NEBRASKA NATURAL RESOURCES COMMISSION

Water Sustainability Fund

Application for Funding

Section A.

ADMINISTRATIVE

PROJECT NAME: Robotic Camera Inspection System

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

Sponsor Business Name: Nebraska Public Power District (NPPD)

Sponsor Contact's Name: Randy Zach

Sponsor Contact's Address: PO Box 499, 1414 15th Street, Columbus, NE 68602-0499

Sponsor Contact's Phone: 402-276-4591

Sponsor Contact's Email: rrzach@nppd.com

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

   Grant amount requested. $ **81,892**
   - If requesting less than 60% cost share, what %? **N/A**

   If a loan is requested amount requested. $ **N/A**

   - How many years repayment period? **N/A**
   - Supply a complete year-by-year repayment schedule. **N/A**

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? **N/A**
- Provide a demonstration of need. **N/A**
- **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☐

No permits are required for this project. NPPD wishes to purchase a piece of equipment to be utilized only on its property and right of way. There is no ground disturbing activity associated with this project.

4. **Partnerships**

List each Partner / Co-sponsor, attach documentation of agreement:
NPPD does not have any partners or co-sponsors for this project, however, NPPD has received a number of Letters of Support from stakeholders of the project. See Attachment A for Letters of Support:
1. From Twin Platte Natural Resources District for the seepage return flow and groundwater recharge benefits to the Integrated Management Plan as well as recreation

benefits to the NRD from the safe and reliable operation of NPPD's Sutherland System.

2. From The Central Nebraska Public Power & Irrigation District (Central) for the protection of the Sutherland System through protection of NPPD's Sutherland System. NPPD and Central FERC hydropower projects are interrelated, and this Robotic Camera Inspection System is valuable to protecting those interrelated operations. NPPD's FERC Project and the Sutherland System are synonymous.

3. From the Platte River Recovery Implementation Program by providing important operational flexibility in NPPD's system to assist PRRIP in attaining its objective of managing river flows to benefit threatened and endangered species.

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

NPPD is the sole project sponsor and is fully capable of completing the project.

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.

NPPD is requesting funding of $81,892. NPPD is seeking 60% funding of the total cost of $136,487 for a Robotic Camera Inspection System, which consists of inspection cameras, cabling, trailer, display monitor, and other associated equipment.

There are no other contributors.

If funding is not obtained from the Water Sustainability Fund, NPPD will be required to fund the project through rates it charges its electricity customers.

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!

Nebraska Public Power District (NPPD) wishes to purchase a Robotic Camera Inspection System (Inspection System). Also known as a pipe inspection camera system, it is a tool used to visually inspect the inside of pipelines, drains, toe drains, and other underground or hard-to-reach structures. It consists of inspection cameras, cabling, trailer, display monitor, and other associated equipment. The purpose is to provide safeguards for NPPD's Sutherland System (including canals and reservoirs) and irrigation canals (Gothenburg Canal, Dawson County Canal, and Kearney Canal) and all their beneficial uses of water by providing additional monitoring of the condition of structures.

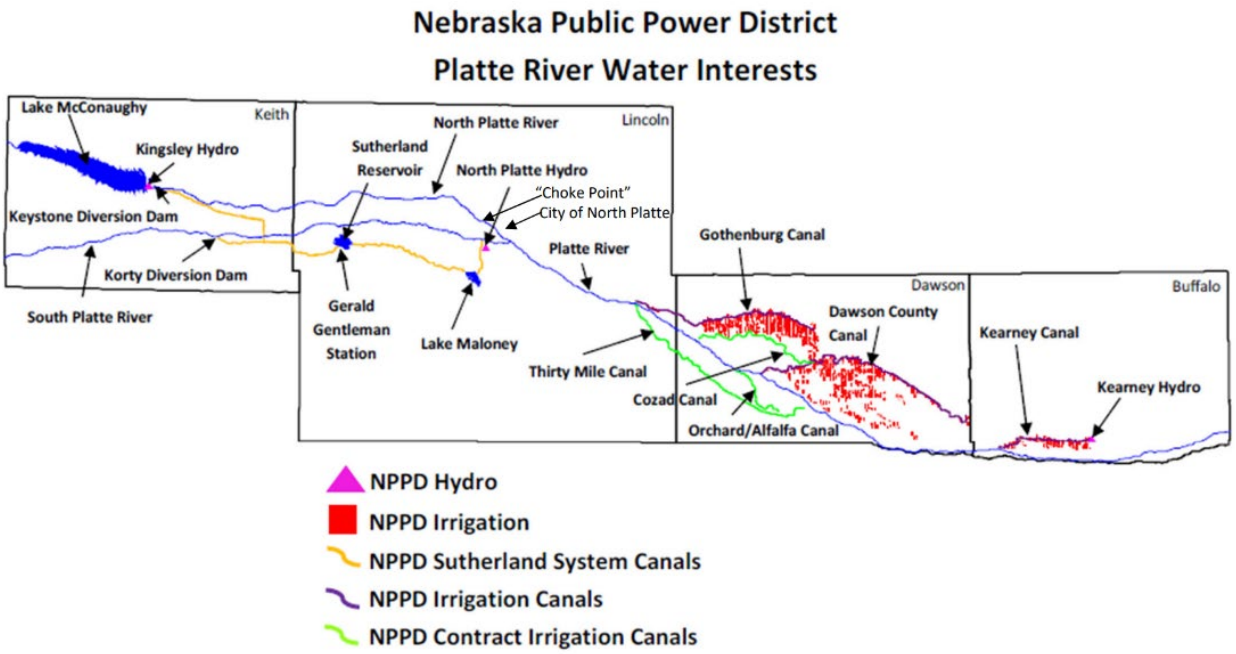
Here are some of the benefits of using a Robotic Camera Inspection System:

1. Early Detection of Issues: A robotic camera inspection system allows NPPD to detect issues early on, before they become major problems. This can help save money on expensive repairs and prevent damage to property.
2. Non-Destructive Testing: Robotic camera inspection systems are non-destructive, meaning they don't require excavation or demolition. This saves time and money, and helps minimize operational disruptions.
3. Accurate Diagnostics: Robotic camera inspection systems provide accurate diagnostics of structures, allowing NPPD to identify the exact location and nature of any issues. This helps NPPD make more informed decisions about repairs and maintenance.
4. Increased Efficiency: Robotic camera inspection systems are efficient, allowing NPPD to quickly and easily inspect large lengths of pipeline or other structures. This can save time and money on inspections and repairs.
5. Improved Safety: Robotic camera inspection systems improve safety by allowing NPPD to inspect pipes and other structures from a safe distance, without the need for workers to enter confined spaces or work at heights. This reduces the risk of accidents and injuries.

This Inspection System contributes to multiple water sustainability goals:

1. Protect the integrity of the Sutherland System by providing additional tools for ensuring safe and continuous operation;
2. Flood protection by allowing for additional inspections, which if not performed could lead to plugged underdrains and potential damage to the Sutherland System and irrigation canals including agricultural/wildlife habitat damage;
3. Protects the Sutherland System's delivery of water around the "North Platte Chokepoint";
4. Water conservation by ensuring the Sutherland System and NPPD irrigation canals are available for the groundwater recharge it provides and baseflows for both the North Platte River and South Platte River along their routes;
5. Preservation of water resources by providing for the safe and reliable operation of NPPD's water systems;
6. Ensure the Sutherland System is available for routing of the Platte River Recovery Implementation Plan Environmental Account water;
7. Protecting the main supply of cooling water for Gerald Gentleman Station power plant;
8. Ensure continued canal and lake recreation as wells as benefits to migratory birds;
9. Carbon-free hydropower at the North Platte and Kearney hydropower plants will be protected by protecting the canals that route water to them; and
10. Protecting the irrigation canals and the irrigated acres they serve, as well as the Kearney Hydropower plant.

See Attachment B for a map of the NPPD facilities where this Robotic Camera Inspection System will be used.



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.

The project consists of expenditures only in Year 1. Total cost of $136,487.

Purchase of the Robotic Camera Inspection System	August 2023	$ 136,487

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; NPPD has Professional Engineers on staff who determined purchasing a Robotic Camera Inspection System was the best course of action to safely, efficiently, and accurately inspect structures along NPPD's Sutherland System (including canals and reservoirs) and irrigation canals. They determined that it is more cost effective to purchase a system as opposed to renting a system or hiring a contractor. Having our own inspection system offers flexibility and immediate response in the event of an emergency. An additional factor to consider: if NPPD chose to hire a contractor for this work, in the case of emergent work, we have seen costs for a consultant to drop what they are doing and come out to make an inspection dramatically drives up the cost, possibly doubling it. This would be avoided if NPPD owned its own inspection system. (See Attachment G for two quotes from contractors for one day of inspection between ~$1,600-3,000 per day.)

The risk being mitigated is the effects a damaged structure may have on associated canals and reservoirs. For instance, if a canal underdrain structure becomes plugged over time, it could allow uncontrolled water to enter the canal. This in turn could cause overtopping or breaching, causing damage to agricultural land and structures in the water's path and prevent the canal from serving all of its beneficial purposes.

