

Ridenbaugh Canal Diversion Modernization

WaterSMART Water and Energy Efficiency Grants

Funding Opportunity No. R23AS00008



Nampa & Meridian Irrigation District

1503 First St. South

Nampa, ID 83651

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Technical Proposal

Executive Summary

Date: July 28, 2022

Applicant: Nampa & Meridian Irrigation District

City, County, State: Nampa, Canyon County, Idaho

Category A or B: Category A

Partnering Stakeholders: Water District 63, City of Boise, City of Nampa, City of Meridian, Boise River Flood Control District No. 10

Project Title: Ridenbaugh Canal Diversion Modernization

Length of Time: 33 Months

Completion Date: December, 2025

Federal Facility Location: N/A

Project Summary:

NMID summary

Nampa & Meridian Irrigation District (NMID) is a large, diverse Idaho irrigation district, whose board of directors and staff operate and maintain extensive, intricate canal and drainage systems to deliver irrigation water and provide drainage for 40,867 tracts of land consisting of approximately 60,000 acres south of the Boise River in the heart of the Treasure Valley. The major components of NMID's Ridenbaugh Canal system and the land are served by NMID, are depicted in Figure 1. Rapidly changing land uses within NMID run the gamut, from traditional agriculture to Idaho's most populated urban settings. The water delivery benefits NMID provides to these lands are based on substantial, early priority natural flow rights in the Boise River, and storage rights in Arrowrock and Anderson Ranch Reservoirs.

Depending on their locations and development history, individual tracts of land in NMID are entitled to one or more of NMID's irrigation water and drainage benefits. NMID lands are categorized as "Ridenbaugh acres," "Project acres" and "Drainage acres" according to the water right and drainage benefits apportioned to them:

- over 20,000 "Ridenbaugh acres" that are entitled to NMID natural flow and storage rights delivered through the Ridenbaugh Canal system depicted in green in Figure 1;

- over 26,000 “Project acres” lying below the Ridenbaugh Canal system that are entitled to NMID storage rights conveyed from the Boise River by the New York Canal system¹ through feeder canals to the Ridenbaugh Canal system for delivery to the NMID Project acres;
- over 12,000 “Project acres” lying above the Ridenbaugh Canal system that are entitled to NMID storage rights delivered directly from the New York Canal system, and
- Over 59,000 “Drainage acres” that benefit from NMID’s drainage system.

Ridenbaugh Canal diversion project summary

The Ridenbaugh Canal is the second largest irrigation conveyance system in the Treasure Valley, diverting over 500 cfs from the Boise River to deliver water to over 46,300 Ridenbaugh and Project acres located in Ada and Canyon Counties, including lands in or near the cities of Boise, Meridian, Kuna, Nampa and Caldwell (see Figure 1).

The current diversion structure, constructed in the 1930s, checks the Boise River above Barber Park, just upstream from downtown Boise, to create the pool that feeds the Ridenbaugh Canal. The diversion is constructed of concrete piers anchored in the riverbed, with slots for check boards to dam the river. NMID staff adjust the diversion from a wooden walkway by manually placing and removing 20’ long wooden check boards in the slots. This operation is relatively slow, imprecise, and dangerous compared to modern water diversion systems and methods.

NMID plans to modernize the Ridenbaugh Canal diversion by: replacing the check boards with pneumatic bladder dams; replacing the 550’ sediment control structure and catwalk; replacing the weed rack, and installing the necessary electrical, pneumatic, and mechanical systems to operate the automated diversion. As explained in greater detail throughout this proposal, modernizing and automating the Ridenbaugh Canal diversion will significantly improve the timing and precision of NMID’s operation and adjustment of the diversion structure, to:

- impound, divert and convey the quantity of water required by NMID landowners;
- eliminate the time, fuel consumption and safety risks associated with manual adjustment of the diversion by NMID operations staff;
- maintain a more consistent diversion pool level and reduce fluctuations in Boise River flows, and thereby;

¹ The New York Canal system is owned by the United States Bureau of Reclamation and operated as transferred works by NMID and four other irrigation districts comprising the Boise Project Board of Control.

- reduce Boise River system operational losses and storage account reductions by up to 1,000 acre-ft annually;
- reduce seepage loss from the diversion pool;
- reduce water losses from flow disruptions caused by malfunctions of the upstream Barber Dam (currently the subject of a water delivery call and violation notices issued by the Idaho Department of Water Resources);
- preserve storage held by Reclamation for streamflow maintenance and flow augmentation for ESA-listed salmon and steelhead;
- improve instream aquatic habitat, aesthetics, and recreational uses;
- enhance water right administration by the Boise River Watermaster;
- reduce the risk of water delivery calls by downstream senior water right holders diverting from the Boise River below the Middleton Gage; and
- reduce flood risk.

Project Location

The Ridenbaugh Diversion is located in Ada County, Idaho within City of Boise, at River Mile 61.2, which is 5.4 miles downstream of Lucky Peak Dam, 3.2 miles downstream of Diversion Dam, and 0.6 miles downstream of the Barber Dam. The project latitude is 43°33'56" N and longitude is 116°7'55" W. See Figure 1 for the project location map.



Figure 1 The Ridenbaugh Headworks is located at Boise River mile 61.2 in Boise, ID

Flow in the Boise River is regulated by three federally-owned dams: Anderson Ranch Dam, Arrowrock Dam, and Lucky Peak Dam. These dams are operated to provide storage for water supply and flood mitigation for the Treasure Valley.

Technical Project Description

This is a project to modernize the existing 92-year-old diversion structure with a new automated diversion structure, replace the 550' sediment control structure and catwalk, replace the weed rack, and install the necessary electrical, pneumatic, and mechanical systems to operate the automated diversion. Two-stage temporary cofferdams will be constructed in the Boise River to dewater one side of the river and allow flow through the other side. The riverbed will be prepared and new concrete piers will be constructed. The piers will have new walkways, safety railings, and anchor points for hoists or lifting equipment to reduce risk to NMID employees in operating the check boards.

NMID will install pneumatic bladder dams and new supporting structures to replace the existing river diversion structure. This project will also replace the 550' sediment control structure and the weed rack. These were both constructed with the diversion and are at the end of their usable lives. Opportunities to install self-cleaning and fish exclusion features will be evaluated as part of this project. All the necessary electrical, pneumatic, and mechanical systems to operate the automated diversion will be included. The existing diversion is shown in Figure 2. A project layout is shown in Figure 3 and the concept site plan is shown in Figure 4. Figure 5 is a photo of a similar pneumatic diversion gate.



Figure 2 Existing Ridenbaugh Diversion Structure



Figure 3 Project Layout Map

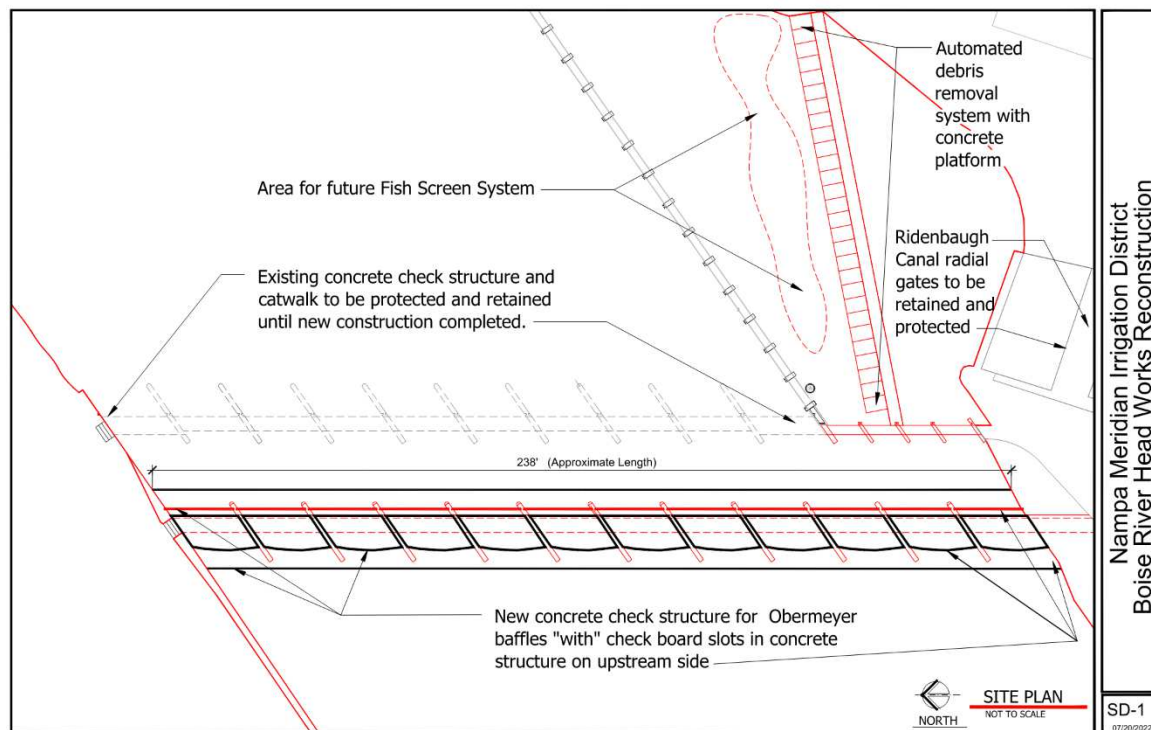


Figure 4 Concept Diversion Plan

Nampa Meridian Irrigation District
Boise River Head Works Reconstruction

SD-1
07/20/2022



Figure 5 Photo of a Similar Pneumatic Gate Diversion Dam

NMID owns the land beneath the Ridenbaugh Headworks and the eastern portion of Barber Park. Construction will not require the acquisition of additional land or easements.

The schedule for this project starts in September of 2022 and concludes in December of 2025. The schedule for the project and project planning materials are provided in **Attachment A**. The project will include the following elements:

- Site investigation
 - Topographic Survey
 - Geotechnical Investigation
- Engineering design and permitting
 - Concept Design/Value Engineering
 - Hydraulic Analysis
 - 30% Design, 60% Design, 90% Design
 - Final Design
 - Permitting
- Bidding and Construction
 - Bidding
 - Contractor Selection
 - Mobilization
 - Dewatering

- Demolition
- Earthwork
- Site Improvements
- Concrete
- Dam installation
- Demobilization
- Facility Start up

NMID will procure professional services for survey, geotechnical investigation, engineering design, and construction as part of this project. The diversion will be constructed between October 2024 and December 2025, with the facility being fully operational for the 2025 irrigation season.

Evaluation Criteria

Evaluation Criterion A—Quantifiable Water Savings

The lack of real-time flow monitoring and control of the Ridenbaugh Canal diversion contributes to significant operational loss in the Boise River System annually. Automated control of the Ridenbaugh Diversion Dam will reduce operational inefficiency in the Boise River by an estimated 1,000 acre-ft every year. Additionally, losses due to seepage and over delivery could be reduced by an estimated 12-15 acre-feet annually.

OPERATIONAL LOSSES

Water delivery in the Boise River is managed by Water District 63 (WD63). Over the last ten years, WD63 has experienced between 3,000 and 10,000 acre-feet of operational loss annually, as shown in Figure 6. These operational losses, measured as cumulative flow exceeding the target flowrate of the Boise River at Middleton stream gage, represents excess diversions and releases from Lucky Peak that result from inefficient diversion operations. Flow in the Boise River at Middleton above the target flowrate has no known benefit. Recent discussions with WD63 indicate that with the existing diversion operations, between 3,000 and 5,000 acre-feet of operational loss is expected every year, and up to 10,000 acre-feet is expected regularly. Addressing operational inefficiencies of Boise River diversions would greatly reduce operational loss.

