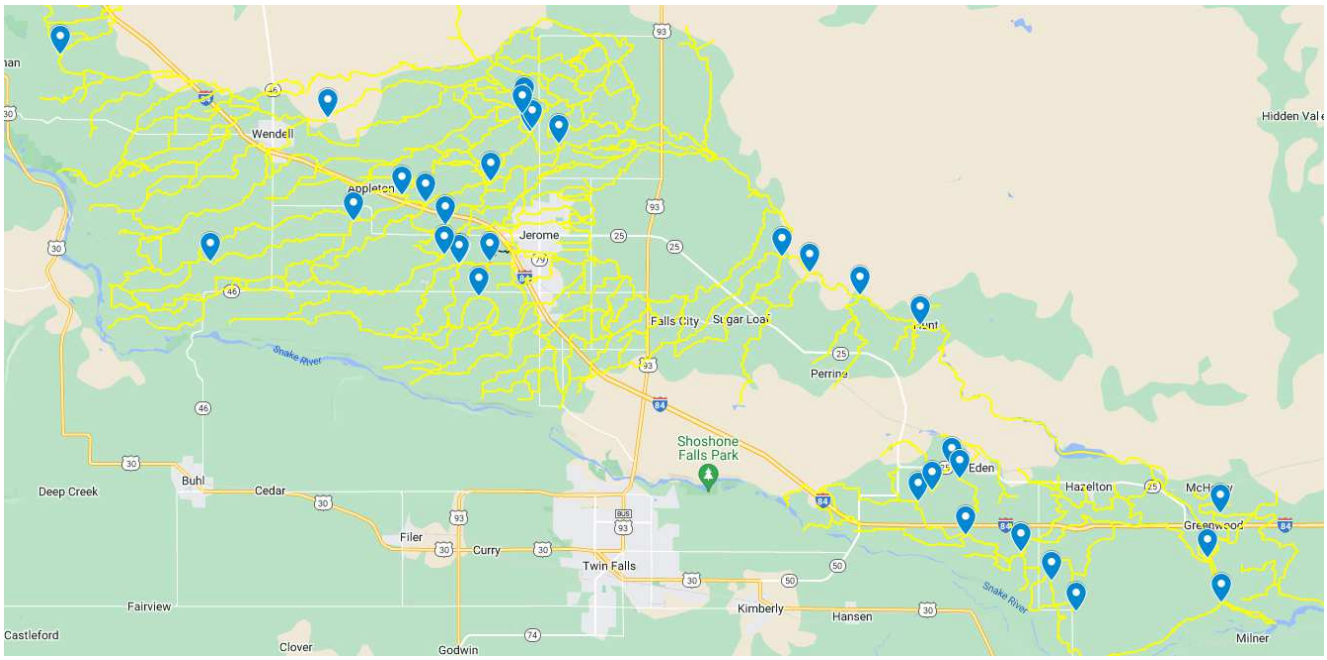
North Side Canal Company

Water Conservation and Delivery Efficiency Improvements by Adding SCADA Sites

Funding Opportunity Announcement: R23AS00008, Funding Group I



Applicant: North Side Canal Company
921 N. Lincoln Ave.
Jerome, ID 83338-1860

Project Manager: Alan W. Hansten
921 N. Lincoln Ave.
Jerome, ID 83338-1860
awh@northsidecanal.com
208-324-2319

Table of Contents

Table of Contents 1

Technical Proposal and Evaluation Criteria 3

Executive Summary 3

Project Location 4

Technical Project Description 6

Evaluation Criteria 9

A - Quantifiable Water Savings 9

1)Describe the amount of estimated water savings 9

2)Describe current losses 9

3) Describe the support/documentation of the estimated water savings: 10

4) SCADA Installation 12

B - Renewable Energy 13

C - Sustainability Benefits 13

Enhancing drought resiliency 13

Addressing a specific water and/or energy sustainability concern(s) 14

D - Complementing On-Farm Irrigation Improvements 15

E - Planning and Implementation 15

E.1 Project Planning 15

E.2 Readiness to Proceed 17

F- Collaboration 19

G- Additional Non-Federal Funding 19

H- Nexus to Reclamation 19

Performance Measures for SCADA and automation 19

Project Budget 20

(1) Budget Proposal and Funding Plan 20

(2) Budget Narrative 20

Environmental and Cultural Resources Compliance 25

Environmental Compliance 25

Letters of support 28

Official Resolution 29

Conflict of Interest Disclosure 29

Single Audit Reporting Statement 30

Certification Regarding Lobbying 30

Appendix 31

Major Supplies Cost 31
Water Savings Calculation 33
In-System Travel Calculation 34
Co2 Savings Estimate 36
Project Location Map 38

Technical Proposal and Evaluation Criteria

Executive Summary

Date: July 28, 2022
Applicant Name: North Side Canal Company
City: Jerome
County: Jerome
State: Idaho
Applicant Category: A

North Side Canal Company (NSCC) owns and operates a network of 900 miles of canals (see Figure 1) used to convey irrigation water to 160,000 acres of farmland between Hazelton and King Hill, Idaho with the main office located in Jerome. NSCC has storage water contracts with the United States Bureau of Reclamation (USBR) in Jackson Lake (Wyoming), Palisades Reservoir (Idaho), and American Falls Reservoir (Idaho), all located on the main stem of the Snake River. This storage water along with natural flow water rights on the Snake River, are diverterted at Milner Dam, near Hazelton, Idaho for irrigation purposes. The Idaho Department of Water Resources through Water District #1 oversees the administration and accounting of NSCC's storage and natural flow water rights.

Figure 1: NSCC distribution network

With infrastructure that is over 100 years old and the effects of climate change being felt every year, NSCC has the need to conserve water wherever possible. An analysis performed by CH2MHill of the water distribution network determined that only 50% of the water conveyed from Milner Dam makes it to the farms. NSCC plans to recapture some of the lost water by improving water management and delivery efficiency by adding 33 strategically placed Supervisory Control and Data Acquisition sites (SCADA) to its current network of 66 sites. This addition of SCADA sites is expected to result in an annual water savings of 30,856 acre-feet. If the proposed project is awarded funds, construction of the sites is expected to begin in November of 2023 after the company stops making irrigation water deliveries for the season. The proposed project is not located within federal land.

Project Location

The 33 proposed SCADA sites are to be installed in strategic locations throughout the canal network which starts at Milner Dam near Hazelton and ends near King Hill. The current active SCADA sites on the NSCC network are shown in blue and the proposed new SCADA sites are in red on the map below.

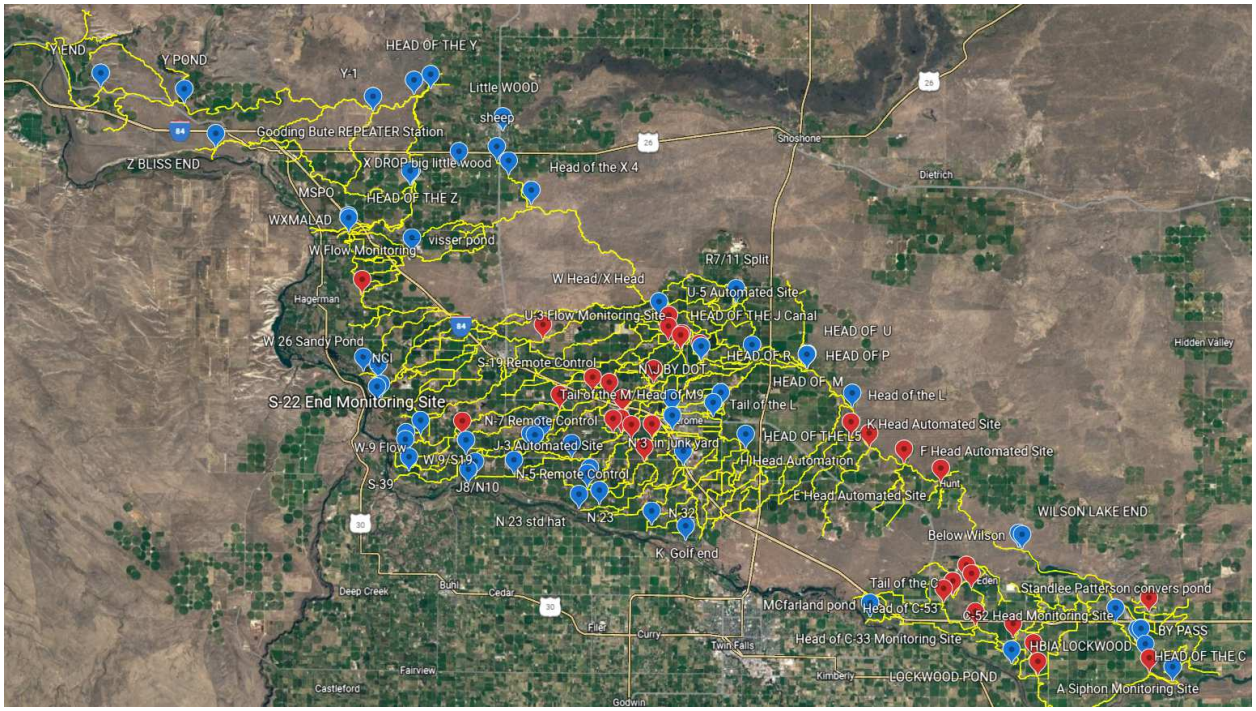


Figure 2: Map of the current SCADA sites (blue) and the proposed SCADA sites (red)