Note that NPPD is aware that NDNR's Dam Safety Division has a camera inspection system available at no charge, but because NPPD's inspections will be approximately 150 / year, this option, although appreciated, is not as feasible as owning an inspection system.

Below is a picture of part of the inspection system NPPD is considering for this project.

Example Deep Trekker A-200 system (see photo on right of ROV component):

1.A.2 Describe the plan of development (004.01 A); In the fall of 2022, NPPD completed a Federal Energy Regulatory Commission (FERC) inspection by an independent consultant, Pete Haug with Aryes and Associates (NPPD's FERC Project No. 1835 and the Sutherland System are synonymous). NPPD has a draft report that recommends that NPPD perform additional inspections of underdrains, etc. on the Sutherland System. The increase in inspections is estimated to be approximately 150 annually.

In February 2023 NPPD's internal Professional Engineers determined a Robotic Camera Inspection System to be a priority acquisition. NPPD has reviewed the intended purposes/tasks to be undertaken by such a system which led to an evaluation of features required. Those features currently include remote measuring capability, long distance cabling, mobility, inspection and recording software, remote camera monitoring, high-definition video, expandability, long battery life, and high lumen lighting. The inspection system will be deployed to a location of need, inserted into the structure, problems identified, and data collected/recorded. It is also important for the system to be able examine various types of structures such as corrugated metal pipe, clay, concrete, steel, aluminum piping etc., in both dry and submersed conditions. There are even uses for the Robotic Camera Inspection System at the Gerald Gentleman Station and Canaday Station electricity generation plants water related structures.

As shown in Attachment D -- Cost/Benefit Information, it is cost effective for NPPD to have its own Robotic Camera Inspection System.

1.A.3 Include a description of all field investigations made to substantiate the feasibility report (004.01 B); NPPD Professional Engineers researched top providers of these type of inspection systems and that research led to two leading vendors—Deep Trekker and

Riezler. NPPD received estimate quotes from these two in February and March of 2023 for this grant application. Attachment C contains the quotes and shows a 6% cost savings with Deep Trekker.

In comparison, NPPD has used consultants to inspect in the past and that will not be cost effective for the number of annual inspections needed. See Attachment G for examples of actual cost and quotes of approximately $1,600 and $3,000 per day. For the expected increase of 150 inspections, this would range from $240,000 -$450,000 annually, which is infeasible.

1.A.4 Provide maps, drawings, charts, tables, etc., used as a basis for the feasibility report (004.01 C); Attachment C contains examples of potential choices for Robotic Camera Inspection Systems and shows a 6% cost savings for Deep Trekker.

1.A.5 Describe any necessary water and/or land rights including pertinent water supply and water quality information (004.01 D); There are no water or land rights needed for this Robotic Camera Inspection System.

1.A.6 Discuss each component of the final plan (004.01 E); Technology in this arena is constantly evolving and improving. NPPD plans to continually monitor advancements in capability offerings up until final purchase in the fall of 2023. Current acceptable specifications are listed in 1.A.2., above.

The final component of the plan is to purchase the Robotic Camera Inspection System.

1.A.7 When applicable include the geologic investigation required for the project (004.01 E 1); No geologic investigation was required because this project is a purchase of equipment.

1.A.8 When applicable include the hydrologic data investigation required for the project (004.01 E 2); No hydrologic investigation was required because this project is a purchase of equipment.

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). Technology in this arena is constantly evolving and improving. Criteria for final Robotic Camera Inspection System purchase is to continually monitor vendors for the best Inspection System that meets all of NPPD's water sustainability needs at a reasonable price.

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

1.B.1 Insert data necessary to establish technical feasibility (004.02); **N/A**

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

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

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

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). **N/A**

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.
Owning the Robotic Camera Inspection System allows for it to be available to NPPD 24 hours / 7 days a week if needed in an emergency. Two reasonable alternatives to purchasing a Robotic Camera Inspection System is to either have a contractor on-call within a 1-hour call-out distance or rent a system. NPPD believes the rental route to be the next best alternative and has received an estimate from Deep Trekker on the rental cost of the equipment. That rental cost is $7,999 per week for an estimated annual cost of $79,990 for 150 inspections per year at 4 per day and 4 work-days per week and this does not include an operator. (See Attachment E Robotic Camera Rental Cost).

The avoided cost of renting an Inspection System makes the cost of purchasing our Robotic Camera Inspection System recoverable in 2 years ($136,487 / $79,990 camera rental avoided cost).

An additional factor to consider if NPPD chose to hire a contractor for this work, in the case of emergent work, we have seen costs for a consultant to drop what they are doing and come out to make an inspection dramatically drives up the cost, possibly doubling it. This would be avoided if NPPD owned its own inspection system. (See Attachment G for two quotes from contractors for one day of inspection between ~$1,600-3,000 per day for non-emergent work.)

Note that NPPD is aware that NDNR's Dam Safety Division has a camera inspection system available at no charge, but because NPPD's inspections will be approximately 150 / year, this option, although appreciated, is not as feasible as owning an inspection system.

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). The purchase of a Robotic Camera Inspection System is cost-effective. NPPD will use the next best alternative of renting a camera inspection system for the basis for the cost/benefit analysis. The cost of the project is expected to be $136,487. The annual benefit is the avoided cost of renting an Inspection System ($79,990 / year, escalated at 3%). See Attachment E Robotic Camera Rental Cost. Attachment D -- Cost/Benefit Information, shows that the net benefit is a positive $1,826,047 over the 20-year life of the Inspection System. The Benefit/Cost ratio is 11 (Benefit of 2,009,098 / life-time cost of 183,052).

Intangible benefits include:
1. Early Detection of Issues: A Robotic camera inspection system allows NPPD to detect issues early on, before they become major problems. This can help save money on expensive repairs and prevent damage to property.
2. Non-Destructive Testing: Robotic camera inspection systems are non-destructive, meaning they don't require excavation or demolition. This saves time and money, and helps minimize operational disruptions.
3. Accurate Diagnostics: Robotic camera inspection systems provide accurate diagnostics of structures, allowing NPPD to identify the exact location and nature of any issues. This helps NPPD make more informed decisions about repairs and maintenance.
4. Increased Efficiency: Robotic camera inspection systems are efficient, allowing NPPD to quickly and easily inspect large lengths of pipeline or other structures. This can save time and money on inspections and repairs.
5. Improved Safety: Robotic camera inspection systems improve safety by allowing NPPD to inspect pipes and other structures from a safe distance, without the need for workers to enter confined spaces or work at heights. This reduces the risk of accidents and injuries.

Other benefits stemming from the project that are not easily quantified include the following:
1. Protect the integrity of the Sutherland System by providing additional tools for ensuring safe and continuous operation;
2. Flood protection by allowing for additional inspections, which if not performed could lead to plugged underdrains and potential damage to the Sutherland System and irrigation canals including agricultural/wildlife habitat damage;
3. Protects the Sutherland System's delivery of water around the "North Platte Chokepoint";
4. Water conservation by ensuring the Sutherland System and NPPD irrigation canals are available for the groundwater recharge it provides and baseflows for both the North Platte River and South Platte River along their routes;
5. Preservation of water resources by providing for the safe and reliable operation of NPPD's water systems;

6. Ensure the Sutherland System is available for routing of the Platte River Recovery Implementation Plan Environmental Account water;
7. Protecting the main supply of cooling water for Gerald Gentleman Station power plant;
8. Ensure continued canal and lake recreation as wells as benefits to migratory birds;
9. Carbon-free hydropower at the North Platte and Kearney hydropower plants will be protected by protecting the canals that route water to them; and
10. Protecting the irrigation canals and the irrigated acres they serve, as well as the Kearney Hydropower plant.

There are even uses for the Robotic Camera Inspection System at the Gerald Gentleman Station and Canaday Station electricity generation plants water related structures.

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 purchase price of the Robotic Camera Inspection System is estimated to be $136,487.

Ongoing operations and maintenance (O/M) costs for the equipment is estimated to be approximately $2,328 annually over the 20-year useful life. This includes $1,643 every 3rd year for a new Service Kit and $8,117 every 5th year for new wheels and tracks; escalated at 3% per year. Preventative maintenance is minimal.

The Attachment D -- Cost/Benefit Information shows the costs for the total project and demonstrates that it is cost beneficial. A summary table is below.

Robotic Camera Inspection System					
Cost/Benefit Item	**Year 1 - 2023**	**Year 2 - 2024**	**Year 3 - 2025**	**Years 4-20**	**Total Amount**
Purchase Cost of Robotic Camera Inspection System	(136,487)	-	-	-	(136,487)
O&M (1)	-	-	-	(46,565)	(46,565)
Benefit: Avoided cost of renting an inspection system (2)	-	79,990	82,390	1,846,719	2,009,098
Benefit: Groundwater Recharge Value to the basin IMPs (3)	Note: not all benefits were quantified.				-
Benefit: Drought Resiliency Benefit (4)	Note: not all benefits were quantified.				-
Benefit: Flood benefit (5)	Note: not all benefits were quantified.				-
Net Benefit over 20 years					**1,826,047**

(1) O&M includes: Estimated to be $1,643 every 3rd year for a new Service Kit and $8,117 every 5th year for new wheels and tracks; escalated at 3% per year. Preventative maintenance is minimal.

