

NEBRASKA NATURAL RESOURCES COMMISSION

Water Sustainability Fund

Application for Funding

Section A.

ADMINISTRATIVE

PROJECT NAME: LPD Lake Babcock Hydroelectric Power Enhancement Evaluation

SPONSOR'S PRIMARY CONTACT INFORMATION (Not Consultant's)

Sponsor Business Name: Loup Power District (LPD)

Sponsor Contact's Name: Neal Seuss

Sponsor Contact's Address: 2404 15th Street, Columbus Nebraska 68601

Sponsor Contact's Phone: (402) 564-3171

Sponsor Contact's Email: nsuess@loup.com

1. **Funding** amount requested from the Water Sustainability Fund:

Grant amount requested. \$ 75,000

- If requesting less than 60% cost share, what %? NA

If a loan is requested amount requested. \$ NA

- How many years repayment period? NA
- Supply a complete year-by-year repayment schedule. NA

2. **Neb. Rev. Stat. § 2-1507 (2)**

Are you applying for a **combined sewer overflow project**? YES NO

If yes:

- Do you have a Long Term Control Plan that is currently approved by the Nebraska Department of Environmental Quality? YES NO
- Attach a copy to your application. NA
- What is the population served by your project? NA
- Provide a demonstration of need. NA
- **Do not complete the remainder of the application.**

3. **Permits Required/Obtained** Attach a copy of each that has been obtained. For those needed, but not yet obtained (box “NO” checked), 1.) State when you will apply for the permit, 2.) When you anticipate receiving the permit, and 3.) Your estimated cost to obtain the permit.

(N/A = Not applicable/not asking for cost share to obtain)
 (Yes = See attached)
 (No = Might need, don't have & are asking for 60% cost share to obtain)

G&P - T&E consultation (required)	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
DNR Surface Water Right	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
USACE (e.g., 404/other Permit)	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
FEMA (CLOMR)	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
Local Zoning/Construction	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
Cultural Resources Evaluation	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
Other (provide explanation below)	N/A <input checked="" type="checkbox"/>	Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>

4. **Partnerships**

List each Partner / Co-sponsor, attach documentation of agreement:

The Loup Power District (LPD) is the primary sponsor of the Lake Babcock Hydroelectric Power Enhancement Evaluation (Evaluation) and has engaged three other partner agencies to provide support. These partners are the Nebraska Game and Parks Commission (NGPC), the Lower Loup Natural Resources District (LLNRD), and the City of Columbus. Support letters from each partner are provided in Appendix A.

Identify the roles and responsibilities of each Partner / Co-sponsor involved in the proposed project regardless of whether each is an additional funding source.

LPD is the lead partner and funding authority for the Evaluation. They will work and coordinate with stakeholders, organizations, and members of the public that may be affected by the recommendations contained within the Evaluation. LPD will hire an engineering consultant to complete the plan of work.

LLNRD will provide general support and input during the alternative review process. LLNRD supports projects that enhance capabilities to store and utilize water resources for public benefit in the Lower Loup River Basin. LLNRD also supports outdoor education and recreation opportunities.

NGPC will provide technical support for planning aquatic habitat and fishery enhancements during the conceptual design.

The City of Columbus will provide general support and input during the alternative review.

5. **Other Sources of Funding**

Identify the costs of the entire project, what costs each other source of funding will be applied to, and whether each of these other sources of funding is confirmed. If not, please identify those entities and list the date when confirmation is expected. Explain how you will implement the project if these sources are not obtained.

The total project cost is \$125,000 and there are no other funding partners. The LPD’s financial contribution is documented in a letter of financial support in Attachment A. The cost breakdown by tasks is shown in Table 1. The LPD is not applying for other funds to support the Evaluation.

Table 1 - Project Tasks and Costs

TASK	NAME	COST	WSF	LPD
1	Stakeholder Meetings	\$ 10,000	\$ 6,000	\$ 4,000
2	Capacity Assessment	\$ 20,000	\$ 12,000	\$ 8,000
3	Alternative Assessment	\$ 25,000	\$ 15,000	\$ 10,000
4	Conceptual Design & Cost	\$ 30,000	\$ 18,000	\$ 12,000
5	Reporting	\$ 40,000	\$ 24,000	\$ 16,000
	TOTAL	\$ 125,000	\$ 75,000	\$ 50,000
		COST SHARE	60.0%	40.0%

6. Overview

In 1,000 words or less, provide a brief description of your project including the nature/purpose of the project and its objectives. Do not exceed one page!

The Loup River Canal Hydroelectric Power Project (Power Project) is located in Nance and Platte Counties, Nebraska and is owned and operated by the Loup Power District (LPD) of Columbus, Nebraska. The Power Project is licensed by the Federal Energy Regulatory Commission (FERC). In 1933 the State of Nebraska approved the formation of LPD and granted it the right to appropriate Loup River water (3,500 cubic feet per second {cfs}) for power generation purposes. The original 50-year federal license for the Power Project (FERC Project No. 1256) was granted on April 17, 1934. The layout of the Power Project is shown in Figure 1.

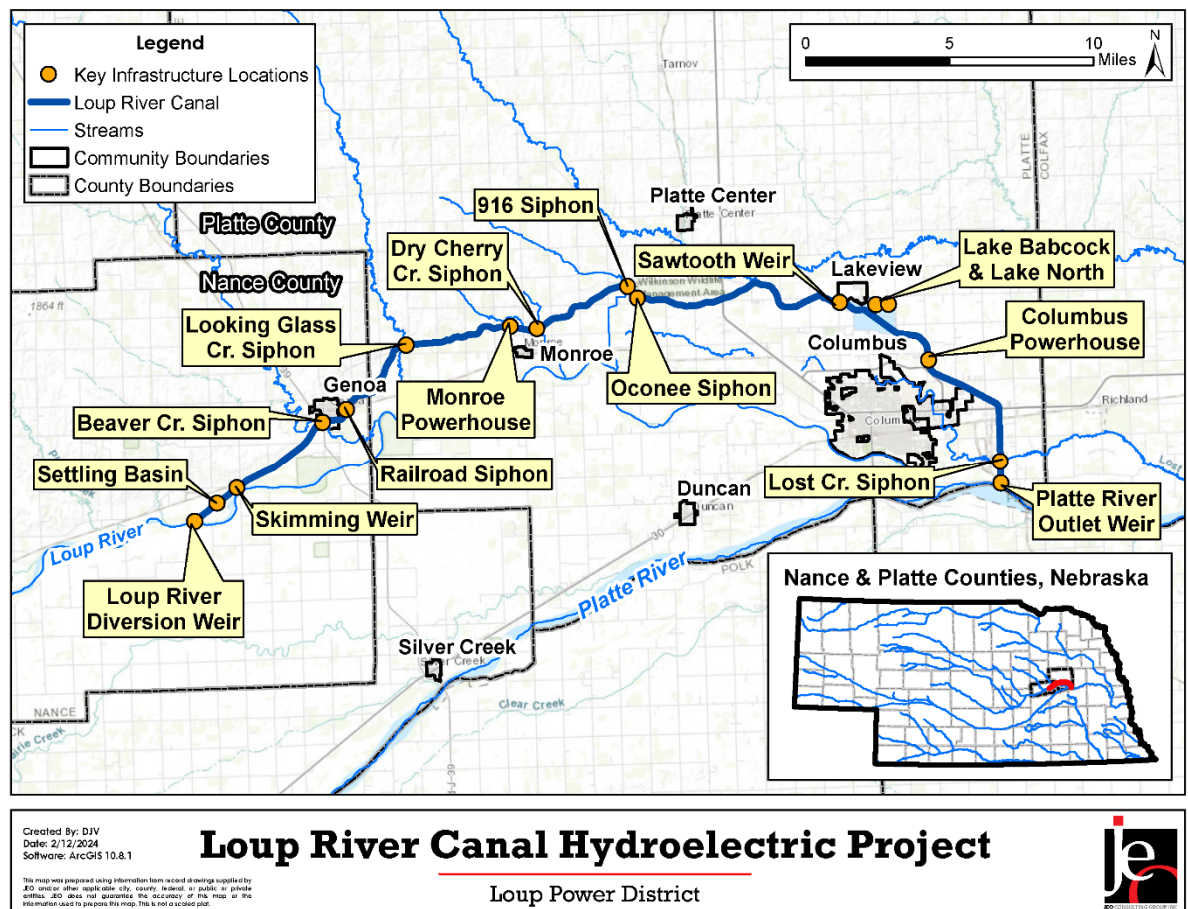


Figure 1 – Loup River Hydroelectric Project

The purpose of the Evaluation is to identify a cost-effective method to address severe sedimentation of Lake Babcock. Sediment buildup in Lake Babcock has significantly decreased its holding capacity, thus reducing its capability to support

hydropower production. The Evaluation will result in a 30% conceptual design and cost estimate of the preferred alternative which may be a combination of dredging and infrastructure to prevent recurrence of future sedimentation. The Evaluation will serve as a catalyst to leverage local and state funding with Federal funding applications, specifically the Bureau of Reclamation WaterSMART and other sources to cost-share final design and construction. The Evaluation supports a state-wide effort to lower the carbon footprint of power generation by sustaining green energy alternatives to meet state-wide power demand. The Evaluation will be written in a manner that is consistent with the information required in a WaterSMART application in order to expedite the future application process.

Lake Babcock, located in Platte County near the City of Columbus, Nebraska, is an 867-acre¹ hydropower forebay to the Columbus Powerhouse. The lake was designed to provide 5-feet of drawdown for power production. Lake Babcock is one of two reservoirs that temporarily stores water for hydroelectric power production. The second, Lake North, is a 202-acre² storage reservoir and was constructed within Lake Babcock. Lake North was separated from Lake Babcock to provide a protected waterbody with reduced sedimentation potential. This provided resiliency to the system and ensured holding capacity remained for power production even as Lake Babcock filled with sediment. The two reservoirs are linked by a concrete control structure.

LPD serves 22 Nebraska communities with a combined population of about 62,300 people. Between just the Monroe and Columbus Powerhouses, LPD can provide power to approximately 8,000 ³homes annually. The total service area covers 2,248 square miles and consists of 869 miles of transmission and distribution lines. LPD serves the counties of Platte, Madison, Colfax, and Boone. The District sells electric power to one wholesale customer, the Nebraska Public Power District (NPPD). Additionally, there are 44 individual owners with 104 surface water rights from the Loup Power Canal (Canal). This water is used to irrigate approximately 7,100 acres.

The Power Project was relicensed in 1984 for a 30-year term and relicensed again by FERC in 2017. The long-term average flow diversion from the Loup River to the Power Project is 1,685 cfs. The Power Project and associated infrastructure are critical state infrastructure to produce renewable power. The LPD is committed to

¹ Final Environmental Assessment for Hydropower License, FERC Project No. 1256-031, June 2016

² Final Environmental Assessment for Hydropower License, FERC Project No. 1256-031, June 2016

³ Loup Power District Columbus Powerhouse, Lincoln Journal Star, April 21, 2021

enhancing hydroelectric power capabilities to ensure a renewable energy source is available to all Nebraskans.

Over the past 90 years sediment has been deposited into Lake Babcock from the Loup River through the Canal. At the Canal headgate, LPD operates a hydraulic dredge in the Skimming Basin located west of Genoa. On average, approximately 1.7 million cubic yards of sediment is pumped by this hydraulic dredge annually. While a significant amount of sediment is removed from the Canal at this location, sedimentation remains a significant and costly challenge. The Evaluation will help determine the sediment sources, which included twelve local drainages into the Canal, and create an action plan to mitigate sedimentation in the future after rehabilitation is complete.

In order to provide LPD with the information they need to make an informed decision, the Evaluation will:

- Utilize stakeholder input to help evaluate the most cost-effective and multi-beneficial alternative to increase the storage capacity of the reservoir,
- Conduct a topographic and bathymetric survey to guide design and evaluate annual sedimentation rates,
- Evaluate options for disposal areas for the excavated sediment spoils,
- Perform geotechnical analysis of sediment to determine its suitability for embankment structures,
- Prepare a conceptual engineering design report and supporting documents,
- Develop a preliminary engineer's opinion of cost,
- Evaluate economic costs and benefits of various alternatives,
- Establish a funding strategy and final report.

While the primary purpose of Lake Babcock is hydroelectric power production; there are other benefits that it provides such as camping, fishing, trails, boating, and similar outdoor activities. Lake Babcock and the Canal provide vast recreation opportunities and groundwater recharge from Genoa to Columbus. The reservoir can also serve as storage of flood waters to help protect downstream properties along the Loup and Platte Rivers, which helps reduce the sediment loads downstream on the Lower Platte River.

It should also be noted that LPD is a nonprofit organization. Increases in revenue due to increases in overall power generation capability from improvements in Lake Babcock would equate to lower energy fees charged to LPD's customers. Excess power generated by LPD is sold to the regional grid, reducing local costs.

7. **Project Tasks and Timeline**

Identify what activities will be conducted to complete the project, and the anticipated completion date.

- What activities (Tasks) are to be completed.
- An estimate of each Tasks expenditures/cost per year.
- Activities in years 4 through project completion under a single column.

A breakdown of major tasks by cost, and schedule milestones, are shown in Table 2. This schedule assumes WSF cost-share will be available in August 2024.

Table 2 - Project Tasks, Schedule, and Costs

TASK	NAME	SCHEDULE	COST
1	Stakeholder Meetings	Aug. 2024	\$ 10,000
2	Capacity Assessment	Sep. 2024	\$ 20,000
3	Alternative Assessment	Sep. - Nov. 2024	\$ 25,000
4	Conceptual Design & Cost	Nov. – Dec. 2025	\$ 30,000
5	Reporting	Jan. – Jun. 2025	\$ 40,000
	TOTAL		\$ 125,500

8. **IMP**

Do you have an **Integrated Management Plan** in place, or have you initiated one? YES NO Sponsor is not an NRD

Section B.

DNR DIRECTOR'S FINDINGS

Prove Engineering & Technical Feasibility

(Applicant must demonstrate compliance with Title 261, CH 2 - 004)

1. Does your project include physical construction (defined as moving dirt, directing water, physically constructing something, or installing equipment)?
YES NO

If you answered "YES" you must answer all questions in section 1.A.
If you answer "NO" you must answer all questions in section 1.B.