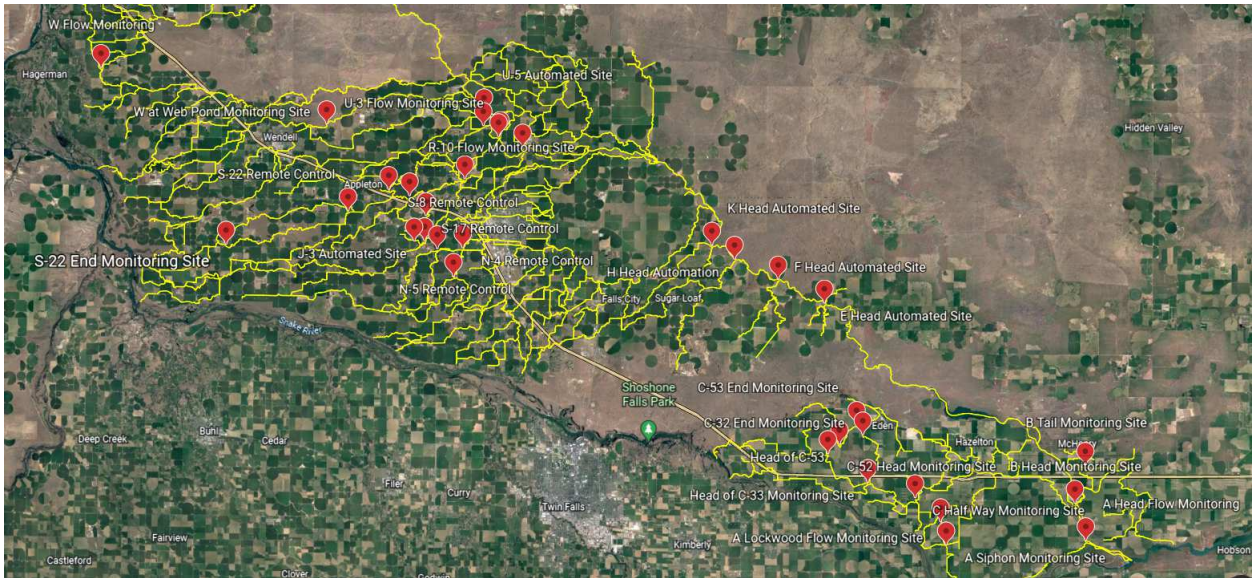


Figure 3: Map of the 33 proposed sites on the NSCC canal flow line

The canals on the network were named alphabetically starting with A at the first diversion point from the main canal. Further diversions from the lettered canals have a number attached, for example, the first diversion from the A canal is called the A-1 canal. Below is a table with more information about the 33 proposed sites.

Proposed Site Name	**Type of Site**	**Approximate Site Coordinates**
Head of the A	Flow Monitoring	42.5365686,-144.044402
Head of the B	Flow Monitoring	42.5589875,-114.0535394
Tail of the B	Flow Monitoring	42.5818234,-114.0451341
A at Siphon	Flow Monitoring	42.5339243,-114.1581727
A at Lockwood	Flow Monitoring	42.5476273,-114.1627009
C Half Way	Flow Monitoring	42.5621373,-114.1834218
Head of C-33	Flow Monitoring	42.5709667,-114.2219702
Head of C-52	Flow Monitoring	42.5881011,-114.2547941
Head of C-53	Flow Monitoring	42.593763,-114.2454935
Tail of C-32	Flow Monitoring	42.5994119, -114.2264995
Tail of C-53	Flow Monitoring	42.6056629, -114.2315521
Head of the E	Automated/Remote Control Site	42.6778715, -114.2538089

Head of the F	Automated/Remote Control Site	42.6929761, -114.2955557
Head of the H	Automated/Remote Control Site	42.7047459, -114.3306578
Head of the K	Automated/Remote Control Site	42.7126023, -114.3473206
R-7 Flow	Flow Monitoring	42.7702423, -114.5053092
R-10 Flow	Flow Monitoring	42.7779536, -114.5243486
Head of U-3	Flow Monitoring	42.7763739, -114.5250723
Head of U-4	Flow Monitoring	42.7851086, -114.5304975
Head of U-5	Flow Monitoring	42.7892935, -114.5304096
Head of S-2	Automated/Remote Control Site	42.7510916, -114.5522514
W at Web Pond	Flow Monitoring Site	42.7832602, -114.6658393
Head of S-8	Automated/Remote Control Site	42.7442129, -114.6144275
Head of S-19	Automated/Remote Control Site	42.7405516, -114.5974083
Head of S-17	Automated/Remote Control Site	42.6909433, -114.5687528
Head of J-3	Automated/Remote Control Site	42.7136762, -114.5848075
Head of N-10	Flow Monitoring Site	42.7089738, -114.5743387
Head of N-7	Automated/Remote Control Site	42.7089829, -114.573559
Head of N-4	Automated/ Remote Control Site	42.7099662, -114.5530482
Head of N-5	Automated/ Remote Control Site	42.6925047, -114.5607961
Head of S-22	Automated/ Remote Control Site	42.7310479, -114.6476739
Tail of S-22	Flow Monitoring	42.7103946, -114.7472391
W Flow	Flow Monitoring	42.8156671,-114.851585

Table 1: Proposed site type and coordinates

Technical Project Description

NSCC has 66 active SCADA sites that allow staff to quickly determine the state of a particular canal or diversion point within the network. With over 900 miles of canals it can often take over an hour to get from one end of the system to the other so the SCADA system has become integral to the daily operations of the company.

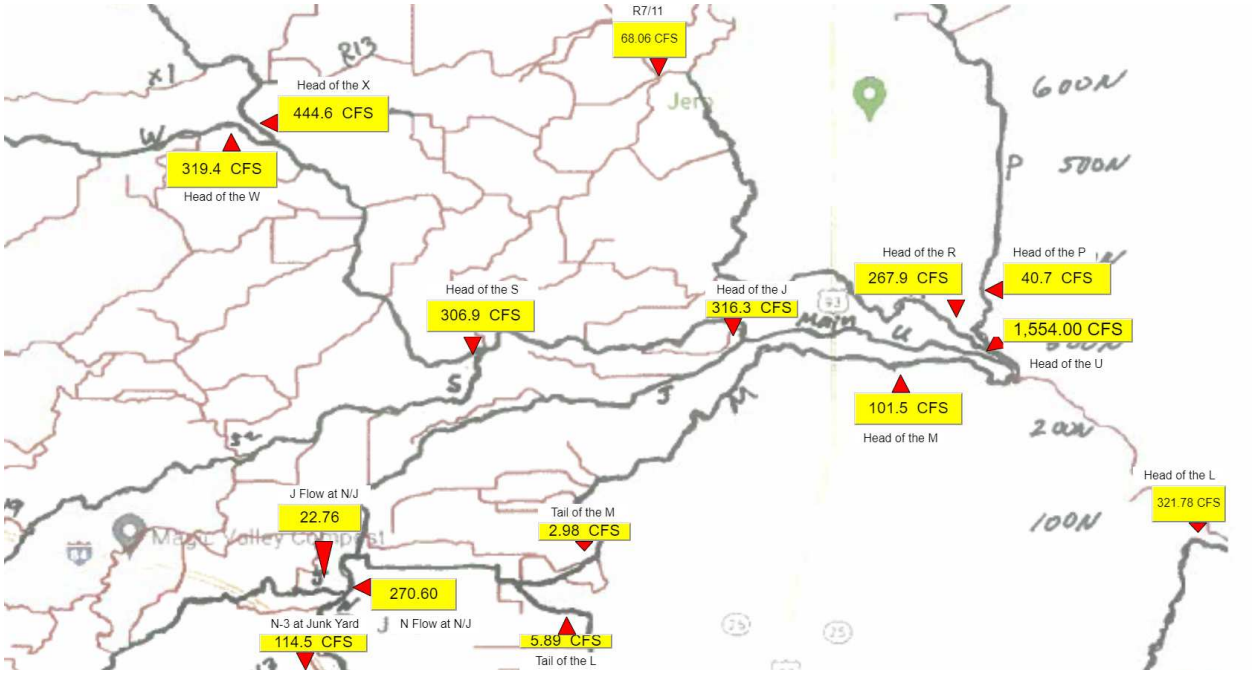


Figure 4: A section of the company's SCADA site map view version 1

NSCC has two types of SCADA sites, one for automated gate control and another for flow monitoring. The proposed project consists of 15 control sites and 18 monitoring sites. Meetings were conducted between management and staff to determine where these sites are most needed. NSCC SCADA sites typically consist of a Campbell Scientific data logger, a water level sensor such as a shaft encoder or pressure transducer, a spread spectrum radio for network communications, directional antenna, solar panel, solar charger and a battery. Electrical components are all secured in an electrical enclosure for protection from the elements. For automated gate control, an electrically powered worm gear screw jack is also added to the headworks of the canal to be controlled. The data logger functions as the brain of the site and is programmed by using the appropriate mathematical relationships such as flow equations through structures or company developed rating curves.

Monitoring site installation:

The construction of a water monitoring SCADA site can vary depending on the existing infrastructure. When possible, equipment is mounted to existing structures such as weirs or box culverts. When mounting equipment to an existing weir for example, the flow sensor is set up to measure the water going over the weir and then the flow is calculated by the appropriate flow equation. Often there is no infrastructure near a planned monitoring site so a concrete block is placed on a dug out section of the canal bank and level sensors/telemetry equipment is fixed to that block. (See figure 5) A staff gauge is mounted near an absolute point of reference (such as a CMP culvert) which is used to calibrate the level sensor. The company's ADCP instrument (See figure 6) is

then used to measure the flow at different water flows and depths to develop the rating curve for the site. The rating curve is then programmed into the site's data logger.