Each year, this operational loss is pro-rated and charged to all storage account holders in the USBR's Boise River Storage System. The Ridenbaugh Canal Diversion is the second largest diversion on the Boise River, and accounts for roughly 10% of Boise River System diversions during the irrigation season. The Ridenbaugh Diversion, operated through a series of manually adjusted 20-ft check board structures contributes to the operational loss measured at the Middleton gage. The operational loss

associated with the Ridenbaugh Canal diversion is estimated to be a minimum of 300-500 acre-ft and as much as 1,000 acre-ft annually, by prorating the total operational loss based on the Ridenbaugh Canal's typical diversions (10% of total Boise River diversions). NMID and the Boise River Watermaster (WD 63) believe this annual operational loss can be greatly reduced by incorporating automated control and flow measurement technology in the Ridenbaugh Canal diversion. This reduction benefits NMID and all storage accounts in the Boise River Storage System to which operational losses are charged, including USBR.

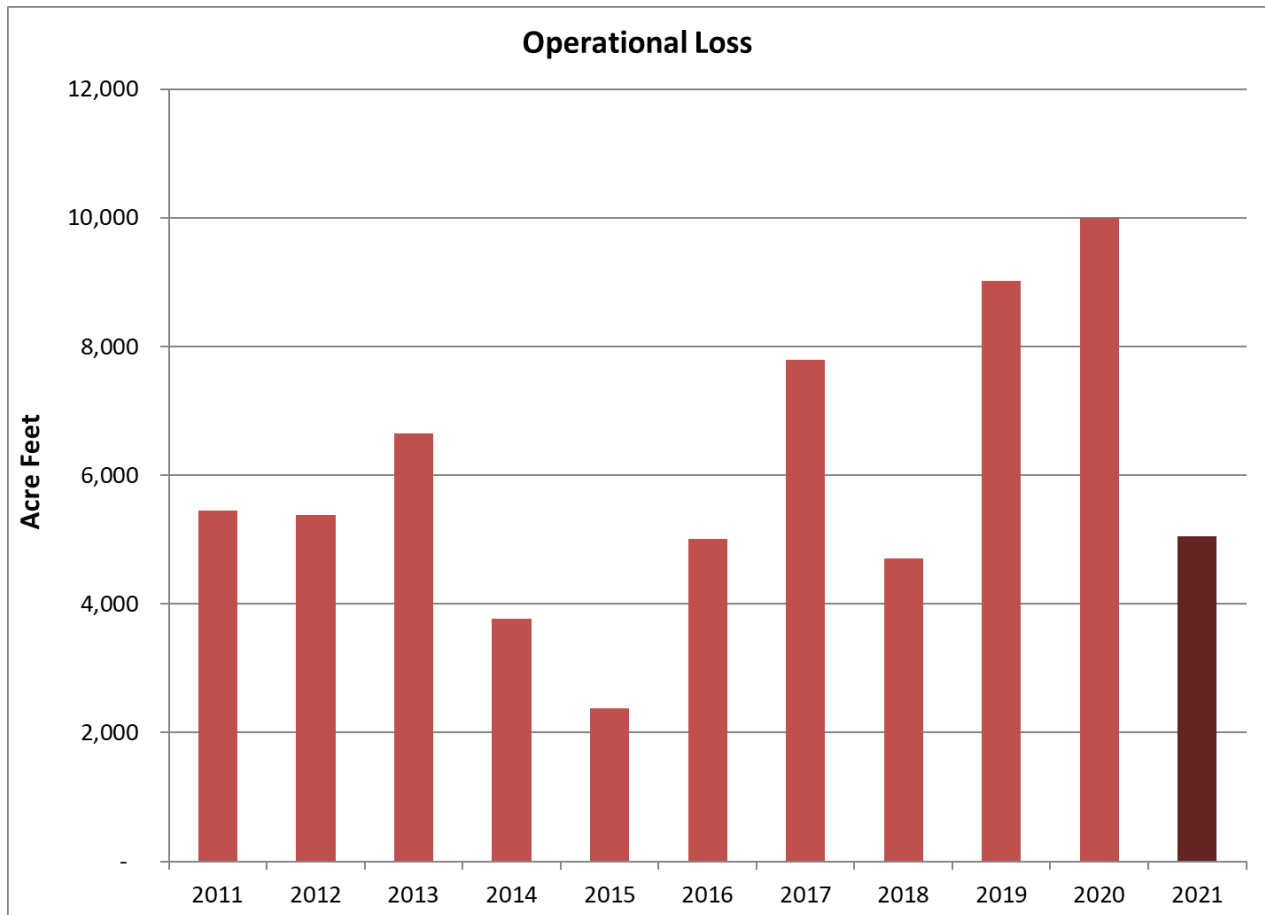


Figure 6 Operational Loss, Calculated as flow in excess of target flows at Boise River at Middleton

SEEPAGE LOSSES

NMID has been operating the diversion pool approximately 0.3 feet higher than it would like to account for changes in river flow and response time to adjust the diversion manually. This increase in water surface elevation increases the wetted area by 0.13 acres. Assuming a standard maximum infiltration rate of 0.2 ft/day, this higher pool elevation can lead to annual seepage losses in the pool of 10 acre-ft/year. Therefore, lowering the pool in the area by 0.3 feet will reduce seepage losses in the pool by up to 10 acre-ft/year.

OVER DELIVERY DURING BARBER DAM INTERRUPTIONS

The Ridenbaugh diversion also experiences losses in the form of over-deliveries following flow disruptions at Barber Dam. Barber Dam, located 0.6 miles upstream of the Ridenbaugh diversion, has experienced operational malfunctions, causing complete loss of flow in the Boise River until water overtops the Barber Dam Spillway. During periods of diminished flow in the Boise River, the headgates at the Ridenbaugh diversion are opened to divert existing flow in an attempt to meet delivery requirements. When flow through Barber Dam returns, these gates need to be adjusted back to normal level. This process can take 30-60 minutes, and during this time the canal can be diverting up to 60 cfs more than intended. Based on the typical time and over-delivery during flow disruptions, each disruption can result in between 2 and 5 acre-ft of loss. Between 2017 and 2020, there were 12 disruption events. These disruptions are not regular occurrences and are hard to annualize moving forward. Automating the diversion pool control will greatly reduce these over delivery losses.

Describe the support/documentation of estimated water savings.

The water savings calculations are described above and are provided in **Attachment B**. The Idaho Department of Water Resources provided calculations of operation loss, which can be made available upon request.

In summary, the main water savings from this project occur from better management of the Ridenbaugh diversion pool, which will reduce the operational inefficiencies in managing a manually controlled diversion structure from an office that is over twenty miles away. These inefficiencies add up over the course of the water year. Other smaller water savings are expected due to local reduction in infiltration loss and improved response time to upstream disruptions of the Barber Dam.

How have average annual water savings estimates been determined?

Annual water savings have been estimated based on the operational losses calculations provided by WD63 and typical summer irrigation diversions. These calculations are presented in **Attachment B**. WD63 staff have indicated that inefficient canal operations are the primary source of operational loss and that real-time operations could nearly eliminate between 3,000 and 5,000 acre-ft every year up to 10,000 acre-ft of operational loss annually.

Have current operational losses been determined?

Operational losses have been determined by observed flows at the Boise River USGS streamflow gage at Middleton (<https://waterdata.usgs.gov/nwis/uv?13210050>). WD63 uses this gage to determine if target flowrates for diversions are being met. Flow above these targets are considered operational loss, and indicate that WD63 has released

more water from Boise River System storage than required to meet the delivery requests throughout the Boise River. These operational losses are calculated annually, prorated to storage holders in the Boise River Storage System, and charged to all storage holders. WD63 has investigated the source of these losses and has determined that inefficient diversion controls lead to the cumulative losses observed at Middleton.

Ridenbaugh Canal diversion measurement

The current diversion structure for the Ridenbaugh Canal consists of a stop log structure measuring approximately 240 feet long across the Boise River to create approximately 4 foot of head pressure to supply water to three Waterman Radial Gates positioned on the west bank of the river. The gates are adjusted through AUMA Actuators. Campbell Scientific equipment has been utilized to control the head gate actuators and thus automate the flows from the Boise River to the Ridenbaugh Canal. Transducers installed in the river upstream of the check structure monitor the height of the impounded river and the Ridenbaugh Canal also has a transducer that monitors the height of the canal in a rated section approximately 800 feet downstream of the canal gates. This rated section is qualified annually by manual flow meter readings.

This proposal does not include installing any new measurement devices.

Will annual farm delivery volumes be reduced by more efficient and timely deliveries?

As described in the previous sections, automated operation of the pneumatic gates will reduce operational loss, reducing the total volume of water released to meet delivery demands at the Ridenbaugh Canal and throughout the Boise River Storage System.

How will actual water savings be verified upon completion of the project?

Water savings will result because of the improved response time in the operation and adjustment of the Ridenbaugh diversion structure. NMID plans to field test and document the improved response time of the diversion as an indication that the operational improvement has greatly reduced the time to complete adjustments to diversion pool operations.

WD 63 is also undertaking a project to improve real-time monitoring of flow on the Boise River and all diversions and returns to the Boise River. These measurement devices, which are not part of this project, will allow for better quantification of the source of operational losses and would complement this project. If these devices are installed, they could be used to refine and verify the estimate of the reduction in operational losses from this and other diversion structures.

Evaluation Criterion B—Renewable Energy

SUBCRITERION NO. B.1: IMPLEMENTING RENEWABLE ENERGY PROJECTS RELATED TO WATER MANAGEMENT AND DELIVERY

Solar Panels

NMID intends to include solar panels to provide energy for instrumentation and controls where it is practical and feasible. A typical 300-watt panel could be used to provide power to level sensors, actuators, SCADA, and other instrumentation and controls. Specific power requirements and use of solar panels will be analyzed during final design for components and loading.

Describe the amount of energy generated.

The power used in this project will be minor, with enough energy to run small instrumentation, controls, and SCADA system. Larger battery power can be utilized for automated gate and remote control and will be given consideration during design.

Describe any other benefits of the renewable energy project.

Low-Head Hydropower

Installation of hydropower generating facilities is not planned as part of this project. However, the associated facility upgrades are necessary to allow for a potential future low-head hydropower project at this location.

SUBCRITERION NO. B.2: INCREASING ENERGY EFFICIENCY IN WATER MANAGEMENT

Will the project result in reduced vehicle miles driven, in turn reducing greenhouse gas emissions?

Reduced Vehicle Travel and Associated Costs and Emissions

The existing Ridenbaugh Diversion structure is operated manually with a series of check boards inserted into piers in the Boise River. Every adjustment of the diversion requires mobilization of NMID staff to adjust the structure. In a typical year, staff will need to adjust the structure 12-14 times. Each mobilization requires 6 staff (three trucks) to make a 48-mile round trip from the NMID office to the diversion and back. Adjusting the structure currently requires approximately 1,700 to 2,000 vehicle-miles annually. Assuming each truck gets roughly 15 miles per gallon, this equates to 115-135 gallons of gasoline annually. High flow years require several additional trips to mobilize staff to clear debris blockage from the dam. Using an automated gate, NMID will not have to mobilize staff to adjust the diversion, eliminating staff time and annual vehicle miles associated with gate operation entirely. Additionally, the gates and improved trash

rack will require significantly less effort to clear during high flow years, likely yielding a similar reduction.

