previous mussel survey in 1997/1998 had found only dead individuals of a common mussel species. . It is one of four populations known in Minnesota, all in the Missouri River drainage (Sietman pers. comm.). Recently dead or weathered shells suggest there could be populations in a few other locations in Minnesota (Sietman et al 2003), although Sietman (pers. comm.) states the only known viable population in Minnesota is within the Rock River watershed. This species is at the northern edge of its range in South Dakota, Minnesota and Iowa. However, Minnesota likely harbors the most substantial stream population remaining in the region (Sietman et al 2003). Pond Mussels are classified S1 (critically imperiled) in South Dakota and Nebraska, and presumed extirpated in Iowa (NatureServe, 2015).

Pond Mussels live in small streams, sloughs, and quiet areas of larger rivers as well as shallow parts of lakes and ponds. Usually they occur in sand/mud bottoms in less than two feet of water (NatureServe 2015). Although this species occurs frequently in lakes and ponds in southern states, Sietman (pers. comm.) states that he has never found this species in lentic habitats in Minnesota. Parasitic hosts of this

species include green sunfish, warmouth, bluegill and largemouth bass (NatureServe 2015). It reportedly adapts well to newly created channels and ponds (Parmalee and Bogan 1998).

Impoundments can negatively impact stream mussels in several ways. Dams create barriers to fish and mussel migration, change water depth and chemistry and sediments dropping out of the slower water in the impoundment can bury mussel beds (USFWS 2015).

Freshwater mussels are also negatively impacted by channelization and dredging, pollution, fish kills that impact host fish and introduction of non-native species (USFWS 2015).

This project is designed to benefit mussel species by removing the dam barrier and creating off channel habitat. Newly created wetlands in the project area planted with native vegetation can help improve local water quality which would benefit the mussels.

Blanchard's Cricket Frog *(Acris crepitans blanchardi)*
In June, 2017, Blanchard's Cricket Frogs were rediscovered in Rock County, just outside the park. Their presence within the project area is unknown at this time and further surveys are anticipated. The Cricket Frog is primarily a riparian/riverine species and would benefit from this project through increased stream connectivity and restored banks. They typically do not overwinter in steep banks, but instead prefer gradual slopes. Currently, the banks of Mound Creek in the project area are incised and steep and do not appear to be suitable habitat for Blanchard's Cricket Frogs. The grading and sloping activities associated with the stream restoration will create more gradual slopes, providing more suitable habitat for the frogs.

These species may occur within the project area but will likely not be impacted by activities as the actual work area will avoid their habitat:

- Devil's Tongue (*Opuntia macrorhiza*), Federal Status: Not Listed, Minnesota Status: Special Concern
- Regal Fritillary (*Speyeria idalia*), Federal Status: Under Review - Not Listed, Minnesota Status: Special Concern
- A species of lichen (*Buellia nigra*), Federal Status: Not Listed, Minnesota Status: Special Concern
- Western Harvest Mouse (*Reithrodontomys megalotis*), Federal Status: Not Listed, Minnesota Status: Special Concern
- Lined Snake (Tropidoclonion lineatum), Federal Status: Not Listed, Minnesota Status: Special Concern
- Western Foxsnake (Pantherophis ramspotti), Federal Status: Not Listed, Minnesota Status: Species of Greatest Conservation Need

A visual survey was conducted along the current stream channel and adjacent seep in the spring of 2017 for the following species:
Blanding's Turtle (*Emydoidea blandinii*), Federal Status: Not Listed, Minnesota Status: Threatened

Blanding's Turtles currently are not known to be present in the park. The nearest known occurrence is approximately five miles away. However, Blanding's Turtles are known to make long distance movements along rivers and streams. Their presence in or near Blue Mounds State Park cannot be ruled out due to habitat availability as well as stream connectivity with the nearest documented locations. The DNR Regional Nongame Wildlife Specialist was consulted and recommended monitoring for Blanding's Turtles starting in early spring 2018 and throughout the restoration project. The Nongame Wildlife Specialist will provide additional guidance for precautions during the restoration project to help

minimize risks of injury or death of Blanding's Turtles should they occur in the project area and will coordinate with the project proposer or others as appropriate and needed.

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

The project area is currently infested with reed canary grass. The soils that will be moved all likely contain this seed already so movement of the soils within the project area will not contribute to the infestation. It will be important to have equipment come clean and leave clean to prevent the spread of this seed beyond the project area. Any additional soils imported from outside the project area will be inspected for invasive species prior to transporting, and will only be imported if they are free of invasives. The spoil pile will not be used outside of the project area, or the extra will be hauled off-site to prevent the spread of invasive species. MN DNR Operational Order 113 on preventing the spread of invasive species will be followed, including drying or pressure washing any excavation and construction equipment before use on the project. The project manager will be responsible for ensuring that the contractor complies.

