



**OREGON WATER RESOURCES DEPARTMENT
WATER SUPPLY DEVELOPMENT ACCOUNT
LOAN AND GRANT APPLICATION**

I. Project Information

Project Name: East Side Water Recycling Project

Type of Project: Water Reuse Project Check box if project type includes storage

Funding Request Type: Loan Grant

Funding Amount Requested: \$ \$268,673 Total cost of project: \$ \$358,231

Note: Grant funding requests must demonstrate cost match of at least 25% of total project cost. This may include in-kind.

II. Applicant Information

Principal Contact: Tracey Liskey	Fiscal Officer: Mary Cheyne
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Involved Landowner 1: Tracey Liskey	Involved Landowner 2: Tim O'Connor
Address: <u>4650 Lower Klamath Lake Road</u>	Address: <u>5800 Lower Klamath Lake Road</u>
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**Please include a supplementary document that lists all additional involved landowners if applicable.*

Certification:

I certify that this application is a true and accurate representation of the proposed project work and that I am authorized to sign as the Applicant or Co-Applicant. By the following signature, the Applicant certifies that they are aware of the requirements of an Oregon Water Resources Department funding award and are prepared to implement the project if awarded.

Applicant Signature: Exhibit A (pg 29) Certification and Signature Date: January 18, 2016

Print Name: Tim O'Connor Title/Organization: President

III. Project Summary

Please provide a description of the need, purpose and nature of the project. Include what the applicant intends to complete and how the applicant intends to proceed.

Project Overview

The Klamath Drainage District (KDD) proposes to recycle drainage water in an effort to conserve water and augment water supplies on the east side of the District. The project will generally consist of collecting drainage water from 10,803 acres of agricultural land lying on the east side of the District (District size is 27,000 acres) and convey it to a proposed pumping station that will lift it back into the irrigation canal (North Canal) for reuse on 6,206 acres. It is estimated that a total of 16,204 AF of drainage water will be available for recycling per year.

The project will not only conserve water for in-stream use but will also keep 6,206 acres of agricultural land in full production rather than being idled during low water years. This will help stabilize the local economy by retaining up to 63.5 full and part-time jobs and result in gross annual income of nearly \$4,412,466 as well as indirect and induced economic benefits of \$3,971,219, not including added revenues that may be generated from bird watchers and bird hunters.

The proposed project is estimated to cost \$358,231.24. It will provide environmental benefits as well as all of the economic benefits noted above at a cost of \$22/AF. We feel that this project is a very economical solution for increasing the water supply in the Klamath River watershed.

Overview of the Klamath Drainage District

The Klamath Drainage District (KDD) is situated in Southern Oregon on the lakebed of the historic Lower Klamath Lake. The District's boundary is the meander line of the historical high water mark of the Lower Klamath Lake.

All irrigation water for the Klamath Drainage District comes directly from the Klamath River. The District's water right grants the taking of water either from the natural river flow or from stored lake water released down the Klamath River. KDD generally relies on the natural flow of the Klamath River, but when these flows are not available, the District draws on releases of the stored water in Upper Klamath Lake.

KDD has two points of diversion and both are located along the west side of the District:

(1) At the northerly end of the District water is conveyed through a one mile long channel that connects the Klamath River with the District at the North Canal head-works. The North Canal, a major supply canal, is approximately twelve and a half miles long and flows in a southeasterly direction along the eastern boundary of the District. This canal serves the east half of the District.

(2) Towards the middle of the District water is conveyed through a one mile long channel (known as the Klamath Straits) which connects the Klamath River to the District at the Ady head-works. It is at this location that the Klamath River historically spilled water into Lower Klamath Lake. The Ady Canal, a major supply canal, flows south through KDD and ends at the Oregon-California state line serving primarily the westerly half of the District and Lower Klamath National Wildlife Refuge.

These two points of diversion are on the main stem of the Klamath River approximately 10 -12 miles downstream of Upper Klamath Lake.

The Klamath Drainage District has an extremely efficient water delivery and drainage system. All drains within KDD terminate at the Klamath Straits Drain, which is operated by USBR. All tail water, if not recycled, is pumped back to the Klamath River via the Straits Drain.

The Need for the Project:

Bi-Op imposed requirements to increase in-stream flows in the Lower Klamath River while maintaining higher water levels in Upper Klamath Lake to preserve critical aquatic habitats have resulted in a set of conflicting demands that make it difficult for the USBR to deliver adequate water supplies for both irrigation and fisheries. KDD has been impacted in that reliability of water delivered by the Klamath Project to the District has become uncertain. The problem has been exacerbated by climate change and the resulting droughts.

The USBR's mitigation measures, which often call for a reduction or curtailment of water deliveries to the District, have influenced KDD's search for efficient water conservation projects. Implementaion of water reuse projects have become essential in order to maintain the viability of the District.

Project Purpose:

The primary purpose of the project is to augment water supply on the east side of the District by efficiently reusing 16,204 AF of drainage water prior to discharging to the Klamath River through the Straits Drain and potentially conserve that same amount for in-stream use. This could augment water supply in all water years but will be especially important during drought years.

The Nature of the Project:

KDD will initially install a 5,000 gpm pump in the Township Drain through which it will pump the drainage from 10,803 acres of KDD land into the North Canal. The North Canal is the major supply canal for the east side of the District. Joe Frost, KDD Operations Manager for over 30 years, estimates the drainage amount to be 1.5 AF per acre, per year based upon historical measurements of drainage water recycled at the District's west side recirculation plant. At this rate, KDD expects a total of 16,204 AF of water available for reuse on the east side of the District.

The project makes better use of federally allocated water. Reusing drainage water may mean less Klamath River water is diverted from the River and it means the water that has been diverted for use on KDD lands is being applied more efficiently.

KDD has identified 6,206 acres (or seven farms) within KDD upon which this recycled drainage water can be applied. There is also the potential to supply the Klamath Hills District Improvement Company with recycled water for an (as of yet) undetermined number of acres. The Klamath Hills District receives its water through the North Canal under its own contract with the USBR.

Some groundwork has been completed in the years ensuing since KDD first evaluated the feasibility of such a project. Enlargement of the culvert from the O'Connor Drain under Township Road and into the Township Drain was completed in 2001. Additional groundwork (deepening of the Township Drain) was necessarily completed in 2015 when the District installed a temporary pump at the project site to test the efficiency of a recirculation plant at that location. Other groundwork such as cleaning 1.5 miles of the O'Connor Drain and the actual construction of the project will be carried out by District employees as KDD's in-kind contribution to the project.

Note: KDD's design and infrastructure lend itself to efficient water recycling projects. As a result, the District has become a leader and innovator in the Klamath Basin with regard to water recycling. KDD has undertaken ambitious water reuse projects in the past. In the 1990's, KDD designed and installed a drainage water recycling system on the west side of the District which has enabled it to reuse over 10,000 AF of drainage water in some years. Improvements to the west side water recirculation system were completed in December of 2014. This improvement project, partially funded through a Federal WaterSmart grant, makes it possible to recirculate approximately 8,000 AF of additional drainage water through the Westside Pumping Plant. From 1997 through September 2014, KDD has recycled 122,999.00 AF of drainage water through its Westside Pumping Plant. Because of the success of the water reuse system on the west side of the District, KDD is planning to expand its recycling capabilities to the east side of the District.

IV. Project Specifics

Instructions: Answer all questions in this section by typing the answer below the question, using additional space as needed.

- 1. Describe how the project will provide public benefits in each of the three public benefit categories.** Project applications will be scored and ranked based on the economic, environmental and social/cultural public benefits identified below. Describe the conditions prior to and after project implementation to demonstrate changes resulting from the project. Descriptions should be quantitative when possible. Information provided must be sufficient to allow evaluation of the public benefits of the project. **Please see the Public Benefit and Evaluation Guidance document for a description of how public benefits will be evaluated.** Applications that do not demonstrate public benefit in each of the three categories (economic, environmental, social/cultural) will be deemed incomplete. Leave blank any categories that are not applicable to project.

Economic Benefits ORS 541.673(2)

(a) Job creation or retention:

This project will result in the retention of 63.5 full and part-time jobs.

