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Attorneys for City of Nampa

BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF RIVERSIDE'S PETITION FOR DECLARATORY RULING REGARDING NEED FOR A WATER RIGHT UNDER REUSE PERMIT NO. M-255-01	Docket No. P-DR-2020-01 **REUSE PROPONENTS' SUBMISSION OF EXHIBIT J**

Pursuant to *Reuse Proponents' Stipulation of Facts*, the Association of Idaho Cities ("AIC"), the Cities of Boise, Caldwell, Idaho Falls, Jerome, Meridian, Nampa, Pocatello, Post Falls, and Rupert, and the Hayden Area Regional Sewer Board ("HARSB") (collectively, "Municipal Intervenors") and Pioneer Irrigation District ("Pioneer") hereby submit true and correct copy of the documents identified below. Municipal Intervenors and Pioneer are referred to collectively as "Reuse Proponents."

Respectfully submitted this 30th day of June, 2020.

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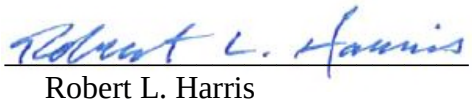

Robert L. Harris

Attorneys for City of Idaho Falls

I HEREBY CERTIFY that on this 30th day of June, 2020, the foregoing was filed, served, and copied as shown below.

DOCUMENT FILED:

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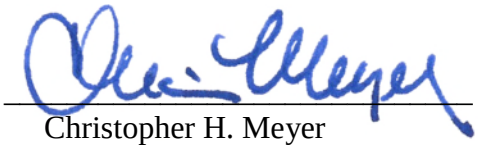

Christopher H. Meyer

Tom Points, P.E.
Public Works Director

Sheri L. Murray
Executive Assistant

March 19, 2019

Ms. Valerie Greer
Idaho Department of Environmental Quality
Boise Regional Office
1445 North Orchard Street
Boise, ID 83705

Subject: City of Nampa Recycled Water Reuse Application

Dear Ms. Greer:

The City of Nampa (City) has identified a recycled water reuse program as the preferred alternative for wastewater treatment plant upgrades. The City arrived at this decision through the recently completed wastewater facility planning process. Facility planning efforts included public engagement through development of the Nampa Wastewater Advisory Group (NWAG) and the Industrial Working Group (IWG). The NWAG and IWG worked to identify priorities for the City's water re-sources and capital investment in the next generation of wastewater treatment for Nampa. These groups overwhelmingly supported pursuing a recycled water program due to the positive community outcomes and environmental benefits.

The City has prepared the materials in the attached application, preliminary technical report, and plan of operations to provide the Idaho Department of Environmental Quality (IDEQ) with information necessary to develop a permit for this reuse project.

Benefits of Reuse
The proposed recycled water reuse project for the Nampa Wastewater Treatment Plant (WWTP) enjoys broad support from the Nampa community, Mayor Kling, and Nampa City Council. City leadership has specifically shown support for water reuse through the following directives passed down to the City's wastewater program:

- Develop a recycled water program for Nampa to maximize the value of Nampa's treated water
- Look for opportunities to maximize the amount of water reused through a combination of industrial and irrigation reuse

The City has also recently committed financially to the next phase for WWTP improvements through the Nampa Sewer Bond Election on May 15, 2018. The sewer bond passed with an 87 percent yes vote. The focal point of the sewer bond funding stressed pursuing opportunities for industrial and irrigation reuse to make the most of the City's available water resources. Recycled water reuse for irrigation source augmentation is the first step in a potential broader water reuse approach.

This project also benefits the Pioneer Irrigation District (PID), Nampa's partner in the irrigation reuse strategy. PID delivers irrigation water to approximately 34,000 acres in western Ada and Canyon Counties, including the City's pressurized irrigation system. In recent years, PID has seen the impacts of changing flow regimes in its supplies as more rural lands are developed for housing and as the climate swings drastically from drought conditions forcing early shutoffs to spring flooding due to excess storage volume in the reservoirs. The consistent discharge from the WWTP provides stability to PID irrigation users and resiliency to the irrigation water supply. Below the proposed recycled water discharge point, the Phyllis Canal distributes irrigation water to approximately 17,000 acres north to the Riverside Canal in Caldwell and west to Greenleaf. The City and PID have entered into an agreement for reception and use of Class A recycled water from the City to the Phyllis Canal at flows up to 41 cubic feet per second.

Water quality benefits to Indian Creek are also realized through eliminating the Nampa WWTP discharge during the summer months. Routing recycled water to Phyllis Canal decreases total phosphorus loading to Indian Creek and the Lower Boise River each year from May 1 through September 30. The recycled water discharge to Phyllis Canal also eliminates thermal loading from the Nampa WWTP during months when Indian Creek is impaired for temperature.

Proposed Permit Requirements

The City proposes to meet the following recycled water effluent limits at the discharge to Phyllis Canal for use as agricultural and municipal irrigation supply augmentation.

Standard requirements for Class A recycled water including oxidized, clarified, and disinfected recycled water are proposed for operations under a reuse permit. Class A recycled water protects the beneficial uses of water in the Phyllis Canal. Water not meeting Class A standards will be discharged to Indian Creek under the Nampa Wastewater NPDES Permit. Class A requirements are also in-line with the approach of other, similar recycled water systems.

Temperature limits are not required in the recycled water reuse permit; and since the intended use of Phyllis Canal is agricultural and municipal irrigation, the intended uses are not affected by water temperature. Having no temperature limit on the recycled water allows the City to avoid integrating chillers into the treatment system at the Nampa WWTP and mitigates the adverse effects of this energy intensive process. Avoiding unnecessary temperature control is critical for the feasibility of a recycled water program for the City.

The City proposes a total nitrogen limit of 30 mg/l for the recycled water discharge to Phyllis Canal. This limit is consistent with requirements for non-groundwater recharge Class A recycled water. Background concentrations of nitrogen in the Phyllis Canal are comparatively low at less than 2 mg/l. Mixing the recycled water discharge with the Phyllis Canal irrigation water results in a canal concentration around 5 mg/l.

The City proposes a total phosphorus limit of 0.35 mg/l for discharge to the Phyllis Canal. Canal background water quality has consistently been measured at or below this limit, so average water quality in the canal is not expected to exceed this concentration. Changing the receiving water for the

City's phosphorus load during the summer months from Indian Creek to the Phyllis Canal removes phosphorus from the Indian Creek and Lower Boise River system and provides an opportunity for the phosphorus to be beneficially used as the irrigation water is applied to crops and lawns throughout the PID service area. This proposed limit allows for a more economical filtration approach with consistent operation throughout the year and removes more total phosphorus than the total maximum daily load requires.

Considering the use for the Class A recycled water as agricultural and municipal irrigation supply augmentation, the City believes the end of the distribution pipe to Phyllis Canal is the most appropriate compliance point. This compliance point establishes a clear distinction between recycled water and irrigation water and limits signage requirements for the system. Once the water enters the canal it is considered irrigation water and is used as such downstream from the discharge.

The City is currently planning for a compliance deadline of 2026 for total phosphorus reduction in wastewater effluent and a 2031 deadline for temperature. Because of the design and construction of improvements necessary at the Nampa WWTP, the recycled water program will not start up until 2026 at the earliest. However, the City needs the certainty of a recycled water reuse permit in hand before beginning the design process. Therefore, the City requests a 10-year permit term coinciding with the City's National Pollutant Discharge Elimination System permit timing. The first renewal would be in 2031.

The City also hopes to maintain close communication and collaboration with the IDEQ throughout the application review and permit development process. Should you have any questions during review, or wish to schedule a meeting, please do not hesitate to contact me or Nate Runyan, Deputy Public Works Director (Water), at 208-468-4493.

Sincerely,

Tom Points, P.E.
Public Works Director

ec: Nate Runyan, P.E., City of Nampa
Matt Gregg, P.E., Brown and Caldwell

Enclosure

Recycled Water Reuse Permit Application

Contents

Figures:

Appendices:

March 19, 2019

Idaho Department of Environmental Quality

Regional Office Contact

Name, title: Valerie Greer, Lead Reuse Engineer

Regional office: Boise Regional Office

Address: 1445 N. Orchard St., Boise, ID, 83705

Phone/e-mail: 208-373-0459/Valerie.Greer@deq.idaho.gov

1. Application for Recycled Water Reuse Permit

Instructions: Complete the following form and attachments as completely as possible. Failure to provide sufficient information will delay processing of the application and final action on the permit. A pre-application meeting between the applicant and Idaho Department of Environmental Quality (DEQ) is strongly encouraged to discuss site-specific issues and level of detail needed. If clarification is needed, contact DEQ's Boise Regional Office at (208) 373-0550.

Type of application (attach appropriate checklists) New ☒ Renewal ☐: Permit No.: Major modification ☐ Minor modification ☐ Waiver ☐	
Legal name of applicant:	City of Nampa
Responsible Official and title (see Form A for definition of Responsible Official and Authorized Representative)	Tom Points, Public Works Director
Authorized Representative and title (attach Form A for designating Authorized Representative)	Andy Zimmerman, Wastewater Superintendent
Mailing address:	411 3rd St S, Nampa, ID 83651
Facility address, if different:	340 W Railroad St., Nampa, ID, 83867
Phone/fax:	(208) 465-2200
E-mail address:	pointst@cityofnampa.us
Company Internet address:	www.cityofnampa.us
Attachments (check all that apply): ☒ Form A ☒ Section 2. Facility Information ☒ Section 3. Plan of Operation Checklist/Preliminary Technical Report Checklist ☒ Preliminary Technical Report ☒ Plan of Operation ☒ Other: Cover Letter	
"I certify that the information provided in this submittal is, to the best of my knowledge, true, accurate and complete and I acknowledge that knowing submission of false or incomplete information may result in permit revocation as provided for in IDAPA 58.01.17.920.01, non-issuance of the permit, or other enforcement action as provided for under Idaho law." Signature of Responsible Official:	
Title: Public Works Director	
Date: 03/19/19	

Form A: Responsible Official/Duly Authorized Representative Designation Form

Use the following form to specify facility contacts.

Permittee name: Nampa Wastewater Treatment Plant	
Permit number: N/A	
I hereby certify that I am qualified to be the responsible official for the above-named permittee.	
Specifically, I,	
☐	am an officer of the corporation.
	My title is:
☐	perform policy or decision-making functions similar to that of an officer of the corporation.
	Explain:
☐	am a general partner in a partnership.
☐	am the owner of a sole proprietorship.
☒	am a principal executive officer, ranking elected official, or a person of decision-making authority of a municipality, state, federal, or other public agency who can legally bind the permittee with respect to the permit.
	My office/title is: City of Nampa Public Works Director
	My agency is: City of Nampa, ID
I hereby designate the following person or position title as a duly authorized representative: Andy Zimmerman, City of Nampa Wastewater Superintendent	
I certify that the individual filling this position is responsible for the overall operation of the regulated facility or an individual having overall responsibility for environmental matters.	
Signature of responsible official:	
Signature of duly authorized representative designee:	
Date:	

The Responsible Official is the facility contact person authorized by the permittee to communicate with DEQ on behalf of the permittee on any matter related to the permit, including without limitation, the authority to communicate with and receive notices from DEQ regarding notices of violation or noncompliance, permit violations, permit enforcement, and permit revocation.

The Responsible Official is responsible for providing written certification of permit application materials, annual report submittals, and other information submitted to DEQ as required by the permit. Any notice to or communication with the responsible official is considered a notice to or communication with the permittee.

The Responsible Official may designate an Authorized Representative to act as the facility contact person for any of the activities or duties related to the permit, except signing and certifying the permit application, which must be done by the Responsible Official.

The designated Authorized Representative shall act as the Responsible Official and shall bind the permittee as described above. The designation of an Authorized Representative must a) be made in writing by the Responsible Official and attached to the permit application using Form A and b) specify an individual having responsibility for the overall operation of the regulated facility, such as the plant manager, superintendent, or an individual having overall responsibility for environmental matters.

2. Facility Information

Type of facility from which wastewater is generated	Municipal, Class A facility
Types of wastewater produced	- Domestic wastewater from the City of Nampa - Pretreated industrial wastewater from food processing and manufacturing industries
Method(s) of wastewater treatment	Headworks, primary clarification, activated sludge secondary treatment, secondary clarification, tertiary filtration (in design phase), and disinfection
For municipal wastewater systems, provide and collection and treatment system classifications. Refer to IDAPA 58.01.16.202.01.a located at: *Wastewater Rules*	Collection: Class level IV Treatment: Class level IV Classification Forms that were submitted for recent plant upgrades are included at the end of this application form
For municipal wastewater treatment, designate "class" of recycled water generated and method(s) of reuse	☒Class A ☐Class B ☐Class C ☐Class D ☐ Class E Class A recycled water provided for municipal and agricultural irrigation supply augmentation
For industrial wastewater treatment, describe the different types of recycled water streams generated and method(s) of reuse	N/A
Facility ownership	☒ Public (specify type): POTW ☐ Private
Site elevation (feet above sea level)	2,420 ft amsl to 2,465 ft amsl
USGS Quadrangle	Area of analysis is mostly located within the Nampa and Caldwell quadrangles. Also includes portions of the Lake Lowell and Notus quadrangles.
Legal location (township, range, section)	Nampa WWTP: Nampa Quadrangle: Section 16, T3N R2W Proposed discharge locations to Phyllis Canal: 1A: Section 22, T3N, R2W 1B: Section 22, T3N, R2W 2A: Section 21, T3N, R2W 2B: Section 21, T3N, R2W 3: Section 21, T3N, R2W
County	Canyon
Representative soil profile for method of reuse	Soils in the area of analysis consist primarily of silt loams including Power, Greenleaf-Owyhee, Purdam, Bram series, and Baldock loam. An overview of these soils is included in Section 6.3 of the Preliminary Technical Report.

Seasonal high ground water, if available	Depth to seasonal high ground water: 5 to 35 ft below ground surface (bgs) Season encountered: Summer An overview of groundwater is included in Section 6.6 of the Preliminary Technical Report
Depth, thickness, and flow direction of aquifer(s) located at or near the reuse facility	Shallow aquifer may extend to 250 ft bgs across the area of analysis. Deep aquifer may be confined or unconfined below 250 ft bgs. Both aquifers flow to the west or northwest. More information on the aquifer system is included in Section 6.6 of the Preliminary Technical Report.
Beneficial uses of ground water **(Check all that apply)**	☒ Agriculture ☒ Industrial ☒ Domestic ☐ Aquaculture ☐ Other (identify):
Nearby surface water(s) and distance(s) to nearest reuse area	Indian Creek Distance to nearest reuse area: Area of analysis includes two drains that return to Indian Creek. See discussion of surface water in Section 6.5 of the Preliminary Technical Report and the conceptual diagram of surface waters and irrigation conveyances in Figure 8.
Beneficial uses of surface water **(Check all that apply)**	☐ Agriculture ☐ Industrial ☐ Domestic ☐ Aquaculture ☐ Aquatic life ☐Salmonid spawning ☐ Primary Recreation ☐ Secondary Recreation ☒ Other (identify): Agricultural and Municipal Irrigation Supply Note: Beneficial uses of surface water are listed in the Water Quality Rules, 58.01.16, sections 110 through 160.
Operator Certification Requirements (for municipal systems only)	Operators at the Nampa WWTP are licensed in accordance with IDAPA 24.05.01. Andy Zimmerman and Shannon Johnson, are certified level IV operators.
Engineer/consultant that prepared application documents: Firm Person(s) Address Phone/fax/email	Brown and Caldwell Andy Weigel, P.G. 950 W Bannock Suite 350 Boise, ID 83702 Phone: 208-389-7730 Fax: 208-389-7750 Email: aweigel@brwncald.com

3. Plan of Operation Checklist/Preliminary Technical Report Checklist

For facilities with an existing reuse permit, use these checklists as a guide to update your plan of operation and prepare a preliminary technical report for submittal with the permit application. A pre-application workshop will be held one year prior to permit expiration to discuss permit application requirements and answer questions regarding application content.

For facilities applying for a new reuse permit, provide an outline of the plan of operation with the permit application. If reuse facilities are in the design and construction phase, submit a detailed plan of operation at the 50% completion point of construction. After 1 year of operating the reuse facility, the plan must be updated to reflect actual operating procedures. A pre-application workshop between the applicant and DEQ is *strongly encouraged*.

Consult the DEQ Guidance or other information source listed in the right-hand column of the checklists for assistance in developing the plan of operation or preliminary technical report. If additional clarification is needed, contact your DEQ regional office.

The preliminary technical report is the core of the application. This report shall describe how the facility will comply with the "Recycled Water Rules" (IDAPA 58.01.17) and conform to DEQ guidance (*Guidance for Reclamation and Reuse of Municipal and Industrial Wastewater*). The application should include those checklist items **as applicable and necessary to characterize the wastewater treatment and reuse systems.**

Plan of Operation and Preliminary Technical Report Checklists

Plan Section and Requirements	Plan of Operation	Prelim. Technical Report	DEQ Guidance Section No. or other source of information
Section 1. Operation and Management Responsibility			
a. Attach organizational chart showing positions responsible for operation and maintenance of wastewater treatment and reuse systems. For municipal systems, include operator training and certification requirements, certification credentials for operators, and any other operator certification information.	X	X	Classification and Licensure
b. Describe operator and manager responsibilities.	X		
c. Describe process for updating the plan of operation as operational and/or facility changes occur.	X		
d. If a party other than the applicant operates and maintains any portion of the wastewater treatment or recycled water reuse system, provide a copy of the signed contract or agreement. The contract or agreement must contain language outlining how the system will be operated to meet the conditions and requirements of the reuse permit.		X	

Plan Section and Requirements	Plan of Operation	Prelim. Technical Report	DEQ Guidance Section No. or other source of information
Section 2. Permits and Other Regulatory Requirements			
a. Attach copies of the reuse permit, National Pollutant Discharge Elimination System (NPDES) permit, planning and zoning conditional use permits, and all other applicable permits, licenses, and approvals.	X	X	NPDES Permits in Idaho
b. List applicable ordinances, rules, statutes, and standards.	X		
Section 3. Land Application Site			
a. A topographic map identifying and showing the location and extent of wastewater inlets, outlets, and storage structures and facilities, land application area, wells, springs, wetlands, surface waters, FEMA floodplains, service roads, natural or man-made features necessary for treatment, buildings and structures, and process chemical and residue storage facilities. See 58.01.17.300.03.e	X	X	Recycled Water Rules
b. A topographic map extending ¼ mile beyond the outer limits of the facility site identifying and showing the location and extent of wells, springs, wetlands, surface waters, public and private drinking water supply sources, applicable source water assessment areas, public roads, dwellings, and public gathering places. See 58.01.17.300.03.f	X	X	Recycled Water Rules
c. Description of and a regional map showing important land features (cities, major roads, major surface water bodies, county/state lines) in relation to the reuse facility.		X	
d. A scaled map showing hydraulic management units (HMUs) and associated acres, ground water monitoring wells, and wastewater and recycled water lagoons.	X	X	
e. A scaled map showing the recycled water and supplemental water (if used) irrigation system, including piping, appurtenances, and the type & efficiency of irrigation system used for each HMU.	X	X	
f. Description of land uses adjacent to reuse facility.		X	
g. Identify ownership of the reuse sites, including documentation. If not owned by the applicant, include copies of leases and agreements for the reuse sites. For leased or rental reuse sites, provide a signed agreement between applicant and landowner that clearly states the applicant will have sufficient control of the site to meet reuse permit requirements.		X	
Section 4. General Plant Description			
a. Describe wastewater treatment design basis and/or criteria.	X	X	
b. Describe wastewater treatment processes and/or unit operations used to generate recycled water for reuse, including design capacities. For municipal systems, include disinfection processes and disinfection level. (See 58.01.17.601 for municipal recycled water classifications)	X	X	Municipal Disinfection Class

Plan Section and Requirements	Plan of Operation	Prelim. Technical Report	DEQ Guidance Section No. or other source of information
c. Provide plot plans and process and instrumentation diagrams. (P&IDs)	X	X	
d. Provide hydraulic profile, including key inverts and elevations.	X		
e. Characterize wastewater and recycled water streams, including daily, monthly, & annual flow rates, seasonal variability, chemistry and microbiology. Provide source of data for this characterization.	X	X	Guidance 3.1, 3.2, 3.3, 3.4
f. Describe wastewater treatment and reuse system efficiencies.	X		
Section 5. Description, Operation, and Control of Unit Operations and Processes			
a. Describe unit operation/process purpose and control strategy.	X		
b. Describe normal operations. (e.g., flow patterns, typical process and reuse system flow rates, and sludge production rates)	X		
c. Describe process monitoring and control systems.	X		
d. Provide operating instructions for equipment with reference to manufacturer's operation and maintenance (O&M) manuals, standard operating procedures (SOPs), or other applicable documents.	X		
e. Discuss common operating problems and solutions. (troubleshooting guide)	X		
f. List laboratory tests for process control.	X		
g. List laboratory tests for compliance determination.	X		
h. Describe start-up procedures.	X		
i. Provide emergency operating plans and procedures.	X		
Section 6. Wastewater and Recycled Water Treatment and Storage Lagoons			
a. Describe all treatment and storage ponds and lagoons, including date constructed, purpose, capacity, liner material, last seepage rate test date and result, scheduled seepage rate tests, and operating parameters (e.g., minimum freeboard and minimum depth).	X	X	Guidance 6.3
b. Describe lagoon maintenance.	X		Guidance 6.3.4
c. Sludge accumulation monitoring	X		
Section 7. Reuse Site Features and Characteristics			
a. Describe fencing and posting (signs) used on each HMU. Fencing and posting guidance is shown in Tables 6.4 and 6.5 of the Guidance.	X	X	Guidance 6.5
b. Describe backflow prevention equipment for each irrigation well, domestic well and public water system that has an interconnection with a wastewater, recycled water system, or other source of contamination.	X		

Plan Section and Requirements	Plan of Operation	Prelim. Technical Report	DEQ Guidance Section No. or other source of information
c. Climatic characteristics – provide meteorological data of the site, including precipitation, high and low temperature data, frost-free days, and wind speed and direction.		X	Guidance 2.1.1, 4.1.1.1
d. Soils i. Describe the soil types present at all reuse sites. Use Natural Resources Conservation Service (NRCS) soil survey information if available or site-specific information, ii. provide and interpret available soil monitoring results, and iii. for sites applying or proposing to apply during the non-growing season, provide calculations used to determine acceptable non-growing season hydraulic loading rates. (See Guidance Section 4.4.9)		X	Guidance 2.1.2, 4.4.9, 7.4.3
e. Topography – describe configuration of land surface: elevation, slope, relief, and aspect and the relationship to land application design.		X	Guidance 2.1.3
f. Surface Water i. Identify and describe the location of surface water(s) located near the wastewater treatment and reuse sites. ii. List applicable DEQ beneficial uses of surface water. (See 58.01.02, sections 110 through 160) iii. Describe the influence of the wastewater treatment system and reuse site on nearby surface waters.		X	Beneficial Uses of Surface Water
g. Ground Water i. Describe the ground water conditions including depth to first water, depth to regional ground water, confined or unconfined (if known), ground water flow direction, and seasonal variations in depth or flow direction. ii. Describe the ground water monitoring well network, including location, depth, construction, completion, lithology, and aquifer parameters for each monitoring well (attach well logs). Describe the gradient position of each monitoring well and the purpose it serves in the network. Identify wells that no longer produce samples. iii. Provide the location of public wells, private wells, irrigation wells, and injection wells located within a one-quarter mile of the reuse site(s). Include copies of well logs if available. iv. Conduct a well location acceptability analysis for the wells identified. (see Guidance Section 6.6.4) v. Provide and interpret ground water monitoring or modeling results.		X	Guidance 2.1.4, 6.6, 7.1, 7.2, 7.7.4

Plan Section and Requirements	Plan of Operation	Prelim. Technical Report	DEQ Guidance Section No. or other source of information
Section 8. Reuse Site Loading Rates			
a. Describe how the facility tracks recycled water and irrigation water hydraulic loading for each HMU.	X	X	Guidance 4.1, 7.5.2.2
b. Provide the design and typical recycled water and irrigation water hydraulic loading rates by month for each HMU and the basis used to establish design rates.	X	X	Guidance 4.1.1
c. Describe irrigation scheduling methods and practices used.	X	X	Guidance 4.1.1.2
d. Describe the source(s) of supplemental irrigation water and typical hydraulic loading rate by month.	X	X	Guidance 4.1.1.2.1, 4.1.1.2.2
e. Attach documentation of water rights for supplemental irrigation water (if used). Confirm water rights, in combination with recycled water volume are sufficient to meet crop water needs.	X	X	
f. Describe non-growing season application practices.	X		Guidance 4.1.2
g. If storage ponds/lagoons are used, include monthly water balances for the storage system, including all inputs and outputs to demonstrate sufficient capacity is provided for the system.	X	X	
h. Describe how the facility calculates and manages loading rates for relevant constituents (e.g., nitrogen, phosphorus, chemical oxygen demand, NVDS) for each HMU. Loading rate information should identify respective loadings from each source, such as recycled water, waste solids, and fertilizers.	X	X	Guidance 4.2.1, 4.2.2
i. Identify the land limiting constituent for the land application system.	X	X	Guidance 4.
Section 9. Reuse Site Vegetation			
a. Cropped sites: describe the crop rotation plan. Include crop type, approximate planting and harvest dates, expected yield, expected crop uptake values for relevant constituents, method used to calculate crop uptake, anticipated commercial fertilizers application rates, any other anticipated source of nutrients or constituents of concern, irrigation water requirement (IWR) for each crop type and the basis used to determine IWR.	X	X	Guidance 2.2
b. Silvicultural (forest) site: describe dominant forest and understory species, respective percentage of the site occupied by each, and age class and successional stage of the forest. Describe management of forested sites. Include pest and weed control, harvest, thinning, new planting, and anticipated dates of these operations.	X	X	Guidance 2.2.2
c. Native vegetation site: describe dominant vegetation species and respective percentage of the site occupied by each. Describe the management of sites with native vegetation, including pest and weed control and other operations, if any, and anticipated dates of these operations.	X	X	

Plan Section and Requirements	Plan of Operation	Prelim. Technical Report	DEQ Guidance Section No. or other source of information
Section 10. Reuse Site Management			
a. Site management history – describe past uses and management of reuse sites including important events and dates, agronomic practices, and other relevant land use practices.		X	
b. Compliance Activities: If applying for a permit modification or renewal, provide a summary of the status of each compliance activity in the existing permit.		X	
c. Site Management Plans - If the site has previously developed management plans listed below (or other site-specific plans), provide updated plans as necessary to reflect current operations. For new sites or if the applicable management plan(s) have not been developed for existing sites, prepare the following plans:	X	X	
i. Buffer Zone Plan – Address buffer zones for dwellings, areas of public access, surface waters, private and public water sources, and irrigation and monitoring wells. Compare proposed or existing buffer zone distances with DEQ guideline buffer distances and describe any proposed mitigation measures to reduce buffer zone distances. Include a scaled map showing buffer zones (existing or proposed).	X	X	Guidance 6.5, 6.6
ii. Grazing management: describe planned grazing activities, including type and number of animals, grazing rotation, and time of year.	X	X	Guidance 6.4
iii. Nuisance management: describe administrative and engineering controls to prevent nuisance conditions, such as odors, overspray, vector attraction, and noise. Include specific design considerations, operation and maintenance procedures, and management practices to be employed. Describe procedures for handling and responding to complaints about facility-caused nuisances.	X	X	Guidance 2.3.2 Air Quality Pollutants and Odors
iv. Waste solids management: describe type and quantity of waste solids generated, process by which wastes are generated, physical and chemical characteristics, and waste storage systems. Describe disposal or recycling of these wastes, identify locations of disposal or recycling sites, and discuss criteria for selecting these sites. (See 58.01.16.650 of the Wastewater Rules). Waste solids management plans should be submitted prior to stock-piling, disposal, or reuse for DEQ review and approval.	X	X	Sludge and Biosolids Wastewater Rules
v. Nonvolatile Dissolved Solids (NVDS) Management Plan – Systems with high NVDS (referred to as salts) loading rates may cause elevated ground water total dissolved solids (TDS) levels. The NVDS management plan is used to identify sources of salt and reduce NVDS-loading rates as necessary to satisfy the *Ground Water Quality Rule*, IDAPA 58.01.11.	X	X	Guidance 4.2.2.5

Plan Section and Requirements	Plan of Operation	Prelim. Technical Report	DEQ Guidance Section No. or other source of information
vi. Runoff management: describe administrative and engineering controls and best management practices used to prevent runoff of recycled water from the reuse site. Include provisions/practices to prevent run-on of storm water onto reuse sites.	X	X	Guidance 4.1.3
vii. Weed management.	X		Guidance 6.8
Section 11. Quality Assurance Project Plan			
Prepare and implement a quality assurance project plan (QAPP) to assist in planning for collection, analysis, and reporting of all monitoring in support of permit and explaining data anomalies when they occur. At a minimum, the QAPP must include the following: i. Number of measurements, number of samples, type of sample containers, preservation of samples, holding times, analytical methods, analytical detection, and quantitation limits for each target compound, type and number of quality assurance field samples, precision and accuracy requirements, sample preparation requirements, sample shipping methods, and laboratory data delivery requirements. ii. Maps indicating the location of each monitoring and sampling point. iii. Personnel qualification and training. iv. Names, addresses, and telephone numbers of the laboratories used by or proposed to be used by the permittee. v. Example formats and tables that will be used by the permittee to summarize and present all data in the annual report. The QAPP format and content should adhere to recommendations and references in the quality assurance and data processing sections of the DEQ guidance. Note: For existing facilities having a QAPP, include with the preliminary technical report. For new facilities, QAPP requirements will be discussed during the pre-application conference.		X	Guidance 7.1.5, 7.1.6, 7.1.7
Section 12. Monitoring Activities			
a. Describe recycled water monitoring.	X	X	Guidance 7.5, 7.7.8
b. Describe supplemental irrigation water monitoring.	X	X	Guidance 7.5
c. Describe ground water monitoring.	X	X	Guidance 7.2, 7.7.3.1, 7.7.4
d. Describe soil monitoring.	X	X	Guidance 7.4, 7.7.6, 7.7.7
e. Describe crop tissue monitoring.	X	X	Guidance 7.6, 7.7.9
f. Describe any other monitoring (e.g., meteorological and vadose zone).	X	X	Guidance 7.3, 7.7.5

Plan Section and Requirements	Plan of Operation	Prelim. Technical Report	DEQ Guidance Section No. or other source of information
Section 13. Maintenance			
Provide maintenance information, including the following: preventative maintenance schedules; troubleshooting charts and guides; maintenance record system; location of manufacturer's manuals; management of spare parts inventory; vendors, outside contractors and suppliers.	X		
Section 14. Records and Reports			
a. Provide general overview of records kept, recordkeeping system, and reports generated.	X		
b. Describe daily operating logs and provide examples.	X		
c. Describe laboratory records and reports and provide examples.	X		
d. Describe reporting procedures for permit violations.	X		

IDAHO PUBLIC WASTEWATER TREATMENT PLANT CLASSIFICATION WORKSHEET

OFFICE USE DO NOT WRITE HERE
System Class _____
Upgrade ___ STD 5 Yr ___
Approved by _____
Date_____

Name of System:_____

Legal Owner of Treatment System _____

System Address: _____

City: _____ **State:**_____ **Zip Code:** _____

Contact Person:_____ **Title:** _____

Business Phone Number: (___)_____ **Email** _____

Treatment System - Design Flow/Actual Flow ____/____
(MGD) (MGD)

Treatment Plant Classification Worksheet is (Check one):

☐ **Initial System Rating** ☐ **System Upgrade** ☐ **Standard 5 Year Rating**

Date of last system classification rating (if applicable) _____

☐ **Attach a flow schematic or hydraulic flow diagram of the treatment facility to this treatment plant classification worksheet when submitting to DEQ.**

Instructions:

Use this rating form for all types of public wastewater treatment plants, facilities, or systems[D-16] that treat domestic and/or industrial wastewater including, but not limited to traditional biological and mechanical treatment processes, large soil absorption systems, community drainfields, and wastewater lagoon systems. Fill out ONE form for the wastewater treatment facility including all sequential, parallel or multiple treatment processes for both effluent and solids that provide treatment of all wastewater introduced into the system.