The current channel of Mound Creek will serve as a diversionary channel during construction to maximize the amount of construction activity can occur out of the water and not impact the stream community. Once wetlands, oxbows, and meanders are excavated, the main channel can be connected and plugged in appropriate places quickly to minimize disturbance to the aquatic community. While the current vegetation is not all desirable, it will be left in place and only mowed prior to construction so that it can provide stabilization of the soil and reduce erosion. After the project is stabilized the undesirable vegetation will be converted to native prairie and wet meadow.

A SWPPP will be designed by the engineer on this project to protect water resources and aquatic communities. Best management practices that will be used will include preserving existing vegetation, minimizing the construction footprint, site phasing, installation of silt fences and floating silt curtains, use of bio-rolls and wildlife friendly erosion control blankets, and other practices not yet specified. Disturbed areas will be re-vegetated with a temporary cover crop or native vegetation as soon as possible after disturbance.

Exposure of fish and other aquatic organisms, including Topeka Shiners, Pond Mussels and Plains Topminnow, to the project will be minimized by conducting most of the work off-channel, employing redundant stormwater BMP's, and carefully sequencing activities. Seine nets will be used to move turtles, shiners and other fish downstream prior to in channel work as allowed for under the State's Section 6 permit. Additionally, the contractor will be required to use temporary bridges above bankfull width or a constructed low water crossing to cross the active stream channel.

Work in the stream bed will not be undertaken until potential impacts to Pond Mussels have been resolved to the satisfaction of the MN DNR's Endangered Species Coordinator. Activities will include, but may not be limited to, visually inspecting the streambed for adult Pond Mussels and moving them out of the project area. Any such work will be conducted with the coordination with and approval from the MN DNR Endangered Species Coordinator.

14. 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.

In addition to the state MEPA review of this EAW, this project is also subject to review under NEPA and Section 106 of the National Historic Preservation Act (NHPA). FEMA was the lead agency to coordinate with appropriate State Historic Preservation Office (SHPO) and Tribal Historic Preservation Office (THPO).

FEMA initiated consultation with the SHPO on November 9, 2016, to inform them of the scope of the proposed project and to provide ongoing opportunities for informal and formal review of the project's potential effects on historic resources. Although Tribal lands do not constitute any part of the APE, with input from SHPO, in January of 2017, FEMA notified THPOs and tribal leaders of eight federally-recognized Tribal Nations (Tribes) with potential ancestral interests in Rock County, requesting comment on the proposed project. None of the Tribes contacted requested to take part in the consultation. FEMA also contacted four offices or organizations with potential interest in the project: the Minnesota Indian Affairs Council, the Office of the State Archaeologist (OSA), the Preservation Alliance of Minnesota, and the Rock County Historical Society. Of these organizations, only the OSA asked to be included in the consultation. At the SHPO's request, FEMA also invited Benjamin Vander Kooi, a private citizen and resident of Rock County, to join the consultation, due to his long interest and involvement in historic preservation initiatives throughout the state and, particularly, in Rock County.

1) historic designations

The Blue Mounds State Park WPA/Rustic Style Historic Resources historic district is located within the Area of Potential Effect (APE) of the proposed project. The Blue Mounds State Park WPA/Rustic Style Historic Resources historic district was listed in the National Register of Historic Places (NRHP) on October 25, 1989. It includes: one contributing building (latrine/sanitation building), four contributing structures (two dams and two lakes/impoundments), and one non-contributing building (picnic shelter). The majority of the historic district is comprised of the two dams and their two impoundments (identified as lakes in the NHRP nomination).

The historic district has statewide significance in the areas of: government, for its association with the social and economic impacts of the federal relief program of the Great Depression known as the Works Progress Administration (WPA); recreation, for its significance in state park/recreational development in Minnesota; and architecture, because the structures within the district are considered outstanding examples of the Rustic style of architecture. Although landscape is not listed as an area of significance, it is indicated as an historic function of the park and may warrant further evaluation to determine if it is a contributing feature to the historic district. The historic district has a period of significance defined as 1937-1942.

Lower Mound Lake and Lower Dam are located in the APE for the proposed project. Both are listed in the NHRP as contributing resources to the Blue Mounds State Park WPA/Rustic Style Historic Resources historic district. The district nomination form notes that contributing resources are considered eligible under Criterion A for Government and Recreation for their association with the Works Progress Administration, and under Criterion C for architecture as good examples of the Rustic Style.