If "YES", it is considered mostly structural, so answer the following:

- 1.A.1 Insert a feasibility report to comply with Title 261, Chapter 2, including engineering and technical data; NA
- 1.A.2 Describe the plan of development (004.01 A); NA
- 1.A.3 Include a description of all field investigations made to substantiate the feasibility report (004.01 B); NA
- 1.A.4 Provide maps, drawings, charts, tables, etc., used as a basis for the feasibility report (004.01 C); NA
- 1.A.5 Describe any necessary water and/or land rights including pertinent water supply and water quality information (004.01 D); NA
- 1.A.6 Discuss each component of the final plan (004.01 E); NA
- 1.A.7 When applicable include the geologic investigation required for the project (004.01 E 1); NA
- 1.A.8 When applicable include the hydrologic data investigation required for the project (004.01 E 2); NA
- 1.A.9 When applicable include the criteria for final design including, but not limited to, soil mechanics, hydraulic, hydrologic, structural, embankments and foundation criteria (004.01 E 3). NA

If "NO", it is considered mostly non-structural, so answer the following:

- 1.B.1 Insert data necessary to establish technical feasibility (004.02);

The Evaluation will assess various alternatives to restore capacity to Lake Babcock, such as mechanical and hydraulic dredging, and determine preferred spoil locations. A primary deliverable will be a 30% conceptual design supported by a Professional Engineer's opinion of cost. The report will include an implementation and funding strategy for LPD to move forward with achieving the overall project goal. To support the Evaluation, a mix of survey grade Global Positioning System (GPS) equipment and available remote sensing elevation data will be used along with aerial imagery to measure the existing capacity of the lake through a bathymetric survey. In 2013, LPD flew LiDAR over Lake Babcock when it was drained and Lake North was lowered to a level well below normal operating water elevation. This information, and an updated bathymetric survey, will be compared to the original 1935 as-built volumes to determine the lost capacity of the lake over time. The 2013 and 2024 volume estimates will also aid in estimating an annual sedimentation load to Lake Babcock annually and to estimate the future capacity of the lake after improvements are completed.

Since the construction of the Power Project in 1937, LPD has been continuously removing sediment deposited in the settling basin using a floating hydraulic dredge, shown in Figure 2, just past the Canal headgate. On average, this hydraulic dredge pumps approximately 1.7 million cubic yards of sediment each year. The layout of the Canal headgate and dredging operation is shown in Figure 3. LPD has technical knowledge of hydraulic dredging, which will be a strong asset when determining how to dredge Lake Babcock most effectively. The LPD employs 118 staff to operate the hydroelectric power production facilities. The staff consists of technical personnel including engineers, scientists, and technicians.



Figure 2 – LPD Settling Basin Dredge⁴

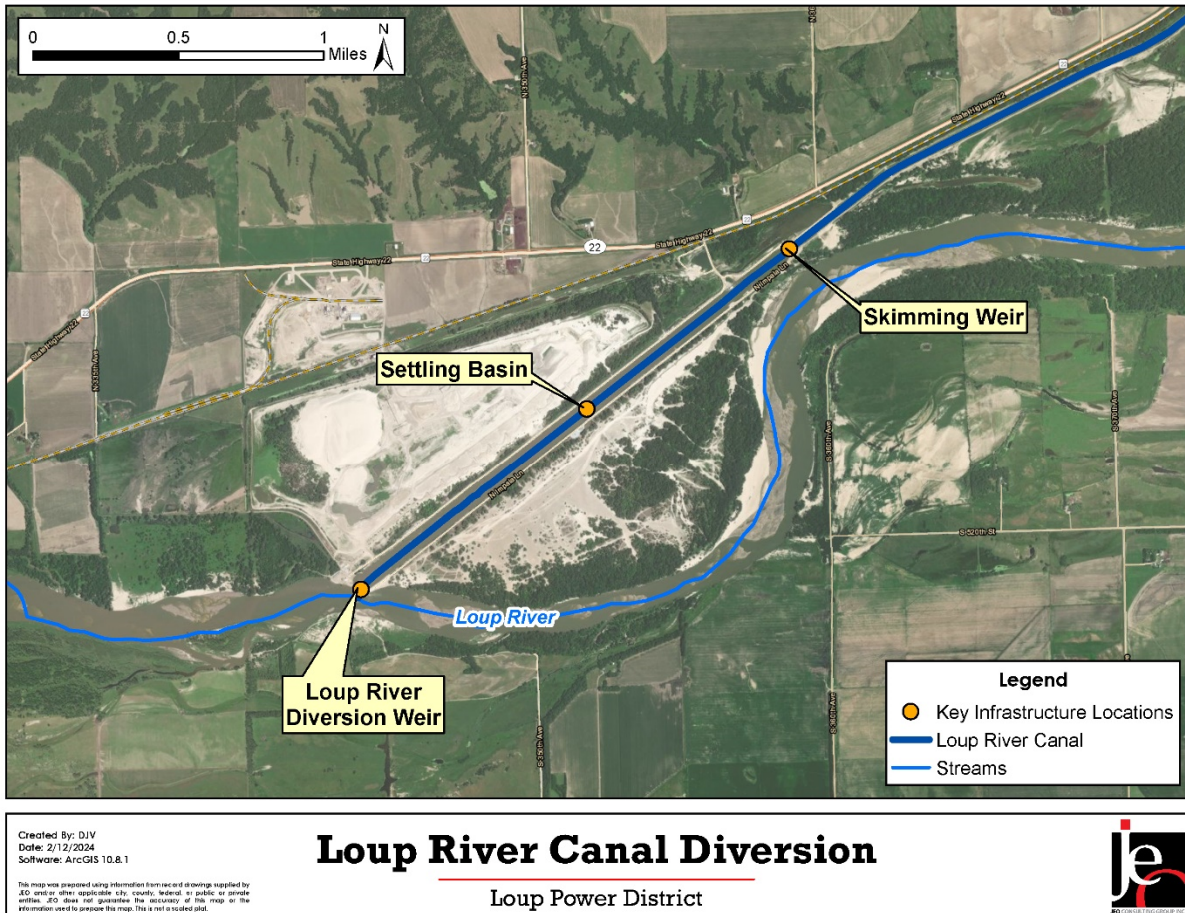


Figure 3 - LPD Loup River Diversion and Settling Basin

LPD will complete geotechnical analysis of the sediment prior to any placement of dredged material on farm ground, within spoils basins, or back within portions of the lake dedicated for sediment storage. This information will be critical to determine the sediment’s suitability for potential use in berms or other construction projects.

LPD will hire a qualified engineering firm to complete the Evaluation. A Professional Engineer licensed in the State of Nebraska will lead the Evaluation team. The team will also include scientists, hydrologists, hydrogeologists, surveyors, and technicians.

1.B.2 Discuss the plan of development (004.02 A);

⁴ Photo taken from Columbus Telegram, photo credit Cole W. Eberle

A scope has been established to guide completion of the Evaluation. Major tasks include stakeholder coordination, capacity assessment, alternative development, conceptual design and cost, and reporting. Each task is described in more detail below.

Stakeholder Meetings

Includes a kickoff meeting with LLNRD, NGPC, LPD, Consultant, and City of Columbus to discuss the goals of the project and a strategy for multi-agency coordination. Other meetings will include discussion of alternatives, review of design and cost, and review of the draft report as well as a funding strategy.

Capacity Assessment

The capacity assessment includes sampling and evaluation of sediment, topographic survey of critical locations, and completion of a bathymetric survey (reservoir depth contours). This will also allow LPD to understand the current rate of sedimentation within Lake Babcock and will be critical to estimating cost, most of which will be removal of sediment. The as-built construction drawings will be utilized to estimate the current water volume of both Lake Babcock and Lake North.

Alternative Development

The alternative development includes a review of seepage concerns through completion of a hydrogeologic assessment using Nebraska Department of Natural Resources (NeDNR) well logs, University of Nebraska Conservation and Survey Division (UNL CSD) test holes, LLNRD Airborne Electromagnetic (AEM) data, and other available information. The hydrogeologic assessment will include detailed cross sections showing the depth of the reservoir and canal to clay, sand, and gravel layers within the area.

Another major component is review of dredging options including mechanical and hydraulic options. The alternative review will be aided by LPD staff with decades of experience operating the floating dredge in the settling basins.

Structural alternatives, besides dredging, may include a second off-channel settling basin, second regulating reservoir, lake inlet forebay to collect sediment near the Canal inlet to Lake Babcock to aid sediment removal, and upstream forebay/settling basin within the Canal. Figure 4 shows some of the potential concepts that have been considered by LPD ahead of initiating the Evaluation.

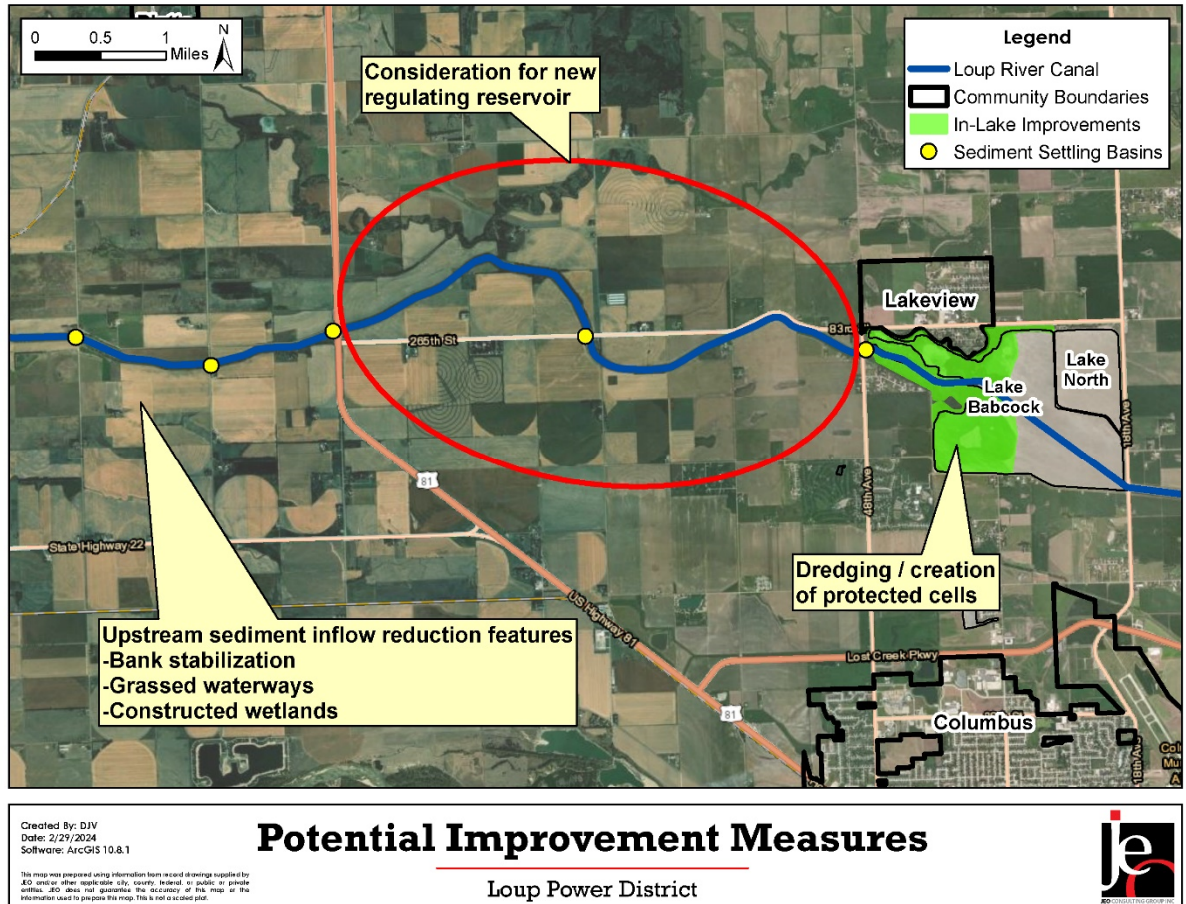


Figure 4 – Potential Improvement Measures

Sediment spoil evaluation includes coordination with neighboring property owners. Options may include field application, sacrificing a portion of the reservoir, or constructing spoil basins to separate water from sediment.

The final element of alternative development supports secondary actions, such as aquatic habitat enhancements, expansion of recreational amenities, fishery access, and outdoor education. Between 2018 and 2023 the campgrounds provided at Lake Babcock were used by more than 2,800 campers.

Conceptual Design and Cost

The conceptual design will include an economic assessment to weigh the benefit of alternatives carried forward against the planning level cost estimate. Ultimately, the alternative deemed most feasible will be carried ahead into a 30% conceptual engineering design. The conceptual design may also include project phasing, as funding constraints will ultimately determine how far the project moves ahead.

The design will also include an initial evaluation of land rights, easements, or other agreements needed to complete the project. The Evaluation will cover all potential permits, which may include Clean Water Act 404, stormwater permits, cultural resources reviews, FERC coordination, and description of environmental clearances necessary to proceed.

Reporting

The primary outcome of the Evaluation will be a design report along with a set of 30% engineering design drawings. The report and design will be used when applying for additional funding to complete design, permitting, and construction. The report will include sections such as: Project Background, Findings, Implementation Strategy, Design Summary, Recommendations, Schedule, and Funding Strategy.

While multiple local, state, and federal funds will be targeted – it is anticipated that a major focus will be to obtain a Federal Water and Energy Efficiency Grant through WaterSMART. The final Evaluation report will be written to include much of the information requested in that anticipated grant application.

1.B.3 Describe field or research investigations utilized to substantiate the project conception (004.02 B);

Data that will be obtained includes topographic survey, bathymetric survey, and sediment samples. Existing data to be researched includes as-built drawings, well logs, test hole logs, review of AEM survey, historical reservoir operations, power production trends, and review of property ownership. More detail is provided below.

Topographic and Bathymetric Survey

The bathymetry will be supplemented with available remote sensing elevation data and aerial imagery to verify the shoreline, and will utilize an acoustic echosounder mounted to a boat. In areas where water is too shallow or unsafe to navigate a boat (due to dense aquatic vegetation) a kayak or similar smaller vessel may be used with a weight and sub-meter mounted GPS unit. Key depths to be measured include the water-surface elevation and top of the submerged sediment (silt/sand layer) bed elevation. The original bottom elevation will be obtained from the 1935 as-built drawings.

Topographic data will be targeted at critical features such as grade changes, buildings, weirs, berms, disposal pits, and Boy Scout Island / Girl Scout Camp located in the northwest portion of Lake Babcock. Remote sensing elevation data

and available imagery will be used to supplement surface data. These data sources will be the most appropriate for the surveys of spoils disposal sites such as neighboring farm fields and as base maps for the more detailed GPS surveys.

Contour maps will be generated following the surveys. The existing bathymetric survey will be compared to as-built capacity estimates and depths. This data will aid in estimating the quantity of sediment to be removed along with an estimate of annual sedimentation rates. Disposal of the dredged sediment will be based on cost-effectiveness on the availability of disposal sites. Figure 5 displays approximate shoreline extents and depths based upon aerial imagery, areas known to have shallow water and dense vegetation, and areas of open water.