Due to climate change, the amount of yearly precipitation has become more and more unpredictable, and the USBR's management of the water resource in response to the water supply unpredictability results in uncertainty in the lives of the KDD landowners as to whether or not they will be able to keep their lands at full production. This makes it difficult to absolutely quantify job related economic benefits, however based upon the acreage of land that can benefit from the recycling of drainage water, estimates can be made. With more stability in the water supply, which KDD believes this project will give, the result is a significant retention of jobs. The following analysis is based upon a more certain water supply resulting in fully productive farm land. (See Exhibit K - pg 63 for calculations)

At the completion of this project, the drainage from 10,803 acres of KDD land will be retrieved, recycled and re-applied to 6,206 acres (seven farms). In poor water years this 6,206 acres would likely not receive sufficient fresh water to be fully productive and may even have to be idled. Loss of production means loss of jobs. However, by augmenting deliveries with recycled water, the land would be more assured of reaching full production.

The estimated gross annual income from one acre of crop land in Klamath County is \$711 (based on the 2012 Census of Agriculture and 2012 OSU Agricultural Commodity Sales). This is a conservative rate based upon crop production only. It does not take into consideration the gross income from cattle sales, yet the cattle market is currently strong and beef prices high. The reason for not including the economic benefit from livestock is that it would be difficult to quantify considering that some cattle leave the Klamath Basin during several months of the year to calve and graze on winter range in warmer climates and some cattle remain in the area.

At a rate of \$711 per acre, the direct gross annual income on 6,206 acres is estimated to be \$4,412,466, based on OSU Agricultural Commodity Sales.

Using the Klamath 2007 Aggregated Model 091409.iap, (Exhibit K - pg 65) the Value Added Multiplier for agricultural commodities was determined. The results is that for every dollar of direct gross income generated through agriculture, 90 cents of indirect and induced economic benefit, or in this case \$3,971,219 is estimated income in other business sectors that are impacted by the agriculture industry. The total direct, indirect and inducted economic value generated by supplying sufficient water to enable 6,206 acres of crop land to become fully productive is estimated to be \$8,383,655.

For every one millions dollars of direct gross income generated, 9 full and part time jobs directly related to the industry are supported. These would include year-round full and part time jobs as well as full and part time seasonal employees engaged in the planting, irrigating, harvesting and transporting of crops. In this case 39.7 jobs directly related to agriculture would be retained.

Additionally, every one million dollars of indirect/induce income results in 6 indirect/induced jobs. The 3.97 million dollars in indirect/induced income would result in the retention of 23.8 jobs in other business sectors.

In conclusion, by supplying sufficient water to enable 6,206 acres to realize full production, 63.5 full and part time jobs will be retained which would otherwise be lost without sufficient water supply. For Klamath County, with its high unemployment rate of 7.7% as recent as November 2015 (compared to 5.3% for Oregon and 5.0% nationally), this results in a significant number of people who are able to keep their jobs. (See Exhibit L for economic benefits analysis)

Job retention outside of the Klamath Basin

At those times when KDD can reuse its drainage water, it may not need to divert from the Klamath River. This would increase in-stream flows by as much as 16,204 AF (1.5 AF/AC), impacting job retention for commercial fisheries, Tribes and those in the recreation sector whose livelihood depends on reliable stream flows and a healthy ecosystem.

(b) Increases in economic activity:

This project will result in a significant increase in economic activity in 20+ sectors (see modeling output table in Exhibit K - pg 65). As stated above, for every dollar of direct gross income generated through agriculture, 90 cents of indirect and induced gross income, or in the case of this project approximately \$3,971,219, is realized in other business sectors that are impacted by the agriculture industry. As a result of value-added to KDD's farm commodities, restaurants who serve up prime rib, baked potatoes and fresh baked bread or the Big Mac on a sesame seed bun with french fries which have perhaps come from cattle, potatoes and wheat grown on KDD lands will contribute to increases in economic activity. But the restaurant/food industry is not the only business sector that benefits from agriculture commodities grown on KDD lands, it is just that its probably the most obvious. Willie Riggs has whittled down a list of 100+ sectors to 24 sectors that experience indirect or induced effects from agriculture in the Klamath Basin.

Other potential increase in economic activity

A large number of the small communities downstream are minority and low income communities that depend heavily on the fisheries and recreational opportunities within the Klamath River. Enhancing fisheries and recreational opportunities will stimulate the economic activity of these downstream communities.

Keeping more water in the Klamath River watershed sustains scenic values along the river, provides habitat for waterfowl which results in opportunities for tourist, recreationist, bird watchers and hunters all of which stimulate the economy.

Short-term Increase in Economic Activity

Construction of the project would stimulate a short-term increase in economic activity as KDD procures the materials, supplies and contractors necessary to construct the project.

(c) Increases in efficiency or innovation:

Increased Energy Efficiency

Recycling water at an Eastside Pumping Plant will result in a decrease in the high energy costs associated with returning drainage water to the Klamath River through the government pumping stations on the Straits Drain. It will be more cost effective to pay the energy expense associated with operating a 5,000 gpm pump than to pay the energy costs to operate the large, 600 hp government pumps at the Straits Drain. (The government pumps pump 100 cfs or 44,883 gpm). Additionally, the new water reuse system will preserve the life of the government pumps thus reducing maintenance expense.

KDD also intends to install a solar power system to supplement electrical energy for powering the new east side pumping plant. KDD has installed solar power systems at its shop compound and on the west side of the District. The solar power system on the west side of the District helps power its west side water recirculation plant. The District has discovered that solar energy is efficient enough to make a noticeable difference its power bills and therefore worth installing. Since solar energy is created from a renewable energy source, the amount of energy produced for the operation of the new pumping plant will be helpful to the environment and will enable the District to realize further energy savings.

Increased on-farm efficiency

Recycling 16,204 AF of drainage water will increase the efficiency on seven family farms because it will allow the landowners to retain employees to help with all aspects of the farming operation causing their farms to run more efficiently. Also, at times during the year the District is unable to keep water levels low enough to properly drain some lands within the District while attempting to reuse the water on other District lands. This pump station will enable the District to keep the water levels low enough to provide adequate drainage to farmers by continually recycling water, thereby increasing crop production efficiency.

The project is an innovative solution to increase water savings and meet KDD's needs during years with low precipitation amounts. The idea of an eastside pumping plant was conceived in the year 2000 to improve the efficiency (and sufficiency) of Project water delivered to the south end of the North Canal. Insufficient water supply at the south end of the North Canal were a common occurrence due to the flatness and configuration of the canal. Introducing water into the North Canal at the Township Road will boost the head in the canal and deliver a better flow to the south end of the North Canal System resulting in better crop production.

(d) Enhancement of infrastructure, farmland, public resource lands, industrial lands, commercial lands or lands having other key uses:

Increasing KDD's water supply by as much as 16,204 AF will enhance the value of District farms by at least \$500 per acre (for a total value of \$3,103,000) because the guarantee of a stable water supply is key to property values. In the Klamath Irrigation Project, farm ground is designated 'A', 'B', and 'C' ground based on government contract authorities, and these groups are not treated equal with regards to water deliveries. (KDD is designated 'B' ground.)

For example, in spring of 2014, the USBR limited irrigators of Klamath Project "B" (or Warren Act) land to 1 AF per acre, at least until the June 1 inflow forecast by the National Resources Conservation Service was available. This action was taken as part of the 2014 Drought Plan for the Klamath Project as a result of below-average precipitation and above-average water demands in April of that year. KDD's full allocation would have been 3 AF/ac.

The USBR stated that if they hadn't imposed this restraint on the 'B' water users, by their estimation the Project supply would have run out sometime in mid-summer. With the limitation placed on the 'B' users, the BOR was reasonably assured that the total Project supply would not run out until the end of the irrigation season.

In contrast, according to Hollie Cannon, who at that time was the Executive Director of Klamath Water and Power Authority, said, "the settlement and repayment contractors, or "A" land irrigators, were unaffected by the drought mitigation measure" and received a full allocation. <http://www.bendbulletin.com/nation/2080054-151/klamath-irrigators-facing-water-restrictions>

So a distinction between 'A' and 'B' ground is that 'A' ground can be said to enjoy a more stable and adequate water supply in drought years compared to 'B' ground.

