NEBRASKA NATURAL RESOURCES COMMISSION

Water Sustainability Fund

Application for Funding

Section A.

ADMINISTRATIVE

PROJECT NAME: Pine Lake Rehabilitation Project

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

Sponsor Business Name: Pine Lake Association

Sponsor Contact's Name: Aaron Mittelstet

Sponsor Contact's Address: 7831 Dougan Drive

Sponsor Contact's Phone: 405-612-9987

Sponsor Contact's Email: aaronmittelstet@gmail.com

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

   Grant amount requested. $ 1,042,140

   - If requesting less than 60% cost share, what %? 46%

   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. N/A
- 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☐ Obtained: YES☐ NO☒
DNR Surface Water Right	N/A☐ Obtained: YES☐ NO☒
USACE (e.g., 404/other Permit)	N/A☐ Obtained: YES☐ NO☒
FEMA (CLOMR)	N/A☐ Obtained: YES☐ NO☒
Local Zoning/Construction	N/A☐ Obtained: YES☐ NO☒
Cultural Resources Evaluation	N/A☐ Obtained: YES☐ NO☒
Other (provide explanation below)	N/A☐ Obtained: YES☐ NO☒

We will need to obtain a local floodplain permit, USACE Regulatory 404, NPDES (SWPPP) and NDEE 401. The Flatwater Group will assist the PLA in applying and obtaining these permits in the spring and summer of 2023. The permits will cost $6,000.

4. **Partnerships**

List each Partner / Co-sponsor, attach documentation of agreement:
Lower Platte South NRD

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

The Lower Platte South Natural Resource District (LPSNRD) paid 40% ($40,528) of the emergency repairs on the Pine Lake Dam in Summer 2020. At their meeting on June 15, 2022, the LPSNRD Board approved an additional $49,500 for the Pine Lake Association (PLA) watershed assessment and outlet structure design phase of a multi-phase rehabilitation project (Appendix A p. 1). At the November 16, 2022, Board meeting, the LPSNRD approved PLA's request for an additional $15,000 for the watershed assessment and outlet structure design phase (Appendix A, p. 2).

Upon completion of the final outlet structure design, permitting, and bidding for construction estimates for the project, the PLA will seek an additional cost-share of $512,900 from the LPSNRD to remove sediment from two retention ponds, replace the outlet structure for the Pine Lake Dam, and conduct watershed improvements.

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.

Phase	Timeline	Total Cost	Pine Lake Association (PLA)	LPSNRD
0. Emergency Repairs Main Dam	Summer 2020	$102,934	$65,067	$40,528
I. Bathymetric & Sediment Depth Survey	Fall 2021	$25,000	$25,000	
II. Watershed Assessment & Outlet Structures	Summer/Fall 2022	$144,000	$79,500	$64,500
100-Project Management		$10,000	$5,000	$5,000
200-Pine Lake Watershed Analysis		$16,000	$8,000	$8,000
300-Preliminary Design: Lake Bottom Grading Plan		$15,000	$15,000	
400-Outlet Structure Evaluation		$19,000	$9,500	$9,500
500-Preliminary Design: Outlet Structures (2)		$32,000	$16,000	$16,000
600-Final Design: Outlet Structures (2)		$22,000	$11,000	$11,000
601-Dam Repair Option 2: Additional Design Fee		$30,000	$15,000	$15,000
III. Finalize Financing of Project	Summer 2022-Summer 2023	No Cost		

IV. Construction Management	Fall 2023-Spring 2024	$106,000	$87,500	$18,500
700-Permitting		$6,000	$6,000	
800-Final Design: Lake Bottom Grading Plan		$20,000	$20,000	
900-Bidding Services		$6,000	$6,000	
1000-Construction Related Services		$22,000	$16,500	$5,500
1100-Construction Observation/Inspection		$38,000	$28,500	$9,500
1200-Final As-Built Plans		$14,000	$10,500	$3,500
Estimated Construction Costs		$2,143,800	$1,649,400	$494,400
a. Removal of sediment-2 holding ponds		$8,000	$4,000	$4,000
b. Excavation of Lake		$1,155,000	$1,155,000	
c. Watershed Improvements		$75,000	$37,500	$37,500
d. Outlet Structure Construction		$905,800	$452,886	$452,886

The work and finances for Phases 0, I, II, and III are completed and as such, PLA is not requesting a cost-share for these phases of the project in this WSF grant proposal.

Total estimated cost for Phase IV - Construction Management and estimated construction costs is $2,249,800. Finances have not been finalized as we are in the process of seeking permits required prior to bidding for construction costs.

Upon completion of the permitting and bidding for construction estimates, the PLA will seek an additional cost-share of $512,900 from LPSNRD to remove sediment from two retention ponds, replace the outlet structure for the Pine Lake Dam, and conduct watershed improvements. This will result in an unfunded balance of $1,736,900 of which the PLA is requesting 60% or $1,042,140 from the Water Sustainability Fund (WSF). PLA will cover the remaining $694,760 (40%) through funds already in hand ($500,000, Appendix A, p. 3) and assessments of PLA's 135 homeowners.

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 Pine Lake neighborhood accounts for roughly 50% of the Pine Lake watershed. The remainder of the watershed is upstream from Pine Lake and is not owned or managed by the residents of PLA. The residents of Pine Lake take an integrated and holistic approach to the management of both the waters coming into the Pine Lake watershed from outside the neighborhood and from challenges within the neighborhood. The PLA's goal is for the water leaving the lake and flowing into the

Upper Beal Slough to be cleaner than when it first entered the portion of the Pine Lake watershed that our neighborhood stewards. Most water into Pine Lake flows in from the Southeast. Intense development has occurred around PLA since the lake was excavated in 1996. The percent of the Pine Lake watershed classified as urban in 2001 was 26% compared to 71% in 2019 (Figures 1 and 2). This development has led to the accelerated build-up of sediment in the network of PLA-managed holding ponds and in the lake itself. According to a 2021 bathymetric and depth of sediment survey of Pine Lake, The Flatwater Group (TFG) estimates there is currently approximately 55,000 cy of sediment deposition. While open lots suitable for development in the Eastern portion of the Pine Lake watershed are available, the most intensive development is now complete. This sediment has greatly reduced the storage capacity of the lake. It is the intent of the PLA to repair the holding ponds, to install rock checks and erosion control, to assess, repair, and update critical outlet structures and water retention systems and dams, and to remove the sediment that has accumulated in the lake over the past 25 years. Our goal is to improve the watershed's and lake's overall health, longevity, and structural integrity. These changes will result in a cleaner and more healthy lake with improved water quality in the Lake, Beal Slough, and Salt Creek, enhanced sediment control, and will maximize stormwater management and flood control downstream. The anticipated completion date for the project at Pine Lake is the summer of 2024. The inlet pipe, riser, and outlet pipe of the main dam structure is 60 years old and failed inspection by Nebraska Dam Safety and an emergency repair had to be made in 2020 (see budget above). This was a temporary stop-gap solution and did not address the entire structure. The dam offers protection for Nebraska Parkway and Beal Slough. The inlet and riser pipes are corroded and threaten the integrity of the dam. It is therefore unsafe for the PLA to adjust the water level of the lake given the antiquated engineering and eroded structural integrity of the riser. To reduce erosion from across the watershed, rock checks and bank reinforcement are needed to control runoff that occurs from outside the neighborhood. The objectives of this project are to 1) replace the dam structure; 2) excavate Pine Lake; 3) excavate and repair the three retention ponds east and south of Pine Lake; and 4) reduce erosion and runoff from surfaces outside of PLA's portion of the watershed. These changes will result in a cleaner and more healthy lake with improved water quality in the Lake, Beal Slough, and Salt Creek, enhanced sediment control, and will maximize stormwater management and flood control downstream.

7. **Project Tasks and Timeline**

Identify what activities will be conducted to complete the project, and the anticipated completion date.
For multiyear projects please list (using the following example):

Tasks	Year 1$	Year 2$	Year 3$	Remaining	Total $ Amt.
Permits	$18,000				$18,000
Engineering		$96,000			$96,000
Construction		$87,000	$96,000		$183,000
Close-out				$8,000	$8,000

TOTAL $305,000

- 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.

Overall, this is a 5-year project that started in 2020 and will be completed in 2024. In year 1 (2020), emergency repairs were made to the dam. In year 2 (2021), a bathymetric survey of Pine Lake was completed. In year 3 (2022), the watershed and lake assessment were completed and the outlet structure assessment and design were initiated. At this time, final design work is nearing completion. Permitting and bidding will follow as will the finalization of project funding. The Lake will be drained later this year (2023) and watershed improvements, and sediment removal from the retention ponds will occur. The Lake will be drained in the fall of 2023 so that the dam inlet and outlet structures can be replaced. Sediment in the lake will be excavated late 2023 and winter-spring 2024 (year 5). The lake will be allowed to refill after excavation and dam repairs are completed.

Tasks	Year 1	Year 2	Year 3	Years 4-5	Total Amount
0. Emergency repairs to Pine Lake Dam	$102,934	$2,661			$105,595
I. Bathometric survey of Pine Lake		$25,000			$25,000
II. Watershed assessment & outlet structures			$144,000		$144,000
I.V. Construction management				$106,000	$106,000
Estimated Construction costs. Removal of sediment (two holding ponds)				$8,000	$8,000
Excavation of Pine Lake				$1,155,000	$1,155,000
Watershed improvements on Pine Lake golf course				$75,000	$75,000
Outlet structure construction for dam				$905,800	$905,800
				Total	$2,524,395

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; The feasibility report was conducted by The Flatwater Group (TFG) and is attached as Appendix B.

1.A.2 Describe the plan of development (004.01 A); The Pine Lake Rehabilitation Project consists of three components. First, the pipes for the main dam/water control structure for Pine Lake are 60 years old. The outlet pipe failed inspection by Nebraska Dam Safety and emergency repairs were made to the outlet pipe in 2020. This was not a permanent solution and did not address the entire structure. The dam offers protection for Nebraska Parkway and Beal Slough. The inlet and riser pipes have corroded and threaten the integrity of the dam. As is, it is unsafe for members of the Pine Lake Association (PLA) to adjust the water level of the lake given the antiquated engineering and eroded structural integrity of the rise. Hazard Engineering provided estimates for two options (Appendix A, p. 3-4). For option 1, the riser and drawdown pipe would be replaced while the existing CIPP lined outlet pipe would remain in place. This option would cost $300,000. Option 2 includes a full replacement of the outlet system and would cost $905,800. This option includes a concrete riser designed with a slide gate outlet control system to provide the PLA the flexibility to manage the lake level. Since option 2 has a design life of 100 years, this option has been selected. Failure to repair the dam may lead to dam failure and flooding to Beal Slough. This would lead to a large amount of sediment flowing downstream to Beal Slough, Salt Creek, and the Platte River. The second component is the sedimentation of Pine Lake and three retention ponds. The retention ponds reduce peak runoff and the sediment load entering Pine Lake and Beal Slough. Pine Lake has two main tributaries entering from the northeast and southeast (Figure 3). The NE and SE tributaries drain roughly 1/3rd and 2/3rds of the watershed, respectively. The larger SE tributary drains through five existing sediment retention ponds prior to entering Pine Lake. Three of these ponds are located on the PLA and Golf Course property, while two are located further up in the watershed on neighboring properties. The smaller NE tributary drains primarily through the Golf Course property and does not contain any active sediment retention ponds. The Flatwater Group (TFG) performed a topographic and bathymetric survey of the lake and

in-lake sediment basin in 2021 (Figure 4). Survey of the sedimentation basins included the ground surface (top of the soft sediments) and the elevation of the hard pan material below. 3-D surface generation and comparison was used to estimate a total sediment volume of 54,500 cy in the lake, of which 1,100 cy is located in the south sediment pond. Assuming that these sediments entered the lake since the 1997 restoration project, the annual sediment loading was approximately 2,700 tons per year. From historic aerial imagery, TFG found that the watershed has urbanized over this period of time from what was once 40% agricultural (Figure 2). Soil loss associated with tillage of crop fields and urban land development account for this high annual sediment loading. TFG anticipates that future sediment loading will be substantially lower. For this component of the project, the three retention ponds and Pine Lake will be excavated. If the sediment is not removed from the retention ponds and Pine Lake, there is an increased chance of dam failure and flooding of Beal Slough. The storage capacity of the ponds and Pine Lake have been drastically reduced since 1996. The third component of this project is to reduce runoff and erosion from across the Pine Lake watershed. Rock checks and bank reinforcement is needed to control runoff that occurs from outside the neighborhood. These improvements will reduce the peak runoff, sediment and nutrients flowing into Pine Lake, Beal Slough and Salt Creek.