Structures within the APE for the proposed project were damaged as a result of flooding between June 11, 2014 and July 11, 2014. Damages included the breach of the Lower Dam due to the failure of the emergency spillway and the destruction of over 100 feet of the emergency spillway and approximately 90 feet of the diversion channel. The washed out area was approximately 10 feet deep, and damage to the dam prevented the impoundment of water, resulting in the complete loss (by discharge) of the Lower Mound Lake Lower Dam.

The identification of historic properties began with a consideration of the flood-related damages to the Lower Dam and the loss of Lower Mound Lake. Through consultation with the parties noted above, FEMA defined a plan for identification efforts and worked with the consulting parties to define the APE. Those discussions resulted in the re-scoping of identification efforts to include a more expansive APE for indirect effects. Identification efforts were also broadened to include resources that have significance only in terms of public recreation and resources that might contribute to a Cultural Landscape, assuming such a landscape might exist.

As a result, in addition to the archaeological site noted below, FEMA worked with the MN DNR to identify twenty (20) resources within the APE. These include paved and unpaved trails, parking lots, and stands of trees that either have the potential to contribute to a currently undefined Cultural Landscape or to contribute to a potential historic district significant only for its role in public recreation. Such a historic district might, once defined, completely replace or co-exist with the Blue Mounds District, which was deemed significant in 1989 for both its role in public recreation and its Rustic Style resources.

FEMA reached the following determinations of eligibility, with which the SHPO concurred by letter dated November 27, 2017 (attached):

- The A. D. LaDue Farmstead is not eligible for listing on the NRHP.
- The remains of the Lower Dam and the bed of Lower Mound Lake are not eligible for listing on the NRHP individually, nor do they maintain sufficient integrity to serve as contributing features to the Blue Mounds District.
- The other contributing resources in the Blue Mounds District, namely the Upper Dam, Upper Mound Lake, and Latrine 4-77, retain sufficient integrity to be eligible for continued listing as contributing resources to the historic district as currently defined.
- One additional resource, the Unpaved East-West Southern Trail, has sufficient integrity to contribute to the district under Criterion A for Entertainment / Recreation.
- The remaining resources identified within the APE lack the significance or integrity required for individual listing on the NRHP, and do not together possess a significant concentration, linkage, or continuity united historically or aesthetically, to serve as contributing elements to either the Blue Mounds District or to another historic district and are therefore not eligible for listing on the NRHP.

The restoration of Mound Creek and removal of the remains of the Lower Dam will not affect contributing resources of the Blue Mounds District. The current condition of the remains of the dam and the topography of the former lake bed is a result of flooding caused by the disaster event. The lake bed is neither naturally-occurring nor planned in either design or appearance, and the dam has lost the emergency spillway and diversion channel, comprising approximately one-third of the dam's historic fabric. The remaining element of the dam, the earthen dike, will be retained and repaired,

as will the trail which runs along the top of the dike. That work, along with the restored creek bed with appropriate vegetation and associated trails and bridges, would enhance the recreational nature of this section of the park within the APE for direct effects.

Also within the APE for direct effects are three resources identified for potential inclusion in a cultural landscape: the Trail along the Earthen Dike, Mound Creek, and the eastern Parking Loop off the southern paved road. The integrity of the Trail and Mound Creek are both poor, both having been damaged by the flooding event. The scope of work for the proposed project would restore the Mound Creek stream bed within the APE and provide a new pedestrian bridge and other improvements to the Trail along the Earthen Dike. The work proposed would not directly affect the eastern Parking Loop.

Outside the APE for direct effects, the proposed project would affect the character and use of the surrounding parkland by providing a new recreational destination and new views which reflect and amplify the natural features of the park. The remaining features identified for potential inclusion in a cultural landscape will experience only indirect effects from this undertaking. Many of these features stand within the APE, and the restoration of the stream bed, along with improved trails for access to these improved resources, would have a beneficial effect on views of the APE for direct effects. Approaches to the APE for direct effects would also benefit in that their destination—the restored creek bed—would provide for more aesthetically-pleasing views and improved recreational features related not only to the creek itself, but also to the new trails and bridges. The undertaking, then, would have no adverse effects on any of these resources that may be found eligible for listing in the future as contributing elements in a broader cultural landscape.