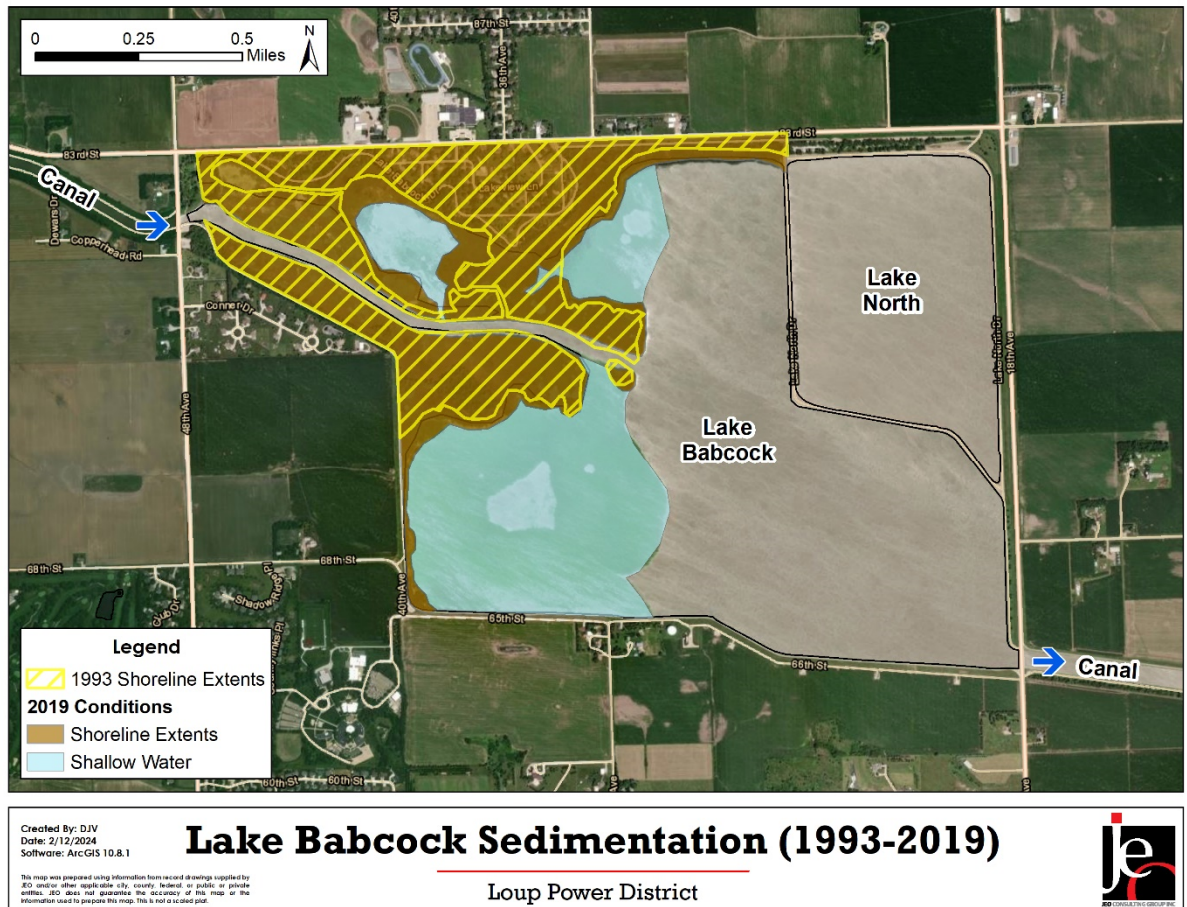


Figure 5 - Approximate Shoreline Extents and Shallow Water Areas

Physical Analysis of the Sediment

Analyzing the physical properties of Lake Babcock's sediment is important to determine its suitability for use in other project elements, such as building embankments. Approximately 5 samples of the sediment material at various locations and depths will be collected across the lake to determine its suitability for construction.

It is expected that the spoils will be a mixture of primarily silt and sand. The nature of the mixture will be laboratory analyzed to determine if the material can be applied to farm fields, deposited in existing borrow pits, used as berm material, or for recreational island/land building at Boy Scout Island and Girl Scout Camp located in the northwest portion of Lake Babcock.

Hydrogeologic Assessment

Existing data will be used to evaluate the hydrogeology surrounding the lake. NeDNR logs, UNL CSD test holes, and LLNRD's AEM survey data will be used to create hydrogeologic cross sections. The location of AEM survey in the area is shown in Figure 6. An example of a cross section is shown in Figure 7. The cross section will provide information on the distance between the lake bottom and principal aquifer. The design will ensure the seal of the lake bottom is undisturbed and there is no significant loss of water from the reservoir beyond typical leaching to groundwater.

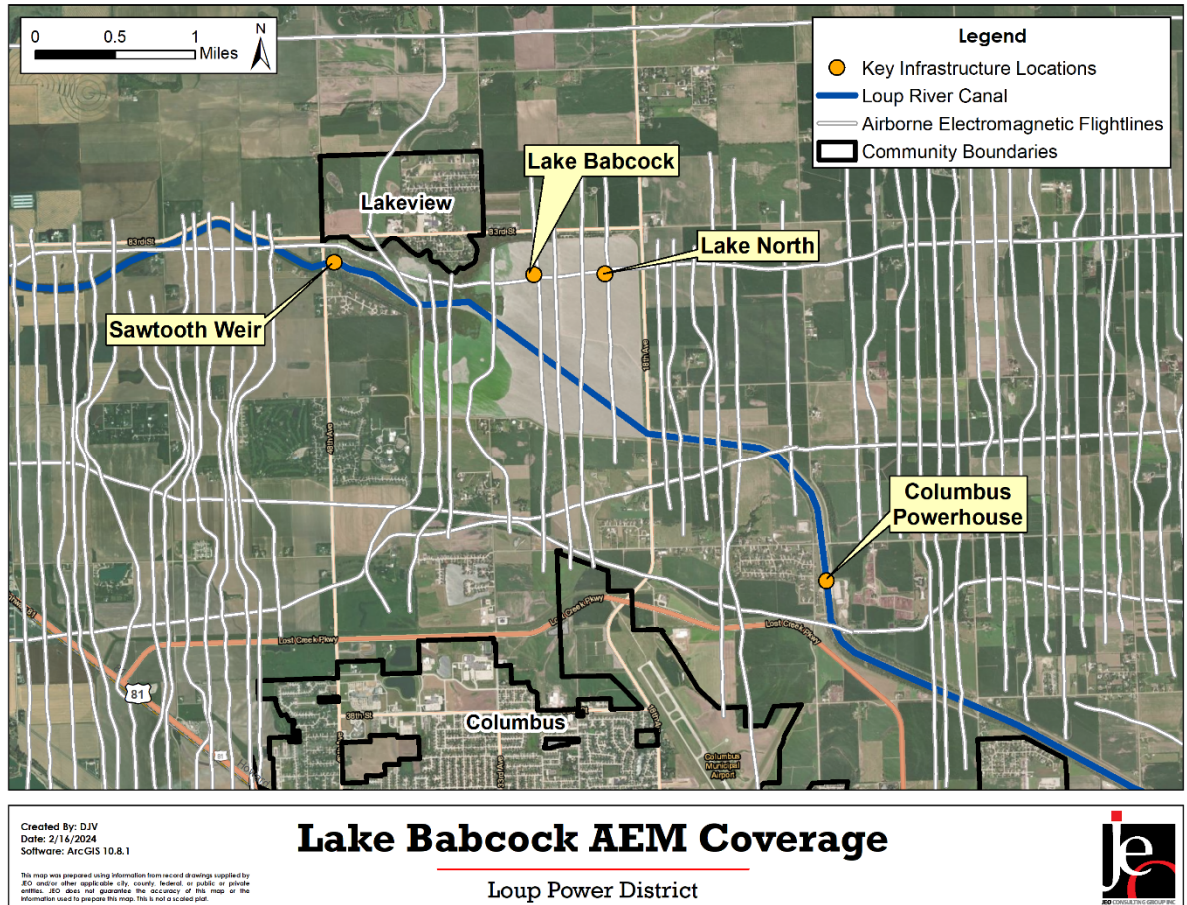


Figure 6 - AEM Flight Location

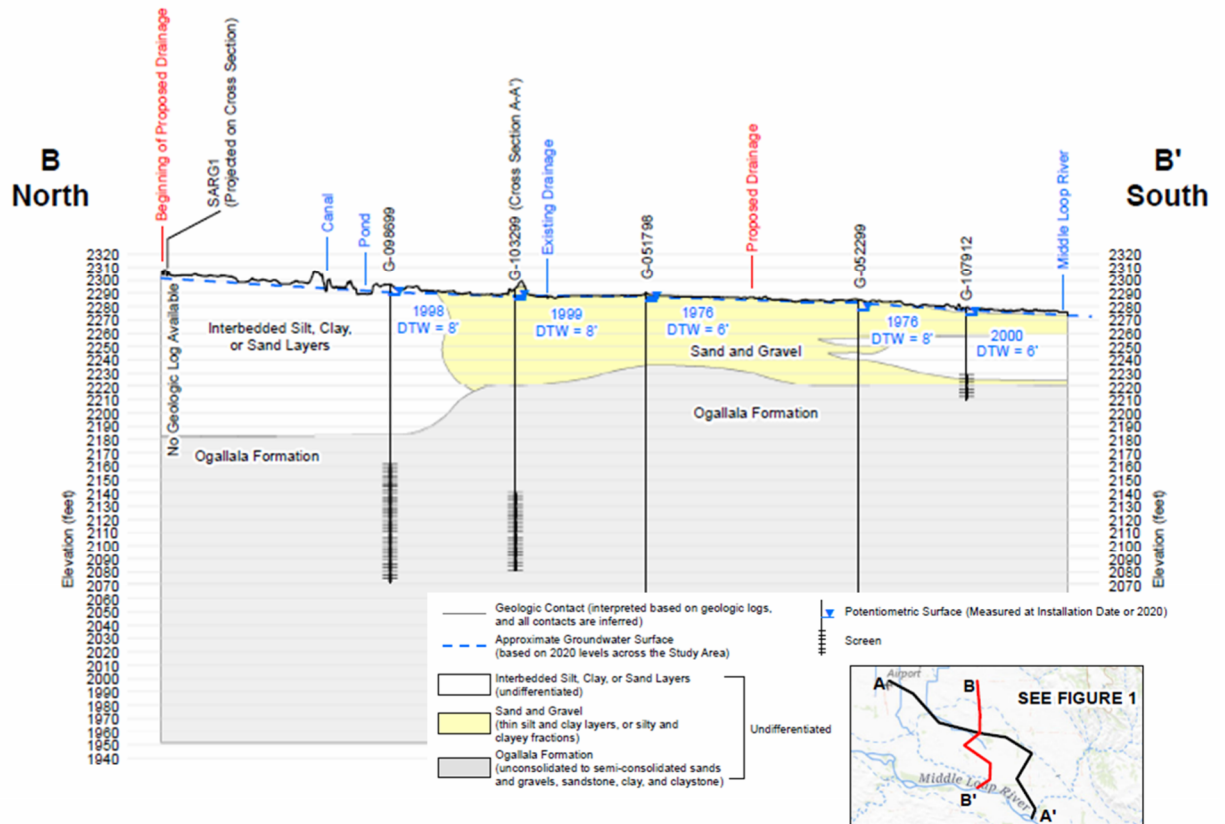


Figure 7 – Example Cross Section Showing Surface Water Elevation in Relation to Groundwater Elevations

1.B.4 Describe any necessary water and/or land rights (004.02 C);

The Evaluation will not require additional water rights but will include a robust review of parcels for sediment to potentially be deposited on. The Canal has a water right from the Loup River of 3,500 cubic feet per second (cfs) that was granted on April 15th, 1932. LPD owns Lake Babcock and the Power Project land, therefore land rights will not be necessary for in-lake or near-lake activity. Access to potential disposal sites may be needed if the LPD borrow pits do not have adequate capacity, but no formal land rights will be required until the project moves onto final design, permitting, and construction.

1.B.5 Discuss the anticipated effects, if any, of the project upon the development and/or operation of existing or envisioned structural measures including a brief description of any such measure (004.02 D).

During the Evaluation, and eventual construction, there could be modifications to existing infrastructure at Lake Babcock and the Canal. For purposes of this application, there will be no effects to operations or existing structural measures.

The Evaluation is critical for the development of future structural measures. Dredging of Lake Babcock is the fundamental component of future measures to achieve the goal of increasing hydroelectric power generation, however, modifications to the Canal may be considered to trap and remove sediment before it enters Lake Babcock in the future. This will be a sizable project since the existing footprint of the reservoir (excluding Lake North) is 867-acres. The volume of sediment dredged from the reservoir will be determined during alternative review and conceptual design. Transportation and disposal of spoils will also be an important consideration of the Evaluation. Potential disposal sites include neighboring farm fields, existing borrow pits along the Canal, utilization by LPD for other projects, use by others with a need for fill material, or sacrificing locations in the lake that have already experienced severe sedimentation.

Prove Economic Feasibility

(Applicant must demonstrate compliance with Title 261, CH 2 - 005)

2. Provide evidence that there are no known means of accomplishing the same purpose or purposes more economically, by describing the next best alternative.

The next best alternative to dredging would be to construct a second regulating reservoir that would achieve the same goal of increasing capacity for hydropower. While dredging Lake Babcock has been the focus thus far, additional alternatives will be strongly considered during the Evaluation. Having an accurate bathymetric survey is critical to rigorously evaluating structural alternatives and vetting what may be the next best alternative.

3. Document all sources and report all costs and benefit data using current data, (commodity prices, recreation benefit prices, and wildlife prices as prescribed by the Director) using both dollar values and other units of measurement when appropriate (environmental, social, cultural, data improvement, etc.). The period of analysis for economic feasibility studies is the project life. (Title 261, CH 2 - 005).

Benefits and costs will be determined and refined for the various alternatives considered during the Evaluation. Potential sources of costs and benefit data include, but are not limited to:

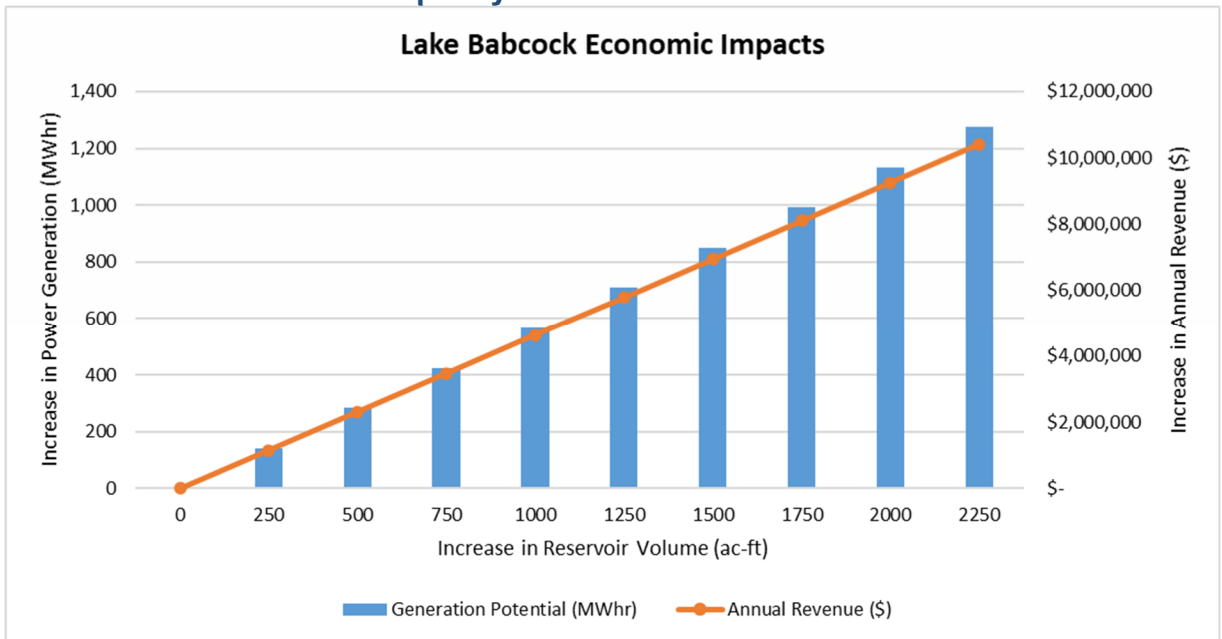
- Power production capability of the Columbus Powerhouse

- Variability of the value of electricity in the Southwest Power Pool
 - Values vary in 15 minute increments
- Capacity of Lake Babcock
 - Losses due to sediment accumulation reduce the overall power production capability of the Columbus Powerhouse

Prior to making the formal decision to proceed with the Evaluation, LPD performed an internal assessment on the increased hydropower production based upon assumed amounts of sediment removed from Lake Babcock. This assessment assumed a market rate of \$60 / MWhr and estimated increases to annual revenue and increases to annual power generation capability based on increases to the volume of Lake Babcock via dredging. The overall depth of Lake Babcock is assumed to be returned to 5 ft to allow for the designed capacity of the Columbus Powerhouse to be met. Table 3 below shows the results of this initial internal assessment and serves to visualize the potential increases in power generation and revenue directly tied to increases in the water holding capacity of Lake Babcock. Figure 8 is intended to display potential dredging increments of 50 acres each in relation to the overall waterbody.