How to Assign Points:

Evaluate each item listed in the table below and place the specified point value next to each item selected. *Each unit process should have points assigned only once* .Add the total number of points selected to determine the class of the treatment system. Definitions describing all configurations, names, and/or reasons why rating points are or are not assigned to a particular item are provided for those items with a small D-number behind the item, i.e. D-1. Check the definition if unsure whether a particular treatment plant process qualifies for the point value shown.

Treatment facilities will be classified as VSWW, Class I, Class II, Class III or Class IV with IV being the largest and most complex. *Mail the completed, signed form to the Department of Environmental Quality 1410 N. Hilton, Boise, ID 83706 Attention: Mike May. Keep a photocopy of the original form for your files.*

Item	Points	Your System
System Size (2 to 20 points)		
Number of Connections (for information only)	(not scored)	
Maximum population served, peak day (1 point minimum to 10 point maximum)	1 point/10,000 or part	

Item	Points	Your System
Design flow (average/day) or peak months (average/day) Whichever is larger (1 point min to 10 point max)	1 point/MGD or part	
Variation in Raw Waste (0 to 6 points) [1]		
Variations do not exceed those normally or typically expected	0 points	
Recurring deviations/excessive variations of 100% to 200% in strength/flow	2 points	
Recurring deviations/excessive variations of more than 200% in strength/flow	4 points	
Raw wastes subject to toxic waste discharges	6 points	
Impact of septage of truck-hauled waste (0 to 4 points)	0-4 points	
Preliminary Treatment Process		
Plant pumping of main flow	3 points	
Screening, comminution	3 points	
Grit removal	3 points	
Equalization	1 point	
Primary Treatment Process		
Primary clarifiers	5 points	
Imhoff tanks, septic tanks, or similar (combined sedimentation/digestion)[D-8]	5 points	
Secondary Treatment Process		
Fixed-film reactor[D-7]	10 points	
Activated sludge[D-1]	15 points	
Stabilization ponds or lagoon without aeration	5 points	
Stabilization ponds or lagoon with aeration	8 points	
Membrane Biological Reactor (MBR) – Basic MBR which combines activated sludge (minus secondary clarification) and membrane filtration.[D-17]	15 points	
Tertiary Treatment Process		
Polishing ponds for advanced waste treatment	2 points	
Chemical/physical advanced waste treatment w/o secondary[D-5]	15 points	
Chemical/physical advanced waste treatment following secondary[D-4]	10 points	
Biological or chemical/biological advanced waste treatment[D-2]	12 points	
Nitrification by designed extended aeration only	2 points	
Ion exchange for advanced waste treatment	10 points	
Reverse osmosis, electrodialysis and other membrane filtration techniques for advanced waste treatment	15 points	
Advanced waste treatment chemical recovery, carbon regeneration	4 points	
Media filtration (removal of solids by sand or other media) [D-13]	5 points	
Additional Treatment Processes		
Chemical additions (2 points each for a max of 6 points)[D-3]	0-6 points	
Dissolved air floatation (for other than sludge thickening)	8 points	
Intermittent sand filter	2 points	
Recirculating intermittent sand filter	3 points	
Microscreens	5 points	
Generation of oxygen	5 points	
Solids Handling		
Solids stabilization (used to reduce pathogens, volatile organic chemicals &		

Item	Points	Your System
odors include lime or similar treatment and thermal conditioning)[D-15]	5 points	
Gravity thickening	2 points	
Mechanical dewatering of solids[D-11]	8 points	
Anaerobic digestion of solids	10 points	
Aerobic digestion of solids	6 points	
Evaporative sludge drying	2 points	
Solids reduction (including incineration, wet oxidation)	12 points	
On-site landfill for solids	2 points	
Solids composting[D-14]	10 points	
Land application of biosolids by contractor [D-9]	2 points	
Land application of biosolids by facility operator in responsible charge	10 points	
Disinfection (0 to 10 points maximum)		
No disinfection	0 points	
Chlorination (including chlorine dioxide or chloramines) or ultraviolet irradiation	5 points	
Ozonation	10 points	
Effluent Discharge (0 to 10 points maximum)		
No discharge	0 points	
Discharge to surface water receiving stream[D-6]	0 points	
Mechanical post aeration[D-12]	2 points	
Land treatment with surface disposal or land treatment with subsurface disposal [D-10]	4 points	
Direct recycle and reuse	6 points	
Instrumentation (0 to 6 point maximum)		
SCADA or similar instrumentation systems to provide data with no process operation	0 points	
SCADA or similar instrumentation systems to provide data with limited process operation	2 points	
SCADA or similar instrumentation systems to provide data with moderate process operation	4 points	
SCADA or similar instrumentation systems to provide data with extensive or total process operation	6 points	
Laboratory Control (0 to 15 point maximum) [2]		
Bacteriological/Biological Laboratory Control (0 to 5 point maximum)		
Lab work done outside the treatment plant	0 points	
Membrane filter procedures	3 points	
Use of fermentation tubes or any dilution method; fecal coliform determination	5 points	
Chemical/Physical Laboratory Control (0 to 10 point maximum)		
Lab work done outside the treatment plant	0 points	
Push-button or visual (colorimetric) methods for simple tests such as pH, settleable solids	3 points	
Additional procedures such as DO, COD, BOD, gas analysis, titrations, solids, volatile content	5 points	
More advanced determinations such as specific constituents; nutrients, total		

Item	Points	Your System
oils, phenols	7 points	
Highly sophisticated instrumentation such as atomic absorption, gas chromatography	10 points	
TOTAL POINTS FOR YOUR SYSTEM		

System Classification Key			
*VSWWS***		*Class II*	*31 to 55 points*
Class I	*30 points or less*	*Class III*	*56 to 75 points*
Class IV	76 points or greater		
YOUR SYSTEM CLASSIFICATION		**VSWWS, I, II, III, IV (Circle one)**	

Footnote [1] The key concept is frequency and/or intensity of deviation or excessive variation from normal or typical fluctuations; such deviation can be in terms of strength, toxicity, shock loads, I/I, with points from 0-6.

Footnote [2] The key concept is to credit laboratory analyses done on-site by plant personnel under the direction of the operator in direct responsible charge with points from 0-15.

**The Very Small Wastewater System Classification is applicable to a system comprised of one of the following wastewater treatment processes: aerated lagoon (s); non-aerated lagoon(s); primary treatment; or LSAS.

_____/_____

Signature of Legal Owner or Owner's Representative Date

Wastewater Treatment Definitions

D-1. **Activated Sludge** - Wastewater treatment by aeration of suspended organisms followed by secondary clarification, including extended aeration, oxidation ditches, Intermittent Cycle Extended Aeration system (ICEAS), and other similar processes. A sequencing batch reactor with the purpose of providing this form of treatment would be rated under this category.

D-2. **Biological or chemical/biological advanced waste treatment** - The advanced treatment of wastewater for nutrient removal including nitrification, denitrification, or phosphorus removal utilizing biological or chemical processes or a combination. If the facility is designed to nitrify based solely on detention time in an extended aeration system, only the points for nitrification by designed extended aeration should be given.

D-3. **Chemical addition** - The addition of a chemical to wastewater at an application point for the purposes of adjusting pH or alkalinity, improving solids removal, dechlorinating, removing odors, providing nutrients, or otherwise enhancing treatment, excluding chlorination for disinfection of effluent and the addition of enzymes or any process included in the Tertiary Chemical/Physical Processes. The capability to add a chemical at different application points for the same purpose should be rated as one application; the capability to add a chemical(s) to dual units should be rated as one application; and the capability to add a chemical at different application points for different purposes should be rated as separate applications.

D-4. **Chemical/physical advanced treatment following secondary** - The use of chemical or physical advanced treatment processes following (or in conjunction with) a secondary treatment process. This would include processes such as carbon adsorption, air stripping, chemical coagulation, and precipitation, etc.

D-5. **Chemical/physical advanced treatment without secondary** - The use of chemical or physical advanced treatment processes without the use of a secondary treatment process. This would include processes such as carbon adsorption, air stripping, chemical coagulation, precipitation, etc.

D-6. **Discharge to Receiving Water** - Treatment processes present at the facility are designed to achieve NPDES permit limitations that have already factored in the sensitivity of the receiving stream. Consequently, no additional points are assigned to rate the receiving stream separately from the facility treatment processes.

D-7. **Fixed-film reactor** - Biofiltration by trickling filters or rotating biological contactors followed by secondary clarification.

D-8. **Imhoff tanks (or similar)** - Imhoff tanks, septic tanks, spirogester, clarigester, or other single unit for combined sedimentation and digestion.

D-9. **Land application of biosolids by contractor** - The land application or beneficial reuse of biosolids by a contractor outside of the control of the operator in direct responsible charge of the wastewater treatment facility.

D-10. **Land treatment and disposal (surface or subsurface)** - The ultimate treatment and disposal of the effluent onto the surface of the ground by rapid infiltration or rotary distributor or by spray irrigation. Subsurface treatment and disposal would be accomplished by infiltration gallery, injection, or gravity or pressurized drain field.

D-11. **Mechanical dewatering** - The removal of water from sludge by any of the following processes and including the addition of polymers in any of the following: vacuum filtration; frame, belt, or plate filter presses; centrifuge; or dissolved air floatation.

D-12. **Mechanical post-aeration** - The introduction of air into the effluent by mechanical means such as diffused or mechanical aeration. Cascade aeration would not be assigned points.

D-13. **Media Filtration** - The advanced treatment of wastewater for removal of solids by sand or other media or mixed media filtration.

D-14. **Solids composting** - The biological decomposition process producing carbon dioxide, water, and heat. Typical methods are windrow, forced air-static pile, and mechanical.

D--15. **Solids stabilization** - The processes to oxidize or reduce the organic matter in the sludge to a more stable form. These processes reduce pathogens or reduce the volatile organic chemicals and thereby reduce the potential for odor. These processes would include lime (or similar) treatment and thermal conditioning. Other stabilization processes such as aerobic or anaerobic digestion and composting are listed individually.

D-16 **Wastewater Treatment Facility**. Any physical facility or land area for the purpose of collecting, treating, neutralizing or stabilizing pollutants including treatment plants, the necessary intercepting, outfall and outlet sewers, pumping stations integral to such plants or sewers, equipment and furnishing thereof and their appurtenances. A treatment facility may also be known as a treatment system, waste treatment system, waste treatment facility, or waste treatment plant (IDAPA 58.01.16.010).

D-17 **Membrane Biological Reactor (MBR) Point Factoring** - The points assigned to the basic MBR unit does not include points for any additional treatment processes such as phosphorus removal, nitrification, denitrification, land application, rapid infiltration basins, lagoons, etc. Points must be assigned separately to each additional treatment process beyond the basic MBR unit. Additional treatment processes may vary on a case-by-case basis.

IDAHO PUBLIC WASTEWATER COLLECTION SYSTEM CLASSIFICATION WORKSHEET

OFFICE USE ONLY
DON'T WRITE HERE

System Class _____

Approved by: _____

Date: _____

Name of System: _____

Legal Owner of Treatment System: _____
System Address: _____
City: _____ **State:** _____ **Zip Code:** _____

Contact Person: _____ **Title:** _____

Business Phone Number: (___)_____ **Email:** _____

Collection System Classification Worksheet is (check one):

☐ **Initial System Rating** ☐ **System Upgrade** ☐ **Standard 5 yr Rating**

Date of last system classification rating (if applicable) _____

Collection System - Design Flow /Actual Flow _____/_____

Item	Points	Your System
System Size (Minimum 3 points)		
Miles of Line	1 point/10 miles or part	
Number of Connections = _____ (Use Connection Equivalencies)	1 point /250 or part	
Number of Manholes	1 point/150 or part	
Lift Stations	1 point/each	
Miles of Force Mains	1 point/mile or part	
Odor Abatement		
Chemical Feed System	2 points	
Air Entrainment System	2 points	
Bio-filter System	2 points	
Maintenance Management System		
Manual Maintenance Management System	3 points	
Manual Mapping System	3 points	
Computerized Maintenance Management System	5 points	
Computerized Mapping System	5 points	
Alarm or SCADA System for Lift Stations	5 points	
TOTAL POINTS FOR YOUR SYSTEM		

System Classification Key		
VSWWS**	Class I 0-30 points	
Class II 31-55 points	Class III 56-75 points	Class IV 76 or greater points
YOUR SYSTEM CLASSIFICATION	**VSWWS, I, II, III, IV (Circle one)**	

**The Very Small Wastewater System Classification is applicable to a system that serves 500 connections with a system size of six points or less.

_____/_____
Signature of Legal Owner or Owner's Representative Date

Mail form to: Department of Environmental Quality, 1410 N. Hilton, Boise, Idaho 83706, Attn: Mike May

Recycled Water Reuse Permit Application
Preliminary Technical Report

Prepared for
City of Nampa
Nampa, Idaho
March 19, 2019

Recycled Water Reuse Permit Application
Preliminary Technical Report

Prepared for
City of Nampa
March 19, 2019

950 W Bannock Street, Suite 350
Boise, Idaho, 83702

Table of Contents

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List of Abbreviations

ac	acre
amsl	above mean sea level
BC	Brown and Caldwell
bgs	below ground surface
BOD	biochemical oxygen demand
cfm	cubic feet per minute
cfs	cubic feet per second
City	City of Nampa
COLD	cold water aquatic life
EPA	U.S. Environmental Protection Agency
ft	feet
ft^2	square feet
ft bgs	feet below ground surface
gpm	gallons per minute
gs	growing season
hp	horsepower
I/I	infiltration and inflow
IDEQ	Idaho Department of Environmental Quality
IDAPA	Idaho Administrative Procedure Act
in/hr	inch per hour
IWR	Irrigation Water Requirement
kW	kilowatt
lb/ac-gs	pounds per acre per growing season
LF	linear feet
mgd	million gallons per day
mg/l	milligrams per liter
mJ/cm^2	millijoule per square centimeter
MG	million gallons
MPN	most probably unit
MS4	Municipal Separate Storm Sewer System
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
PCR	primary contact recreation
PI	pressurized irrigation
PID	Pioneer Irrigation District
RAS	return activated sludge
S.U.	standard unit
TDH	total design head
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
TN	total nitrogen
TP	total phosphorus
TSS	total suspended solids
WAS	waste activated sludge
WWTP	wastewater treatment plant

Executive Summary

The City of Nampa (City) is authorized to discharge treated wastewater effluent from the Nampa Wastewater Treatment Plant (WWTP) to Indian Creek under U.S. Environmental Protection Agency National Pollutant Discharge Elimination System (NPDES) Permit No. ID0022063 (Appendix A). The City is seeking a recycled water reuse permit from the Idaho Department of Environmental Quality authorizing discharge of Class A recycled water from the Nampa WWTP as agricultural and municipal irrigation supply augmentation water to the Phyllis Canal. The discharge will occur annually between approximately May 1 and September 30. Once the water enters the canal it is considered irrigation water and is managed by Pioneer Irrigation District for use downstream from the discharge point. The design flow planned for this discharge is 31 cubic feet per second (cfs). The Phyllis Canal typically conveys irrigation water at a rate of approximately 200 cfs along the reach of the proposed recycled water discharge location.

This preliminary technical report includes background information and a discussion of proposed activities and operations to support the City's requested target effluent limits as described below:

- Class A recycled water concentrations for constituents of concern.
- 30 mg/L total nitrogen (recycled water use is not groundwater recharge)
- 0.35 mg/L total phosphorus (TP)
- No temperature limit

This reuse project is expected to improve water quality in Indian Creek by removing Nampa WWTP discharges to the creek for 5 months out of the year. Compared to the Nampa WWTP NPDES permit conditions, the proposed recycled water reuse permit conditions would achieve a 24 percent average decrease in total phosphorus loading to Indian Creek and a 60 percent average decrease in total nitrogen loading during the proposed period of recycled water discharge to the canal.

The City and PID have entered into an agreement for receipt and use of Class A recycled water from the City to the Phyllis Canal at flows up to 41 cfs. PID provides irrigation service to approximately 34,000 acres in western Ada County and Canyon County, including the City's pressurized irrigation system. Below the proposed recycled water discharge point, the Phyllis Canal distributes irrigation water to approximately 17,000 acres north and west, ultimately discharging to tributaries of the Riverside Canal in Caldwell and other irrigation facilities west to Greenleaf.

Total nitrogen concentrations (average 1.7 mg/l) are much lower than the proposed recycled water effluent limit of 30 mg/l, and the mixed concentration in the canal would be about 5.5 mg/l under the discharge conditions of this water reuse project. This would benefit agricultural users because the irrigation water has historically been deficient in nitrogen. Because nitrogen fertilizer application is a common practice in this area, the City and PID will cooperate to educate customers in the service area about the increasing total nitrogen levels to avoid over application of total nitrogen that may exceed agronomic uptake rates of crops and landscaped areas in the portion of the PID service area downstream of the recycled water discharge location.

Section 1

Introduction and Background

The City of Nampa (City) is authorized to discharge treated wastewater effluent from the Nampa Wastewater Treatment Plant (WWTP) to Indian Creek under U.S. Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Permit No. ID0022063. The permit was issued September 20, 2016, effective November 1, 2016, through October 31, 2021. The permit is included at the end of the application as Appendix A.

In early 2018, the City completed a wastewater facility plan (BC, 2018) that was accepted by the Idaho Department of Environmental Quality (IDEQ) in spring 2018. The facility plan describes irrigation supply augmentation as the preferred alternative for wastewater management between May 1 and September 30. This alternative was selected through public engagement and a business case evaluation that compared multiple identified alternatives.

Therefore, the City is seeking a recycled water reuse permit from the IDEQ and has developed this application to provide information to support development and issuance of a permit. This document serves as the City's preliminary technical report in anticipation of approval to convey Class A recycled water treated at the Nampa WWTP to be discharged as agricultural and municipal irrigation supply augmentation water to the Phyllis Canal annually between May 1 and September 30. The maximum design flow planned for this discharge is 31 cubic feet per second (cfs). The Phyllis Canal typically conveys irrigation water at a rate of approximately 200 cfs along the reach of the proposed recycled water discharge location.

The Phyllis Canal is owned and operated by the Pioneer Irrigation District (PID). The City and PID have entered into an agreement for receipt and use of Class A recycled water from the City to the Phyllis Canal at flows up to 41 cfs. PID provides irrigation service to approximately 34,000 acres in western Ada County and Canyon County, including the City's pressurized irrigation system. Below the proposed recycled water discharge point, the Phyllis Canal distributes irrigation water to approximately 17,000 acres north and west, ultimately discharging to tributaries of the Riverside Canal in Caldwell and other irrigation facilities west to Greenleaf.

This Preliminary Technical Report includes a discussion of the organization of the Nampa WWTP and permits and regulatory documents in Sections 2 and 3, respectively. Section 4 includes several figures that provide reference for the recycled water discharge, the PID service area, and the broader area of analysis. Section 5 describes the wastewater treatment design and characterization of wastewater, while Section 6 discusses the applicability of treatment lagoons and storage ponds.

Sections 7 through 10 provide background information for the area of analysis pertinent to the reuse permit conditions, as well as a discussion of loading rates and the management conditions in the area of analysis. Sections 11 and 12 provide a preliminary discussion of the monitoring of recycled water prior to discharge to Phyllis Canal and the quality assurance and quality control procedures the City will employ to maintain compliance with permit requirements.

Table 1-1 below shows where key sections of the Recycled Water Rules are addressed in the Preliminary Technical Report and Plan of Operations.

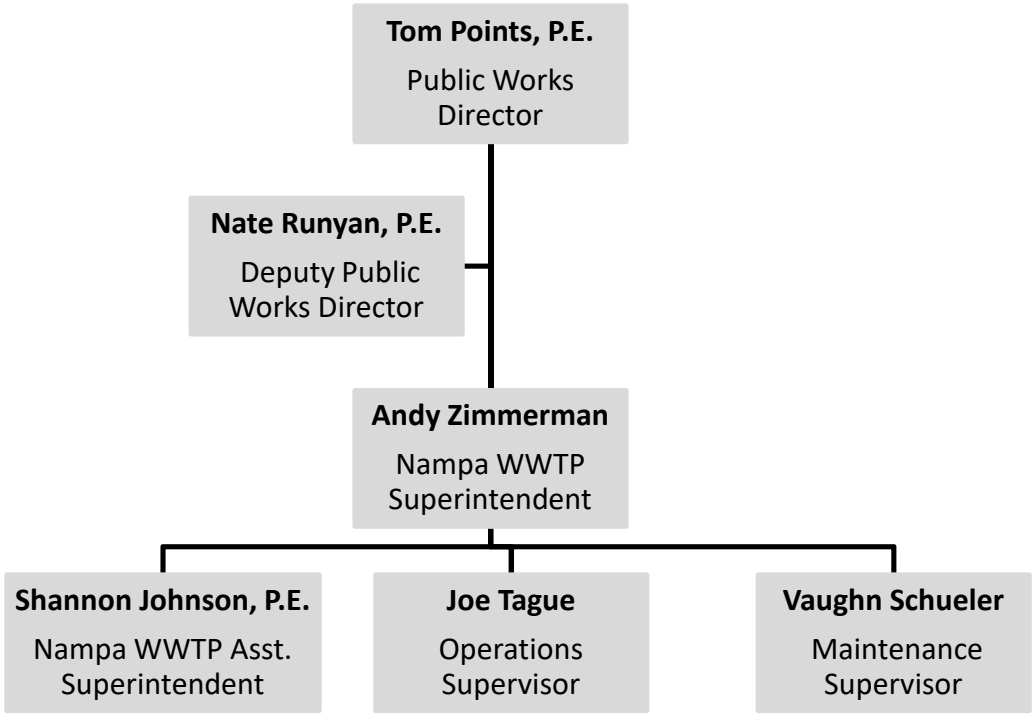
Table 1-1. Recycled Water Rules Requirement Discussion Location in Application			
Section of Recycled Water Rules	Description of Recycled Water Rule	Preliminary Technical Report Section	Plan of Operations Section
601	Municipal Recycled Water: Classification, Treatment, Use	Section 5	Section 5
602	Municipal Recycled Water: Classification and Uses Tables	Section 3	Section 3
603	Municipal Recycled Water: Access, Exposure and Signage	Section 7, Section 10	Section 8
604	Reuse Facilities: Buffer Distances	Section 10	Section 8
605	Municipal Recycled Water: Preliminary Engineering Reports	Section 5	Section 5, Section 6
606	Reuse Facility: Plan and Specification Review	Section 5	Section 5
607	Municipal Recycled Water: Distribution Pipelines	Section 4	Section 4
608	Municipal Recycled Water: Pumping Stations	Section 5, Section 7	NA
609	Municipal Recycled Water: Lagoons	Section 6	Section 7
610	Municipal Recycled Water: Class A Recycled Water Filtration	Section 5, Section 8	Section 5, Section 6
611	Municipal Recycled Water: Reliability and Redundancy	Section 6	NA
612	Demonstration of Technical, Financial, and Managerial Capacity of Municipal Reuse Facility	Section 2	Section 2
613	Reuse Facility: Rapid Infiltration System	Section 7	NA
614	Ground Water Recharge: Class A Recycled Water	Section 5, Section 7	Section 3
615	Subsurface Distribution of Recycled Water	Section 4	Section 4

Section 2

Operation and Management Responsibility

2.1 Organizational Chart

The personnel and positions identified in the organizational chart below are responsible for operating and maintaining the wastewater and reuse water systems for the City of Nampa Wastewater Treatment Plant.



In accordance with IDAPA 24.05.01 all wastewater treatment operators, collections operators, and laboratory analysts have a wastewater treatment operator license, ranging from level I through level IV. Andy Zimmerman and Shannon Johnson are certified Class IV operators.

2.2 Applicant Operation Documentation

The Applicant is the sole owner and operator of the City of Nampa WWTP, including all recycled water treatment, conveyance, and discharge equipment and operations.

Section 3

Permits and Other Regulatory Requirements

3.1 Permits and Regulatory Documents

Discharges from the Nampa WWTP to Indian Creek are authorized under EPA NPDES Permit No. ID0022063. The permit was issued September 20, 2016, effective November 1, 2016, through October 31, 2021. The permit is included at the end of the application as Appendix A.

The City has also completed an agreement with PID, dated March 8, 2018, authorizing the City to discharge up to 41 cfs (annual average) of recycled water to the Phyllis Canal every year between May 1 and October 1. A copy of the fully executed agreement is included as Appendix B.

Other than the IDEQ Wastewater Reuse Permit associated with this application, no other permitting is anticipated at this time to maintain the treatment and discharge of Class A Recycled Water to the Phyllis Canal.

During the design phase of the reuse water pipeline from the Nampa WWTP to Phyllis Canal, permits and agreements required for constructing the pipeline and discharge structure will be identified and scheduled to be attained in a sequence amenable to design and construction timing.

Section 4

Land Application Site

4.1 Topographic Maps

Figure 1 is a topographic map identifying the Nampa WWTP in relation to the Phyllis Canal. Figure 2 provides a view of the potential routes a recycled water pipeline may take from the Nampa WWTP to the Phyllis Canal. Figure 3 presents the PID service area downstream from the proposed recycled water discharge point. The area within the red polygon includes an approximately 1/4-mile buffer of the area. The customers served by PID in this area include the cities of Nampa and Caldwell. Both cities have several pump stations and diversions installed along the Phyllis canal and associated drains and laterals to supply irrigation water to each city's irrigation utility customers. Other major PID customers in this area include unincorporated subdivisions, private residences, and farms. Additional information on the major crop types in this area is included in Section 9. Downstream (north and west) irrigation districts including Riverside Irrigation District and the Black Canyon Irrigation District also rely heavily on irrigation water and return flows (both surface water and shallow groundwater) managed by PID.

4.2 Regional Map and Description

A broader regional map surrounding the PID area is included as Figure 4. Included for reference, Figure 5 is map developed by the Idaho Department of Water Resources that identifies the jurisdictions of all irrigation companies and cooperatives operating in Canyon County.

4.3 Scaled Map (Hydraulic Management Units)

Hydraulic management units are not applicable for this permit, considering the discharge of recycled water directly to the Phyllis Canal as opposed to application to a specific hydraulic management unit.

4.4 Scaled Map (Recycled Water and Supplemental Water)

The scaled map presented in Figure 2 identifies multiple proposed pipeline routes and associated discharge points. All pipeline routes begin near the Nampa WWTP outfall to Indian Creek and discharge at points along a 1-mile section of the Phyllis Canal. Pipeline routes will be further evaluated in the predesign phase of Nampa WWTP upgrades, and the selected route will be reported to the IDEQ.

4.5 Description of Land Use

As seen in Figure 2, land uses adjacent to pipeline routes and discharge points may vary slightly. The table below identifies the adjacent land uses for each proposed pipeline route and discharge point. It is important to note that regardless of the pipeline route chosen, the discharge point will be located on PID property.

Table 3-1. Land Uses Adjacent to Pipeline Route Options					
	Option 1A	Option 1B	Option 2A	Option 2B	Option 3
Land uses adjacent to pipeline route	• industrial • transportation • commercial	• industrial • transportation • commercial • public • residential	• industrial • transportation • commercial • public • residential	• industrial • transportation • commercial • public • residential	• industrial • transportation • commercial
Land use adjacent to PID property at discharge point	• commercial	• residential	• residential	• public	• commercial

4.6 Identify Ownership

The recycled water pipeline will be buried from the Nampa WWTP to the discharge point. The discharge to Phyllis Canal will be located on PID property, but the pipeline and associated infrastructure will be owned by the City. The City and PID have entered into an agreement authorizing the discharge of Class A recycled water to the Phyllis Canal, with the pipeline and associated infrastructure to be authorized under a subsequent license agreement in the future once final location and design are selected and completed. A copy of the existing discharge agreement is included as Appendix B.

Section 5

General Plant Description

5.1 Wastewater Treatment Design

The Nampa WWTP receives wastewater from domestic (residential/commercial) dischargers, industrial dischargers, infiltration and inflow (I/I) from seasonal irrigation sources, and I/I from sources other than irrigation users. The current design total rated hydraulic (maximum month) capacity is 18 million gallons per day (mgd). The recent *Nampa Wastewater Program Facility Plan* (*Facility Plan*) provides flow and loading projections through 2040. The future expected influent flow to the Nampa WWTP is 20.1 mgd.

In addition to future growth, the City considered applicable regulatory requirements for both NPDES and Recycled Water discharge. These combined factors are summarized in Table 5-1, below.

Table 5-1. Nampa WWTP Recycled Water Program Design Conditions

Parameter	Summer Design Condition	Winter Design Condition [1]
Maximum month flow	20.1 mgd	20.1 mgd
Effluent TSS	Monthly average: 30 mg/l Weekly average: 45 mg/l 4-month average: 17.5 mg/l	Monthly average: 30 mg/l Weekly average: 45 mg/l 4-month average: 17.5 mg/l
Effluent BOD_5	Monthly average: 10 mg/l	Monthly average: 30 mg/l Weekly average: 45 mg/l
Effluent total phosphorus	0.35 mg/l	Monthly average: 52.4 lbs/day (0.35 mg/l) [1,2]
Effluent total nitrogen	30 mg/l [3]	30 mg/l
Effluent ammonia	Monthly average: 1.31 mg/l (March–November) Daily maximum: 4.92 mg/l (March–November)	Monthly average: 1.41 mg/l (December–February) Daily maximum: 5.31 mg/l (December–February)
Other	Class A Recycled Water (IDAPA 58.01.17) requirements	Class A Recycled Water (IDAPA 58.01.17) requirements for industrial reuse stream (1 – 2 mgd)

[1] The values listed assume discharge to an irrigation canal during the summer season. During the winter season NPDES permit limits apply.

[2] Effluent TP limits are on a pounds per day basis. Concentration is provided for reference only.

[3] Effluent total nitrogen limits are estimated to be lower for summer discharge as a conservative assumption based on the requirements of the Recycled Water Rules (IDAPA 58.01.17, Section 607.02.d). The requirements for this discharge will be further refined through additional permit negotiations.