KDD looks to boost water supply to its lands by recirculating drainage water through an Eastside Pumping Plant in order to provide a more adequate and stable water supply and reduce the gap between land values for 'A'

ground and 'B' ground. According to Bob Bacon, Summit Realty, who sells farms and ranches in Klamath County, 'B' ground is worth about \$500 to \$600 per acre less than 'A' ground.

Conservatively then, land being valued at \$500 per acre more with an adequate water supply means the 6,206 acres of KDD land that will receive the recycled water could increase in value by as much as \$3,103,000.

Not only do land values increase with a stable and adequate water supply, but so do land rent prices. It is difficult to find a renter for a piece of farm ground if it is questionable whether or not the land will have sufficient water to grow a crop. Because it benefits the soil to rotate crops, and because a farmer may not own the equipment to plant and harvest every kind of crop, it is often necessary to rent farm land out for a year or two to someone with expertise growing a particular kind of crop. But back in the spring of 2014, before the USBR gave the 'B' users the 1 AF, irrigators and water managers were speculating whether "B" irrigators would receive any water deliveries at all that year. Farmers won't rent ground with that level of uncertainty.

Therefore, this project will help ensure higher rent and resale values of the land compared to those lands that do not have a reliable water source.

Enhancement of Public Resource Land

This project could also enhance public resource land. Because KDD believes it will be able to recirculate more drainage water than it has land on which to apply the water, the Lower Klamath National Wildlife Refuge would surely benefit and be enhanced from this excess water if they were allowed to receive it. In the past couple of years, the California Audubon Society is made a plea for concerned citizens to write to the Secretary of the Interior asking that more water be released for the refuge.

"The Lower Klamath National Wildlife Refuge, located just below the Oregon border, is completely dry, potentially dooming the most important habitat for migratory waterfowl in the Lower 48. This year, the U.S. Bureau of Reclamation has failed to provide adequate water to support the refuge. Birds in desperate need of water have dangerously crowded onto nearby Tule Lake, and thousands have already died from disease. This type of disease outbreak this early in the migratory season is a bad sign of things to come.

"The Lower Klamath National Wildlife Refuge is a national treasure. It was the first waterfowl refuge when it was established in 1908 by President Theodore Roosevelt. And its importance has never waned. Approximately 40 percent of the entire Pacific Flyway migratory waterfowl depend on this Refuge during spring and fall migrations. It hosts the largest concentration of wintering Bald Eagles south of Canada and harbors more than 80 species that are listed as sensitive, threatened or endangered.

"Please send an email to Secretary of the Interior Sally Jewell asking her to direct the Bureau to send more water to the Refuge and avert a major disaster for birds."

Source: <https://secure.audubon.org/site/Advocacy?cmd=display&page=UserAction&id=1747>

Infrastructure Enhancement

In response to an on-going uncertainty of its water supply KDD is enhancing the infrastructure needed to ensure some reliable supply of water to the farms, ranches and wildlife refuge, especially during low water years.

- (e) Enhanced economic value associated with tourism or recreational or commercial fishing, with fisheries involving native fish of cultural significance to Indian tribes or with other economic values resulting from restoring or protecting water instream:

Increasing instream flows improves navigability, fish movement, fish health, scenic value, bird watching, waterfowl hunting and many other recreational pursuits which helps the Klamath Basin economy as well as the economy of communities located downriver.

People engaged in the commercial and recreational fishing industries along the Pacific coast have lost jobs, incomes, industrial output, and recreational opportunities because of reduced salmon populations. Increasing instream flows should help boost populations of fish species that are important to tribes, commercial fisheries and recreational fisherman. In turn, jobs in the associated recreational and commercial industries would be generated which would reinforce the economic strength of local and tribal communities. More natural stream flows in the Klamath River would make Klamath Falls and other communities along the river, attractive to families, professionals, businesses and investors seeking communities with high-quality natural amenities.

Tourism:

The Klamath Basin, and KDD in particular, is a popular spot for bird watching and waterfowl hunting which brings revenue into the Klamath Basin's economy each year. An annual event that is important to the economy of the Klamath Basin is the Winter Wings Festival. For the past 35 years the Klamath Basin has hosted what birding magazines call "the oldest birding festival in the United States." In 1980, the first Bald Eagle Conference was held in Klamath Falls with the help of the Portland and Eugene Audubon chapters and the Klamath Basin Wildlife Refuges. Issues of bald eagle management relative to the habitat, politics, and the economy of the area were discussed by professionals and conservationists. The Bald Eagle Conference continued annually in February until 2005 when it was expanded and renamed the Winter Wings Festival. The Winter Wings Festival, draws hundreds of visitors annually to enjoy the eagles and many other bird species that make their winter home in the Klamath Basin. Because of its winter flooding practices, KDD plays a large role in providing a food base for the eagles and habitat for other bird species. Many businesses in the Klamath Basin benefit from this event. The east side water recirculation project will insure an adequate water supply for KDD's winter flooding which draw migrating eagles and waterfowl to the area. <http://winterwingsfest.org/>

(f) Increases in irrigated land for agriculture:

Due to recent drought conditions, KDD has not had an adequate water supply for several years to consistently irrigate all of the acres for which it holds a water right. In 2015, 2,671.22 acres of KDD lands were idled District-wide. At an anticipated gross annual income of \$711/ac, this would equate to \$1,899,237 in lost revenue/production. While the District is not planning to add new agriculture acres or apply for new water rights, it does aspire to end the idling of its land and to achieve optimum production on the land it does have. This requires an adequate and stable water supply.

Willie Riggs, economist and Director of the Klamath Basin Research and Extension Center (KBREC), recently reported that by 2025 the world population is expected to reach 9 billion people. He went on to say that in order to feed the world population ten years from now, every acre of land currently in production will need to produce 40% more food. We cannot afford to idle productive agricultural land and think that we will still be able to meet the world food needs in ten years.

Environmental Benefits ORS 541.673(3)

- (a) A measurable improvement in protected streamflows that accomplishes one or more of the following:
- (A) Supports the natural hydrograph;
 - (B) Improves floodplain function;
 - (C) Supports state- or federally-listed sensitive, threatened or endangered fish species;
 - (D) Supports native fish species of cultural importance to Indian tribes; or
 - (E) Supports riparian habitat important for wildlife:

By potentially leaving an additional 16,204 AF of Klamath River water instream, the project may result in measurable improvements in protected stream flows and accomplish the following:

(A) Support the natural hydrograph:

(A review of the historic natural hydrograph of the Klamath River above Keno, OR)

KDD was created on March 6, 1915 as part of the Bureau of Reclamation's Klamath Project. The District lies over that portion of the historic Lower Klamath Lakebed situated in Oregon. Prior to the building of the railroad levee and the construction of the Klamath Reclamation Project, the Lower Klamath Lake would naturally flood in the winter months during high flow events as the Keno reef diverted water into the lake. These waters would ebb back to the Klamath River during the spring, producing by the summer months, both areas of marsh and forage for livestock grazing. With the building of the railroad levee and the closing of the gates in the levee, Lower Klamath Lake was drained for reclamation.

However, KDD simulates and supports the natural hydrograph when it diverts water and floods the historical lake bottom during the winter months under its Federal and/or State rights. This project will support the historic natural hydrograph by providing a more reliable water supply for winter flooding.

To the extent that KDD recycles drainage water through the North Canal Pumping Plant during the summer months and does not divert Klamath River water, to that extent the historic natural hydrograph is supported. KDD expects the hydrological benefit from this project to be intermittent.

(B) Improve floodplain function: Not Applicable

(C) Support state- or federally-listed sensitive, threatened or endangered fish species;

Recycling KDD drainage water keeps water in Upper Klamath Lake (UKL) and the Klamath River to help meet the Biological Opinion. The NMFS and USFWS Biological Opinion on the Klamath Project mandates minimum UKL levels and minimum Klamath River flows at specific times of the year.