(2) Cost/Benefit is being calculated using the Next Best Alternative approach, which is to rent a Camera Inspection System. Escalated at 3%. See Attachment E – Rental Cost.

(3) Recharge is valuable to PRRIP and NRDs' IMPs. PRRIP pays: $34.88/AF recharged(2022 price). NPPD is not including this as benefit because we are not getting paid for it.

(4) Drought Resiliency: No quantitative values have been determined for the drought resiliency benefits provided by the Sutherland Canal System protections this Camera Inspection System provides.

(5) Flood benefits: Flood protection benefits of continuing the routing of water past the North Platte ChokePoint, and other flood benefits have not been quantified.

3.B Only primary tangible benefits may be counted in providing the monetary benefit information and shall be displayed by year for the project life. In a multi-purpose project, estimate benefits for each purpose, by year, for the life of the project. Describe intangible or secondary benefits (if any) separately. In a case where there is no generally accepted method for calculation of primary tangible benefits describe how the project will increase water sustainability, in a way that justifies economic feasibility of the project such that the finding can be approved by the Director and the Commission (005.02). The primary tangible benefit is the avoided cost of renting an Inspection System ($79,990 annually, escalated at 3%). See Attachment D -- Cost/Benefit Information and Attachment E Robotic Camera Rental Cost.

Intangible or secondary benefits include:
1. Early Detection of Issues: A Robotic camera inspection system allows NPPD to detect issues early on, before they become major problems. This can help save money on expensive repairs and prevent damage to property.
2. Non-Destructive Testing: Robotic camera inspection systems are non-destructive, meaning they don't require excavation or demolition. This saves time and money, and helps minimize operational disruptions.
3. Accurate Diagnostics: Robotic camera inspection systems provide accurate diagnostics of structures, allowing NPPD to identify the exact location and nature of any issues. This helps NPPD make more informed decisions about repairs and maintenance.
4. Increased Efficiency: Robotic camera inspection systems are efficient, allowing NPPD to quickly and easily inspect large lengths of pipeline or other structures. This can save time and money on inspections and repairs.
5. Improved Safety: Robotic camera inspection systems improve safety by allowing NPPD to inspect pipes and other structures from a safe distance, without the need for workers to enter confined spaces or work at heights. This reduces the risk of accidents and injuries.

An additional factor to consider: if NPPD chose to hire a contractor for this work, in the case of emergent work, we have seen costs for a consultant to drop what they are doing and come out to make an inspection dramatically drives up the cost, possibly doubling it. This would be avoided if NPPD owned its own inspection system.

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). See Attachment D -- Cost/Benefit Information.

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 purchase of a Robotic Camera Inspection System is cost-effective. NPPD will use the next best alternative of renting a camera inspection system for the basis for the cost/benefit

analysis. The cost of the inspection system is expected to be $136,487. The annual benefit is the avoided cost of renting an Inspection System ($79,990 / year, escalated at 3%). The Cost/Benefit Table in Attachment D shows that the net benefit is a positive $1,826,047 over the 20-year life of the Inspection System.

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. NPPD has sufficient funds to pay for its 40% share of inspection system costs. NPPD is a public corporation and political subdivision of the state of Nebraska and has the authority under Nebraska Statutes Chapter 70 to develop rates to its customers to recover its share of the project costs. NPPD's chartered territory includes all or parts of 86 of the State's 93 counties and more than 400 municipalities in the State.

   Neb. Rev. Stat. 70-655 states in part: (1) Except as otherwise provided in this section, the board of directors of any district organized under or subject to Chapter 70, article 6, shall have the power and be required to fix, establish, and collect adequate rates, tolls, rents, and other charges for electrical energy, water service, water storage, and for any and all other commodities, including ethanol and hydrogen, services, or facilities sold, furnished, or supplied by the district, which rates, tolls, rents, and charges shall be fair, reasonable, nondiscriminatory, and so adjusted as in a fair and equitable manner to confer upon and distribute among the users and consumers of commodities and services furnished or sold by the district the benefits of a successful and profitable operation and conduct of the business of the district.

5. Provide evidence that sufficient annual revenue is available to repay the reimbursable costs and to cover OM&R (operate, maintain, and replace). NPPD has sufficient funds to pay for its 40% share of the inspection system costs. NPPD is a public corporation and political subdivision of the state of Nebraska and has the authority under Nebraska Statutes Chapter 70 to develop rates to its customers to recover its share of the project costs. NPPD's chartered territory includes all or parts of 86 of the State's 93 counties and more than 400 municipalities in the State.

   Neb. Rev. Stat. 70-655 states in part: (1) Except as otherwise provided in this section, the board of directors of any district organized under or subject to Chapter 70, article 6, shall have the power and be required to fix, establish, and collect adequate rates, tolls, rents, and other charges for electrical energy, water service, water storage, and for any and all other commodities, including ethanol and hydrogen, services, or facilities sold, furnished, or supplied by the district, which rates, tolls, rents, and charges shall be fair, reasonable, nondiscriminatory, and so adjusted as in a fair and equitable manner to confer upon and distribute among the users and consumers of commodities and services furnished or sold by the district the benefits of a successful and profitable operation and conduct of the business of the district.

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

7. Describe how the plan of development minimizes impacts on the natural environment (i.e. timing vs nesting/migration, etc.). The purchase of the Robotic Camera Inspection System will not negatively impact the natural environment. NPPD consistently monitors migration restrictions when performing physical work on our canals and this would include during use of the Robotic Camera Inspection System.

   No U.S. Army Corps of Engineers (USACE) Clean Water Act (CWA) Section 404 permit is needed because there are no ground disturbing activities.

   The project will not involve release of chemicals into waterways or soil.

   Positive impacts on the natural environment include providing for the protection of carbon-free power from the North Platte and Kearney Hydropower plants (through protecting the integrity of the canals and reservoirs that provide their water) and the additional monitoring of underdrains. This Robotic Camera Inspection System will help to maintain natural drainage ways for wildlife, etc.

8. Explain how you are qualified, responsible and legally capable of carrying out the project for which you are seeking funds. NPPD is a public power and irrigation district that operates under statutes of the State of Nebraska. NPPD and its predecessors have been operating the Sutherland System since the 1930s and its irrigation canals since the 1890s. NPPD and its predecessor have provided for operation, maintenance, professional engineering, construction, and monitoring of the structures. As such, NPPD is qualified, responsible, and legally capable of carrying out this project by purchasing and operating a Robotic Camera Inspection System.

9. Explain how your project considers plans and programs of the state and resources development plans of the political subdivisions of the state. NPPD's project not only will have benefits to NPPD (a political subdivision of the state), but to other stakeholders in the basin. The State of Nebraska is a party to the Platte River Recovery Implementation Program (PRRIP). NPPD anticipates benefits of protecting the integrity of the Sutherland System to assist the PRRIP in attaining its objective of managing river flows to benefit threatened and endangered species. The project also helps maintain canal seepage river returns for the Twin Platte Natural Resources Districts' Platte River Integrated Management Plan and Upper Platte River Basinwide Plan. Each of these Plans has the State of Nebraska as a stakeholder.

   The Robotic Camera Inspection System provides additional protections of NPPD's irrigation canal structures (Gothenburg, Dawson County, and Kearney Canal) by having more safe and efficient structure inspections. The irrigation canals' benefits accrue to both NPPD and the Central Platte Natural Resources District, which are political subdivisions of the state.

NPPD believes the Robotic Camera Inspection System will benefit The Central Nebraska Public Power & Irrigation District (Central) (a political subdivision) by protecting the integrity of the Sutherland System. The Sutherland System routes a portion of Central's storage water, which incurs less losses than if the storage water were left in the North Platte River and allows Central's water to go around the "Choke Point" at North Platte; and routes Platte River Recovery Implementation Program Environmental Account water, of which Central is a stakeholder.

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

If yes:

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

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

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

11. Identify how you possess all necessary authority to undertake or participate in the project. NPPD owns the property where the Robotic Camera Inspection System will be used. NPPD has the authority under Nebraska Statutes Chapter 70 to develop rates to its customers to recover its share of the project costs.

12. Identify the probable consequences (environmental and ecological) that may result if the project is or is not completed. There are no environmental and ecological consequences of completing this project.

The environmental and ecological consequences of not completing this project stem from the potential for the inoperability of NPPD's Sutherland System or irrigation canals should a plugged underdrain, for example, cause additional water to enter an already full canal and cause a breach. The uses at risk include but are not limited to: carbon-free energy from hydropower; improved water management; the canal fishery; migratory birds; and continued seepage providing North Platte River and South Platte River baseflows. Also overtopping or breaching would cause damage to agricultural land and structures in the water's path.