Figure 5: Flow Monitoring Site

Figure 6: ADCP instrument

Automated gate installation:

The installation of automated gates is typically done by retrofitting existing canal headworks. A manual head gate is replaced with a worm gear screw jack (See Figure 7) gate powered by a 12 V motor. An internal potentiometer relays a voltage signal to the site's data logger which can be correlated with the position or opening of that gate. The water level sensor is placed on the upstream side of the headworks and a sluice gate flow equation is then used to determine the discharge into the canal for locations that have non-submerged outlets. The data loggers have control capabilities and are programmed to maintain a target discharge rate or a pool level by opening or closing the gate as needed. Adjustments to the gate's target discharge can be made remotely via computer, tablet, or smartphone.

Figure 7: Worm Gear Screw Jack

Evaluation Criteria

A - Quantifiable Water Savings

1) **Describe the amount of estimated water savings**

   NSCC estimates that the installation of the 33 SCADA sites will result in 30,856 acre-feet saved per season.

2) **Describe current losses**

a. The water that NSCC is trying to conserve is being spilled back into the Snake River from the end of the canals at spill sites.
b. Junior water right holders such as Idaho Power benefit from any water that NSCC spills by increasing the flow on the river and increasing their power production as a consequence. NSCC believes that this benefit is small since they

are mostly dependent on the water from the Eastern Snake Plain Aquifer which supplies the major portion of the river flow.

c. While the increase of flow in the river due to spills could potentially benefit fish and the aquatic habitat, the amount of water being spilled is insignificant compared to the overall flow of the Snake River. Additionally, NSCC only operates the system for 7 months out of the year so any potential benefits are not year round. Decreasing the operational spill also decreases the amount of nutrients being discharged into the river that are believed to be causing nuisance aquatic plant growth and adversely impacting overall river health. Presently, the Idaho Department of Environmental Quality and the local watershed advisory group, which North Side Canal Company is a member, are working with the Environmental Protection Agency on the development of a new Total Maximum Daily Load program to control pollutants being discharged to the river.

3) Describe the support/documentation of the estimated water savings:

NSCC estimated the water savings by expecting a minimum 5% operational efficiency flow reduction at each site. To arrive at the 30,856 acre-feet in water savings the staff at NSCC took measurements at each site and determined the average flow per season. 5% of that number was taken and converted to acre-ft/day, multiplied by the 180 day season and added up to arrive at the estimated figure.

Supporting Data

In the winter of 2021-2022 NSCC installed 11 flow monitoring SCADA sites on the southwest of the canal network (see figure 8). These sites have had a profound effect on operations and in the understanding of how this region of the canal system behaves. The data being gathered is helping staff and management understand how much water it takes to meet the demand of the region and how water can be cut back without drying up the water users.

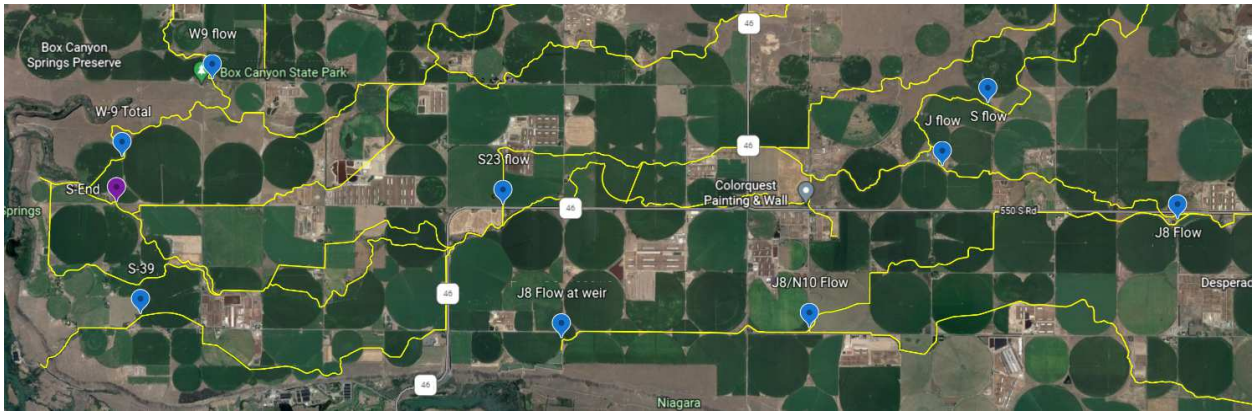


Figure 8: 2021 SCADA improvement project flow monitoring sites

These sites have not been operating and collecting data for a full irrigation season but their deployment has already resulted in significant water savings in 2022 as can be seen in the graphs below. The first graph shows the spills at the S-End site (shown in purple in the map above) in 2020 before the new SCADA sites were implemented. The flows were often above 75 CFS and the behavior of the canal was very erratic.

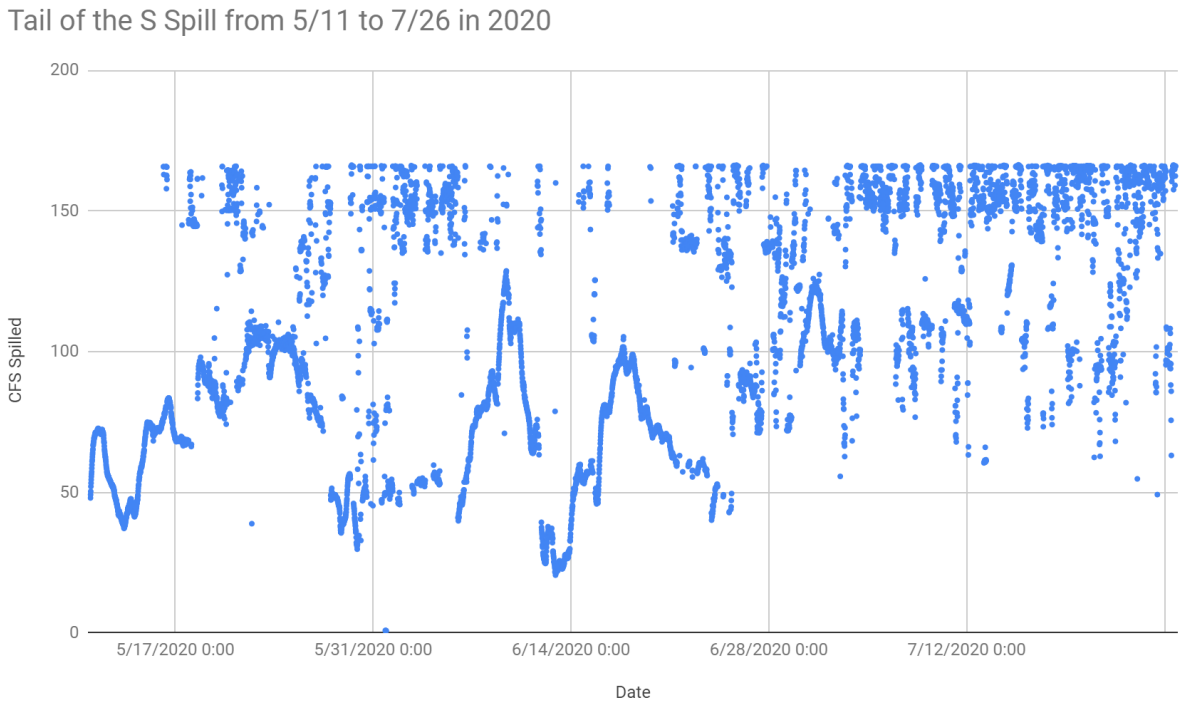


Figure 9: 2020 S-End site data

After the implementation of the new sites, the spill at the end of the canal has decreased significantly and is now being maintained at around 25 CFS as can be seen in the graph below. The behavior of the canal is much more consistent too.