Fall and winter operations have the following goals: "Water management from October through February will follow a formulaic approach focused on meeting the needs of coho salmon in the Klamath River while increasing water storage in UKL and providing fall/winter water deliveries to the Project and Lower Klamath NWR. This approach attempts to ensure adequate water storage and sucker habitat in UKL while providing variable river flows that mimic natural hydrology, based on real-time hydrologic conditions in the upper Klamath Basin. The fall/winter Klamath Project operational procedure distributes the available UKL inflows as described below. The primary goals of fall/winter water management on the west side of the Project are to:

- Increase the UKL elevation to meet listed species habitat needs and increase storage for spring/summer EWA releases and irrigation deliveries.*
- Release sufficient flow from Link River Dam to meet listed species needs in the Klamath River.*
- Provide Project irrigation deliveries to:*
 - Klamath Drainage District (Area A2 from North Canal and Ady Canal)*
 - Lease Lands in Area K (Area A2 from Ady Canal)*
 - Lower Klamath National Wildlife Refuge (from Ady Canal)"*

There are times during the fall/winter delivery season, when in order to meet the needs of the suckers in the UKL and the coho salmon in the Klamath River, the USBR reduces or curtails winter deliveries to KDD. Because KDD's winter flooding practices simulate the historic hydrograph, winter flooding is important from a farming aspect as well as a wildlife aspect. The migratory waterfowl and wintering bald eagles depend on KDD's winter flooding for forage and habitat. When this recirculation plant is built and in operation, KDD will be able to continue providing beneficial water to farmers and fowl if the USBR reduces or curtails deliveries to KDD for awhile in order to meet the Bi-Op. This may also be true during KDD's spring/summer irrigation season. This project could help to meet the needs of farmers and fish under all USBR water management regimes.

<http://www.fws.gov/klamathfallsfwo/news/2013%20BO/2013-Final-Klamath-Project-BO.pdf>

To the degree that KDD can recycle drainage water and does not need to call on its stored water in Upper Klamath Lake or divert from the Klamath River, to that degree there is more water in the lake to support suckers and in the river to support coho salmon and steelhead.

(D) Support native fish species of cultural importance to Indian tribes

To the extent that KDD does not need to make a demand on its stored water in UKL, populations of suckers, which are important to the Klamath tribe will be benefited. By recycling up to 16,204 AF KDD anticipates an increase in the instream flows in the Klamath River. The increased flows will benefit water quality and coho salmon and steelhead species that have significant cultural and economic benefits to the tribes dependent on the Lower Klamath River.

(E) Support riparian habitat important for wildlife.

KDD's use of the proposed pumping plant will be on an "as needed" basis (intermittent), therefore the timing of the benefits are somewhat unpredictable. Because the value of riparian areas as wildlife habitat depends on the abundance of water, any increase in instream flows will improve the water quality and the habitat along the riparian corridor of the Klamath River. Because KDD holds water rights that allow it to divert water year round, these benefits could occur at any time of the year.

This project may also result in some benefit to the Lower Klamath National Wildlife Refuge as stated elsewhere in this application.

(b) A measurable improvement in groundwater levels that enhances environmental conditions in groundwater restricted areas or other areas:

The project will result in measurable improvement in groundwater levels that enhance conditions in groundwater restricted areas or other areas. While irrigation wells are not present on the Klamath Drainage District (see note below), there are wells located off the District which pump water into the North Canal for application to KDD lands during drought conditions. If KDD can recycle water in drought years, then irrigators won't need to pump their drought wells which in turn improves ground water levels.

Note: During 2001 and 2002, KDD hired three geologists to perform a ground water investigation within the District boundaries. These geologists geologically mapped the terrain underlying the District using three different methods. Based upon their findings, a qualified geologist used an integrated interpretation of their data and identified the six most probable locations to find ground water on the District. Test wells were subsequently drilled and no appreciable groundwater was found. The conclusion was that high production irrigation wells are not a viable solution for augmenting KDD's water supply and therefore KDD believes further groundwater investigations within District boundaries is unwarranted.

(c) A measurable improvement in the quality of surface water or groundwater:

As stated in the conclusion of the following report, strictly from a nutrient loading perspective, recycling drainage water would be the most effective way to reduce the amount of nutrients flowing into the Klamath River at the Straits Drain.

By recycling drainage water KDD expects a measureable improvement in the quality of surface water eventually returned to the Klamath River.

Based upon the findings and conclusions within the report, FARMING PRACTICES AND WATER QUALITY IN THE UPPER KLAMATH BASIN: Final Report to the California State Water Resources Control Board, Dr. Stephen Kaffka, U.C Davis, measured the nutrient loading to the Klamath River at the Straits Drain attributed to agriculture from the Klamath Irrigation Project (KIP), particularly the Tulelake Irrigation District (TID). TID is located upstream from KDD and seperated from KDD by the Lower Klamath Lake Wildlife Refuge. Like KDD, much of TID overlies an historical lakebed.

Kaffka found the following:

"As water moves through the study area, P concentrations do not increase as much as do salts. And the quantity of total P returned to the Klamath River is estimated to be lower than the amount of P entering the TID, and lower still when the amount of P entering the southern portion of the Klamath Project as a whole (including the P amounts associated with the ADY and North Canal diversions) are accounted. Outflows include the effects of any total P losses from farming to surface waters in the region. Adding the estimated values of P imported with water into the study area given in (table omitted), results in an estimate of approximately 100 t yr⁻¹ of elemental P per year imported, while approximately 62 t yr⁻¹ are exported to the Klamath River at location 20 (Klamath Straits Drain KSD). The diversion of water through the southern portion of the Klamath Project results in an apparent storage or removal of P from the surface water supply. Conservatively, it can be determined with reasonable certainty that the operation of the southern portion of the Klamath Project does not result in net P transfers to the Klamath River, if the data evaluated here are representative. Nutrients are added to the Klamath River from the southern portion of the Klamath Project at the Klamath Straits Drain. (However) The amounts added are less than the amounts that would have been carried down the river if the cumulative water diversions made to serve the project area studied had not been made."

Regarding Total Nitrogen Kaffka writes, "TN values are lower at inflow locations than in outflow locations, but are fairly consistent otherwise (fig. 8, Table 8). There is a small, but insignificant increase in TN concentrations at the KSD outlet (location 20) compared to other outflow locations..."

The conclusion was that the Klamath Irrigation Project, and particularly the southern portion of the KIP, is a net sink for total phosphorus. Nevertheless Kaffka offers, "there may be a more direct and certain way to reduce further the amount of nutrients added to the river at the Straits Drain if this is thought necessary. Some of the water returned to the river at the Straits Drain can be re-diverted to farming, rather than to the river. In that case, the nutrients in the water can serve a useful role as inputs to crop production. If necessary, water not returned to the river can be substituted by additional releases from Upper Klamath Lake...Strictly from a nutrient loading perspective, recycling would be the most effective way to reduce the amount of nutrients flowing in the Klamath River at that location....recycling drainage water would provide a rational measure for reducing further overall nutrient transport."

This is exactly what KDD is proposing to do with its eastside water recirculation plant.

KDD expects the eventual return of the recycled drainage water to the Klamath River to contain less non-point source pollution, resulting in a measurable improvement in water quality.

One way the water quality will be improved is through sedimentation. Sedimentation is a mechanism whereby particulates and associated contaminants are physically deposited on the soil surface. This is a fairly permanent retention mechanism. KDD believes recycling its drainage water will provide greater opportunity for sedimentation to occur.

Plant uptake is another mechanism which helps to alter the quality of surface water. By recycling its drainage water there is greater opportunity for plant uptake of nutrients (such as phosphorus) that might otherwise be flushed into the Klamath River.

Because peat soils act as an ion exchanger, there is concern that recycled water will, over time, increase soil salinity. Although soil salinity would increase if undiluted drainage water is repeatedly applied directly to crop land, the recycled water will be pumped into the North Canal and commingled with fresh water thereby minimizing potential problems.

(d) Water conservation:

The project will directly result in water conservation by recycling up to 16,204 AF per year. The primary purpose and need for the project is to conserve water by efficiently reusing drainage water prior to discharging to the Klamath River. Because KDD holds water rights that allow it to divert Klamath River water year round,

water conservation could be experienced year round, however it will be intermittent. KDD anticipates recycling drainage water in order to keep farm land in production and keep more water instream for fish, wildlife and downstream uses.