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:

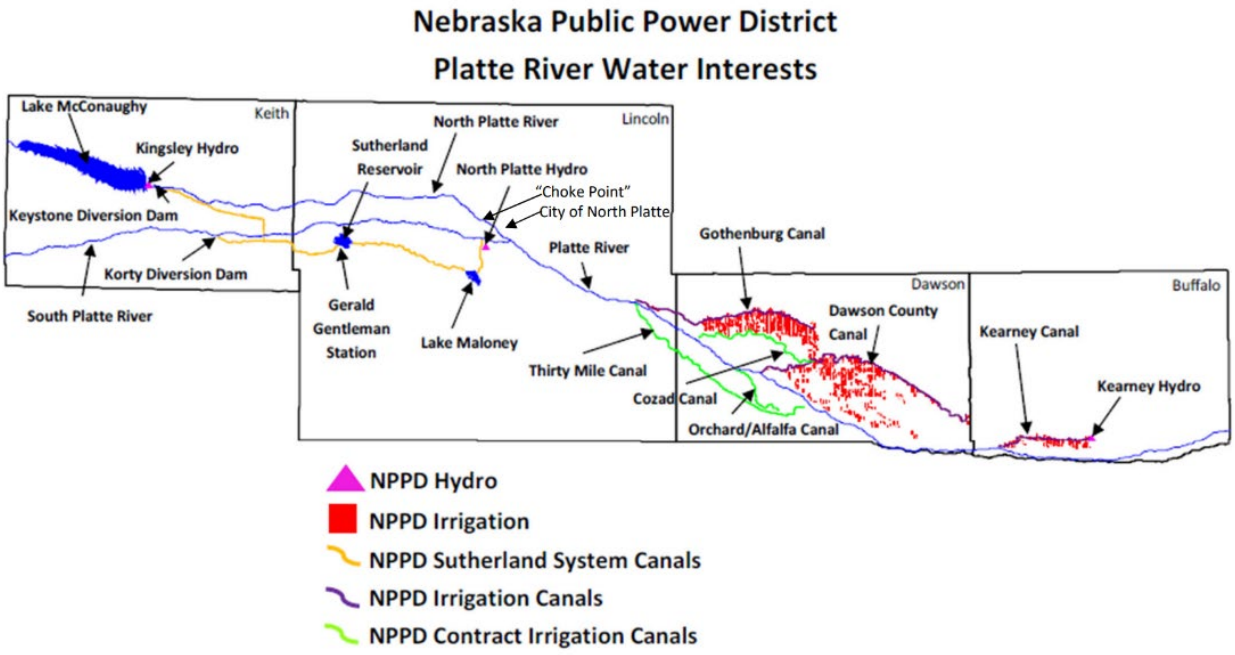
- The responses to one criterion ***will not*** be considered in the scoring of other criteria. Repeat references as needed to support documentation in each criterion as appropriate. The 15 categories are specified by statute and will be used to create scoring matrixes which will ultimately determine 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.

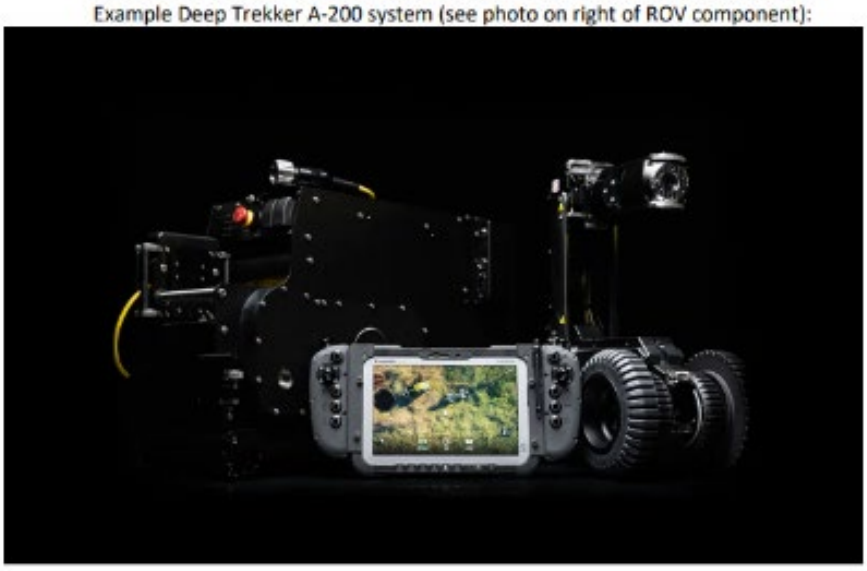
Complete any of the following (15) criteria which apply to your project. Your response will be reviewed and scored by the NRC. Place an N/A (not applicable) in any that do not apply, an N/A will automatically be placed in any response fields left blank.

Below is a map of the NPPD facilities where this Robotic Camera Inspection System will be used. Note that the "Sutherland System" includes canal facilities as well as Sutherland Reservoir and Lake Maloney.



Below is a picture of part of the inspection system NPPD is considering for this project.

Example Deep Trekker A-200 system (see photo on right of ROV component):



1. Remediates or mitigates threats to drinking water;

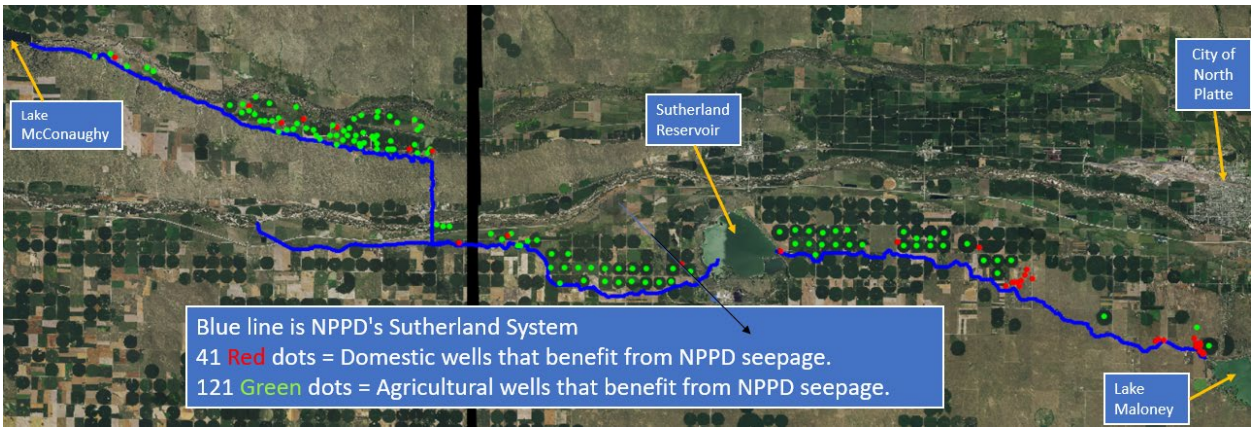
- Describe the specific threats to drinking water the project will address.
- Identify whose drinking water, how many people are affected, how will project remediate or mitigate.
- Provide a history of issues and tried solutions.
- Provide detail regarding long-range impacts if issues are not resolved.

The purchase and use of a Robotic Camera Inspection System is important to drinking water because its use will enhance the integrity of the Sutherland System and NPPD's irrigation canals in Dawson and Buffalo Counties (Gothenburg Canal, Dawson County Canal, and Kearney Canal).

Operation of the Sutherland System and NPPD's irrigation canals provide groundwater recharge to domestic wells along their routes--from Lake Ogallala to the city of North Platte and many miles in Dawson and Buffalo Counties. The protections this project provides will help remediate or mitigate threats to drinking water for those wells.

This benefit would be to the historical issues of quantity of drinking water as well as water quality. Recharge from NPPD's canals and reservoirs provides a source of well water that is lower in nitrates than that of recharge from rainfall through agricultural land. Recharge may allow for less nitrate treatment at those wells. Due to the low cost of this project, we did not perform any studies on exact effects that could be caused.

Below is a map showing a conservative estimate of wells that are influenced by NPPD's Sutherland System. Of the wells shown, 41 are domestic (shown in red) and 121 are agricultural wells (shown in green). There are additional wells in NPPD's irrigation canal area that are also influenced by those canals.



2. Meets the goals and objectives of an approved integrated management plan or ground water management plan;

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

The purchase and use of a Robotic Camera Inspection System is important to integrated management plans (IMP) and ground water management plans (GWMP) because its use will enhance the integrity of the Sutherland System and NPPD's irrigation canals in Dawson and Buffalo Counties (Gothenburg Canal, Dawson County Canal, and Kearney Canal).

The project will benefit the following plans:
1) the Twin Platte Natural Resources District (TPNRD) IMP effective September 11, 2019 by the TPNRD and the Nebraska Department of Natural Resources (NDNR);
2) Upper Platte River Basin Wide-Plan (UPRBP)) effective September of 2019 issued Jointly by the Upper Platte River NRD's and the NDNR;
3) the Central Platte Natural Resources District (CPNRD) IMP effective September 11, 2019 by the CPNRD and the NDNR;
4) the TPNRD GWMP, effective January 1, 2018;
5) the CPNRD GWMP, effective January 2021; and
6) allows NCORPE to continue to provide offsets as required by the Basin-wide IMP.