It should also be noted that LPD is a nonprofit organization. Increases in revenue due to increases in overall power generation capability from improvements in Lake Babcock would equate to lower energy fees charged to LPD’s customers. Excess power generated by LPD is sold to the regional grid, reducing local costs.

Table 3 – Lake Babcock Capacity vs. Power Generation



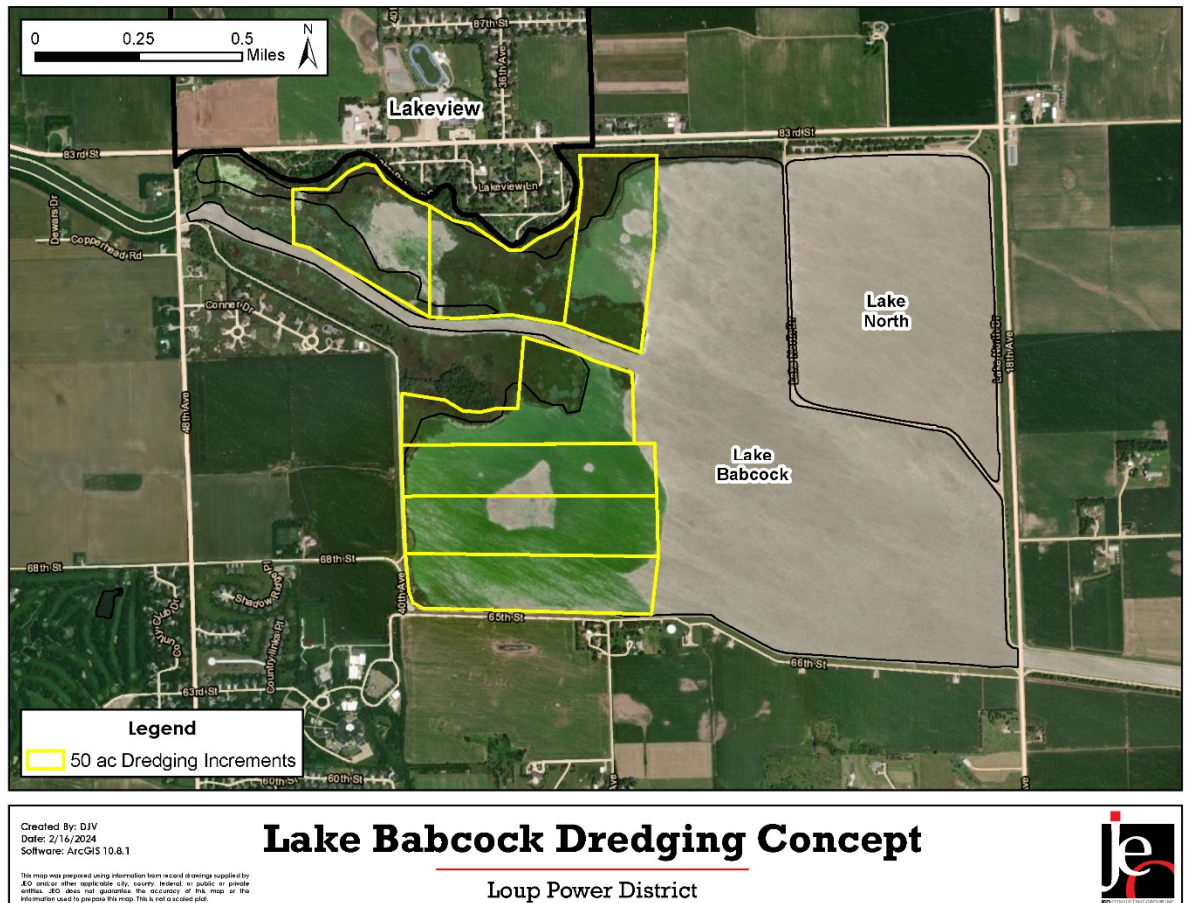


Figure 8 – 50-acre Dredging Increments for Economic Forecast Scenario

Power sales are managed by the Southwest Power Pool (SPP), where the price for generation may fluctuate by 15-minute increments. A major benefit of hydropower to meeting short-term or even day-by-day energy demands, is the relatively small amount of time it takes to activate the Columbus Powerhouse as compared to a traditional coal-fired powerplant. The increased capacity of Lake Babcock enables LPD to meet critical energy demands statewide. The assumed project life is 50-years but could likely be much longer especially if infrastructure is added to reduce future sedimentation rates.

The initial review of cost and benefits did not take into account benefits to the region for increased use of the reservoir post-project due to improved recreational facilities, improved fishing, and other related amenities. Between 2018 and 2023 the campgrounds provided at Lake Babcock were used by more than 2,800 campers, this would likely increase if recreational opportunities were improved at Lake Babcock.

- 3.A Describe any relevant cost information including, but not limited to the engineering and inspection costs, capital construction costs, annual operation and maintenance costs, and replacement costs. Cost information shall also include the estimated construction period as well as the estimated project life (005.01).

The cost for the Evaluation is described in Table 4 and includes engineering, laboratory analysis, survey, hydrogeologic services, and project management. The stakeholder meetings include coordination with project partners, property owners, and general coordination with those potentially impacted when construction would occur. The capacity assessment includes the topographic and bathymetric surveys along with an assessment to review the annual sedimentation rates and estimated quantity of sediment to be removed to make the project beneficial. The alternative analysis includes planning level engineering design and evaluation of benefits and costs for a variety of potential improvement options. The conceptual engineering design phase of the Evaluation will address the dredging operation and the options for transportation and disposal of sediment. The preliminary engineer’s opinion of cost is critical so that LPD has an understanding of the cost magnitude of the construction and dredging project. The Evaluation is estimated to take approximately ten months to complete.

Table 4 - Project Tasks and Costs

TASK	NAME	COST	WSF	LPD
1	Stakeholder Meetings	\$ 10,000	\$ 6,000	\$ 4,000
2	Capacity Assessment	\$ 20,000	\$ 12,000	\$ 8,000
3	Alternative Assessment	\$ 25,000	\$ 15,000	\$ 10,000
4	Conceptual Design & Cost	\$ 30,000	\$ 18,000	\$ 12,000
5	Reporting	\$ 40,000	\$ 24,000	\$ 16,000
	TOTAL	\$ 125,000	\$ 75,000	\$ 50,000
		COST SHARE	60.0%	40.0%

The Evaluation will serve as leverage to obtain future Federal funding. Cost estimates for the potential future project will be a deliverable in the Evaluation.

- 3.B Only primary tangible benefits may be counted in providing the monetary benefit information and shall be displayed by year for the project life. In a multi-purpose project, estimate benefits for each purpose, by year, for the life of the project. Describe intangible or secondary benefits (if any) separately. In a case where there is no generally accepted method for calculation of primary tangible benefits describe how the project will increase water sustainability, in a way that justifies economic feasibility of the project such that the finding can be approved by the Director and the Commission (005.02).

The Evaluation is fundamental in providing a 30% conceptual design for sediment removal and disposal from the reservoir to increase hydropower production capabilities. While the Evaluation will not produce any primary tangible benefits, it will serve as a catalyst to the remainder of the effort, including obtaining funding to complete design, obtain necessary permits, and provide a strategy for construction. Once the future proposed project is completed, tangible benefits may include a steady and renewable source of energy production, and increased LPD revenue leading to reduced fees charged to customers. The Evaluation is fundamental in providing an implementation and funding strategy needed to effectively dredge and dispose of sediment from Lake Babcock to increase the capability of hydropower production.

The Evaluation benefits include:

- Providing a detailed summary of cost vs. benefit to determine the most cost-effective method to address severe sedimentation of Lake Babcock which has decreased its holding capacity significantly.
- Place LPD in a favorable position by using the Evaluation as a catalyst to leverage local and state funding with Federal funding applications, specifically the Bureau of Reclamation WaterSMART and other sources to fund final design and construction.
- Creating a vision for improvements to critical state aging hydropower production infrastructure.

Assuming the project is completed in the future, primary benefits will include:

- Enhancement of hydropower production and support of a state-wide initiative to lower the carbon footprint by sustaining and expanding green energy alternatives.
- Keeping electricity rates low state-wide and for its approximately 21,000 service meters served by LPD's electrical distribution system over a four-county area.
- Continued beneficial use of water resources in the Loup River Basin,

Secondary project benefits, once completed, will include but are not limited to:

- Fishery and aquatic habitat enhancements,
 - Lake Babcock currently has degraded habitat due to high turbidity and primarily supports carp species.
- Improved access for fishing, trails, and camping locations,
- Flood mitigation within the Loup River and Platte River Basin,
- Potential for improvements to existing outdoor education venues including Boy Scout Island and a Girl Scout Camp both located at Lake Babcock,
- Water quality improvements.

Recreation is a major aspect of Lake Babcock. Currently, both the Boy Scouts and Girl Scouts have campsites at the lake. The lake also has two campgrounds that are open to the public, at no charge. Between 2018 and 2023 the campgrounds provided at Lake Babcock were used by more than 2,800 campers. The lake provides habitat for fish, wildlife, and waterfowl. Siltation has created challenges for boats in Lake Babcock.

3.C Present all cost and benefit data in a table to indicate the annual cash flow for the life of the project (005.03).

For the purpose of forecasting the annual cash flow, it was assumed the project construction would be complete and any improvements would have a lifespan of at least 50 years. It is important to note that LPD as this stage is initiation work on this project through completion of a conceptual design. Table 5 shows an estimated increase in hydropower production using assumed quantities. These estimates will be refined and updated as new information is obtained during completion of the Evaluation.

Note that the chart below assumed a market rate of \$60 / MWhr and estimated increases to revenue and power generation capability based on increases to the volume of Lake Babcock via dredging. The overall depth of Lake Babcock is assumed to be returned to 5 ft to allow for the designed capacity of the Columbus Powerhouse to be met. It should also be noted that LPD is a nonprofit organization. Increases in revenue due to increases in overall power generation capability from improvements in Lake Babcock would equate to lower energy fees charged to LPD's customers. Excess power generated by LPD is sold to the regional grid, reducing local costs.

Table 5 – Lake Babcock Capacity vs. Power Generation

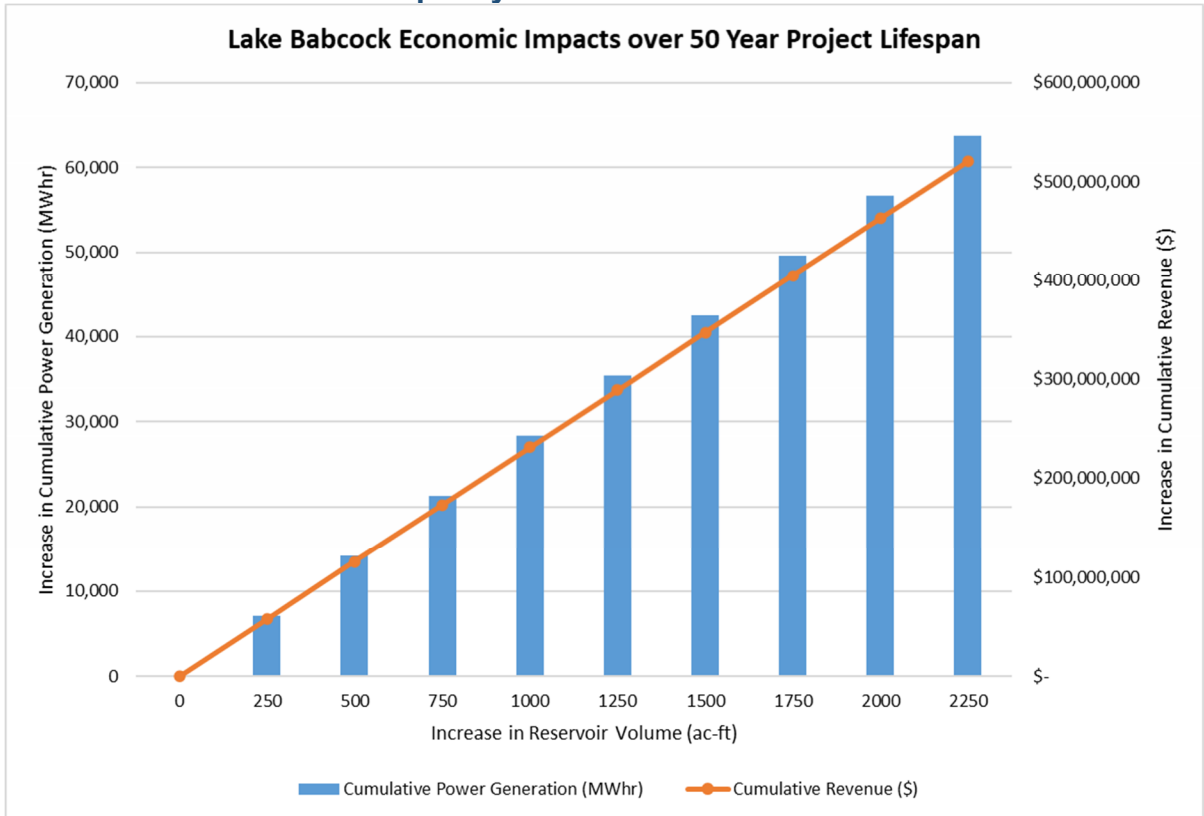


Table 6 - Evaluation Tasks and Costs

TASK	NAME	COST
1	Stakeholder Meetings	\$ 10,000
2	Capacity Assessment	\$ 20,000
3	Alternative Assessment	\$ 25,000
4	Conceptual Design & Cost	\$ 30,000
5	Reporting	\$ 40,000
	TOTAL	\$ 125,500

3.D In the case of projects for which there is no generally accepted method for calculation of primary tangible benefits and if the project will increase water sustainability, demonstrate the economic feasibility of such proposal by such method as the Director and the Commission deem appropriate (005.04). (For example, show costs of and describe the next best alternative.)