Although the amount of water and timing of release may be variable, the State's goals and objectives of sending additional water downstream are met with regard to KDD through federally mandated water management regimes. KDD commits some of irrigation water to instream flows everytime it agrees to reduce or curtail its North Canal deliveries in order to meet Bi-Op requirements. It bears repeating that every drop of water that KDD can recycle will mean more water can stay instream for other stakeholders in the waters of the Klamath River.

KDD has a track record of implementing water conservation measures. In the 1990's, KDD designed and installed a drainage water recycling system on the west side of the District which has enabled it to reuse over 10,000 AF of drainage water in some years. Improvements to the west side water recirculation system were completed in December of 2014. This improvement project makes it possible to recirculate approximately 8,000 AF of additional drainage water through the Westside Pumping Plant. From 1997 through September 2014, KDD has recycled 122,999.00 AF of drainage water through its Westside Pumping Plant.

(e) Increased ecosystem resiliency to climate change impacts:

KDD anticipates that climate change will continue to result in more variable weather patterns yielding less snow pack and/or less rain which will reduce streamflows and water allocations to farmlands. Increasing instream flows of the Klamath River by recycling up to 16,204 AF of drainage water during these times will make a significant contribution to increasing ecosystem resiliency.

The project will maintain an equal amount of water upstream and/or downstream which could be used to maintain water storage elevation in Klamath Lake which would protect endangered suckers/species or increase stream flows in the Klamath River. Increasing stream flows may improve water quality by decreasing water temperature. Overall the net benefit would result in protection of fish and wildlife.

Protects Habitat

By insuring a more reliable water supply on KDD lands, this project will help to protect a viable food supply and sustain an ecosystem that is critical to migratory waterfowl and other species. Dr. Robert McLandress, (Ph.D. in Ecology from UC Davis) states, "...the Klamath Basin is the most important waterfowl area in North America. Waterfowl eat 70 million pounds of food here, and more than half comes from the farms."

He further states: "It is well known to most waterfowl biologists and hunters that certain agricultural crops (cereal grains, potatoes, alfalfa, irrigated pasture, etc.) provide critical foods for waterfowl and that the farming community needs to remain viable if current waterfowl populations are to be sustained."

Source: <http://www.klamathbasincrisis.org/refuges/refugestoc.htm>

Improves air quality

Peat soils need to be kept moist. When KDD landowners must idle land due to insufficient water supplies, the peat soils dry out and winds can quickly kick up blinding dust storms. Also, in the past when the peat soil dried out the District experienced large fires which were very difficult to suppress. Reusing drainage water will ensure that soil moisture content is maintained at optimum levels.

Increases natural storage (wetlands)

In addition to potentially enhancing Upper Klamath Lake levels and increasing Klamath River instream flows, this project could benefit the Lower Klamath Lake National Wildlife Refuge which has been hit hard in recent years. The Lower Klamath National Wildlife Refuge overlays that portion of the historic Lower Klamath Lake bed situation in California.

The Klamath Basin has experienced a series of successive drought years. The result has been the drying up of many acres of wetlands in the Lower Klamath National Wildlife, reducing prime habitat for local as well as migratory waterfowl and diminishing the food base for wintering bald eagles. We cannot overstate the seriousness of this ecological problem caused by climate change.

The adjudicated water right for the Lower Klamath Lake National Wildlife Refuge (which lies directly south of KDD) is junior to KDD's adjudicated water right. This means that in water years with insufficient water supply, the Refuge may see little or no water for wildlife. For several years KDD has been exploring ways to divert water during drought years to the National Wildlife Refuge. During the spring months when landowners are draining their properties, there will be limited beneficial use of recycled water on the District. Excess recycled water could be conveyed to the wildlife refuge for their use.

The District considers the Refuge to be a very important natural resource for migratory birds and other species. This project may provide a very viable solution for the refuge if the managing agencies will permit it.

(f) Improvements that address one or more limiting ecological factors in the project watershed:

Recycling 16,204 AF of drainage water addresses major limiting ecological factors in the project watershed such as improved water quality, increased instream flows for fish and improved water supply wildlife habitat.

Improved Water Quality

Recycling up to 16,204 AF of water per year will improve water quality by reducing total phosphorus and other pollutants by refiltering through KDD crop lands.

In 1999 and 2000, Kenneth Rykbost, Superintendent and Professor at the Oregon State University Experiment Station in Klamath Falls and his assistant Brian Charlton, investigated nutrient loading to the Klamath Irrigation Project (KIP) from diversions out of Klamath Lake and the Klamath River.

For the two years under investigation, Rykbost monitored nutrient concentrations at the diversions points for the A Canal, North Canal and the Ady Canal. The nutrient loading of Total Phosphorus (TP) to the Klamath Irrigation Project averaged about 180,000 lbs per year. Taking into consideration the amount of water diverted to the Project, he converted the loads to parts per million, separating them into the three points of diversion as follows:

<i>1999</i>	<i>TP (ppm)</i>	<i>2000</i>	<i>TP (ppm)</i>
<i>A Canal</i>	<i>.183</i>	<i>A Canal</i>	<i>.205</i>
<i>North Canal (KDD)</i>	<i>.184</i>	<i>North Canal (KDD)</i>	<i>.235</i>
<i>Ady Canal (KDD)</i>	<i>.207</i>	<i>Ady Canal (KDD)</i>	<i>.245</i>

This data shows that the Klamath River accrued additional TP between Klamath Lake and KDD's points of diversion. Several opportunities for increase in nutrient loading occur between these points as Rykbost points out. These include storm drain discharges, discharges from a water treatment plant, influence of a lumber mill with log decks in the river, decomposition of submerged wood debris and effects from marshes and water fowl habitat along the river.

As already stated, Stephen Kaffka of U.C. Davis, investigated the nutrient concentration of return flows to the Klamath River at the Straits Drain for the same time period. These return flows included tailwater from the Tulelake Irrigation District (KIP), and flows from two wildlife refuges. The return flow was commingled with an influx of KDD drainage water. Total phosphorus measured by Kaffka at the Straits Drain appears to represent approximately 60% of the TP diverted to the KIP from Klamath Lake and the Klamath River. And this is with no consideration for loading from Lost River, municipal sources or the two National Wildlife Refuges. The conclusion is that the tailwater from the Klamath Irrigation Project which includes KDD's tailwater, is of better quality than the water entering the Project.

Rykbost, Kenneth A., and Brian A. Charlton. "Nutrient Loading of Surface Waters in the Upper Klamath Basin: Agricultural and Natural Sources." Oregon State University Library. n.p. March 2001. Web. 13 Dec. 2015. < http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/6244/SR%20no.%201023_OCR.pdf>

Improved Habitat

Recycling KDD drainage water can supplement winter flooding which supports the continued population growth of the American Bald Eagle. Although the bald eagle is no longer considered threatened or endangered, a February 2015 report from Nature World News states that wildlife officials are taking this good news with a grain of salt, as it appears the majestic birds are not completely in the clear.

KDD's ability to flood its lands during the winter is not only important to the success of its crops but it is critical to providing a food base for wintering bald eagles and habitat for waterfowl utilizing the Pacific Flyway.

Eagles and waterfowl from surrounding refuge lands use KDD for resting and foraging. The irrigation and farming practices within KDD create thousands of acres of wildlife habitat providing the optimum use of land and water resources.

Because of the Klamath Basin's relatively mild climate and reliable and abundant food resource, the area supports the largest wintering population of bald eagles in the continental United States. Primary prey base for wintering eagles in the Klamath Basin is waterfowl and small mammals, according to R.W. Frenzel (1985). Forage areas for the eagles include privately-owned KDD lands and government managed wildlife refuges.