1.A.3 Include a description of all field investigations made to substantiate the feasibility report (004.01 B);

The dates and the field investigations completed by TFG are the following:
7/22/23 – sediment pond survey
7/26/23 – TFG site visit with Chad to investigate the sediment ponds and golf course
8/3/23 – TFG site visit to assess golf course channel erosion
8/4/23 – drone photos of Pine Lake
8/4/23 – site visit of outlet structure with dam engineer
1/6/2023 – site visit with TFG and dam engineer for measurements on existing outlet structure
1/6/2023 – existing dam topographic survey by dam engineer
1/18/2023 – Pine Lake dam road paving core to determine thickness and composition for replacement as part of dam replacement.

1.A.4 Provide maps, drawings, charts, tables, etc., used as a basis for the feasibility report (004.01 C); Click here to enter text.

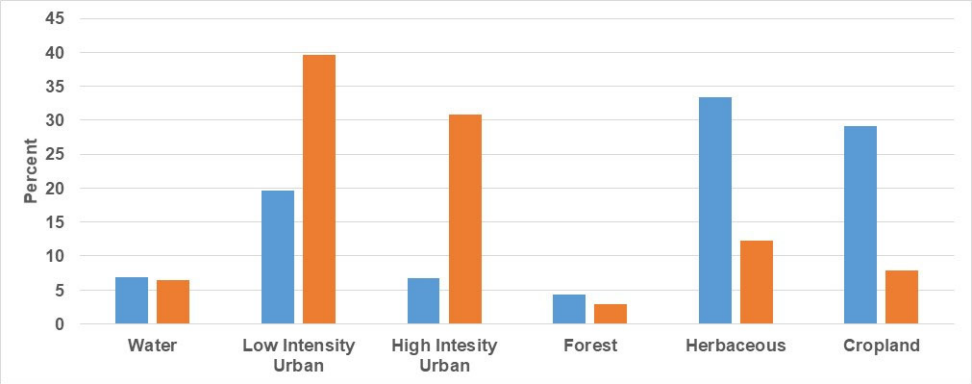


Figure 1. Percent land use in the Pine Lake watershed in 2001 (blue) compared to 2019 (orange).

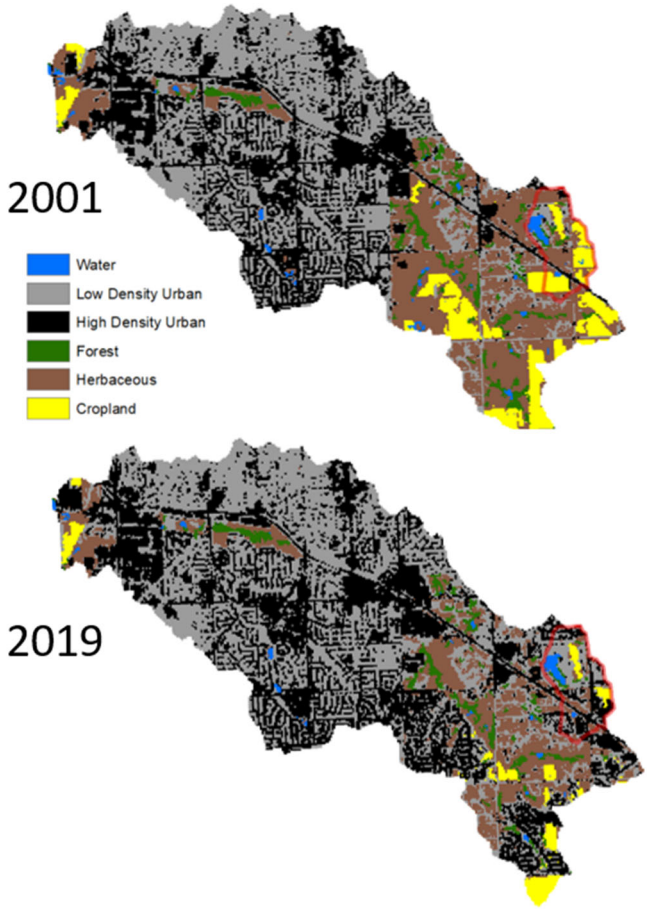


Figure 2. Land use in the Beal Slough watershed in 2001 and 2019. The Pine Lake watershed is outlined in red. Most of the development within the watershed is in the southern portion, specifically within the Pine Lake watershed.

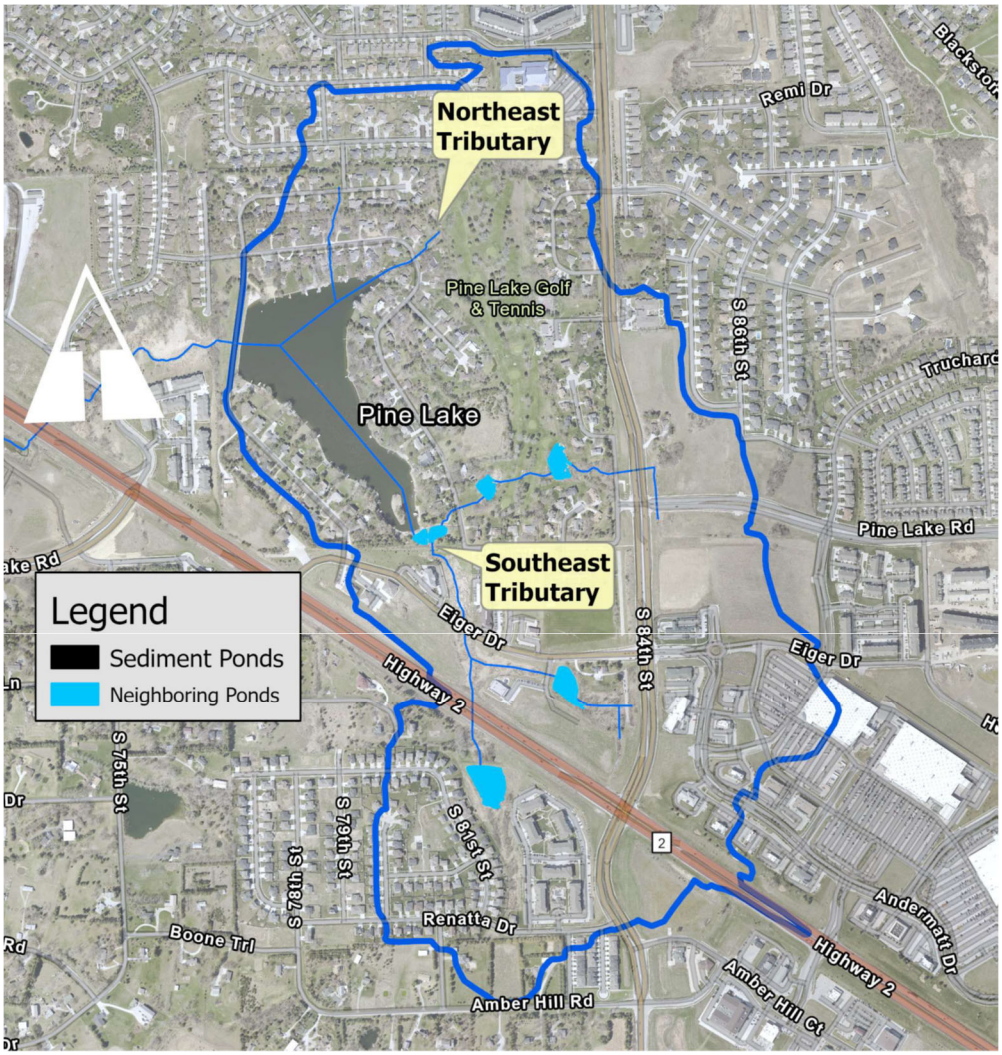


Figure 3. Location of sediment ponds within the Pine Lake watershed.

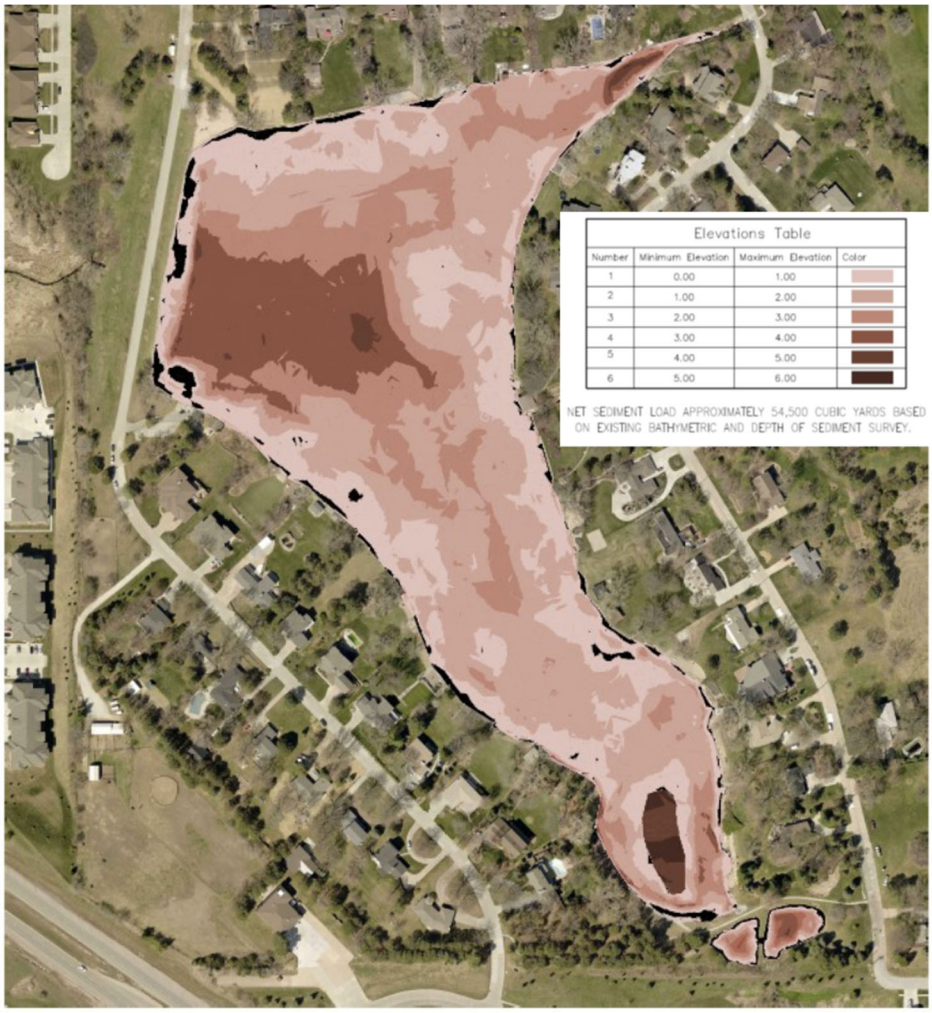


Figure 4. 2021 sediment depth survey.