In summary, the Evaluation is fundamental in providing a 30% conceptual design for sediment removal and disposal from the reservoir to increase hydropower production capabilities. While the Evaluation will not produce any primary tangible benefits, it will serve as a catalyst to the remainder of the effort, including obtaining

funding to complete design, obtain necessary permits, and provide a strategy for construction. One of the benefits to LPD is to use the Evaluation as a guide to obtain federal funding, specifically Water and Energy Efficiency Grant from the Bureau of Reclamation's WaterSMART program. The LPD also intends to apply for additional local and state funding sources, including a second WSF application.

The Evaluation will be the basis to identify and document the primary tangible benefits for the dredging and disposal, and recreational facilities upgrades project.

Prove Financial Feasibility

(Applicant must demonstrate compliance with Title 261, CH 2 - 006)

4. Provide evidence that sufficient funds are available to complete the proposal.

LPD has verified sufficient funds are committed to paying \$50,000 (40%) of the total project cost of \$125,000. The LPD commitment letter to the Evaluation and financial assurances is shown in Appendix A.

5. Provide evidence that sufficient annual revenue is available to repay the reimbursable costs and to cover OM&R (operate, maintain, and replace).

The LPD has sufficient funds on an annual basis to repay reimbursable costs, and to cover operation, maintenance, and replacement costs. The LPD receives rate payer revenue and is fully prepared to pay the \$50,000 obligated for the Evaluation.

6. If a loan is involved, provide sufficient documentation to prove that the loan can be repaid during the repayment life of the proposal.

N/A

7. Describe how the plan of development minimizes impacts on the natural environment (i.e. timing vs nesting/migration, etc.).

During the Evaluation there will be no impact to the natural environment. Sediment cores will be collected using small auto samplers that are designed to collect the sediment with minimum disturbance.

8. Explain how you are qualified, responsible and legally capable of carrying out the project for which you are seeking funds.

In 1932 the State of Nebraska approved the formation of the Loup River Public Power District, (known today as the Loup Power District) and granted it the right to appropriate Loup River water at 3,500 cubic feet per second (cfs) for the purpose

of hydropower generation. Additionally, the LPD is regulated by FERC under license No. 1256. The FERC license authorizes the operation of hydroelectric power production. The LPD staff of engineers, scientists, and technicians are responsible and qualified to conduct this Evaluation in conjunction with its engineering consultant.

9. Explain how your project considers plans and programs of the state and resources development plans of the political subdivisions of the state.

The LPD sells power to one wholesaler, NPPD. NPPD's demand and purchasing is managed by the SPP. In 2021, NPPD voted in favor of adopting a nonbinding decarbonization goal of net-zero emissions by 2050. Increasing hydropower production capabilities through restoration of Lake Babcock's capacity directly benefits plans and programs of the state and political subdivisions of the state.

Another benefit to achieving these goals is the capability to quickly start up the hydropower. For example, should SPP be relying on other green energy sources such as wind or solar and cannot meet demands, LPD can quickly increase hydropower generation by releasing water from Lake Babcock.

The Evaluation will consider plans and programs of the State of Nebraska and political subdivisions, and the FERC. The Evaluation will work towards goals and objectives outlined in the NeDNR Annual Report to the Legislature and Plan of Work 2021-2022 and the Lower Loup Natural Resources District (LLNRD) Voluntary Integrated Management Plan (VIMP). The FERC license requirements will be met.

The LLNRD VIMP identifies four measurable goals. These goals contribute to the long-term mission of LLNRD of achieving and sustaining a balance between water users and water supplies within the NRD. The Evaluation and future dredging project will help LLNRD meet three of the goals.

LLNRD Goal 1 - Promote and support a water supply and use inventory based on the best available data and analysis.

The Evaluation will support water supply and use to increase hydropower within the Loup River Basin. Increasing storage capabilities in Lake Babcock could result in a lower demand to divert water into the Canal, thus benefiting downstream water users on the Loup and Platte Rivers where the U.S. Fish and Wildlife Service work to manage threatened and endangered species. Furthermore, the Evaluation will utilize the best available data and includes an analysis to most effectively complete the project goals.

LLNRD Goal 2 - Implement this water management plan to maintain an efficient and economical balance between current and future water supplies and demands.

As a water resource management authority in the Lower Loup River Basin, the LPD can work in collaboration with LLNRD on various water management actions. The Evaluation and future dredging project will help maintain a balance between current and future water supplies and demands by increasing storage for water intended for a beneficial use in the Lower Platte River Basin. As mentioned above, the increased capacity in Lake Babcock could decrease the need to divert water from the Loup River.

LLNRD Goal 3 - Develop and implement water use policies and practices that prioritize and contribute to the protection of existing surface and groundwater uses while allowing for future water development.

Once Lake Babcock is restored and expanded, the overall water storage capacity in the LLNRD will be increased. Additionally, 44 agricultural producers in the Loup Canal System will continue to have water for 7,080 acres irrigation.

10. Are land rights necessary to complete your project? YES NO

If yes:

10.A Provide a complete listing of all lands involved in the project. N/A

10.B Attach proof of ownership for each easements, rights-of-way and fee title currently held. N/A

10.C Provide assurance that you can hold or can acquire title to all lands not currently held. N/A

11. Identify how you possess all necessary authority to undertake or participate in the project.

In 1932 the State of Nebraska approved the formation of the Loup River Public Power District, (known today as the Loup Power District) and granted it the right to appropriate Loup River water at 3,500 cfs for the purpose of hydropower generation. Additionally, the LPD is regulated by the FERC under license No. 1256. The FERC license authorizes the operation of hydroelectric power production. The LPD is responsible for operation and maintenance of the Loup Power Project as well as power distribution.

12. Identify the probable consequences (environmental and ecological) that may result if the project is or is not completed.

If the Evaluation and future dredging project are not implemented, there will be environmental and ecological impacts. The LPD's hydroelectric power production system is a green energy source. If Lake Babcock's storage capacity is diminished, hydroelectric power production will be vulnerable. As a result, other non-green energy sources will have to increase production to fill the gap in energy availability. Lake Babcock provides habitat for fish, wildlife, and waterfowl. A renovated lake with a large storage capacity will improve this habitat.

Section C.

NRC SCORING

In the NRC's scoring process, points will be given to each project in ranking the projects, with the total number of points determining the final project ranking list.

The following 15 criteria constitute the items for which points will be assigned. Point assignments will be 0, 2, 4, or 6 for items 1 through 8; and 0, 1, 2, or 3 for items 9 through 15. Two additional points will be awarded to projects which address issues determined by the NRC to be the result of a federal mandate.

Notes:

- The responses to one criterion *will not* be considered in the scoring of other criteria. Repeat references as needed to support documentation in each criterion as appropriate. The 15 categories are specified by statute and will be used to create scoring matrixes which will ultimately determine which projects receive funding.
- There is a total of 69 possible points, plus two bonus points. The potential number of points awarded for each criteria are noted above. Once points are assigned, they will be added to determine a final score. The scores will determine ranking.
- The Commission recommends providing the requested information and the requests are not intended to limit the information an applicant may provide. An applicant should include additional information that is believed will assist the Commission in understanding a proposal so that it can be awarded the points to which it is entitled.

Complete any of the following (15) criteria which apply to your project. Your response will be reviewed and scored by the NRC. Place an N/A (not applicable) in any that do not apply, an N/A will automatically be placed in any response fields left blank.

1. Remediates or mitigates threats to drinking water;
 - Describe the specific threats to drinking water the project will address.
 - Identify whose drinking water, how many people are affected, how will project remediate or mitigate.
 - Provide a history of issues and tried solutions.
 - Provide detail regarding long-range impacts if issues are not resolved.

Since the Canal and Lake Babcock began operating in the 1930s, they have served as a significant groundwater recharge source for the Lower Loup Basin from Genoa to Columbus. Within this area, there are hundreds of private domestic

wells, along with hundreds of irrigation wells. Furthermore, the City of Columbus North Wellfield is situated on the south shore of Lake Babcock and provides water to the nearly 25,000 residents of Columbus. The continuous recharge from Lake Babcock to the principal aquifer supplying these wells is of immense value to ensuring the wells remain a long-term and sustainable water supply for the community. The Evaluation, and ultimately the completion of the project to increase the surface water capacity of Lake Babcock, will help ensure the wellfield and surrounding aquifer remains adequately recharged into the future. This is a great benefit to the City of Columbus's water system (see Figure 9) . Groundwater recharge can also mitigate well interference issues between irrigation, domestic, and public water supply wellfields.



Figure 9 - City of Columbus North Wellfield

Other benefits to drinking water originate from the immense wetland system that has developed at the headgates in Lake Babcock. The Common Arrowhead, a plant that has become well-established in Lake Babcock's shallow water areas, provides uptake of nutrients while also providing valuable habitat to wildlife. Some studies have shown that wetlands can remove 70 to 90 percent of nitrate pollutants – a key function of water purification that is especially important in areas of extensive agriculture⁵. Upon completion of the project, wetlands will be maintained and enhanced through the increase of lacustrine wetland habitats.

⁵ Wetlands & Loup: A Good Mix, May 17, 2023 by LPD

A hydrogeologic assessment will be completed as part of the Evaluation to ensure the design of the project ensures the lake bottom remains sealed to allow adequate surface water capacity to produce hydropower and to mitigate any seepage issues. Seepage issues were a concern when Lake Babcock was constructed, but currently the system remains in equilibrium and continues to serve as a ‘filter’ for pollutants and a source of groundwater recharge in an area with domestic, public water supply, and heavy irrigation well consumption.

2. Meets the goals and objectives of an approved integrated management plan or ground water management plan;
 - Identify the specific plan that is being referenced including date, who issued it and whether it is an IMP or GW management plan.
 - Provide the history of work completed to achieve the goals of this plan.
 - List which goals and objectives of the management plan the project provides benefits for and how the project provides those benefits.

The Evaluation will consider plans and programs of the LLNRD VIMP. The Nebraska Department of Natural Resources and LLNRD reached a joint agreement on the IMP on March 24th, 2016. The effective date of the IMP is June 8, 2016.

The LLNRD VIMP identifies four measurable goals. These goals contribute to the long-term mission of LLNRD of achieving and sustaining a balance between water users and water supplies within the NRD. The Evaluation and future dredging project will help LLNRD meet three of the goals.

LLNRD Goal 1 - Promote and support a water supply and use inventory based on the best available data and analysis.

The Evaluation will support water supply and use to increase hydropower within the Loup River Basin. Increasing storage capabilities in Lake Babcock could result in a lower demand and less diversion from the Loup River into the Canal, thus benefiting downstream water users on the Loup and Platte Rivers. Furthermore, the Evaluation will utilize the best available data and includes an analysis to complete the project goals most effectively.

LLNRD Goal 2 - Implement this water management plan to maintain an efficient and economical balance between current and future water supplies and demands.

As a water resource management authority in the Lower Loup River Basin, the LPD can work in collaboration with LLNRD on various water management actions. The Evaluation and future dredging project will help maintain a balance between current and future water supplies and demands by increasing storage for water intended for a beneficial use in the Lower

Platte River Basin. As mentioned above, the increased capacity in Lake Babcock could decrease the need to divert water from the Loup River.

LLNRD Goal 3 - Develop and implement water use policies and practices that prioritize and contribute to the protection of existing surface and groundwater uses while allowing for future water development.

Once Lake Babcock is restored and expanded, the overall water storage capacity in the LLNRD will be increased. Additionally, agricultural producers in the Loup Canal System will continue to have water for irrigation.

3. Contributes to water sustainability goals by increasing aquifer recharge, reducing aquifer depletion, or increasing streamflow;

List the following information that is applicable:

- The location, area and amount of recharge;
- The location, area and amount that aquifer depletion will be reduced;
- The reach, amount and timing of increased streamflow. Describe how the project will meet these objectives and what the source of the water is;
- Provide a detailed listing of cross basin benefits, if any.

The Canal and Lake Babcock play an essential role in meeting water sustainability goals, providing a source of surface water irrigation to 44 users in 7,080 acres, and by providing groundwater recharge to the surrounding area and reduced sediment in streamflow to the Platte River. Hydropower is a beneficial use of Nebraska's water resources, and the Evaluation will identify a pathway to ensure Lake Babcock remains an important utility to LPD's vision and goals.

Lake Babcock provides surface water for groundwater recharge in multiple locations, including the City of Columbus North Wellfield and nearby irrigation and domestic wells serving two campgrounds and multiple residences. Lake Babcock and Lake North have a combined total of 1,096-acres⁶, just under two square miles. Groundwater levels on the east side of Lake Babcock have declined from 2021 to 2022.

The Evaluation will determine the volume of sediment that must be removed to restore and expand the lake. By having the capacity to store a greater amount of water LPD could potentially divert less water from the headgates and provide greater in-stream flow down the Loup River.

⁶ Final Environmental Assessment for Hydropower License, FERC Project No. 1256-031, June 2016

Lake Babcock and the Canal system also play a role in maintaining surface water flow. Before it flows into the lake, the Loup Power Canal draws water from the Loup River approximately 6 miles southwest of Genoa. At the Canal headworks the velocity of the flow is reduced, allowing part of the sediment consisting of silt and sand to drop out. The Canal runs north of the Loup River for approximately 25 miles until it reaches Lake Babcock, which acts as the forebay to the Columbus Powerhouse, shown in Figure 10.



Figure 10 – Columbus Powerhouse Penstocks⁷

Within the reservoir, the significantly reduced velocity causes most of the remaining sediment to drop out. Flows then pass through the Columbus Powerhouse, where hydroelectric power is produced. The water then flows through the tailrace, where some is diverted for use as recharge surface water in the Columbus Groundwater Recharge Project and the rest is discharged into the Platte River. The canal is designed to carry 3,500 cubic feet per second of water at a velocity of 2.25 feet per second.

The cross-basin benefits are related to the capability of the Canal, and storage within Lake Babcock, to be managed for flow alteration on the Lower Platte River. The peaking operation used for production at the Columbus Powerhouse alters water levels by up to 18 inches in the Platte River between the outlet weir and the City of North Bend downstream. The LPD has established a management strategy that includes operating peaking in a manner to benefit aquatic species in the Lower Platte River. During this time, LPD switches to ‘run-of-canal’ mode to maximize flows in the Platte River, when needed. Run-of-canal mode is when water passes through the Canal without increasing storage in Lake Babcock and Lake North. The Monroe Power Plant operates at run-of-canal mode. Adding capacity within Lake Babcock will allow more flexibility to meet power demands while balancing

⁷ Taken from journalstar.com, photo credit Cole W. Eberle, Columbus Telegram file photo

the environmental needs downstream. Run-of-canal mode also maintains a steady oxygen supply for fish and aquatic organisms.

The effect of the sediment removed at the headworks and captured by Lake Babcock is beneficial to the flow of the Platte River downstream. By facilitating the dredging and restoration of the lake, the Evaluation will result in reduced sediment to the Lower Platte River, thus providing cross basin benefits.

4. Contributes to multiple water supply goals, including, but not limited to, flood control, agricultural use, municipal and industrial uses, recreational benefits, wildlife habitat, conservation of water resources, and preservation of water resources;

- List the goals the project provides benefits.
- Describe how the project will provide these benefits
- Provide a long range forecast of the expected benefits this project could have versus continuing on current path.