Reduced travel to the diversion dam to adjust the check board structure will reduce required vehicle mileage and therefore reduce greenhouse gas emissions. Using the US EPA Greenhouse Gas emissions calculator (<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>), reducing gasoline usage by 135 gallons would reduce emissions by 1.2 metric tons of carbon dioxide equivalent annually. In a high-flow year when staff would have to mobilize 35 times, using the automated gate could reduce emissions by 3.6 metric tons of carbon dioxide equivalent.

Describe any renewable energy components that will result in minimal energy savings/production (e.g., installing small-scale solar as part of a SCADA system).

As described above, NMID intends to include solar panels to provide energy for instrumentation and controls where it is practical and feasible.

Evaluation Criterion C—Sustainability Benefits

Increasingly, improving the efficiency of irrigation systems to divert and deliver *existing* water rights and supplies is the most viable option for enhancing water supply sustainability in the Treasure Valley. The Boise River water supply has been fully appropriated for many years, with the exception of periodic high flows released for flood control. Opportunities to store flood flows are limited, relatively unreliable and expensive, and require significant agency administration to resolve and manage engineering, construction, water rights, ecological and social issues. For example, Reclamation estimates a 38% probability of filling the 29,000 additional storage space that would be created by raising Anderson Ranch Dam at a cost of \$83 million.

Sustaining water supplies and deliveries to support the rapidly changing land uses and water demand profiles in the Treasure Valley in the era of climate change, recurring drought and prolonged extreme summer temperatures, requires the use of modern irrigation methods, equipment and technology. Continuing to operate the 92 year-old Ridenbaugh Canal diversion structure by the manual installation of 20' wooden check boards will not meet the challenges that face NMID, Water District 63 or the communities that depend on the Boise River as the lifeblood of the Treasure Valley.

Modernizing the Ridenbaugh Canal diversion will significantly improve the timing and precision of NMID's operation and adjustment of its diversions from the Boise River. The primary purposes and benefits of this project are to: impound, divert and convey the quantity of water required by NMID landowners; eliminate the time, fuel consumption and safety risks associated with manual adjustment of the diversion by NMID operations staff; and maintain a more consistent diversion pool level and reduce fluctuations in

Boise River flows. This project will result in additional benefits to the Boise River ecosystem and ESA-listed species described below.

Water management efficiency and supply sustainability

The primary purpose of this project is to increase the efficiency of the Ridenbaugh Canal diversion. As explained under Evaluation Criterion A, by improving the timing and precision of NMID's operation and adjustments of the Ridenbaugh Canal diversion, this project will increase the efficiency of NMID's diversion and delivery of water to its landowners, reduce Boise River system operational losses and storage account reductions by up to 1,000 acre-ft annually, reduce seepage loss from the Ridenbaugh Canal diversion pool, and reduce water losses from flow disruptions caused by malfunctions of the upstream Barber Dam. These efficiency improvements and water savings will help NMID support the rapidly changing land uses and water demands of its landowners.

Drought resilience and climate change

Modernization of the Ridenbaugh Canal diversion will help ameliorate the impacts of water shortages resulting from recurring droughts, and the impacts of climate change on the timing and quantity of snowfall, snowpack, water supply and extreme summertime temperatures.

This project helps address the following climate change challenges identified by the City of Boise's Climate Adaptation Assessment

(https://www.cityofboise.org/media/9641/boise-climate_factsheet.pdf):

- **HEAVY PRECIPITATION DAYS:** The ability to operate the diversion pool automatically will allow the diversion to be adjusted during and shortly after heavy precipitation events, reducing flood risks at and upstream of the facility.
- **IRRIGATION DEMANDS:** By reducing operational losses, more water will be left in the Boise River Storage system to meet growing demands. Also, replacing the dam will provide reliable water diversion for the life of the project.
- **DROUGHT FREQUENCY:** By reducing operational losses, more water will be left in the Boise River Storage system to increase resiliency during droughts.
- **SEASONAL STREAM FLOWS:** NMID will be able to adapt to shifts in seasonable streamflow more readily with the automated structure.
- **FLOODING DANGER:** The ability to operate the diversion pool automatically will allow the diversion to be adjusted during and shortly after a heavy precipitation event, reducing flood risks at and upstream of the facility.
- **WATER QUALITY:** NMID can evaluate alternative pool operations to address ongoing and emerging water quality and habitat concerns.

Reducing Safety Risks for NMID Workers and Boise River Recreationists

Another primary purpose of this project is to reduce the safety risks associated with the existing Ridenbaugh Canal diversion.

As described previously, operation of the existing diversion requires manual installation, removal, and adjustment of groups of 20-foot long check boards. Installing each board requires teams of three staff members to access the structure using a wooden access platform and insert the boards forcefully by hand and with hand tools. Installing and using an automated pneumatic weir or similar structure will significantly improve worker safety conditions by avoiding the need to regularly have staff access the dam and install check boards to adjust the structure. Other irrigation districts in the region have had near-miss events related to operating similar structures. Replacing the existing structure with an automated structure is an important part of NMID's plan to continuously improve worker safety.

The Boise River is used by recreationists including floaters, kayakers, and anglers. The existing structure is unsafe at water level for a recreationist. Replacing the structure will improve safety for in the event of an encounter with the diversion by creating safer flow conditions and improving warning signage at the diversion.

Ecosystem and ESA-Listed Species Benefits

Modernizing the Ridenbaugh Canal diversion to improve the timing and precision of NMID's operation and adjustments of the Ridenbaugh Canal diversion is expected to improve aquatic habitat, aesthetics and recreational use of the Boise River in the diversion pool and downstream from the diversion by reducing instream flow fluctuations. Automated diversion control will allow NMID to operate this pool elevation lower than it currently does. This will reduce the depth and increase the channel complexity in this reach. The City of Boise is completing habitat modeling of the Boise River. Coordination with the City of Boise could assist NMID in determining the degree to which revised operations improve upstream habitat conditions. Additionally, there is potential to improve passage at the diversion, depending on the configuration of Obermeyer gates and the operation of the gates. This is not a primary objective of the project, but opportunities for these benefits will be considered when establishing gate operations and configuration during design

Also, as previously discussed, this project is expected to help preserve storage held by Reclamation for streamflow maintenance and flow augmentation for ESA-listed salmon and steelhead, providing reclamation additional water and flexibility in releasing water for these purposes.

Energy Sustainability and Air Quality

The automated diversion will require electricity to operate the compressors which automate the gates. Power to the diversion will be provided by Idaho Power Company. Currently, most of Idaho Power Company's energy is both clean and renewable. Idaho Power Company plans to end all coal plants by 2028 and achieve a 100% clean energy portfolio by 2045. Therefore, the additional energy required to operate this system will be mostly clean and renewable. By 2045, greenhouse gas emissions associated with the operation of these gates are expected to be reduced entirely.

By reducing vehicle emissions, this project will reduce the air pollution contributed from NMID associated with operating the pneumatic gates. Irrigation gate operations are most critical in the summertime, when unhealthy air quality is most likely to occur due to the combination of heat, wildfire smoke, industrial emissions, and vehicle emissions. Although the relative impact of these trips may be minor, the reductions are occurring at the most critical time to address air quality.

Water Related Conflicts

Impacts from Barber Dam Unauthorized Diversions

Barber Dam malfunctions have caused 12 major flow interruptions to the Ridenbaugh Canal between 2017-2020 that have prevented NMID from diverting the quantity of water it is entitled to and requires to deliver water to NMID landowners. During a flow disruption, significant emergency response by NMID staff is required to adjust the Ridenbaugh Canal diversion to continue making water deliveries. The unauthorized Barber Dam diversions are the subject of a water delivery call and contested case before the Idaho Department of Water Resources.

Incorporating automated control of the Ridenbaugh Diversion will enable NMID to respond to and mitigate the Barber Dam flow interruptions more quickly as it will not require travel, emergency diversion control, and mobilizing NMID staff in potentially dangerous situations.

WD63 Water Rights Administration

The WD63 Watermaster has warned NMID and other Boise River water users about the possibility of water delivery calls by senior water right owners that divert water below the Middleton gage. Improving the efficiency of upstream diversions such as the Ridenbaugh Canal diversion to reduce diversion heights and volumes is likely to reduce periodic downstream water shortages that could result in such water delivery calls.

Flood Risk Reduction

Replacing the existing diversion with automated gates will allow for better response and management of flow conditions in the event of flood conditions. The existing diversion

can become inaccessible during high flows and flood conditions. For example, during the 2017 flood, the diversion structure was overtopped and could not be adjusted for approximately 4 months. During this time, the structure accumulated sediment and debris. Following the event, NMID staff spent over one week cutting trees and removing debris from the dam. The Obermeyer gate can be quickly lowered during high flow conditions to reduce flood risks and impacts, and limit excess flow diverted into the Ridenbaugh Canal. See **Letters of Support** for Boise River Flood Control District No 10's support letter.

Disadvantaged and Underserved Communities

NMID delivers water through the Ridenbaugh Canal system to landowners in Nampa, Caldwell, and Canyon County, each of which meet the definition of a disadvantaged community in Section 1015 of the Cooperative Watershed Act. Additionally, the communities within this area have disproportionately high Latino populations, when compared to the Idaho state average.

Table 1 presents data from the US Census Bureau's Quick Facts website, documenting the Median household income of communities served by the Ridenbaugh Canal. The data shows that the City of Nampa, City of Caldwell, and Canyon County are all disadvantaged communities benefiting from the improved water supply reliability from this project.

	Idaho	City of Nampa	City of Caldwell	Canyon County	Ada County	City of Kuna	City of Boise	City of Meridian
Median Household Income *	\$58,915	\$53,205	\$55,069	\$56,916	\$69,954	\$69,940	\$63,778	\$76,403
* In 2020 Dollars, 2016-2020								
Data From https://www.census.gov/quickfacts								

Table 1 Summary of median household income for communities served by this project

Table 2 summarizes the communities of Hispanic Origin served by the project in comparison to the State of Idaho. The data shows that the City of Nampa, City of Caldwell, and Canyon County all have a much larger percentage of residents with Hispanic origin that would benefit from improved water supply reliability from this project.

	Idaho	City of Nampa	City of Caldwell	Canyon County	Ada County	City of Kuna	City of Boise	City of Meridian
Hispanic of Latino, percent	13.3%	24.8%	35.9%	25.7%	9.1%	10.7%	9.0%	8.0%
Data From https://www.census.gov/quickfacts								

Table 2 Summary of percent of population having Hispanic or Latino origin for communities served by this project

Tribal Benefits

On May 15, 2004, Governor Dirk Kempthorne and Nez Perce Tribal Executive Committee Chairman Anthony Johnson announced an agreement to settle the Nez Perce water rights claims in the Snake River Basin, including the Boise River. This agreement established minimum streamflow and flow augmentation programs, both of

which provide immediate benefits to ESA-listed fish downstream. This project's reduction in operational losses will benefit water supply in all accounts on the Boise River Storage System, including the Reclamation's stream channel maintenance account and flow augmentation program. In this way, this project and all projects that support reduction of operational loss benefit the reliability of water supply for supporting the Nez Perce Agreement.

Multi-Sector Benefits

NMID serves diverse agricultural, urban, suburban, commercial, residential, and industrial land uses. Increasing the efficiency of NMID's diversion and conserving water as described throughout this proposal will benefit all of these land uses.