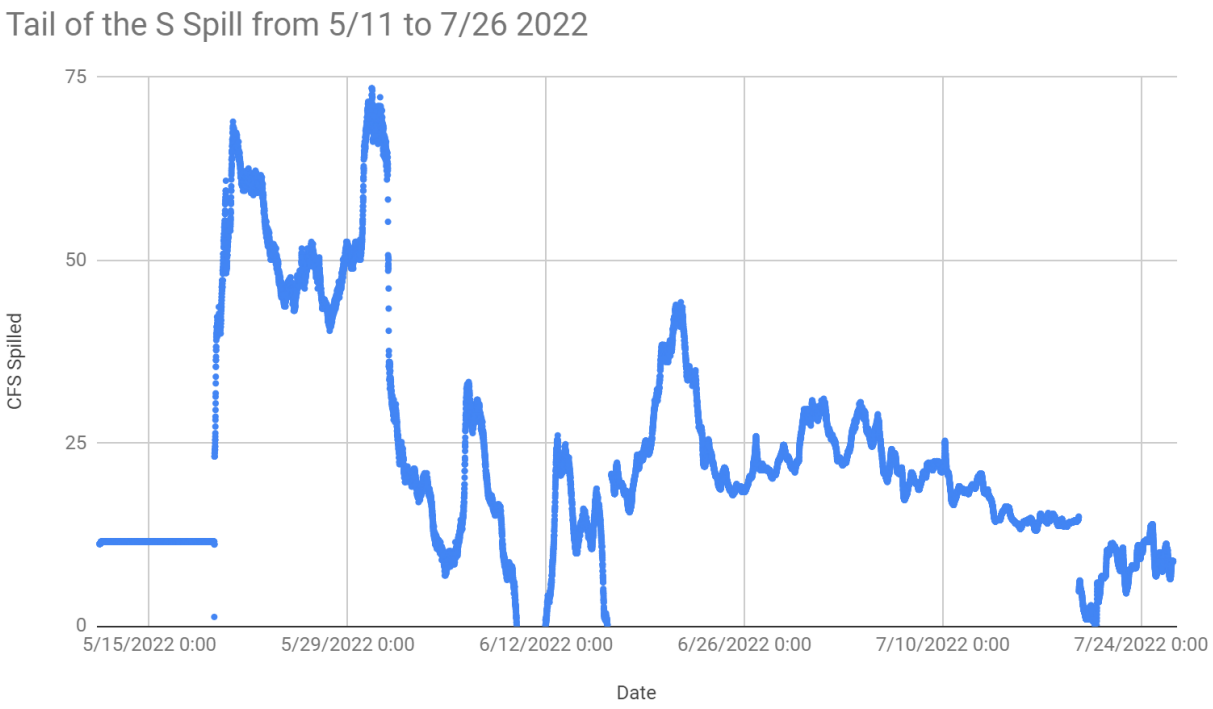


Figure 10: 2022 S-End site data

4) SCADA Installation

- Flow is currently only visually estimated at the proposed sites by referencing high water marks or other visual references. Having dedicated SCADA sites would allow accurate real time measurements and allow for historical data to be collected and analyzed at the end of each season to better determine the flow needed at each site.
- The new SCADA sites will be maintained by NSCC's team of technical staff which includes a staff engineer, SCADA technician and electrician.
- NSCC has developed a form on the SCADA site screen that allows users to report problems with any site. If the site is of vital importance the SCADA team is alerted by text message so they can rapidly respond. In the event of a system wide outage the staff is trained on how to take manual measurements and has access to online resources where they can calculate the flow across standard structures such as weirs.
- Shaft encoders made by Sutron will serve as the flow measuring devices at each site. NSCC will use its ADCP device to generate a rating curve. The ADCP device has an estimated 5% error derived from the various transects that are within 5% of each other used to determine the flow at various depths. When a structure is present and an equation is being used to determine the flow such as

the rectangular weir equation and the sluice gate equation it is also estimated that it will be within 5%-15% of the real flow due to unpredictable field conditions. The flows at these sites are routinely measured with the ADCP instrument to confirm their accuracy.

B - Renewable Energy

The installation of the new SCADA sites will result in the decrease of greenhouse gas emissions by decreasing the amount of miles being driven every day because staff will be able to remotely monitor the sites that they currently drive to. Assuming that these sites are monitored every day of the irrigation season . It is estimated that 31 less miles will be driven every day and 5908 less miles will be driven over the average irrigation season length (about 190 days). This number was obtained by taking the distance from the SCADA site to the nearest major road. NSCC staff drive 2017 Dodge Ram trucks with a 17 mpg combined fuel economy. This means that 347 gallons of fuel will not be combusted which would have resulted in 6733 lbs.of CO_2 being released into the atmosphere. The estimate was derived using the 19.37 lb of CO_2/Gal consumed figure that the EPA provides on their website. This estimate is conservative and does not include the times that staff have to drive from their homes to one of the sites. A spreadsheet with the distances and calculations is provided in the appendix.

Most existing and all proposed NSCC SCADA sites are in remote locations and powered by a 20 W solar panel which is hooked up to a charge controller and a 12 V gel battery. Automated SCADA sites are powered by a 30 W solar panel and larger deep cycle 12 V lead acid batteries.

C - Sustainability Benefits

Enhancing drought resiliency

The installation of the proposed SCADA sites will result in more efficient water management. The sites will allow staff to quickly respond to changes and will allow them to cut back or divert water where needed. This will help keep water within the upper Snake River system for future use. The new SCADA sites will allow for a more targeted application of the water supply to mitigate supply issues in southern Idaho from season to season. It also aids in maintaining good water quality and lower temperatures for sensitive species by reducing the volume of warmer water returning to the river from the canal system. Irrigation water conservation will also allow for more recreation and fishing activities upstream by helping to keep reservoirs as high as possible through the irrigation season.

Addressing a specific water and/or energy sustainability concern(s)

(1) Combating the Climate Crisis

With the effects of climate change being felt and seen every year, it's clear that more efficient methods of managing water are needed. The decrease in snowpack translates to a decrease in water supplies throughout the summer. The increase in temperature puts stress on crops which increases the demand for water. The proposed SCADA sites would result in the better management of the current water supplies and allow staff and management to quickly respond to demand changes. With a system as big as NSCC's, the current water management methods result in a large amount of water being returned to the Snake River and with SCADA it can be conserved.

The conserved water will stay in the Upper Snake River system in the company's storage account and be used to offset the stress of exceptionally low snowpack years.

(2) Disadvantaged or Underserved Communities

Idaho is a large and mostly rural western state. Due to geography and distance, rural communities often do not have access to the same services that urban residents do. NSCC spans 3 rural counties in which agriculture is the primary industry. NSCC's water distribution is essential to the local agricultural economy that these rural communities rely on. Water conservation will directly benefit the community by shoring up the water supply that many depend on to sustain the agricultural economy that many depend on in southern Idaho.

(3) Tribal Benefits

NSCC supplies water to the USBR in support of the Snake River Flow Augmentation Program to increase flows during salmon migration as part of the Nez Perce agreement. By conserving water within the canal system, it will be easier and more sustainable for NSCC to continue voluntarily supplying this water for salmon migration associated with the Nez Perce agreement. Last year, NSCC supplied 58,000 acre-feet of water for salmon migration in the Snake and Columbia Rivers.

(4) Other Benefits

The canal system is a work in progress, if there is water to be saved then there is work to be done. NSCC is looking to improve the reliability, sustainability and resiliency of the canal network in an ever changing environment. The data that the SCADA sites gather helps the company make informed decisions on future projects which can save even more water. It also helps in educating future employees of the company. The SCADA system increases productivity by allowing staff to know the state of the canal system at a glance and allowing them to focus on areas of the canal network that require attention.

D - Complementing On-Farm Irrigation Improvements

Alan Hansten, NSCC General Manager, is a board member for the North Side Soil and Water Conservation District. The district works with local farmers, the Idaho Soil and Water Conservation Commission, and the NRCS to identify and implement on-farm projects to conserve soil and water in Jerome county. NSCC is committed to working with farmers and providing online resources to help educate and inform them on their water usage and improve communications.

Below is a map (figure 11) of NSCC's water service area boundary which extends over parts of Jerome, Gooding and Elmore Counties in South Central Idaho.

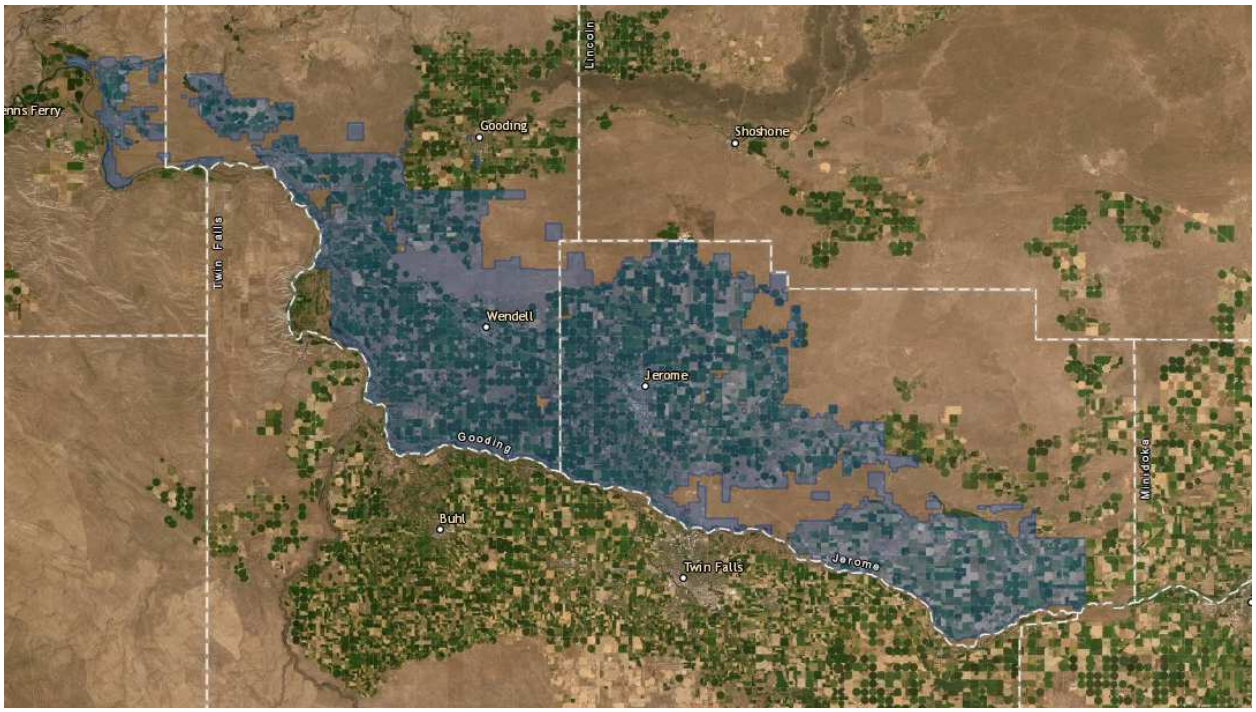


Figure 11: NSCC Service area boundary highlighted in blue (from IDWR irrigation organization map)

E - Planning and Implementation

E.1 Project Planning

The deployment of SCADA sites is included within the objectives of the company's last Water Management and Conservation Plan (WMCP) which was written in 2003. It specifically addresses one of the three main problems identified with the delivery network: "Delivery system efficiency is hindered by slow response to regulate flows within the canal system." This project is part of the company's plan of deploying strategic automated flow control and measurement sites. Below is a snapshot (figure 12) of the cover and the relevant section (figure 13) that mentions company objectives.