BOD = biochemical oxygen demand.

lbs/day = pounds per day.

mgd = million gallons per day.

mg/l = milligrams per liter.

5.2 Wastewater Treatment Process

The Nampa WWTP operates as a secondary treatment facility that uses conventional aerated activated sludge units for biological oxidation of the wastewater. The Nampa WWTP will be upgraded

to provide full-scale recycled water. The goal is to provide Class A recycled water (as defined in IDAPA 58.01.17.601) to local industries and irrigation users for reuse. The processes that will be installed to achieve this include tertiary filtration, additional disinfection, an industrial pump station and pipeline, and an irrigation reuse pump station and pipeline. All water quality requirements for municipal Class A recycled water, as prescribed by IDAPA 58.01.17, are summarized for reference in Table 5-2.

Table 5-2. Class A Recycled Water Classification and Additional Requirements

Description		Requirement	IDAPA 58.01.17 Section
Oxidized		Yes	601.01
Clarified		Yes	601.01
Filtered		Yes	601.01
Disinfected		Yes	601.01
Total coliform (organisms/ 100 milliliters)	Median results for last x-days for which analysis have been completed	2.2 7-day median	601.01.a.ii
	Maximum in any sample	23	601.01.a.ii
	Monitoring frequency	Daily, or as determined	601.01.a.iii
Disinfection requirements contact time		Contact time of 450 mg-min L with 90 min of modal time OR disinfection to 5log inactivation of virus	601.01.a.i
Turbidity (NTU)	24-hr - mean, not to exceed	Granular or cloth media: 2 **Membrane filter: 0.2** [1]	601.01.b.i
	Maximum in any sample	Granular or cloth media: 5 **Membrane filter: 0.5** [1]	601.01.b.i
	Monitoring frequency	Continuous	601.01.b.ii
Maximum Total nitrogen (mg/L)		**Groundwater recharge: 10** [2] Residential irrigation and other non-recharge uses: 30 OR As required based on an analysis of ground water impacts	601.01.c.i
BOD5 (mg/L)	Monthly arithmetic mean, not to exceed	**Ground water recharge: 5** [2] Residential irrigation and other non-recharge uses: 10	601.01.c.iii
	Monitoring frequency	Weekly composite	601.01.c.iii
pH	Any sample	Between 6.0 and 9.0	601.01.c.ii
	Monitoring frequency	Daily grab or continuous monitoring	601.01.c.ii

[1] *Membrane filtration identified as tertiary treatment technology per the Facility Plan; should unit process assumptions change during preliminary design; water quality requirement assumptions should be revisited.*

[2] *Per IDAPA 58.01.17 Section 607.02.d, "Class A recycled water may be mixed with other irrigation water in an unlined pond if the Class A recycled water is permitted for ground water recharge." Since the project assumes no additional lining of PID canals will occur, groundwater quality assumptions will be assumed.*

The necessary unit processes and the associated design capacity of the systems required to provide Class A recycled water at the Nampa WWTP are summarized in Table 5-3. These design criteria will be further defined through preliminary and final design stages of the project.

Table 5-3. Recycled Water Program Unit Processes Required & Preliminary Design Criteria

Unit Process	Unit Process Assumptions
Aeration basin modifications	• Aeration Basin #4 construction • Sized identical to existing aeration basins: 134 ft x 160 ft x 21 ft • 3,304,000-gallon capacity
Blower building	• Six 700-hp blowers (five duty, one standby), 9,750 cfm sizing • 12,000-ft^2 building • 500-kW generator
RAS piping and WAS pumping	• Two WAS pumps (10 hp each) • WAS pump TDH: 50 ft • 60 LF of 18-inch RAS piping and fittings • 275 LF 30-inch piping
Mixed liquor return pumps	• Four pumps, 17,000 gpm (24 mgd) each • 10 feet TDH • 125 hp mixed flow pumps, one per treatment train
Final Clarifier No. 4	• Circular clarifier, 120-ft diameter with mechanism
Solids facility expansion	• 1,650-ft^2 building expansion • Two rotary drum thickeners, 440 gpm capacity each • One centrifuge, 200 gpm capacity
Struvite reactor	• 3,888-ft^2 building • Struvite reactor equipment and piping • 1,185 LF of 10-inch piping
Filter lift pump station	• Building enclosure • Three vertical turbine pumps • 20-inch vertical turbine solids handling • Flow: 9,450 gpm • TDH: 30 feet • Power: 100 hp • 500-kW generator • 530 LF of 42-inch piping
Sand or Membrane filtration [1]	Sand Filtration • 1,900- ft^2 building • 9 filter cells, 108 modules, 40-inch filter bed • Three rotary screw compressors (two duty, one standby) • Coagulant feed system Membrane Filtration • 12,000-ft^2 building (200 ft x 60 ft x 36 ft) • 105-ft long, 40-ft wide, 16-ft deep membrane tanks • 36 membrane cassettes and 2,808 modules installed • Six permeate pumps • Two positive displacement blowers (one duty, one standby)

Table 5-3. Recycled Water Program Unit Processes Required & Preliminary Design Criteria

Unit Process	Unit Process Assumptions
Ultraviolet disinfection: Class A	• 5,460-ft² building • Four channels, Nine banks per channel • Disinfection dose: 100 mJ/cm²
Effluent force main for irrigation reuse	• 6,000 LF of 42-inch high density polyethylene pipe
Effluent pump station for irrigation reuse	• Three vertical turbine pumps • References Project Group A Primary Effluent Pump Station • 20-inch vertical turbine solids handling • Flow: 9,450 gpm • TDH: 30 feet • Power: 100 hp • Building enclosure: 14 ft x 54 ft
Effluent pump station & force main for industry	• Two submersible pumps, duplex-type arrangement • TDH: 40–80 ft • 10,000 LF of 12-inch polyvinyl chloride force main • 840 LF of 42-inch piping industrial flow (1–2 mgd) disinfected to Class-A standards using in-pipe ultraviolet treatment • Disinfection dose: 100 mJ/cm²
Digester #5	• One mixing pump, 125 hp motor • Flare relocation
Primary thickening	• Thickening feed pumps, two duty/one standby, 30 hp motors • Rotary drum thickeners, two duty/one standby • Thickened primary sludge pumps, two duty/one standby, 15 hp motors • Polymer makeup and feed systems • Centrate pumps: two duty/one standby, 20 hp motors

[1] *Title 22 approved technology per IDAPA 58.01.17 Section 610.01. Filtration technology is still being evaluated as part of the project pre-design phase.*

Any potable water used as seal water for recycled water pump seals shall be protected from backflow with an approved backflow prevention device or air gap per IDAPA 58.01.17 Section 608.02a.

cfm = cubic feet per minute.

ft = feet.

ft² = square feet.

gpm = gallons per minute.

hp = horsepower.

kW = kilowatt.

LF = linear feet.

mJ/cm² = millijoule per square centimeter.

RAS = return activated sludge.

TDH = total design head.

WAS = waste activated sludge.

Process flow diagrams for the liquid and the solid streams are provided in Figures 6 and 7, respectively.

5.3 Characterize Wastewater and Recycled Water Streams

The Nampa WWTP receives and treats wastewater flow and loadings from four sources: domestic (residential/commercial) dischargers, industrial dischargers, I/I from seasonal irrigation, and I/I from sources other than seasonal irrigation influences. The wastewater collected from the service area contains both organic and inorganic loadings.

Domestic flow is independent of seasonal and climate conditions and tends to follow a diurnal flow pattern that reflects timing of water usage in the community. Industrial discharges come from a range of industries in the service area, including food processing plants, sanitation, and technology services. Industrial discharges are less consistent than domestic discharges and tend to be higher strength in terms of biochemical oxygen demand (BOD), total suspended solids (TSS), total Kjeldahl nitrogen (TKN), and total phosphorus and other loadings. I/I resulting from seasonal irrigation increases throughout the summer and peaks in the early fall. The non-seasonal irrigation I/I is driven by precipitation and groundwater variations (these are independent of irrigation influences).

The City's wastewater flow varies seasonally. Flow volumes are highest from June to January because of irrigation season and industrial food processors' peak discharge during the late fall and winter. The annual average flow to the Nampa WWTP has gradually decreased over recent years, caused by a reduction in local industry and subsequent industrial discharges to the municipal sewage system. The load has also decreased over the past 2 years due to the reduction in industrial discharges. The average monthly flow has not decreased at the same rate as the influent load, most likely because the industrial flows have not decreased at the same rate as loads and there has been growth in domestic discharge, which constitutes flow with lower concentrations of BOD and TSS, yielding less load for the same flow.

A wastewater characterization study was performed as part of the *Facility Plan* development. The results of the study were documented in *TM T-49 Nampa WWTP Capacity Assessment*. For more information on wastewater characteristics, refer to Appendix C of the *Facility Plan.*

The *Facility Plan* included developing *TM T-46 Flow and Loads,* which evaluated current conditions and developed future projections based on population growth. The current condition was based on available Nampa WWTP data from 2012 through 2015. Table 5-4 is the resulting current flow and load condition for the Nampa WWTP.

Table 5-4. Nampa Wastewater Current Flows and Loads

	Flow (mgd)			BOD (lbs/day)			TSS (lbs/day)			TKN (lbs/day)			TP (lbs/day)		
	Annual Average	Maximum Month	Peak Day	Annual Average	Maximum Month	Peak Day	Annual Average	Maximum Month	Peak Day	Annual Average	Maximum Month	Peak Day	Annual Average	Maximum Month	Peak Day
Domestic	7.67	7.67	7.67	16,132	19,578	40,564	17,807	19,898	37,414	2,524	2,880	4,175	373	414	700
Industrial [1, 2]	2.82	2.82	4.23	20,389	20,389	30,583	10,632	10,632	15,948	1,988	1,988	2,983	345	345	517
Irrigation-related I/I [3]	0.95	2.28	2.38	–	–	–	–	–	–	–	–	–	–	–	–
Non-irrigation I/I	0.14	0.34	2.30	–	–	–	–	–	–	–	–	–	–	–	–
Total Influent [4]	11.6	13.1	16.6	36,521	39,967	71,147	28,439	30,530	53,362	4,512	4,868	7,158	718	759	1,217

TP = total phosphorus.

[1] For industrial customers, the Average Annual flow capacity represents the allowable daily discharge. Values are rounded to the nearest hundredth mgd and whole value lbs/day for flow and load, respectively.

*[2] Peak Day = 1.5 * monthly average for industrial flows and loads.*

[3] Seasonal irrigation is calculated to increase during irrigation season (April–September) by approximately 1.9 mgd. This period represents approximately half the year; therefore, the monthly average is 1.9 divided by 2 = 0.95 mgd. Estimates were developed based on Nampa WWTP influent data from 2008 through 2015. Seasonal irrigation average, maximum month, and peak day flows are assumed to not change over time.

[4] Total flows = total industrial permitted flow + total domestic flow + seasonal irrigation + other I/I; Total loads = total industrial permitted load + total domestic load; values are rounded to the nearest tenth mgd for flow and nearest lbs/day for loads.

The *Facility Plan* evaluated future flow and loading conditions through 2040, which will inform the design of the Preferred Alternative. During the summer season, the full 20.1 mgd maximum month flow would be treated to Class A recycled water quality and then discharged to an irrigation canal. The City plans to produce 1–2 mgd of treated Class A water for industrial reuse that would be available year-round. During the winter, the City would operate under its existing NPDES permit and discharge the treated effluent to Indian Creek. Table 5-5 summarizes these future flow and loading conditions.

Table 5-5. Nampa Wastewater 2040 Flow and Loading Projections

	Flow (mgd)			BOD (lbs/day)			TSS (lbs/day)			TKN (lbs/day)			TP (lbs/day)		
	Annual Average	Maximum Month	Peak Day	Annual Average	Maximum Month	Peak Day	Annual Average	Maximum Month	Peak Day	Annual Average	Maximum Month	Peak Day	Annual Average	Maximum Month	Peak Day
Domestic	13.69	13.69	13.69	30,652	38,136	83,029	35,330	41,892	90,700	4,693	5,483	9,079	708	848	1,347
Industrial [1,2]	3.8	3.8	5.7	32,907	32,907	49,360	23,150	23,150	34,725	2,906	2,906	4,360	762	762	1,143
Irrigation-related I/I [3]	0.95	2.28	2.38	–	–	–	–	–	–	–	–	–	–	–	–
Non-irrigation I/I	0.14	0.34	2.30	–	–	–	–	–	–	–	–	–	–	–	–
Total influent flow and loads [4]	18.6	20.1	24.1	63,560	71,040	132,390	58,480	65,040	125,430	7,600	8,390	13,440	1,470	1,610	2,490

[1] *Peak Day = 1.5 * monthly average for industrial flows and loads.*

[2] *For industrial customers, the Average Annual flow capacity represents the allowable daily discharge. Values are rounded to the nearest hundredth mgd and whole value lbs/day for flow and load, respectively.*

[3] *Seasonal irrigation is calculated to increase during irrigation season (April–September) by approximately 1.9 mgd. This period represents approximately half the year; therefore, the monthly average is 1.9 divided by 2 = 0.95 mgd. Estimates were developed based on Nampa WWTP influent data from 2008 through 2015. Seasonal irrigation average, maximum month, and peak day flows are assumed to not change over time.*

[4] *Total flows = total industrial permitted flow + total domestic flow (2040) + seasonal irrigation + other I/I; total loads = total industrial permitted load + total domestic load (2040); values are rounded to the nearest tenth mgd for flow and 10 lbs/day for loads.*

Section 6

Wastewater and Recycled Water Treatment and Storage Lagoons

6.1 Treatment and Storage Ponds

Per the Guidance Manual, storage ponds are typically required for the following applications:

- precipitation causes excessive hydraulic loading
- cultivating practices prevent wastewater application
- winter weather precludes operation or a reduction in the rate of application
- flow variations in quality require equalization
- when an emergency backup for the treatment system is required

Treatment ponds and storage lagoons are not included as part of this project because the Nampa WWTP will maintain its permitted Indian Creek outfall for winter discharges and as an alternative backup system during the irrigation season, as required for additional reliability and redundancy requirements for Class A recycled water by IDAPA 58.01.17 Section 609 Municipal Recycled Water: Lagoons Class A requirements do not apply.

Section 7

Reuse Site Features and Characteristics

7.1 Fencing and Posting

Buffer zones and fencing are not required for Class A recycled wastewater per IDAPA 58.0117 Section 602.02, Table 3. However, the discharge location and security for instrumentation will provide a buffer zone and a physical barrier to the discharge point. The discharge pipe will be located on PID property (which prohibits access to canal roads by unauthorized personnel). Security fencing or other measures will be installed at the discharge location, similar to City irrigation pump stations located along the Phyllis Canal. In the secured fenced area, signs that read "Caution: Recycled Water—Do Not Drink" or equivalent signage in both Spanish and English will be posted on the fence on all sides.

Warning labels will be installed on designated facilities and equipment within the secured fenced area. The labels will read, "Caution: Recycled Water—Do Not Drink" or equivalent signage, in both Spanish and English.

All piping, valves, and other appurtenances for the pipeline from the Nampa WWTP to the discharge point to Phyllis Canal, both buried and exposed, will be purple in color (Pantone 512, 522, or equivalent). If fading or discoloration of buried purple pipe is experienced during construction, then identification tape or locating wire will be installed that reads "Caution: Recycled Water—Do Not Drink" in either white or black font on purple tape, in both Spanish and English. The overall width of the tape will be at least 3 inches. Identification tape will be installed 18 inches above the transmission pipe longitudinally, will be centered over the pipe, and shall run continuously along the length of the pipe.

Public outreach will also be part of educational programming pursued in conjunction with added signage and fencing. The addition of nutrients to the Phyllis Canal is anticipated to be a benefit for the irrigated crops and lawns in the PID service area. Because fertilizer application is a common practice in this area, the City and PID will cooperate to educate customers in the service area about the increase in nutrient levels in irrigation water to avoid over application of fertilizers.

More broadly, the City will meet with water user groups, environmental advocacy groups, and others to facilitate a dialogue concerning the City's use of recycled water and address concerns as they are brought to the City. The City also hopes to maintain close communication and collaboration with the IDEQ throughout the application review and permit development process.

7.2 Climatic Characteristics

According to Koppen-Geiger climate zones, Nampa, Idaho, and surrounding areas exhibit a BSk climate, or a "cold semi-arid environment," marked by hot dry summers and moderate winters. The area receives most precipitation in the cold season while the warm season is mostly dry. Total annual rainfall averages around 10.94 inches, and the bulk of the annual precipitation is received between November and May. The winter months are characterized by uniform widespread precipitation while the warm season months have more irregular convective showers and

thunderstorms. Temperatures represent a high desert regime, with an average annual temperature of 51.6 degrees Fahrenheit. The spring last freeze date is typically around May 3 in Nampa, while the fall first freeze is around October 12. These dates result in a total of 163 frost-free days on average. (National Oceanic and Atmospheric Administration [NOAA], 2018).

The Site is not located in a particularly windy area, but there are times when strong gusts of wind occur. The most significant control on wind direction in the Treasure Valley and the city of Nampa is exerted by the northwest to southeast orientation of the surrounding mountain ranges. Because the valley slopes from southeast to northwest, a southeast drainage wind often occurs during the night and early morning hours. During the afternoon, the east end of the valley typically heats up faster than the west end creating surface low pressure, which in turn creates a northwest wind. Monthly average wind speeds range from 5.9 to 8.5 miles per hour, with occasional strong wind gusts (NOAA, 2018).

The weather parameters that most affect crop evapotranspiration are radiation, air temperature, humidity, and wind speed (FAO, 1998). The evapotranspiration rates of crops directly correlate with their water requirement. An additional discussion of crop types and evapotranspiration rates is included in Section 9.

Monthly and annual average climate data is included below in Table 7-1.

Table 7-1. Monthly and Annual Climate

	Maximum Temp [1] (F)	Minimum Temp [1] (F)	Average Temp [1] (F)	Precipitation [1] (in)	Wind Speed [2] (mph)
January	38.7	22.6	30.6	1.21	5.9
February	45.5	25.7	35.6	0.96	7.4
March	56.6	31.7	44.1	1.26	8.0
April	64.6	36.5	50.5	1.08	8.5
May	73.3	44.1	58.7	1.29	7.8
June	82.5	51.4	67.0	0.68	7.6
July	91.9	57.0	74.5	0.26	7.0
August	90.7	55.1	72.9	0.23	6.6
September	79.9	45.9	62.9	0.48	6.4
October	66.4	36.5	51.4	0.75	6.6
November	50.0	28.7	39.4	1.27	7.4
December	39.2	21.8	30.5	1.47	6.9
Annual Average	65.0	38.1	51.6	10.94	7.18

[1] *Temperature and precipitation data from National Climatic Data Center—NOAA.*

[2] *Wind speed from Nampa Municipal Airport 2010–present*

7.3 Soils

The area of analysis used for soils is the PID service area located downstream from the proposed recycled water discharge point. This area is approximated by the red polygon in Figure 3 and is located primarily on sediments of the Bonneville Flood slack waters that inundated the Snake River Valley and lower Boise Valley. The flood deposits overlay terrace gravels of the ancestral Boise River. In addition, basalt flows erupted onto the Snake River Plain during the Pleistocene and inundated ancestral valleys and plains. The basalt flows underlay sediments in the eastern portion of the area of analysis. The following geologic units as described by the Geologic Map of the Boise Valley and Adjoining Area, Western Snake River Plain, Idaho (Othberg et al., 1992) are found within the area:

- Basalt Flows of Indian Creek Buried by Loess and Stream Sediments: tan massive silt, stratified clay, silt, and sand with basalt approximately 20–50 ft below the surface. Pedogenic clay 10–20 percent.
- Sandy Silt of Bonneville Flood Slack Water: thin bedded tan silt, silty sand, and fine sand (10–20 ft thick) buries this loess, duripan, and sandy pebble gravel of Wilder Terrace (10–25 ft thick) and Whitney Terrace.
- Sandy Alluvium of Side-Stream Valleys and Gulches: medium to coarse sand interbedded with silty fine sand and silt. Sediment is derived mostly from weathered granite and reworked Tertiary sediments. Minor pedogenic clay and calcium carbonate are present. Thickness is variable.
- Clay of Bonneville Flood Slack Water: light tan silty clay 3–7 ft thick that buries gravel of the Boise Terrace.
- Alluvium of the Boise and Snake River: sandy cobble gravel to sandy pebble gravel that is 20–46 ft thick.

Soils in the area of analysis consist primarily of silt loams including Power, Greenleaf-Owyhee, Purdam, Bram series, and Baldock loam. The soils are described in the Soil Survey of Canyon Area (U.S. Department of Agriculture, 1972). These soils formed from mixed alluvium, lacustrine deposits, or loess. The soils are well drained for the most part except where depth to water is shallow and the soils are saturated. Soil depths within the area of analysis range from 60 to 65 inches.

Infiltration rates are moderately high (0.2–0.6 inch per hour [in/hr]) for soils in the area of analysis with the exception of Purdam, which commonly has a cemented layer at 20–40 inches below ground surface (bgs) that limits infiltration rates to very low to moderately low (0–0.06 in/hr). The soils range from non-saline to very saline.

7.4 Topography

The area of analysis is located on the western Snake River Plain geographical feature, a northwest-trending basin bounded by normal faults. The Lower Snake River Valley slopes downward from southeast to northwest with elevation decreasing from Mountain Home, Idaho (3,146 ft above mean sea level [amsl]), to Ontario, Oregon (2,150 ft amsl).

The irrigation conveyances within the area of analysis distribute and drain water almost exclusively to the north and west (Figure 4) through a network of canals, laterals, and drains. Land application of effluent will be completely within PID. The canal section near the proposed discharge location has an elevation of approximately 2,465 ft amsl. The Phyllis Canal terminus is located southeast of Greenleaf, Idaho, at an elevation of 2,420 ft amsl.

A topographic map can be found on Figure 3.

7.5 Surface Water

The Nampa WWTP currently discharges effluent to Indian Creek, which flows northwest from the Nampa WWTP toward the Lower Boise River. The Nampa WWTP is situated within PID service area, approximately 1 mile from the Phyllis Canal. Recycled water is proposed to be discharged to the Phyllis Canal at one of the locations shown on Figure 2. PID provides irrigation water to around 22,000 acres of both agricultural and developed land downstream of the City's proposed recycled water addition point.

7.5.1 Nearby Surface Waters

7.5.1.1 Lower Boise River

The lower Boise River is a 64-mile-long stretch of river starting at Lucky Peak Dam and flowing northwest through Ada and Canyon Counties to its confluence with the Snake River near Parma, Idaho. The lower Boise River basin drains 1,290 square miles of rangeland, agricultural fields, forests, and growing urban areas, and provides freshwater for a variety of uses including recreation, municipal supply, environmental flows, hydropower, and the primary use of agricultural irrigation. The irrigation conveyance system in the lower Boise River basin is complex; a network of canals and laterals divert water from the lower Boise River for agricultural and municipal irrigation. Local organizations responsible for water allocation and distribution include irrigation districts, canal companies, ditch companies, and individual irrigators.

The Lower Boise River Subbasin, Hydrologic Unit Code 17050114, comprises 17 water body units. The Boise River section from Indian Creek's confluence to the river's mouth (SW-1) has two beneficial uses as listed by Rules of the Department of Environmental Quality, IDAPA 58.01.02, "Water Quality Standards": cold water aquatic life (COLD) and primary contact recreation (PCR). COLD is designated by water quality appropriate for the protection and maintenance of a viable aquatic life community for cold water species. PCR refers to water quality appropriate for prolonged and intimate contact by humans or for recreational activities when the ingestion of small quantities of water is likely to occur (IDAPA 58.01.02 Section 100).

Certain stretches of the Lower Boise River are impaired by pollutants. The IDEQ's 2014 Integrated Report (IDEQ, 2017) reports impairments to the lower Boise River from Indian Creek to the river's mouth (ID17050114SW001_06). These impairments include sedimentation/siltation, fecal coliform, and total phosphorus.

7.5.1.2 Indian Creek

Indian Creek is a tributary of the Boise River, beginning southeast of the Treasure Valley and flowing northwest through Ada and Canyon counties. Indian Creek's confluence with the New York Canal near Kuna, Idaho, serves as artificial headwaters for the waterway. Indian Creek splays from the New York Canal and flows northwest through Nampa and Caldwell, intersecting the Riverside Canal at the western limits of Caldwell. During non-irrigation season (~November–March), Indian Creek's flow is naturally discharged into the Boise River. During irrigation season (~April–October), most of Indian Creek's flow is diverted to Riverside Canal, leaving minimal flow to discharge directly to the Boise River. Riverside Canal is a diversion of the Boise River that conveys water to irrigated lands west and north of Caldwell, Idaho.

Indian Creek from Sugar Avenue to its mouth (SW-2) has two designated beneficial use designations: COLD and secondary contact recreation, which refers to water quality appropriate for recreational uses on or about the water and which are not included in the primary contact category (IDAPA 58.01.02 Section 100). The outfall from the Nampa WWTP is located along this reach of Indian Creek.

The IDEQ's 2014 Integrated Report (IDEQ, 2017) also reports impairments of Indian Creek from Sugar Avenue to the Boise River (ID17050114SW002_04). These impairments include sedimentation/siltation and *Escherichia coli*.

7.5.1.3 Major Irrigation Conveyances extending beyond the Area of Analysis

The following are major canals in the area that have some interaction with the waterways and/or irrigation conveyances within the area of analysis. Further discussion of interactions is included in Section 7.5.1.4. Information about major irrigation conveyances extending beyond the area of

analysis is the result of interviews with PID staff that took place between May 2018 and February 2019 (PID, 2019).

Notus Canal

The Notus Canal is owned and operated by Black Canyon Irrigation District. The first unit of the canal begins at the Wilson (Caldwell Canal) Feeder (described in Section 7.5.1.4) and is made up of diverted flow from Wilson drain. From the feeder, Notus Canal, flows northeast and crosses underneath Indian Creek. It then follows Indian Creek for the distance of about 2 miles before it heads north, under the Boise River. In this stretch it makes deliveries to 184 acres of land inside the PID service area before beginning deliveries to Golden Gate Irrigation District customers on the north side of Caldwell. After the Notus Canal emerges on the north side of the Boise River, deliveries are made to Black Canyon Irrigation District Customers in the agricultural area north and east of Notus, Idaho, between U.S. Highway 26 and Interstate 84.

Caldwell Highline Canal

The Caldwell Highline Canal is another Canal owned and operated by PID. The Caldwell Highline Canal originates as a diversion off the Boise River approximately 2.5 miles downstream from where State Highway 16 crosses the Boise River, flowing to the west/southwest. The Caldwell Highline Canal provides irrigation water for area to the north and east of Caldwell, Idaho, and north of Nampa. The canal eventually crosses over Indian Creek and terminates near the point at which Elijah Drain joins Wilson Drain.

Riverside Canal

The Riverside Canal is owned and operated by the Riverside Irrigation District. Riverside Canal begins as a diversion off the Boise River just north of Caldwell, approximately 2 miles upstream from the mouth of Indian Creek. The Riverside Canal intercepts Indian Creek for a quarter mile stretch as it flows through Caldwell and heads west toward Greenleaf, Idaho. The West End drain (described further in Section 7.5.1.4) flows into the Riverside Canal near canal mile 8. Below this point, the Riverside canal winds through western Canyon County approximately 22 miles before its tailwaters reach the Snake River. In this stretch, the Riverside Canal delivers water via laterals and diversions and receives water from drains and return flows from fields.

7.5.1.4 Phyllis Canal, Laterals, Drains, and Conveyances inside the Area of Analysis

Information about the Phyllis Canal, laterals, drains, and other conveyances inside the area of analysis is the result of PID and City staff interviews, discussions, and site visits conducted to document actual conditions at critical locations within the PID service area. Site visits were conducted during the 2018 irrigation season. Multiple interviews and discussions with PID and City staff took place between May 2018 and February 2019 (PID, 2019). The Phyllis Canal is a man-made canal diverting from the Boise River near Eagle Island and extending west through Canyon County to near Greenleaf, Idaho. In the area of the proposed recycled water discharge points (shown on Figure 1), flow is maintained at around 200 cfs throughout the irrigation season (typically mid-April through mid-October). This flow is distributed through the PID service area via a system of laterals, ditches, drains, and pumps to provide water to agricultural and residential land and customers served by the Nampa and Caldwell irrigation utilities. The Phyllis Canal marks the southern and western borders of the PID service area. All the laterals in this area are on the north side of the Canal, and flow direction in the majority of laterals and drains is to the north and the west. A limited number of deliveries to individual customers are made off the south side of the canal.

Downstream of where the Phyllis Canal crosses over Indian Creek, the Canal receives inputs from drains and tailwaters of conveyances operated by the Nampa Meridian Irrigation District and the

Wilder Irrigation District. These inputs typically total between 65 and 75 cfs and are discussed in more detail in the text below. Receiving tailwater flow results in a substitution of water flowing through the Phyllis Canal such that the volume of water present at proposed recycled water discharge points is replaced by the time the Phyllis Canal reaches Pipe Gulch Drain. At its terminus, between 2 and 4 cfs flow down a chute into Pipe Gulch Drain which flows (mostly) north into the West End Drain. The West End Drain ultimately discharges into the Riverside Canal.

The irrigation conveyances within PID's jurisdiction are designed to distribute irrigation water to customers efficiently and reliably. Under typical operations, the demand for water is higher than the water volume available for delivery by the Phyllis Canal. The deficiency is typically made up from groundwater pumping and irrigation rotation. PID does have the ability to spill water to drains from the Phyllis Canal for flood control purposes during significant storm events, but routine canal operations do not spill water from the Canal. These diversion gates and interactions are shown in Figures 9 and 10 and Table 7-2. Figure 9 is a map of the PID service area focusing on the area of analysis. Figure 10 focuses on the upper half of the area of analysis to provide greater detail of irrigation conveyances and the proposed recycled water discharge locations.

The text below provides a detailed accounting for water delivery points and irrigation conveyances from the point at which Phyllis Canal crosses Indian Creek to where the Pipe Gulch (receiving water at the terminus of the Phyllis Canal) enters the Riverside Canal. Notes in the text correspond to locations on Figures 9 and 10 for ease of reference.

The Phyllis Canal crosses over Indian Creek [1] via a short aqueduct at a point approximately 400 feet due east from the intersection of 7th Avenue North and 2nd Street North in Nampa. PID has the ability at this intersection to spill water from Phyllis Canal to Indian Creek during storm events, or PID can pump water from Indian Creek (pumping capacity up to 20 cfs) into the Phyllis Canal to supplement irrigation supply at this point in the canal. The latter use is the routine operation.

The area of proposed recycled water discharge locations [2] is less than 1 mile downstream from the Indian Creek crossing, between a point just upstream of the intersection of Northside Blvd and 2nd Street South to just south of the intersection of Caldwell Boulevard and West Orchard Ave. The first water delivery below the discharge is a small pump station [3] operated by PID (1 cfs) that provides water to about 50 acres on the southwest side of Caldwell Boulevard. The first major delivery is to the 15.0 Lateral [4] at approximately 32 cfs (slightly more than the maximum recycled water design flow) to serve 1,600 acres of developed and agricultural land within the City. This area includes more irrigable land than the PID irrigation system can deliver. The shortfall is made up by pumping from wells (two owned and operated by PID and other private wells operated by property owners as needed) and irrigation rotation.