Evaluation Criterion D—Complementing On-Farm Irrigation Improvements

NMID participates in the Lower Boise Watershed Council (LBWC) (<https://www.lowerboisewatershedcouncil.org>) through its legal counsel, Daniel Steenson, who is one of the LBWC's Directors representing the agricultural sector. LBWC serves as the Watershed Advisory Group (WAG) advising the Idaho Department of Environmental Quality (IDEQ) on the development of Total Maximum Daily Loads (TMDLs) and implementation plans to achieve TMDL objectives for the Boise River downstream from Lucky Peak Dam and its tributaries that are impaired by nutrient and sediment loadings from point and non-point sources.

LBWC also works in partnership with the Canyon Soil and Water Conservation District (CSWCD) and the local NRCS office to provide funding for the implementation of on-farm best management practices (BMPs) to reduce the loading of sediment and phosphorus to the Boise River and its tributaries. LBWC obtains funding for its agricultural BMP implementation program from federal 319 grants and State agricultural BMP grants administered by IDEQ. **Attachment C, Exhibit C1** is list of the BMP projects implemented within the Lower Boise River watershed by the LBWC, CSWCD and NRCS between 2009 and 2020. Most of these projects converted on-farm irrigation from flood to sprinkler. The list identifies the Boise River drainage or "subwatershed" within which each BMP project was implemented. NMID's service area includes the Fivemile Creek, Tenmile Creek, Mason Creek and Indian Creek subwatersheds, as shown on the map included as **Attachment C, Exhibit C2**. **Exhibit C2** highlights in yellow each on-farm project implemented within one of these subwatersheds.

On-farm projects funded by the LBWC are marked on **Attachment C, Exhibit C3** with yellow. In addition, the LBWC provided funding for the acquisition of no-till drills by CSWCD and the Ada Soil and Water Conservation District (ASWCD). These drills are rented annually to agricultural producers within the Lower Boise Watershed. The locations of agricultural fields where these drills have been used within the Lower Boise River watershed are marked with white placemarks in **Attachment C, Exhibit C3**.

The CSWCD and ASWCD drills will continue to be rented to fields that receive water from the Ridenbaugh Canal. Additionally, the LBWC, CSWCD and NRCS will continue to pursue funding for on-farm irrigation conversion projects and other BMPs within the subwatersheds that drain lands that receive irrigation water from the Ridenbaugh Canal.

Water delivery, water use, drainage, phosphorus and sediment loading, and ultimately water quality are all interconnected. By improving the efficiency of water delivery from the Ridenbaugh Canal delivery system, the Ridenbaugh Canal diversion project will complement the existing and future on-farm agricultural BMPs described above.

Evaluation Criterion E—Planning and Implementation

SUBCRITERION E.1— PROJECT PLANNING

Does the project address an adaptation strategy identified in a completed WaterSMART Basin Study?

In 2015, the Boise River Enhancement Network developed the Boise River Enhancement Plan (BREP) as part of a WaterSMART Cooperative Watershed Management Program grant. This plan identifies opportunities and strategies to improve the geomorphic, environmental, and recreational value of the Boise River. One of the opportunities identified in the BREP includes updating irrigation infrastructure to improve fish passage, mitigate fish entrainment, promote sediment transport, and enhance recreational safety at diversions. Opportunities to incorporate these features will be evaluated during the design phase.

SUBCRITERION E.2— READINESS TO PROCEED

Identify and provide a summary description of the major tasks necessary to complete the project.

TASK NUMBER	TASK	START DATE	END DATE
1	<i>Administration and Procurement</i>	<i>9/2022</i>	<i>3/2023</i>
2	<i>Surveying and Geotech</i>	<i>3/2023</i>	<i>8/2023</i>
3	<i>Engineering Design</i>	<i>6/2023</i>	<i>8/2024</i>
4	<i>Permitting</i>	<i>9/2023</i>	<i>8/2024</i>
5	<i>Bidding</i>	<i>6/2024</i>	<i>8/2024</i>
6	<i>Construction</i>	<i>8/2024</i>	<i>5/2025</i>

Table 3 Major Project Tasks and Milestones

This project includes project work required to design, permit, and construct the Ridenbaugh Diversion Dam. NMID has been coordinating with stakeholders and partnering agencies since 2021 about the potential replacement of this structure. So far, there has been broad-based support for replacing the aging diversion structure with a modern, automated, and adaptable structure like the one included in this proposal. With receipt of the award of this grant, NMID will have the necessary funding to proceed with procuring professional design services, including survey, geotechnical design, and

development of construction bid documents. The schedule presented in Table 3 assumes that a contractor will be able to complete in-stream construction between the end of irrigation season in August 2024 the start of irrigation season in spring of 2025.

Describe any permits that will be required, along with the process for obtaining such permits.

This project may require several permits from local, state, and federal permitting agencies. Locally, the project will include both a Floodplain Development Permit and Boise River System Permit from the City of Boise. Coordination with the City of Boise throughout the design process will allow the engineering team to meet permitting requirements related to floodplain impacts (such as a no-rise) and minimized riparian impacts. A joint permit application will be submitted. This application will be used to support the following permits, if they are required:

- Section 404 Permit, United States Army Corps of Engineers
- Stream Channel Alteration Permit, Idaho Department of Water Resources
- Water Quality Certificate, Idaho Department of Environmental Quality

NMID will hold a pre-permitting on-site meeting with these agencies to discuss the project and answer questions. Because this project replaces an existing structure, environmental impacts are anticipated to be relatively minor. These permits will include construction requirements to reduce temporary impacts during construction.

This project application assumes that the project will be eligible for a Categorical Exclusion, as the project will not greatly change the existing structure functionally. NMID will comply with all NEPA requirements identified as part of the project and coordinate with Reclamation to complete the required analysis and documentation.

Identify and describe any engineering or design work performed specifically in support of the proposed project.

NMID has developed a Level 4/5 Cost Estimate for the project, based on a project concept, to determine project feasibility. This estimate, prepared for NMID by Jacobs Engineering Group in 2021, includes cost estimates for major bid items. This budget-level cost estimate is the basis for this grant application.

Describe any new policies or administrative actions required to implement the project.

No policies or administrative actions are required to implement the project. NMID owns the land beneath the Ridenbaugh Headworks and the eastern portion of Barber Park. Construction will not require the acquisition of additional land or easements.

Please also include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.

The project schedule, spending projections, and other project planning data are included in **Attachment A**. NMID will discuss environmental and cultural compliance with the local Reclamation Regional and Area Office upon notice of award.

Evaluation Criterion F—Collaboration

Letters of support for the Ridenbaugh Canal diversion replacement project from the Boise River Watermaster (Water District 63), Boise River Flood Control District No. 10, the City of Boise, the City of Meridian and the City of Nampa are included in the **Letters of Support** Section. NMID collaborates in Boise River water supply and water rights management through Water District 63. NMID collaborates in Boise River flood management with Flood Control District No. 10 (“FCD 10”). As discussed previously, NMID collaborates in Lower Boise River watershed water quality management through the Lower Boise Watershed Council.

This project is supported by Water District 63 to improve Boise River flow management, reduce operational loss, and set an influential example for similar future improvements to other Boise River diversion structures. Similarly, this project is supported by FCD 10 to demonstrate the flood risk reduction benefits of automated diversion structures. The cities’ support letters show their interests in this project and the ongoing collaboration between NMID and the cities within NMID’s service area.

Evaluation Criterion G— Additional Non-Federal Funding

The estimated total project cost, presented in **Attachment A** is \$8,445,000. This estimate was developed in 2021. Assuming three years of 4.5% inflation, the estimate for this project completed on the schedule provided is \$9,637,000. The following cost share is proposed for the project.

Funding Source	Percent of Project Funding	Amount
NMID	18%	\$1,735,000
Idaho Water Resource Board – Aging Infrastructure Grant	33%	\$3,180,000
Reclamation WaterSMART Grant	49%	\$4,722,000

Table 4 Summary of Cost Share Percentages

The percentage of non-federal funding is calculated below:

$$\$4,915,000 / \$9,637,000 = \underline{51\%}$$

Evaluation Criterion H— Nexus to Reclamation

Describe the nexus between the proposed project and a Reclamation project or Reclamation activity. Please consider:

The nexus between NMID and Reclamation has existed since 1909 through multiple contracts. NMID has contracts with Reclamation for storage in Arrowrock Reservoir and Anderson Ranch Reservoir. Storage water from these reservoirs is delivered to the Ridenbaugh Canal through feeder canals from the New York Canal, a Reclamation-owned “transferred works” canal system that is operated by NMID and four other irrigation districts through the Boise Project Board of Control pursuant to contracts between Reclamation and the districts. Storage water is also conveyed to and diverted by the headworks for the Ridenbaugh Canal. Storage water is delivered through the Ridenbaugh Canal to over 26,000 “project acres” within NMID’s service area that are entitled to Arrowrock and Anderson Ranch storage.

Performance Measures

Water savings will result because of the improved response time and precision of the diversion structure. NMID plans to field test and document the improved response time of the diversion as an indication that the operational improvement has greatly reduced the time to complete adjustments to diversion pool operations.

Water District 63 is also undertaking a project to improve real-time monitoring of flow on the Boise River and all diversions and returns to the Boise River. These measurement devices, which are not part of this project, will allow for better quantification of the source of operational losses and would complement this project. If these devices are installed, they could be used to refine and verify the estimate of the reduction in operational losses from this and other diversion structures.

Project Budget

Funding Plan

Table 5 summarizes total project cost sharing and voluntary committed cost sharing necessary to complete the project.

FUNDING SOURCES	AMOUNT
Non-Federal Entities	
1. Nampa & Meridian Irrigation District	\$1,735,000
2. Idaho Water Resource Board Aging Infrastructure Grant Program (NMID application pending)	\$3,180,000
Non-Federal Subtotal	\$4,915,000
REQUESTED RECLAMATION FUNDING	\$4,722,000

Table 5 Summary of Funding Sources

Budget Proposal

Table 6 summarizes cost share by the applicant and third-party in-kind contributions, and those that will be covered using the funding requested from Reclamation.

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	\$4,722,000
Costs to be paid by the applicant	\$1,735,000
Value of third-party contributions	\$3,180,000
TOTAL PROJECT COST	\$9,637,000

Table 6 Total Project Cost Table

A detailed cost estimate for the project is provided in **Attachment A**.

Budget Narrative

The total budget for the Ridenbaugh Diversion Modernization, \$9,637,000, includes costs for engineering and construction of the new diversion. The cost estimate is provided in **Attachment A**. In addition to this WaterSMART grant, NMID is pursuing funding through the Idaho Water Resource Board's Aging Infrastructure Grant Program to cover 33% of project costs, which will be a portion of the non-federal cost share. The application and review timeline is similar to that of the WaterSMART grant. NMID plans to cash finance the remaining cost of the project.

Environmental and Cultural Resources

Compliance

NMID will coordinate with Reclamation to address all NEPA environmental and cultural considerations.

The proposed work is in the Boise River and will have limited temporary impacts to the aquatic environment. The project will include demolition and construction of several in-channel features. The proposed concept design involves constructing this using a two-phased coffer dam approach to dewater areas within the river. This will limit additional sediment suspension and turbidity during construction. NMID will coordinate with Idaho Department of Fish and Game (IDFG) to determine the appropriate actions to take before and during construction to limit temporary impacts to aquatic species. These could include completing fish and mussel surveys and relocation.