Quoting Keister 1981, and Keister and Anthony 1983, Frenzel states that "Bald eagle foraging was usually concentrated in wetlands and flooded fields. Montane voles (*Microtus montanus*) became available in abundance in conjunction with flooding of agricultural fields beginning in January." Page 92

"Results indicate that voles were a major component of the wintering eagle's diet during some periods." Page 98

"Montane voles were captured by eagles on agricultural fields that were flooded for rodent control and preparation for spring planting. These fields were flooded annually in mid-winter to early spring by diversion of irrigation water...until the field was covered with water forcing the voles out of their burrows. Animals observed foraging on voles in flooded fields included gulls, Red-tailed and Rough-legged hawks, Northern Harriers, common Ravens, Great Blue Herons, Sandhill Cranes and coyotes. However, bald eagles were the most numerous predator attracted to the fields. Number of eagles foraging on voles increased during the first few days a field was flooded and peaked with as many as 200 eagles in a single 250 ha field before tapering off as the flooding was completed." Page 99

In documenting bald eagle use of KDD lands, Keister et al., (1987) refers to the area serviced by the Klamath Drainage District and the Klamath Game Management Area immediately to the west, as the Oregon feeding area. Bald eagles that roost at the Bear Valley National Wildlife Refuge roost site use the Oregon feeding area extensively in winter. (Keister, et al., 1987). The highest estimates of the population [occurred] during the second week in January and the first week of February. (Keister et al., 1987) This time frame exactly coincides with time frame the KDD landowners are engaged in winter flooding practices.

Iacurci, Jenna. "Bald Eagles No Longer Endangered, But in the Clear?" Nature World News. n.p. 17 Feb 2015. Web. 13 Dec. 2015 <<http://www.natureworldnews.com/articles/12779/20150217/bald-eagle-no-longer-endangered-but-in-the-clear.htm>>

Frenzel, R.W. "Environmental Contaminants and Ecology of Bald Eagles in Southcentral Oregon: Ph.D. Thesis" Oregon State University Library, n.p. 1985. Web. 12 Dec. 2015

<<http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/22984/FrenzelRichardW1985.pdf?sequence=1>>

Keister, G. P., Jr. "Characteristics of Winter Roosts and Populations of Bald Eagles in the Klamath Basin. M.S. Thesis." Oregon State University Library, Corvallis. 1981

Keister, G.P. and R.G. Anthony. "Characteristics of Bald Eagle Communal Roosts in the Klamath Basin: Oregon and California." *Journal of Wildlife Management* 1983
<<http://www.jstor.org/stable/3808166>>

Keister, G.P., R.G. Anthony and E.J. O'Neill. "Use of Communal Roosts and Foraging Area by Bald Eagles Wintering in the Klamath Basin." *Journal of Wildlife Management*. 1987. Web. 12 Dec. 2015
<<http://www.jstor.org/stable/3801028>>

Improved Stream Flow:

In the past decade, commercial fishermen, the tribes, and those tied to recreational fisheries have been hit very hard, losing jobs and income due to reduced salmon populations. This project helps to maintain water levels in the lake and river for endangered species, salmon and steelhead for the fishermen and tribes while attempting to reduce TMDL's to the river. By keeping more water in-stream, we create a healthier Klamath River watershed in hopes of seeing the salmon population return to its historic levels.

Social/Cultural Benefits ORS 541.673(4)

(a) The promotion of public health and safety and of local food systems:

Protects Local Food Systems

Recycling up to 16,204 AF of water and applying it to 6,206 acres will increase KDD's ability to continue producing food crops and feed people. It is both reasonable and logical to assume that crops receiving the appropriate amount of water will produce more than crops that become moisture stressed due to lack of adequate water. An increased and more reliable water supply will put idled land back into production and insure optimum yields for beef, cereal grains, potatoes and onions.

(b) A measurable improvement in conditions for members of minority or low-income communities, economically distressed rural communities, tribal communities or other communities traditionally underrepresented in public processes:

This project will result in measurable improvements and conditions of minority and low income communities, economically distressed rural communities and tribal communities by retaining jobs.

Below are the median incomes for the rural communities along the Klamath River as well as state averages:

<i>Community</i>	<i>2013 Median Income</i>	<i>2013 State Avg.</i>
<i>Klamath Falls, OR</i>	<i>\$29,776</i>	<i>\$50,251</i>
<i>Yreka, CA</i>	<i>\$27,093</i>	<i>\$60,190</i>
<i>Happy Camp, CA</i>	<i>\$28,532</i>	<i>\$60,190</i>
<i>Klamath, CA</i>	<i>\$25,934</i>	<i>\$60,190</i>

The Klamath Basin has a large population of Native Americans and Hispanic farm workers while downriver are large populations of Native Americans. Water is absolutely essential to the economic health of both of these minority groups and the communities they live in. Recirculating up to 16,204 AF of drainage water retains 63.5 full and part-time jobs and provides a healthier watershed for Native American needs.

The meetings KDD holds regarding the Eastside Pumping Plant are open to the public and are noticed on the District's webpage in advance of the meeting. The Karuk Tribe has expressed an interested in sending a tribal

representative to consult with the District in future meetings regarding the project. KDD looks forward to meeting with them and receiving their input should future meetings be required.

As stated earlier, we are helping in maintaining water levels in the lake and river for endangered species, salmon and steelhead for the tribes while attempting to reduce TMDL's to the river. By instituting this project, KDD aspires to improve ecosystem health and reduce water use conflicts in the Klamath Basin and downstream in California.

(c) The promotion of recreation and scenic values:

By keeping up to 16,204 AF of water in the Klamath Lake and the Klamath River, this project promotes recreation and scenic values. Bird watching, waterfowl hunting, recreational fishing on UKL and in the Klamath River, sailing, canoeing, white water kayaking, white water rafting all depend on reliable lake levels, healthy refuges, and adequate instream flows.

The Klamath River, downstream from the John C. Boyle powerhouse, is popular with rafting companies and white water kayakers. The testimony of these companies during FERC relicensing negotiations was the need for reliable flows in the Klamath River. This project will help to sustain reliable flows for recreationist.

Keeping more water in the river also sustains scenic values along the Klamath River corridor especially benefiting the R Ranch, the Klamath River Country Estates, Copco and Irongate subdivisions as well as those residents living along Highway 96 between I-5 and the Pacific Coast.

(d) Contribution to the body of scientific data publicly available in this state:

The USGS currently has measurement devices at the North Canal point of diversion and return flows at the point of discharge into the Klamath River at the Straits Drain. The data from these measurement sites are available online to OWRD, its stakeholders and the public. When the Eastside Pumping Plant is in operation, a reduction in diversions from the Klamath River may be reflected in the readings at the North Canal. A reduction of returns flows to the Klamath River should be reflected in the USGS gauge at the Straits Drain. Stakeholders will be able to capture this data from the internet and will be able to analyze and apply it to studies associated with ecosystem health, instream flows, etc.

KDD will either install a measuring device at the location of the new recirculation plant to monitor the quantity of water being reused or it may quantify the amount of recycled water by documenting the pump run time and multiply it by the output per minute (5,000 gpm). Either way, KDD will make this data available to the public upon request.

(e) The promotion of state or local priorities, including but not limited to the restoration and protection of native fish species of cultural significance to Indian tribes:

The Integrated Water Resources Strategy states that, "many populations of Chinook salmon, Coho, chum, and steelhead are at a fraction of their historic levels and are listed as threatened or endangered." (Page 13) Because KDD diverts directly out of the Klamath River, every drop of water that KDD can recycle means that more water stays in the river for fisheries. The conservation of water that KDD achieves may ultimately help to improve ecosystem health and aid in the recovery of critical sucker, salmon and steelhead populations which are important to the tribes.

Reduced TMDL's

Sedimentation and nutrients are both mentioned in the Integrated Water Resources Strategy (IWRS) as pollutants that impair the water quality of Oregon waters (page 12). Recycling water through peat soils and providing opportunities for sedimentation and plant uptake of nutrients to occur is a viable means of reducing pollutants. TMDLs will be reduced because the water that KDD returns to the river after recycling will have essentially been "re-filtered" and therefore of a higher quality.

Water temperature is oftentimes directly related to stream flow levels. Water temperature can increase as river flows decrease (IWRS page 13). During those times when KDD is recycling drainage water rather than diverting out of the Klamath River, the resulting increased instream flows should have a positive impact on the temperature of Klamath River water. This in turn positively impacts the fisheries and wildlife that utilize the waters of the Klamath River.