Some of the historic work of the TPNRD and CPNRD IMPs and GWMPs completed to achieve the goals of the plan related to NPPD's project includes:
1) to provide offset water for groundwater well impacts through continuing supply of groundwater recharge from the Sutherland System
2) to minimize conflicts between water users
3) safeguard current uses of water for irrigation
4) safeguard recreational uses
5) ensure compliance by Nebraska with any interstate decree, compact, or other formal state contract or agreement through the benefits that NPPD's Sutherland System and irrigation canals provide to the Platte River Recovery Implementation Plan, especially through its routing of Environmental Account water to the central Platte River near Grand Island and groundwater recharge and
6) Nitrogen management programs.

The UPRBP, of which NPPD is a primary stakeholder, addresses aging infrastructure including canals by
1) providing offset water for groundwater well impacts through continuing supply of groundwater recharge from NPPD's Sutherland System and irrigation canals
2) minimizing conflicts between water users. The UPRBP mentions NPPD with respect to its "Current to Fully Appropriated Study"; various uses of water by NPPD in the

Upper Platte Basin; assessments of upcoming water supplies; and NPPD's excess flow diversions on our irrigation canals.

The following goals and objectives of the IMPs could benefit from the project:
1) to provide offset water for groundwater well impacts, and
2) to minimize conflicts between water users. NPPD's Sutherland System and irrigation canals can assist in these by increasing normal flows during times of excess to retime flows to times when water may be needed, potentially in times of drought and will increase recharge along the canals and reservoirs. These retimed river flows reduce the NRDs need to provide offsets.

(See Attachment B for map of area.)

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 purchase and use of a Robotic Camera Inspection System is important to water sustainability goals because its use will enhance the integrity of the Sutherland System and NPPD's irrigation canals in Dawson and Buffalo Counties (Gothenburg Canal, Dawson County Canal, and Kearney Canal).

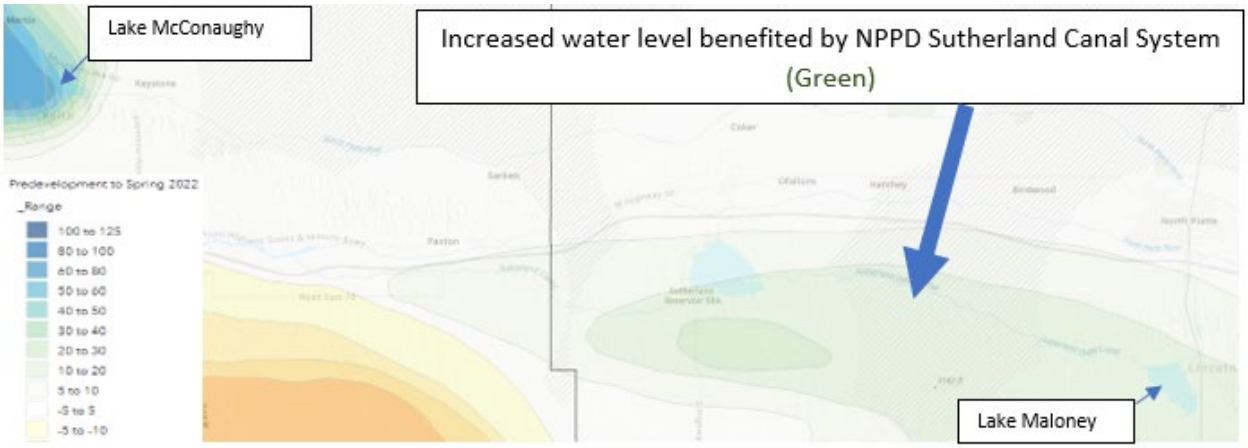
   Benefits of the project align with the protection of existing groundwater recharge because NPPD's Sutherland System and irrigation canals provide groundwater recharge to wells along its route from Lake Ogallala to the city of North Platte and many miles in Dawson and Buffalo Counties. NPPD estimates the Sutherland System recharge that is being protected by this project to be 120,000 acre-feet annually.

   Benefits of the project align with increased streamflow. By protecting NPPD's Sutherland System and irrigation canals, the seepage that results in streamflow is protected. It is protected along its route from Lake Ogallala to the city of North Platte and many miles in Dawson and Buffalo Counties. These benefits accrue to the North Platte River, the South Platte River, and the Platte River. NPPD estimates this streamflow that is being protected by this project to be 120,000 acre-feet annually, and by contrast, aquifer depletion also benefits from protecting the Sutherland System.

   Because the Sutherland System traverses both the North Platte River and the South Platte River, the water is protected by this project has cross-basin benefits of groundwater

recharge, reduction of aquifer depletion, and streamflow. These benefits have been in place since the 1930s and the project is critically important to continue the current benefits.

Below is a map showing, in green, the groundwater benefit NPPD's Sutherland System has provided (up to 10-40 feet).



Ground Water Level Map for Predevelopment to 2022 (Source: Nebraska Conservation & Survey Division Ground Water and Geology Data Portal)

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.

   The purchase and use of a Robotic Camera Inspection System is important to multiple water supply goals because its use will enhance the integrity of the Sutherland System and NPPD's irrigation canals in Dawson and Buffalo Counties (Gothenburg Canal, Dawson County Canal, and Kearney Canal).

   The project can contribute to multiple water supply goals for:
   1. Protect the integrity of the Sutherland System by providing additional tools for ensuring safe and continuous operation;
   2. Flood protection by allowing for additional inspections, which if not performed could lead to plugged underdrains and potential damage to the Sutherland System and irrigation canals including agricultural/wildlife habitat damage;
   3. Protects the Sutherland System's delivery of water around the "North Platte Chokepoint";
   4. Water conservation by ensuring the Sutherland System and NPPD irrigation canals are

available for the groundwater recharge it provides and baseflows for both the North Platte River and South Platte River along their routes;
5. Preservation of water resources by providing for the safe and reliable operation of NPPD's water systems;
6. Ensure the Sutherland System is available for routing of the Platte River Recovery Implementation Plan Environmental Account water;
7. Protecting the main supply of cooling water for Gerald Gentleman Station power plant;
8. Ensure continued canal and lake recreation as wells as benefits to migratory birds;
9. Carbon-free hydropower at the North Platte and Kearney hydropower plants will be protected by protecting the canals that route water to them; and
10. Protecting the irrigation canals and the irrigated acres they serve, as well as the Kearney Hydropower plant.

The camera inspection system can provide these benefits through:
1. Early Detection of Issues: A Robotic camera inspection system allows NPPD to detect issues early on, before they become major problems. This can help save money on expensive repairs and prevent damage to property.
2. Non-Destructive Testing: Robotic camera inspection systems are non-destructive, meaning they don't require excavation or demolition. This saves time and money, and helps minimize operational disruptions.
3. Accurate Diagnostics: Robotic camera inspection systems provide accurate diagnostics of structures, allowing NPPD to identify the exact location and nature of any issues. This helps NPPD make more informed decisions about repairs and maintenance.
4. Increased Efficiency: Robotic camera inspection systems are efficient, allowing NPPD to quickly and easily inspect large lengths of pipeline or other structures. This can save time and money on inspections and repairs.
5. Improved Safety: Robotic camera inspection systems improve safety by allowing NPPD to inspect pipes and other structures from a safe distance, without the need for workers to enter confined spaces or work at heights. This reduces the risk of accidents and injuries.

There are even uses for the Robotic Camera Inspection System at the Gerald Gentleman Station and Canaday Station electricity generation plants water related structures.

The long-range forecasted benefits are greater than continuing the current path of hiring a contractor to perform inspections of NPPD's structures. Attachment D -- Cost/Benefit Information shows the net benefits of completing this water sustainability project as $1,826,047 over the 20-year useful life.

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 purchase and use of a Robotic Camera Inspection System maximizes the beneficial use of Nebraska's water resources for the benefit of the state's residents because its use will enhance the integrity of the Sutherland System and NPPD's irrigation canals in Dawson and Buffalo Counties (Gothenburg Canal, Dawson County Canal, and Kearney Canal).

Uninterrupted operation of NPPD's Sutherland System and irrigation canals is vital to providing
1. Protection of the integrity of the Sutherland System by providing additional tools for ensuring safe and continuous operation;
2. Flood protection by allowing for additional inspections, which if not performed could lead to plugged underdrains and potential damage to the Sutherland System and irrigation canals including agricultural/wildlife habitat damage;
3. Protects the Sutherland System's delivery of water around the "North Platte Chokepoint";
4. Water conservation by ensuring the Sutherland System and NPPD irrigation canals are available for the groundwater recharge it provides and baseflows for both the North Platte River and South Platte River along their routes;
5. Preservation of water resources by providing for the safe and reliable operation of NPPD's water systems;
6. Ensure the Sutherland System is available for routing of the Platte River Recovery Implementation Plan Environmental Account water;
7. Protecting the main supply of cooling water for Gerald Gentleman Station power plant;
8. Ensure continued canal and lake recreation as wells as benefits to migratory birds;
9. Carbon-free hydropower at the North Platte and Kearney hydropower plants will be protected by protecting the canals that route water to them; and
10. Protecting the irrigation canals and the irrigated acres they serve, as well as the Kearney Hydropower plant.

Each of the purposes listed is a benefit to residents of Nebraska. If any of NPPD's water conveyances are inoperable for any length of time, water that was being used for those purposes would be interrupted. There are even uses for the Robotic Camera Inspection System at the Gerald Gentleman Station and Canaday Station electricity generation plants water related structures.