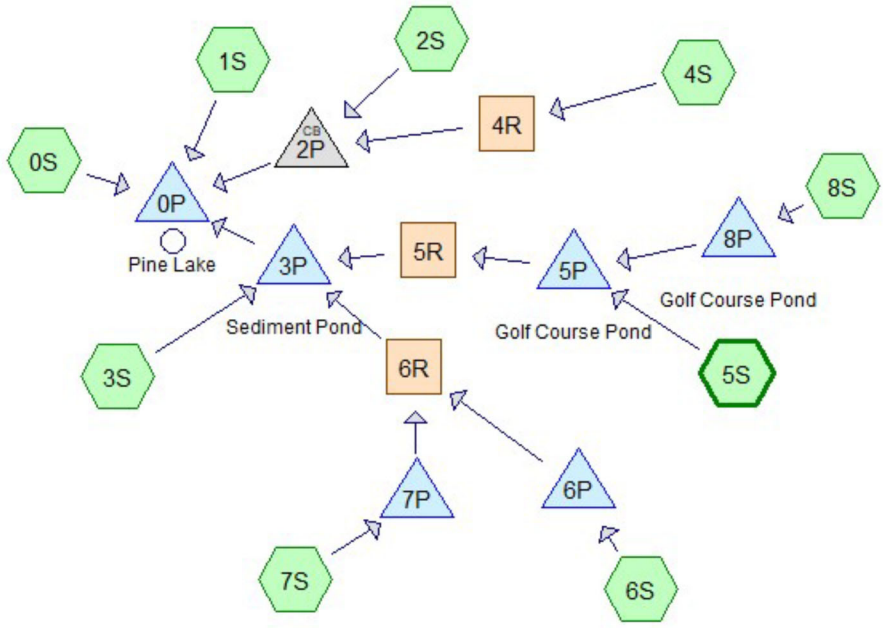


Figure 5. HydroCAD hydrological model schematic.

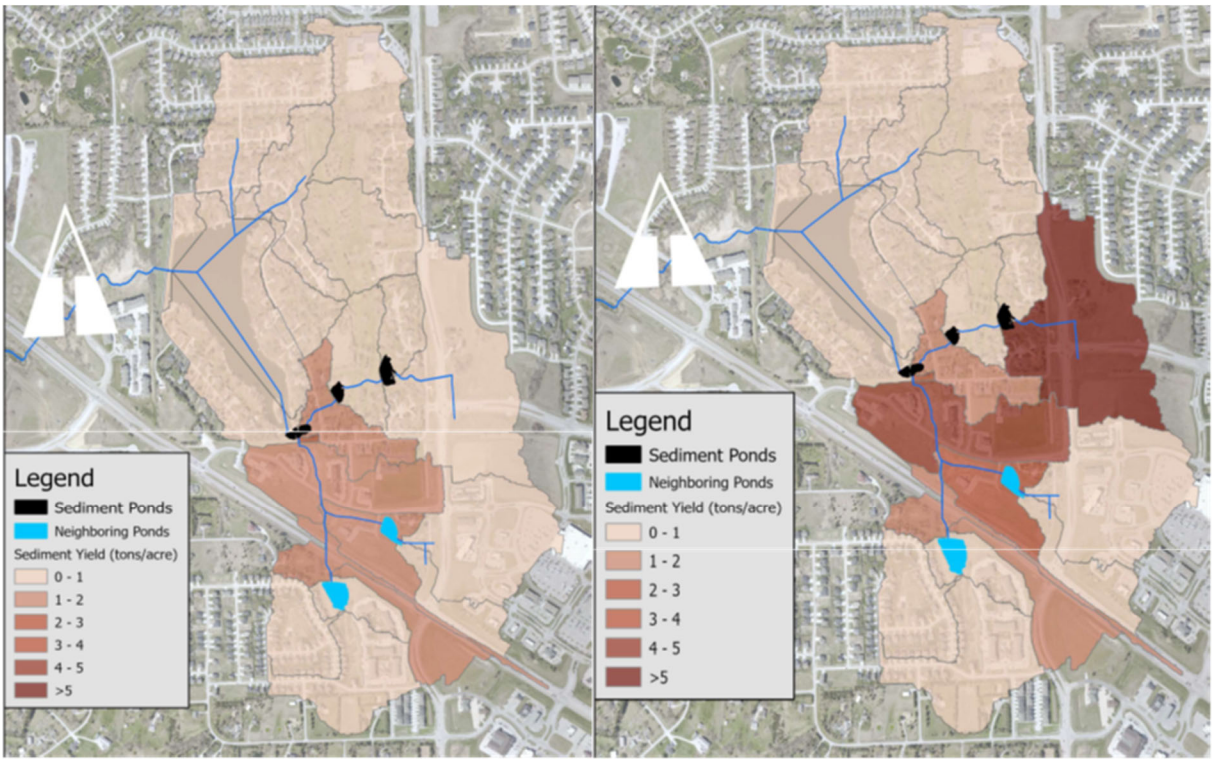


Figure 6 Sediment Yield (tons/acre) for future land use conditions (left) and the potential increase in sediment yield caused by construction activities from urban development in the watershed (right).

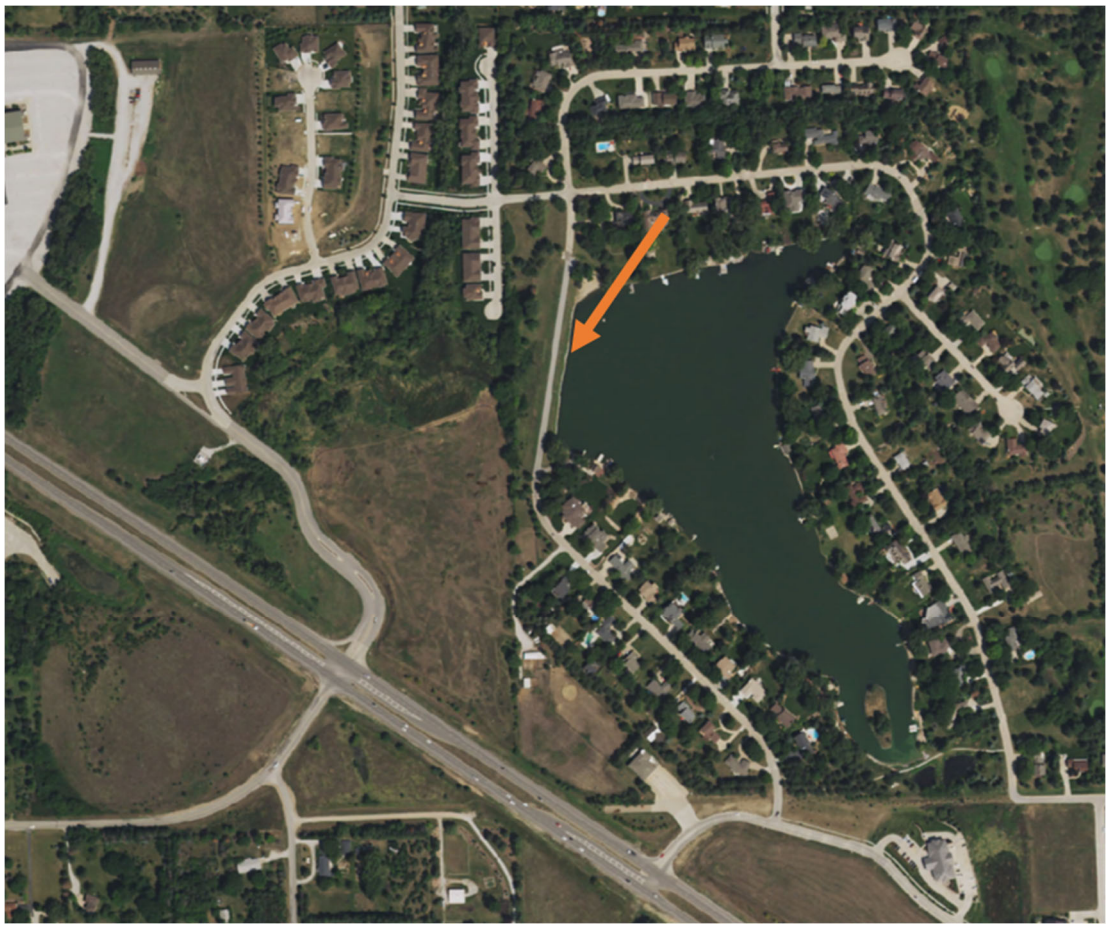


Figure 7. Image showing Pine Lake, the dam, and the structures downstream of the dam. Orange arrow illustrates the location of the dam.

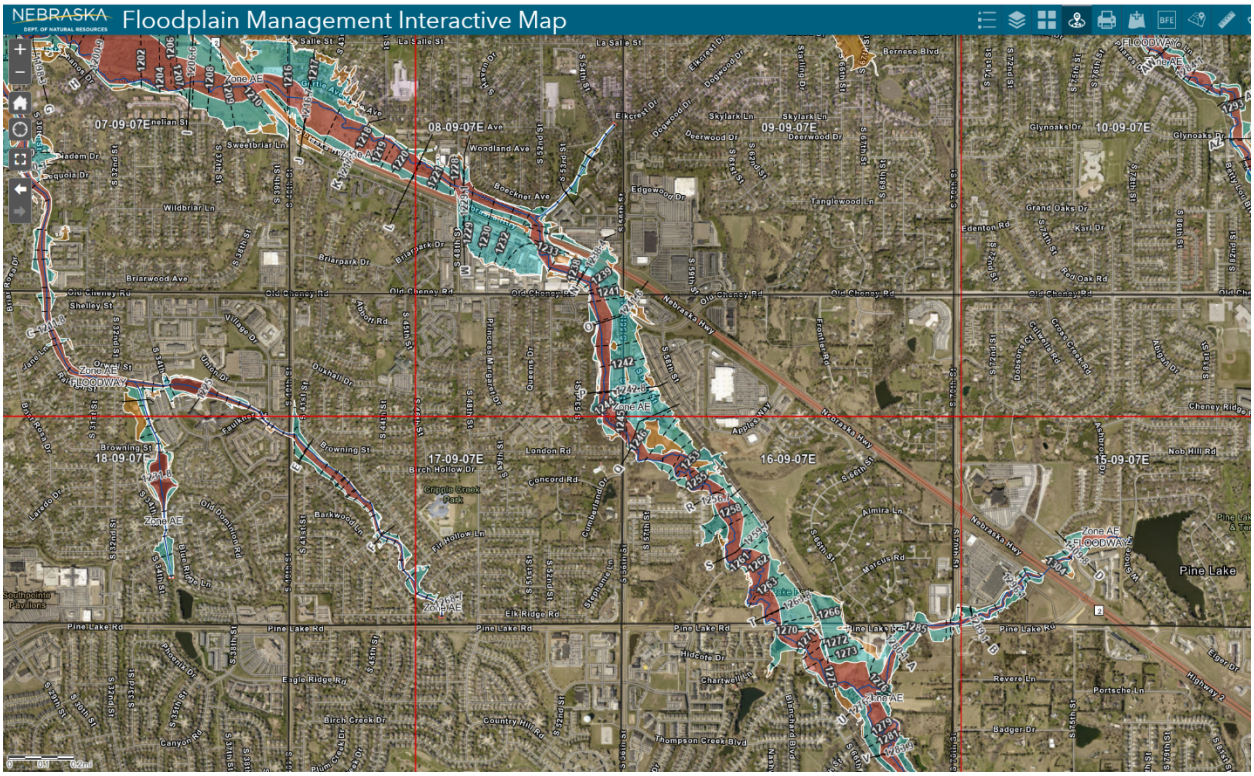


Figure 8. Floodplain downstream of Pine Lake.