The City has one pressurized irrigation (PI) pump station [5: Eaglecrest pump] located on the main branch of the 15.0 Lateral and another on the South Branch farther downstream [6: Moss Point pump]. A third Nampa PI pump station is situated along the Elijah Drain in close proximity to the South Branch pump station [7: Crestwood pump]. Another City PI pump station is situated just south of the intersection of West Moss Lane and Midway Road [8: Asbury Park pump]. The four Nampa-owned PI pump stations supply irrigation water for lawn watering in the surrounding subdivisions. The City of Caldwell also maintains a PI pump station at the end of the North Branch of the 15.0 Lateral [9], used to supply irrigation water for the same purposes. Each City-owned PI pump station in the PID service area is capable of pumping 2 to 4 cfs. Consistently meeting water demand from the Nampa PI pump stations in this area is a perpetual challenge for the City's irrigation utility. Customers reliant on water delivered from these four pump stations often experience low water pressures during peak hours.

Under current operations, a small operational spill occurs somewhat regularly to the Moses Drain at the end of both the North [10] and South Branches [11] of 15.0 Lateral. The Moses Drain then conveys return flows to Indian Creek. The spill is a result of maintaining hydraulic head throughout the lateral to adequately fill water orders for customers near the end of the delivery laterals. To eliminate this spill, the City and PID plan to install an automated flow control system on both branches of 15.0 Lateral that is regulated by the City's PI pump stations at locations 6, 7, and 8. Level sensors at the end of each branch will trigger the PI pump stations to turn on (or adjust pumping rates if already operating) to increase withdrawals from the lateral in the amounts necessary to maintain a no-spill (zero discharge) condition at the end of each branch of the 15.0 Lateral. Additional controls may be placed at the headgate to 15.0 lateral to provide further regulation of flows, which will prevent water from spilling into Moses Drain and subsequently, Indian Creek.

Approximately 1,000 feet downstream from the 15.0 Lateral are the Hatfield Lateral and the Horton Pump Station [12]. These typically both divert between 2 and 3 cfs to serve neighborhoods in the immediate vicinity. In the next 2 miles the Phyllis Canal crosses over the Elijah Drain [13] and the Joseph Drain [14] (which joins the Elijah approximately ½ mile downstream of this crossing). Both drains are piped under the Phyllis Canal. At the Elijah Drain crossing, PID has the ability to pump water from the Elijah Drain to the Phyllis Canal, as needed to supplement irrigation supply, at a rate up to 10 cfs. PID also operates a flood control gate at the Elijah Drain crossing that is used to regulate canal levels when runoff from exceptionally large storm events is collected upstream in the Phyllis Canal.

Just over 1 mile downstream from the Joseph Drain is the Isaiah Drain [15]. The Phyllis Canal has no plumbing connection to either drain. Between the two drains PID delivers water to another City PI pump station [16: Orchard Heights pump] and Stevens Lateral [17] (about 14 cfs). The Isaiah Drain joins the Elijah Drain about 3 miles north of the Phyllis Canal.

The Elijah feeder is situated along the Elijah Drain, with its gate [18] located approximately 750 ft north of the intersection of Midway Road and Moss Lane. The feeder diverts nearly all Elijah Drain flows (leaving only about 1 cfs in the drain) and delivers the water to Unit 1 of the Notus Canal [19] (described above). Below the feeder, Elijah Drain picks up flows from shallow groundwater and runoff from fields and joins the Wilson Drain about 1.25 miles downstream.

Approximately 1 mile downstream from the Elijah Drain crossing, the Phyllis Canal crosses over the Wilson Drain [20]. This crossing is also used as a flood control point to regulate flows in response to storm events that result in large volumes of stormwater runoff entering the canal. At the Wilson Drain crossing, PID has the ability to pump water from the Wilson Drain to the Phyllis Canal at a rate up to 15 cfs, as needed to supplement irrigation supply. About 14 cfs is diverted into Stone Lateral [21] from the Phyllis Canal between the Elijah Drain and the Wilson Drain.

Over the next 2 miles the Phyllis Canal delivers about 6 cfs to the McCarthy Lateral [22], then crosses over the Jonah Drain [23] and the Upper Embankment Drain [24]. There is no plumbing connection between the Phyllis Canal and the Jonah Drain. The farthest downstream Nampa PI pump station (Midway Park pump station) is installed just downstream of the Jonah Drain. The Upper Embankment Drain is used to regulate canal levels when runoff from exceptionally large storm events is collected upstream in the Phyllis Canal.

Just over 1.5 miles due north of where the Phyllis Canal crosses over the Upper Embankment Drain, flows from the Wilson Drain, Jonah Drain, and Upper Embankment Drain are diverted into the Wilson (Caldwell Canal) Feeder [25]. The feeder diverts nearly all Wilson Drain flows (leaving only about 1 cfs of flow in the drain) and delivers the water to a diversion [26] which sends a portion of the flow to the east, forming the Notus Canal, and the rest of the flow to the west to make the Caldwell Lowline

Canal. Both Canals are described above. Below this point, the Wilson drain picks up flows from shallow groundwater and runoff from fields before finally flowing into Indian Creek approximately 0.25 mile southeast of the intersection of South 21st Street and South Georgia Avenue in Caldwell, Idaho [27].

Below the Wilson Drain crossing, the Phyllis Canal continues on for another 12 miles to a concrete chute [28] located southwest of the intersection of Top Road and Lower Pleasant Ridge Road where between 1 and 4 cfs runs down into Pipe Gulch Drain. Over these 12 miles, the Phyllis Canal delivers water to 12 laterals. The largest diversion on this stretch is to 25.1 Lateral [29] at 26 cfs. The 11 smaller lateral diversions range from 0.8 to 7.2 cfs. A gate above the Bardsley Gulch Drain [30] creates a flood control point that can be used to regulate flows in response to storm events. In this final stretch, the Phyllis Canal also picks up about 50 cfs of water from drains and tailwaters of conveyances operated by the Nampa Meridian Irrigation District and the Wilder Irrigation District on the south side of the Phyllis Canal. The largest input is from the Deer Flat Canal [31], which consistently adds between 10 and 20 cfs.

All the drains situated in the lower reach of the Phyllis Canal (the area west of Wilson Drain, south of the Riverside Canal, and north of the Phyllis Canal) flow into the Riverside Canal. The majority of the drain flows, including Pipe Gulch Drain, get there by way of the West End Drain, which joins the Riverside Canal a mile north of Greenleaf [32].

Figures 9 and 10 provide overview maps of the PID service area focusing on the area of analysis. The maps' numbered sites correspond with attributes discussed above, and a quick reference table is included on each figure. Table 7-2 lists the diversion flows and inputs along the Phyllis Canal downstream from the proposed recycled water discharge location.

Table 7-2. Phyllis Canal Diversions and Inputs

Diversion	Miner's Inches	CFS
Individual headgate deliveries (proposed recycled water discharge location to Smith Road) [1]	(299.80)	(6.00)
15.0 Lateral	(1,587.87)	(31.76)
Hatfield Lateral	(112.69)	(2.25)
Pumping from Elijah Drain	–	10
Wilde Lateral	(65.76)	(1.32)
Stevens Lateral	(692.54)	(13.85)
Stone Lateral	(689.90)	(13.80)
Pumping from Wilson Drain	–	15
Individual headgate deliveries (Smith Road to tail)	(3,170.21)	(63.40)
McCarthy Lateral	(297.14)	(5.94)
25.1 Lateral	(1,299.87)	(26.00)
Small returns from irrigated land on south side of Phyllis Canal	–	30–40
Lonkey Lateral	(91.37)	(1.83)
Mesler Lateral	(358.25)	(7.17)
Douglas Lateral	(151.61)	(3.03)
Cowling Lateral	(40.67)	(0.81)
Torbett Lateral	(160.32)	(3.21)
Hitchcock Lateral	(86.79)	(1.74)

Table 7-2. Phyllis Canal Diversions and Inputs		
Diversion	Miner's Inches	CFS
Smiley Lateral	(88.21)	(1.76)
Return flow from Deer Flat Canal	–	10–20
Fisher Lateral	(298.01)	(5.96)
Whittig Lateral	(186.00)	(3.72)
Talcott Lateral	(60.50)	(1.21)
Shelp Lateral	(161.50)	(3.23)
Pipe Gulch Laterals	(213.20)	(4.26)
Total diversions	(10,112.21)	(206.25)
Total inputs	-	65–75

[1] *Includes two City PI pump stations located in the Phyllis Canal.*

7.5.2 Influence on Nearby Surface Waters

This reuse project is expected to improve water quality in Indian Creek by removing the Nampa WWTP effluent discharge from an impaired reach of Indian Creek from May 1 through September 30 annually. Projected water quality impacts to Indian Creek are identified in Table 7-3. Projected water quality impacts use Indian Creek water quality data from 2012 as background conditions for the Creek. This is the same time period dataset used by the EPA to develop effluent limits for the City's wastewater NPDES permit and the Lower Boise River TMDL: 2015 Total Phosphorus Addendum. The full dataset is included in Appendix C.

Table 7-3. Projected Indian Creek Impacts					
With WWTP Effluent Discharge (Permit Condition) [1]					
	May	June	July	August	September
Flow (cfs)	85.9	69.1	68.9	71.4	97.2
TP load (lbs/day)	76	60	64	73	81
TN load (lbs/day)	2,450	2,783	2,550	2,794	2,929
Without WWTP Effluent Discharge (Made possible by Reuse Permit) [2]					
Flow (cfs)	54.9	38.1	37.9	40.4	66.2
TP load (lbs/day)	59	43	47	57	64
TN load (lbs/day)	778	1,111	878	1,122	1,257
TP load decrease (%)	-22%	-28%	-26%	-23%	-21%
TN load decrease (%)	- 68%	- 60%	- 66%	- 60%	- 57%

TN = total nitrogen.

TP = total phosphorus.

[1] *With WWTP Effluent (Permit Condition) represents effluent flow of 31 cfs with 0.1 mg/l total phosphorus and 10 mg/l total nitrogen.*

[2] *Without WWTP Effluent (Made possible by Reuse Permit) represents the background condition of Indian Creek (2012 data) with no effluent discharge.*

Representative background water quality conditions were determined for Phyllis Canal by reviewing a historical dataset and conducting additional water quality monitoring. The dataset consists of water quality samples collected by the City throughout the irrigation season during 2007, 2008, and 2009 and another set of 19 samples collected near the end of the irrigation season in 2018. Results of

water quality analyses conducted during each round of sampling are included in Appendix D. Monthly average concentrations for total dissolved solids (TDS), total nitrogen (TN), total phosphorus (TP), and temperature are shown in Table 7-4.

Table 7-4. Background Phyllis Canal Data Summary

Month	Total Dissolved Solids [1] (mg/l)	Total Nitrogen [2] (mg/l)	Total Phosphorus [3] (mg/l)	Temperature [2] (°C)
May	138	1.43	.31	11.3
June	138	1.46	.25	13.7
July	138	1.51	.30	17.1
August	138	1.99	.32	17.3
September	138	1.59	.32	16.0

[1] TDS concentrations are available for 2018 only and do not span the whole irrigation season.

[2] TN and temperature concentrations represent data from 2007–2009 and 2018.

[3] TP concentrations are substantially higher in the dataset from 2007–2009 (average 0.30 mg/L) than in the dataset from 2018 (average 0.08). To simulate the highest phosphorus load that would be delivered to crops via canal water, monthly averages from 2007–2009 were used to represent background TP concentrations in Phyllis Canal.

Background water quality data and the proposed recycled water effluent concentrations were used in mixing calculations to determine the influence of discharging Class A recycled water to the Phyllis Canal. Under the proposed conditions of this recycled water reuse permit, the recycled water discharged to the canal will be treated to 700 mg/l for TDS, 30 mg/l for TN, and .35 mg/l for TP. Effluent will not be treated for temperature. Phyllis Canal background data and mixing scenarios for total dissolved solids, total nitrogen, total phosphorus, and temperature are shown in Tables 7-5 through 7-8.

Table 7-5. Total Dissolved Solids Mixing

	May	June	July	August	September
Background Phyllis Canal					
Flow (cfs) [1]	200	200	200	200	200
TDS concentration (mg/L)	138	138	138	138	138
Class A Recycled Water from WWTP					
Flow [2] (cfs)	31	31	31	31	31
TDS concentration (mg/L)	700	700	700	700	700
Phyllis Canal after Recycled Water Mixing					
Flow (cfs)	231	231	231	231	231
TDS concentration (mg/L)	213	213	213	213	213

[1] 200 cfs is the typical target flow rate in the canal along the proposed recycled water discharge reach when fully operational.
[2] 31 cfs is the planned maximum design flow.

Table 7-6. Total Nitrogen Mixing					
Background Phyllis Canal					
	May	June	July	August	September
Flow [1] (cfs)	200	200	200	200	200
TN concentration (mg/l)	1.43	1.46	1.51	1.99	1.59
Daily load (lbs)	1,542	1,575	1,629	2,146	1,715
Class A Recycled Water from WWTP					
Flow [2] (cfs)	31	31	31	31	31
TN concentration (mg/l)	30	30	30	30	30
Daily load (lbs)	5,015	5,015	5,015	5,015	5,015
Phyllis Canal after Recycled Water Mixing					
Flow (cfs)	231	231	231	231	231
TN concentration (mg/l)	5.26	5.29	5.33	5.75	5.40
Daily load (lbs)	6,557	6,589	6,643	7,161	6,730

[1]200 cfs is the typical target flow rate in the canal along the proposed recycled water discharge reach when fully operational.
[2] 31 cfs is the planned maximum design flow.

Table 7-7. Total Phosphorus Mixing					
Background Phyllis Canal					
	May	June	July	August	September
Flow [1] (cfs)	200	200	200	200	200
TP concentration (mg/L)	0.31	0.25	0.30	0.32	0.32
Daily load (lbs)	337.6	271.8	327.9	340.8	343.0
Class A Recycled Water from WWTP					
Flow [2] (cfs)	31	31	31	31	31
TP concentration (mg/L)	0.35	0.35	0.35	0.35	0.35
Daily load (lbs)	58.5	58.5	58.5	58.5	58.5
Phyllis Canal after Recycled Water Mixing					
Flow (cfs)	231	231	231	231	231
TP concentration (mg/L)	0.32	0.27	0.31	0.32	0.32
Daily load (lbs)	396.1	330.3	386.4	399.3	401.5

[1] 200 cfs is the typical target flow rate in the canal along the proposed recycled water discharge reach when fully operational.
[2] 31 cfs is the planned maximum design flow.

Table 7-8. Temperature Mixing					
Background Phyllis Canal					
	May	June	July	August	September
Flow [1] (cfs)	200	200	200	200	200
Temperature (°C)	11.3	13.7	17.1	17.3	16.0
Class A Recycled Water from WWTP					
Flow [2] (cfs)	31	31	31	31	31
Temperature (°C)	18.3	20.2	22.5	22.9	21.4
Phyllis Canal after Recycled Water Mixing					
Flow (cfs)	231	231	231	231	231
Final Temperature (°C)	12.20	14.57	17.78	18.01	16.73

[1] 200 cfs is the typical target flow rate in the canal along the proposed recycled water discharge reach when fully operational.
[2] 31 cfs is the planned maximum design flow.

7.6 Groundwater

The area of analysis is located within the Treasure Valley aquifer system, a sedimentary aquifer located in a complex series of interbedded, tilted, faulted, and eroded sediments up to 6,000 ft deep. The aquifer contains a shallow flow system composed of sand and gravel (Terrace Gravels of the Boise River) and a deep regional flow system composed of fine sand, silt, and gravel found in the Glenns Ferry Formation. The shallow system extends to approximately 250 feet below ground surface (ft bgs). The deep regional system is often separated from the shallow system by a blue or grey clay that commonly shows up in well drillers' reports throughout the valley. The deep aquifer system is confined or semi-confined and extends below 250 ft bgs (Cosgrove and Taylor, 2007).

7.6.1 Groundwater in the Area of Analysis

Depth to groundwater across the area of analysis is relatively shallow and typically ranges from 5 to 35 ft bgs. Groundwater flow is generally to the west or northwest. Recharge to the shallow aquifer system occurs from canal seepage, irrigation infiltration, and stream channel losses. Discharge from the shallow aquifer often occurs at drains or streams in the area. Recharge to the deep regional flow system occurs in the eastern part of the Treasure Valley, and some recharge enters as underflow from the Boise Foothills to the north. Regional flow is believed to discharge primarily to the Boise or Snake Rivers west of the area. Groundwater residence times range from days to tens of years in the shallow system to hundreds to tens of thousands of years in the deep regional system (IDWR, 2001).

Groundwater quality within the Treasure Valley is generally good, and groundwater is usually safe for human consumption. Nitrate, bacteria, arsenic, fluoride, gross alpha, radon, and uranium are the main constituents that are found to exceed Maximum Contaminant Levels in the valley. Arsenic, uranium, and nitrate have been detected in exceedance of the Maximum Contaminant Levels throughout Nampa. As a result, much of the area of analysis is located within a Nitrate Priority Area (IDEQ, 2016).

Many wells including municipal, domestic, irrigation, and injection wells are located within the area of analysis. Municipal drinking water supply wells are shown on Figures 9 and 10. Table 7-9 describes minimum distances these public supply wells need to be from various sites according to IDAPA 58.01.08 – Idaho Rules for Public Drinking Water Systems. Nampa's drinking water wells adhere to these requirements thus far. This permit would contribute recycled water to irrigation conveyances within a safe buffer from drinking water wells. The 15.0 Lateral is the closest lateral off the Phyllis Canal to these two wells, with distances of 500 ft and 2,500 ft. One of the wells is 200 ft

from the Elijah Drain, which can receive flood control flows from the Phyllis Canal in response to large precipitation events.

Table 7-9. Minimum Distances from a Public Water System Well [1]	
Gravity Wastewater Line	50 feet
Any potential source of contamination	50 feet
Pressure wastewater line	100 feet
Class A Municipal Reclaimed Wastewater Pressure Distribution line	50 feet
Individual home septic tank	100 feet
Individual home disposal field	100 feet
Individual home seepage pit	100 feet
Privies	100 feet
Livestock	50 feet
Drainfield: standard subsurface disposal module	100 feet
Absorption module: large soil absorption system	150–300 feet, see IDAPA 58.01.03
Canals, streams, ditches, lakes, ponds, and tanks used to store non-potable substances	50 feet
Storm water facilities disposing storm water originating off the well lot	50 feet
Municipal or industrial wastewater treatment plant	500 feet
Reclamation and reuse of municipal and industrial wastewater sites	See IDAPA 58.01.17
Biosolids application site	1,000 feet

[1] *IDAPA 58.01.08.900.*

7.6.2 Modelled Impacts on Groundwater Quality

Section 8 describes reuse site loading rates and demonstrates that constituents in the recycled water discharged to the canal are not anticipated to exceed crop uptake rates in the areas irrigated by the Phyllis Canal. Therefore, the only significant pathway for groundwater constituents of concern (nitrogen and total dissolved solids) is through seepage from the bottom of the Phyllis Canal. To better understand the impacts that canal seepage (with the water quality described in Section 7.5.2) may have on groundwater, the City completed a modelling analysis that identifies the range of anticipated impacts.

As discussed in Section 7.5 the flow and water quality conditions in the Phyllis Canal begin to change quickly with distance from the recycled water discharge location due to diversions and inputs into the canal from drains and tailwaters. Therefore, the City set up IDEQ's Water Reuse/Land Treatment System model to represent conditions in the shallow aquifer below the Phyllis Canal in the area of analysis, focusing specifically on the area just downstream of the recycled water discharge location. A series of iterations were completed to identify model sensitivity to critical variables as well as the range of likely groundwater mixing scenarios based on conditions in and around the area of analysis. A detailed description of modeling activities is included in Appendix E.

Well logs and geological maps in the area of analysis were reviewed to assist with determining model domains and hydrogeologic inputs to the model including hydraulic conductivity, hydraulic gradient, aquifer material, aquifer porosity, and aquifer thickness. Model domains, well locations, local geology, and representative well logs are shown on Figure 11.

Background groundwater quality was determined with analyte data contained in the State of Idaho's Environmental Data Management System. Wells were identified in the vicinity of anticipated impact and included wells directly upgradient of the Class A Recycled water discharge location (Figure 11). Well and analyte data was filtered to include only wells in the shallow aquifer (85 feet or less) and a water quality sampling date within the past 10 years. Background analyte concentration is a model input and is calculated as the average of the filtered data.

The Groundwater Contaminant Transport model results in a vertical and lateral dilution of background groundwater concentration for nitrate and TDS. This is the expected result because percolate concentration is less than background groundwater concentration for both constituents. Sensitivity analysis of uncertain input parameters modified the spatial extent of dilution, but all cases resulted in lower concentrations in the near field.

Section 8

Reuse Site Loading Rates

8.1 Tracking of Recycled Water and Irrigation

Recycled water discharged to the Phyllis Canal will be monitored and recorded using automated in-pipe flow monitoring equipment. Data is recorded and stored on secure City servers and will be used to meet analysis and reporting requirements.

8.2 Design and Loading Rates

The area of analysis covers approximately 22,000 acres throughout the Nampa area. Of the total area, around 17,000 acres use irrigation water from Phyllis Canal and its distribution system of pumps and laterals. The land use in this area ranges from highly developed/urbanized properties to diverse agricultural fields with crops ranging from alfalfa to beans and mixed vegetables. This land use data was used to develop the Irrigation Water Requirement (IWR), which in turn was used to estimate hydraulic and constituent loading rates. IWR calculations are described in detail in Appendix F.

The IWR was calculated based on the following equation:

$$IWR = IR_{net}/E_i$$

Where

IWR = irrigation water requirement

IR_{net} = net irrigation requirement

E_i = irrigation efficiency

The net irrigation water requirement calculations used data supplied by the Kimberly Research Institute for individual crops that are typically grown in the area and were used to develop individual IWRs for each subdivided land area and land use or crop. To maintain a conservative analysis approach, acreage for developed land uses was reduced by 20–80 percent to account for the comparatively smaller percentage of land that is composed of lawns and landscaping, as detailed in Appendix F, Table F-1.

The IWR sets the basis for hydraulic loading on the land application area and the expected volume of water to be applied for constituent loading calculations. The IWR represents the amount of irrigation that should be applied to a specific crop over the growing season to substantially meet this requirement. For this analysis, the term growing season is defined as the period when recycled water will be discharged to the Phyllis Canal each year (May 1 to September 30). A summary of the IWR for the estimated 17,442 irrigated acres serviced by the Phyllis Canal below the proposed recycled water discharge location is provided in Table 8-1. Background calculations and assumptions associated with the total water available and the IWR are included in Appendix F.

Table 8-1. Total Water Available vs. Irrigation Water Requirement		
Month	Total Water Available (MG/Month)	Total Water Required (MG/Month)
May	4,824	3,382
June	4,667	4,515
July	4,822	5,589
August	4,863	4,614
September	4,631	2,774
Totals	23,806	20,874

Constituent loading rates were calculated using the IWR and the blended canal water quality data for TN and TP found in Tables 7-6 and 7-7, respectively. The loading rates are calculated using the following equation:

M = (Q x C x k)/A

Where

M = mass of constituent applied per area (lb/ac-gs)
Q = flow rate (MG/gs)
C = constituent concentration (mg/l)
A = unit area (ac)
K = unit conversion from mg/l to lbs/MG (1 mg/l = 8.34 lb/MG)

A monthly summary of the daily constituent crop loading rates is provided in Table 8-2.

Table 8-2. Nutrient Loading Rates [1]		
Month	TN (lbs/day)	TP (lbs/day)
May	5,231	291
June	7,217	402
July	8,647	481
August	7,138	397
Sept	4,435	247

[1] *Average day.*

Table 8-3 provides a summary of the expected IWR and expected TN and TP loading for each month during the growing season.

Table 8-3. Expected IWR, Total Nitrogen, and Total Phosphorus by Month

Month	IWR (total)	Land Applied Area (total)	TN Load	TP Load	TN	TP
	MG	Acres	lbs/month	lbs/month	lbs/acre/month	lbs/acre/month
May	3,382	17,442	162,161	9,025	9.3	0.5
June	4,515	17,442	216,497	12,049	12.4	0.7
July	5,589	17,442	268,043	14,917	15.4	0.9
August	4,614	17,442	221,280	12,315	12.7	0.7
Sept	2,774	17,442	133,039	7,404	7.6	0.4
Total GS	20,874	–	1,001,020	55,709	11.48 [2]	0.6 [2]

[1] *Land applied area includes only assumed vegetated percentage of land within the 3,300-acre sample area described above.*

[2] *Value represents average load per acre.*

8.3 Irrigation Scheduling Methods

Irrigation water is typically supplied to the area of analysis beginning in April and ending in October. Class A recycled water is scheduled to be discharged to the Phyllis Canal at a rate up to 31 cfs from May 1 through September 30 each year.

8.4 Source(s) of Supplemental Irrigation Water

Supplemental irrigation water considerations are not applicable for this project.

8.5 Water Rights Documentation

There will be no supplemental water used for irrigation or mixing purposes as part of this project.

8.6 Monthly Water Balances

There are no storage lagoons or ponds associated with this project. An overview of the monthly water balance for the Phyllis Canal and the area of analysis is described below.

The PID currently delivers approximately 12,000 acre feet of irrigation water per month to customers in the service area downstream from the proposed recycled water discharge location. This volume corresponds to an average approximate flow rate of 200 cfs in the Phyllis Canal at the proposed recycled water discharge location. This water is distributed to irrigated lands through laterals, direct diversions, and pumps. Water orders change every day.

The additional flow from recycled water added to the system may be balanced using various methods throughout the irrigation season depending on growing season temperatures and precipitation, storage water availability, fluctuations in water orders, and changes in drainage flows entering the Phyllis Canal from upgradient irrigation users and surface waters. To operate the irrigation system efficiently, PID maintains only as much flow as is needed to deliver water up to the last customers on each ditch or lateral. The primary locations PID will use to regulate flow in the canal to maintain operational flows and avoid spillback are both located upstream from the recycled water discharge point. PID can control flow in the canal by diverting more or less water from the Fivemile Creek feeder and by pumping more or less water from Indian Creek. This method of operation mitigates risk of the addition of recycled water resulting in excess water in the system.

8.7 Facility Calculations and Management of Loading Rates

Loading rates are the result of mixing the Class A Recycled water discharged from the Nampa WWTP and the background concentrations in Phyllis Canal. With design flows up to 31 cfs, the Class A recycled water will make up approximately 15 percent of the Phyllis Canal flow at the discharge point. Considering the end of the discharge pipe as the point of compliance and the approximately 17,000 irrigated acres of PID service area downstream from the discharge location, constituent loading is not anticipated to exceed agronomic uptake rates of crops in the PID service area.

Table 8-4 below provides the design effluent concentrations of relevant constituents.

Table 8-4. Design Effluent Concentrations of Relevant Constituents

Constituent	Design Effluent Concentration
pH	6.0–9.0 S.U.
BOD-5 day	10 mg/l
Total coliform	7-day median: 2.2 MPN/100 ml Max single sample: 23 MPN/100 ml
Turbidity	For filtration by cloth or sand/granular media: Daily mean: ≤ 2 NTU Instantaneous max: ≤ 5 NTU For membrane filtration*: Daily mean: ≤ 0.2 NTU Instantaneous max: ≤ 0.5 NTU *To be met prior to disinfection.
Total nitrogen	30 mg/L (max month: 5.75 mg/L in Phyllis Canal after mixing)
Total phosphorus	0.35 mg/L (max month: 0.32 mg/L in Phyllis Canal after mixing)
Total dissolved solids	700 mg/l (max month: 213 mg/L in Phyllis Canal after mixing)
Total suspended solids	30 mg/l

MPN = most probable number.

NTU = Nephelometric Turbidity Units.

S.U. = standard unit.

8.8 Land Limiting Constituent

Considering the end of the recycled water discharge pipe as the point of compliance and the approximately 17,000 irrigated acres of PID service area downstream from the discharge point, constituent or hydraulic loading is not anticipated to exceed agronomic uptake rates of crops in the PID service area.

Applying fertilizers is a common practice within the area of analysis. The addition of Class A recycled water from the Nampa WWTP is expected to elevate nutrient levels in Phyllis Canal, which could reduce the amount of fertilizer addition required by irrigators. The City and PID will partner to educate water users in the PID service area downstream of the recycled water discharge location about the existing nutrient levels in the Phyllis Canal and the nutrient levels expected with the addition of the recycled water.

To determine the land limiting constituent, this analysis used the loading rates and land area described in Section 8.2 above. The calculated loading rates were compared against typical crop

uptake rates, which were found through an online literature review. These crop uptake rates are included in Table 8-5 below.

Table 8-5. Typical Uptake Rates [1,2]

Type	TN (lbs/acre/gs)	TP (lbs/acre/gs)
Turf grass	196	27
Alfalfa	482	45
Grass pasture	95	12
Winter wheat	84	16
Beans	331	42
Peas	81	10
Corn	116	22
Sugar beets	137	25
Grass hay	94	13
Other vegetables [3]	110	11

[1] Nutrient uptake rates from USDA-NRCS, 2019

[2] Uptake rates are typically provided as a traditional growing season total. Nutrient uptake rates have been discounted by 13% to align with this application's definition of the growing season as May 1 to September 30.

[3] Values used for this category are representative of an average of typical values for other crops, mostly vegetables, with a smaller footprint in the area of analysis.

A comparison of the loading rates and crop uptake rates for sample crops is provided below in Table 8-6. This table compares the loading rates discussed in Section 8.2 against the standard crop uptake rates listed above. The table indicates that constituent loading for TN and TP is anticipated to be well below typical crop uptake rates. As constituent loading rates relate to crop uptake rates and the beneficial use of the Phyllis Canal as irrigation water, the results in Table 8-6 indicate that there is substantial additional capacity in the area of analysis for TN and TP beyond the requested effluent limits.

Table 8-6. Applied Nutrient Load percent of Typical Uptake

Type	TN	TP
Turf grass	29%	12%
Alfalfa	12%	7%
Grass pasture	61%	26%
Winter wheat	68%	20%
Beans	17%	8%
Peas	71%	33%
Corn	50%	15%
Sugar beets	42%	13%

Grass hay	61%	24%
Other vegetables	52%	28%

Section 9

Reuse Site Vegetation

9.1 Cropped Sites

The Pioneer Irrigation District serves over 34,000 acres of land in Canyon and Ada Counties. The area of analysis included in this report encompasses a total of approximately 22,000 acres. Of this area, approximately 17,000 acres are irrigated by water managed by PID. The total area is split almost evenly between developed and agricultural land. Table 9-1 displays crop acreage totals in the area of analysis. Developed land accounts for 10,692 acres and is divided between high density, medium density, low density, and areas of open developed space. In Figure 12, developed land is denoted by shades of red. Alfalfa, corn, winter wheat, and dry beans are the top four crops by acreage, together totaling another 6,036 acres. Grass and pasture, such as grazing fields make up 2,528 acres.