The proposed project will not reduce beneficial uses of water.

The project also removes safety hazards for NPPD employees who will be able to safely

and efficiently inspect structures.

Public safety could also be enhanced in the case of emergency situations where time is of the essence. If the stability of a structure is in question and requires immediate attention, NPPD may not have time to wait for a consultant. NPPD manages large volumes of water (up to 1,800 cubic feet per second in the Sutherland System) that comes with inherent risks.

6. Is cost-effective;

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

The purchase and use of a Robotic Camera Inspection System is cost-effective. NPPD is requesting funding of $81,892. The total project cost is estimated at $136,487.

NPPD will use the next best alternative of renting a camera inspection system for the basis for the cost/benefit analysis. The cost of the project is expected to be $136,487. The annual benefit is the avoided cost of renting an Inspection System ($79,990 / year, escalated at 3%). See Attachment E Robotic Camera Rental Cost. Attachment D -- Cost/Benefit Information shows that the net benefit is a positive $1,826,047 over the 20-year life of the Inspection System. The Benefit/Cost ratio is 11 (Benefit of 2,009,098 / life-time cost of 183,052).

Intangible benefits include:
1. Early Detection of Issues: A Robotic camera inspection system allows NPPD to detect issues early on, before they become major problems. This can help save money on expensive repairs and prevent damage to property.
2. Non-Destructive Testing: Robotic camera inspection systems are non-destructive, meaning they don't require excavation or demolition. This saves time and money, and helps minimize operational disruptions.
3. Accurate Diagnostics: Robotic camera inspection systems provide accurate diagnostics of structures, allowing NPPD to identify the exact location and nature of any issues. This helps NPPD make more informed decisions about repairs and maintenance.
4. Increased Efficiency: Robotic camera inspection systems are efficient, allowing NPPD to quickly and easily inspect large lengths of pipeline or other structures. This can save time and money on inspections and repairs.
5. Improved Safety: Robotic camera inspection systems improve safety by allowing NPPD to inspect pipes and other structures from a safe distance, without the need for workers to enter confined spaces or work at heights. This reduces the risk of accidents and injuries.

Other benefits stemming from the project that are not easily quantified include the

following:
1. Protect the integrity of the Sutherland System by providing additional tools for ensuring safe and continuous operation;
2. Flood protection by allowing for additional inspections, which if not performed could lead to plugged underdrains and potential damage to the Sutherland System and irrigation canals including agricultural/wildlife habitat damage;
3. Protects the Sutherland System's delivery of water around the "North Platte Chokepoint";
4. Water conservation by ensuring the Sutherland System and NPPD irrigation canals are available for the groundwater recharge it provides and baseflows for both the North Platte River and South Platte River along their routes;
5. Preservation of water resources by providing for the safe and reliable operation of NPPD's water systems;
6. Ensure the Sutherland System is available for routing of the Platte River Recovery Implementation Plan Environmental Account water;
7. Protecting the main supply of cooling water for Gerald Gentleman Station power plant;
8. Ensure continued canal and lake recreation as wells as benefits to migratory birds;
9. Carbon-free hydropower at the North Platte and Kearney hydropower plants will be protected by protecting the canals that route water to them; and
10. Protecting the irrigation canals and the irrigated acres they serve, as well as the Kearney Hydropower plant.

There are even uses for the Robotic Camera Inspection System at the Gerald Gentleman Station and Canaday Station electricity generation plants water related structures.

Ongoing operations and maintenance (O/M) costs for the equipment is estimated to be approximately $2,328 annually over the 20-year useful life. This includes $1,643 every 3rd year for a new Service Kit and $8,117 every 5th year for new wheels and tracks; escalated at 3% per year. Preventative maintenance is minimal.

Below is the Cost/Benefit table from Attachment D.

Robotic Camera Inspection System					
Cost/Benefit Item	**Year 1 - 2023**	**Year 2 - 2024**	**Year 3 - 2025**	**Years 4-20**	**Total Amount**
Purchase Cost of Robotic Camera Inspection System	(136,487)	-	-	-	(136,487)
O&M (1)	-	-	-	(46,565)	(46,565)
Benefit: Avoided cost of renting an inspection system (2)	-	79,990	82,390	1,846,719	2,009,098
Benefit: Groundwater Recharge Value to the basin IMPs (3)	Note: not all benefits were quantified.				-
Benefit: Drought Resiliency Benefit (4)	Note: not all benefits were quantified.				-
Benefit: Flood benefit (5)	Note: not all benefits were quantified.				-
Net Benefit over 20 years					**1,826,047**

(1) O&M includes: Estimated to be $1,643 every 3rd year for a new Service Kit and $8,117 every 5th year for new wheels and tracks; escalated at 3% per year. Preventative maintenance is minimal.

(2) Cost/Benefit is being calculated using the Next Best Alternative approach, which is to rent a Camera Inspection System. Escalated at 3%. See Attachment E – Rental Cost.

(3) Recharge is valuable to PRRIP and NRDs' IMPs. PRRIP pays: $34.88/AF recharged(2022 price). NPPD is not including this as benefit because we are not getting paid for it.

(4) Drought Resiliency: No quantitative values have been determined for the drought resiliency benefits provided by the Sutherland Canal System protections this Camera Inspection System provides.

(5) Flood benefits: Flood protection benefits of continuing the routing of water past the North Platte ChokePoint, and other flood benefits have not been quantified.

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.

The purchase and use of a Robotic Camera Inspection System will help the state meet its obligations under interstate compacts, decrees, or other state contracts or agreements or federal law. It will assist the state in maximizing the beneficial use of Nebraska's water resources for the benefit of the state's residents because its use will enhance the integrity of the Sutherland System and NPPD's irrigation canals in Dawson and Buffalo Counties (Gothenburg Canal, Dawson County Canal, and Kearney Canal).

Colorado, Wyoming, Nebraska, and the Department of Interior formed a unique partnership with the goal of developing a shared approach for managing the Platte River for endangered and threatened species. Water users from the three states, U.S. Bureau of Reclamation, U.S. Fish & Wildlife Service, and local and national conservation groups joined the effort. Together, these stakeholders developed an innovative approach for improving the management of the Platte — for the health of the ecosystem and the people that depend on it. The Platte River Recovery Implementation Program (PRRIP) is the result of that planning effort. The PRRIP is focused on implementing this shared vision for creating and maintaining habitats on the Platte, including river flows. This includes reducing shortages to target flow in the Platte River from Lexington to Chapman,

Nebraska--this is the deficiency our project will protect. Part of PRRIP includes an Environment Account of water in Lake McConaughy that can be used for PRRIP purposes downstream is routed through NPPD's Sutherland System thus saving losses that would have occurred had the water went down the North Platte River.

The Robotic Camera Inspection System and the protections it provides to the Sutherland System will help the state and PRRIP meet its obligations for endangered species and wildlife habitat. The Sutherland System provides a means for the PRRIP to move water past the "choke point" at North Platte. The North Platte River channel at North Platte has capacity issues commonly known as the "choke point". If not for NPPD's Sutherland System, at certain times, the PRRIP would not be able to move their Environmental Account water from Lake McConaughy to areas of critical habitat in the central Platte River near Grand Island.

Also, federal law requires NPPD's North Platte Hydropower facility to be licensed with the Federal Energy Regulatory Commission (FERC). NPPD has a license for FERC Project No. 1835. As mandated by FERC, in 2022, NPPD completed its routine 5-year inspection of the Project by an independent consultant, Pete Haug with Aryes and Associates (NPPD's FERC Project No. 1835 and the Sutherland System are synonymous). NPPD has a draft report that recommends that NPPD perform additional inspections of underdrains, etc. on the Sutherland System. The increase in inspections is estimated to be approximately 150 annually as a direct result of this mandated FERC inspection. Purchasing a Robotic Camera Inspection System will allow NPPD to fulfill the additional 150 inspections in the most cost-effective and safe manner.

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 purchase and use of a Robotic Camera Inspection System reduces threats to property damage or protects critical infrastructure because its use will enhance the integrity of the Sutherland System and NPPD's irrigation canals in Dawson and Buffalo Counties (Gothenburg Canal, Dawson County Canal, and Kearney Canal).

NPPD's Sutherland System and irrigation canals are critical infrastructure vital to Nebraska including

1. Protect the integrity of the Sutherland System by providing additional tools for ensuring safe and continuous operation;
2. Flood protection by allowing for additional inspections, which if not performed could lead to plugged underdrains and potential damage to the Sutherland System and irrigation canals including agricultural/wildlife habitat damage;
3. Protects the Sutherland System's delivery of water around the "North Platte Chokepoint";
4. Water conservation by ensuring the Sutherland System and NPPD irrigation canals are available for the groundwater recharge it provides and baseflows for both the North Platte River and South Platte River along their routes;
5. Preservation of water resources by providing for the safe and reliable operation of NPPD's water systems;
6. Ensure the Sutherland System is available for routing of the Platte River Recovery Implementation Plan Environmental Account water;
7. Protecting the main supply of cooling water for Gerald Gentleman Station power plant;
8. Ensure continued canal and lake recreation as wells as benefits to migratory birds;
9. Carbon-free hydropower at the North Platte and Kearney hydropower plants will be protected by protecting the canals that route water to them; and
10. Protecting the irrigation canals and the irrigated acres they serve, as well as the Kearney Hydropower plant.