2) known artifact areas (archeological sites)

A Minnesota State Parks and Trails Cultural Resource Management Program (MSPATCRMP) archaeological survey of the construction limits was conducted by the MN DNR in 2016 (2016 MSPATCRMP survey). The report of this archaeological survey has been submitted to the SHPO and OSA, and is subject to review and consultation with those offices and representatives of any Tribes that may express an interest in joining the consultation.

That survey identified two archaeological sites within the originally-defined APE: the Cadwallader J. Lynch Homestead (Site No. 21RK77) and the A. D. LaDue Farmstead (Site No. 21RK78). Due to protection of security information, limited information about these sites is included here and in the documentation attached (Section 106 Consultation Documentation).

In order to avoid impacts to Site 21RK77, it has been excluded from the construction limits, and therefore from the APE for direct effects. The SHPO, in its letter of August 25, 2017, has noted that the site is potentially eligible for listing on the NRHP, but as it is excluded from the APE for direct effects, FEMA is not required to complete the evaluation necessary to determine eligibility.

The archaeological assemblage at site 21RK78 was found to have poor integrity (see attached Section 106 Consultation), and therefore FEMA determined, and the SHPO concurred in its letter of August 25, 2017, that the A. D. LaDue Farmstead is not eligible for listing on the NRHP.

The APE for direct effects for the proposed project has been drawn to exclude site 21RK77. Although the APE for direct effects includes a small section of site 21RK78, as the site lacks integrity and is not

eligible for listing on the NRHP, this alternative does not result in effects on historic archaeological properties. Under the proposed project, there would be no historic properties affected.

The following project conditions provide additional protection to archaeological sites potentially impacted by the proposed project:

1) Applicant will monitor ground disturbance and if any potential archeological resources are discovered, will immediately cease construction in that area and notify the State and FEMA. The applicant will ensure construction activities in the vicinity of the discovery are immediately halted and will take all reasonable measures to avoid or minimize harm to the property until FEMA concludes consultation with the SHPO, THPOs, and other appropriate consulting parties, including Tribal Nations.
2) Contractor is expected to use fill from a commercial source or regularly-maintained stockpile. If this is not the case, the sub-recipient shall inform FEMA of the fill source so required agency consultations can be completed prior to beginning ground disturbing activities.

3) architectural features

Lower Dam and Lower Mound Lake were both constructed in 1938 by the WPA, in collaboration with the Emergency Relief Administration as well as the Minnesota Department of Conservation. Prior to the flood, Mound Creek flowed from the Upper Dam through Lower Mound Lake and continued on the east side of Lower Dam.

Lower Dam is constructed of Sioux Quartzite stone native to the area. The dam is 107-ft-6-in long and 28-ft wide and is constructed of native Sioux Quartzite and concrete. The primary spillway is of stepped, Sioux Quartzite and is 66-ft-11-in length and 14-ft in height. Five concrete piers- capped with a concrete catwalk with metal railings- are spaced along the top of the primary spillway. The abutments are C-shaped and of Sioux Quartzite capped with concrete; heavy scouring occurred beneath the concrete during the flood event. A 500-ft earthen and grouted riprap embankment with an unpaved trail across the top is located on the north side. The embankment was not damaged during the flood except for a small area of scour near the adjoining abutment. Extending south from the spillway abutments, the emergency spillway originally consisted of an armored dike surmounted by a concrete path leading to the spillway. Quartzite rip rap armoring the emergency spillway, later grouted and then eventually encased in concrete, was destroyed by the flooding event. At least one-half of the 120-ft long emergency spillway was swept away by the flood, along with approximately half of the diversion channel, which had been a channel armored with concrete extending northeast from the southern end of the emergency spillway, approximately 200 feet to the creek channel at the base of the primary spillway.

The character-defining features of Lower Dam were the grouted Sioux Quartzite dam; the concrete piers and catwalk; the earthen embankment- some of which is armored with grouted riprap; and the emergency spillway. All of these are features were designed by the WPA and, prior to the flood, had undergone only minor alterations since 1940. The metal railings along the catwalk and abutments appear to be replacements and are not considered a character-defining feature of the Lower Dam.

Prior to the storm event, Lower Mound Lake consisted of an area approximately 2,000-ft long and 500 feet wide, encompassing approximately 20 acres. The character-defining features of Lower Mound Lake were its shape, size, and its function as a recreational lake for state park visitors. It is important to note that Lower Dam and Lower Mound Lake historically functioned as one, rather

than as separate elements. The lake would not exist if not for the dam and, if there was not a need for the lake, the dam would not have existed historically.