As previously described, the Evaluation is a critical first step to determine the most cost-effective manner to improve capacity of Lake Babcock to meet state-wide power demand. The Evaluation will be a catalyst to meeting multiple water supply goals. While the primary purpose of Lake Babcock is hydroelectric power production, it serves other functions as well. Lake Babcock and the Canal provide irrigation, recreation, fish and wildlife habitat, and groundwater recharge for the City of Columbus municipal water supply and serve as a surface water source for the Columbus Groundwater Recharge Project. While storage of flood water within Lake Babcock and Lake North may not have immediate benefits to the City of Columbus and local area, the storage will benefit properties from Genoa downstream to Columbus on the Loup and Platte Rivers.

The Lake Babcock Waterfowl Refuge was established in the 1940s to conserve waterfowl habitat. The refuge is partially located within the Evaluation area and consists of Lake Babcock, Lake North, and some adjoining lands. Hunting is prohibited in the refuge, and both boating and fishing are restricted at Lake Babcock during open waterfowl season. However, fishing and boating are allowed in Lake North year-round. The refuge is managed by the NGPC. The Evaluation, and eventual project to restore capacity for hydroelectric power, would expand existing recreation and wildlife habitat benefits. Figure 11 displays the use of Lake Babcock by migratory waterfowl.



Figure 11 - Migratory Waterfowl on the Lake Babcock Wildlife Refuge

The Evaluation is fundamental in providing the conceptual design needed to lead LPD to an effective approach to effectively dredge and dispose of sediment from Lake Babcock. The Evaluation serves as a catalyst to obtaining federal funding to leverage local and state resources as the project moves towards final design, permitting, and construction. The project will undoubtedly work to sustain all the existing benefits. The Evaluation benefits include:

- Providing a detailed summary of costs vs. benefits to determine the most cost-effective method to address severe sedimentation of Lake Babcock, which has decreased its holding capacity significantly.
- Place LPD in a favorable position by using the Evaluation as a catalyst to leverage local and state funding with Federal funding applications, specifically the Bureau of Reclamation's WaterSMART and other sources to fund final design and construction.
- Creating a vision for improvements to aging hydropower production infrastructure that is critical to the state.

Assuming the project is completed in the future, primary benefits will include:

- Enhancement of hydropower production and support of a state-wide initiative to lower the carbon footprint by sustaining and expanding green energy alternatives.
- Keeping electricity rates low for approximately 21,000 service meters served by LPD's electrical distribution system over a four-county area.
- Continued beneficial use of water resources in the Loup River Basin,
- Improved drought resiliency for hydroelectric power production through increased water storage capacity.

Secondary project benefits, once completed, will include but are not limited to:

- Fishery and aquatic habitat enhancements,
 - Lake Babcock currently has degraded habitat due to high turbidity and primarily supports carp species.
- Improved access for fishing, trails, and camping locations,
- Flood mitigation within the Loup River Basin,
- Potential for improvements to existing outdoor education venues including Boy Scout Island and a Girl Scout Camp both located at Lake Babcock,
- Water quality improvements.

5. Maximizes the beneficial use of Nebraska's water resources for the benefit of the state's residents;

- Describe how the project will maximize the increased beneficial use of Nebraska's water resources.
- Describe the beneficial uses that will be reduced, if any.
- Describe how the project provides a beneficial impact to the state's residents.

LPD is a nonprofit organization thus increases in revenue due to increases in overall power generation capability from improvements in Lake Babcock would equate to lower energy fees charged to LPD's customers. Excess power generated by LPD is sold to the regional grid, reducing local costs. LPD's users benefit directly from this project.

Supplying hydroelectric power, a green energy source that reduces Nebraska's dependence on fossil fuels and reduces its carbon footprint, is a current statewide priority. The power generated by LPD not only benefits the approximately 62,300 people in their service area, but also across the state, as LPD sells its power directly to NPPD through marketing on the SPP. Between only the Monroe and Columbus Powerhouses, LPD can provide power to approximately 8,000 homes annually. Enhancing hydropower capability allows for diversification in the energy portfolio.

Additionally, as a flow-through system, the hydroelectric power process does not consume water. The resulting discharge to the Platte River has a reduced sediment load which is beneficial to the flow of the Platte River. During the restoration and expansion of the lake, additional sedimentation basins will be installed so that even more sediment and pollutants can be treated naturally by wetlands, thereby extending the life of the lake for another 50+ years.

The secondary benefits of the project included improving the status of the current beneficial uses assigned by the Nebraska Department of Environment and Energy (NDEE) to Lake Babcock through Title 117 – Nebraska Surface Water Quality Standards, including recreation, warmwater aquatic life, agricultural supply, industrial supply, and aesthetics. By removing sediment from the waterbody, water quality will be improved, thus improving aquatic species habitat and supplies for agriculture and industrial water supply.

Other statewide benefits include the use of Lake Babcock and Lake North and the entire Canal system for storage of Loup River floodwater. While this may not have an immediate benefit on the local area and parts of Columbus, it will help reduce peak flows on the Loup River below the diversion west of Genoa. During the spring 2019 bomb cyclone, flood waters from the Loup River were stored in the Power Project, including Lake Babcock, thus reducing flows that could further damage downstream properties. Expanding the capacity of Lake Babcock will provide additional flood storage capacity.

The Canal also provides surface water irrigation to users along the canal system with 44 agricultural producers who are permitted to withdraw surface water for \$1 per acre-foot over 7,080 acres. Additionally, groundwater irrigation is enhanced due to groundwater recharging from the Canal and Lake Babcock. Lake Babcock also provides many recreational opportunities. Fish, wildlife and waterfowl are plentiful at Lake Babcock. Two campgrounds in the Lake Babcock area are owned by LPD and are provided free of charge to the community. These campgrounds are fully equipped with electrical hookups which are also free of charge. Between 2018 and 2023 the campgrounds provided at Lake Babcock were used by more than 2,800 campers. In the northwestern portion of Lake Babcock, LPD provides recreational areas to both the Boy Scouts of America and Girl Scouts of America at Boy Scout Island and Girl Scout Camp respectively.



Figure 12 - Excessive Sedimentation and Vegetation within Lake Babcock

6. Is cost-effective;

- List the estimated construction costs, O/M costs, land and water acquisition costs, alternative options, value of benefits gained.
- Compare these costs to other methods of achieving the same benefits.
- List the costs of the project.
- Describe how it is a cost effective project or alternative.

The purpose of the Evaluation is to complete a detailed analysis and consider all critical aspects of a proposed project and to determine the most effective path to success. The LPD is preparing for a major undertaking and intends to partner with multiple agencies to complete the full-scale project. This Evaluation is the first key step. The Evaluation will result in a 30% conceptual design and cost estimate of the preferred alternative and serve as a catalyst to leverage local and state funding with Federal funding applications, specifically the Bureau of Reclamation WaterSMART, and other sources, to fund final design and construction.

The cost of the Evaluation is shown in Table 7. Once a final action alternative is decided by the Evaluation, the cost of the overall future construction project will likely exceed several million dollars. By leveraging federal funding to complete the project, LPD can limit its reliance on local and state funding sources. Having the preliminary design and cost will greatly increase the chances for additional funding sources in the near future.

Table 7 – Evaluation Cost

TASK	NAME	COST	WSF	LPD
1	Stakeholder Meetings	\$ 10,000	\$ 6,000	\$ 4,000
2	Capacity Assessment	\$ 20,000	\$ 12,000	\$ 8,000
3	Alternative Assessment	\$ 25,000	\$ 15,000	\$ 10,000
4	Conceptual Design & Cost	\$ 30,000	\$ 18,000	\$ 12,000
5	Reporting	\$ 40,000	\$ 24,000	\$ 16,000
	TOTAL	\$ 125,000	\$ 75,000	\$ 50,000
		COST SHARE	60.0%	40.0%

Once the project is complete, infrastructure will be put into place that will allow LPD to perform regular silt removal from the reservoir to prolong the value of the overall effort. One concept considered within the Evaluation is adding the ability for LPD to operate excavators to remove sediment from settling basins, potentially placed within the Canal or at the inlet to Lake Babcock. Figure 13 shows an excavator being used to remove sediment from a public water body.



Figure 13 – Use of Excavator to Remove Sediment from a Waterbody (Crystal Lake)

7. Helps the state meet its obligations under interstate compacts, decrees, or other state contracts or agreements or federal law;
 - Identify the interstate compact, decree, state contract or agreement or federal law.
 - Describe how the project will help the state meet its obligations under compacts, decrees, state contracts or agreements or federal law.
 - Describe current deficiencies and document how the project will reduce deficiencies.

Obtaining new clean energy sources, such as wind and solar projects, continues to grow more controversial. As recently seen in several cases in Nebraska, new projects can be difficult to establish. Property owners are reluctant to sell or lose property to solar farms or have windmills placed through the landscape. New transmission lines have also been controversial. Given this magnitude of challenge, it becomes more important to sustain existing hydropower infrastructure to maintain and enhance production capabilities while being able to deliver power from a diverse set of sources statewide.

The Evaluation will meet that goal and create an implementation strategy for LPD to increase power production and help meet increasing power demands. This project will help multiple agencies meet federal demands to reduce the carbon footprint of power generation.

The NDEE is currently establishing the Nebraska Climate Pollution Reduction Plan to reduce greenhouse gas emissions in Nebraska. NDEE is coordinating with other state agencies and government entities to identify voluntary actions and incentive programs to reduce emissions. One of the key sectors includes electricity generation facilities. A Comprehensive Climate Action Plan is due to be published in August 2025. An action to achieve this goal would be to support continued hydropower production within the state of Nebraska.

The LPD has a FERC license (No. 1256) to authorize the operation and maintenance of the Loup River Hydroelectric Project. The Evaluation and the future enhancement project will help the State of Nebraska meet its obligations to FERC by providing a sustainable source of green hydroelectric energy. The Loup Power Canal Project's authorized installed capacity is 50.937 megawatts. Water storage capacity is being reduced and hydroelectric power generation is being threatened due to the sedimentation issues within Lake Babcock. The Evaluation will provide the details necessary to proceed with the project. Recreation is also an important aspect of FERC's agreement with LPD. The project will enhance recreational opportunities and create multiple statewide benefits.

8. Reduces threats to property damage or protects critical infrastructure that consists of the physical assets, systems, and networks vital to the state or the United States such that their incapacitation would have a debilitating effect on public security or public health and safety;
 - Identify the property that the project is intended to reduce threats to.
 - Describe and quantify reductions in threats to critical infrastructure provided by the project and how the infrastructure is vital to Nebraska or the United States.

- Identify the potential value of cost savings resulting from completion of the project.
- Describe the benefits for public security, public health and safety.

Since 1937, the Power Project has served as critical infrastructure to Nebraska and United States due to its capability to produce clean and renewable electricity through hydropower while providing 118 jobs over a four-county area. The primary threat to the system is continuous sedimentation of Lake Babcock causing reduced hydrologic capacity that is critical for hydro cycling water through the Columbus Powerhouse. Given the current focus by NPPD, who purchases power from LPD, to achieve net-zero carbon emissions from their generating sources by 2050, the steady decrease of LPD's hydropower capabilities would have a negative impact on this statewide goal.

LPD serves 22 Nebraska communities with a combined population of about 62,300 people. Between just the Monroe and Columbus Powerhouses, LPD can provide power to approximately 8,000⁸ homes annually. The total service area covers 2,248 square miles and consists of 869 miles of transmission and distribution lines. LPD serves the counties of Platte, Madison, Colfax, and Boone. In addition, LPD sells electric power to one wholesale customer, NPPD.

If LPD went offline, other sources of energy would be required, and Nebraska's power supply would become less diversified and more reliant on traditional power production methods. Lake Babcock plays a crucial role in the system by serving as the forebay to the Columbus Powerhouse. Its role as a forebay is to store water for power production. With diminished storage capacity due to sediment, hydropower generation capacity is threatened.

The Loup River Canal Power Project also serves as a source of water for LLNRD's Columbus Recharge Project, which obtains water from the Canal's tailrace below the Columbus Powerhouse. This project was created after LLNRD technicians observed water levels near Columbus falling from 2010 to 2014. Irrigation wells, commercial wells, and domestic wells were all impacted by decreased groundwater availability. Rather than utilizing regulatory authority over area water users, the recharge project was created to augment groundwater recharge.

Lake Babcock also serves as a source of groundwater recharge along the Canal from Genoa to Columbus. The City of Columbus North Wellfield, directly adjacent to Lake Babcock, relies on the lake for groundwater recharge. Finally, flood waters

⁸ Loup Power District Columbus Powerhouse, Lincoln Journal Star, April 21, 2021

are stored in the Loup Power System, including Lake Babcock and Lake North, such as during the 2019 bomb cyclone event. While flood control due to Lake Babcock does not benefit the City of Columbus, it does provide some protection to communities further downstream.

9. Improves water quality;

- Describe what quality issue(s) is/are to be improved.
- Describe and quantify how the project improves water quality, what is the target area, what is the population or acreage receiving benefits, what is the usage of the water: residential, industrial, agriculture or recreational.
- Describe other possible solutions to remedy this issue.
- Describe the history of the water quality issue including previous attempts to remedy the problem and the results obtained.

Excessive sediment loading can change the physical, chemical, and biological components of the reservoir's ecosystem, which can result in degradation of beneficial uses such as drinking water supplies, electricity production, flood control, and recreation. Without mitigation or rehabilitation, many reservoirs become abandoned.⁹ As previously described, the end goal is to restore capacity within Lake Babcock to improve its capability for hydropower production. Achieving this goal includes many secondary environmental benefits, including improved water quality within the reservoir.

LPD has been working diligently on managing sediment since the Power Project was built in 1937. On an annual basis, LPD dredges 2,004,800 tons of sediment from the settling basin. Approximately 561,300 tons (28 percent) of this sediment returns to the Loup River from the south Sand Management Area adjacent to the settling basin west of Genoa. In addition to the sediment dredged from the settling basin, it is estimated that 350,000 tons of sediment are deposited in the Canal, Lake Babcock, Lake North, and the tailrace canal. Therefore, the Power Project removes 1,793,500 tons of sediment annually from the river system, which is slightly less than the average annual sediment yield of the Platte River near Duncan, Nebraska and is 43.0 percent of the average sediment annual yield of the Loup River upstream of the diversion weir.¹⁰

Even though sediment is dredged at the headworks, sediment is still flowing into Lake Babcock. As the lake fills, less sediment storage capacity is available.

⁹ Best Management Practices Manual, Chapter 3: Sedimentation, friendsofreservoirs.com

¹⁰ Final Environmental Assessment for Hydropower License, FERC Project No. 1256-031, June 2016

Therefore, more silt and sand is able to pass through the lake and is released from the Canal into the Lower Platte River.

The Evaluation will determine the amount of sediment currently in Lake Babcock, create a plan for disposal of sediment, considerations to reduce future sedimentation, and will include design features to benefit aquatic and wildlife habitat, fishery access, and other recreational benefits.