1.A.5 Describe any necessary water and/or land rights including pertinent water supply and water quality information (004.01 D);

The PLA owns the land where all work will be completed so no additional and or water rights need to be obtained.

1.A.6 Discuss each component of the final plan (004.01 E);

The final plan consists of engineering design, permitting, construction, excavation and repair. The engineering design for the dam rehabilitation was conducted by Hazard Engineering. Of the two options, the PLA has chosen option 2, which has a design life of 100 years (Appendix C). The design and permitting services cost $32,000. The construction costs to completely replace the dam outlet structure is $905,000 and the construction administration and certification will cost an additional $106,000 with PLA paying for $87,500, and NRD paying $18,500. The estimated construction costs total $2,143,800 of which we will ask NRD for $494,400, leaving a balance of $1,736,400.

1.A.7 When applicable include the geologic investigation required for the project (004.01 E 1);

TFG performed a topographic and bathymetric survey of the lake and in-lake sediment basin in 2021. Survey of the sedimentation basins included the ground surface (top of the soft sediments) and the elevation of the hard pan material below. 3-D surface generation and comparison was used to estimate a total sediment volume of 54,500 cy

in the lake, of which 1,100 cy is located in the south sediment pond (Figure 4). Assuming that these sediments entered the lake since the 1997 restoration project, the annual sediment loading is approximately 2,700 tons per year. From historic aerial imagery, TFG found that the watershed has urbanized over this period of time from what was once 40% agricultural (Figure 2). Soil loss associated with tillage of crop fields and urban land development account for this high annual sediment loading. TFG anticipates that future sediment loading will be substantially lower.

Surface texture for soils in the watershed were obtained from the Web Soil Survey. Predominant soils include Aksarben, Wymore and Colo-Nodaway Silty Clay Loams, and Pawnee Clay loam. Based on grain size analysis, Stoke's Law was used to estimate the particle settling velocity for the watershed.

SWAT is a continuous time model used to evaluate long-term watershed and sediment yield in Pine Lake's northeast and southeast tributary channels. Watershed delineation and physically based weather, soil, slope, and land use input parameters were derived by TFG through the ArcSWAT model component. A summary of the data sources input into the model are listed below. Model parameters for subbasins (soil type, land use, slope), stream reaches, sediment ponds, and neighboring ponds were modified to reflect site observations, aerial imagery and topography data.

Hydrologic and sedimentological input parameters are derived by SWAT through unique hydrologic response units (HRUs) for each delineated subbain. A HRU contains a unique combination of land use, soil type, and slope condition. SWAT was run on monthly and daily time steps over the available weather data time period with a 2-year warm up period. Average monthly and annual results were derived to predict long term sediment yields for evaluating input parameter sensitivity and calibration to observed sediment loads. Daily sediment loading and tributary outflow data was input into TFG's sediment basin capture analysis.

Results from the SWAT model were analyzed to estimate future sediment loads entering Pine Lake from the northeast tributary and southeast tributary. Average annual sediment yields are shown for model subbasins in Figure 6. Included is an estimate of the potential increase in sediment yield caused by construction activities for urban development. These construction activities were assumed to have a duration of one-year per site for a total sediment yield of 400 tons. This estimate assumes that sediment and erosion control measures will be employed in accordance with state and local regulations to reduce potential runoff to Pine Lake.

There are two existing sediment catch basin features located on the Pine Lake Golf Course, which drain to the southeast tributary. TFG estimates that these structures could capture 67% of incoming sediment loads for a total of 30 tons (26 cy) on an average annual basis. An additional 240 tons (200 cy) of potential sediment loading to these basins could come from construction activities related to future urban development. TFG recommends removing at least 800 cy from these basins to provide 25 years of future sediment storage capacity. These features currently function to

capture sediment, but are in need of maintenance to remove accumulated sediment, remove trees from the embankment, and replace deteriorated pipe outlet structures.

South of the larger lake, there is an existing sedimentation pond (Figure 6). As described above, TFG estimates 1,100 cy of sediments have accumulated since the last cleanout in 2009 (84 cy per year). TFG estimates that these structures could capture 60% of incoming sediment loads for a total of 85 tons (72 cy) on an average annual basis. This capture rate closely matches the volume of sediments accumulated since 2009, which validates TFG's analysis method. An additional 400 tons (340 cy) of potential sediment loading to these basins could come from construction activities related to future urban development. TFG recommends removing at least 1,300 cy from this basin. This quantity, in combination with excavation in the sediment retention ponds, provides an estimated 25 years of future sediment storage.

1.A.8 When applicable include the hydrologic data investigation required for the project (004.01 E 2);

A rainfall-runoff response hydrologic model was developed to evaluate event-based rainfall data on a sub daily time-step. Twenty-four-hour duration design storms were input into the model using rainfall depths for the 1, 2-, 5-, 10- and 25-year flood events. Hydrologic input data was derived from HRU parameters generated through SWAT. The SCS Curve Number method was applied to generate storm runoff hydrographs. Subbasin time of concentration was calculated using the SCS lag equation, which relies on hydraulic length and average subbasin land slope. Runoff was routed through stream reaches, ponds and inline reservoirs using the storage-indication and translation method. Reach and reservoir input data was derived from TFG survey and LiDAR topography. The HydroCAD model schematic is shown in Figures 5.

The northeast tributary does not contain any existing sediment capture features, but does contain an open channel that runs through the golf course property. This channel is in relatively stable shape, but could be enhanced to detain storm runoff and provide water quality benefits. TFG recommends shaping the channel bank and planting native tall grass vegetation to capture leave and grass clipping detritus that would otherwise be transported into Pine Lake. Additionally, the over widened channel can induce. sediment deposition. These three areas would not include open/standing water. Channel shaping would include widening the channel bottom to 10ft to 30ft with gradual 4h:1v side slopes to facilitate annual mowing maintenance. TFG recommends excavating 640 cy over an area of 0.2 acres (8,700 sq-ft) to provide 25 years of future sediment storage capacity.

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). Click here to enter text.

Pine Lake Dam design is included in Appendix C.

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

1.B.1 Insert data necessary to establish technical feasibility (004.02); Click here to enter text.

1.B.2 Discuss the plan of development (004.02 A); Click here to enter text.

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

1.B.4 Describe any necessary water and/or land rights (004.02 C); Click here to enter text.

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). Click here to enter text.

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 two major improvements for which we are requesting funds from the WSF include replacing the dam outlet structure and removal of 35,000 cy of sediment from Pine Lake. The Pine Lake Dam outlet failed its inspection in 2020 and an emergency repair had to be made. This was a temporary fix so the dam must be repaired. The cost of these emergency stop-gap repairs were shared by PLA ($65,067) and the LPSNRD ($40,528). TFG's specialty subconsultant Travis Hazard of Hazard Engineering visited the site to conduct outlet structure repair/replacement cost estimates. Hazard Engineering prepared two repair/replacement options with cost estimates. Because the Pine Lake Dam is a significant hazard structure, a concrete riser will be required. The existing CMP (corrugated metal pipe) riser could not be replaced with a new CMP riser structure due to hazard classification. Note: Option 1 (Appendix A, p. 4) cost estimate doesn't include Design & Permitting fee as that is already part of TFG scope of work. The option 2 (Appendix A, p. 5) cost estimate includes fees that would be in addition to existing scope and therefore a scope modification would be needed if Option 2 is preferred route for PLA.

Option 1: Riser and Drawdown Pipe Replacement

- Existing CIPP lined outlet pipe would remain in place.
- New concrete riser would be constructed according to NRCS design standards at recommendation of NeDNR.
- Concrete riser would be designed with slide gate outlet control system to provide Pine Lake HOA the flexibility to manage lake level.

- New drawdown pipe (lake intake side) would be constructed in conjunction with new riser.
- Preliminary Planning Cost Estimate Option 1: $300,000.

Option 2: Full Replacement of Outlet System

- Replacement of outlet pipe, new concrete riser, and drawdown pipe (lake intake side).
- Addition of standard practice internal sand drains and seepage protection.
- Addition of standard plunge pool outlet protection.
- Addition of standard pipe support.
- Concrete riser would be designed with slide gate outlet control system to provide Pine Lake HOA the flexibility to manage lake level.
- Full replacement would involve opening of dam and removing section of road for new pipe and outlet riser construction.
- Design Life of ~100 years with up to standard conduit pipe.
- Preliminary Planning Cost Estimate Option 2: $905,800.

The PLA would prefer to go with option 2. Option 2 provides all new, like material, and provides the internal sand drains, seepage protection, and plunge pools for outlet protection. This gives higher confidence in the resilience of the new structure. An added benefit is this fix has a life expectancy of 100 years vs 40 years in option 1. PLA believes that by spending extra money now we will save those expenses in upcoming years by not having to do these repairs again three times over in the next 100 years. It also significantly reduces the risk of a breach because it is a uniform system, and we are not trying to merge differing materials from the upright structure and the exit pipe that was repaired a few years ago.

The second major component is the excavation of Pine Lake. TFG performed a topographic and bathymetric survey of the lake and in-lake sediment basin in 2021.

Survey of the sedimentation basins included the ground surface (top of the soft sediments) and the elevation of the hard pan material below. 3-D surface generation and comparison was used to estimate a total sediment volume of 54,500 cy in the lake. This sediment has significantly reduced the storage capacity of the lake and water quality. We are planning on removing 35,000 cubic yards of sediment. Because we are not planning on removing the sediment in the deepest parts of the lake, we will avoid a total fish kill that would have a major negative impact on the ecosystem. Excavation of the 35,000 cy sediment was estimated by TFG to cost $1,155,000 assuming $33 per cy.

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). TFG did not do a CBA for our project.