Table 9-1. Pioneer Irrigation District Land Use

Crop/Land Type	Acres	Percent of Total
Developed/open space	5,336	24%
Developed/low intensity	3,987	18%
Developed/medium intensity	1,169	5%
Developed/high intensity	200	1%
Alfalfa	2,985	13%
Grass/pasture	2,528	11%
Corn	1,459	7%
Winter wheat	879	4%
Dry beans	714	3%
Sugar beets	544	2%
Onions	377	2%
Herbs	347	2%
Fallow/idle cropland	294	1%
Peas	248	1%
Shrubland	232	1%
Other hay/non-alfalfa	192	1%
Other crops/Land types (less than 40 acres)	682	3%
Total	22,172	100%

Source: National Agricultural Statistics Service (NASS): CropScape, 2017.

9.2 Forest and Native Vegetation

There is no forested area within the area of analysis. There is a small amount of uncultivated or fallow land. No irrigation water from the PID system is applied to acreages of fallow or uncultivated lands.

Section 10

Reuse Site Management

10.1 Site Management History

The area of analysis includes rural acreage, subdivisions, and portions of the municipalities of the cities of Nampa and Caldwell. As the population of Canyon County grows, land uses in the area of analysis are increasingly changed from agricultural to urban/residential. As residential subdivisions are developed in the PID service area many of them install pressurized irrigation systems to supply water to residents for the primary purpose of landscape irrigation. PID has provided service to this area since 1901.

10.2 Site Management Plans

Site management plans included in this application are limited to activities conducted at the Nampa WWTP and activities associated with the piping and appurtenances located at the discharge point to Phyllis Canal. Management plan considerations are described below.

10.2.1 Buffer Zone Plan

The City is requesting authorization to discharge Class A recycled water only. Therefore, buffer zones are not required for this project.

10.2.2 Grazing Management

There are approximately 2,500 acres of grass and pasture within the area of analysis. The activities identified in the City's operations are not anticipated to have any impact on grazing activities, rotation, or time of year.

10.2.3 Nuisance Management

The actual discharge of Class A recycled water to the Phyllis Canal is not anticipated to result in excess noise, odor, overspray, or other nuisance conditions. The City will undertake a public outreach campaign to educate neighbors close to the discharge pipe about the project. The City will also post signage with contact information for nuisance complaints or emergency situations.

Nuisance odors at WWTPs are primarily due to influent flows and large open tanks early in the treatment process such as clarifiers, lagoons, aeration basins, and filters. The Nampa WWTP has several planned improvements to the overall treatment process that will result in lower odor than other WWTP designs. Lagoons are absent from the WWTP process and trickling filters are odor contributors that will be demolished as part of Phase 2 construction at the treatment plant. Other potentially odorous elements of the plant are housed in covered structures such as the centrate tank, wet well from solids handling, headworks operations, and solids handling. Class B biosolids that are produced in Nampa also have lower odor due to higher volatile solids reduction.

Discharged waters have been treated extensively through the WWTP process. By the time waters are discharged from the plant they are relatively free from odor. Minor chlorine odors from residual disinfection are possible but unlikely and minimal.

10.2.4 Waste Solids Management

In the treatment process, waste activated sludge is pumped through two thickening feed pumps to three rotary drum thickeners after the addition of polymer for more efficient thickening. The thickened waste activated sludge is pumped to four primary anaerobic digesters along with the primary sludge. The digested sludge is then stored in three secondary anaerobic digesters. Polymer is added to the sludge prior to dewatering using centrifuges. The centrate is sent to a centrate storage tank, combined with the filtrate from the rotary drum thickeners, and mixed with ferrous chloride for control of hydrogen sulfide odors prior to being pumped back to headworks. Dewatered biosolids are stored on site in sludge drying beds prior to landfill disposal. Collected screenings and grit are also landfilled. This process is summarized in Figure 7.

10.2.5 Nonvolatile Dissolved Solids (Total Dissolved Solids)

Total dissolved solids concentrations in the recycled water will be around 700 mg/L. When mixed with water in the canal, which is approximately 135 mg/L on average, the concentration is expected to decrease to 211 mg/L. Guidance for TDS in irrigation water typically places the lower threshold for impacts to crops between 450 mg/l and 750 mg/l (Ayers, 1977; Ayers and Westcott, 1994; U.S. BOR, 2003). Therefore, TDS in the recycled water should have no impact on crops, once mixed with the water in the canal, as described in Section 7.5.

10.2.6 Runoff Management

The cities of Nampa and Caldwell both have irrigation utilities that provide water for irrigation to their utility customers. These utilities regularly provide information to their customers regarding water conservation and efficient water usage practices including avoiding overwatering that may result in excess runoff from the urban area. Excess irrigation water that does flow off properties may likely enter the cities' Municipal Separate Storm Sewer Systems (MS4s). Each MS4 conveys stormwater runoff and other surface runoff through a system of storm drain pipes that discharge to natural waterways such as Indian Creek and Mason Creek, as well as to irrigation conveyances, the majority of which are owned and operated by PID. Irrigation runoff is considered an allowable non-stormwater discharge in both cities' NPDES MS4 permits. Public education and outreach programs required by the MS4 permits include information about avoiding overwatering and overspray, as well as proper application and storage of chemicals such as fertilizers and pesticides.

Outside of the MS4 areas, PID actively manages water deliveries to run the irrigation system efficiently, maintaining only as much flow as is needed to deliver water up to the last customers on each ditch or lateral. This practice acts to mitigate excess spills and tailwater runoff from fields. However, tailwater runoff is often collected in drains or ditches for further use in deliveries downstream. As an example, approximately 10,000 acres of the Black Canyon Irrigation District is served by the Notus Canal, which begins within the PID service area and is made up entirely of diverted flow from the Wilson Drain. As described in Section 8.6, PID will balance diversions upstream of the recycled water discharge point to avoid excess water in the system below the discharge point.

Section 11

Quality Assurance Project Plan

Following permit issuance, and prior to discharging recycled water to the Phyllis Canal, the City will develop a Quality Assurance Project Plan to assist in planning for collection, analysis, and reporting of monitoring data in support of the permit. The Quality Assurance Project Plan will include the following information:

- Number of measurements, number of samples, type of sample containers, preservation of samples, holding times, analytical methods, analytical detection, and quantitation limits for each target compound, type and number of quality assurance field samples, precision and accuracy requirements, sample preparation requirements, sample shipping methods, and laboratory data delivery requirements
- Maps indicating the location of each monitoring and sampling point
- Personnel qualification and training
- Names, addresses, and telephone numbers of the laboratories the City will use
- Example formats and tables that the City will use to summarize and present all data in the annual report

Section 12

Monitoring Activities

Recycled water monitoring will occur at the discharge point to Phyllis Canal. Monitoring is anticipated to include continuous automated flow monitoring and water quality monitoring for target constituents identified in the permit.

Groundwater, soil, crop tissue, and other monitoring is not believed to be applicable for this permit, due to the discharge of recycled water directly to the Phyllis Canal for use as irrigation water supply augmentation.

Section 13

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Recycled Water Reuse Permit Application
Plan of Operations

Prepared for
City of Nampa, Idaho
March 19, 2019

Recycled Water Reuse Permit Application
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March 19, 2019

950 W Bannock Street, Suite 350
Boise, Idaho 83702

Table of Contents

List of Tables

List of Abbreviations

µg/l	micrograms per liter
BOD	biochemical oxygen demand
cfs	cubic feet per second
City	City of Nampa
Facility Plan	City of Nampa Wastewater Treatment Plant Facility Plan
FAZ	flexible aerated zone
I/I	infiltration and inflow
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
MCC	motor control center
mgd	million gallons per day
mg/l	milligrams per liter
NPDES	National Pollutant Discharge Elimination System
O&M	operations and maintenance
PID	Pioneer Irrigation District
PLC	programmable logic controller
SSORP	Sanitary Sewer Overflow Response Plan
TP	total phosphorus
TSS	total suspended solids
UPS	uninterruptable power supply
WWTP	wastewater treatment plant

Executive Summary

The City of Nampa (City) is authorized to discharge treated wastewater effluent from the Nampa Wastewater Treatment Plant to Indian Creek under U.S. Environmental Protection Agency National Pollutant Discharge Elimination System Permit No. ID0022063. The permit was issued September 20, 2016, effective November 1, 2016, through October 31, 2021. The permit is included at the end of the application as Attachment A.

The City is seeking a recycled water reuse permit from the Idaho Department of Environmental Quality and has developed this application to provide information to support development and issuance of a permit. This document serves as an outline for the Plan of Operations the City will develop to maintain the recycled water discharge requirements and other requirements of the recycled water reuse permit, once issued. The Plan of Operations is an iterative document that will be used and maintained to reflect the most up-to-date information regarding operation of the treatment system delivering Class A Recycled Water to the Phyllis Canal for the purpose of agricultural and municipal irrigation supply augmentation. The Plan of Operations will describe the normal operations of the treatment system, specific operating instructions and troubleshooting guidance, system monitoring for process control and compliance reporting, and a discussion of recordkeeping and emergency reporting procedures.

Section 1

Introduction and Background

The City of Nampa (City) is authorized to discharge treated wastewater effluent from the Nampa Wastewater Treatment Plant (WWTP) to Indian Creek under U.S. Environmental Protection Agency National Pollutant Discharge Elimination System (NPDES) Permit No. ID0022063. The permit was issued September 20, 2016, effective November 1, 2016, through October 31, 2021. The permit is included at the end of the application as Attachment A.

The City is seeking a recycled water reuse permit from the Idaho Department of Environmental Quality (IDEQ) and has developed this application to provide information to support development and issuance of a permit. This document serves as an outline for the Plan of Operations the City will develop to maintain the recycled water discharge requirements and other requirements of the recycled water reuse permit, once issued.

The intent of the permit application is to secure authorization for Class A recycled water treated at the Nampa WWTP to be discharged as agricultural and municipal irrigation supply augmentation water to the Phyllis Canal annually between approximately May 1 and September 30. The design flow planned for this discharge is 31 cubic feet per second (cfs) (20.1 million gallons per day [mgd]). The Phyllis Canal typically conveys irrigation water at a rate of approximately 200 cfs along the reach of the proposed recycled water discharge location.

In early 2018 the City completed the *City of Nampa Wastewater Treatment Plant Facility Plan* (Facility Plan) (BC, 2018) that was accepted by the IDEQ in spring 2018. The Facility Plan discusses irrigation supply augmentation as the preferred alternative for wastewater management between May 1 and September 30. The Facility Plan provides the basis for much of the information included in this document. The Plan of Operations describes the basis of the treatment system and operations required to consistently produce Class A recycled water for this purpose. This Plan of Operations will be updated following permit issuance and as the project design and construction moves forward.

Table 1-1 below shows where key sections of the Recycled Water Rules are addressed in the Preliminary Technical Report and Plan of Operations.

Table 1-1. Recycled Water Rules Requirement Discussion Location in Application

Section of Recycled Water Rules	Description of Recycled Water Rule	Preliminary Technical Report Section	Plan of Operations Section
601	Municipal Recycled Water: Classification, Treatment, Use	Section 5	Section 5
602	Municipal Recycled Water: Classification and Uses Tables	Section 3	Section 3
603	Municipal Recycled Water: Access, Exposure and Signage	Section 7, Section 10	Section 8
604	Reuse Facilities: Buffer Distances	Section 10	Section 8
605	Municipal Recycled Water: Preliminary Engineering Reports	Section 5	Section 5, Section 6
606	Reuse Facility: Plan and Specification Review	Section 5	Section 5
607	Municipal Recycled Water: Distribution Pipelines	Section 4	Section 4
608	Municipal Recycled Water: Pumping Stations	Section 5, Section 7	NA

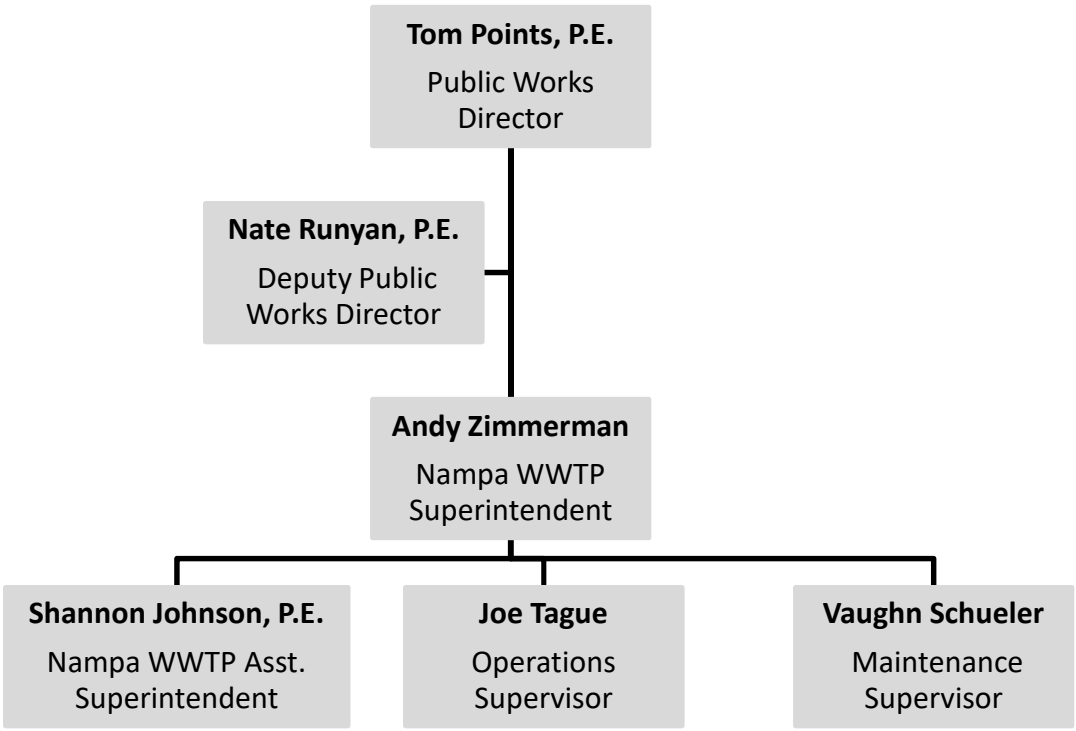
Table 1-1. Recycled Water Rules Requirement Discussion Location in Application			
Section of Recycled Water Rules	Description of Recycled Water Rule	Preliminary Technical Report Section	Plan of Operations Section
609	Municipal Recycled Water: Lagoons	Section 6	Section 7
610	Municipal Recycled Water: Class A Recycled Water Filtration	Section 5, Section 8	Section 5, Section 6
611	Municipal Recycled Water: Reliability and Redundancy	Section 6	NA
612	Demonstration of Technical, Financial, and Managerial Capacity of Municipal Reuse Facility	Section 2	Section 2
613	Reuse Facility: Rapid Infiltration System	Section 7	NA
614	Ground Water Recharge: Class A Recycled Water	Section 5, Section 7	Section 3
615	Subsurface Distribution of Recycled Water	Section 4	Section 4

Section 2

Operation and Management Responsibility

2.1 Organizational Chart

The personnel and positions identified in the organizational chart below are responsible for operating and maintaining the wastewater and reuse water systems for the Nampa WWTP.



In accordance with Idaho Administrative Procedures Act (IDAPA) 24.05.01 all wastewater treatment operators, collections operators, and laboratory analysts have a wastewater treatment operator license, ranging from level I through level IV. Andy Zimmerman and Shannon Johnson are certified Class IV operators.

2.2 Operator and Manager Responsibilities

Operators at the Nampa WWTP are responsible for the day-to-day activities and make adjustments as necessary to maintain efficient treatment process operation. Managers are responsible for maintaining and implementing requirements of the NPDES permit and the recycled water reuse permit. Managers are also responsible for scheduling, reporting, and assigning personnel.

2.3 Process for Updating the Plan of Operation

The Nampa WWTP superintendent and supervisors will be responsible for understanding the requirements of the recycled water reuse permit including what constitutes document updates and/or minor or major permit modifications. Updates will be assigned to appropriate staff and documented and reported following the guidance in the reuse permit issued by the IDEQ.

Section 3

Permits and Other Regulatory Requirements

3.1 Permits and Regulatory Documents

The City has authorization to treat wastewater and discharge to Indian Creek through its NPDES permit ID-0022063. This permit became effective November 1, 2016. The permit contains new requirements for total phosphorus (TP) and temperature treatment, which were not regulated in the previous NPDES permit. Compliance schedules are in place to meet these new limits. Stated effluent limits for final TP, mercury, and copper must be achieved by August 31, 2026. State effluent limits for temperature must be achieved by August 31, 2031. The key NPDES permit requirements are provided in Table 3-1. For other permit requirements refer to the Nampa WWTP NPDES permit provided in Attachment A.

Table 3-1. Nampa WWTP NPDES Permit Requirements

Parameter	Timing	Design Criteria	Compliance Year Deadline, if applicable
Discharge location	–	Indian Creek (surface water)	–
Effluent temperature [1]	Summer only	July: 19°C (maximum daily) August: 19°C (maximum daily); 22.8°C (instantaneous maximum) September: 19.7°C (maximum daily)	2031
Effluent 5-day biochemical oxygen demand (BOD_5)	Year-round	Monthly average: 30 mg/l Weekly average: 45 mg/l	–
Total suspended solids (TSS)	Year-round	Monthly average: 30 mg/l Weekly average: 45 mg/l 4-month rolling average: 17.5 mg/l (2,629 lbs/day)	–
Total nitrogen	–	–	–
Total phosphorus [1]	May 1–September 30	Monthly average: 15 lbs/day	2026
	October 1–April 30	Monthly average: 52.6 lbs/day	2026
Copper [1]	April–October	Monthly average: 10.7 µg/l Maximum daily: 23.1 µg/l	2026
	November–March	Monthly average: 17.8 µg/l Maximum daily: 38.5 µg/l	2026
Cyanide	March–November	Monthly average: 4.75 µg/l Maximum daily: 9.53 µg/l	–
	December–February	Monthly average: 4.96 µg/l Maximum daily: 9.96 µg/l	–

Table 3-1. Nampa WWTP NPDES Permit Requirements			
Parameter	Timing	Design Criteria	Compliance Year Deadline, if applicable
Mercury [1]	March–November	Average monthly limit: 0.011 µg/l Maximum daily: 0.022 µg/L	2026
	December–February	Average monthly limit: 0.011 µg/l Maximum daily: 0.023 µg/L	2026
Ammonia	March–November	Monthly average: 1.31 mg/l Daily maximum: 4.92 mg/l	–
	December–February	Monthly average: 1.41 mg/l Daily maximum: 5.31 mg/l	–

[1] *Effluent limit must be met in the future, as required by permit compliance schedule.*

lbs/day = pounds per day.

mg/l = milligrams per liter.

µg/l = micrograms per liter.

The City has not previously possessed a recycled water permit; therefore, no requirements that would apply are listed at this time.

In addition to the NPDES permit, the Lower Boise River total phosphorus total maximum daily load drives the regulatory requirements at the Nampa WWTP.

3.2 Ordinances, Rules, Statutes, and Standards

The IDAPA contains multiple rules that govern Nampa WWTP operations and discharge, including Idaho Wastewater Rules (IDAPA 58.01.16) and Ground Water Quality Rules (IDAPA 58.01.11). The Recycled Water Rules (IDAPA 58.01.17) will also be applicable to the City once the reuse permit is secured. In developing the Facility Plan, the City used Class A recycled water standards to develop a preliminary concept of the preferred alternative.

Table 3-2 provides a summary of the key ordinances, rules, statutes, and standards applicable for the Nampa WWTP.

Table 3-2. Ordinances, Rules, Statutes and Standards		
Category	Title	Description
Resolution	Resolution No. 32-2018	A resolution of the City Council of the City of Nampa, Canyon County, Idaho, Implementing Increases in Service Fees Charged by the City of Nampa for Wastewater Rates and User Fees
Resolution	Resolution No. 33-2018	A resolution of the City Council of the City of Nampa, Canyon County, Idaho, Implementing Increases in Service Fees Charged by the City of Nampa for Wastewater Hookup Fees
Nampa City Code	Chapter 8 – Sewer Regulations Chapter 9 – Wastewater Pretreatment	• Includes basis for charges, sewer fund, inspection, permit, connections limited, etc. • This chapter sets forth uniform requirements for dischargers into the city wastewater collection and treatment system and enables the city to protect public health in conformity with all applicable local, state, and federal laws including the Clean Water Act (33 USC 1251 et seq.) and the general pretreatment regulations (40 CFR part 403).

Section 4

Land Application Site

4.1 Topographic Maps

Figure 1 is a topographic map identifying the Nampa WWTP in relation to the Phyllis Canal. Figure 2 provides a view of the potential routes a recycled water pipeline may take from the Nampa WWTP to the Phyllis Canal.

Figure 3 presents the Pioneer Irrigation District (PID) service area downstream from the proposed recycled water discharge point. The area within the red polygon includes an approximately 1/4-mile buffer of the area. The customers served by PID in this area include the cities of Nampa and Caldwell. Both cities have several pump stations and diversions installed along the Phyllis Canal and associated drains and laterals to supply irrigation water to each city's irrigation utility customers. Other major PID customers in this area include unincorporated subdivisions, private residences, and farms. Additional information on the major crop types in this area is included in Section 9 of the Preliminary Technical Report. Downstream (north and west) irrigation districts including Riverside Irrigation District and the Black Canyon Irrigation District also rely heavily on irrigation water and return flows (both surface water and shallow groundwater) managed by PID.

4.2 Regional Map and Description

A broader regional map surrounding the PID area is included as Figure 4. Figure 5 further identifies various irrigation companies and cooperatives in the region.

4.3 Scaled Map (Hydraulic Management Units)

Hydraulic management units are not applicable for this permit considering the discharge of recycled water directly to the Phyllis Canal, as opposed to applying to a specific hydraulic management unit.

4.4 Scaled Map (Recycled Water and Supplemental Water)

The scaled map presented in Figure 2 identifies multiple proposed pipeline routes and associated discharge points. All pipeline routes begin near the Nampa WWTP outfall to Indian Creek and discharge at points along a 1-mile section of the Phyllis Canal. Pipeline routes will be further evaluated in the predesign phase of Nampa WWTP upgrades, and the selected route will be reported to the IDEQ.

Section 5

General Plant Description

5.1 Wastewater Treatment Design

The Nampa WWTP receives wastewater from domestic (residential/commercial) dischargers, industrial dischargers, infiltration and inflow (I/I) from seasonal irrigation sources, and I/I from sources other than irrigation users. The current design total rated hydraulic (maximum month) capacity is 18 mgd. The recent Facility Plan provides flow and loading projections through 2040. The future expected influent flow to the Nampa WWTP is 20.1 mgd. For additional discussion on current and future flow rates, refer to Section 5.4.

In addition to future growth the City considered applicable regulatory requirements for both NPDES and Recycled Water discharge. These combined factors are summarized in Table 5-1, below.

Table 5-1. Nampa WWTP Recycled Water Program Design Conditions

Parameter	Summer Design Condition	Winter Design Condition [1]
Maximum month flow	20.1 mgd	20.1 mgd
Effluent total suspended solids	Monthly average: 30 mg/l Weekly average: 45 mg/l 4-month average: 17.5 mg/l	Monthly average: 30 mg/l Weekly average: 45 mg/l 4-month average: 17.5 mg/l
Effluent BOD_5	Monthly average: 10 mg/l	Monthly average: 30 mg/l Weekly average: 45 mg/l
Effluent total phosphorus	0.35 mg/l [2]	Monthly average: 52.4 lbs/day (0.35 mg/l) [1,2]
Effluent total nitrogen	30 mg/l [3]	30 mg/l
Effluent ammonia	Monthly average: 1.31 mg/l (March–November) Daily maximum: 4.92 mg/l (March–November)	Monthly average: 1.41 mg/l (December–February) Daily maximum: 5.31 mg/l (December–February)
Other	Class A Recycled Water (IDAPA 58.01.17) requirements	Class A Recycled Water (IDAPA 58.01.17) requirements for industrial reuse stream (1–2 mgd)

[1] The values listed assume discharge to an irrigation canal during the summer season. During the winter season NPDES permit limits apply.

[2] Effluent TP limits are on a pounds per day basis. Concentration is provided for reference only.

[3] Effluent TN limits are estimated to be lower for summer discharge as a conservative assumption based on the requirements of the Recycled Water Rules (IDAPA 58.01.17, Section 607.02.d). The requirements for this discharge will be further refined through additional permit negotiations.

BOD = biochemical oxygen demand.

lbs/day = pounds per day.

mgd = million gallons per day.

mg/l = milligrams per liter.

5.2 Wastewater Treatment Process

The Nampa WWTP operates as a secondary treatment facility that uses conventional aerated activated sludge units for biological oxidation of the wastewater. The Nampa WWTP will be upgraded

to provide full-scale recycled water. The goal is to provide Class A recycled water (as defined in IDAPA 58.01.17.601) to local industries and irrigation users for reuse. The processes that will be installed to achieve this include tertiary filtration, ultraviolet disinfection, industrial pump station and pipeline, and irrigation reuse pump station and pipeline. IDAPA 58.01.17 provides the disinfection requirements for achieving Class A municipal recycled water quality, which must be a disinfection process that, when combined with filtration, can achieve 5-log inactivation of virus (IDAPA 58.01.17 Section 601.01.a.i.2).

The new or modified unit processes that will be necessary and the associated design capacity of these systems are provided in Table 5-2. These systems will need to be installed at the Nampa WWTP in order to provide Class A recycled water to irrigation and industrial users. These design criteria will be further defined through preliminary and final design stages of the project.

Table 5-2. Recycled Water Program Unit Processes Required and Preliminary Design Criteria

Unit Process	Unit Process Assumptions
Aeration basin modifications	• Construction of Aeration Basin #4 • Sized identical to existing aeration basins: 134 ft x 160 ft x 21 ft • 3,304,000-gallon capacity
Blower building	• 6, 700-hp blowers (5 duty, 1 standby), 9,750 cfm sizing • 12,000-ft^2 building • 500-kW generator
RAS piping and WAS pumping	• 2 WAS pumps (10 hp each) • WAS pump TDH: 50 ft • 60 LF of 18-inch RAS piping and fittings • 275 LF 30-inch piping
MLR pumps	• 4 pumps, 17,000 gpm (24 mgd) each • 10 feet TDH • 125 hp mixed flow pumps, 1 per treatment train
Final clarifier No. 4	• Circular clarifier, 120-ft diameter with mechanism
Solids facility expansion	• 1,650-ft^2 building expansion • 2 rotary drum thickeners, 440 gpm capacity each • 1 centrifuge, 200 gpm capacity
Struvite reactor	• 3,888-ft^2 building • Struvite reactor equipment and piping • 1,185 LF of 10-inch piping
Filter lift pump station	• Building enclosure • 3 vertical turbine pumps • 20-inch vertical turbine solids handling • Flow: 9,450 gpm • TDH: 30 feet • Power: 100 hp • 500-kW generator • 530 LF of 42-inch piping

Table 5-2. Recycled Water Program Unit Processes Required and Preliminary Design Criteria

Unit Process	Unit Process Assumptions
Sand or Membrane filtration [1]	Sand Filtration • 1,900-ft² building • 9 filter cells, 108 modules, 40-inch filter bed • Three rotary screw compressors (two duty, one standby) • Coagulant feed system Membrane Filtration • 12,000-ft² building (200 ft x 60 ft x 36 ft) • 105-ft long, 40-ft wide, 16-ft deep membrane tanks • 36 membrane cassettes and 2,808 modules installed • 6 permeate pumps • 2 positive displacement blowers (1 duty, 1 standby)
Ultraviolet disinfection: Class A	• 5,460-ft² building • 4 channels, 9 banks per channel • Disinfection dose: 100 mJ/cm²
Effluent forcemain for irrigation reuse	• 6,000 LF of 42-inch high density polyethylene pipe
Effluent pump station for irrigation reuse	• Vertical turbine pumps (3) • References Project Group A Primary Effluent Pump Station • 20-inch vertical turbine solids handling • Flow: 9,450 gpm • TDH: 30 feet • Power: 100 hp • Building enclosure: 14 ft x 54 ft
Effluent pump station & forcemain for industry	• 2 submersible pumps, duplex-type arrangement • TDH: 40–80 ft • 10,000 LF of 12-inch polyvinyl chloride forcemain • 840 LF of 42-inch piping industrial flow (1–2 mgd) disinfected to Class-A standards using in-pipe ultraviolet treatment • Disinfection dose: 100 mJ/cm²
Digester #5	• 1 mixing pump, 125 hp motor • Flare relocation
Primary thickening	• Thickening feed pumps, 2 duty/1 standby, 30 hp motors • Rotary drum thickeners, 2 duty/1 standby • Thickened primary sludge pumps, 2 duty/1 standby, 15 hp motors • Polymer make-up and feed systems • Centrate pumps: 2 duty/1 standby, 20 hp motors

[1] *Title 22 approved technology per IDAPA 58.01.17 Section 610.01. Filtration technology is still being evaluated as part of the project pre-design phase.*

Any potable water used as seal water for recycled water pump seals shall be protected from backflow with an approved backflow prevention device or air gap per IDAPA 58.01.17 Section 608.02a.

cfm = cubic feet per minute.

ft = feet.

gpm = gallons per minute.

hp = horsepower.

kW = kilo-Watt.

LF = linear feet.

mJ/cm^2 = millijoule per square centimeter.
RAS = return activated sludge.
TDH = total design head.
WAS = waste activated sludge.

Process flow diagrams for the liquid and the solid streams are provided in Figures 6 and 7, respectively.

5.3 Hydraulic Profile

The City updated the Nampa WWTP hydraulic profile as part of the Facility Plan development. This preliminary hydraulic profile, including key inverts and elevations, is provided in Figure 13. It is anticipated that this preliminary hydraulic profile will be further refined as the remaining design stages of the project are completed.

5.4 Characterize Wastewater and Recycled Water Streams

The Nampa WWTP receives and treats wastewater flow and loadings from four sources: domestic (residential/commercial) dischargers, industrial dischargers, I/I from seasonal irrigation, and I/I from sources other than seasonal irrigation influences. The wastewater collected from the service area contains both organic and inorganic loadings.

Domestic flow is independent of seasonal and climate conditions and tends to follow a diurnal flow pattern that reflects timing of water usage in the community. Industrial discharges come from a range of industries in the service area, including food processing plants, sanitation, and technology services. Industrial discharges are less consistent than domestic discharges and tend to be higher strength in terms of BOD, TSS, total Kjeldahl nitrogen, and TP and other loadings. I/I resulting from seasonal irrigation increases throughout the summer and peaks in the early fall. The non-seasonal irrigation I/I is driven by precipitation and groundwater variations (these are independent of irrigation influences).