Upper Mound Lake, Upper Dam, and the latrine may be located in the APE for indirect effects from the project. Upper Dam was constructed in 1938 by the WPA. It consists of a 61-ft spillway and 65-ft dike that blend in with the native stone along the banks of the creek. The west side of the spillway contains a 200-ft stone abutment comprised of a riprapped dike with a stone core wall; an 18-in sluice gate is located at the base of the spillway. Upper Mound Lake was created in 1938 by the Upper Dam and is approximately 2,250-ft long and 250-ft wide (Anderson 1989:7(1)).

The latrine was constructed from 1939-1942 by the WPA. The roof features walls of Sioux Quartzite and rough clapboard siding, paired casement windows, and plank entrance doors. The Sioux Quartzite end walls are pierced by four, 6-in x 10-in openings for ventilation. The gable roof features projecting lookouts on the gable ends and exposed rafter tails, and is covered with cedar shakes.

Additional Coordination

In compliance with the NEPA process and federal laws, FEMA submitted invitations to Tribes to join the consultation or to provide comment on the presence or absence of known cultural properties of religious or traditional significance, or of cultural properties formally designated as Traditional Cultural Properties (TCPs), within the proposed project area. This notification was sent on January 5, 2017, to the Flandreau Santee Sioux Tribe of South Dakota, the Iowa Tribe of Kansas & Nebraska, the Lower Sioux Indian Community of Minnesota, the Prairie Island Indian Community, the Santee Sioux Tribe, the Shakopee Mdewakanton Sioux Community of Minnesota, the Spirit Lake Tribe of Fort Totten, and the Upper Sioux Community of Minnesota. The Minnesota Indian Affairs Council was also invited to comment and consult.

The Shakopee Mdewakanton Sioux Community of Minnesota responded on January 10, 2017, declining to consult, but expressing interest in updates as the project progresses. Their response also mentioned a stone structure to be avoided; subsequent investigation confirmed that this resource was outside the APE for this undertaking. FEMA received a response from the Upper Sioux dated February 9, 2017, indicating that they had no specific interest in the area but would like to be contacted if any archaeological artifacts were discovered as a result of ground disturbing activities. No other comments from invited Tribes have been received to date.

The proposed project will not have impacts to properties of interest to Tribes consulted. The following project conditions provide additional protection to properties of potential interest to Tribes that may be inadvertently impacted by the proposed project:

1) Applicant will monitor ground disturbance and if any potential archeological resources are discovered, will immediately cease construction in that area and notify the State and FEMA. The applicant will ensure construction activities in the vicinity of the discovery are immediately halted and will take all reasonable measures to avoid or minimize harm to the property until FEMA concludes consultation with the SHPO, THPOs, and other appropriate consulting parties, including Tribes.
2) Contractor is expected to use fill from a commercial source or regularly-maintained stockpile. If this is not the case, the subrecipient shall inform FEMA of the fill source so required agency consultations can be completed prior to beginning ground disturbing activities.

3) The subrecipient will notify the Shakopee Mdewakanton Sioux Community of Minnesota by U.S. mail of the start of construction 30 days before that date.
4) The subrecipient will notify the Shakopee Mdewakanton Sioux Community of Minnesota by U.S. mail of status 60 days after construction activities have begun.
5) The subrecipient will notify the Shakopee Mdewakanton Sioux Community of Minnesota that construction has ended within 30 days of the conclusion of construction activities.

Attachment - Section 106 Review – FEMA/SHPO correspondence and SHPO concurrence letter

15. 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.

Blue Mounds State Park is known for its Sioux Quartzite cliff rising 100 feet from the plains, a bison herd that grazes on the prairie within the park boundary, and surrounding prairie grasses and flowers. Rock outcrops and shallow soil prevented much of the land within the park from being plowed. However, heavy grazing by domestic livestock has diminished the native grasses and wildflowers and has introduced exotic or foreign weedy plants. Special management programs are currently underway to restore the native grasses and wildflowers.

The project area consists of approximately 60 acres within the park and is defined to surround the former basin, the Lower Dam site and the creek as it exits the park's eastern boundary. (See Figure 1)

The general landscape character of the project area includes a parking lot used to access a day use area of the park consisting of the former lake, hiking trails, and a designated picnic area. Mound Creek can be seen from the parking lot as well as the drained basin, which is now dominated by cottonwood saplings and reed canary grass. The historic Upper Dam can be seen along with the damaged Lower Dam, which also served as a pedestrian bridge across the creek and impoundment area, connecting to other hiking trails in the park.