NMID completed a summary of listed species in the project area using the U.S. Fish and Wildlife Service's online tool. Based on the results of this scan, NMID is aware of the following species listed or proposed to be listed as a Federal threatened or endangered species or designated critical habitat in the project area:

- yellow-billed cuckoo
- monarch butterfly
- slickspot peppergrass

Based on the nature and location of this work, impacts to these species are not anticipated. Several migratory bird species were also identified as being potentially affected based on project area. Tree removal is not anticipated as part of this project. Therefore, no impact to these species is anticipated. If tree removal is required, nest surveys can be completed if deemed necessary or required.

Many of the project components including the removal and installation of the diversion dam, sediment control weir, and trash rack will be completed partially or entirely below ordinary high water and will fall under CWA jurisdiction as "Waters of the United States." Impacts of the project will be temporary in nature, as this project will be replacing existing infrastructure. Construction impacts may be up to 1 acre. NMID will coordinate with USACE to determine the requirements for attaining Section 404 permit for this project.

The Ridenbaugh Canal delivery system was originally constructed over a period of years during the late 1800s and early 1900s. The proposed project will replace the existing diversion, sediment control weir, and trash rack structures. The current

Ridenbaugh Canal Headworks structures were built in the 1930s. Several modifications have been made over the lifespan of the diversion as part of routine maintenance. Most recently, the radial headgates at the intake of the canal were reconstructed in 2001. The river diversion structure has degraded over the life of the project and is at the end of its useful life.

The NMID office building, located at 1503 First Street South, Nampa, ID, is listed on the National Register of historic places. In December of 2000, in conjunction with the Transfer of Title of certain federally constructed laterals and drains to NMID, Reclamation, in consultation with the State Historic Preservation Office (SHPO) and Advisory Council on Historic Preservation (ACHP) determined that NMID's irrigation system is eligible for the Nation Register of Historic Places as a linear resource or district. Reclamation and the SHPO determined that Reclamation would prepare a Level III Historic American Engineering Record (HAER) documentation for the system.

There are no known archeological sites within the proposed area. The project will not have any adverse effects on low-income or minority populations, will not limit access to or use of Indian sacred sites or tribal lands, and will not contribute to the introduction or spread of noxious weeds.

Required Permits or Approvals

NMID will coordinate with the local, state, and federal regulatory agencies to develop proper permitting documents for the diversion. The following permits are anticipated for this project:

- Floodplain Development Permit, City of Boise
- Boise River System Permit, City of Boise
- Section 404 Permit, United States Army Corps of Engineers
- Stream Channel Alteration Permit, Idaho Department of Water Resources
- Water Quality Certificate, Idaho Department of Environmental Quality

Additionally, NMID will coordinate with Reclamation to address all NEPA environmental and cultural considerations.

Overlap or Duplication of Effort Statement

There is no overlap between this project and other anticipated projects or proposals. This proposal does not duplicate work included in any other federal funding proposals.

Conflict of Interest Disclosure Statement

NMID is not aware of any actual or potential conflicts of interest exists at the time this application was developed and submitted.

Uniform Audit Reporting Statement

NMID's Employer Identification Number is 82-6000459. The last audit report for NMID is not available through the Federal Audit Clearinghouse website.

Letters of Support

The enclosed letters of support demonstrate the partnership between NMID and several key stakeholders.

STATE OF IDAHO
WATER DISTRICT No. 63

P.O. BOX 767
STAR, IDAHO 83669-0767
(208) 908-5482

21 July 2022

To Whom It May Concern,

Water District 63 fully supports Nampa & Meridian Irrigation District (NMID) in their efforts to reconstruct the headworks of the Ridenbaugh Canal. The Ridenbaugh Canal diversion is the second largest on the Boise River. Improvements to the diversion and headworks have the potential to improve river operations for all users of the river. Rebuilding and modernizing the Ridenbaugh Headworks will benefit all spaceholders on the Boise River system by reducing: operational losses, bank storage, and evaporative losses. In addition, a modern, automated diversion with a more modern, reactive, and efficient check structure will reduce the impacts to all users from upstream flow disruptions caused by Barber Dam hydroelectric facilities. Water District 63 is planning an automation project to show that reducing the fluctuation at the Middleton gauge could save spaceholders 3,000 acre feet (af) to 5,000 af every irrigation season. The Middleton gauge daily data show that, on average, the river swings about 40 cubic feet per second (cfs). Approximately 20 cfs of this swing comes from the discharge of Boise's wastewater treatment facilities. Eliminating 10-20 cfs of the remaining variability could save 600 af to 1200 af per month (see Figure 1) by releasing less water to stabilize the flow at the Middleton gauge.

NMID's planned project is complementary to Water District 63's planned project to install automation and measurement upgrades on the Boise River. The Ridenbaugh Canal head gates have automation and are not included in Water District 63's project. I believe these projects would help reduce fluctuations in the river.

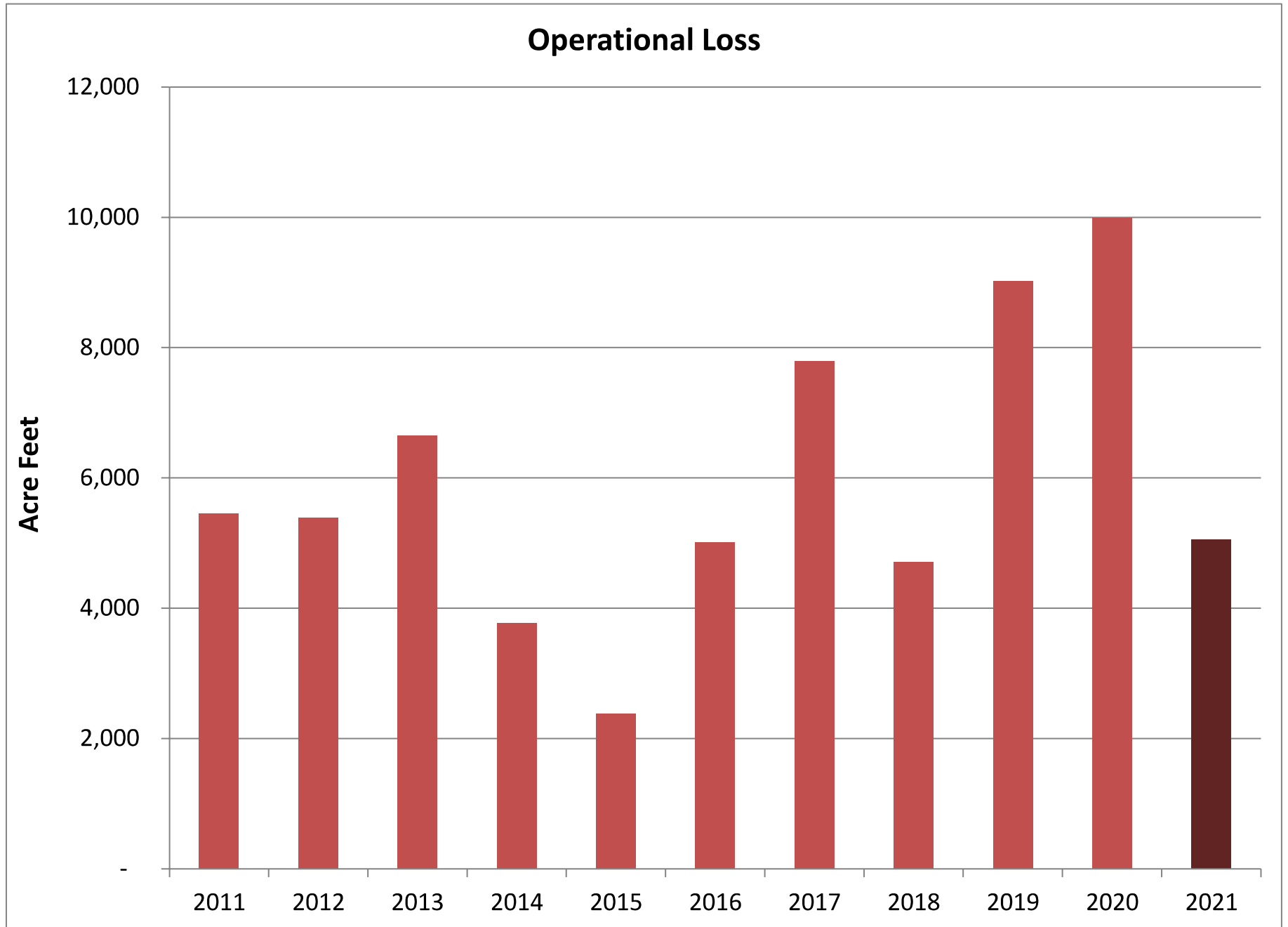
Thank you for your consideration of this project.

Sincerely,



Mike Meyers
Watermaster

Figure 1, IDWR Calculation of Operational Loss based on Boise River Flows at Middleton, ID





PUBLIC WORKS DEPARTMENT

MAYOR: Lauren McLean | DIRECTOR: Stephan Burgos

July 20, 2022

To Whom It May Concern,

The City of Boise (Boise) fully supports Nampa & Meridian Irrigation District (NMID) in their efforts to reconstruct the headworks of the Ridenbaugh Canal. NMID is one of the largest irrigation water providers to Boise.

Residents of Boise depend on surface water deliveries for irrigation of gardens, lawns, and landscaping. Using surface water for irrigation reduces demand on the aquifer and helps ensure the sustainability of our drinking water supply. We believe the Ridenbaugh Canal and NMID's operations are critical to maintaining Boise's use of surface water for irrigation.

The additional benefits of rebuilding the Ridenbaugh headworks also align with Boise's values. A new, automated diversion structure mitigates the risk of flooding and impacts to recreationalists along the Greenbelt and Boise River. We also recognize the potential for habitat improvements for fish and water savings from more precise management of the Ridenbaugh headworks diversion pool.

Thank you for your consideration of this project.

Sincerely,

John Roldan, P.E.
Strategic Water Resources Manager

DEBBIE KLING
MAYOR



NAMPA CITY HALL
411 3RD STREET SOUTH
NAMPA, ID 83651
(208) 468-5401
MAYOR@CITYOFNAMPA.US

OFFICE OF THE MAYOR

July 21st, 2022


To Whom It May Concern:

The City of Nampa fully supports Nampa & Meridian Irrigation District (NMID) in their efforts to reconstruct the headworks of the Ridenbaugh Canal. The Nampa Meridian Irrigation District is the largest supplier of irrigation water in our city and our residents of Nampa depend on the surface water they supply for watering our local farms, lawns, and gardens.

Nampa's goal is to ensure the sustainability of our drinking water supplies by reducing demand on the aquifer. Additionally, a new automated diversion structure will help mitigate the risks of flooding, insure adequate deliveries, and support our conservation of our precious water. The Ridenbaugh Canal and NMID's operations are critical to maintaining Nampa's use of surface water for irrigation.

The benefit of the reconstruction of the headworks of the Ridenbaugh canal aligns with Nampa's values and goals, as established through our Drought Task Force. We fully support the efforts of the Nampa Meridian Irrigation District as they pursue the reconstruction of the headworks of the Ridenbaugh Canal.

Sincerely,


Debbie Kling
Mayor



Mayor Robert E. Simison

City Council Members:

Treg Bernt
Joe Borton
Luke Cavener

Brad Hoaglund
Jessica Perreault
Liz Strader

July 21, 2022

Bureau of Reclamation
Financial Assistance Operations Section
Attn: NOFO Team
P.O. Box 25007, MS84-27133
Denver, CO 80225

RE: Nampa & Meridian Irrigation District (NMID) Fiscal Year 2023 WaterSMART Grant

To Whom it Concerns,

Please accept this letter acknowledging the City of Meridian's full support for NMID's efforts to reconstruct the headworks of the Ridenbaugh Canal. NMID is the largest supplier of irrigation water in our city as well other areas of the Treasure Valley, and the Ridenbaugh Canal serves a vital role in maintaining Meridian's vitality and economic health.