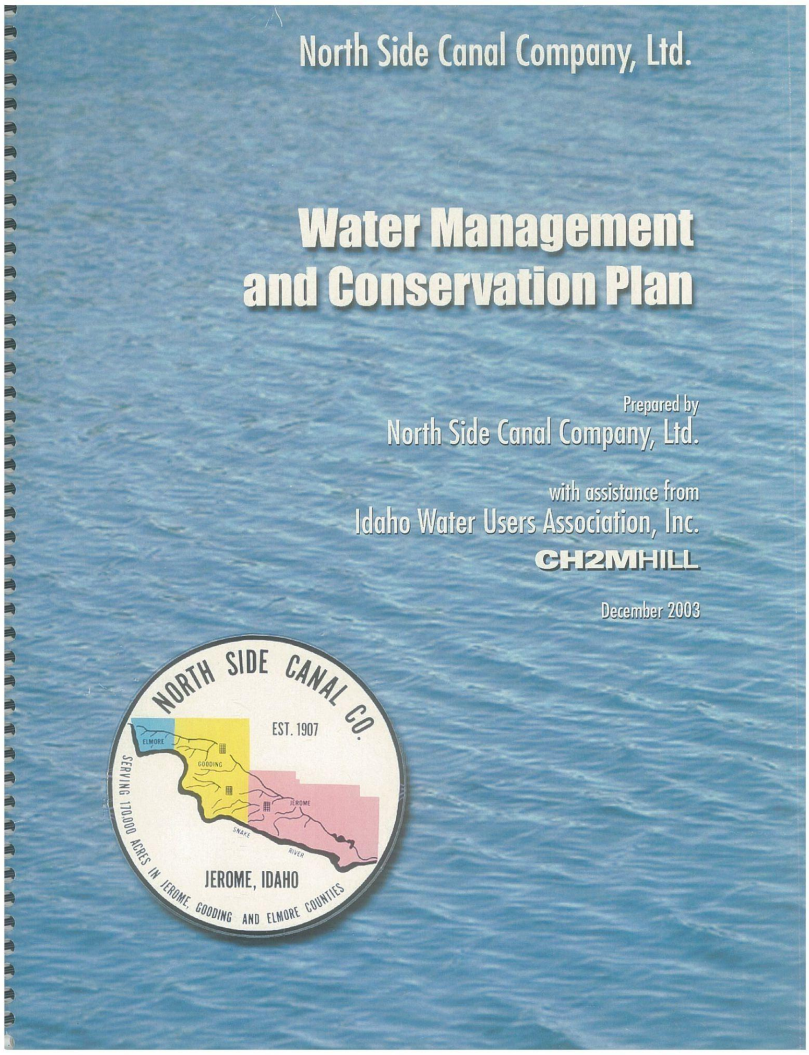


Figure 12: Cover of NSCC's Last WMCP

Goal: Upgrade Flow Measurement Devices

Accurate and reliable flow measurement devices will enhance system capabilities.

Canal Company Objectives:

- Upgrade the measurement of diversions at the head of all main laterals with the installation of automated gates. The NSCC plans to upgrade five per year.
- Upgrade farm deliveries with turnouts that use a submerged orifice for measurement. The NSCC plans to replace or maintain an average of 30 per year.

Goal: Enhance Automation of Flow Control

Automation of flow control would allow NSCC personnel to monitor and regulate flows within the complete system from a remote location like the office.

Canal Company Objectives:

- Increase automation of flow measurement and control at main canal diversions. The NSCC intends to automate 5 laterals per year.

Figure 13: Excerpt from NSCC's last WMCP's objectives section

E.2 Readiness to Proceed

The installation of the new SCADA sites will be accomplished in two phases to be completed over two irrigation off-seasons. Priority will be given to the sites that will help conserve the most water. NSCC has identified nine major tasks that are to be completed from the start to the end of this project:

1. Survey the proposed SCADA sites and identify the type of installation that will be required.
2. Assign installation priority to all of the proposed sites.
3. Order all of the equipment that will be needed for the installations.
4. Determine installation order and schedule.
5. Begin phase 1 of the installations (17 sites)
6. Begin calibration and validation of obtained flow data at the new sites over the course of the irrigation season.
7. Begin phase 2 of the installations. (16 sites)
8. Begin calibration and validation of obtained flow data at the new sites over the course of the irrigation season.

9. Compare the estimated water conservation and the actual water conservation to determine the degree of project success.

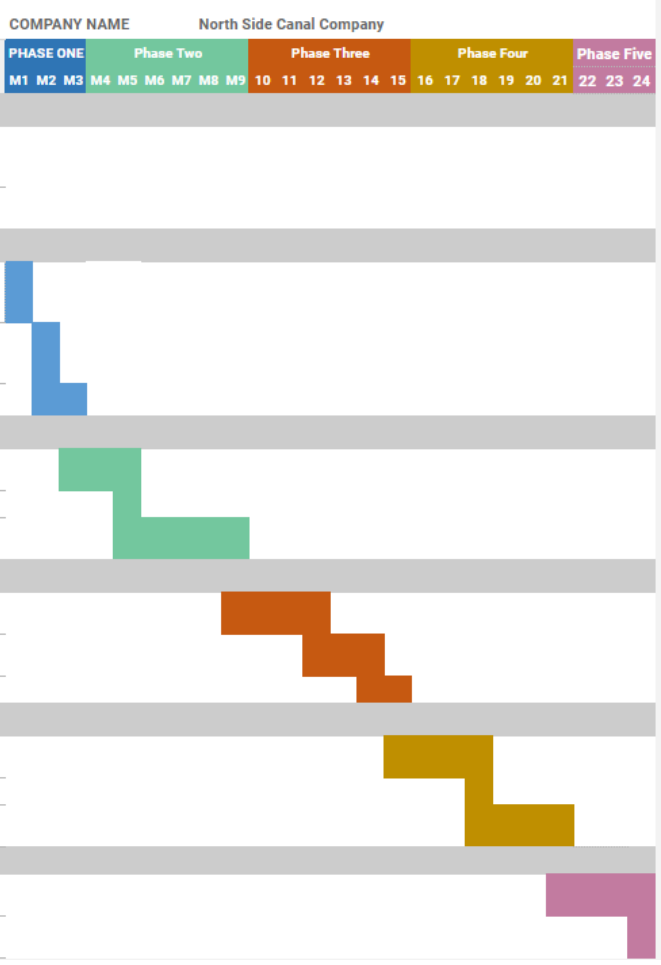
Depending on the proposed SCADA sites survey, new installation methods/designs will potentially need to be developed to accommodate unique existing structures and topography.

According to the NOFO for this grant, the USBR will be awarding this grantt on 5/31/23, NSCC is prepared to begin work on the outlined tasks above as soon as the grant is awarded and plans to be finished with all tasks within 2 years of the award date. The proposed project schedule is summarized in the Gantt chart below:

Estimated Project Schedule

PROJECT TITLE		SCADA Site Addition Project		COMPANY NAME	North Side Canal Company

WBS NUMBER	TASK TITLE	START DATE	DUE DATE
0	**Proposal reviews and recipient contact**		
0.1	Grant proposal review and anticipated award date (USBR dependent)	7/28/22	5/31/23
0.2	Grant agreement review and execution (USBR dependent)	5/31/23	8/1/23
1	**Project planning and goal setting**		
1.1	**Work Begins:** Survey proposed SCADA sites and identify type of installation required	8/1/23	9/1/23
1.2	Assign installation priority based on amount of flow and off-season duration	9/1/23	9/15/23
1.3	Order all equipment necessary	9/15/23	10/1/23
2	**Phase I, Off-Season**		
2.1	Begin phase I of the installations (17 sites)	10/1/23	1/15/24
2.2	Mid off-season goals review	1/15/24	1/15/24
2.3	Finish Phase I of site construction and integration into current network	1/15/24	4/1/24
3	**Irrigation Season I**		
3.1	Begin calibration and validation of data obtained from the new sites	4/1/24	7/1/24
3.2	Begin data gathering for performance measures	7/1/24	9/1/24
3.3	Planning for Phase II	9/1/24	10/1/24
4	**Phase II, Off-Season**		
4.1	Begin phase 2 of the installations (16 sites)	10/1/24	1/15/25
4.2	Mid off-season goals review	1/15/25	1/15/25
4.3	Finish Phase II of site construction and integration into current network	1/15/25	4/1/25
5	**Irrigation season II and Project performance review**		
5.1	Begin calibration and validation of data obtained from the new sites	4/1/25	7/1/25
5.2	Begin data gathering for performance measures	7/1/25	9/1/25



Gantt Chart with estimated project schedule

F- Collaboration

The North Side Soil and Water Conservation District board and the NSCC board, which is made up of local farmers, are both supporters of this project. The data gathered by the new SCADA sites can be used to inform water users on ways that they can help NSCC increase their water efficiency.