Specific benefits resulting from the project for public security, public health and safety include: the project could reduce flood threats to property downstream to bridges, agricultural land, highways, roads, etc. For example, if a breach flow was to occur on the Sutherland, at ~1800 cfs, then this would be additional flow in the North Platte River during irrigation season. The North Platte River at North Platte almost always is at or near flood stage during summer irrigation water deliveries and this extra flow would likely cause flood damage. NPPD did not estimate the amount of the damage.

The benefits to public security and safety are the flood reductions the use of the Robotic Camera Inspection System would attempt to prevent. Public safety will be enhanced in the case of emergency situations where time is of the essence to determine the stability of a structure immediately and not have time to wait for a consultant. NPPD manages large volumes of water (up to 1,800 cubic feet per second in the Sutherland System) that comes with inherent risks that an inspection system would help mitigate.

Additionally, NPPD irrigation canals also provide vital stormwater routing from controlled and uncontrolled run-in and controlled return of that stormwater. These flood control aspects would also benefit the United States by reducing FEMA expenditures.

NPPD's Sutherland Canal System and irrigation canals, including the power plants are critical infrastructure and this project would protect them. There are even uses for the Robotic Camera Inspection System at the Gerald Gentleman Station and Canaday Station electricity generation plants water related structures.

9. Improves water quality;

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

The purchase and use of a Robotic Camera Inspection System can improve water quality because its use will enhance the integrity of the Sutherland System and NPPD's irrigation canals in Dawson and Buffalo Counties (Gothenburg Canal, Dawson County Canal, and Kearney Canal).

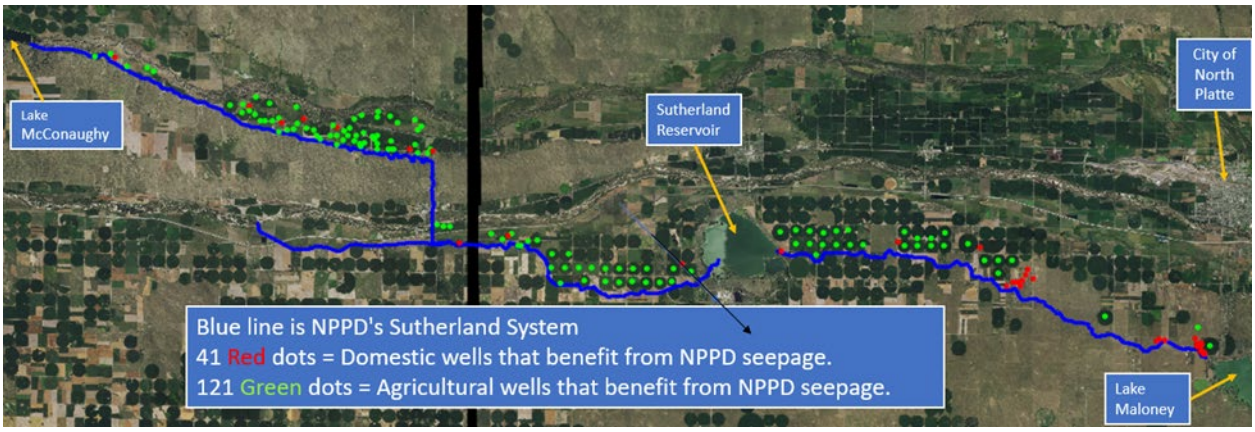
The water quality issues to be improved include the seepage recharge benefit to any domestic/livestock wells along the canals or reservoirs. Typically, the canal seepage would include less nitrates than water infiltrating the land to those wells. Nitrate problems in wells are a well-known phenomenon in the area.

Another water quality issue improved is to protect the existing flow of cooling water for Gerald Gentleman Station (GGS). GGS has a pollutant discharge limit with respect to the temperature of water it discharges into the Sutherland Reservoir. Protecting the flows of cool water from the canal is vital to full operation of GGS. If a water quality temperature limit is reached, one of the solutions is for GGS to reduce generation with that generation needing to come from a more costly generating plant, thus raising costs to NPPD electricity users throughout the state.

Previous attempts to remedy water quality problems of nitrates include nitrate management areas (Central Platte NRD, for example) where agricultural nitrate application is monitored and controlled, as well as NRDs' Chemigation Permits, and water quality sampling. Previous attempts to remedy water quality problems for cooling water at the GGS include 1) restoration of NPPD's South Supply Canal Project in 2021 (the Water Sustainability Fund provided key cost-sharing) and 2) installation of a wellfield around GGS that is used to provide cool groundwater when needed.

For recreational benefits, see NPPD's last Federal Energy Regulatory Commission Recreation Report in Attachment G, which shows recreation benefits of fishing, boating, picnicking, swimming, hunting, camping, etc.

Below is a graphic of a conservative estimate of wells that benefit from NPPD's Sutherland System. Wells in NPPD's irrigation canal area benefit similarly.



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.

There are no other local funding resources available for this project. NPPD has obtained letters of support from stakeholders of the project.
1. Twin Platte Natural Resources District for the seepage return flow and groundwater recharge benefits to the Integrated Management Plan as well as recreation benefits to the NRD.
2. The Central Nebraska Public Power & Irrigation District (Central) for the protection of the Sutherland System through protection of NPPD's Keystone Diversion Gates. NPPD and Central FERC hydropower projects are interrelated, and this Robotic Camera Inspection System is valuable to protecting those interrelated operations. NPPD's FERC Project and the Sutherland System are synonymous.
3. Platte River Recovery Implementation Program by providing important operational flexibility in NPPD's system to assist PRRIP in attaining its objective of managing river flows to benefit threatened and endangered species.
(See Attachment A).

NPPD will use its budgeted funds for its matching portion of the project.

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 Robotic Camera Inspection System will be used within the Twin Platte Natural Resources District (TPNRD) and the Central Platte Natural Resources District. Both have an Integrated Management Plan (IMP) and a Ground Water Management Plan (GWMP) and is involved with the Basin-Wide Plan for Joint Integrated Water Resources Management of Overappropriated Portions of the Platte River Basin, Nebraska, and the Platte Basin Coalition.

The history of work completed to achieve the goals of the aforementioned plans include: a moratorium on new or expanded water well construction, certification of irrigated acres, provisions for ground water transfers, tracking of municipal, industrial, and commercial uses, contractual arrangements with irrigation canals to divert excess flows for groundwater recharge, nitrate management, chemigation training/permitting, and water quality sampling.

NPPD's Robotic Camera Inspection System supports those goals and objectives of the IMPs and GWMPs through its protection of the NPPD's Sutherland System and irrigation canals through:
1. Protecting the integrity of the Sutherland System by providing additional tools for ensuring safe and continuous operation;
2. Flood protection by allowing for additional inspections, which if not performed could lead to plugged underdrains and potential damage to the Sutherland System and irrigation canals including agricultural/wildlife habitat damage;
3. Protects the Sutherland System's delivery of water around the "North Platte Chokepoint";
4. Water conservation by ensuring the Sutherland System and NPPD irrigation canals are available for the groundwater recharge it provides and baseflows for both the North Platte River and South Platte River along their routes;
5. Preservation of water resources by providing for the safe and reliable operation of NPPD's water systems;
6. Ensure the Sutherland System is available for routing of the Platte River Recovery Implementation Plan Environmental Account water;
7. Protecting the main supply of cooling water for Gerald Gentleman Station power plant;
8. Ensure continued canal and lake recreation as wells as benefits to migratory birds;

9. Carbon-free hydropower at the North Platte and Kearney hydropower plants will be protected by protecting the canals that route water to them; and
10. Protecting the irrigation canals and the irrigated acres they serve, as well as the Kearney Hydropower plant.

Both Central Public Power & Irrigation District and NPPD have irrigation customers relying on stored water for irrigation. Some of that water is supplied through NPPD's Sutherland System which will be protected by use of the Robotic Camera Inspection System. The Platte River Recovery Implementation Program (PRRIP) also benefits from use of the Robotic Camera Inspection System because it uses the Sutherland Canal to usher Environmental Account(EA) in Lake McConaughy past the "North Platte Chokepoint" (the chokepoint is at the city of North Platte during summer high irrigation water deliveries in the river where water is needed to be routed through NPPD's Sutherland Canal around that chokepoint and returned to the South Platte River just upstream of the confluence of the North and South Platte rivers east of North Platte). PRRIP also contracts with NPPD to provide ground water recharge on Gothenburg and Dawson County Canals. Protecting NPPD's facilities is vital for these to continue unaffected.

The primary stakeholders of the proposed project are Upper Platte Basin NRDs; the PRRIP; NPPD power generation; NPPD irrigation customers (protect/enhance their water supply); and Central Nebraska Public Power & Irrigation District irrigation customers (protect/enhance their water supply). Other stakeholders include irrigators, recreators, electricity users, etc.