The City's wastewater flow varies seasonally. Flow volumes are highest from June to January during irrigation season and followed by influences from industrial food processors' peak discharge occurring during the late fall and winter. The annual average flow to the Nampa WWTP is gradually decreasing over recent years, caused by a reduction in local industry and subsequent industrial discharges to the municipal sewage system. The load has also decreased over the past 2 years due to the reduction in industrial discharges. The average monthly flow has not decreased at the same rate as the influent load, most likely because the industrial flows have not decreased at the same rate as loads, and there has been growth in domestic discharge, which constitutes flow with lower concentrations of BOD and TSS, yielding less load for the same flow.

A wastewater characterization study was performed as part of the Facility Plan development. The results of the study were documented in *TM T-49 Nampa WWTP Capacity Assessment*. For more information on wastewater characteristics, refer to Appendix C of the Facility Plan.

The Facility Plan included the development of *TM T-46 Flow and Loads* which evaluated current conditions and developed future projections based on population growth. The current condition was based on available Nampa WWTP data from 2012 through 2015. Table 5-3 is the resulting current flow and load condition for the Nampa WWTP.

Table 5-3. Nampa Wastewater Current Flows and Loads

Influent Category	Flow (mgd)			BOD (lbs/day)			TSS (lbs/day)			TKN (lbs/day)			TP (lbs/day)		
	Annual Average	Maximum Month	Peak Day	Annual Average	Maximum Month	Peak Day	Annual Average	Maximum Month	Peak Day	Annual Average	Maximum Month	Peak Day	Annual Average	Maximum Month	Peak Day
Domestic	7.67	7.67	7.67	16,132	19,578	40,564	17,807	19,898	37,414	2,524	2,880	4,175	373	414	700
Industrial [1, 2]	2.82	2.82	4.23	20,389	20,389	30,583	10,632	10,632	15,948	1,988	1,988	2,983	345	345	517
Irrigation-related I/I [3]	0.95	2.28	2.38	–	–	–	–	–	–	–	–	–	–	–	–
Non-irrigation I/I	0.14	0.34	2.30	–	–	–	–	–	–	–	–	–	–	–	–
Total Influent [4]	11.6	13.1	16.6	36,521	39,967	71,147	28,439	30,530	53,362	4,512	4,868	7,158	718	759	1,217

[1] *For industrial customers, the Average Annual flow capacity represents the allowable daily discharge. Values are rounded to the nearest hundredth mgd and whole value pounds per day (lbs/day) for flow and load, respectively.*

[2] *Peak Day = 1.5 * monthly average for industrial flows and loads.*

[3] *Seasonal irrigation is calculated to increase during irrigation season (April–September) by approximately 1.9 mgd. This period represents approximately half the year; therefore, the monthly average is 1.9 divided by 2 = 0.95 mgd. Estimates were developed based on Nampa WWTP influent data from 2008 through 2016. Seasonal irrigation average, maximum month, and peak day flows are assumed to not change over time.*

[4] *Total flows = total industrial permitted flow + total domestic flow + seasonal irrigation + other I/I; Total loads = total industrial permitted load + total domestic load; values are rounded to the nearest tenth mgd for flow and nearest lbs/day for loads.*

The Facility Plan evaluated future flow and loading conditions through 2040, which will inform the design of the Preferred Alternative. During the summer season, the full 20.1 mgd maximum month flow would be treated to Class A recycled water quality and then discharged to an irrigation canal. The City plans to produce 1–2 mgd of treated Class A water that would be available year-round for industrial reuse (the permitting for this will occur in the future). During the winter, the City would operate under its existing NPDES permit and discharge the treated effluent to Indian Creek. Table 5-4 summarizes these future flow and loading conditions.

Table 5-4. Nampa Wastewater 2040 Flow and Loading Projections

Influent Category	Flow (mgd)			BOD (lbs/day)			TSS (lbs/day)			TKN (lbs/day)			TP (lbs/day)		
	Annual Average	Maximum Month	Peak Day [1]	Annual Average	Maximum Month	Peak Day [1]	Annual Average	Maximum Month	Peak Day [1]	Annual Average	Maximum Month	Peak Day [1]	Annual Average	Maximum Month	Peak Day [1]
Domestic	13.69	13.69	13.69	30,652	38,136	83,029	35,330	41,892	90,700	4,693	5,483	9,079	708	848	1,347
Industrial [2]	3.8	3.8	5.7	32,907	32,907	49,360	23,150	23,150	34,725	2,906	2,906	4,360	762	762	1,143
Irrigation-related I/I [3]	0.95	2.28	2.38	–	–	–	–	–	–	–	–	–	–	–	–
Non-irrigation I/I	0.14	0.34	2.30	–	–	–	–	–	–	–	–	–	–	–	–
Total influent flow and loads [4]	18.6	20.1	24.1	63,560	71,040	132,390	58,480	65,040	125,430	7,600	8,390	13,440	1,470	1,610	2,490

[1] *Peak Day = 1.5 * monthly average for industrial flows and loads.*

[2] *For industrial customers, the Average Annual flow capacity represents the allowable daily discharge. Values are rounded to the nearest hundredth mgd and whole value lbs/day for flow and load, respectively.*

[3] *Seasonal irrigation is calculated to increase during irrigation season (April–September) by approximately 1.9 mgd. This period represents approximately half the year; therefore, the monthly average is 1.9 divided by 2 = 0.95 mgd. Estimates were developed based on Nampa WWTP influent data from 2008 through 2015. Seasonal irrigation average, maximum month, and peak day flows are assumed to not change over time.*

[4] *Total flows = total industrial permitted flow + total domestic flow (2040) + seasonal irrigation + other I/I; total loads = total industrial permitted load + total domestic load (2040); values are rounded to the nearest tenth mgd for flow and 10 lbs/day for loads.*

5.5 Wastewater Treatment and Reuse System

The Nampa WWTP will be designed to treat for constituents as designated in the future reuse permit. The influent concentrations for the Class A constituents and phosphorus is compared with the target removal efficiencies in Table 5-5.

Table 5-5. Nampa WWTP Influent Concentrations & Removal Efficiencies

Parameter	Influent Concentration [1]	Effluent Limit [2]	Removal Efficiency
TSS	220 mg/l	30 mg/l	86%
Turbidity	NA	0.5 NTU	
BOD_5 [3]	263 mg/l	10 mg/l	96%
TN [4]	36.2 mg/l	30 mg/l	17%
TP		0.35 mg/l	
Ammonia, total as N	22.5 mg/l	1.41 mg/l (December–February) and 1.31 mg/l (March–November)	94%
Total coliform (organisms/100 mL)	– [5]	2.2 (7-day median)	–
Viruses	– [5]	Disinfection to 5-log inactivation of virus	–
pH	7.9 SU	6.0–9.0 S.U.	–

[1] Influent concentrations represent 2017 annual averages.

[2] Effluent limits are shown as monthly averages unless otherwise indicated.

[3] BOD_5 removal is based on IDAPA 58.01.17 Class A requirements for non-recharge and residential irrigation uses.

[4] The TN limit of 30 mg/l proposed for discharge to Phyllis Canal (non-recharge use).

[5] Data not measured.

Section 6

Description, Operation, and Control of Unit Operations and Processes

6.1 Unit Operations/Process

The Nampa WWTP is a secondary treatment facility that uses conventional aerated activated sludge units for biological oxidation of the wastewater. The current design total rated hydraulic (maximum month) is 18 mgd. This rating will be increased to 20.1 mgd with the completion of the Phase II Upgrades to the Nampa WWTP.

Figures 6 and 7 show the overall process flow schematic for the Nampa WWTP after the completion of the Phase II and Phase III upgrades which include the proposed recycled water program and tertiary filtration components. As shown in the figures, raw wastewater enters the influent pump station and is pumped up to the influent screens. The primary influent then flows by gravity through the grit chambers and to the primary influent splitter box. The screened and degritted wastewater flow is then split between the three primary clarifiers for primary treatment. This headworks building is enclosed thereby reducing nuisance odors from affecting the surrounding community.

Currently, anywhere from 0 to 40 percent of the primary effluent is directed to the trickling filter recirculation pump station where it is split between two trickling filters for BOD removal. The trickling filter mixed liquor flows from the trickling filter recirculation pump to a secondary clarifier for settling. The trickling filter secondary effluent is then mixed with the remaining primary effluent and directed to one of the three aeration basins via the primary effluent pump station for biological treatment. Following the completion of the Phase II Upgrades the primary effluent will flow directly to the primary effluent pump station as the trickling filters will be demolished which will additionally result in the removal of a large nuisance odor producing element at the plant

The aeration basins are configured with an anaerobic zone, a flexible aerated zone (FAZ), and an aerobic zone for biological nutrient removal. Mixing in the anaerobic and FAZ cells is provided by submerged medium-speed mixers, while aeration and mixing in the aerobic zones and FAZ is provided by centrifugal blowers and membrane and ceramic diffusers. After exiting the aeration basins, the mixed liquor flows by gravity to the final clarifier flow splitter box and is divided between one of three final clarifiers. The secondary effluent flow is injected with sodium hypochlorite for disinfection then flows through one of two chlorine contact chambers. The disinfected effluent is dosed with sodium bisulfite for dechlorination before a portion of the water is pumped for use as No. 4 water throughout the plant. The remainder is sent to the post aeration basin to increase the dissolved oxygen concentration before being discharged to Indian Creek.

The Phase II/III Upgrades will modify the operation of the Nampa WWTP to make it capable of producing recycled water. The most notable changes will be the addition of tertiary filtration and additional disinfection steps. These processes are in the design process but will be configured to meet the requirements for Class A Recycled Water including incorporation of a recycled water pump station to convey the recycled water to Phyllis Canal.

Waste activated sludge is pumped through thickening feed pumps to rotary drum thickeners after the addition polymer for more efficient thickening. The thickened waste activated sludge is pumped

to primary anaerobic digesters along with the primary sludge. Polymer is added to the sludge prior to dewatering using centrifuges. The centrate is sent to a centrate storage tank, combined with the filtrate from the rotary drum thickeners, and mixed with ferrous chloride for control of hydrogen sulfide odors prior to being pumped back to headworks. Dewatered biosolids are stored on site in sludge drying beds prior to landfill disposal. Due to high volatile solids reduction these biosolids have low associated nuisance odors. Collected screenings and grit are also landfilled.

6.2 Normal Operations

The Class A recycled water system may discharge up to 31 cfs at full design flow rates. Typical flow patterns and flow rates will be developed following design and construction of the Nampa WWTP upgrades.

6.3 Process Monitoring and Control Systems

The City's overall control system was described within the preliminary design documents developed under Phase I Upgrades. The project team (Brown and Caldwell and Nampa WWTP staff) developed the Instrumentation and Control Philosophy, which was described as "a defined thought process regarding system controls in support of a set operational philosophy through standards and procedures." The final programmable logic controller (PLC) manufacturer and model, Rockwell Automation ControlLogix platform, were selected through this effort.

The existing control system architecture is a distributed system placing automatic logic within the uninterruptable power supply (UPS) backed, non-redundant, PLCs located within main process areas and dedicated controls for complex equipment. Manual controls are separated between the motor control centers (MCCs) and the local equipment. As part of the "hands-on" control philosophy, the existing equipment preference is to have the operator visit the MCC prior to moving to the local equipment. At the MCC, the operator places the equipment in the Hand position, which allows the Start/Stop selection to become active local to the equipment. This movement confirms the operator's intentions of removing the equipment control from the PLC.

Remote operations for the entire plant can be accessed both at the MCC located PLC cabinets, where panel mounted workstations reside, and within the administrative building where the Supervisory Control and Data Acquisition (SCADA) desktop workstations and servers reside. These controls include supervisory actions such as set point manipulation and lead equipment selection and remote manual start/stop action and manual speed manipulations for variable speed equipment.

Remote and off-site access is not provided to operations staff due to the City's requirement to maintain a highly secured control system by limiting remote network access, but remote alarming is extended offsite through the use of both a hardware alarm autodialer for critical alarms and a SCADA based software autodialer for all alarms.

Through Phase I, the existing control system was expanded to include support for new facilities and equipment with the plant network system being rerouted to designated utility corridors, providing distinct utility paths through the facility. The new corridors will provide designated locations for all in-plant utilities to be routed, including communications. The existing fiber optic communication cable was retained and new fiber optic cable was routed through the new corridors, providing a redundant network path to each of the existing facilities modified under the Phase I construction. Because the Phase I upgrades will not touch every part of the existing facility, the network topology during this time frame comprises both a modified star configuration and a new redundant ring. UPS-supported

SCADA workstations are located at each MCC located PLC cabinet providing access to the plant SCADA system.

Complex equipment added through Phase I Upgrades also includes a UPS-supplied PLC control system with local human machine interfaces. These equipment types provide full automatic control with access to the plant-wide SCADA system for remote status, indications, and alarming. In a case-by-case evaluation, remote supervisory control will be provided, allowing operations to update local control set points and alarm points, with limited start/stop capability and process adjustment.

Throughout Phase II/III Upgrades, portions of the facility will be modified to include the utility corridors and new process buildings, the older fiber optic cable will be abandoned or used to pull in additional fiber, which will be routed through the corridors forming two complete smaller redundant rings, with some outlying buildings maintaining the original conduit route until the facility's new Headworks, Operations building, and Administrative building are constructed. At this time, the final corridors will be completed allowing the final three fully redundant network rings to be completed.

The three separate but redundant rings allow the network attachments at buildings to be close to the corridor, minimizing single routes, which could allow breakage at two points within the network during a single excavation. To minimize this possibility, the network routings into building should be placed at a minimum of 4 feet of depth difference, where multiple entries into the building are not feasible.

The inclusion of redundant paths minimizes the City's dependency on the SCADA software to mitigate network outages. Overall, they provide for a greater support mechanism for data transfers from the local PLCs to the SCADA Historian located in the Administration building. This new configuration is designed to accommodate relocation of the Administration building at some time in future planning.

6.4 Operating Instructions

The City maintains an existing operations and maintenance (O&M) manual in hardcopy form, retained on-site at the Nampa WWTP. The City will be converting this O&M manual to electronic format and incorporating new facilities, such as Phase I Upgrades – Project Group A, into the manual.

In the future, as Phase II Upgrades are constructed and commissioned, the O&M manual will also be updated with the new unit processes and equipment. Because the recycled water program is still in the preliminary design stage at this time, there are no O&M manuals available because the major processes and equipment are still being developed. When these are selected and constructed in the future, the City will actively be modifying the existing O&M manual as required.

6.5 Common Operating Problems

The existing Nampa WWTP experiences few operational issues. Most processes are set up with redundancy to mitigate the risks of equipment failure. Troubleshooting and common operating problems will be documented once the reuse system becomes operational.

6.6 Laboratory Tests (Process Control)

The laboratory tests list for process control will be developed following permit issuance and project design. Current tests performed at the Nampa WWTP include, but are not limited to, chlorine, carbonaceous oxygen demand, suspended solids, settleometer, pH, microscope examination,

settleable solids, centrifuge, sludge volume index, F/M ratio, dissolved oxygen uptake, volatile solids, volatile suspended solids, total volatile solids, acidity, alkalinity, and percent carbon dioxide.

6.7 Laboratory Tests (Compliance Determination)

The laboratory tests list for compliance determination will be developed following permit issuance and project design. Current tests performed at the Nampa WWTP include, but are not limited to, flow, pH, BOD, *E. coli*, TSS, TP, orthophosphate, conductivity, turbidity, NH3, total Kjeldahl nitrogen, nitrate, nitrite, hardness, temperature, and chlorine.

6.8 Start-up Procedures

Startup procedures will be documented once the reuse system becomes operational.

6.9 Emergency Operating Plans

The City maintains the *Sanitary Sewer Overflow Response Plan (SSORP)*, pursuant to the terms and conditions of the U.S. Environmental Protection Agency's 2000 Consent Decree. The *SSORP* is designed to ensure every report of a confirmed sewage spill is immediately dispatched to the appropriate collections personnel so that the effects of the overflow can be minimized with respect to its adverse impacts on beneficial use, water quality of surface waters, and customer service. The SSORP includes provisions to ensure safety, pursuant to the directions provided by the City, and make sure notification and reporting procedures are executed to the necessary collections personnel, state, and federal authorities. The SSORP comprises overflow response procedures, public advisory procedures, regulatory agency notification plan, media notification procedure, and distribution and maintenance of the SSORP.

This emergency response plan and procedures will be reevaluated and revised to document any changes that may result from the implementation of the recycled water program.

Section 7

Wastewater and Recycled Water Treatment and Storage Lagoons

Treatment ponds and storage lagoons are not included as part of this project. All treatment is conducted at the Nampa WWTP as described in Sections 5 and 6.

Section 8

Reuse Site Features and Characteristics

8.1 Fencing and Posting

Per the Guidance Manual, buffer zones and fencing are not required for Class A recycled wastewater. However, the discharge pipe will be located on PID property. PID prohibits access to canal roads by unauthorized personnel. Additionally, access to the discharge point will be secured for access by authorized personnel only via security fencing or other measures, similar to City irrigation pump stations located along the Phyllis Canal.

Signage with a message indicating that the discharge is recycled wastewater and a “do not drink” warning will be posted at the discharge pipe.

All piping, valves, and other appurtenances from the Nampa WWTP to the discharge point to Phyllis Canal will be purple in color (Pantone 512, 522, or equivalent).

This section of the Plan of Operations will be updated to meet requirements of the reuse permit, once issued.

8.2 Backflow Prevention Equipment

There will be no connections to other water sources utilized for the operation of the recycled water system.

Section 9

Reuse Site Loading Rates

Considerations for reuse site loading rates are discussed in Preliminary Technical Report Section 8. This section of the Plan of Operations will be updated to meet requirements of the reuse permit once issued.

Section 10

Reuse Site Vegetation

Vegetation within the area of analysis is described in Preliminary Technical Report Section 9. This section of the Plan of Operations will be updated to meet requirements of the reuse permit once issued.

Section 11

Reuse Site Management

Considerations for reuse site management planning are discussed in the Preliminary Technical Report Section 10. This section of the Plan of Operations will be updated to meet requirements of the reuse permit once issued.

Section 12

Monitoring Activities

Recycled water monitoring will occur at the discharge point to Phyllis Canal. A monitoring plan guiding the collection of compliance determination data will be developed following issuance of the reuse permit and before discharging recycled water authorized under the permit.

Groundwater, soil, crop tissue, and other monitoring is not believed to be applicable for this permit due to the discharge of recycled water directly to the Phyllis Canal for use as irrigation water supply augmentation.

Section 13

Maintenance

The City's recycled water system will have detailed maintenance information and guidance to facilitate proper care and troubleshooting. Future maintenance information, including preventative maintenance schedules, troubleshooting charts and guides, maintenance record system, location of manufacturer's manuals, management of spare parts inventory, vendors, and outside contractors and suppliers will be developed and made available to the IDEQ following permit issuance and prior to discharging recycled water authorized by the permit.

During the Facility Plan development for the Nampa WWTP, the City evaluated high level operations and maintenance costs for the preliminary equipment. These planning-level estimates will be further refined through the preliminary and final design stages of the project.

Section 14

Records and Reports

This section of the plan of operations will be updated following issuance of the reuse permit and before the discharge of recycled water authorized under the permit. For current operations, daily operating logs are completed by operators at the Nampa WWTP and filed for NPDES permit compliance. Storage of laboratory data, records, and report generation is currently in the process of being migrated to the HACH WIMS program. This program and associated records will be stored on secure City servers. Reporting procedures for permit violations will be written and adopted following issuance of the reuse permit.

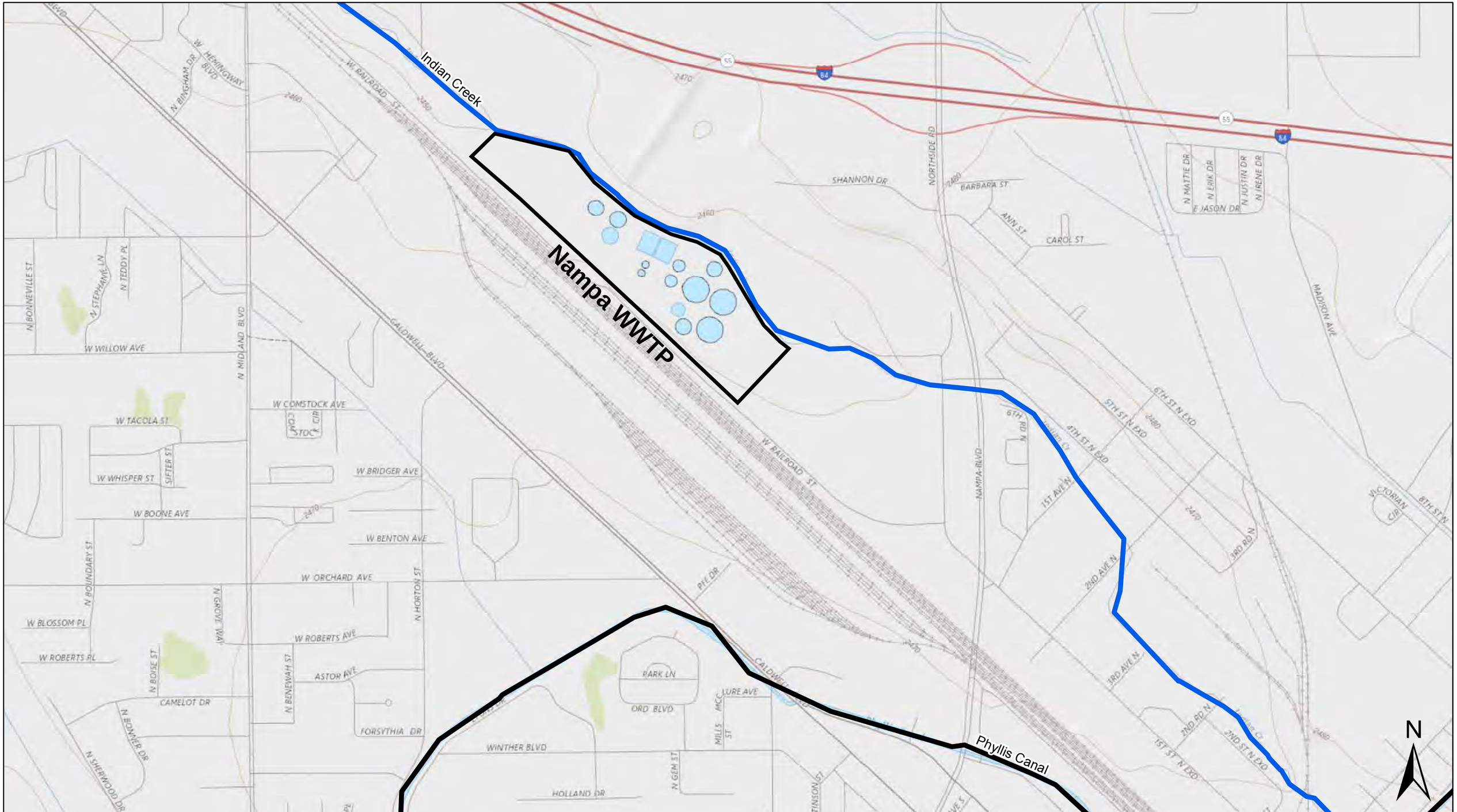
Section 15

References

Brown and Caldwell. 2018. City of Nampa Wastewater Treatment Plant Facility Plan.

Idaho Department of Environmental Quality. 2018. IDAPA 58 Administrative Rules.

Figures



Brown AND Caldwell

Figure 1. Topographic Map: WWTP and Phyllis Canal

Client: City of Nampa
Date: 2-25-2019

0 0.075 0.15 0.3 0.45 0.6 Miles

Path: Bcboi02\P:_Nampa, City of_Nampa WW Program\230 DEQ Negotiations\620 Reuse Permit Application\Background\Maps\Topography.mxd

Locations are approximate and require further investigation.

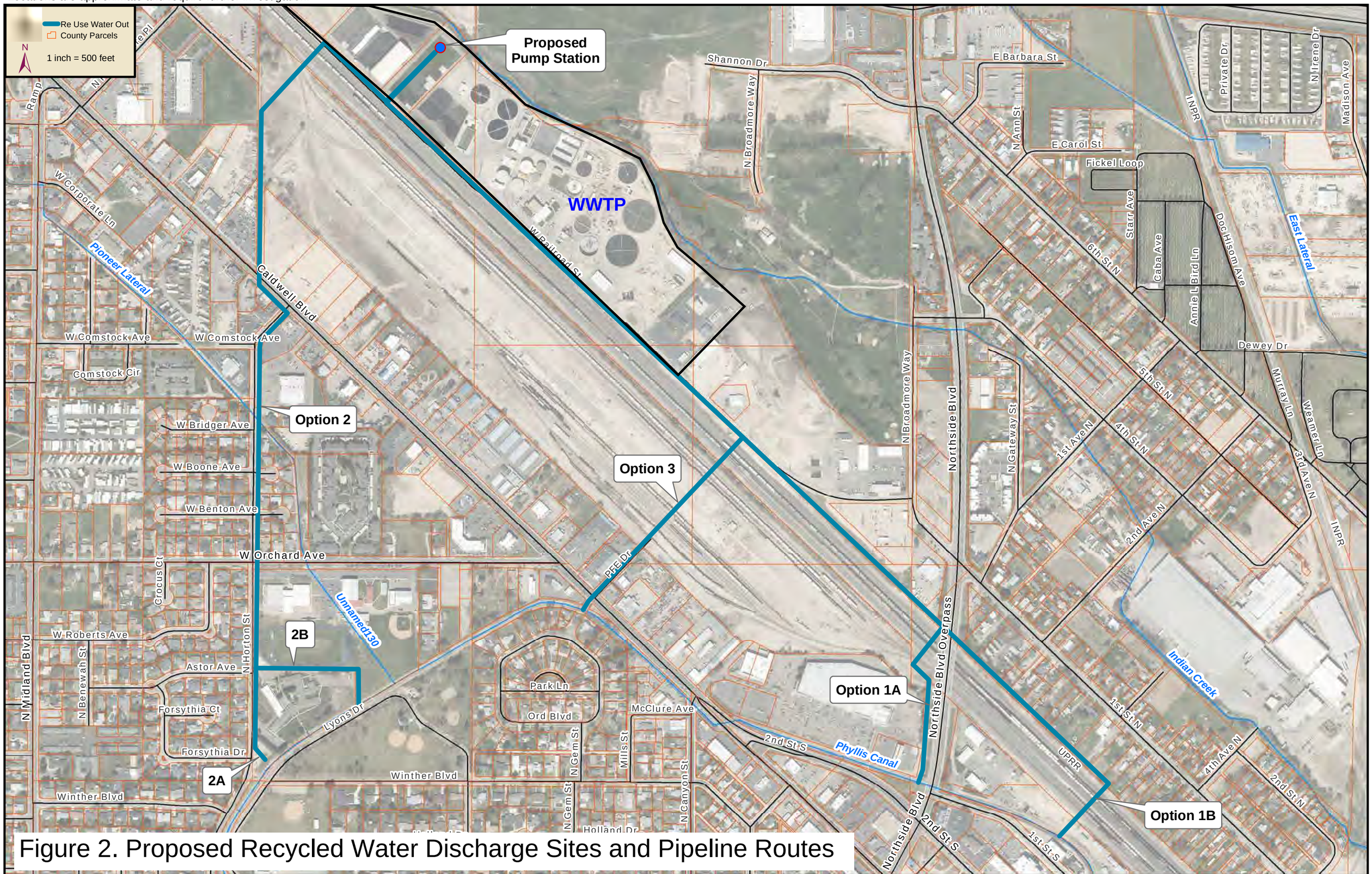
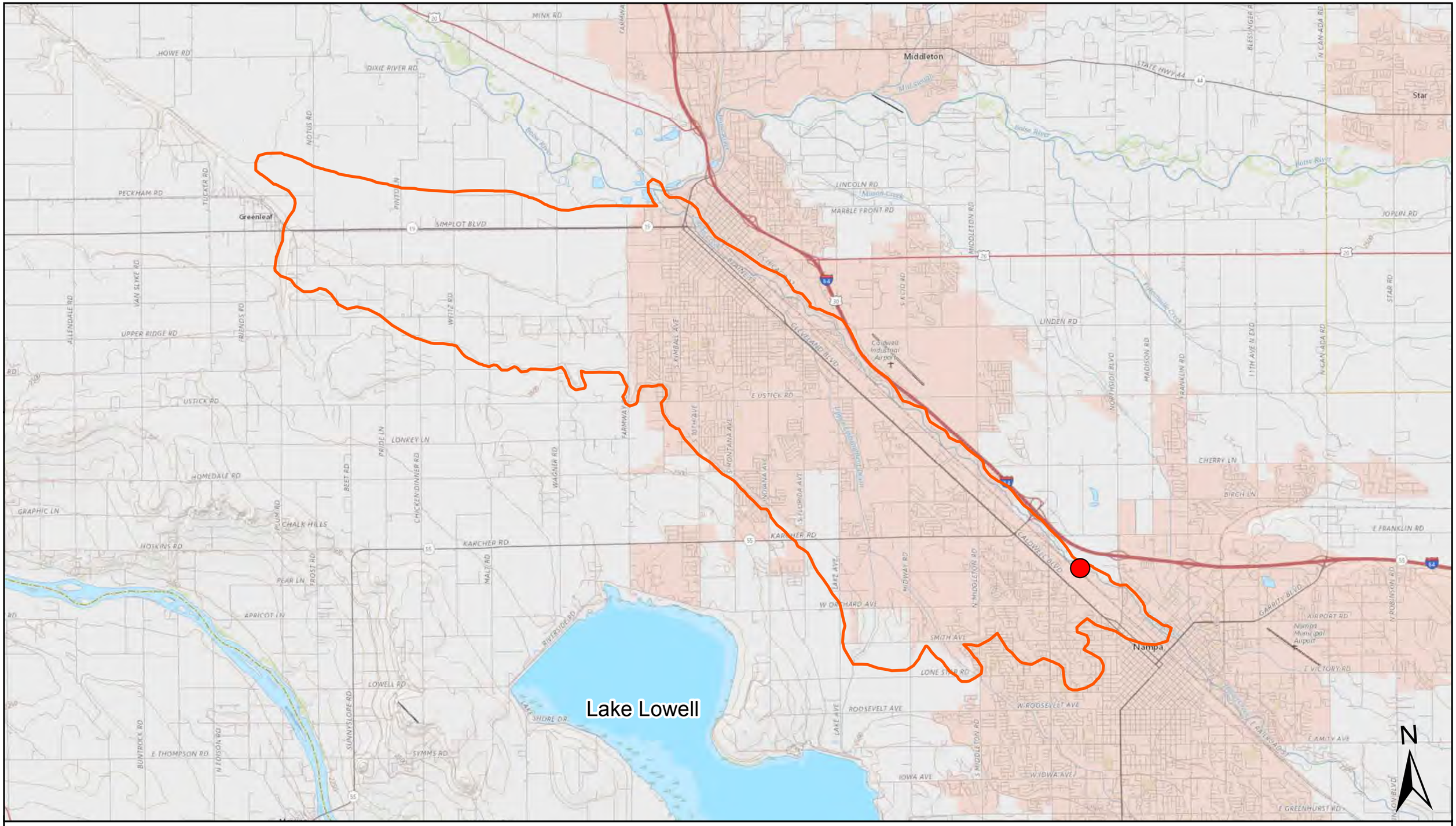