G- Additional Non-Federal Funding

NSCC is prepared to fund 50% of the total project cost and provide all the labor and equipment to complete it.

H- Nexus to Reclamation

NSCC diverts water from the Snake River, part of the Columbia River Basin whose waters are managed by the USBR. NSCC has storage contracts with the USBR in Jackson Lake, Palisades Reservoir, and American Falls Reservoir in the amount of 859,898 acre-feet annually. NSCC also has natural flow water rights on the Snake River for 4,560 cubic feet per second. Water conservation efforts by NSCC directly benefit the community and the basin as a whole by keeping water in the system longer and allowing for more targeted application of the water supply to mitigate supply issues in southern Idaho. Irrigation water conservation will also allow for more recreation and fishing activities upstream and also aid in maintaining good water quality.

Performance Measures for SCADA and automation

The proposed SCADA sites will provide access to instantaneous flow data which can be used to make quick water management decisions. Currently the flow at these sites is assessed visually and decision making is done in a reactionary manner instead of proactively. A quicker response upstream allows water to be decreased at the source in order to decrease the spill at the end sites back into the river.

This project's performance will be assessed by comparing the aggregated data on water spilled before and after the implementation of the proposed sites, the reduction of miles driven and time saved on manual flow data collection. The amount of carryover storage water will continue to be recorded and any improvements will be noted.

NSCC employs 4 technical staff that currently oversee the installation of new sites and the maintenance on current SCADA sites. The technical staff decreases the reliance on third parties and ensures that all problems relating to SCADA can be fixed in-house. It also allows for programming flexibility and long term planning. The only services that NSCC relies on are its internet service for the main SCADA computer and the RTMC

software developed by Campbell Scientific which allows site data to be viewed on the web and gates to be controlled remotely.

Project Budget

(1) Budget Proposal and Funding Plan

Funding Sources	Amount
Non-Federal Entities	$0
North Side Canal Company	$277,709
Non-Federal Subtotal	$277,709
Requested Reclamation Funding	$266,817

Table 2: Summary of Non-Federal and Federal Funding Sources

Source	Amount
Costs to be reimbursed with the requested Federal Funding	$266,817
Costs to be paid by the applicant	$277,709
Value of third-party contributions	$0
Total Project Cost	**$544,526**

Table 3: Total Project Cost Table

(2) Budget Narrative

a. Personnel: NSCC staff hourly rate breakdown and tasks

The following are the costs associated with some of NSCC's staff spending 30% of their weekly working hours over the 2 years needed to complete the project starting in 2023. It includes their estimated wages at the start of the project along with the average company yearly pay raise of 5%.

Jesus Barrera, staff engineer, will lead the SCADA team in the deployment of the proposed sites which includes acquiring and calibrating equipment with appropriate flow

equation or rating curve, integrating proposed sites to the current network and acquiring/processing data from the data loggers for project performance measures.

Year 1 Pay Rate: $29.4, Estimated Time: 624 hours in year 1, Total: $ 18,346
Year 2 Pay Rate: $30.87, Estimated Time:624 Hours in year 2, Total:$ 19,263

Tom Boguslawski, SCADA technician, will lead the installation of the equipment and the setup of radio communications.

Year 1 Pay Rate:$25.2, Estimated Time: 624 hours in year 1, Total: $15,724
Year 2 Pay Rate:$26.46, Estimated Time:624 Hours in year 2 , Total:$16,511

Kevin Fleming, Electrician, will lead the custom mounting hardware manufacturing and its installation at each site.

Year 1 Pay Rate: $27.38 Estimated Time: 624 hours in year 1, Total:$17,085
Year 2 Pay Rate: $28.75, Estimated Time:624 hours in year 2, Total:$17,940

Alan Hansten, NSCC general manager, will oversee the tasks performed by the staff and will guide the team in prioritizing site deployment. He will spend an estimated 5% of his time over the duration of this project.

Year 1 Pay Rate $12,574/month, Estimated Time: 5% of time in year 1, Total:$7,544
Year 2 Pay Rate:$13,202/month Estimated Time:5% of time in year 2, Total:$7,922

NSCC Staff	**Total Estimated Wages Over Project Duration**
Jesus Barrera	$37,609
Tom Boguslawski	$32,235
Kevin Fleming	$35,025
Alan Hansten	$15,466
Total in Wages	**$120,335**

Table 4: Estimated Wages

b. Fringe Benefits:

NSCC's fringe benefits are estimated to be 51.367% of employee compensation and consists of FICA (7.65%), unemployment insurance (0.421%), worker's compensation (4.59%), medical-dental-vision-life insurances (20.67%), retirement (6.5%), and annual/sick leave/holidays (11.536%).

NSCC Staff	Total Estimated Fringe Benefits over the project duration
Jesus Barrera	$19,319
Tom Boguslawski	$16,558
Kevin Fleming	$17,991
Alan Hansten	$7,944
Total in Fringe Benefits	**$61,812**

Table 5: Estimated Fringe Benefits

c. Travel:

No out of system travel is expected for the purpose of this project. Mileage for site installation has been estimated at 4 trips for 3 trucks and an average of 32 miles per round trip per site for a total mileage of 12,730 at a cost of $.625 per mile. Total project mileage cost is estimated at $7,956 and will be paid for by NSCC.

d. Equipment:

No equipment ,as defined in the USBR Budget Narrative Guidance Document, will be purchased as part of this project.

e. Supplies:

The estimated major supplies that will be needed for this project and their cost is shown in the table below. Note that these are the costs as of July 2022 and were obtained by visiting supplier websites, these are likely to increase between the writing of this grant application and the award date. For this reason, NSCC decided to add a conservative 5% price increase to all of the supplies that will be needed for this project. If the price increases more than conservative estimate NSCC will cover that cost. All major components such as data loggers, radios, worm gear screw jacks and level sensors are made in the United States.

Item	Unit Cost	5% estimated cost increase	# of units	Total estimated cost at time of purchase
Campbell Scientific CR800 Data Logger	$1,050	$1,102.50	18	$19,845.00
Campbell Scientific CR850 Data Logger	$1,600	$1,680.00	15	$25,200.00
Campbell Scientific RF-451 Spread Spectrum Radio	$1,050	$1,102.50	33	$36,382.50
900 MHz Yagi Antenna	$187	$196.35	33	$6,479.55
5 ft. N to N type coaxial cable	$98.40	$103.32	33	$3,409.56
3 ft. N to SMA coaxial cable	$71.52	$75.10	33	$2,478.10
N to N type lightning arrester	$17.36	$18.23	33	$601.52
20 W Solar Panel	$35	$36.75	18	$1,212.75
30 W Solar Panel	$43.50	$45.68	15	$1,507.28
Actionjac worm gear screw jack	$3,590	$3,769.50	15	$56,542.50
Electric Motor and coupling	$503	$528.15	15	$7,922.25
15" Head gate for automation assembly	$927	$973.35	15	$14,600.25
Solar Charge Controller	$16	$16.80	33	$554.40
12 V gel battery	$28	$29.40	18	$529.20
12 V Deep cycle battery	$180	$189.00	15	$2,835.00
Fuse Block w/fuses	$20	$21.00	33	$693.00
Shaft Encoder w/ accessories	$1,353.65	$1,421.33	33	$46,903.97
Shaft encoder enclosure	$102.32	$107.44	33	$3,545.39
Electrical equipment enclosure	$131	$137.55	33	$4,539.15
Stilling Well 5' Assembly	$137.25	$144.11	33	$4,755.71
Staff Gauge	$29.95	$31.45	33	$1,037.77
Campbell Scientific RF407 Short Range Radio	$470	$493.50	2	$987.00
			Total:	**$242,561.85**

Table 6: Estimated Equipment Cost

f. Contractual/Consultants

All work relating to the installation of the proposed SCADA sites will be completed in-house and no contracts will be awarded to consultants.

g. Construction

Equipment use costs

NSCC owns all of the equipment that is necessary for the construction of the proposed sites. Construction equipment costs are summarized in the table below. The use times for the equipment were calculated by taking the amount of planned sites and multiplying it by the average time operating at each monitoring site. It is assumed that automated sites have existing infrastructure to mount to so no large equipment will be needed at those sites. All equipment costs will be paid for by NSCC.

Equipment	**Operation Rate (/hr)**	**Total Estimated Use Time (hrs)**	**Total**
420F2 CAT Backhoe	$105	72	$7560
Soil Compactor	$25	36	$900
950 G CAT Loader	$140	9	$1260
5 Yd Dump Truck	$90	27	$2430
		Total:	**$12,150**

Table 7: Equipment Use Cost Estimate

Construction Materials

Construction materials for each site will vary depending on the current infrastructure and site topography. For the purposes of this estimate it is assumed that all flow monitoring sites have no existing infrastructure and that automated sites have existing infrastructure.

Material	**Unit Cost**	**Total Needed**	**Total Cost**
Bagged Concrete	$5.74	144	$827
Concrete Block (2’x2x4’)	$65	18	$1170
Concrete Anchoring Hardware	$10/Set	33 Sets	$330
Clay Gravel	$32/yd	18 Loads, 5 yd/load	$2880
		Total	**$5207**

Table 8: Materials Cost Estimate

h. Other Direct Costs

A 10% project contingency cost will be added to the grand total estimate for this project.

i. Total Direct Costs

The total direct costs of this project is estimated to be $450,021.85

j. Indirect Costs

The Company does not have a current Federal negotiated indirect cost rate agreement so indirect costs were calculated using the 10% de minimis rate against MTDC as detailed below. Federal funding will not be used to pay these costs.