The restoration of Mound Creek through the basin is intended to create a natural, meandering stable stream channel and provide improved habitat for species native to southwestern Minnesota, including the Topeka Shiner and Plains Topminnow. Approximately 4,500 feet of stream channel will be created along with several wetland oxbows. The stream restoration will consist of a series of riffles and pools. A highly sinuous 'E' channel, as classified by the Rosgen classification system, will be restored throughout the drained basin. This is the reference stream type for the unconfined valley within the Blue Mounds State Park proposed project boundary.

A diverse native prairie will be restored along the stream corridor and throughout the drained basin.

Vegetation best management practices will be used to establish native plant species throughout the former reservoir. It is expected that restoration of the vegetation will take several years of management effort. The first step will be to remove undesirable woody species and plant native herbaceous species.

Pedestrian trails will connect the existing use areas with the restored stream. The trails will provide opportunities to view the stream and provide opportunities for educational and interpretive programming. One trail will lead from the day-use area to one or more locations along the stream, this trail will meet Americans with Disabilities Act (ADA) requirements. Another trail is planned to lead from the existing trail on the north side of the basin to the restored stream.

A weathering steel pedestrian bridge will be installed near where the former Lower Dam was located. This will restore connectivity of the Mound Creek Trail across the creek. As the stream flows under the pedestrian bridge, a series of rock arch riffles will direct flow through a slightly steeper reach. Downstream of the former dam, the stream restoration is anticipated to include riparian vegetation management, grade control riffles, and slight alternations to the channel shape and/or dimensions to ensure further establishment of an adequate floodplain bench.

No environmental effects associated with visual glare or vapor plumes will occur during construction or park operation. Sanitation buildings and some other park facilities are typically lit through the night to improve visitor safety and convenience.

16. 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, and any greenhouse gases. 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.

Stationary source emissions will not be generated during construction or by normal operation. N/A

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.

Gasoline and diesel powered vehicles will generate air emissions during the construction. Exhaust emissions from these vehicles contain pollutants such as carbon monoxide, nitrogen oxides, reactive organic gasses, sulfur dioxide and suspended particulate matter, all of which may carry associated health risks. Project construction activities will temporarily increase these airborne pollutant levels.

Construction phasing will be implemented to limit the size of the active work zone. Limited daily work hours will be established to minimize disturbance to park patrons and area residents. The increases in air emissions from construction will be temporary, local, and minor.

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 16a). 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.

Dust and odors may result when large machinery is in operation. However, since the site is generally very moist, any dust generated should be minimal. To further reduce impacts, construction phasing will be implemented to limit the size of the active work zone. The MN DNR will establish limited daily working hours to minimize disturbance to park users and area residents.

17. 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.

No noise producing facilities are located within the state park and none are proposed.

1) Existing ambient noise within the state park is typical of wildlife, flowing water, and recreational areas. Some noise is generated from traffic along U.S. Highway 75 and County Road 8, routine park maintenance operations, and from park visitors. Decibel levels of common noise sources for the park may range from 30 (secluded woods) to 90 (chainsaw or lawnmower at one meter). Ambient noise levels will not change as a result of the proposed project.

2) The nearest sensitive receptors to the construction area and project boundary include the park campground which is approximately 1,200 feet away. The nearest private residence is located approximately 2500 feet northwest of the project area; a second residence is over 3000 feet west; the nearest individual campsite within the park is about 500 feet west; and the nearest campground in the park is over 2000 feet northwest of the project area. The combination of the existing vegetative cover and distance to receptors will help diffuse some of the noise generated from construction activities. Noise from construction activities will be temporary and limited to normal daily work periods. All construction work and future use of the area will conform to state noise standards.

3) Noise generated from the construction activities will be a temporary disturbance to wildlife and a minor annoyance to humans in proximity to the project area. The MN DNR will monitor noise generation if complaints arise.

4) The MN DNR will establish limited daily working hours to minimize noise disturbance to park patrons, area residents and wildlife. The confined area of the work zone and distance from sensitive noise receptors would help mitigate the temporary effects of machinery noise.

18. 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.

Existing parking spaces at the picnic ground near the project site accommodate about 25 vehicles and will remain unchanged by the proposed project. New traffic generated by the proposed project will be temporary for workers and construction purposes.

Availability of transit or alternate modes of transportation are limited due to the rural area. Long distance bus travel includes a stop in Luverne, offering service from Sioux Falls, South Dakota to Minneapolis, Minnesota. Daily bus service from Luverne includes one bus traveling north and one traveling south.

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.