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 final plan consists of engineering design, permitting, construction, excavation and repair. The engineering design for the dam rehabilitation was conducted by Hazard Engineering. Of the two options, the PLA has chosen option 2, which has a design life of 100 years (Appendix C). The design and permitting services cost $32,000. The construction costs to completely replace the principal spillway is $905,800 and the construction administration and certification will cost an additional $106,000 with PLA paying for $87,500, and NRD paying $18,500. Of the 55,000 cubic yards of sediment, we are proposing to remove 35,000 at $33 a cubic yard for a total of $1,155,000. The estimated construction costs total $2,143,800 of which we will ask NRD for $494,400, leaving a balance of $1,649,400.

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). Benefits include flood damage reduction, recreational benefits, water quality improvements to the watershed and downstream waterbodies such as Salt Creek and Platte River. The project will maintain the bird, fish and other animal habitats.

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). N/A

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.)

The Pine Lake watershed is a sub watershed within the Beal Slough, Salt Creek and Platte River watersheds. Though the watershed is small compared to the Platte River watershed, the only way to improve water quality in the Platte River is the culmination of small projects such as this one. Any reduction in sediment and nutrient loads from the Pine Lake watershed will ultimately improve the water quality in the Platte River. The Platte River provides drinking water for the cities of Lincoln and Omaha. The three retention ponds and Pine Lake capture and retain a large portion of the sediment and nutrients within the Pine Lake

watershed. Any reduction in sediment and nutrients will lead to better water quality in downstream waterbodies.

There are two existing sediment catch basins located in the watershed which drain to the southeast tributary. The Flatwater Group (TFG) estimates that these structures could capture 67% of incoming sediment loads for a total of 30 tons (26 cy) on an average annual basis. An additional 240 tons (200 cy) of potential sediment loading to these basins could come from construction activities related to future urban development. TFG recommends removing at least 800 cy from these basins to provide 25 years of future sediment storage capacity. These features currently function to capture sediment, but are in need of maintenance to remove accumulated sediments, remove trees from the embankment, and replace deteriorated pipe outlet structures.

South of the larger lake, there is an existing sedimentation pond. As described above, TFG estimates 1,100cy of sediment has accumulated since the last cleanout in 2009 (84cy per year). TFG estimates that these structures could capture 60% of incoming sediment loads for a total of 85 tons (72 cy) on an average annual basis. This capture rate closely matches the volume of sediments accumulated since 2009, which validates TFG's analysis method. An additional 400 tons (340 cy) of potential sediment loading to these basins could come from construction activities related to future urban development. TFG recommends removing at least 1,300cy from this basin. This quantity, in combination with excavation of the two sediment catch basins that drain to the southeast tributary, provides an estimated 25 years of future sediment storage.

It is also estimated that Pine Lake will retain approximately 60% of all sediment and much of the nutrients that flows into the lake. Overall, nearly 1 million people will be impacted by the water quality improvements within the Pine Lake watershed. The population of Omaha is approaching 500,000 people. The majority of their water comes from the Platte and Missouri Rivers. The City of Lincoln, with a population of 268,000, receives its water from the Platte River alluvial aquifer near Ashland.

If the dam outlet structure is not replaced, the dam may fail. This would release all of the lake water and much of the sediment downstream to Beal Slough and eventually Salt Creek. This would have a negative impact on the ecosystem at and around Pine Lake and downstream in Beal Slough and Salt Creek. If the sediment in Pine Lake and its associated sediment capture basins and ponds is not removed, the Pine Lake watershed will be more apt to flood during large storm events/surges. This flooding could compromise the integrity of the dam. A breaching of the dam would send a large pulse of flood waters and sediment downstream to Beal Slough and Salt Creek. All of this water would cause streambank erosion and damage the channel in both Beal Slough and Salt Creek.

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.

   The work and finances for Phases 0, I, II, and III are completed and as such, PLA is not requesting a cost-share for these phases of the project in this WSF grant proposal.

   Total estimated cost for Phase IV - Construction Management and estimated construction costs is $2,249,800. Finances have not been finalized as we are in the process of seeking permits required prior to bidding for construction costs.

   Upon completion of the permitting and bidding for construction estimates, the PLA will seek an additional cost-share of $512,900 from LPSNRD to remove sediment from two retention ponds, replace the outlet structure for the Pine Lake Dam, and conduct watershed improvements. This will result in an unfunded balance of $1,736,900 of which the PLA is requesting 60% or $1,042,140 from the Water Sustainability Fund (WSF). PLA will cover the remaining $694,760 (40%) through funds already in hand ($500,000, Appendix A, p. 3) and assessments of PLA's 135 homeowners.

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

   The total annual revenue of the PLA is $135,000 to cover any costs associated with maintaining the dam outlet structure. The PLA receives $ 29,000 annually. from homeowner dues and almost $100,000 in cell tower rental income (Appendix A, p 6). Additional amounts can be raised from homeowners.

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

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

   To replace the dam outlet structure, most of Pine Lake will have to be drained. This will kill a lot of the fish and most of the aquatic life. The lake is home to a variety of fish, reptiles, amphibians, and birds. In order to drain the lake one time, we would like to excavate the lake while the dam outlet structures are being replaced. Doing both tasks in the fall of 2023 and spring of 2024 will minimize long-term ecological impacts. Once the sediment has been removed and the dam outlet structures replaced, the lake will be refilled and restocked. If the WSF grant is not awarded, the PLA will have to drain the lake, replace the dam outlet structure and then revisit the excavation of the lake and watershed improvements

at a future date. This will prolong the negative impact on the wildlife, not just for the lake but for Beal Slough as well.

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

   The PLA has a Board consisting of seven members elected by the PLA homeowners. The Board has the right to make any changes to the dam and lake and the power to spend funds for any repairs and maintenance. The Board meets the third Monday of each month and votes on each of the proposed changes and decisions.

9. Explain how your project considers plans and programs of the state and resources development plans of the political subdivisions of the state. This project is being implemented as part of the LPSNRD's efforts to meet the regulatory purpose of flood prevention and control. This project also meets other regulatory purposes such as pollution control and wildlife habitat. The project will assist the LPSNRD in meeting the goals of their long-term management plan.

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 easement, 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.

    The PLA has a Board consisting of seven members elected by the PLA homeowners. The Board has the right to make any changes to the dam and lake and the power to spend funds for any repairs and maintenance. The Board meets the third Monday of each month and votes on each of the proposed changes and decisions.

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

    If the dam outlet structure is not replaced, the dam may fail. This would release all of the lake water and much of the sediment downstream to Beal Slough and

eventually Salt Creek. This would have a negative impact on the ecosystem at and around Pine Lake and downstream in Beal Slough and Salt Creek. If the sediment in Pine Lake and its associated sediment capture basins and ponds is not removed, the Pine Lake watershed will be more apt to flood during large storm events/surges. This flooding could compromise the integrity of the dam. A breaching of the dam would send a large pulse of flood waters and sediment downstream to Beal Slough and Salt Creek. All of this water would cause streambank erosion and damage the channel in both Beal Slough and Salt Creek.

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.

   The Pine Lake watershed is a sub watershed within the Beal Slough, Salt Creek, and Platte River watersheds. Though the watershed is small compared to the Platte River watershed, the only way to improve water quality in the Platte River

is the culmination of small projects such as this one. Any reduction in sediment and nutrient loads from the Pine Lake watershed will ultimately improve the water quality in the Platte River. The Platte River provides drinking water for the cities of Lincoln and Omaha. The three retention ponds and Pine Lake capture and retain a large portion of the sediment and nutrients within the Pine Lake watershed. Any reduction in sediment and nutrients will lead to better water quality in downstream waterbodies.

There are two existing sediment catch basins located in the watershed which drain to the southeast tributary. The Flatwater Group (TFG) estimates that these structures could capture 67% of incoming sediment loads for a total of 30 tons (26 cy) on an average annual basis. An additional 240 tons (200 cy) of potential sediment loading to these basins could come from construction activities related to future urban development. TFG recommends removing at least 800 cy from these basins to provide 25 years of future sediment storage capacity. These features currently function to capture sediment, but are in need of maintenance to remove accumulated sediments, remove trees from the embankment, and replace deteriorated pipe outlet structures.

South of the larger lake, there is an existing sedimentation pond. As described above, TFG estimates 1,100 cy of sediment has accumulated since the last cleanout in 2009 (84cy per year). TFG estimates that these structures could capture 60% of incoming sediment loads for a total of 85 tons (72 cy) on an average annual basis. This capture rate closely matches the volume of sediment accumulated since 2009, which validates TFG's analysis method. An additional 400 tons (340 cy) of potential sediment loading to these basins could come from construction activities related to future urban development. TFG recommends removing at least 1,300 cy from this basin. This quantity, in combination with excavation of the two sediment catch basins that drain to the southeast tributary, provides an estimated 25 years of future sediment storage.

It is also estimated that Pine Lake will retain approximately 60% of all sediment and much of the nutrients that flows into the lake. Overall, nearly 1 million people will be impacted by the water quality improvements within the Pine Lake watershed. The population of Omaha is approaching 500,000 people. The majority of their water comes from the Platte and Missouri Rivers. The City of Lincoln, with a population of 268,000, receives its water from the Platte River alluvial aquifer near Ashland.

If the dam outlet structure is not replaced, the dam may fail. This would release all of the lake water and much of the sediment downstream to Beal Slough and eventually Salt Creek. This would have a negative impact on the ecosystem at and around Pine Lake and downstream in Beal Slough and Salt Creek. If the sediment in Pine Lake and its associated sediment capture basins and ponds is not removed, the Pine Lake watershed will be more apt to flood during large storm events/surges. This flooding could compromise the integrity of the dam. A breaching of the dam would send a large pulse of flood waters and sediment

downstream to Beal Slough and Salt Creek. All of this water would cause streambank erosion and damage the channel in both Beal Slough and Salt Creek.

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.

   This project addresses the goals of the Lower Platte South NRD. The three goals in their Integrated Management Plan are to achieve a sustainable water supply, to manage the supply and make it available whenever and wherever needed, and to support water use and conservation that optimizes benefits. With limited surface water sources, highly erodible ground water supplies and the geographic reality of the downstream location in the river basin, the IMP includes the anticipated need to look outside District boundaries to collaborate and cooperate on future water supply expansion. The LPSNRD IMP was approved in 2014 and was jointly developed with the Nebraska Department of Natural Resources.

   LPSNRD IMP goals our project addresses include the following: a) Manage the hydrologically connected waters in the District; b) Preserve and enhance instream flows and other water-based natural ecosystems that provide benefits supporting the health and safety of our citizens and the quality of their lives; c) Collaborate and work cooperatively with the citizens and communities in the District.

   Water originating from the Pine Lake watershed is important for Beal Slough and downstream waters. The quantity and quality of water flowing from the lake will be compromised if actions are not taken in the near future. The goal of the Pine Lake Association (PLA) is similar to those of the LPSNRD. The residents of Pine Lake take an integrated and holistic approach to the management of both the waters coming into our watershed from outside the neighborhood and from challenges within the neighborhood. The goal of our efforts at Pine Lake is for the water leaving the lake and flowing into the Upper Beal Slough to be cleaner than when in first entered our neighborhood and portion of the Pine Lake watershed. Most water flowing into Pine Lake in from the Southeast. Intense development has occurred around PLA since the lake was dredged in 1996. The percent of the watershed classified as urban in 2001 was 26% compared to 71% in 2019. This development has led to the accelerated build-up of sediment in the network of PLA-managed holding ponds and in the lake itself. According to a 2021 bathymetric and depth of sediment survey of Pine Lake, The Flatwater Group (TFG) estimates there is currently approximately 55,000 cy of sediment

deposition. While open lots suitable for development in the Eastern portion of the Pine Lake watershed are available, the most intensive development is now complete. This sediment has greatly reduced the storage capacity of the lake. It is the intent of the PLA to repair the holding ponds, to install rock checks and erosion control, assess, to repair, and update critical outlet structures and water retention systems and dams, and to remove the sediment that has accumulated in the lake over the past 25 years. These changes will result in a cleaner and more healthy lake with improved water quality in the Lake, Beal Slough, and Salt Creek, enhanced sediment control, and will maximize stormwater management and flood control downstream.