Personnel	$120,335
Fringe	$61,812
Travel	$7,956
Equipment	$N/A
Supplies	$242,561.85
Contractual	$N/A
Construction	$17,357
Total	$450,021.85
	X 0.10

Indirect Costs: $45,002.19

k. Totals

The total costs for this project including both direct and indirect costs is estimated to be $495,024.04 and with a 10% project contingency the final project cost estimate is **$544,526**

Environmental and Cultural Resources Compliance

Environmental Compliance

- **Will the proposed project impact the surrounding environment? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.**

The addition of the proposed sites will not significantly impact the surrounding environment. Flow monitoring sites where there is no current structure will need a concrete block added to the side of the canal bank which typically needs 3'x3'x5' of soil, rock, sand or other material to be removed to make space for the block. A concrete pad is poured at the floor of the cut-out on which the concrete block is placed on, then clay gravel is added and compacted to ensure erosion resistance. In places where erosion is a bigger concern, fabric and rip-rap are added to the block surroundings. Planned automated sites will cause no earth disturbance since these are added to the existing headworks infrastructure.

- **Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?**
  NSCC is not aware of any endangered species living near any of the proposed SCADA sites.

- **Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States?" If so, please describe and estimate any impacts the proposed project may have.**
  The proposed sites are not located on or near a federal or state wetland.

- **When was the water delivery system constructed?**
  The NSCC water delivery system was completed in 1905.

- **Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.**
  Only the existing canal banks on which flow monitoring sites are proposed will be modified to accommodate a concrete block to which equipment can be mounted to. The addition of this block does not significantly change the flow of the canal and the surrounding area. Automated sites will be installed by retrofitting current structures, this involves the replacement standard headgates with a custom Action Jac powered head gate.

- **Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural**

resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.
NSCC is not aware of any structures or features that are eligible for listing on the National Register of Historic Places within the NSCC water delivery boundary.

- **Are there any known archeological sites in the proposed project area?**
  NSCC is not aware of any archaeological sites in or near any of the proposed SCADA sites.

- **Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?**
  The proposed project will not have an adverse effect on low income or minority populations.

- **Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?**
  The proposed project will not limit access or interfere with any Indian sacred sites or result in impacts on tribal lands.

- **Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?**
  The proposed project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known in the area.

NSCC submitted the proposed SCADA site locations and a level of environmental disturbance summary to the Bureau of Reclamation's contact for the Boise, Payette and eastern Oregon basins, Melissa Jayo, and is waiting to hear back on the necessary level of NEPA compliance.

Letters of support

North Side Soil & Water Conservation District
1441 Fillmore Street, Ste A, Twin Falls Idaho 83301

July 19, 2022

RE: Support of North Side Canal Company's Supervisory Control and Data Acquisition (SCADA) Equipment Acquisition – USBR WaterSmart Grant Application

To Whom it May Concern:

The North Side Soil and Water Conservation District (NSSWCD) supports North Side Canal Company's (NSCC) SCADA project and associated WaterSmart grant application to the United States Bureau of Reclamation. We believe that this additional equipment will serve NSCC and the community well in helping to better regulate and conserve water within the NSCC canal system. NSSWCD is currently reviewing its financial obligations and may choose to participate monetarily in this project if able to in the near future.

If you have any questions regarding our support of NSCC's project, feel free to contact me at (208) 308-3718.

Sincerely,

Steven Huettig
Vice Chairman
North Side Soil & Water Conservation District

Official Resolution

Resolution

The Board of Directors of the North Side Canal Company, Ltd. (NSCC) reviewed this resolution at their regular board meeting on July 21, 2022. Alan Hansten, Secretary/Treasurer of the board informed the directors that a formal resolution was needed to apply for a United States Bureau of Reclamation (USBR) WaterSmart grant to assist with funding for the acquisition and deployment of additional Supervisory Control and Data Acquisition (SCADA) equipment to be installed within the canal system. A quorum of the board was present and voted unanimously in favor of the following resolution:

RESOLVED, North Side Canal Company authorizes Alan W. Hansten, Secretary/Treasurer, to enter into an agreement for USBR WaterSmart grant funding to assist with the acquisition and deployment of additional Supervisory Control and Data Acquisition (SCADA) equipment to be installed within the canal system. Alan W. Hansten, secretary/treasurer has reviewed the grant application to be submitted on behalf of the company and NSCC has the financial capability to meet its obligations under the funding plan. NSCC will work with the USBR to meet established deadlines for entering into a grant or cooperative agreement.

ATTEST: _____
Secretary – Alan W. Hansten

_____ 7-21-22
Chairman – Mike Elliott

Conflict of Interest Disclosure

To its knowledge, NSCC does not have any conflicts of interest related to applying and receiving federal funds associated with this funding opportunity.

Single Audit Reporting Statement

NSCC does not intend to spend more than $750,000 or more in Federal funds for this fiscal year.

Certification Regarding Lobbying

A certification regarding lobbying will be submitted as a part of this application.

Appendix

Major Supplies Cost

Below are snapshots of the prices for major components obtained from supplier websites and latest invoices for estimating the cost of this project.

RF407 900MHz Spread Spectrum Radio (-40 to +70C) **$470.00** Add

How to Order Shipping Information North Side Canal Company LTD

CR800-ST-SW-NC		**$1,050.00**
CR800 Measurement & Control Datalogger		$1,050.00
Temperature Ranges show details		
◉ -ST	-ST -25 to +50C	$0.00
Warranty Lengths show details		
◉ -SW	-SW Standard 3yr Warranty	$0.00
○ -XW	-XW 4yr Warr Extension	$215.00
Calibration Certificate show details		
◉ -NC	-NC No Calibration Cert	$0.00
○ -CC	-CC Calibration Cert	$150.00

Add

How to Order Shipping Information North Side Canal Company LTD

CR850-ST-SW-NC		**$1,600.00**
CR850 Measurement & Control Datalogger w/Built-In Keyboard & Display		$1,600.00
Temperature Ranges show details		
◉ -ST	-ST -25 to +50C	$0.00
Warranty Lengths show details		
◉ -SW	-SW Standard 3yr Warranty	$0.00
○ -XW	-XW 4yr Warr Extension	$365.00
Calibration Certificate show details		
◉ -NC	-NC No Calibration Cert	$0.00
○ -CC	-CC Calibration Cert	$150.00

Add

How to Order Shipping Information North Side Canal Company LTD

RF451 900MHz 1W Spread Spectrum Radio

How to Order | Shipping Information

$1,050.00

North Side Canal Company LTD

Add

Common Accessories
Other Accessories

Replacement Parts
Services

Product Details	
Quantity Discounts	Yes
Restockable	Yes
Warranty	1 year
Compliance	–

Ships With		
(1)	SC12	Robust CS I/O Cable, 2 ft
(1)	17648	USB Cable, Type A Male to Type B Male, 6 ft
(4)	505	Screw #6-32 x .375 Pan Phillips
(4)	6044	Grommet for #6 or #8 Screw

Product Categories / Power Transmission / Gearmotors / DC Gearmotors / DC Gearmotor: 12V DC, 170 RPM Nameplate RPM, 57...

Email | Print

Roll over image to zoom.

Product Image Feedback

DAYTON

GRAINGERCHOICE

DC Gearmotor: 12V DC, 170 RPM Nameplate RPM, 57 in-lb Max. Torque, CW/CCW, All Angle

Item # 1Z833 | Mfr. Model # 1Z833
UNSPSC # 26101603 | Catalog Page # 82

Country of Origin USA. Country of Origin is subject to change.

This DC gearmotor features a totally enclosed, nonventilated enclosure. It can be mounted in small spaces and in multiple positions. To assemble, simply rotate the gearbox onto the motor helical shaft.

Compare this product

Web Price
$495.23 / each

Qty 1 | Add to Cart

Ship | Pickup

Expected to arrive by end of Aug, 2022.

Ship to 83301 | Change

Shipping Weight 14 lbs

Ship Availability Terms

Add to List

Wayne Haffner

to me

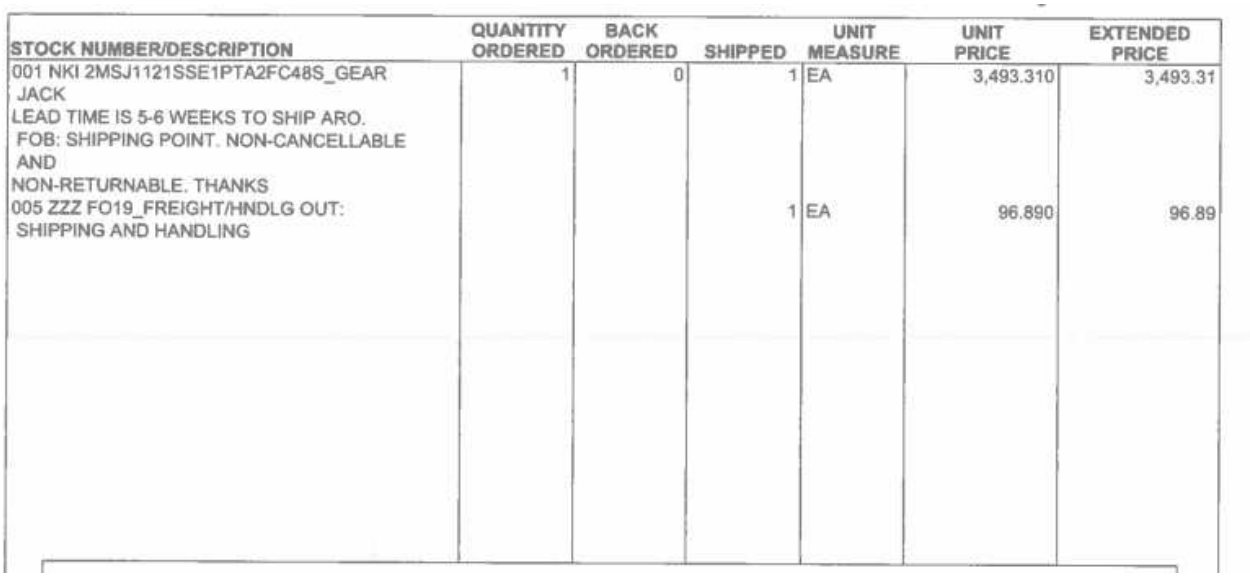
Your current net cost for a 15" 6400 with 48" frame/ wall mount is $927.00

Thanks!