Most motor vehicle access to the park comes from U.S. 75, a north-south two-lane highway that intersects with Interstate 90 at Luverne, Minnesota about 5 miles south of Blue Mounds State Park. Average annual daily traffic (AADT) volume reported by MnDOT, Office of Transportation Data and Analysis, indicate a volume of 3,400 vehicles along U.S. 75 from the intersection with County Road 8 north to County Road 7.

The primary park entrance is located off of County Road 20 (161st Street), a two lane east-west County Road that intersects with U.S. 75 about 1 mile west of the park entrance. Within the park the MNDNR maintains roads to the day-use area and campground; both are two-lane roads.

There are two secondary access points to the park off of County Road 8 along the south and west border of the park. In 2014 the volume was reported as 380 vehicles along County Road 8 from the intersection with U.S. Highway 75 to County Road 19.

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

The proposed project will not affect the long term operation of existing parking or transportation networks within or near the park. Temporary disturbances may occur during construction. Limited trips for hauling materials and equipment to the work site will occur and the day-use parking lot may be closed at times during construction. Park visitors will be directed to other parking areas within the park; overall the disruption to visitors is expected to be minimal.

19. 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.

Land Use

The proposed project would have a permanent beneficial impact on land use throughout the project area, due to restoration of natural hydrologic patterns and landscape appropriate habitats. Currently, the proposed project area is highly disturbed and unstable, so there would be no short term loss of or impact to land uses during project activities.

Soils

The proposed project would have a temporary negative effect on soils over the area in which grading or land alteration activities are conducted. This negative effect would last for the duration of earth disturbance activities, until soils are stabilized. Negative effects include the possibility of soil loss through exposure and erosion. After completion, the project would have a permanent positive impact on topography and small scale landscape features in the project area, as the current unstable and incised topography is replaced with stable, sloped and varied features appropriate to the perennial prairie stream ecosystem.

Surface Water and Water Quality

Surface water and water quality would experience a short term negative impact, limited in geographic extent to the project area and the area immediately downstream to approximately the boundary of the park. This is due to sedimentation and stormwater runoff from active construction and land alteration activities, as well as by any activity that might need to occur in the active stream bed. After completion, the project would restore the natural hydrology and establish native vegetation, removing nutrients and trapping sediments.

Vegetation

The project would have a temporary negative impact to vegetation that would be limited to the project area, and would persist until new vegetation was established. Although it will take several years after completion of the project for the new vegetation to become fully mature, the project staff will reseed and replant with habitat-appropriate vegetation immediately and the vegetation community should see steady improvement throughout that time. Much of the current vegetation consists of invasive species such as reed canary grass or undesirable native vegetation such as cottonwood; their removal would not be a significant detriment to the ecosystem, although there could be a negative impact on erosion and sediment control on the site where these plants are stabilizing slopes or protecting soils from exposure. Some high value native vegetation is currently established on site, and efforts would be made to avoid harming these plants but some loss may occur. After construction, the area would be replanted with native vegetation selected for value to habitat and pollinators.

Aquatic Habitat

The project would have a temporary negative impact on aquatic habitat, limited in geographic extent to the portion of Mound Creek in the active project area and limited in time to the duration of the project. Although the project staff would minimize disturbance to and impacts on the creek itself, a minimal amount of disturbance would be unavoidable. The temporary habitat loss includes loss of movement opportunity through the current creek when barriers are erected to keep aquatic organisms out of the active project area and temporary loss of this stretch of the creek bed for spawning or feeding areas. After completion of the project, habitat quality in the project area would be enhanced since the reconfiguration of the site's topography and creation of oxbows is meant to provide more varied and higher quality habitat for a wider variety of species. The project would also increase variety and quality of wetland and prairie upland habitat and their associated species.

Rare and Protected Species

The project may temporarily restrict the movement of state-listed species while construction activities are occurring. The Topeka Shiner and the Plains Topminnow will be "pushed" downstream using a seine net and the Pond Mussel will be relocated after the stream is dewatered. The dewatered stretch of stream will be unavailable to these organisms until completion of the project, forming a temporary barrier to their instream movements. The presence of fencing and hay bales surrounding the creek would also create a temporary physical obstacle to any rare turtles or frogs that may be present.

Visual Impact

The project would have temporary negative impacts to the area's visual and scenic qualities. This impact is limited to the project area and the duration of construction activities, and is further limited by the fact that the loss of the dam and ancillary impacts has already left a visually degraded area.

Air Quality

The project would have a temporary negative impact on air quality, from the generation of dust, fumes and odors during the operation of heavy gasoline powered equipment, disturbance of soils, and removal

of the remaining dam structures. This impact would only exist while heavy construction activity is being conducted, and would only occur in the immediate vicinity of such activities.