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 area underlying the Pine Lake watershed is the Dakota Aquifer. Pine Lake and the retention ponds within the watershed reduces peak flow and thus reduces downstream flooding. The water retained in the lake and the retention ponds provides recharge to the Dakota Aquifer. With 70% of the watershed now urban, the amount of runoff is significantly greater than it was historically. Instead of recharging the aquifer across the watershed, the recharge zones are now concentrated at the lake and retention ponds. This retained water reduced the peak flows to Beal Slough and Salt Creek. If the sediment in these retention basins, ponds, and lake is not removed, the holding capacity of the Pine Lake watershed will be limited and its core function as a flood control system will be compromised. This will lead to more a higher risk of flooding downstream, loss of life and property, and overall lower water quality.

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.

This project will help reduce flooding in downstream waters, specifically Beal Slough and Salt Creek. This project will also provide recreational benefits and wildlife habitat. With Pine Lake watershed predominantly urban with much of the watershed now paved, the amount of infiltration is minimal. This leads to more runoff and sediment loss across the watershed. Pine Lake and the retention ponds reduce the peak runoff and reduce the downstream flooding.

Pine Lake is a beautiful area enjoyed not only by members of the PLA, but people from much of Lincoln. While only members can use the lake and horse trail, the streets around the lake are open to the public and used by many walkers and runners. The Pine Lake Golf and Tennis Club, that is also part of the Pine Lake watershed, is open to the public. Every year the PLA puts on a large firework display open to the public. The event takes place on the Pine Lake Dam and provides entertainment for approximately 2,000 people. The lake provides the PLA members a place to fish, boat, ice skate and swim as well as contributing to a non-urban ambience.

Pine Lake and its associated retention basins, and sediment ponds provide habitat for several species of fish, reptiles, amphibians, mammals and macroinvertebrates. Many migratory birds such as ducks and geese spend time on the lake each winter. To replace the dam outlet structure, Pine Lake will have to be drained. This will kill all of the fish and most of the aquatic life. In order to only drain the lake one time, we would like to excavate the lake while the dam outlet structure is being replaced. Doing both tasks in the fall of 2023 and spring of 2024 will minimize the long-term impact. Once the sediment has been removed and the dam outlet structures replaced, the lake will be refilled and restocked. If the WSF grant is not awarded, the PLA will have to drain the lake, fix the dam outlet structures, and then revisit the excavation of the lake and watershed improvements at a future date. This will prolong the negative impact on the wildlife, not just for the lake but for Beal Slough as well.

Failure to repair the dam may lead to dam failure and flooding to Beal Slough. This would lead to a large amount of sediment flowing downstream to Beal Slough, Salt Creek and the Platte River. If the sediment is not removed from the retention ponds and Pine Lake, there is an increased chance of dam failure and flooding of Beal Slough. The storage capacity of the ponds and Pine Lake have been drastically reduced since 1996. The third component of this project is to reduce runoff and erosion from across the Pine Lake watershed. Rock checks and bank reinforcement is needed to control runoff that occurs from outside the neighborhood through the watershed. These improvements will reduce the peak runoff, sediment and nutrients flowing into Pine Lake, Beal Slough, and Salt Creek.

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.

The excavation of the three retention basins and sediment ponds and Pine Lake will increase their storage capacity for peak flows and eroded soil. Retaining peak flows, sediment and the nutrients in the ponds and Pine Lake will improve the water quality in Beal Slough, Salt Creek, and the Platte River. The retention basins and ponds and Pine Lake provide habitat for countless migratory birds, fish, reptiles, and amphibians. The lake provides recreation for the PLA residents and many other Lincoln residents enjoy the beautiful area.

Failure to replace the dam outlet structure and spillway and excavate the lake will jeopardize each of these positive benefits. If not replaced, the probability of the dam failing or breaching is high. This will send a large pulse of water and sediment downstream causing damage to the stream banks and channel of Beal Slough and Salt Creek. The flooding may also cause damage to the Nebraska Parkway.

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.

This project includes the replacement of the Pine Lake Dam principal spillway, excavation of Pine Lake and three retention ponds and watershed improvements.

The work and finances for Phases 0, I, II, and III are completed and as such, we are not seeking any cost-share for these phases of the project in this grant proposal.

Total estimated cost for Phase IV - Construction Management and estimated construction costs is $2,249,800. Finances have not been obtained as we are in the process of seeking permits required prior to bidding for construction costs.

Upon completion of the permitting and bidding for construction estimates for the project, the PLA will seek an additional cost-share of $512,900 from the LPSNRD to remove sediment from two retention ponds, replace the outlet structure for the Pine Lake dam, and conduct watershed improvements. This will result in an unfunded balance of $1,736,900 of which the PLA is hoping that the WSF will cover 60% or $1,042,140. The remaining $694,760 will be covered by the PLA

through funds already in hand ($500,000, Appendix A, p. 5) and assessments of the 135 homeowners, approximately $1,500 per homeowner. The two major improvements for which we are requesting funds from the WSF include fixing the inlet and outlet dam structures (principal spillway) and dredging of Pine Lake. The Pine Lake Dam outlet failed its inspection in 2020 and an emergency repair had to be made. This was a temporary fix. The repairs cost the PLA $65,067 and the LPSNRD $40,528 to repair. TFG's specialty subconsultant Travis Hazard of Hazard Engineering visited the site with TFG to conduct outlet structure repair/replacement cost estimates. Hazard Engineering has prepared two repair/replacement options with cost estimates. Due to fact that Pine Lake Dam is significant hazard structure, a concrete riser will be required. The existing CMP (corrugated metal pipe) riser could not be replaced with a new CMP riser structure due to hazard classification. Note: Option 1 cost estimate doesn't include Design & Permitting fee as that is already part of TFG scope of work. Option 2 cost estimate includes fee that would be in addition to existing scope and therefore a scope modification would be needed if Option 2 is preferred route for PLA.

Option 1: Riser and Drawdown Pipe Replacement

- Existing CIPP lined outlet pipe would remain in place.
- New concrete riser would be constructed according to NRCS design standards at recommendation of NeDNR
- Concrete riser would be designed with slide gate outlet control system to provide Pine Lake HOA the flexibility to manage lake level
- New drawdown pipe (lake intake side) would be constructed in conjunction with new riser
- Preliminary Planning Cost Estimate Option 1: $300,000

Option 2: Full Replacement of Outlet System

- Replacement of outlet pipe, new concrete riser, and drawdown pipe (lake intake side)
- Addition of standard practice internal sand drains and seepage protection
- Addition of standard plunge pool outlet protection
- Addition of standard pipe support
- Concrete riser would be designed with slide gate outlet control system to provide Pine Lake HOA the flexibility to manage lake level.
- Full replacement would involve opening of dam and removing section of road for new pipe and outlet riser construction
- Design Life of ~100 years with up to standard conduit pipe
- Preliminary Planning Cost Estimate Option 2: $905,800

Option 2 Provides all new, like material, and provides the internal sand drains, seepage protection plunge pools for outlet protection. This gives higher confidence in the resilience of the new structure. An added benefit is this fix has a life expectancy of 100 years vs 40 years in option 1.

The second major component is the excavation of Pine Lake. TFG performed a topographic and bathymetric survey of the lake and in-lake sediment basin in 2021. Survey of the sedimentation basins included the ground surface (top of the soft sediments) and the elevation of the hard pan material below. 3-D surface generation and comparison was used to estimate a total sediment volume of 54,500 cy in the lake. With all of the sediment in the lake, the storage capacity has significantly been reduced. PLA will remove the 35,000 cy of sediment in the lake. This is estimated to cost $33 per cubic yard for a total of $1,155,000. Since the NRD will not assist with the lake excavation, we are requesting the WSF to pay for 60% and the PLA will pay for 40%. If the grant is not obtained, the PLA will have to postpone the lake excavation. In doing so, the lake will have to be drained a second time, thus causing harm to the ecosystem services, and incur increased inflationary costs. The table breaks down each of the costs and the amount paid by the PLA and LPSNRD.

Phase	Timeline	Total Cost	Pine Lake Association (PLA)	LPSNRD
1. Emergency Repairs Main Dam	Summer 2020	$102,934	$65,067	$40,528
V. Bathymetric & Sediment Depth Survey	Fall 2021	$25,000	$25,000	
VI. Watershed Assessment & Outlet Structures	Summer/Fall 2022	$144,000	$79,500	$64,500
100-Project Management		$10,000	$5,000	$5,000
200-Pine Lake Watershed Analysis		$16,000	$8,000	$8,000
300-Preliminary Design: Lake Bottom Grading Plan		$15,000	$15,000	
400-Outlet Structure Evaluation		$19,000	$9,500	$9,500
500-Preliminary Design: Outlet Structures (2)		$32,000	$16,000	$16,000
600-Final Design: Outlet Structures (2)		$22,000	$11,000	$11,000
601-Dam Repair Option 2: Additional Design Fee		$30,000	$15,000	$15,000
VII. Finalize Financing of Project	Summer 2022-Summer 2023	No Cost		
VIII. Construction Management	Fall 2023-Spring 2024	$106,000	$87,500	$18,500
700-Permitting		$6,000	$6,000	
800-Final Design: Lake Bottom Grading Plan		$20,000	$20,000	
900-Bidding Services		$6,000	$6,000	
1000-Construction Related Services		$22,000	$16,500	$5,500
1100-Construction Observation/Inspection		$38,000	$28,500	$9,500
1200-Final As-Built Plans		$14,000	$10,500	$3,500
Estimated Construction Costs		$2,143,800	$1,649,400	$494,400
		$8,000	$4,000	$4,000

e. Removal of sediment-2 holding ponds f. Excavation of Lake g. Watershed Improvements h. Outlet Structure Construction		$1,155,000 $75,000 $905,800	$1,155,000 $37,500 $452,886	 $37,500 $452,886

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.