An additional element of the Evaluation will be to identify sources of sediment to the Canal other than the primary source from the Loup River. Based upon the FERC Environmental Assessment completed in 2016, there are 12 identified culverts that discharge runoff from small drainage areas into the Canal between the intake gate structure and the Columbus powerhouse. The Evaluation will include delineation of each of the 12 drainages and a desktop and field evaluation to determine planning-level sediment loading into the Canal from each drain. The Evaluation will make recommendations for best management practices, such as establishment of sediment forebays, wetlands, or other practices, which will reduce future sedimentation to the Canal. Sediment in stormwater runoff or irrigation return water carries nutrients and other pollutants. This will further benefit water quality for Lake Babcock and the Canal. The sub-watershed for one of the 12 drainages is shown in Figure 14.

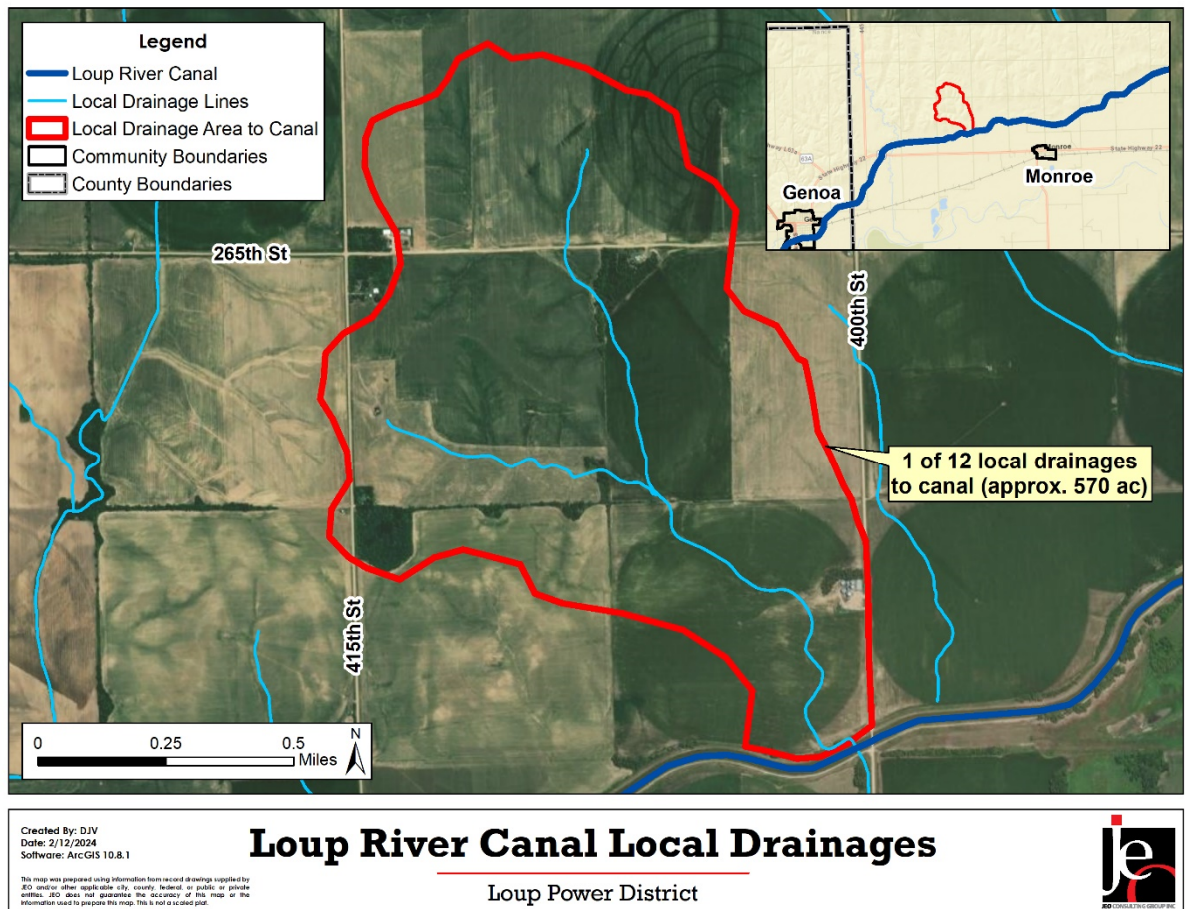


Figure 14 – Example of a Local Drainage to the Canal

10. Has utilized all available funding resources of the local jurisdiction to support the program, project, or activity;

- Identify the local jurisdiction that supports the project.
- List current property tax levy, valuations, or other sources of revenue for the sponsoring entity.
- List other funding sources for the project.

The LPD is the local jurisdiction that is sponsoring the project. LPD is based in Columbus and serves 22 Nebraska communities with a combined population of about 62,300 people. Between just the Monroe and Columbus Powerhouses, LPD can provide power to approximately 8,000¹¹ homes annually. The total service area covers 2,248 square miles and consists of 869 miles of transmission and distribution lines. LPD serves the counties of Platte, Madison, Colfax, and Boone.

¹¹ Loup Power District Columbus Powerhouse, Lincoln Journal Start, April 21, 2021

In addition, the District sells electric power to one wholesale customer, NPPD, where power is then distributed throughout Nebraska.

The LPD is governed by a nine-member Board of Directors. The service area map and political subdivisions are shown in Figure 15.

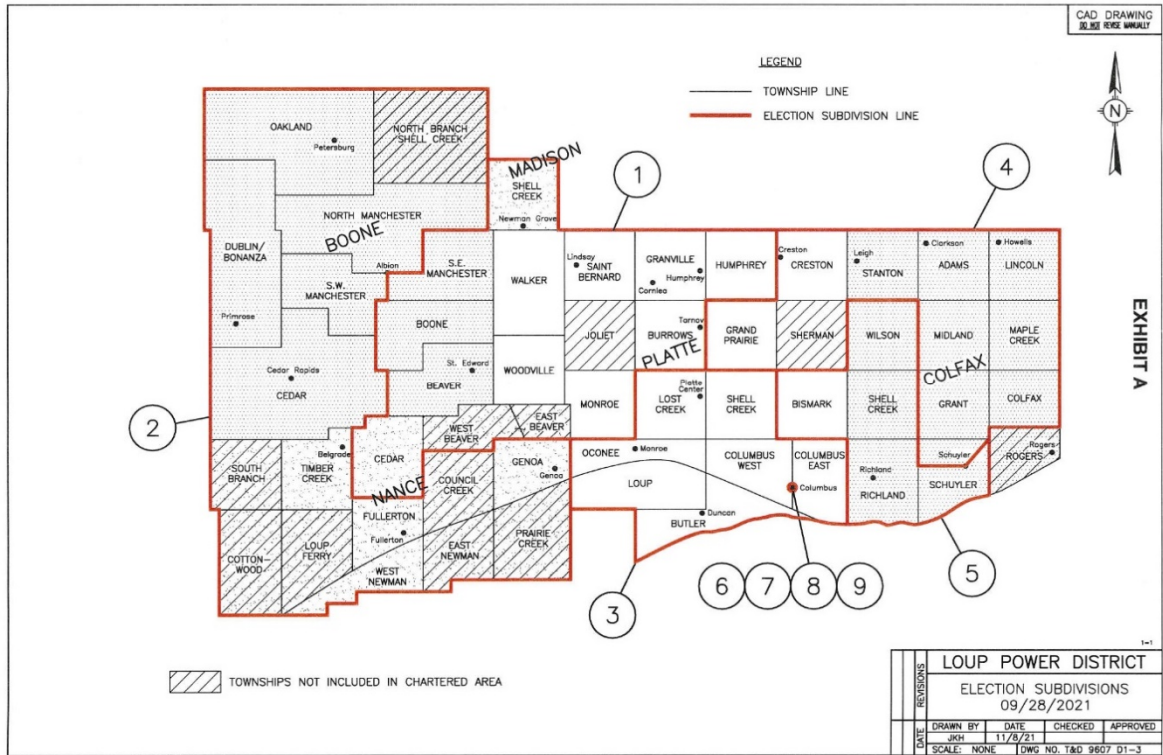


Figure 15 - LPD Election Subdivisions and Service Area

It should also be noted that LPD is a nonprofit organization. Increases in revenue due to increases in overall power generation capability from improvements in Lake Babcock would equate to lower energy fees charged to LPD’s customers. Excess power generated by LPD is sold to the regional grid, reducing local costs. LPD has sufficient funds on an annual basis to repay reimbursable costs, and to cover operation, maintenance, and replacement costs of all its projects.

There are no other funding sources besides LPD and WSF for the Evaluation. The Evaluation will serve as a catalyst to leverage local and state funding with Federal funding applications to complete the full project, specifically the Bureau of Reclamation WaterSMART and other sources to fund final design and construction. Upon completion of the Evaluation, LPD will work to obtain partnerships with multiple funding agencies that may include NGPC, LLNRD, WSF, City of Columbus, in addition to federal sources.

11. Has a local jurisdiction with plans in place that support sustainable water use;

- List the local jurisdiction and identify specific plans being referenced that are in place to support sustainable water use.
- Provide the history of work completed to achieve the goals of these plans.
- List which goals and objectives this project will provide benefits for and how this project supports or contributes to those plans.
- Describe and quantify how the project supports sustainable water use, what is the target area, what is the population or acreage receiving benefits, what is the usage of the water: residential, industrial, agriculture or recreational.
- List all stakeholders involved in project.
- Identify who benefits from this project.

The Power Project is located in Nance and Platte Counties, Nebraska and is owned and operated by LPD of Columbus, Nebraska. The LPD is the jurisdiction responsible for completing the Evaluation. Through the FERC license, LPD is responsible for operation and maintenance to continue the Canal Project. The LPD is governed by a nine-member Board of Directors composed of local officials residing within the LPD boundaries of Platte, Madison, Colfax, and Boone counties. The Board of Directors has authorized completion of the Evaluation. A description of the Power Project is shown in Figure 16.

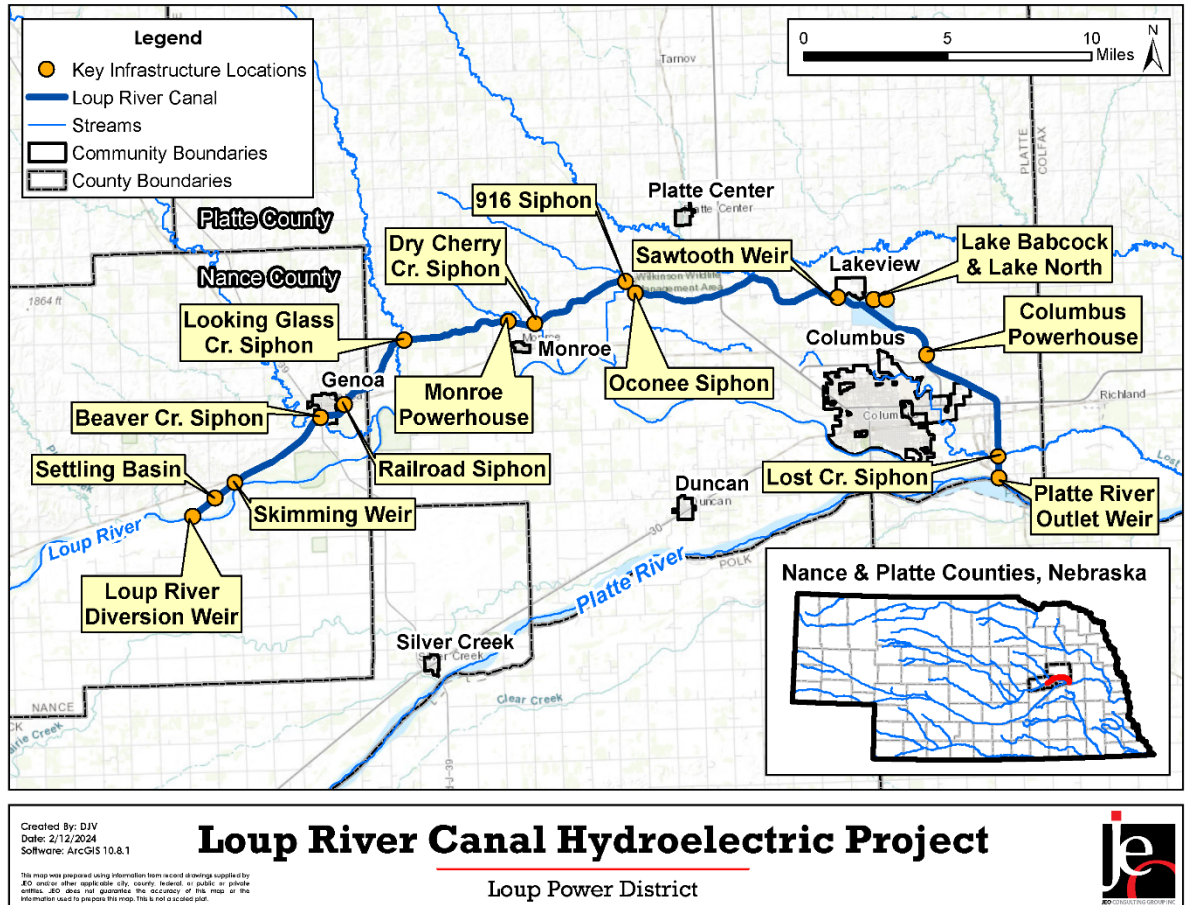


Figure 16 – Loup River Hydroelectric Project

Other projects completed by LPD in the past include the construction of Lake North in 1962. This extension to Lake Babcock created an additional 202-acre storage reservoir within Lake Babcock. The goal was to prevent further sedimentation through the main water body to maintain capacity for hydroelectric power production. The two reservoirs are linked by a concrete control structure. The completion of Lake North is a prime example of the continued commitment by LPD to make the Power Project system sustainable for the long term.

The primary project goal, and purpose of the Evaluation, is to establish a detailed strategy to increase the storage capacity of Lake Babcock. Ultimately this will allow LPD to sustain the Power Project and increase hydropower production at the Columbus Powerhouse for all Nebraskans, while also enhancing recreation opportunities. Additional goals include evaluation of sedimentation sources and design of concepts to mitigation future sedimentation and to enhance capabilities to remove sedimentation as it occurs in the future.

The primary driver, or plan, guiding the effort is LPD's responsibilities for operation of the Canal Project through the FERC license. Through the FERC relicensing process, LPD has outlined multiple water resource and energy developments that involve some degree of economic, cultural, and environmental impacts. These potential impacts were reviewed by multiple agencies.

The District has added numerous enhancements for environmental protection, safety, and public recreation at various Project locations since the Project was placed into commercial operation. One of the primary documents guiding actions taken by the LPD are documented under the Final Environmental Assessment for Hydropower License for the Loup River Hydroelectric Project for FERC Project No. 1256-031. In 2021, LPD filed for a new major license to continue operations. In working with FERC, this document describes proposed actions, facilities, outlines operations, project boundaries, required environmental actions, summarized public involvement, and areas of concern.

Partners supporting this project, starting with the Evaluation, include the LLNRD. The project also meets actions identified by FERC during relicensing of the Canal Project.

The Evaluation will consider plans and programs of the State of Nebraska and political subdivisions, and the FERC. The Evaluation will work towards goals and objectives outlined in the NeDNR Annual Report to the Legislature and Plan of Work 2021-2022 and the Lower Loup Natural Resources District (LLNRD) VIMP. The FERC license requirements will be met.