There are even uses for the Robotic Camera Inspection System at the Gerald Gentleman Station and Canaday Station electricity generation plants' water related structures.

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.

The purchase and use of a Robotic Camera Inspection System addresses a statewide problem because its use will enhance the integrity of the Sutherland System and NPPD's irrigation canals in Dawson and Buffalo Counties (Gothenburg Canal, Dawson County Canal, and Kearney Canal).

Overall, a Robotic Camera Inspection System is a valuable technology tool for any entity in the state who needs to inspect underground or hard-to-reach structures. It provides accurate and safe diagnostics, saves time and money, and improves safety, making it a wise investment. NPPD would be happy to share its experiences with this inspection

system.

The issues addressed by the project include:
1. Protecting the integrity of the Sutherland System by providing additional tools for ensuring safe and continuous operation;
2. Flood protection by allowing for additional inspections, which if not performed could lead to plugged underdrains and potential damage to the Sutherland System and irrigation canals including agricultural/wildlife habitat damage;
3. Protects the Sutherland System's delivery of water around the "North Platte Chokepoint";
4. Water conservation by ensuring the Sutherland System and NPPD irrigation canals are available for the groundwater recharge it provides and baseflows for both the North Platte River and South Platte River along their routes;
5. Preservation of water resources by providing for the safe and reliable operation of NPPD's water systems;
6. Ensure the Sutherland System is available for routing of the Platte River Recovery Implementation Plan Environmental Account water;
7. Protecting the main supply of cooling water for Gerald Gentleman Station power plant;
8. Ensure continued canal and lake recreation as wells as benefits to migratory birds;
9. Carbon-free hydropower at the North Platte and Kearney hydropower plants will be protected by protecting the canals that route water to them; and
10. Protecting the irrigation canals and the irrigated acres they serve, as well as the Kearney Hydropower plant.

The number of people or acres that could benefit from the project includes, but not limited to property owners, businesses, domestic/livestock wells which benefit from canal seepage, irrigation users who benefit from the canals and reservoirs use for moving irrigation water to seven irrigation canal diversions downstream serving over 120,000 acres.

The inspection system will also benefit the state by providing protection of the economic benefits each of the items above provides to Nebraska. There are even uses for the Robotic Camera Inspection System at the Gerald Gentleman Station and Canaday Station electricity generation plants water related structures.

Aging infrastructure in water facilities is a statewide problem and continuous monitoring of the condition of structures could help better manage water.

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

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

This project will utilize funds provided solely by NPPD. NPPD does however have letters of support from the following stakeholders:
1. Twin Platte Natural Resources District for the seepage return flow and groundwater recharge benefits to the Integrated Management Plan as well as recreation benefits to the NRD.
2. The Central Nebraska Public Power & Irrigation District (Central) for the protection of the Sutherland System through protection of NPPD's Keystone Diversion Gates. NPPD and Central FERC hydropower projects are interrelated, and this Robotic Camera Inspection System is valuable to protecting those interrelated operations. NPPD's FERC Project and the Sutherland System are synonymous.
3. Platte River Recovery Implementation Program by providing important operational flexibility in NPPD's system to assist PRRIP in attaining its objective of managing river flows to benefit threatened and endangered species.
(See Attachment A for Letters of Support).

If funding is not obtained from the Water Sustainability Fund, NPPD will be required to fund the project through rates it charges its electricity and irrigation canal customers.

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.

The purchase and use of a Robotic Camera Inspection System contributes to watershed health and function because its use will enhance the integrity of the Sutherland System and NPPD's irrigation canals in Dawson and Buffalo Counties (Gothenburg Canal, Dawson County Canal, and Kearney Canal).

Watershed health and function could be improved by the project through:
1. Protecting the integrity of the Sutherland System by providing additional tools for ensuring safe and continuous operation;
2. Flood protection by allowing for additional inspections, which if not performed could lead to plugged underdrains and potential damage to the Sutherland System and irrigation canals including agricultural/wildlife habitat damage;
3. Protects the Sutherland System's delivery of water around the "North Platte

Chokepoint";
4. Water conservation by ensuring the Sutherland System and NPPD irrigation canals are available for the groundwater recharge it provides and baseflows for both the North Platte River and South Platte River along their routes;
5. Preservation of water resources by providing for the safe and reliable operation of NPPD's water systems;
6. Ensure the Sutherland System is available for routing of the Platte River Recovery Implementation Plan Environmental Account water;
7. Protecting the main supply of cooling water for Gerald Gentleman Station power plant;
8. Ensure continued canal and lake recreation as wells as benefits to migratory birds;
9. Carbon-free hydropower at the North Platte and Kearney hydropower plants will be protected by protecting the canals that route water to them; and
10. Protecting the irrigation canals and the irrigated acres they serve, as well as the Kearney Hydropower plant.

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 purchase and use of a Robotic Camera Inspection System Uses objectives described in the annual report because its use will enhance the integrity of the Sutherland System and NPPD's irrigation canals in Dawson and Buffalo Counties (Gothenburg Canal, Dawson County Canal, and Kearney Canal).

The Nebraska Department of Natural Resources 2019 Annual Report dated September 2019 includes the following objectives that the project helps to meet. Specifically, Objective "3. Support locally developed water management plans for conjunctively managing hydrologically connected water supplies" is aided by the Robotic Camera's use in protection of NPPD's Sutherland System and irrigation canals and their uses for flood protection, routing water around the North Platte chokepoint, canal seepage recharging groundwater. Also, Objective "5. Participate in interagency collaboration with federal agencies, state agencies, local natural resources districts (NRD's), and other water interest entities on various water resources programs and projects" could be met by the Robotic Camera's use in protection of NPPD's Sutherland System and irrigation canals and their uses for
1) routing Platte River Recovery Implementation Program's Environmental Account water
2) protecting NPPD canals' and reservoirs' seepage benefits, and
3) protecting NPPD canals' and reservoirs' groundwater quality benefits.

The proposed project provides additional protections for
1) reducing shortages to target flows for wildlife by retiming ~120,000 acre-feet of flows

through seepage,
2) lessening damaging flood effects by immediately shutting down canal flow, and
3) improves or sustains hydropower production.

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.

NPPD has a Federal Energy Regulatory Commission (FERC) Project No. 1835 hydropower license, which regulates the use of NPPD's facilities used for hydropower at the North Platte Hydropower plant. The hydropower generation is important to water sustainability for the state of Nebraska.

As mandated by FERC, in 2022, NPPD completed its routine 5-year inspection of the Project by an independent consultant, Pete Haug with Aryes and Associates (NPPD's FERC Project No. 1835 and the Sutherland System are synonymous). NPPD has a draft report that recommends that NPPD perform additional inspections of underdrains, etc. on the Sutherland System. The increase in inspections is estimated to be approximately 150 annually as a direct result of this mandated FERC inspection.

Purchasing a Robotic Camera Inspection System will allow NPPD to fulfill the additional 150 inspections in the most cost-effective and safe manner.

The Robotic Camera Inspection System furthers the goals of water sustainability by contributing to multiple water sustainability goals:
1. Protect the integrity of the Sutherland System by providing additional tools for ensuring safe and continuous operation;
2. Flood protection by allowing for additional inspections, which if not performed could lead to plugged underdrains and potential damage to the Sutherland System and irrigation canals including agricultural/wildlife habitat damage;
3. Protects the Sutherland System's delivery of water around the "North Platte Chokepoint";
4. Water conservation by ensuring the Sutherland System and NPPD irrigation canals are available for the groundwater recharge it provides and baseflows for both the North Platte River and South Platte River along their routes;
5. Preservation of water resources by providing for the safe and reliable operation of NPPD's water systems;
6. Ensure the Sutherland System is available for routing of the Platte River Recovery Implementation Plan Environmental Account water;
7. Protecting the main supply of cooling water for Gerald Gentleman Station power plant;

8. Ensure continued canal and lake recreation as wells as benefits to migratory birds;
9. Carbon-free hydropower at the North Platte and Kearney hydropower plants will be protected by protecting the canals that route water to them; and
10. Protecting the irrigation canals and the irrigated acres they serve, as well as the Kearney Hydropower plant.

Below is a query from FERC's online listing of active licenses, provided here as evidence of NPPD's FERC license:

Active Licenses

FERC: eLibrary

NOTE: The information contained in this document is for general guidance only. Information can change between scheduled monthly updates. If further assistance is required, please email Customer@ferc.gov or call 202-502-6088; Toll-free: 1-866-208-3372; 202-502-8659 TTY.

eLibrary Quick Help

Project Number	Project Name	Licensee	Issue Date	Expiration Date	Authorized Capacity (kW)	State	Waterways	Description
P-1835	North Platte/Keystone Diversion	Nebraska Public Power District	07/29/1998	06/30/2038	26,100	NE	Platte River Canal	Conventional
Total	1							

Attachment A – Letters of Support
Attachment B – Map of Area
Attachment C – Examples of Inspection Systems and Potential Locations of Use
Attachment D – Cost/Benefit Information
Attachment E – Robotic Camera Rental Cost
Attachment F – Feasibility Information
Attachment G – Miscellaneous Information