   NA

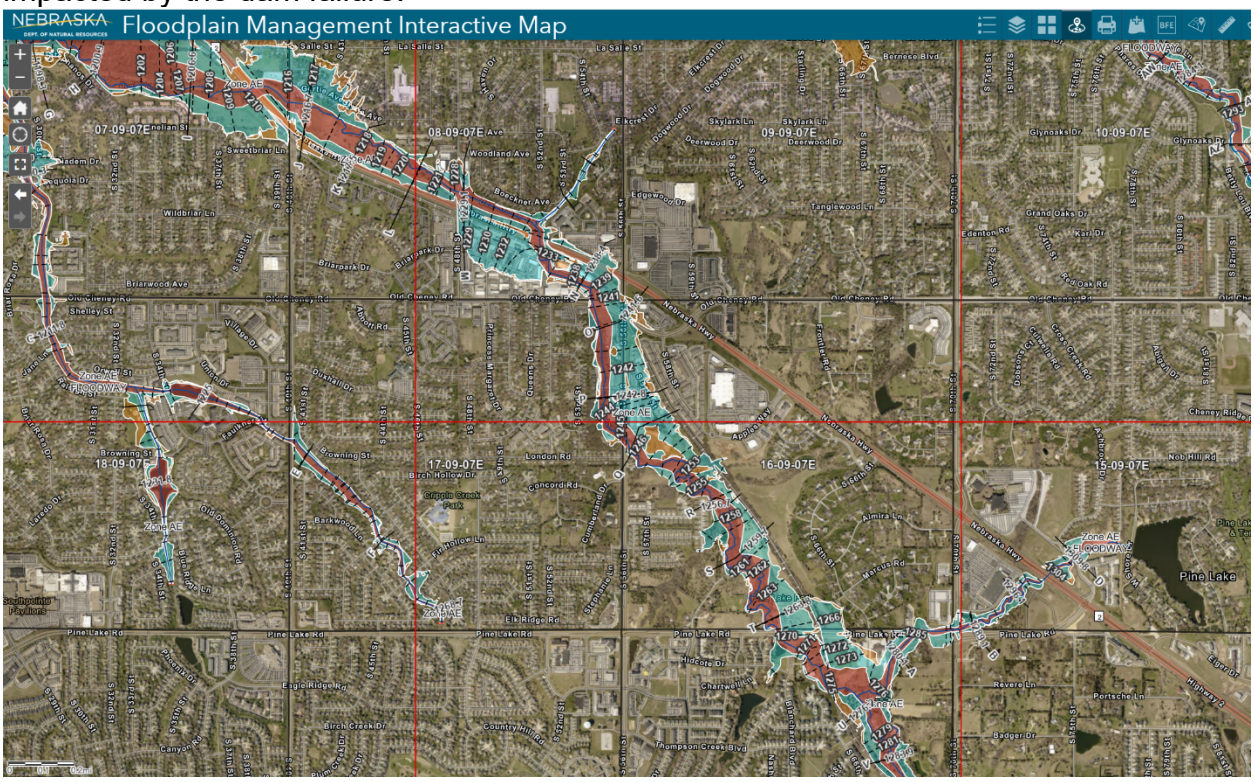
8. Reduces threats to property damage or protects critical infrastructure that consists of the physical assets, systems, and networks vital to the state or the United States such that their incapacitation would have a debilitating effect on public security or public health and safety;

   - 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.

   The inlet pipe, riser, and outlet pipe of the Pine Lake Dam structure is 60 years old and failed inspection by Nebraska Dam Safety and an emergency repair had to be made in 2020. The Federal ID of the dam is NE00529. The dam is earthen and was constructed in 1961 by Fulton and Cramer. The normal storage is 141 acre-ft and max storage 306 acre-ft. Pine Lake has an area of 16 acres (Figure 7) and drains 0.6 square miles. The dam height is 29 ft and the dam length is 851 ft. The hazard potential classification is Significant.

   The maximum discharge from the lake is 2,347 cubic ft/second. To put that value in perspective, Salt Creek at 27th street has only exceeded this discharge 1.2% of the time from 1950 to 2023. Dam failure would cause considerable damage to

any of the infrastructure immediately downstream of the dam. This large pulse of water would cause significant damage to Beal Slough and release a lot of sediment and nutrients into both Beal Slough and Salt Creek. Floodwaters may also cause damage to the Nebraska Parkway, an important highway in south Lincoln. A flood map shows the area and number of structures that could be impacted by the dam failure.



The percent of dam failures in the U.S. due to structural damage is 1.8% compared to 70.9% from floods or overtopping. The Pine Lake Dam is at risk of failing from both structural damage and overtopping. Risk from structural damage is due to the fact that the dam failed its inspection and the repairs are only temporary. The dam is also at risk due to overtopping. The Flatwater Group performed a topographic and bathymetric survey of the lake and in-lake sediment basin in 2021. Survey of the sedimentation basins included the ground surface (top of the soft sediments) and the elevation of the hard pan material below. 3-D surface generation and comparison was used to estimate a total sediment volume of 54,500 cy in the lake. This sediment has reduced the flood capacity of Pine Lake thus increasing the chance of the water overtopping the dam during a large storm event.

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 workable solutions to remedy this issue.
- Describe the history of the water quality issue including previous attempts to remedy the problem and the results obtained.

Water quality will be improved by two different components of this project. The first component is excavating Pine Lake and the retention ponds. The Flatwater Group (TFG) performed a topographic and bathymetric survey of the lake and in-lake sediment basin in 2021. Survey of the sedimentation basins included the ground surface (top of the soft sediments) and the elevation of the hard pan material below. 3-D surface generation and comparison was used to estimate a total sediment volume of 54,500cy in the lake (Figure 4). Based on the study conducted by The Flatwater Group (TFG), the lake and retention ponds will capture 60-70% of all sediment. The lake and ponds will also retain a large portion of the nutrients from Pine Lake watershed. This will improve the quality of water in Beal Slough, Salt Creek and the Platte River.

The second component includes improvements to the 355-acre Pine Lake watershed to reduce runoff and sediment loads flowing into Pine Lake and Beal Slough. Based on TFG visit observations, the 355-acre Pine Lake watershed channel has isolated areas of instability. Solutions for channel stabilization include rock riprap at pipe outlets and channel regrading/shaping. The channel will be reshaped with a bioswale concept to capture sediment runoff and vegetation debris. This native vegetation will provide sediment capture and water quality improvements of lake inflows across the 355-acre Pine Lake watershed. These Pine Lake watershed improvements will cost $75,000 of which the PLA will ask LPSNRD to pay for 50%.

The Pine Lake watershed is a sub watershed within the Beal Slough, Salt Creek and Platte River watersheds. Though the watershed is small compared to the Platte River watershed, the only way to improve water quality in the Platte River is the culmination of small projects such as this one. Any reduction in sediment and nutrient loads from the Pine Lake watershed will ultimately improve the water quality in the Platte River. The Platte River provides drinking water for the cities of Lincoln and Omaha. The three retention ponds and Pine Lake capture and retain a large portion of the sediment and nutrients within the Pine Lake watershed. Any reduction in sediment and nutrients will lead to better water quality in downstream waterbodies.

PLA is also working with the University of Nebraska-Lincoln to install two floating treatment wetlands (FTW) in Pine Lake once the lake is excavated and refilled. The FTWs are floating mats with 1000 plants. The plants remove nitrate from the water column and releases much of it as N_2 gas. Eutrophication is caused from

excess phosphorus and nitrogen, predominantly nitrate. The retention ponds and lake will help reduce the phosphorous while the FTWs will reduce the nitrate. This will help minimize algal blooms and eutrophication in Pine Lake and downstream waterbodies.

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 PLA has partnered with the Lower Platte South NRD (LPSNRD). The LPSNRD paid 40% ($40,528) of the emergency repairs on the Pine Lake Dam in 2020. They provided an additional $49,500 for the watershed assessment & outlet structure (Appendix A p. 1). The NRD had been a good partner in covering approximately 50% of all watershed assessment and outlet structure design costs.
In addition, the LPSNRD has signaled a willingness to cover 50% of the construction management and construction costs.

Phase	Timeline	Total Cost	Pine Lake Association (PLA)	LPSNRD
2. Emergency Repairs Main Dam	Summer 2020	$102,934	$65,067	$40,528
IX. Bathymetric & Sediment Depth Survey	Fall 2021	$25,000	$25,000	
X. Watershed Assessment & Outlet Structures	Summer/Fall 2022	$144,000	$79,500	$64,500
100-Project Management		$10,000	$5,000	$5,000
200-Pine Lake Watershed Analysis		$16,000	$8,000	$8,000
300-Preliminary Design: Lake Bottom Grading Plan		$15,000 $19,000	$15,000 $9,500	$9,500
400-Outlet Structure Evaluation		$32,000	$16,000	$16,000
500-Preliminary Design: Outlet Structures (2)		$22,000	$11,000	$11,000
600-Final Design: Outlet Structures (2)		$30,000	$15,000	$15,000
601-Dam Repair Option 2: Additional Design Fee				
XI. Finalize Financing of Project	Summer 2022-Summer 2023	No Cost		

XII. Construction Management 700-Permitting 800-Final Design: Lake Bottom Grading Plan 900-Bidding Services 1000-Construction Related Services 1100-Construction Observation/Inspection 1200-Final As-Built Plans	Fall 2023-Spring 2024	$106,000 $6,000 $20,000 $6,000 $22,000 $38,000 $14,000	$87,500 $6,000 $20,000 $6,000 $16,500 $28,500 $10,500	$18,500 $5,500 $9,500 $3,500
Estimated Construction Costs i. Removal of sediment-2 holding ponds j. Excavation of Lake k. Watershed Improvements l. Outlet Structure Construction		$2,143,800 $8,000 $1,155,000 $75,000 $905,800	$1,649,400 $4,000 $1,155,000 $37,500 $452,886	$494,400 $4,000 $37,500 $452,886

The total annual revenue of the PLA is $135,000 to cover any costs associated with maintaining the dam outlet structure. The PLA receives $ 29,000 annually from homeowner dues and almost $100,000 in cell tower rental income. Additional amounts can be raised from homeowners (Appendix A, p. 6).

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 LPSNRD has been directly involved with the Pine Lake Rehabilitation Project since 2020. LPSNRD goals our project addresses include the following: a) Manage the hydrologically connected waters in the District; b) Preserve and enhance instream flows and other water-based natural ecosystems that provide benefits supporting the health and safety of our citizens and the quality of their lives; c) Collaborate and work cooperatively with the citizens and communities in the District.

Water originating from the Pine Lake watershed is important for Beal Slough and downstream waters. The quantity and quality of water flowing from the lake will

be compromised if actions are not taken in the near future. The goal of the Pine Lake Association (PLA) is similar to those of the LPSNRD. The residents of Pine Lake take an integrated and holistic approach to the management of both the waters coming into our watershed from outside the neighborhood and from challenges within the neighborhood. The goal of our efforts at Pine Lake is for the water leaving the lake and flowing into the Upper Beal Slough to be cleaner than when in first entered our neighborhood and portion of the Pine Lake watershed.

The Pine Lake Rehabilitation Project consists of three components. First, the pipes for the main dam/water control structure for Pine Lake is 60 years old. The outlet pipe failed inspection by Nebraska Dam Safety and emergency repairs were made to the outlet pipe in 2020. This was not a permanent solution and did not address the entire structure. The dam offers protection for Nebraska Parkway and Beal Slough. The inlet and riser pipes have corroded and threaten the integrity of the dam. As is, it is unsafe for members of the PLA to adjust the water level of the lake given the antiquated engineering and eroded structural integrity of the rise. Hazard Engineering provided estimates for two options (Appendix A, p. 4-5). For option 1, the riser and drawdown pipe would be replaced while the existing CIPP lined outlet pipe would remain in place. This option would cost $300,000. Option 2 includes a full replacement of the outlet system and would cost $905,800. This option includes a concrete riser designed with a slide gate outlet control system to provide the PLA the flexibility to manage the lake level. Since option 2 has a design life of 100 years, this option has been selected. Failure to repair the dam may lead to dam failure and flooding to Beal Slough. This would lead to a large amount of sediment flowing downstream to Beal Slough, Salt Creek and the Platte River.