Residents of Meridian depend on surface water supplied from NMID for watering our local farms, lawns, landscaping and gardens. Using this resource reduces the demand on local aquifers and helps ensure the sustainability of our drinking water supplies. The Ridenbaugh Canal and NMID's operations are critical to maintaining Meridian's use of surface water for irrigation purposes.

A new, automated diversion structure mitigates the risks of flooding, insures adequate deliveries, and conserves the precious resource of water. For these reasons, we support NMID's application for the FY2023 WaterSMART grant cycle.

Sincerely,

A handwritten signature in blue ink, appearing to read "Robert E. Simison".

Robert E. Simison
Mayor

Cc: Greg Curtis, Superintendent, Nampa & Meridian Irrigation District
Warren Stewart, City Engineer, City of Meridian



BOISE RIVER FLOOD CONTROL DISTRICT #10

Bureau of Reclamation
Financial Assistance Operations Section
Attn: NOFO Team
P.O Box 25007, MS84-27133
Denver, CO 80225

RE: Nampa & Meridian Irrigation District's (NMID) Fiscal Year 2023 WaterSMART
Grant Application (Funding Opportunity No. R23AS00008)

To Whom it Concerns:

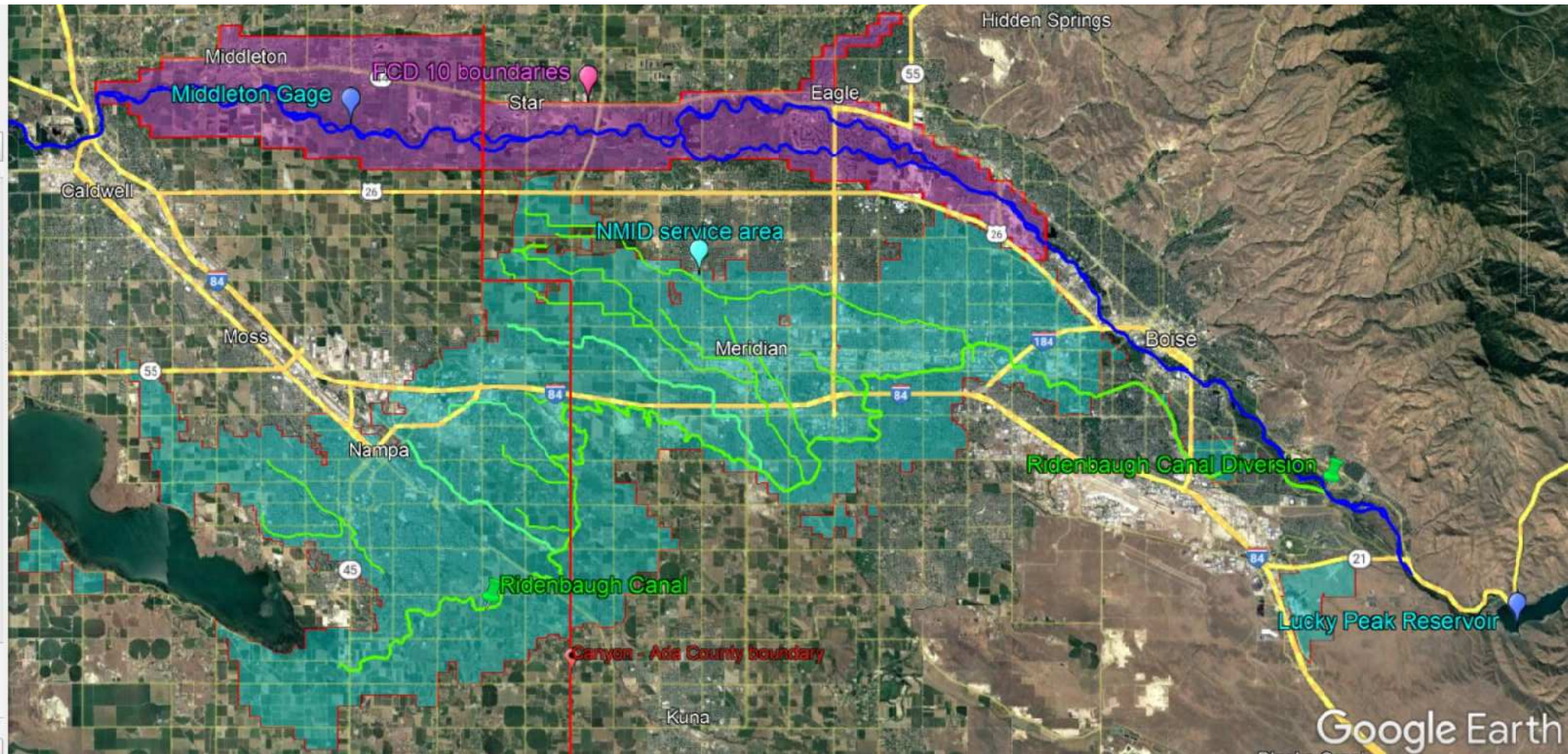
I'm writing as Manager of Boise River Flood Control District No. 10 (FCD 10) to express our support for Nampa & Meridian Irrigation District's (NMID) Fiscal Year 2023 WaterSMART Grant Application (Funding Opportunity No. R23AS00008) for funding to replace the Ridenbaugh Canal diversion, including the installation of Obermeyer gates. During its July 21, 2022 meeting, the FCD 10 Board of Directors voted unanimously to support this NMID project.

FCD 10's boundaries are shown in the attached map in relation to the Ridenbaugh Canal diversion from the Boise River and the NMID service area. Within its boundaries, FCD 10 conducts operations and implements projects to reduce flood risk, and respond to and recover from flood events. High Boise River flows affect and are affected by river diversions such as the Ridenbaugh Canal. Diversion improvement projects such as the one proposed by NMID have the potential to significantly reduce flood risk in the Boise River floodway. FCD 10 particularly supports the installation and use automated, Obermeyer gates such as those proposed by NMID that can be adjusted in high flow conditions to reduce flood risk.

Sincerely,

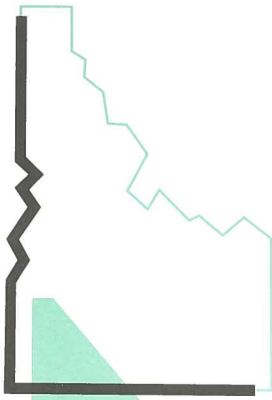
Mike Dimmick
District Manager, FCD 10

Cc: Greg Curtis, Superintendent, Nampa & Meridian Irrigation District



Official Resolution

The attached resolution demonstrates the Board of Director's support of this project



ORGANIZED 1904

Nampa & Meridian Irrigation District

1503 FIRST STREET SOUTH
FAX #208-463-0092

NAMPA, IDAHO 83651-4395
nmid.org

OFFICE: Nampa 208-466-7861
SHOP: Nampa 208-466-0663

Nampa & Meridian Irrigation District July 19, 2022 Resolution Authorizing and Approving WaterSMART Water Energy and Efficiency Grant Application

IT IS HEREBY RESOLVED, during the July 19, 2022 meeting of the Board of Directors of the Nampa & Meridian Irrigation District (NMID), that the NMID Secretary/Treasurer is authorized and directed to submit to the Bureau of Reclamation (Reclamation) the application for a WaterSMART Water Energy and Efficiency Grant in accordance with Reclamation Notice of Funding Opportunity No. R23AS00008 (NOFO), to replace the Boise River headworks and diversion structure for the Ridenbaugh Canal, the main canal in NMID's irrigation system delivering water to approximately 69,000 acres land in Ada County and Canyon County, Idaho, as described in the application. NMID will commit to the financial and legal obligations associated with receipt of a financial assistance award under the NOFO, and will work with Reclamation to meet established deadlines for entering into a grant or cooperative agreement.

Attest:

Donald Barksdale
NMID President



APPROXIMATE IRRIGABLE ACRES
RIVER FLOW RIGHTS - 23,000
BOISE PROJECT RIGHTS - 40,000

Attachment A – Project Cost Estimate, Schedule, and Projected Spending

NAMPA & MERIDIAN IRRIGATION DISTRICT

ESTIMATE OF PROBABLE COST – RIDENBAUGH CANAL HEADWORKS

Item (Major cost elements)	Unit	Unit Cost	Quantity	Extended Total Cost	Remarks
DIRECT COSTS					
<i>EXISTING CONDITIONS</i>					
Demolition & Removal of Existing Check Structure	LF	\$600.00	200	\$120,000	
<i>SUBTOTAL - EXISTING CONDITIONS</i>				\$	120,000
<i>CONCRETE WORK</i>					
Cocncrete Work Required for New Obermeyer Gate	LF	\$2,300.00	200	\$460,000	
<i>SUBTOTAL - CONCRETE WORK</i>				\$	460,000
<i>METALS</i>					
Metals Work for Obermeyer Water Control Gate	LF	\$2,400.00	200	\$480,000	Includes Structural Metals, Catwalks, Handrailing, etc.
<i>SUBTOTAL - METALS</i>				\$	480,000
<i>BUILDINGS</i>					
Obermeyer Gate Control Building	SF	\$350.00	460	\$160,000	
<i>SUBTOTAL - BUILDINGS</i>				\$	160,000
<i>ELECTRICAL</i>					
Electrical for Obermeyer Water Control Gate	LF	\$1,250.00	200	\$250,000	
<i>SUBTOTAL - ELECTRICAL</i>				\$	250,000
<i>EARTHWORK</i>					
Structural Earthworks for Obermeyer Water Control Gate	LF	\$1,000.00	200	\$200,000	
<i>SUBTOTAL - EARTHWORK</i>				\$	200,000
<i>TEMPORARY COFFERDAM</i>					
Temporary Sheet Pile Cofferdam	LF	\$1,650.00	200	\$330,000	Assumes Two Stage Installation for Construction and Bypass
Removal and Control of Water within Cofferdam	LF	\$2,250.00	200	\$450,000	Assumes Two Stage Installation for Construction and Bypass
<i>SUBTOTAL - TEMPORARY COFFERDAM</i>				\$	780,000
<i>EXTERIOR IMPROVEMENTS</i>					
Site Improvements Work	LF	\$2,850.00	200	\$570,000	Including Rip Rap, Surfacing, Bollards, etc.
<i>SUBTOTAL - EXTERIOR IMPROVEMENTS</i>				\$	570,000
<i>MECHANICAL & PIPING</i>					
Yard & Process Piping Required for New Obermeyer Gate	LF	\$2,200.00	200	\$440,000	
Obermeyer Gate System	LF	\$5,000.00	200	\$1,000,000	5-ft Obermeyer Gates with Downstream Shield Plate
<i>SUBTOTAL - MECHANICAL & PIPING</i>				\$	1,440,000
<i>WATERWAY CONSTRUCTION</i>					
Retrofit Existing Trash Rack to Provide Fish Barrier	LS	\$470,000.00	1	\$470,000	New rack(s) to screen pan-sized or larger trout, no site layout modifications
Retrofit Trash Rack Cleaning Mechanism to Existing Trash Rack	LS	\$320,000.00	1	\$320,000	Atlas Polar Hydrorake or similar
<i>SUBTOTAL - WATERWAY CONSTRUCTION</i>				\$	790,000
<i>INSTRUMENTATION & CONTROLS</i>					
I&C Work Required for New Obermeyer Gate	LF	\$400.00	200	\$80,000	
<i>SUBTOTAL - INSTRUMENTATION & CONTROLS</i>				\$	80,000
ENGINEERING, DESIGN, OTHER TASKS, CONTRACTOR CONSTRUCTION ADMINISTRATION AND OVERHEAD/PROFIT					
Engineering, Design, and Permitting	%	\$5,330,000	10%	\$530,000	