(f) The promotion of collaborative basin planning efforts, including but not limited to efforts under Oregon's Integrated Water Resources Strategy:

Meetings related to the Eastside Pumping Plant project have been open to the public. They have been noticed on the District's webpage and also in a conspicuous public place. The USBR attended the meeting where this project was discussed and approved. See minutes which are provided in Exhibit M (pg. 72).

The Karuk Tribe has asked to be notified of future meetings related to this project and KDD looks forward to collaborating with them should further meetings be necessary (Exhibit M - pg. 71).

KDD anticipates using the water conservation measurement data generated by this project to benefit discussions and collaborative planning strategies as KDD works with the USBR and OWRD to find equitable solutions for the delivery water to all Project irrigators in the future.

KDD also hopes to work collaboratively with the USFWS, USBR, OWRD and other water users to provide a more reliable water supply (when able) to the refuge if the regulating government agencies permit.

2. Identify Project Location.

(a) Attach map of project implementation area if appropriate. List map(s) in this space and attach to application.

Exhibit B: Vicinity Map and KDD Boundary Map (pgs. 31 and 32)

Exhibit C: Map of KDD Water Right Diversion Points (pg. 34)

Exhibit D: Map showing KDD lands from which drainage water can be retrieved for recycling (pg. 36)

Exhibit E: Map showing KDD lands to which recycled water can be applied (pg. 38)

Exhibit F: Map showing the location of the proposed Eastside Water Recirculation Plant (pg. 40)

(b) Township Range Section Quarter-Quarter Section
4 0 S 9 EWM 35 SW1/4 SW 1/4

(c) Tax Lot Number(s)
500

(d) Latitude/Longitude
42.039471/ -121.733454

(e) County
Klamath

(f) Watershed
Klamath River

(g) River/Stream Mile (where applicable)
N/A

3. (a) Will the project result in a physical change on private land? Yes No

If yes, attach evidence that landowners are aware of and agree to the proposal. List attachments below.

KDD's legal counsel has drawn up an easement by which Liskey Farms Inc. (the landowners) will grant to KDD the right to build and maintain the Eastside Pumping Plant on their property. The Liskeys have reviewed this easement and are ready to execute it upon an award of funding. (KDD will pay for a survey of the pumping plant site to determine its legal description for insertion into the easement before Liskeys sign.) Liskey Farms Inc. has also provided the District with a letter of intent. Liskey documents can be found in Exhibit G beginning on pg. 42.

(b) Will the project result in monitoring on private land? Yes No

If yes, attach evidence that landowners agree to the proposal and are aware that monitoring information is public record. List attachments below.

Exhibit G: Liskey's letter showing agreement with the proposal and awareness that monitoring information is public record. (See Exhibit G - pg. 42)

4. Provide a project schedule, including beginning and completion dates. Use the following table as a guide. Attach a separate sheet to application if needed.

Estimated Project Duration: November 30, 2016 to November 30, 2017

Place an "X" in the appropriate column to indicate when each Key Task of the project will take place.

Project Key Tasks	2016				2017				20 & Beyond
	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr	
Preliminary engineering services - complete preliminary design and construction cost estimates	X								
Obtain funding approval			X						
Staff: grant administration			X	X	X	X	X	X	
Final engineering design services - complete final design, prepare bid documents, advertise for bids (materials procurement)				X					
Permits: acquire necessary permits				X					
Award of bids					X				
Materials: receipt of project materials						X			
Equipment & Labor: begin construction						X			
Solar panel installation							X		
Electrician - electrical hook-up								X	
End of construction								X	

5. Describe any conditions that may affect the completion of the project.

Due to the fact that this project lies within the old lake bed and has been previously disturbed by farming operations since the early 1900's, we do not foresee any unforeseen conditions that would affect the completion of this project. However, wet weather could delay excavation and backfill operations in the spring or late fall, but if backfill operations can be completed by late summer 2017 then weather should not be a concern. Further, there is always the possibility of encountering archeological artifacts that may delay excavation but this would only cause minor delays since we would only be encountering minor amount of

artifacts within the old lake bed -- most artifacts would be located around the edges of the old lake bed. Either case, we do not foresee the overall completion of the project being jeopardized by these conditions.

6. Attach a completed feasibility analysis if one has been completed.

In the 1990's, KDD landowners approved the concept of installing a pumping plant on the east side of the District for the purpose of recirculating drainage water. In February 2001, the Irrigation Training and Research Center, California Polytechnic State University, San Luis Obispo, CA performed a site visit to evaluate the feasibility of such a proposal. ITREC's recommendation upon completion of its preliminary evaluation was, "The proposed site for the Eastside Pump Station would provide excellent benefits of being able to recycle the district's eastside flows." (See Exhibit H - pg. 47)

KDD, with the help of its engineer, has done a more detailed evaluation to determine flow rate and pump size. Therefore, the current design differs from the specifications ITREC recommended in their report back in 2001.

7. Provide suggestions for interim and long-term project performance benchmarks.

This is a relatively small and simple project, however, we could identify several interim performance benchmarks for the project:

- 1. Complete final design of the project by November 2016.*
- 2. Complete bid documents and advertise for bid December 2016.*
- 3. Receive all procured equipment and materials by April 2017.*
- 4. Complete excavation and backfill operations by September 2017, prior to fall rains.*
- 5. Complete project construction by end of November 2017.*
- 6. Immediately begin recirculating drainage water at the capacity of the 5,000 gpm pump and apply to KDD lands as needed.*

Long Term Performance Benchmarks (and goals)

- 1. Expand delivery of recycled drainage water to Klamath Hills District Improvement Company lands.*
- 2. Install a larger capacity pump to utilize the entire 16,204 AF. The goal of the District is to be able to utilize every drop of the 16,204 AF, therefore our engineer has design the project with a future larger pump in mind.*
- 3. Supply water to the Lower Klamath Lake National Wildlife Refuge during drought years. This is dependent on installing the larger pump and negotiating with the governmental agencies to permit it. At this point there is no need to install a larger pump until KDD can find a place to apply more of the drainage water.*

8. Provide letters of support for the proposed project (list in this space and attach to application).

Exhibit I: Letters of support

- 1. Klamath Water and Power Authority, Hollie Cannon, Manager (pg. 52)*
- 2. Fish and Wildlife Service: Klamath Basin National Wildlife Refuges, Greg Austin, Manager (pg. 53)*
- 3. Oregon State Univeristy: Klamath Basin Research and Extension Center, Willie Riggs, Director (pg. 54)*
- 6. Liskey Farms, Tracey Liskey, President/Landowner (pg. 55)*
- 7. Horsley Farms, Luther Horsley, Landowner (pg. 56)*
- 8. Klamath Hills District Improvement Company, Dan Golden, Secretary/Treasurer (pg. 57)*
- 9. Lee Sukraw, Landowner (pg. 58)*

10. Ron McGill, Landowner (pg 59)

9. Describe partnerships and collaborative efforts associated with the project.

KDD collaborated with Willie Riggs, economist and Director of the Klamath Basin Research & Extension Center (KBREC) on the economic benefits of this project.

The following affected parties were contacted and invited to provide input on the project.

Therese O'Rourke Bradford: USBR Area Manager <tbradford@usbr.gov>

Greg Austin: Fish and Wildlife Service: Lower Klamath Natl. Wildlife Refuge Manager <greg_austin@fws.gov>

10. Consultations/communications with affected Indian tribes and with the Legislative Commission on Indian Services regarding the project.

Has the Legislative Commission on Indian Services been contacted to identify tribes affected by the project?

Yes No

Please provide correspondence as an attachment to this application.

The Legislative Commission on Indian Services website has been consulted and the four tribes affected by the project (Klamath, Yurok, Karuk, Hoopa) have been identified and contacted via email.

Has there been consultation/communications with affected Indian tribes?

Yes No

Please provide a description of consultation/communication that occurred and attach documents to this application if applicable.