The second component is the sedimentation of Pine Lake and three retention ponds. The retention ponds reduce peak runoff and the sediment load entering Pine Lake and Beal Slough. Pine Lake has two main tributaries entering from the northeast and southeast (Figure 3). The NE and SE tributaries drain roughly 1/3rd and 2/3rds of the watershed, respectively. The larger SE tributary drains through five existing sediment retention ponds prior to entering Pine Lake. Three of these ponds are located on the PLA and Golf Course property, while two are located further up in the watershed on neighboring properties. The smaller NE tributary drains primarily through the Golf Course property and does not contain any active sediment retention ponds. The Flatwater Group (TFG) performed a topographic and bathymetric survey of the lake and in-lake sediment basin in 2021 (Figure 4). Survey of the sedimentation basins included the ground surface (top of the soft sediments) and the elevation of the hard pan material below. 3-D surface generation and comparison was used to estimate a total sediment volume of 54,500 cy in the lake, of which 1,100 cy is located in the south sediment pond. Assuming that these sediments entered the lake since the 1997 restoration project, the annual sediment loading is approximately 2,700 tons per year. From historic aerial imagery, TFG found that the watershed has urbanized over this period of time from what was once 40% agricultural (Figure 2). Soil loss

associated with tillage of crop fields and urban land development account for this high annual sediment loading. TFG anticipates that future sediment loading will be substantially lower. For this component of the project, the three retention ponds and Pine Lake will be excavated. If the sediment is not removed from the retention ponds and Pine Lake, there is an increased chance of dam failure and flooding of Beal Slough. The storage capacity of the ponds and Pine Lake have been drastically reduced since 1996.

The third component of this project is to reduce runoff and erosion from the Pine Lake watershed. Rock checks and bank reinforcement is needed to control runoff that occurs from outside the neighborhood. These improvements will reduce the peak runoff, sediment and nutrients flowing into Pine Lake, Beal Slough and Salt Creek.

Pine Lake is a beautiful area enjoyed not only by members of the PLA, but people from much of Lincoln. While only members can use the lake and horse trail, the streets around the lake are open to the public and used by many walkers and runners. The golf course at PLA is open to anyone that pays its daily or annual fee. Every year the PLA puts on a large firework display open to the public. The event takes place on the Pine Lake Dam and provides entertainment for hundreds of people. The lake provides the PLA members a place to fish, boat, ice skate and swim as well as adding to a non-urban ambience.

Other stakeholders include the people of Lincoln and Omaha that use the Platte River water for their drinking water. Though the Pine Lake watershed is small, projects such as this one throughout the Platte River watershed have a cumulative positive impact on water quality in the Platte River.

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.

This project addresses threats to infrastructure, water quality, flood risk reduction, and reservoir sedimentation. The outlet pipe at the Pine Lake Dam failed inspection by Nebraska Dam Safety and an emergency repair had to be made to the outlet pipe in 2020. The repairs were only temporary and the issue must be addressed soon or there is a risk of dam failure, which will cause significant damage to infrastructure downstream of the dam. Hazard Engineering provided estimates for two options (Appendix A, 4-5). For option 1, the riser and drawdown pipe would be replaced while the existing CIPP lined outlet pipe would

remain in place. This option would cost $300,000. Option 2 includes a full replacement of the outlet system and would cost $905,800. This option includes a concrete riser designed with a slide gate outlet control system to provide the PLA the flexibility to manage the lake level. Option 2 provides all new, like material, and provides the internal sand drains, seepage protection plunge pools for outlet protection. This gives higher confidence in the resilience of the new structure. An added benefit is this fix has a life expectancy of 100 years vs 40 years in option 1. Failure to repair the dam may lead to dam failure and flooding to Beal Slough. This would lead to a large amount of sediment flowing downstream to Beal Slough, Salt Creek, and the Platte River.

Three retention ponds and Pine Lake will be excavated. The excavations will increase the storage capacity for future sedimentation and nutrients. The Flatwater Group (TFG) estimates that the retention ponds will reduce the sediment loading to the lake by 60-70%. This will improve the water quality in the lake and the downstream waterbodies: Beal Slough, Salt Creek, and Platte River.

TFG estimated that the sediment volume that has runoff into Pine Lake since the 1997 restoration project to be 54,500 cy. This has reduced the normal storage capacity (106 acre-ft) by 25% and the flood storage capacity (306 acre-ft) by 11%. This reduced storage has increased the chance of floodwaters overtopping the dam, thus causing the dam to breach. This would cause significant flooding downstream and cause damage to the Nebraska Parkway and several houses and businesses (Figure 8). Reservoir sedimentation is a major problem throughout Nebraska. With continuous land use change from grassland to cropland to developed, the quantity of sediment entering our waterways each year is significant. Since most of the Pine Lake watershed is now developed, TFG predicts less sedimentation in the future. Also, with the proposed improvements to the golf course, sedimentation will further be reduced. As a state we must excavate the reservoirs as needed and improve the management practices within the watersheds to reduce soil loss and thus sedimentation rates.

The people that live around and visit Pine Lake will benefit greatly from this project. With the improvement in water quality, the lake will continue to be a popular place to fish, swim, boat, and ice skate. The improvements will also improve the ecosystem and the number and diversity of aquatic species, mammals, birds, reptiles and amphibians. The people and businesses downstream of the Pine Lake Dam will benefit once the principal spillway is repaired and the lake excavated. This will reduce the risk of flooding and the dam breaching. This project will also benefit the cities of Lincoln and Omaha that use the Platte River as their drinking water. Though the Pine Lake watershed is small, projects such as this one throughout the Platte River watershed have a cumulative positive impact on water quality in the Platte River.

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.

Overall, this is a 5-year project that started in 2020 and will be completed in 2024. In year 1 (2020), emergency repairs were made to the dam. In year 2 (2021), a bathymetric survey of Pine Lake was completed. In year 3 (2022), the watershed and lake assessment were completed and the outlet structure assessment and design were initiated. At this time, final design work is nearing completion. Permitting and bidding will follow as will the finalization of project funding. The Lake will be drained later this year (2023) and watershed improvements, and sediment removal from the retention ponds will occur. The Lake will be drained in the fall of 2023 so that the dam inlet and outlet structures can be replaced. Sediment in the lake will be excavated late 2023 and winter-spring 2024 (year 5). The lake will be allowed to refill after excavation and dam repairs are completed. If the WSF are not received, the lake excavation will have to wait. Waiting to excavate the lake will increase the flood risk and result in draining the lake a second time. This will be detrimental to the ecosystem.

Phase	Timeline	Total Cost	Pine Lake Association (PLA)	LPSNRD
3. Emergency Repairs Main Dam	Summer 2020	$102,934	$65,067	$40,528
XIII. Bathymetric & Sediment Depth Survey	Fall 2021	$25,000	$25,000	
XIV. Watershed Assessment & Outlet Structures	Summer/Fall 2022	$144,000	$79,500	$64,500
100-Project Management		$10,000	$5,000	$5,000
200-Pine Lake Watershed Analysis		$16,000	$8,000	$8,000
300-Preliminary Design: Lake Bottom Grading Plan		$15,000	$15,000	
400-Outlet Structure Evaluation		$19,000	$9,500	$9,500
500-Preliminary Design: Outlet Structures (2)		$32,000	$16,000	$16,000
600-Final Design: Outlet Structures (2)		$22,000	$11,000	$11,000
601-Dam Repair Option 2: Additional Design Fee		$30,000	$15,000	$15,000

XV. Finalize Financing of Project	Summer 2022-Summer 2023	No Cost		
XVI. Construction Management 700-Permitting 800-Final Design: Lake Bottom Grading Plan 900-Bidding Services 1000-Construction Related Services 1100-Construction Observation/Inspection 1200-Final As-Built Plans	Fall 2023-Spring 2024	$106,000 $6,000 $20,000 $6,000 $22,000 $38,000 $14,000	$87,500 $6,000 $20,000 $6,000 $16,500 $28,500 $10,500	$18,500 $5,500 $9,500 $3,500
Estimated Construction Costs m. Removal of sediment-2 holding ponds n. Excavation of Lake o. Watershed Improvements p. Outlet Structure Construction		$2,143,800 $8,000 $1,155,000 $75,000 $905,800	$1,649,400 $4,000 $1,155,000 $37,500 $452,886	$494,400 $4,000 $37,500 $452,886

The work and finances for Phases 0, I, II, and III are completed and as such, PLA is not requesting a cost-share for these phases of the project in this WSF grant proposal.

Total estimated cost for Phase IV - Construction Management and estimated construction costs is $2,249,800. Finances have not been finalized as we are in the process of seeking permits required prior to bidding for construction costs.

Upon completion of the permitting and bidding for construction estimates, the PLA will seek an additional cost-share of $512,900 from LPSNRD to remove sediment from two retention ponds, replace the outlet structure for the Pine Lake Dam, and conduct watershed improvements. This will result in an unfunded balance of $1,736,900 of which the PLA is requesting 60% or $1,042,140 from the Water Sustainability Fund (WSF). PLA will cover the remaining $694,760 (40%) through funds already in hand ($500,000, Appendix A, p. 3) and assessments of PLA's 135 homeowners.

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.

Primarily, this project will improve the water quality in the Pine Lake watershed. The improvements made to the golf course and the excavation of the three retention ponds will reduce the quantity of runoff, sediment and nutrients entering Pine Lake. This reduction of sediment and nutrients entering Pine Lake will also

improve the water quality within the Beal Slough, Salt Creek, and Platte River watersheds.

Excavation of Pine Lake and replacing the Pine Lake dam outlet structure will reduce the risk of flooding downstream. If these improvements are not made, there will be an increased risk of floodwaters overtopping the dam. This will cause the dam to fail and send a large amount of water, sediment and nutrients into Beal Slough causing significant damage to the channel and streambanks.

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 date of the Annual Report to the Legislature and Plan of Work is 2021-2022. The second goal is to 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. This project meets this goal. Just as Holmes Lake reduces the flooding of Antelope Creek, Pine Lake reduces the flooding of Beal Slough and Salt Creek. Even though Pine Lake is not as large as Holmes Lake, it is by far the largest reservoir within the Beal Slough watershed. The storage capacity of the reservoir has been reduced due to sedimentation. This lost storage increases the risk of flooding downstream in Beal Slough and Salt Creek. The goal states that dam safety is important. The outlet pipe at the Pine Lake Dam failed inspection by Nebraska Dam Safety and an emergency repair had to be made to the outlet pipe in 2020. The repairs were only temporary and the issue must be addressed soon or there is a risk of dam failure, which will cause significant damage to infrastructure downstream of the dam.

The Annual Report states that they want collaborations statewide to keep citizens safe. This project is a collaboration between the WSF, LPSNRD and the Pine Lake Association. We are all working together to ensure the safety of the Pine Lake Dam and all people and infrastructure downstream of the dam.

Goal three of the Annual Report is to 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. In this project the Pine Lake Association is collaborating directly with the LPSNRD to improve the water quality of Pine Lake and the waterbodies downstream of the dam (Beal Slough, Salt Creek, and the Platte River).

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.

    N/A