Figure 2. Proposed Recycled Water Discharge Sites and Pipeline Routes



Brown AND Caldwell

Figure 3. Topographic map: Area of Analysis

Client: City of Nampa
Date: 2-25-2019

Path: Bcboi02\\bcboifp01\projects_Nampa, City of_Nampa WW Program\230 DEQ Negotiations\620 Reuse Permit Application\Permit Application\Application Figures\Maps.mxd

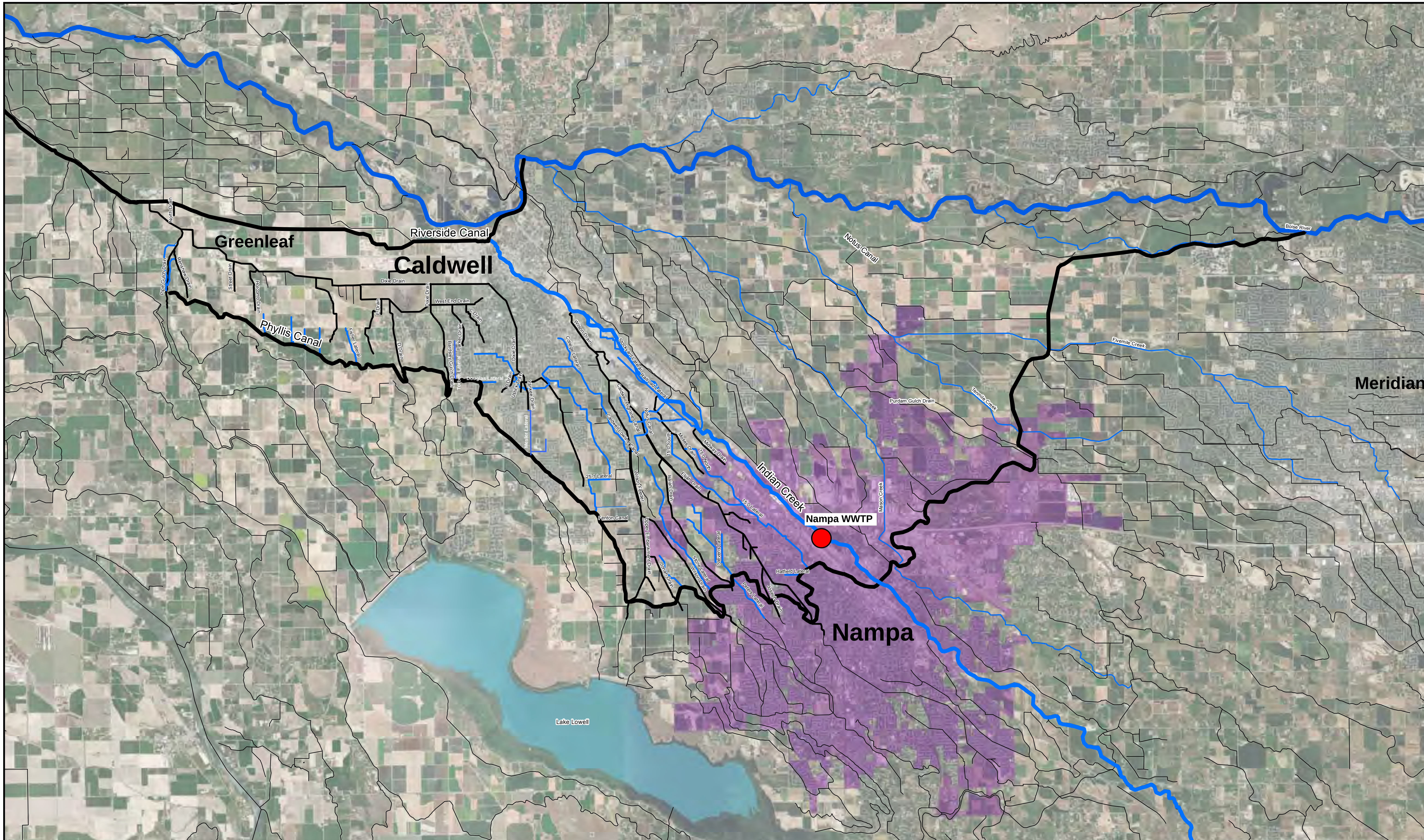


Figure 4. Overview Map

Brown AND Caldwell

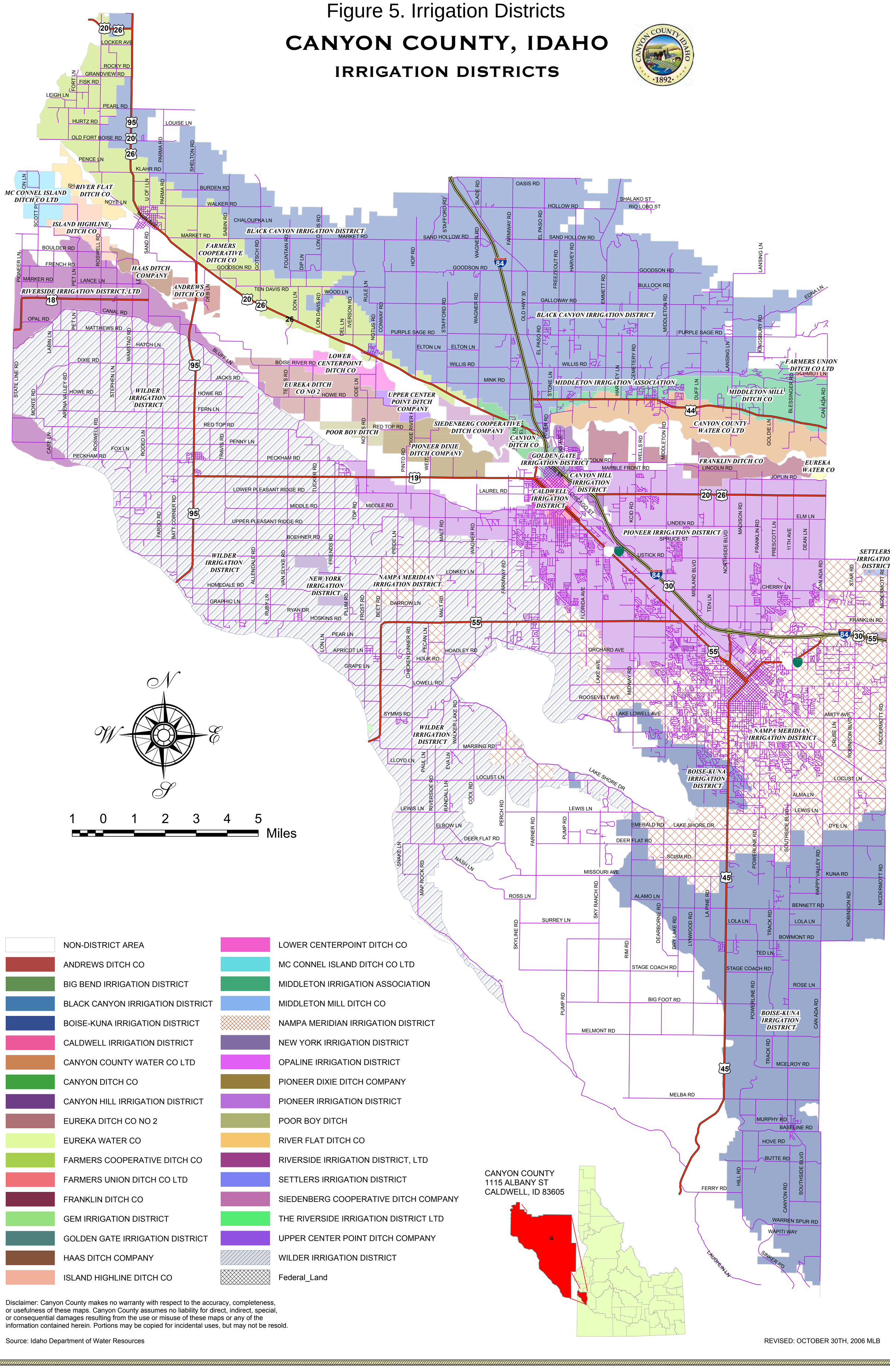
Client: City of Nampa
Date: 2-25-2019

Path: Bcboi02\\bcboifp01\projects_Nampa, City of_Nampa WW Program\230 DEQ Negotiations\620 Reuse Permit Application\Permit Application\Application Figures\Maps.mxd

Figure 5. Irrigation Districts

CANYON COUNTY, IDAHO

IRRIGATION DISTRICTS



1 0 1 2 3 4 5 Miles

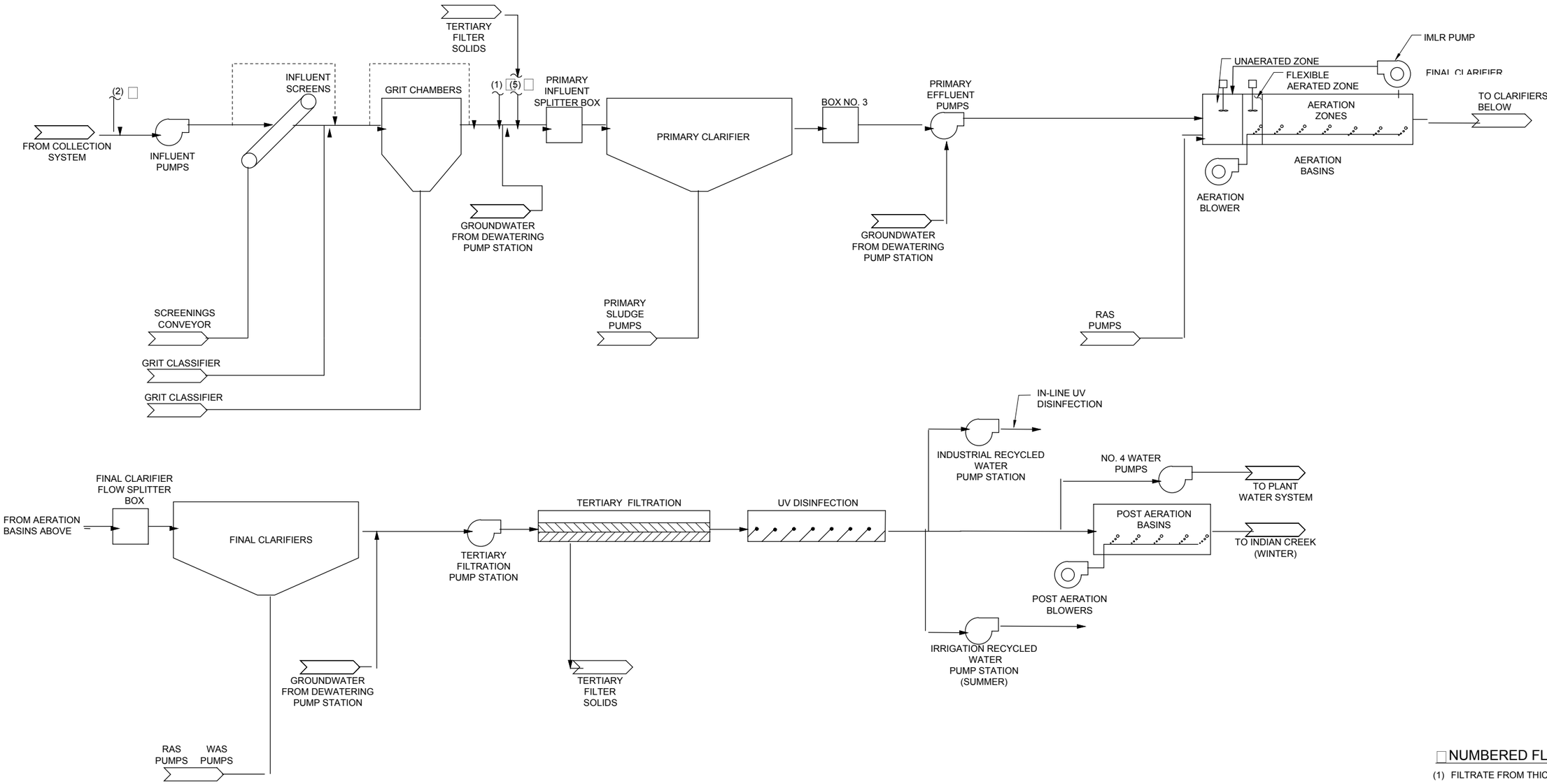
- NON-DISTRICT AREA
- ANDREWS DITCH CO
- BIG BEND IRRIGATION DISTRICT
- BLACK CANYON IRRIGATION DISTRICT
- BOISE-KUNA IRRIGATION DISTRICT
- CALDWELL IRRIGATION DISTRICT
- CANYON COUNTY WATER CO LTD
- CANYON DITCH CO
- CANYON HILL IRRIGATION DISTRICT
- EUREKA DITCH CO NO 2
- EUREKA WATER CO
- FARMERS COOPERATIVE DITCH CO
- FARMERS UNION DITCH CO LTD
- FRANKLIN DITCH CO
- GEM IRRIGATION DISTRICT
- GOLDEN GATE IRRIGATION DISTRICT
- HAAS DITCH COMPANY
- ISLAND HIGHLINE DITCH CO
- LOWER CENTERPOINT DITCH CO
- MC CONNEL ISLAND DITCH CO LTD
- MIDDLETON IRRIGATION ASSOCIATION
- MIDDLETON MILL DITCH CO
- NAMPA MERIDIAN IRRIGATION DISTRICT
- NEW YORK IRRIGATION DISTRICT
- OPALINE IRRIGATION DISTRICT
- PIONEER DIXIE DITCH COMPANY
- PIONEER IRRIGATION DISTRICT
- POOR BOY DITCH
- RIVER FLAT DITCH CO
- RIVERSIDE IRRIGATION DISTRICT, LTD
- SETTLERS IRRIGATION DISTRICT
- SIEDENBERG COOPERATIVE DITCH COMPANY
- THE RIVERSIDE IRRIGATION DISTRICT LTD
- UPPER CENTER POINT DITCH COMPANY
- WILDER IRRIGATION DISTRICT
- Federal_Land

Disclaimer: Canyon County makes no warranty with respect to the accuracy, completeness, or usefulness of these maps. Canyon County assumes no liability for direct, indirect, special, or consequential damages resulting from the use or misuse of these maps or any of the information contained herein. Portions may be copied for incidental uses, but may not be resold.

Source: Idaho Department of Water Resources

CANYON COUNTY
1115 ALBANY ST
CALDWELL, ID 83605

REVISED: OCTOBER 30TH, 2006 MLB



□NUMBERED FLOW STREAMS

(1) FILTRATE FROM THICKENING PROCESS.

(2) OVERFLOW FROM PRIMARY ANAEROBIC DIGESTERS.

(3) CENTRATE FROM DEWATERING PROCESS.

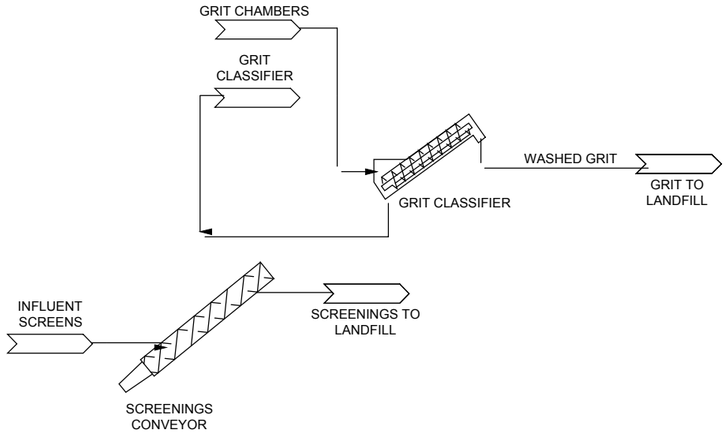
(4) DECANT FROM SLUDGE DRYING BEDS.

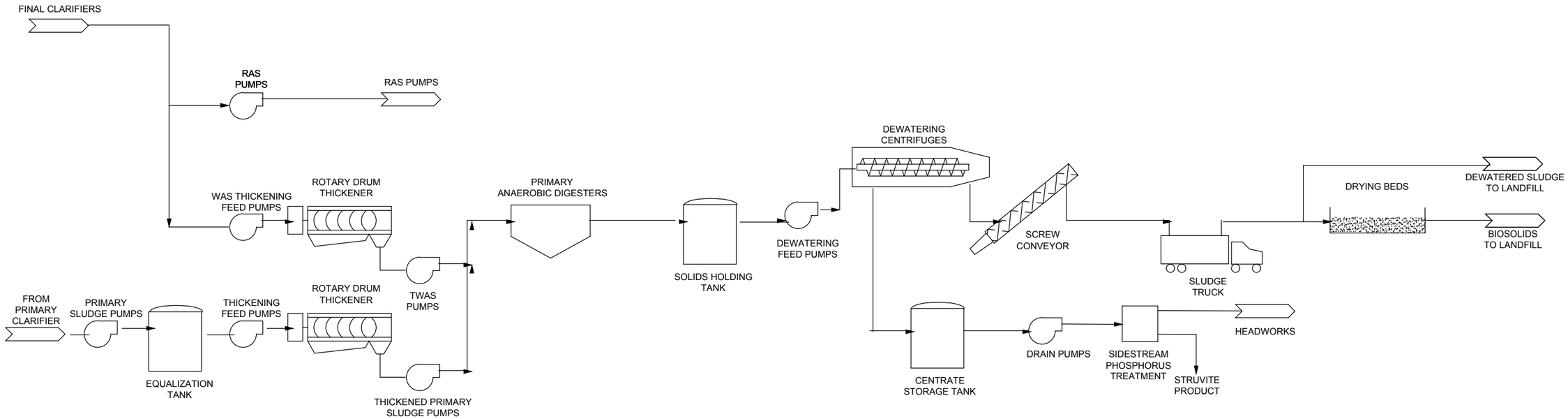
(5) FROM SIDE STREAM PHOSPHOROUS TREATMENT

Brown AND Caldwell

Figure 6. Nampa WWTP Liquid Stream process flow diagram

Client: City of Nampa
Date: 2-25-2019





Brown AND Caldwell

Figure 7. Nampa WWTP Solid Stream process flow diagram

Client: City of Nampa
Date: 2-25-2019

Figure 9 Attributes	
Number	Feature
1	Phyllis Canal crosses over Indian Creek [4]
2	Location of proposed recycled water discharge
3	PFE Pump (PID)
4	Delivery to 15.0 Lateral
5	Eagleroost PI pump station (Nampa)
6	Moss Point PI pump station (Nampa)
7	Crestwood PI pump station (Nampa)
8	Ashley Park PI pump station (Nampa)
9	PI pump station (Caldwell)
10	North Branch 15.0 Lateral current connections to Moses Drain [5]
11	South Branch 15.0 Lateral current connections to Moses Drain [5]
12	Horton Pump Station and delivery to Hatfield Lateral
13	Phyllis Canal crosses over the Elijah Drain [4]
14	Phyllis Canal crosses over the Joseph Drain [4]
15	Phyllis Canal crosses over the Isaiah Drain [4]
16	Orchard Heights PI pump station (Nampa)
17	Delivery to Stevens Lateral
18	Elijah Feeder
19	Elijah Feeder delivery to Notus Canal
20	Phyllis crosses over the Wilson Drain [4]
21	Delivery to Stone Lateral
22	Delivery to McCarthy Lateral
23	Phyllis Canal crosses over the Jonah Drain [4]
24	Phyllis Canal crosses over the Upper Embankment Drain [5]
25	Caldwell Canal Feeder
26	Caldwell Canal Feeder to Notus Canal and Caldwell Lowline Canal
27	Wilson Drain into Indian Creek
28	Phyllis Canal into Pipe Gulch Drain
29	Phyllis Canal delivery to 25.1 Lateral
30	Phyllis Canal route to Barnsley Gulch Drain [4]
31	Deer Flat Canal into Phyllis Canal
32	West End Drain into Riverside Canal

Notes

This table is a figure reference only. See Preliminary Technical Report Section 7.5.1 for full discussion.

[4] Pump and flood control location

[5] Connection to be removed as part of reuse project

[6] No plumbing connection

[7] Flood control location

Brown AND Caldwell

Figure 8. Conceptual Map of Flow through Pioneer Irrigation District Downstream of Recycled Water Discharge

Client: City of Nampa

Date: 2/25/2019

Path: Bcboi02\\bcboifp01\projects_Nampa, City of_Nampa WW Program\230 DEQ Negotiations\620 Reuse Permit Application\Permit Application\Application Figures\Maps.mxd

- City of Nampa Pressurized Irrigation pump station
- City of Caldwell Pressurized Irrigation pump station
- City of Nampa Drinking water well
- 20 Flood Control Gate
- PID boundary

N

0 0.75 1.5 2.25 3 Miles

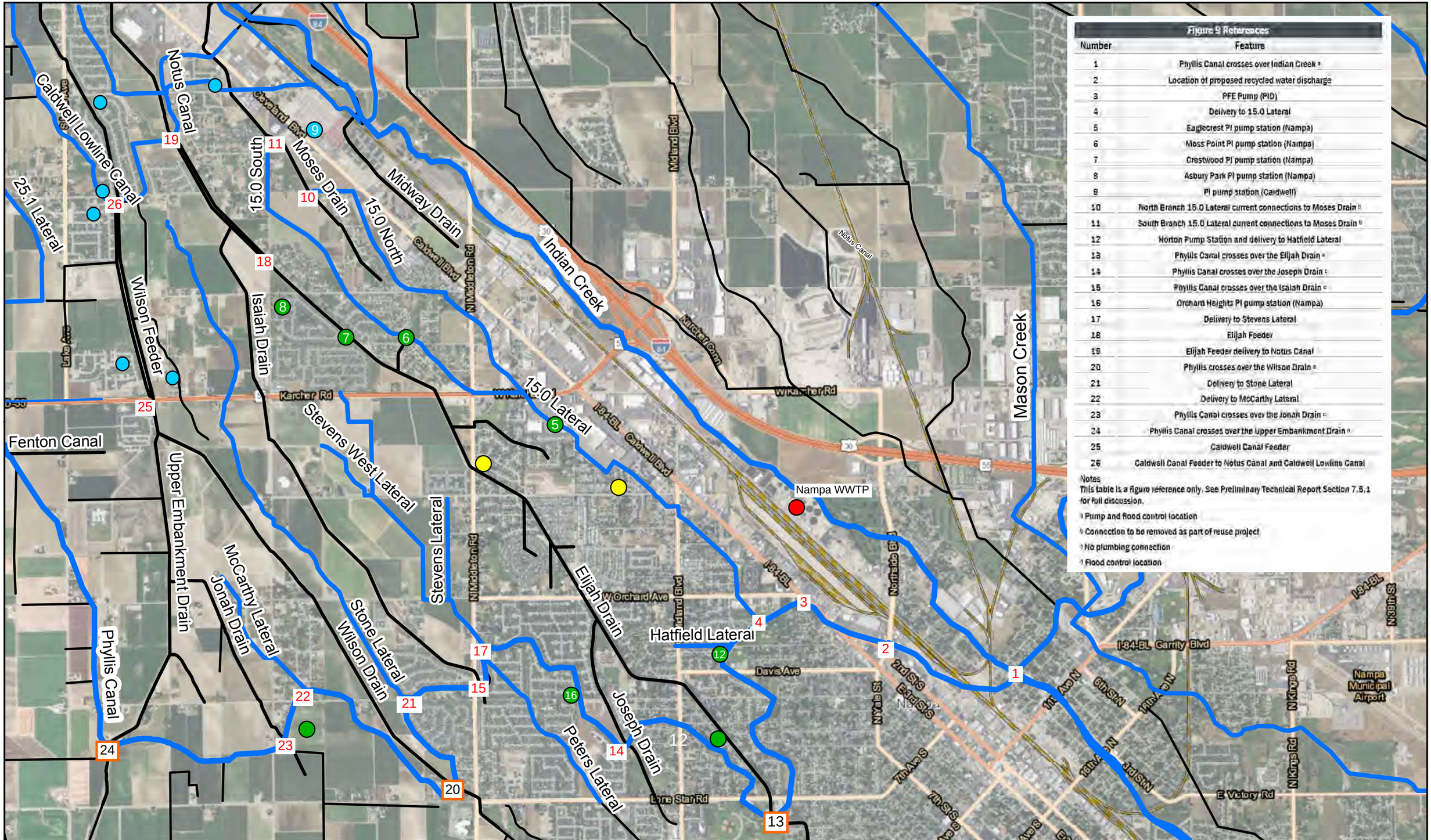


Figure 9 References

Number	Feature
1	Phyllis Canal crosses over Indian Creek [a]
2	Location of proposed recycled water discharge
3	PFE Pump (PID)
4	Delivery to 15.0 Lateral
5	Eaglecrest PI pump station (Nampa)
6	Moss Point PI pump station (Nampa)
7	Crestwood PI pump station (Nampa)
8	Asbury Park PI pump station (Nampa)
9	PI pump station (Caldwell)
10	North Branch 15.0 Lateral current connections to Moses Drain [b]
11	South Branch 15.0 Lateral current connections to Moses Drain [b]
12	Norton Pump Station and delivery to Hatfield Lateral
13	Phyllis Canal crosses over the Elijah Drain [a]
14	Phyllis Canal crosses over the Joseph Drain [c]
15	Phyllis Canal crosses over the Isaiah Drain [c]
16	Orchard Heights PI pump station (Nampa)
17	Delivery to Stevens Lateral
18	Elijah Feeder
19	Elijah Feeder delivery to Notus Canal
20	Phyllis crosses over the Wilson Drain [a]
21	Delivery to Stone Lateral
22	Delivery to McCarthy Lateral
23	Phyllis Canal crosses over the Jonah Drain [c]
24	Phyllis Canal crosses over the Upper Embankment Drain [a]
25	Caldwell Canal Feeder
26	Caldwell Canal Feeder to Notus Canal and Caldwell Lowline Canal

Notes
This table is a figure reference only. See Preliminary Technical Report Section 7.5.1 for full discussion.

[a] Pump and flood control location

[b] Connection to be removed as part of reuse project

[c] No plumbing connection

[d] Flood control location

Brown AND Caldwell

Figure 9. Conceptual Map of Flow through Pioneer Irrigation District Downstream of Recycled Water Discharge: Focus on upper portion of Area of Analysis

Client: City of Nampa Date: 2/25/2019

Path: Bcboi02\\bcboifp01\projects_Nampa, City of_Nampa WW Program\230 DEQ Negotiations\620 Reuse Permit Application\Permit Application\Application Figures\Maps.mxd

- City of Nampa Pressurized Irrigation pump station
- City of Caldwell Pressurized Irrigation pump station
- City of Nampa Drinking water well
- 20 Flood Control Gate

N

0 0.35 0.7 1.05 1.4 Miles

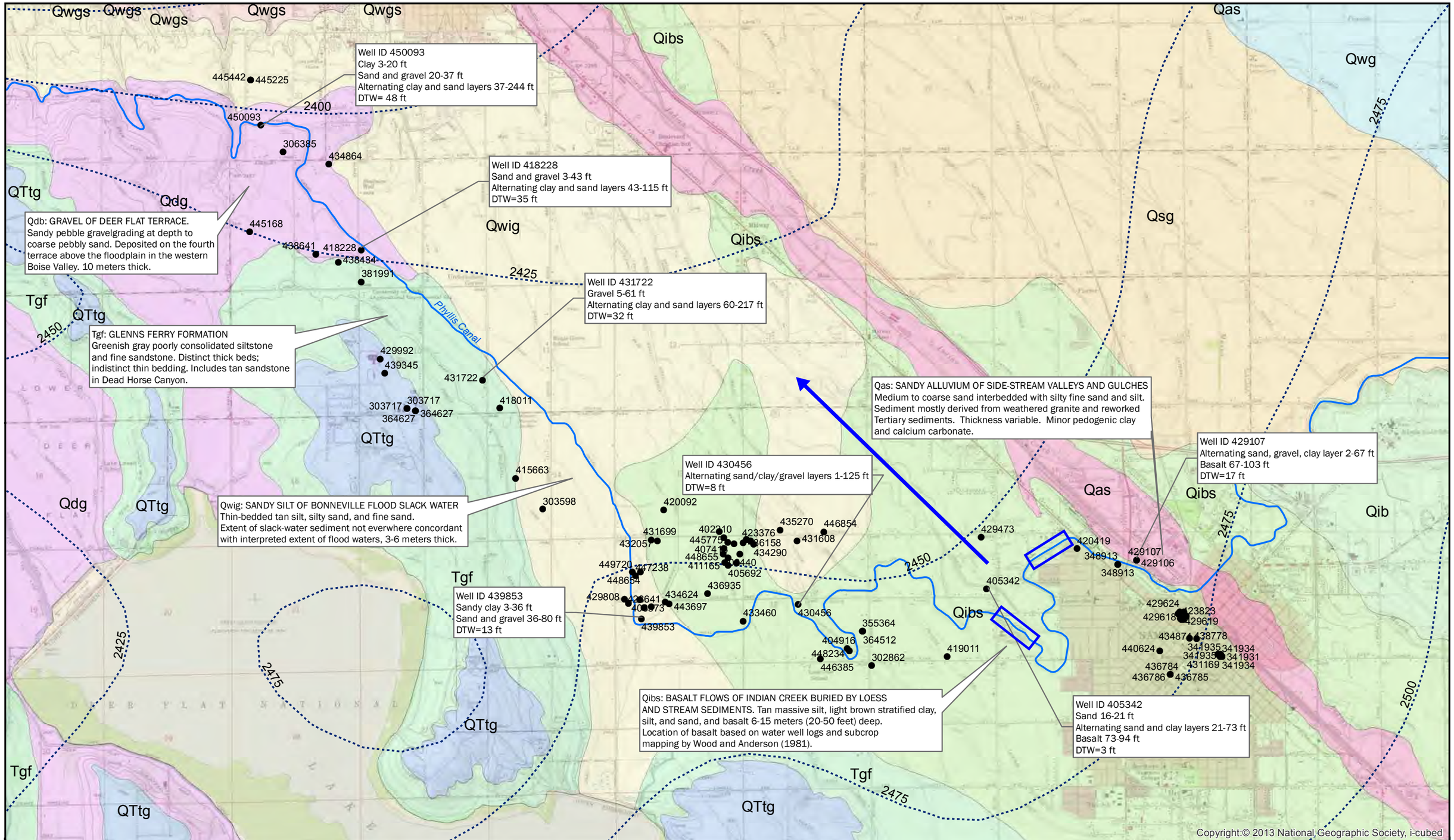


Figure 10. Local Geology and Groundwater Wells

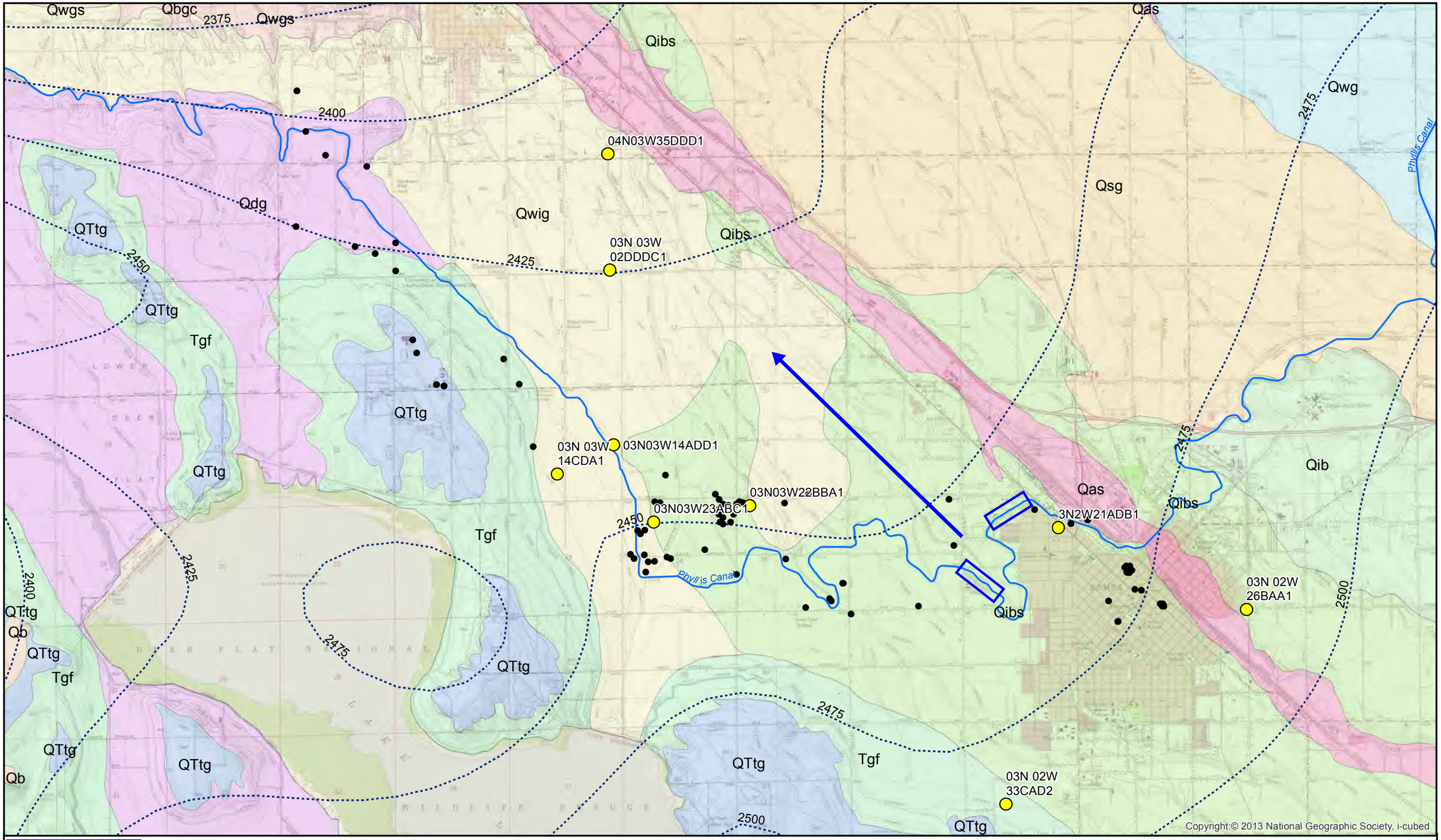
Client: City of Nampa
Date: 2-25-2019

Path: Bcboi02\G:\PROJECTS\City_of_Nampa\FY19 Program Management 152745\Geology and Wells_11x17L_v105.mxd