Noise

There would be a temporary negative impact on noise levels. This would be caused by the operation of construction equipment and is limited to the immediate area and would only be a factor when construction activities require the operation of such equipment.

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, organizations, 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 local DNR area hydrologist, Rock County Planning and Zoning, the Cities of Luverne and Hardwick, the Rock County Feedlot Officer, the USDA Service Center, Rock County Soil and Water Conservation District (SWCD), and the Rock County Highway Department.

The Rock County Highway Department is planning work on County State-Aid Highway 20 (the entrance road to Blue Mounds State Park) in 2018, from Trunk Highway 75 to the State Park Office. This project would involve grinding up and redepositing asphalt pavement and the underlying gravel bed in place, and may include partial removal of the pavement. No grading or excavation is planned. At its closest, this road is less than 500 feet from Mound Creek. There could be some additional sedimentation to Mound Creek upstream of the restoration site as a result of this highway project, which could impact surface water and water quality, as well as aquatic habitat.

Currently, Blue Mounds State Park does not have a potable water supply. The state park is not currently connected to a municipal water supply, but is anticipated to be connected to Rock County Rural Water in 2018. The connection will occur near the shop building, which is located outside the proposed project area. Many of the existing waterlines within the park are expected to be replaced at the same time. No impacts would occur within the proposed project area, and it is not anticipated that any consequences of this project would have any environmental effects that are cumulative with those identified for the proposed restoration project.

Blue Mounds State Park is considering adding Prairie and Bison tours by vehicle through the bison range area. Tours may begin as soon as spring 2018. The bison range is south of the project area. This project would overlap geographically with the proposed Lower Mound Restoration Project, but no environmental effects from the proposed project are expected to interact with this planned project.

There are no known planned projects that would result in cumulative potential effects on land use, soils, vegetation, rare and protected species, noise, air quality, or visual impacts.

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.

The project would temporarily impact approximately 30 acres during an overall period of approximately one year, with an estimated three to six months active construction time. It would impact about 3000-3200 feet of existing stream and result in the construction of approximately

4500 feet of new stream channel. Half of the existing stream will be replaced by a new, highly meandered channel, and the other half, downstream of this, will be graded, revegetated, and have riprap and concrete slabs removed. It is expected that the project will temporarily increase erosion and sedimentation due to runoff from the land alteration, debris removal, and channel construction activities, especially if heavy precipitation events occur during these activities.

Water quality has been reduced due to the disaster, since the new stream channel is unstable and is actively eroding up channel and along the stream banks, thereby increasing the sediment load in the stream. It may be further decreased during construction due to surface water runoff, but would increase after construction due to restoration of the natural stream and oxbow system. Establishment of native vegetation would further improve water quality as it acts as a sediment and nutrient trap and stabilizes bank slopes, and restoration of floodplain connectivity would reduce damages from flooding events. The new channel will not be connected to the existing channel until it is completed, vegetation has been planted, and erosion control measures are in place; this is to minimize erosion and sedimentation impacts downstream, although some short term turbidity is expected when the channel is connected. The flat topography of the dry lake bed also limits runoff volume and velocity.

Aquatic invasive species and threat of their introduction might have decreased after loss of the reservoir, and are expected to decrease after the natural hydrologic system is restored and habitat is enhanced for native species, as discussed in Item 13c above. Invasive wetland and upland plants would be reduced through removal during construction and through active management of vegetation for many years post construction.

The site's biodiversity and habitat value for wildlife would be temporarily decreased while the project is underway, but after completion no further negative impacts to biodiversity and habitat value for wildlife would be expected.

The federally endangered Topeka Shiner and state threatened Plains Topminnow are both present in Mound Creek. Although the project proposers plan to remove or drive these species, along with other aquatic life, out of the affected stream reach prior to construction, it is possible that some individuals may be lost. After the project is completed, the restored hydrology would provide more appropriate habitat for these species with the goal of ultimately benefitting from this project. Loss of the reservoir also reduces the risk of introduction of aquatic invasive species and numbers of predatory fish, to which the Topeka Shiner is vulnerable. Other species of interest, including Blanding's Turtle and Blanchard's Cricket Frog, may also benefit from the increased quality and complexity of habitat.

No other projects are currently proposed or planned within or in the vicinity of the proposed project.

20. 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 _____ Date 3/19/18

Title EAW Project Manager

Blue Mounds State Park, Lower Mound Lake Basin Restoration
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