The four affected tribes have been notified via email that KDD is proposing to construct a water recirculation plant and invited to provide input regarding the same. One letter to the tribes is included in Exhibit J (pg. 61) as a representative letter and the others are available upon request. KDD received a response from the Karuk Tribe indicating their interest in attending future meetings related to this project (see Exhibit M pg. 71). KDD looks forward to opportunity of collaborating with the Karuk Tribe if future meetings become necessary. Email letters went out to the following tribal chairmen:

James Dunlap: Chairman of the Yurok Tribe <jdunlap@yuroktribe.nsn.us>

Don Gentry: Chairman of the Klamath Tribe <don.gentry@klamathtribes.com>

Russell Attebery: Chairman of the Karuk Tribe <battebery@karuk.us>

Ryan P. Jackson: Chairman of the Hoopa Tribe <cbfdistrict@gmail.com>

11. Provide a description of:

(a) Required local, state and/or federal [permits](#) and/or authorizations for project implementation that have been secured to date. Please attach secured permits/authorizations to the application.

N/A

(b) Required local, state and/or federal permits and/or authorizations that will be secured in the future to implement the project. Describe efforts to date in securing these permits and/or authorizations.

A Land Use Compatibility Statement is required from the Klamath County Planning Department

A Structural Permit and an Electrical Permit are required by the Klamath County Building Department

These permits will be obtained upon completion of the final design.

- 12. Provide any additional supplemental materials to demonstrate ability to implement the project. Examples include project plans and specifications, engineering details and [water availability analysis](#). List documents in this space and attach to application.**

*Preliminary engineering plans and specifications. (Final bid documents to be completed upon receipt of funding)
(See Exhibit N - pg. 75)*

V. Storage Project Requirements (if not a storage project continue to Section VI)

For any storage project please contact Water Resources Grant Administrator, Jon Unger, at (503) 986-0869 prior to completing the application.

- 13. Storage Project Type:** Above Ground Below Ground

- 14. If above-ground storage, would the proposed storage project be located in-channel?**

Yes No N/A

- 15. Identify the capacity in acre-feet of the proposed storage project.**

- 16. Has a water right application been filed for the proposed storage project?**

Application not yet made.

Water right application made; permit not yet issued Application #

Permit issued. Application # Permit #

For Questions 17 & 18 answer the following:

- (a) Does the proposed storage project impound surface water on a perennial stream?

Yes No Uncertain

- (b) Does the proposed storage project divert water from a stream that supports state- or federally-listed sensitive, threatened or endangered fish species?

Yes No Uncertain

- (c) Does the proposed storage project divert more than 500 acre-feet of water annually?

Yes No

- 17. Water Dedicated Instream** N/A

For above ground storage projects seeking grant funding: If you answered “yes” to any of the questions posed in a-c above a minimum volume of water equal to at least 25% of the stored water must be dedicated to instream use.

Identify percentage of stored water to be dedicated to instream use.

%

Note: Any storage project dedicating 25% of stored water to instream use will automatically receive a median score in the environmental public benefit category with the opportunity to demonstrate additional environmental benefit to increase the score.

18. Seasonally Varying Flow Prescription

For all storage projects: If you answered “yes” to any of the questions posed in a-c above the project will need a **Seasonally Varying Flow (SVF) Prescription**, determining the duration, timing, frequency and volume of flows (including ecological baseflow), necessary for protection and maintenance of biological, ecological, and physical functions outside of the official irrigation season. The initial step in defining the SVF for the project is to schedule an SVF meeting with OWRD. For assistance and more information please contact Water Resources Grant Administrator Jon Unger at (503) 986-0869.

Identify whether the storage project will need a Seasonally Varying Flow Prescription.

Yes No Uncertain

VI. Environmental Public Benefit for Conservation Projects Dedicating Water Instream (if not a conservation project continue to Section VII)

19. Identify percentage of conserved water to be dedicated to instream use. N/A

%

Note: Any project that conserves water and dedicates at least 25% of the conserved water quantity to instream use will automatically receive a median score in the environmental public benefit category with the opportunity to demonstrate additional environmental benefit to increase the score. Water dedicated to instream use must be permanently placed instream and protected by the Oregon Water Resources Department.

VII. Financial Information

For Loan Applicants – Since loan applications do not require cost match, loan applicants who do not offer a cost match need not complete Section A and can disregard the match funding columns in Sections B and C. Budget and costs of key tasks must be identified in sections B & C. Loan applicants will be required to provide additional financial information related to their ability to repay the loan. This request for information will take place after the scoring and ranking process for those projects that are recommended for funding.

For Grant Applicants – Complete Sections A, B and C.

Section A – Cost Match Information

Applicants must demonstrate a minimum 25% funding match based on the total project cost. The match may include: a) applicant funds or secured funding commitment from other sources; b) pending funding commitment from other sources; and/or c) the value of in-kind labor, equipment rental, and materials essential to the project. For secured funding, the applicant must attach a funding award letter from the match funding source that specifically mentions the dollar amount shown in the “Amount/Dollar Value” column. For pending resources, documentation showing a request for the matching funds must accompany the application. Funds expended prior to grant agreement are not reimbursable nor do they qualify for cost match without prior authorization by the Department.

In the Type column below matching funds may include:	In the Status column below matching funds may have the following status:
<ul style="list-style-type: none"> • Cash - Cash is direct expenditures made in support of the feasibility study by the applicant or partner*. 	<ul style="list-style-type: none"> • Secured - Funding commitments already secured from other sources.
<ul style="list-style-type: none"> • In-Kind - The value of in-kind labor, equipment rental and materials essential to the feasibility study provided by the applicant or partner. 	<ul style="list-style-type: none"> • Pending - Pending commitments of funding from other sources. In such instances, Department funding will not be released prior to securing a commitment of the funds from other sources. Pending commitments of the funding must be secured within 12 months from the date of the award.

* “Partner” means a non-governmental or governmental person or entity that has committed funding, expertise, materials, labor, or other assistance to a proposed project planning study. OAR 690-600-0010.

Match Funding Source (if in-kind, briefly describe the nature of the contribution)	Type (✓ One)	Status (✓ One)	Amount/ Dollar Value	Date Match Funds Available (Month/Year)
<i>KDD will cover the preliminary engineering costs</i>	<input checked="" type="checkbox"/> cash <input type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$4,950	January 16
<i>KDD will cover cost of staff who will administer the grant funds</i>	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$2,120	June 16
<i>KDD will cover the costs for necessary permits required to complete the project</i>	<input checked="" type="checkbox"/> cash <input type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$4,240	November 16
<i>KDD will provide the manual labor necessary to carry out the project.</i>	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$6,524	April 17
<i>KDD will provide the equipment necessary to carry out the project. The equipment cost includes the cost of fuel and operator.</i>	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$33,502	April 17
<i>KDD has budgeted for project contingencies and will pay 25% of those costs</i>	<input checked="" type="checkbox"/> cash <input checked="" type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$10,898	April 17
<i>KDD will cover a portion of the construction materials</i>	<input checked="" type="checkbox"/> cash <input type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$27,324	April 17
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		

Section B – Project Budget

Please provide a line item budget for the project; see example below. If significant additional detail is needed please complete separately and attach to completed application.

Line Items	Number of Units* <i>(e.g. # of Hours)</i>	Unit Cost <i>(e.g. hourly rate)</i>	In-Kind Match	Cash Match Funds	OWRD Funds	Total Cost
Materials				\$27,324	\$173,440	\$200,764
Contractual/Services				\$4,950	\$12,720	\$17,670
Staff Salary/Benefits			\$2,120			\$2,120
Equipment (must be approved)			\$33,502			\$33,502
Supplies						
<i>Other: Contingencies</i>			\$5,449	\$5,449	\$32,693	\$43,591
<i>Manual Labor & Fringe Benefits</i>			\$6,524			\$6,524
<i>Permits</i>				\$4,240		\$4,240
<i>Miscellaneous (Solar and Electrical Installation) See Exhibit L (pg. 69) for itemized budget</i>					\$49,820	\$49,820
Total for Section B			\$47,595	\$41,963	\$268,673	\$358,231
Percentage for Section B			13%	12%	75%	100%

* Note: "Unit" should be per "hour" or "day" not per "project" or "contract." $Number\ of\ Units \times Unit\ Costs = Total\ Cost$

Section C – Key Task Cost

Complete Section C below. Key Tasks identified in Section C should be the same as the Key Tasks in Section IV(4) above.