The LLNRD VIMP identifies four measurable goals. These goals contribute to the long-term mission of LLNRD of achieving and sustaining a balance between water users and water supplies within the NRD. The Evaluation and future dredging project will help LLNRD meet three of the goals.

LLNRD Goal 1 - Promote and support a water supply and use inventory based on the best available data and analysis.

The Evaluation will support water supply and use to increase hydropower within the Loup River Basin. Increasing storage capabilities in Lake Babcock could result in a lower demand to divert water into the Canal, thus benefiting downstream water users on the Loup and Platte Rivers. Furthermore, the Evaluation will utilize the best available data and includes an analysis to most effectively complete the project goals.

LLNRD Goal 2 - Implement this water management plan to maintain an efficient and economical balance between current and future water supplies and demands.

As a water resource management authority in the Lower Loup River Basin, the LPD can work in collaboration with LLNRD on various water management actions. The Evaluation and future dredging project will help maintain a balance between current and future water supplies and demands by increasing storage for water intended for a beneficial use in the Lower Platte River Basin. As mentioned above, the increased capacity in Lake Babcock could decrease the need to divert water from the Loup River.

LLNRD Goal 3 - Develop and implement water use policies and practices that prioritize and contribute to the protection of existing surface and groundwater uses while allowing for future water development.

Once Lake Babcock is restored and expanded, the water storage capacity in LLNRD will be increased. Additionally, agricultural producers in the Loup Canal System will continue to have water for irrigation.

The stakeholders for the proposed Evaluation include:

- The City of Columbus
- Lower Loup Natural Resources District
- Federal Energy Regulatory Commission
- The Columbus Groundwater Recharge Project
- Boy Scouts of America
- Girls Scouts of America
- Nebraska Game and Parks Commission
- Platte County
- Nebraska Department of Natural Resources
- The approximately 62,300 citizens residing in the LPD service area
- The citizens of the State of Nebraska that utilize power from NPPD
- 109 irrigators in the LPD service area
- Archer Daniels Midland (ADM)
- Loup River upstream users that have water rights junior to the LPD
- Platte River downstream users that receive the sediment reduced water

Because LPD sells wholesale power to NPPD, the entire State of Nebraska will benefit from the project by receiving increased power supply from a carbon-free renewable energy source to meet an increasing demand. Other local benefits to stakeholders include a sustained source of groundwater recharge for the City of Columbus North Well Field. The Columbus Groundwater Recharge Project, including the City of Columbus, Christophers Cove Homeowners Association,

ADM, and Platte County, will continue to receive canal water for recharge. The NGPC benefits through aquatic and wildlife habitat enhancements that will be secondary benefits of the future project. The NeDNR Annual Report goals will also be met.

12. Addresses a statewide problem or issue;

- List the issues or problems addressed by the project and why they should be considered statewide.
- Describe how the project will address each issue and/or problem.
- Describe the total number of people and/or total number of acres that would receive benefits.
- Identify the benefit, to the state, this project would provide.

Obtaining new clean energy sources, such as wind and solar projects, continues to grow more controversial and new projects are difficult to establish. Property owners are reluctant to lose property to solar farms or have windmills placed through the landscape. Presented with these challenges, it becomes more important to sustain existing hydropower infrastructure to maintain and/or enhance power production capabilities.

The Evaluation and eventual project have statewide significance because LPD sells power to one wholesaler, the NPPD. In 2021, NPPD voted in favor of adopting a nonbinding decarbonization goal of net-zero emissions by 2050. Increasing LPD's hydropower production capabilities through restoration of Lake Babcock's capacity directly benefits plans and programs of the state and political subdivisions of the state.

Another benefit to achieving these goals is the capability to quickly start up the hydropower. For example, should SPP be relying on other green energy sources such as wind or solar and cannot meet demands, LPD can quickly increase hydropower generation by releasing water from Lake Babcock. Summer energy demands often involve high demand from pivot irrigation systems.

LPD serves 22 Nebraska communities with a combined population of about 62,300 people. Between just the Monroe and Columbus Powerhouses, LPD can provide power to approximately 8,000¹² homes annually. The total service area covers 2,248 square miles and consists of 869 miles of transmission and distribution lines.

¹² Loup Power District Columbus Powerhouse, Lincoln Journal Star, April 21, 2021

LPD provides power service to the counties of Platte, Madison, Colfax, and Boone, and indirectly throughout the State via NPPD's distribution system.

The State of Nebraska is adversely affected by having a small number of energy sources. A robust and diversified portfolio of energy sources such as coal, hydroelectric, natural gas, nuclear, wind and solar is vital to the state. An important benefit will be that the project will help contribute green energy to a diversified portfolio of energy sources. By ensuring the resiliency of a green energy source, the Study also helps to reduce the state's reliance on fossil fuels. Additionally, hydroelectric power production does not consume water.

13. Contributes to the state's ability to leverage state dollars with local or federal government partners or other partners to maximize the use of its resources;

- List other funding sources or other partners, and the amount each will contribute, in a funding matrix.
- Describe how each source of funding is made available if the project is funded.
- Provide a copy or evidence of each commitment, for each separate source, of match dollars and funding partners.
- Describe how you will proceed if other funding sources do not come through.

For the Evaluation, LPD is the only funding source besides the WSF. Looking ahead, the LPD will utilize the Evaluation and the 30% project design and cost estimate resulting from the Evaluation to leverage local and state resources with federal funding, specifically Water and Energy Efficiency Grant through the Bureau of Reclamation's WaterSMART program. The Evaluation will be written in a manner to expedite the WaterSMART application process. Furthermore, federal funding applications typically score higher when the applicant provides a detailed path forward. The purpose for beginning with the Evaluation is to ensure the most cost-effective approach is selected for the eventual dredging of Lake Babcock along with any other mitigation efforts to reduce future sedimentation or to place infrastructure so LPD can more easily manually remove sediment with equipment such as long-reach excavators.

As the lead partner and funding authority for the Evaluation, LPD's Engineering team will work and coordinate with stakeholder organizations and the public that may be affected by the recommended project. A consultant will be hired by LPD to complete the Evaluation and conceptual design. LPD will work with NeDNR on the implementation of the Evaluation, grant management, and technical and procedural reviews. The cost breakdown is shown in Table 8. The LPD Letter of Commitment is provided in Appendix A.

Table 8 - Project Tasks and Costs

TASK	NAME	COST	WSF	LPD
1	Stakeholder Meetings	\$ 10,000	\$ 6,000	\$ 4,000
2	Capacity Assessment	\$ 20,000	\$ 12,000	\$ 8,000
3	Alternative Assessment	\$ 25,000	\$ 15,000	\$ 10,000
4	Conceptual Design & Cost	\$ 30,000	\$ 18,000	\$ 12,000
5	Reporting	\$ 40,000	\$ 24,000	\$ 16,000
	TOTAL	\$ 125,000	\$ 75,000	\$ 50,000
		COST SHARE	60.0%	40.0%

LPD has sufficient funds on an annual basis to repay reimbursable costs, and to cover operation, maintenance, and replacement costs. LPD receives rate payer revenue and is committed to paying the \$50,000 share of the Evaluation.

If the WSF is not successful, LPD will regroup and potentially reapply or seek other funding sources. Given the statewide benefits of enhancing hydropower production, the LPD intends to partner with other agencies and groups, such as the NRC and NeDNR, to complete the full project in the future.

14. Contributes to watershed health and function;

- Describe how the project will contribute to watershed health and function in detail and list all of the watersheds affected.

Lake Babcock and the Power Project are significant water resource components of the Lower Loup River Watershed. These lands are managed by LPD, NGPC, the City of Columbus, and other entities for public hunting and fishing, wildlife viewing, hiking, and primitive camping. Lake Babcock is managed as a waterfowl refuge, with the establishment of the Lake Babcock Waterfowl Refuge in the 1940s to conserve waterfowl habitat. The refuge is partially located within the Evaluation area and consists of Lake Babcock, Lake North, and some adjoining lands. Hunting is prohibited in the refuge, and both boating and fishing are restricted at Lake Babcock during open waterfowl season. However, fishing and boating are allowed in Lake North year-round. The refuge is managed by NGPC.

A vast quantity of wetlands has also become established because of the Power Project. LPD has established wetland mitigation sites in the past to offset impacts as construction has occurred in wetland areas. LPD has been heavily involved in wetland conservation and management for decades. Many benefits of the Power Project are obvious, including recreation and irrigation. In an agri-business state like Nebraska, there is no more important resource than a good, dependable, and

readily available supply of water. But there are other benefits as well. The environmental richness and diversity of LPD's associated wetlands may be overlooked at times. Upon completion of the project, the wetland diversity at Lake Babcock will be greatly enhanced. Areas as shown in Figure 17 have become substantially silted and resulted in a monoculture of wetland species. By providing additional deep water and lacustrine wetland habitat, aquatic species will benefit.



Figure 17 - Existing Wetland Habitat Within Silted Portions of Lake Babcock

The diversion of the Loup River has increased fisheries, expanded wetlands, and improved habitat for waterfowl, shorebirds, and other wildlife throughout the project area. This creates obvious recreational benefits, but also benefits threatened and endangered birds, such as whooping cranes, least terns, and piping plovers.

Lake Babcock (LP1-L0450) has been assigned as a Title 117 waterbody by NDEE with beneficial uses including recreation, warmwater aquatic life, agricultural supply, industrial supply, and aesthetics.

The 35.2-mile-long power canal (which includes the 200-acre Lake North and the 760-acre Lake Babcock) supports a multi-species assemblage of warmwater fish. From among the 20 species of fish collected by NGPC in the power canal in 2010 (which included sampling in Lake North), 9 species were considered to be sport fish, including black crappie, white crappie, bluegill, channel catfish, flathead catfish, largemouth bass, white bass, sauger, and walleye. Based on these sampling results, channel catfish, flathead catfish, and white crappie were the most

abundant sport fish present in the power canal. Freshwater drum, a sought-after fish by anglers, were also abundant¹³.

Additionally, the expansion of Lake Babcock will improve drought resiliency and increase the availability of water for groundwater recharge. The City of Columbus North Wellfield is situated on the south shore of Lake Babcock and benefits from this source of recharge. As the lake becomes silted, less fresh water is available for groundwater recharge.

15. Uses objectives described in the annual report and plan of work for the state water planning and review process issued by the department.

- Identify the date of the Annual Report utilized.
- List any and all objectives of the Annual Report intended to be met by the project
- Explain how the project meets each objective.

The Evaluation will work towards goals and objectives outlined in the NeDNR Annual Report to the Legislature and Plan of Work 2021-2022. The NeDNR Annual Report identifies six measurable goals. These goals contribute to the long-term mission of NeDNR of protecting and managing water resources in the State of Nebraska. The Evaluation and future dredging project will help NeDNR meet five of the goals and objectives.

NeDNR Goal #1 – Establish strong state leadership, involvement, and support for science-based decision making that is necessary to sustain state and local water management outcomes.

The Evaluation will support this goal by demonstrating that the NRC and NeDNR supports hydroelectric power production and green energy in the State of Nebraska. Using data derived from the bathymetric survey, sound engineering principles, and cost estimating procedures, science-based decisions can be made for the future of Lake Babcock.

NeDNR Goal #2 - Provide high quality products and services through the performance of our duties in the areas of floodplain management, flood mitigation planning, dam safety, and survey to promote the safety of all Nebraskans.

¹³ Final Environmental Assessment for Hydropower License, FERC Project No. 1256-031, June 2016

The Power Project provides flood mitigation for the Lower Loup River. During floods, LPD has the capability to maximize its holding capacity within the Canal, Lake Babcock, and Lake North. The Evaluation and future rehabilitation project will provide increased flood reduction benefits by increasing the hydrologic capacity of Lake Babcock. During the spring 2019 bomb cyclone, floodwater from the Loup River was stored in the Loup Power Canal System, including Lake Babcock.

NeDNR Goal #3 - Develop and implement customized and decentralized water management plans established through collaboration with local Natural Resource Districts and stakeholders that provide for long-term sustainability of the state's water resources.

The LPD is considered a water management partner with LLNRD. The LPD tailrace canal is a source of surface water for the Columbus Recharge Project, a completed conjunctive management effort to offset issues from groundwater depletions. Furthermore, the LPD is utilizing water resources within the Lower Loup River basin for multiple beneficial uses for citizens of the State of Nebraska.

NeDNR Goal #4 - Encourage strong public engagement with multiple constituents and stakeholder groups in planning and implementation activities to ensure that local and state needs are addressed.

Through completion of the Evaluation, the LPD will engage multiple stakeholders, including the City of Columbus, LLNRD, NGPC, neighboring property owners, and two scouting organizations utilizing Lake Babcock for outdoor education.

NeDNR Goal #5 - Protect existing water uses through collaborative investments in water resource projects, planning, administration and permitting of surface water rights, and the registration of groundwater wells.

The Evaluation and future rehabilitation project are important to restore and increase Lake Babcock's storage capacity and therefore ensure that hydroelectric power is generated by LPD. LPD has a surface water right to 3,500 cubic feet per second that dates to 1932. As one of the oldest water rights in the Loup River Basin, LPD works collaboratively with surface water users with junior rights to share the water resources. As a measure of collaboration, the 109 agricultural producers utilizing the 35-acre Canal are charged only \$1 per acre-foot for irrigation water. They irrigate approximately 7,000 acres.

16. Federal Mandate Bonus. If you believe that your project is designed to meet the requirements of a federal mandate which furthers the goals of the WSF, then:

- Describe the federal mandate.

- Provide documentary evidence of the federal mandate.
- Describe how the project meets the requirements of the federal mandate.
- Describe the relationship between the federal mandate and how the project furthers the goals of water sustainability.

LPD received a new Federal Energy Regulatory Commission (FERC) license for the operation of the Loup River Hydroelectric Project in 2017. In its operations, LPD must comply with FERC environmental regulations as well as those from several state and federal environmental agencies, like the U.S. Army Corps of Engineers, the U.S. Fish & Wildlife Service, and the NGPC. Much of this regulation pertains to the maintenance and conservation of wetlands. Any work to enhance the continued operation at Lake Babcock will directly benefit LPD in meeting the mandates outlined in the FERC license.

The Energy Policy Act 42 USC 15852 and 13201 (2005) addresses energy production in the United States including.

- Energy efficiency
- Renewable energy
- Oil and gas
- Coal
- Nuclear
- Hydropower
- Geothermal

In accordance with Section 203, each fiscal year the federal government must consume at least 7.5% of its total electricity from renewable sources such as hydroelectric power.

The Evaluation and future dredging project will also help meet the Federal Agency Use of Renewable Electric Energy under the Federal Energy Management Program (FEMP). FEMP helps agencies meet statutory renewable electricity requirements and accomplish their missions through investing in lasting and reliable energy-generation projects.

The Evaluation and future dredging project will provide green energy hydroelectric power production helping the federal government meet their energy consumption requirements.

The relationship between the federal mandate and the project will further the goals of water sustainability. There are multiple FERC requirements that interact with hydropower production along with federal law and executive orders. Having a

robust and expanded capacity to hold water within Lake Babcock will help meet the goals of water sustainability.