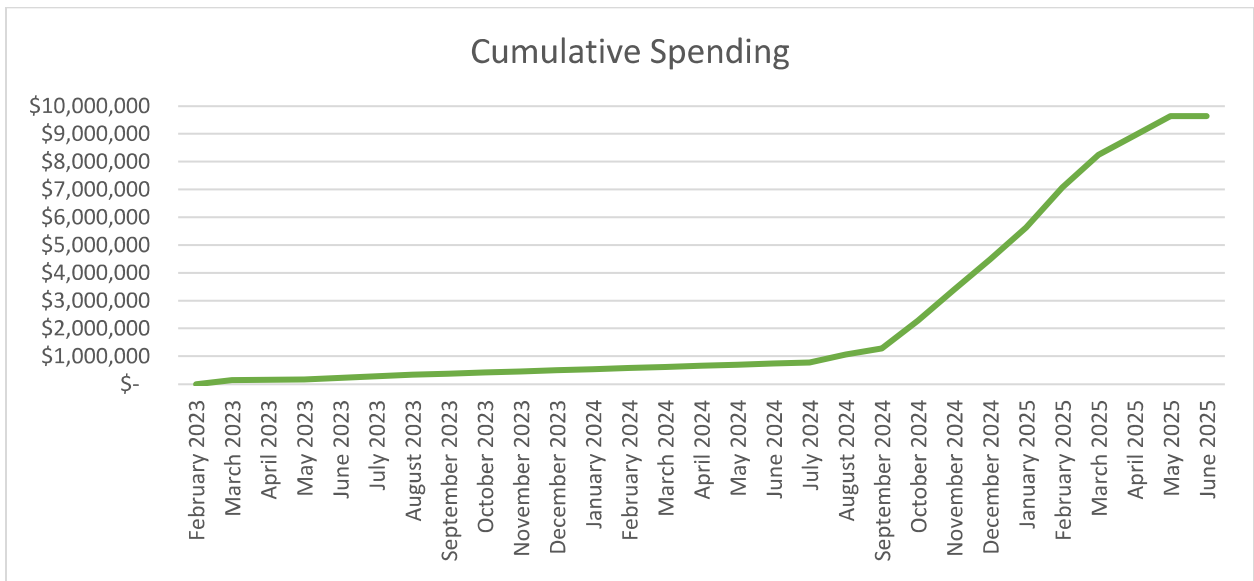
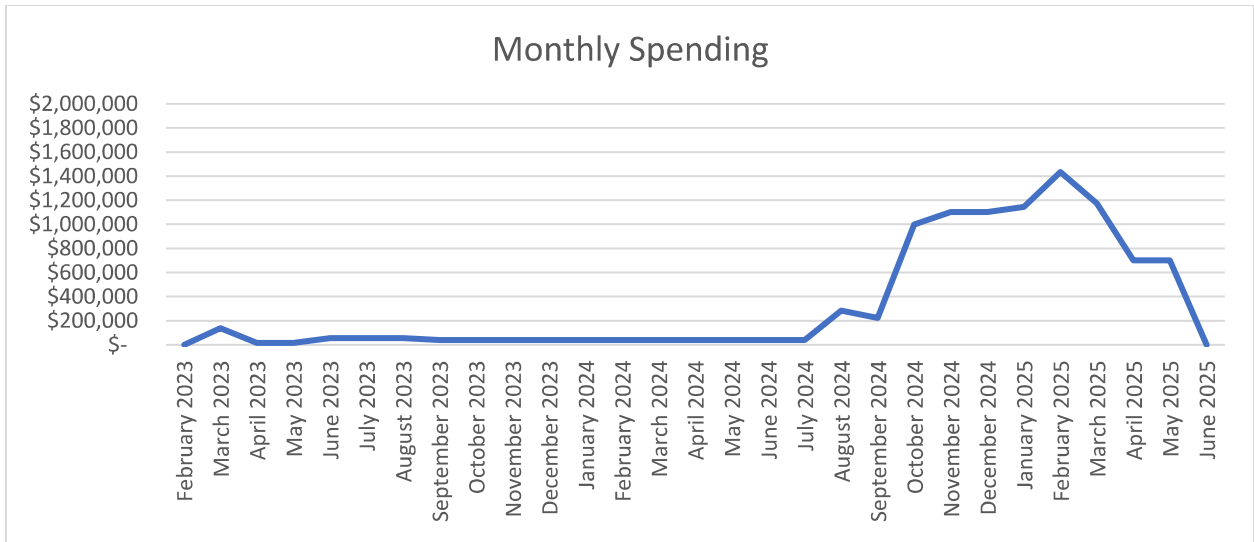
NAMPA & MERIDIAN IRRIGATION DISTRICT

ESTIMATE OF PROBABLE COST – RIDENBAUGH CANAL HEADWORKS

Item (Major cost elements)	Unit	Unit Cost	Quantity	Extended Total Cost	Remarks
Surveying and Geotechnical Investigations	%	\$5,330,000	1.5%	\$80,000	
Services During Construction	%	\$5,330,000	5%	\$270,000	
Construction Contingency	%	\$5,330,000	15%	\$800,000	
General Conditions	%	\$5,330,000	6%	\$320,000	
Mobilization/Demobilization	%	\$5,330,000	4%	\$210,000	
Contractor Overhead & Profit	%	\$5,330,000	15%	\$800,000	
Bonds & Insurance	%	\$5,330,000	2%	\$105,000	
<i>SUBTOTAL - ENGINEERING, DESIGN, OTHER TASKS, CONTRACTOR CONSTRUCTION ADMINISTRATION AND OVERHEAD/PROFIT</i>				\$ 3,115,000	
TOTAL - PROJECT CONSTRUCTION COSTS (CLASS 4/5 ESTIMATE)				\$ 8,445,000	
LOW RANGE			-30%	\$ 5,900,000	
HIGH RANGE			+50%	\$ 12,500,000	

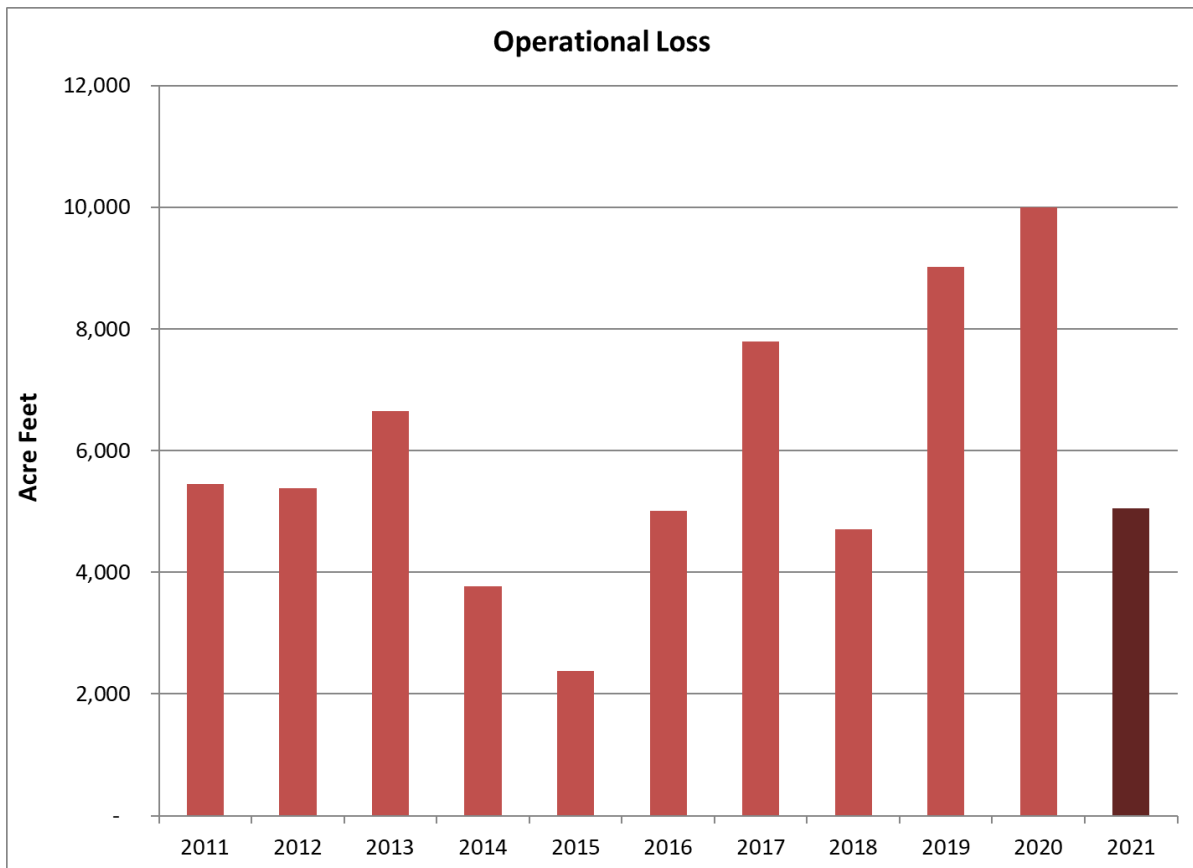
Inflation Adjustment Calculation	
Base Estimate	\$ 8,445,000.00
Estimate year	2021
Bidding year	2024
Year of Inflation	3
Estimated Inflation Rate	4.5%
Requested budget for 2024 Bidding	\$ 9,637,000.00

Projected Monthly and Cumulative Spending for the Ridenbaugh Diversion Modernization



Attachment B Water Savings Calculations

Water Savings Calculation- Operational Loss Reduction			
	Low	Typical	High
Operational Loss, Based on IDWR Calculations of Excess Flow at Middleton (acre-ft) -see plot below	3,000 acre-ft	6,000 acre-ft	10,000 acre-ft
10% of Operational Loss Prorated to Ridenbaugh Canal, which could be reduced annually with improve control (acre-ft)	300 acre-ft	600 acre-ft	1,000 acre-ft
Potential Water Savings associated with improved Diversion Pool Operation	300 acre-ft	600 acre-ft	1,000 acre-ft



Operational Losses from IDWR Calculations. IDWR Calculation Spreadsheets can be provided upon request.