Wayne Haffner
Idaho/Utah
800-898-2045

FRESNO
Valves & Castings, Inc.

Action Jac invoice



STOCK NUMBER/DESCRIPTION	QUANTITY ORDERED	BACK ORDERED	SHIPPED	UNIT MEASURE	UNIT PRICE	EXTENDED PRICE
001 NKI 2MSJ1121SSE1PTA2FC48S_GEAR JACK LEAD TIME IS 5-6 WEEKS TO SHIP ARO. FOB: SHIPPING POINT. NON-CANCELLABLE AND NON-RETURNABLE. THANKS	1	0	1	EA	3,493.310	3,493.31
005 ZZZ FO19_FREIGHT/HNDLG OUT: SHIPPING AND HANDLING			1	EA	96.890	96.89

Water Savings Calculation

Proposed Site Name	AverageCanal Flow (CFS)	Estimated 5% of water saved due to increased operational efficiency (CFS)	Estimated water savings in acre-feet in a 180 day season	cfs to acft/day	days
Head of the A	75	3.75	1338.8625	1.9835	180
Head of the B	30	1.5	535.545	1.9835	180
Tail of the B	6	0.3	107.109	1.9835	180
A at Siphon	22.5	1.125	401.65875	1.9835	180
A at Lockwood	10	0.5	178.515	1.9835	180
C Half Way	250	12.5	4462.875	1.9835	180
Head of C-33	40	2	714.06	1.9835	180
Head of C-52	35	1.75	624.8025	1.9835	180
Head of C-53	17.5	0.875	312.40125	1.9835	180
Tail of C-32	10	0.5	178.515	1.9835	180
Tail of C-53	10	0.5	178.515	1.9835	180
Head of the E	125	6.25	2231.4375	1.9835	180

Head of the F	37.5	1.875	669.43125	1.9835	180
Head of the H	27.5	1.375	490.91625	1.9835	180
Head of the K	22.5	1.125	401.65875	1.9835	180
R-7 Flow	90	4.5	1606.635	1.9835	180
R-10 Flow	10	0.5	178.515	1.9835	180
Head of U-3	10	0.5	178.515	1.9835	180
Head of U-4	10	0.5	178.515	1.9835	180
Head of U-5	10	0.5	178.515	1.9835	180
Head of S-2	62.5	3.125	1115.71875	1.9835	180
W at Web Pond	325	16.25	5801.7375	1.9835	180
Head of S-8	10	0.5	178.515	1.9835	180
Head of S-19	30	1.5	535.545	1.9835	180
Head of S-17	10	0.5	178.515	1.9835	180
Head of J-3	10	0.5	178.515	1.9835	180
Head of N-10	20	1	357.03	1.9835	180
Head of N-7	20	1	357.03	1.9835	180
Head of N-4	15	0.75	267.7725	1.9835	180
Head of N-5	12.5	0.625	223.14375	1.9835	180
Head of S-22	30	1.5	535.545	1.9835	180
Tail of S-22	10	0.5	178.515	1.9835	180
W Flow	325	16.25	5801.7375	1.9835	180
		Total	**30856.32**		

In-System Travel Calculation

Site	Distance to From NSCC Yard to Site	There and Back	3 Trucks for equipment and Staff	4 Estimated Trips
Head of the A	29.2	58.4	175.2	700.8
Head of the B	28.4	56.8	170.4	681.6
Tail of the B	28	56	168	672
A Siphon	24.4	48.8	146.4	585.6
A Lockwood	22.6	45.2	135.6	542.4
C Half Way	21.7	43.4	130.2	520.8

Head of C-33	18.1	36.2	108.6	434.4
Head of C-52	17.1	34.2	102.6	410.4
Head of C-53	19	38	114	456
Tail of C-32	19.8	39.6	118.8	475.2
Tail of C-53	19.1	38.2	114.6	458.4
Head of the E	17	34	102	408
Head of the F	17.7	35.4	106.2	424.8
Head of the H	14.7	29.4	88.2	352.8
Head of the K	13.3	26.6	79.8	319.2
R-7 Flow	11.1	22.2	66.6	266.4
R-10 Flow	10.7	21.4	64.2	256.8
Head of the U-3	10.8	21.6	64.8	259.2
Head of the U-4	11.6	23.2	69.6	278.4
Head of the U-5	12.5	25	75	300
Head of the S-2	9.9	19.8	59.4	237.6
W at Web Pond	19.2	38.4	115.2	460.8
Head of the S-8	12.4	24.8	74.4	297.6
Head of the S-19	11.2	22.4	67.2	268.8
Head of the S-17	11	22	66	264
Head of the J-3	9.8	19.6	58.8	235.2
Head of the N-10	8.6	17.2	51.6	206.4
Head of the N-7	8.7	17.4	52.2	208.8
Head of the N-4	7.8	15.6	46.8	187.2
Head of the N-5	7.2	14.4	43.2	172.8
Head of the S-22	14.2	28.4	85.2	340.8

Tail of the S-22	17.6	35.2	105.6	422.4
W Flow	26	52	156	624
			Total Miles	12729.6

Co2 Savings Estimate

Site	Distance to Nearest major road	Total Distance there and back	Days in irrigation season	Total Miles Saved	Gallons Saved	lb of CO2 saved	Ram MPG	lb CO2/gallons burned
Head of the A	0.09	0.18	190	34.2	2.01	38.97	17	19.37
Head of the B	0.29	0.58	190	110.2	6.48	125.56	17	19.37
Tail of the B	0.27	0.54	190	102.6	6.04	116.90	17	19.37
A Siphon	0.06	0.12	190	22.8	1.34	25.98	17	19.37
A Lockwood	0.01	0.02	190	3.8	0.22	4.33	17	19.37
C Half Way	0.01	0.02	190	3.8	0.22	4.33	17	19.37
Head of C-33	0.46	0.92	190	174.8	10.28	199.17	17	19.37
Head of C-52	0.28	0.56	190	106.4	6.26	121.23	17	19.37
Head of C-53	0.37	0.74	190	140.6	8.27	160.20	17	19.37
Tail of C-32	0.07	0.14	190	26.6	1.56	30.31	17	19.37
Tail of C-53	0.01	0.02	190	3.8	0.22	4.33	17	19.37
Head of the E	1.12	2.24	190	425.6	25.04	484.93	17	19.37
Head of the F	2.33	4.66	190	885.4	52.08	1008.84	17	19.37
Head of the H	2.38	4.76	190	904.4	53.20	1030.48	17	19.37

Head of the K	1.01	2.02	190	383.8	22.58	437.31	17	19.37
R-7 Flow	0.86	1.72	190	326.8	19.22	372.36	17	19.37
R-10 Flow	0.27	0.54	190	102.6	6.04	116.90	17	19.37
Head of the U-3	0.72	1.44	190	273.6	16.09	311.74	17	19.37
Head of the U-4	0.23	0.46	190	87.4	5.14	99.58	17	19.37
Head of the U-5	0.53	1.06	190	201.4	11.85	229.48	17	19.37
Head of the S-2	0.34	0.68	190	129.2	7.60	147.21	17	19.37
W at Web Pond	1.65	3.3	190	627	36.88	714.41	17	19.37
Head of the S-8	0.12	0.24	190	45.6	2.68	51.96	17	19.37
Head of the S-19	0.01	0.02	190	3.8	0.22	4.33	17	19.37
Head of the S-17	0.72	1.44	190	273.6	16.09	311.74	17	19.37
Head of the J-3	0.2	0.4	190	76	4.47	86.60	17	19.37
Head of the N-10	0.1	0.2	190	38	2.24	43.30	17	19.37
Head of the N-7	0.14	0.28	190	53.2	3.13	60.62	17	19.37
Head of the N-4	0.02	0.04	190	7.6	0.45	8.66	17	19.37
Head of the N-5	0.26	0.52	190	98.8	5.81	112.57	17	19.37
Head of the S-22	0.55	1.1	190	209	12.29	238.14	17	19.37
Tail of the S-22	0.01	0.02	190	3.8	0.22	4.33	17	19.37
W Flow	0.06	0.12	190	22.8	1.34	25.98	17	19.37
			Totals:	**5909**	**347.59**	**6732.78**		

Project Location Map

This is a direct link to Google maps with all of the marked locations for the proposed SCADA sites.
https://www.google.com/maps/d/edit?mid=13pxs7Lrq9gQmjdxjJ5gbKBM7XitZrNo&usp=sharing