Water Savings Calculation- Seepage Loss Reduction		
Current Diversion Pool Surface Area (acres)	6.33	acres
Diversion Pool Surface Area at 0.3 feet lower (acres)	6.2	acres
Reduction in Pool Surface Area	0.13	acres
Soil Classification Seepage Rate	0.2	ft/day
Reduced daily seepage, acre-ft/day	0.026	acre-ft/day
Reduced daily seepage, Gallons per day	8471.5	GPD
Reduced daily seepage, Acre-ft annually	9.5	AFA

Water Savings Calculation- Elimination of Over delivery Following Barber Dam flow disruptions		
Over delivery following Disruption at Barber Dam	60	cfs
Typical duration of over delivery	60	minutes
Typical Volume of Over delivery per event, cubic feet	216000	cubic feet
Typical Volume of Over delivery per event, acre-ft	5.0	Acre-ft

Attachment C- On-Farm Irrigation Improvements Supporting Materials

Exhibit C1- List of on-farm projects supported by the LBWC

Exhibit C2- Map of on-farm projects completed within NMID

Exhibit C3- Map of on-farm projects completed by LBWC

Exhibit C1- List of LBWC On-Farm Projects

	Landowner	Grant Source	Subwatershed	Acres	Annual Total	T1	T2	T3	Sediment (tons/acre/yr)	Sediment (tons/yr)	Total Phosphorus (lbs/yr)
2009	Watson #1	Fed 319	Sand Hollow	284.8		142.4	142.4		5.22	1,486	2,972
2009	Skogsberg #1	Fed 319	Riparian (BR outlet)	44.1		44.1			2.14	94	189
2009	Rueth Dairy	Fed 319	Sand Hollow	30.8		30.8			5.4	166	333
2009	Nichols	Fed 319	Snake River	34.6		34.6			6.8	235	471
2009	Ubilla Farms	Fed 319	Sand Hollow	61.4	455.7	61.4			10.33	634	1,269
2010		EQIP	Lower Indian Creek	103.6					4	414	829
2010		EQIP	Dixie Slough	34.2	137.8				4	137	274
2011	McKellip #1	Fed 319	Fivemile Drain	37.4		37.4			3.32	124	248
2011	Hungate	Fed 319	Dixie or Lowline	25.3			25.3		0.35	9	18
2011	Burris	Fed 319	Riparian (BR outlet)	38.1				38.1	2.56	98	195
2011	McKellip #2	Fed 319	Fivemile Drain	57		57			3.32	189	378
2011	Marchbanks #1	Fed 319	Fivemile Drain	37.4		37.4			8.43	315	631
2011	Maxwell	Fed 319	Dixie Slough	34.4		34.4			2.47	85	170
2011		EQIP	Boise River Riparian	14					4	56	112
2011		EQIP	Conway Gulch	53.3	296.9				4	213	426
2012		EQIP	Conway Gulch	56.4					4	226	451
2012		EQIP	Dixie Slough	60.0					4	240	480
2012		EQIP	Lower Indian Creek	44.6					4	178	357
2012		EQIP	Mason Creek	20.6					4	82	165
2012		EQIP	Mill Slough	26.6	208.2				4	106	213
2013		EQIP	Boise River Riparian	5.6					4	22	45
2013		EQIP	Conway Gulch	119.3					4	477	954
2013		EQIP	Lower Indian Creek	38.0	162.9				4	152	304
2014	Marchbanks #2	Fed 319	Riparian (BR outlet)	70		70			8.82	617	1,235
2014	Gooding Farms	Fed 319	Riparian (BR outlet)	81.3			81.3		1.96	159	319
2014	BPO Farms	Fed 319	Riparian (BR outlet)	106		106			2.25	239	477
2014	Riverside/Indian/Dixie	IPCo	Indian Cr/Dixie	21,276					NA	???	24,328
2014		EQIP	Boise River Riparian	153.4					4	614	1,227
2014		EQIP	Conway Gulch	47.3					4	189	378
2014		EQIP	Dixie Slough	76.3					4	305	610
2014		EQIP	Hartley Gulch	55.0	21,865				4	220	440
2014	Ada SWCD (no-till)	Fed 319	various	672					2.9	1,949	3,898
2015		EQIP	Conway Gulch	144.0					4	576	1,152
2015		EQIP	Hartley Gulch	12.0					4	48	96
2015		EQIP	Mason Creek	9.0	165				4	36	72
2016	Dixie Drain	Boise	Dixie Slough	10,665					NA	512	8,760
2016		EQIP	Boise River Riparian	87.8					4	351	702
2016		EQIP	Dixie Slough	30.0					4	120	240
2016		EQIP	Hartley Gulch	89.0					4	356	712
2016		EQIP	Lower Indian Creek	52.8	10,925				4	211	422
2017	Watson #2	State & Fed	Conway Gulch	120		120			2.3	276	552
2017	Clayton Tree Farm	Fed 319	Dixie Slough	160			160		3	480	960
2017	Mill Slough	State	Mill Slough	8,500					NA	900	1,800
2017			Boise River Riparian	18.0					4	72	144
2017			Dixie Slough	93.7					4	375	750
2017			Hartley Gulch	29.1					4	116	233
2017			Lower Indian Creek	42.3					4	169	338
2017			Mason Creek	6.1	8,969				4	24	49
2018	Farmers Co-Op	State & Fed	Sand Hollow	4,000					NA	5,712	12,060
2018	Pintail Ranch	State	Riparian (BR outlet)	190		190			8.37	1,590	3,181
2018	Vandenberg & Sons	State & Fed	Hartley Gulch	137		39	98	136	4.47	612	1,225
2018	Bicandi	State & Fed	Mason Creek	34		34			4.73	161	322
2018		EQIP	Boise River Riparian	36.4					4	146	291
2018		EQIP	Conway Gulch	24.9					4	100	199
2018		EQIP	Dixie Slough	11.3					4	45	90
2018		EQIP	Mill Slough	4.3	4437.9				4	17	34
2019	Skogsberg #2	State	Riparian (BR outlet)	65			65		5.71	369	738
2019		EQIP	Boise River Riparian	34.8					4	139	278
2019		EQIP	Dixie Slough	361.7					4	1,447	2,894
2019		EQIP	Hartley Gulch	127.7					4	511	1,022
2019		EQIP	Lower Indian Creek	33.1					4	132	265
2019		EQIP	Mason Creek	72.4	694.7				4	290	579
2020	Canyon SWCD (no-till)	State & Fed	various	773					2.9	2,242	4,484
2020	Watson (no-till)	State	various	444					2.9	1,288	2,576
2020	Villifana	State	Low Line Canal	65				65	2.7	176	352
2020	Frederick	State	Indian Creek	14		14			1.9	27	54
2020		EQIP	Boise River Riparian	22.1					4	88	177

2020		EQIP	Conway Gulch	23.9	1,342.0				4	96	191
	All Programs	68 projects	9 Subwatersheds	50,332	49,660	1,053	572	239	4.0820313	29,844	92,389
	State Ag BMP	11 projects		14,342		397	163	201		13,354	27,343
	Fed 319	21 projects		6,167		849	507	174		13,935	28,506
	NRCS - EQIP	34 projects		2,947						11,047	22,094
	Other (IPCO & Boise)	2 projects		31,941						512	33,088
	Drain/Watershed	4 projects		44,441						7,124	46,948
	Single On Farm	61 projects		4,002		1,053	572	239		17,241	34,483
	No Till Drill	3 projects		1,889					70% eff.	5,479	10,958
	Boise River Riparian	15 projects		967		410	146	38		4,655	9,310
	Conway Gulch	8 projects		589		120				2,152	4,305
	Dixie Slough	12 projects		11,586		68	185			3,915	15,567
	Fivemile Drain	3 projects		132		132				629	1,257
	Hartley Gulch	6 projects		450		39	98	136		1,864	3,727
	Lower Indian Cr.	7 projects		21,604						1,258	26,843
	Mason Creek	6 projects		142		34				593	1,186
	Mill Slough	3 projects		8,531						1,024	2,047
	Sand Hollow	4 projects		4,377		235	142			7,999	16,633
	Snake River	1 project		35		35				235	471
	Various (no-till drills)	3 projects		1,889						5,479	10,958

1. TP reduction objective = 212,394 lbs/yr
2. 2020 project grants approved, implementation underway.
3. 2020 no-till drill acres = Ada SWCD large drill average annual use 2014-2019.
4. No-till reductions = Freshwater Trust estimate in Lower Boise River Technical Analysis, July 30, 2015.
5. Mill Slough reductions are estimated
6. Farmers Co-Op reductions based on 2019 monitoring

Exhibit C2- Map of on-farm projects completed within NMID

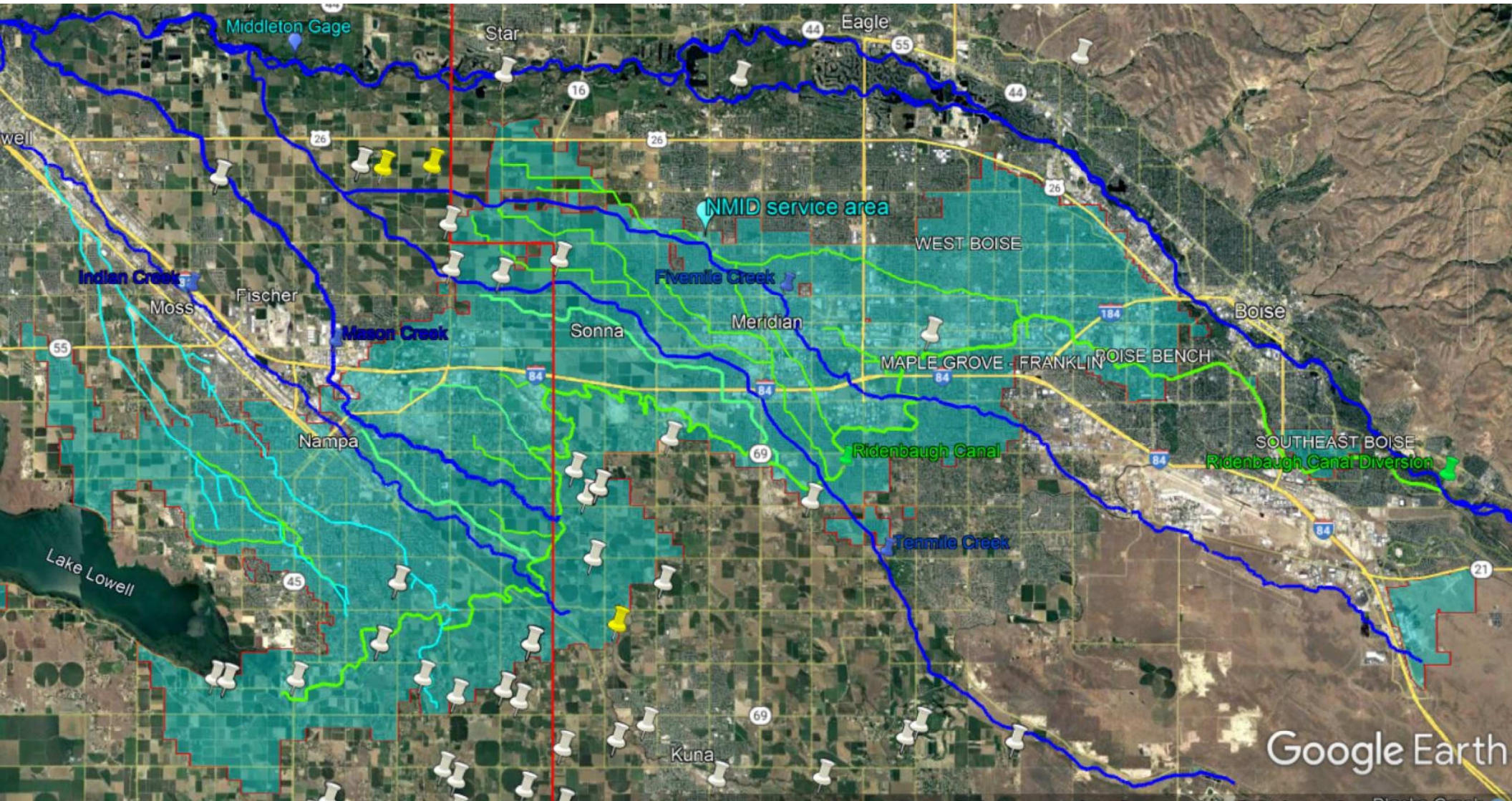


Exhibit C3- Map of on-farm projects completed within NMID