- Wells (IDWR)
- Groundwater model domain
- Groundwater flow direction
- Phyllis Canal
- Groundwater contours

0 0.25 0.5 1 1.5 2 Miles

N



Brown AND Caldwell

Figure 11. EDMS Wells

Client: City of Nampa

Date: 2-25-2019

EDMS Wells

Wells (IDWR)

Phyllis Canal

Groundwater contours

Groundwater model domain

Groundwater flow direction

0 0.275 0.55 1.1 1.65 2.2 Miles

N

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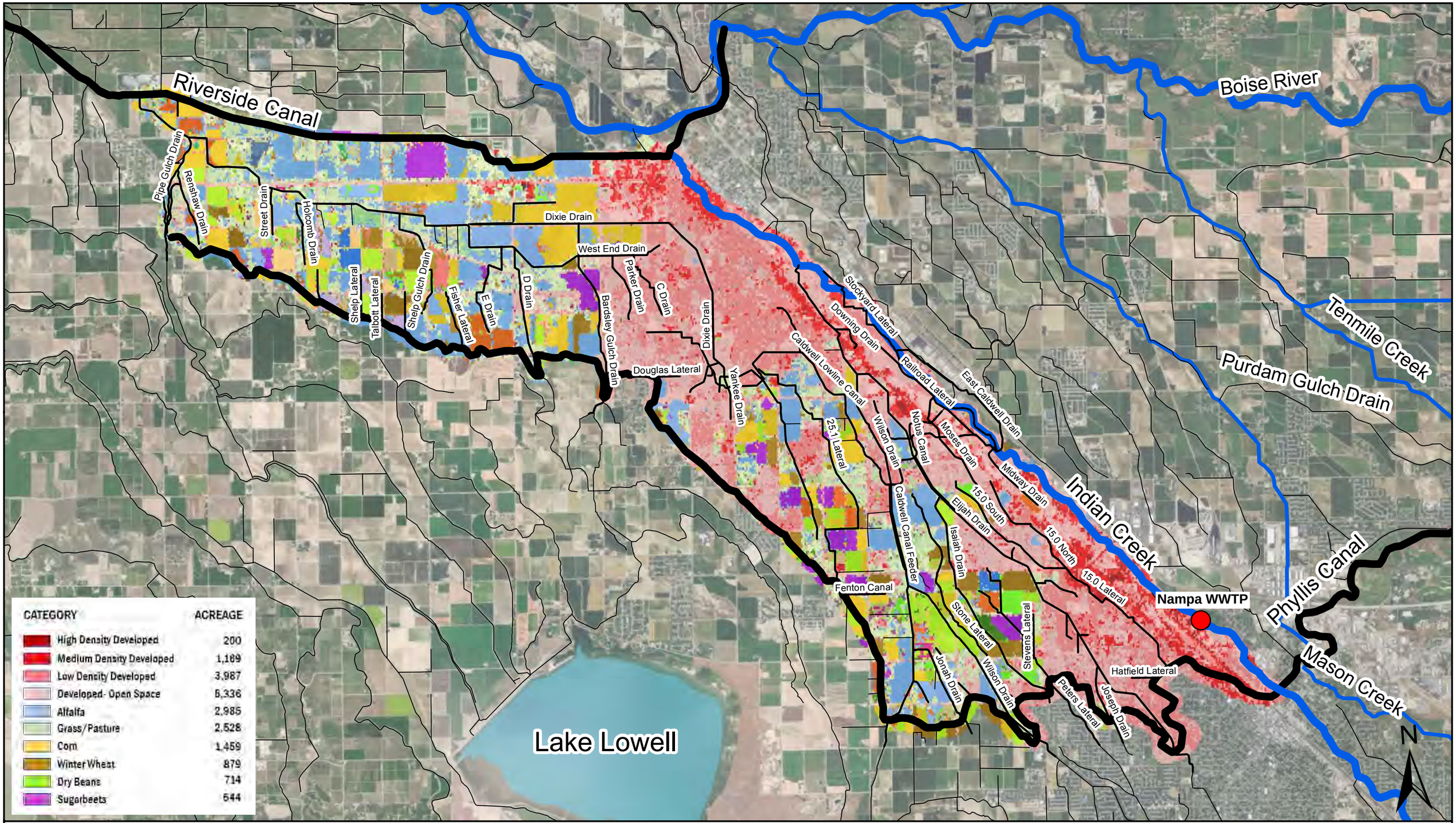


Brown AND Caldwell

Figure 12. Crop Coverage and Land Use map: Area of Analysis

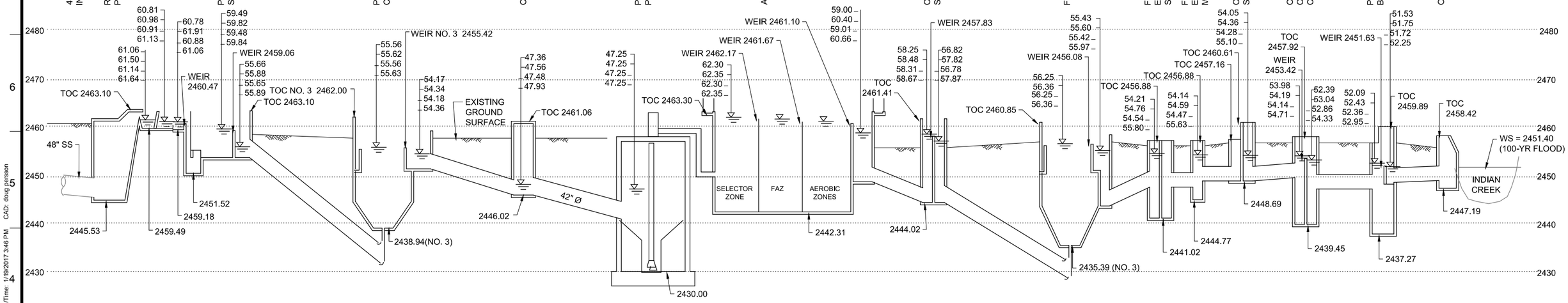
Client: City of Nampa
Date: 2-25-2019

0 0.4 0.8 1.6 2.4 3.2 Miles

Path: Bcboi02\\bcboifp01\projects_Nampa, City of_Nampa WW Program\230 DEQ Negotiations\620 Reuse Permit Application\Permit Application\Application Figures\Maps.mxd

GENERAL NOTES:

1. ELEVATIONS ARE BASED ON THE INDIAN CREEK 100-YR FLOOD LEVEL.
2. ALL ELEVATIONS REFERENCED TO NAVD88 VERTICAL DATUM.



HYDRAULIC PROFILE
SCALE: HORIZ NO SCALE, VERT 1" = 10'

HYDRAULIC PROFILE SCENARIOS:

PLANT INFLUENT FLOWS

- XX.XX 12 MGD - FIRM CAPACITY
- XX.XX 20 MGD - FIRM CAPACITY
- XX.XX 18 MGD - TOTAL CAPACITY
- XX.XX 31 MGD - TOTAL CAPACITY

	UNITS ONLINE/TOTAL UNITS								
PLANT OPERATION	SCREENS	GRIT CHAMBERS	PCs	TFs	SCs	ABs	FCs	CCTs	PAB
FIRM CAPACITY	2/3	2/2	2/3	1/2	1/1	2/3	2/3	2/2	2/2
TOTAL CAPACITY	3/3	2/2	3/3	1/2	1/1	3/3	3/3	2/2	2/2

Figure 13. WWTP Treatment Process Hydraulic Profile

Client: City of Nampa
Date: 2-19-2019

Appendix A: NPDES Permit

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
WATER AND
WATERSHEDS

SEP 2 0 2016

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Michael Fuss
Public Works Director
City of Nampa
411 3rd Street South
Nampa, ID 83651

Re: City of Nampa Wastewater Treatment Plant
NPDES Permit No.: ID0022063

Dear Mr. Fuss:

We are reissuing a National Pollutant Discharge Elimination System (NPDES) permit for City of Nampa Wastewater Treatment Plant. The enclosed document authorizes the facility to discharge to Indian Creek. Also enclosed is the U.S. Environmental Protection Agency's response to the comments received on the draft permit during the public notice period.

This letter serves as service of notice under 40 CFR §124.19(a). The service of notice date for this permit, in accordance with 40 CFR §124.19(a) and 40 CFR 124.20, is September 29, 2016. The permit will become effective on the date indicated in the permit unless a timely appeal meeting the requirements of 40 CFR §124.19 is received by the EAB. Information about the administrative appeal process may be obtained on-line at http://www.epa.gov/eab or by contacting the Clerk of the EAB at (202) 233-0122.

Sincerely,

Daniel D. Opalski, Director
Office of Water and Watersheds

Enclosures

cc: Mr. Aaron Scheff, Regional Administrator, Idaho Department of Environmental Quality, Boise Regional Office
Ms. Kati Carberry, Idaho Department of Environmental Quality, Boise Regional Office
Mr. Justin Hayes, Idaho Conservation League
Ms. Liz Paul, Idaho Rivers United
Mr. Steve Burgos, City of Boise

RECEIVED
SEP 26 2016
BY:

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue Suite 900
Seattle, Washington 98101-3140

Authorization to Discharge Under the National Pollutant Discharge Elimination System

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §1251 *et seq.*, as amended by the Water Quality Act of 1987, P.L. 100-4, the "Act",

City of Nampa
Wastewater Treatment Facility
340 West Railroad Street
Nampa, ID 83687

is authorized to discharge from the wastewater treatment plant located in Nampa, Idaho, at the following location(s):

Outfall	Receiving Water	Latitude	Longitude
001	Indian Creek	43° 35' 50" N	116° 34' 52" W

in accordance with discharge point(s), effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective November 1, 2016.

This permit and the authorization to discharge shall expire at midnight, October 31, 2021.

The permittee shall reapply for a permit reissuance on or before May 4, 2021 if the permittee intends to continue operations and discharges at the facility beyond the term of this permit.

Signed this 20th day of September, 2016.

Daniel D. Opalski, Director
Office of Water and Watersheds

Schedule of Submissions

The following is a summary of some of the items the permittee must complete and/or submit to EPA during the term of this permit:

Item	Due Date
1. Discharge Monitoring Reports (DMR)	DMRs are due monthly and must be submitted on or before the 20th day of the month following the monitoring month (see III.B).
2. Quality Assurance Plan (QAP)	The permittee must provide EPA and IDEQ with written notification that the Plan has been developed and implemented by January 31, 2017 (see II.C). The Plan must be kept on site and made available to EPA and IDEQ upon request.
3. Operation and Maintenance (O&M) Plan	The permittee must provide EPA and IDEQ with written notification that the Plan has been developed and implemented by January 31, 2017 (see II.B). The Plan must be kept on site and made available to EPA and IDEQ upon request.
4. NPDES Application Renewal	The application must be submitted by May 4, 2021 (see V.B).
5. Compliance Schedule	Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date (see III.K).
6. Twenty-Four Hour Notice of Noncompliance Reporting	The permittee must report certain occurrences of noncompliance by telephone within 24 hours from the time the permittee becomes aware of the circumstances. (See III.G and I.B.2).
7. Local Limits Evaluation	By October 31, 2017, the permittee must submit to EPA a complete local limits evaluation pursuant to 40 CFR 403.5(c)(1) (See II.A.5).
8. Annual Pretreatment Report	The Report must be submitted to the pretreatment coordinator no later than November 1st of each calendar year (See II.A.9).
9. Emergency Response and Public Notification Plan	The permittee must develop and implement an overflow emergency response and public notification plan. The permittee must submit written notice to EPA and IDEQ that the plan has been developed and implemented by April 30, 2017 (See II.D).
10. Mercury Minimization Plan	Written notice must be submitted to the EPA and the IDEQ that the plan has been developed and implemented by April 30, 2017 (See I.F).

Table of Contents

I. Limitations and Monitoring Requirements

A. Discharge Authorization

During the effective period of this permit, the permittee is authorized to discharge pollutants from the outfalls specified herein to Indian Creek, within the limits and subject to the conditions set forth herein. This permit authorizes the discharge of only those pollutants resulting from facility processes, waste streams, and operations that have been clearly identified in the permit application process.

B. Effluent Limitations and Monitoring

1. The permittee must limit and monitor discharges from outfall 001 as specified in Table 1, below. All figures represent maximum effluent limits unless otherwise indicated. The permittee must comply with the effluent limits in the tables at all times unless otherwise indicated, regardless of the frequency of monitoring or reporting required by other provisions of this permit.

Table 1: Effluent Limitations and Monitoring Requirements

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Report	—	Report	Effluent	continuous	recording
Temperature Until 1 October 31, 2017.	°C	—	Report	Report	Effluent	5/week[11]	grab[11]
Temperature[4,7,8] After November 1, 2017. (July – September)	°C	See Table 2 and Notes 7 and 8.			Effluent	continuous	recording
Temperature[7,8] After November 1, 2017. (October – June)	°C	See Notes 7 and 8.			Effluent	continuous	recording
Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	—	Influent and Effluent	1/week	24-hr. comp.
	lb/day	4504	6755	—	Effluent		calculation
	% removal	85% (minimum)	—	—	% removal	1/month	calculation
Total Suspended Solids (TSS)	mg/L	30	45	—	Influent and Effluent	2/week	24-hr. comp.
	mg/L	4-month rolling average: 17.5					
	lb/day	4503	6755	—	Effluent		calculation
	lb/day	4-month rolling average: 2,629 lb/day					
	% removal	85% (minimum)	—	—	% removal	1/month	calculation
pH[10]	s.u.	6.5 – 9.0 at all times			Effluent	5/week	grab
E. Coli Bacteria[1,2]	#/100 ml	126 (geometric mean)	—	576 (instantaneous max.)	Effluent	10/month	grab
Phosphorus, Total as P[4] (May – September)	µg/L	Report	Report	—	Effluent	2/week	24-hr. comp.
	lb/day	15	Report	—			calculation
Phosphorus, Total as P[4] (October – April)	µg/L	Report	Report	—	Effluent	2/week	24-hr. comp.
	lb/day	52.6	Report	—			calculation
Phosphorus, Soluble Reactive (Year-Round)	mg/L	Report	Report	—	Effluent	1/month	24-hr. comp.

Table 1: Effluent Limitations and Monitoring Requirements							
		Effluent Limitations			Monitoring Requirements		
Parameter	Units	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Sample Location	Sample Frequency	Sample Type
Phosphorus, Total as P (Year-Round)	mg/L	Report	Report	—	Influent	1/month	24-hr. comp.
Ammonia, Total as N[2] (March – November)	mg/L	1.31	—	4.92	Effluent	2/week	24-hr. comp.
	lb/day	197	—	739			calculation
Ammonia, Total as N[2] (December – February)	mg/L	1.41	—	5.31	Effluent	2/week	24-hr. comp.
	lb/day	212	—	797			calculation
Chlorine, Total Residual[6] (March – November)	µg/L	9.2	—	18	Effluent	5/week	grab
	lb/day	1.4	—	2.7			calculation
Chlorine, Total Residual[6] (December – February)	µg/L	9.6	—	19	Effluent	5/week	grab
	lb/day	1.4	—	2.9			calculation
Copper, Total Recoverable[2,4] (April – October)	µg/L	10.7	—	23.1	Effluent	1/month	24-hr. comp.
	lb/day	1.61	—	3.47			calculation
Copper, Total Recoverable[2,4] (November – March)	µg/L	17.8	—	38.5	Effluent	1/month	24-hr. comp.
	lb/day	2.67	—	5.78			calculation
Copper, Total Recoverable (Year-Round)	µg/L	Report	—	Report	Influent	2/year[3]	24-hr. comp.
Cyanide, Weak Acid Dissociable[2,9] (March – November)	µg/L	4.75	—	9.53	Effluent	1/month	See I.B.8.
	lb/day	0.713	—	1.43			calculation
Cyanide, Weak Acid Dissociable[2,9] (December – February)	µg/L	4.96	—	9.96	Effluent	1/month	See I.B.8.
	lb/day	0.745	—	1.50			calculation
Cyanide, Weak Acid Dissociable (Year-Round)	µg/L	Report	—	Report	Influent	2/year[3]	See I.B.8.
Dissolved Oxygen	mg/L	6.0 minimum			Effluent	5/week	grab
	% sat.	90% minimum	80% min.	—		5/week	calculation
Mercury, Total Recoverable[2,4] (March – November)	µg/L	0.011	—	0.022	Effluent	1/month	24-hr. comp.
	lb/day	0.0017	—	0.0033			calculation
Mercury, Total Recoverable[2,4] (December – February)	µg/L	0.011	—	0.023	Effluent	1/month	24-hr. comp.
	lb/day	0.0017	—	0.0035			calculation
Floating, suspended or submerged matter	—	See Part I.B.3.				1/month	Visual observation
Mercury, Total (Year-Round)	µg/L	Report	—	Report	Influent	1/month	24-hr. comp.
Nitrate + Nitrite	mg/L	Report	—	Report	Effluent	1/month	24-hr. comp.
Total Kjeldahl Nitrogen	mg/L	Report	—	Report	Effluent	1/month	24-hr. comp.
Arsenic, Total Recoverable	µg/L	Report	—	Report	Influent & Effluent	2/year[3,12]	24-hr. comp.
Cadmium, Total Recoverable	µg/L	Report	—	Report	Influent & Effluent	2/year[3]	24-hr. comp.
Chromium, Total Recoverable	µg/L	Report	—	Report	Influent & Effluent	2/year[3]	24-hr. comp.
Chromium VI, Dissolved	µg/L	Report	—	Report	Influent, & Effluent	2/year[3,12]	24-hr. comp.
Conductivity[10]	µmhos/cm	Report	—	Report	Effluent	1/month	24-hr. comp.
Dissolved Organic Carbon (DOC)[10]	mg/L	Report	—	Report	Effluent	1/month	24-hr. comp.

Table 1: Effluent Limitations and Monitoring Requirements

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Sample Location	Sample Frequency	Sample Type
Hardness, Total[10]	mg/L as $CaCO_3$	Report	—	Report	Effluent	1/month	24-hr. comp.
Lead, Total Recoverable	µg/L	Report	—	Report	Influent & Effluent	2/year[3]	24-hr. comp.
Molybdenum, Total Recoverable	µg/L	Report	—	Report	Influent & Effluent	2/year[3,12]	24-hr. comp.
Nickel, Total Recoverable	µg/L	Report	—	Report	Influent & Effluent	2/year[3]	24-hr. comp.
Selenium, Total Recoverable	µg/L	Report	—	Report	Influent & Effluent	2/year[3]	24-hr. comp.
Silver, Total Recoverable	µg/L	Report	—	Report	Influent & Effluent	2/year[3]	24-hr. comp.
Whole Effluent Toxicity	TU_c	Report	—	Report	Effluent	2/year[5]	24-hr. comp.
Zinc, Total Recoverable	µg/L	Report	—	Report	Influent & Effluent	2/year[3]	24-hr. comp.
NPDES Application Form 2A Expanded Effluent Testing	—	See I.B.9.			Effluent	3x/5 years	—

1. The average monthly E. Coli bacteria counts must not exceed a geometric mean of 126/100 ml based on samples taken every 3-7 days within a calendar month. See Part V for a definition of geometric mean.
2. Reporting is required within 24 hours from the time the permittee becomes aware of a maximum daily limit or instantaneous maximum limit violation. See Parts I.B.2 and III.G.
3. Sampling must be conducted twice per year, once during the period from April 1 through October 31, and once during the period from November 1 through March 31 each year. For each twice-per-year sampling event, the permittee must collect three 24-hour composite samples within a calendar week. The permittee must report the results of sampling for these parameters on the March and October DMRs and in the pretreatment annual report required by Part II.A.9 of this permit.
4. These effluent limits are subject to a compliance schedule. See I.C.
5. Sampling must take place at least once during each of the following seasons: December – February and March – November. See I.D.
6. See I.B.10.
7. Temperature data must be recorded using micro-recording temperature devices known as thermistors. Set the recording device to record at one-hour intervals. Report the following temperature monitoring data on the DMR: monthly instantaneous maximum, maximum daily average, seven-day running average of the daily instantaneous maximum.
8. Use the temperature device manufacturer's software to generate (export) a spreadsheet or text file. The file must be submitted monthly to the EPA as an electronic attachment to the City's DMRs (see Part III.B.1.b.). The files for the previous monitoring year must also be submitted annually to IDEQ by January 31. The placement logs must be submitted annually to the EPA and IDEQ by January 31 for the previous monitoring year. The placement logs should include the following information for both thermistor deployment and retrieval: date, time, temperature device manufacturer ID, location, depth, whether it measured air or water temperature, and any other details that may explain data anomalies.
9. See I.B.11.
10. Samples for dissolved organic carbon, pH, hardness, conductivity and copper must be collected on the same day.
11. Grab samples for temperature must be taken between 4:00 PM and 6:00 PM.
12. Sampling must begin by September 30, 2017.

Table 2: Effluent Limits for Temperature			
Season	**Units**	**Maximum Daily Limit[1]**	**Instantaneous Maximum Limit**
July[2]	°C	19.0	—
August[2]	°C	19.0	22.8
September[2]	°C	19.7	—
1. The maximum daily limit is the highest allowable average temperature measured over a calendar day or any 24-hour period that reasonably represents the calendar day for the purposes of sampling. 2. These effluent limits are subject to a compliance schedule. See I.C.			

2. The permittee must report within 24 hours from the time the permittee becomes aware of any violation of the maximum daily or instantaneous maximum limits for the following pollutants: Total ammonia as N, total recoverable copper, weak acid dissociable cyanide, total recoverable mercury, and E. coli. Violations of all other effluent limits are to be reported at the time that discharge monitoring reports are submitted (See III.B. and III.H.).
3. Narrative limitations for floating, suspended or submerged matter:
   a) The permittee must not discharge floating, suspended, or submerged matter of any kind in amounts causing nuisance or objectionable conditions or that may impair designated beneficial uses of the receiving water.
   b) The permittee must observe the surface of the receiving water in the vicinity of where the effluent enters the surface water. The permittee must maintain a written log of the observation which includes the date, time, observer, and whether there is presence of floating, suspended or submerged matter. The log must be retained and made available to EPA or IDEQ upon request. The log must note, as a binary, yes/no response, whether there is presence of floating, suspended or submerged matter and include a photograph taken at the time of observation.
4. Removal Requirements for BOD_5 and TSS: The monthly average effluent concentration must not exceed 15 percent of the monthly average influent concentration. Percent removal of BOD_5 and TSS must be reported on the Discharge Monitoring Reports (DMRs). For each parameter, the monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month. Influent and effluent samples must be taken over approximately the same time period.
5. The permittee must collect effluent samples from the effluent stream after the last treatment unit prior to discharge into the receiving waters.
6. For all effluent monitoring, the permittee must use sufficiently sensitive analytical methods which meet the following:
   a) Parameters with an effluent limit: The method must achieve a minimum level (ML) less than the effluent limitation unless otherwise specified in Table 1 Effluent Limitations and Monitoring Requirements.
   b) Parameters that do not have an effluent limit.

(i) The permittee must use a method that detects and quantifies the level of the pollutant, or

(ii) The permittee must use a method that can achieve a maximum ML less than or equal to those specified in *Appendix A. Minimum Levels*.

c) For parameters that do not have an effluent limit, the permittee may request different MLs. The request must be in writing and must be approved by EPA.

d) See also Part III.C *Monitoring Procedures*.

7. For purposes of calculating monthly averages, except for E. coli, zero may be assigned for values less than the MDL, and the {numeric value of the MDL} may be assigned for values between the MDL and the ML. If the average value is less than the MDL, the permittee must report "less than {numeric value of the MDL}" and if the average value is less than the ML, the permittee must report "less than {numeric value of the ML}." If a value is equal to or greater than the ML, the permittee must report and use the actual value. The resulting average value must be compared to the compliance level, the ML, in assessing compliance.

8. Influent and effluent sampling for cyanide must be conducted as follows. Eight discrete grab samples must be collected over a 24-hour day. Each grab sample must be at least 100 ml. Prior to compositing, any interferences must be removed or suppressed and the individual grab samples must be preserved as specified in Table II of 40 CFR 136.3. The grab samples can then be composited into a larger container to allow for one analysis for the day. The composited sample must also be preserved as specified in Table II of 40 CFR 136.3.

9. The permittee must perform the effluent testing required by Part D of NPDES application Form 2A (EPA Form 3510-2A, revised 1-99). The permittee must submit the results of this testing with its application for renewal of this NPDES permit. To the extent that effluent monitoring required by other conditions of this permit satisfies this requirement, these samples may be used to satisfy the requirements of this paragraph.

10. The effluent limits for total residual chlorine are not quantifiable using EPA approved analytical methods. EPA will use the Minimum Level (ML) as the compliance evaluation level for total residual chlorine. The permittee will be compliant with the total residual chlorine limitations if the average monthly and maximum daily chlorine concentrations and mass loadings are less than specified below:

a) Until 1 year after the effective date of the final permit: The permittee will be compliant with the total residual chlorine limitations if the average monthly and maximum daily chlorine concentrations are less than 100 µg/L and the average monthly and maximum daily mass discharges of chlorine are less than 15 lb/day

b) After 1 year after the effective date of the final permit: The permittee will be compliant with the total residual chlorine limitations if the average monthly and maximum daily chlorine concentrations are less than 50 µg/L and the

average monthly and maximum daily mass discharges of chlorine are less than 7.5 lb/day.

11. The effluent limits for weak acid dissociable cyanide are not quantifiable using EPA approved analytical methods. EPA will use 10 µg/L (the Minimum Level) as the compliance evaluation level for weak acid dissociable cyanide. The permittee will be compliant with the weak acid dissociable cyanide limitations if the average monthly and maximum daily weak acid dissociable cyanide concentrations are less than 10 µg/L and the average monthly and maximum daily mass discharges of weak acid dissociable cyanide are less than 1.5 lb/day.

C. Schedules of Compliance

1. The permittee must comply with all effluent limitations and monitoring requirements in Part I.B beginning on the effective date of this permit, except those for which a compliance schedule is specified in Part I.C.2.
2. A schedule of compliance is authorized only for the following effluent limits:
   a) Total recoverable mercury
   b) Total phosphorus
   c) Total recoverable copper
   d) Temperature
3. While the schedules of compliance are in effect, the City of Nampa must comply with the following interim requirements:
   a) Monitoring requirements in Part I.B.
   b) Until compliance with the final effluent limitations is achieved, the permittee must complete the tasks listed in Table 3.
   c) For TP and mercury, the permittee must comply with the interim effluent limitations in Table 4.
   d) The Permittee must submit an annual progress report outlining overall progress made toward reaching the final compliance dates for TP, temperature, mercury, and copper. The annual report of progress must be submitted to DEQ and EPA by December 31st of each year. The first report is due December 31, 2016, and annually thereafter until compliance with the final effluent limits is achieved. At a minimum, the annual progress report must include:
      (i) An assessment of the previous year's TP, temperature, mercury and copper data and comparison to the final effluent limitations in the Permit.
      (ii) A description of progress made towards meeting the final effluent limitations, including the applicable deliverables required under the tasks in Table 3 and parts I.C.3.d and I.C.3.e, below. Include any exceedances of interim Permit limits or anticipated challenges for

compliance within the next year. This may include a technological explanation and/or a request to modify the Permit.

(iii) Further actions and milestones targeted for the upcoming year.

Table 3: Tasks Required Under the Schedules of Compliance for TP, Temperature, Mercury and Copper

Task No.	Deadline	Task Activity and Deliverable
1	December 31, 2016 and annually thereafter	Report of Progress: The Permittee must submit an annual progress report outlining the overall progress made toward reaching the final compliance dates for TP, temperature, mercury, and copper. Deliverable: The annual report of progress must be submitted to DEQ and EPA by December 31st of each year. The first report is due December 31, 2016, and annually thereafter until compliance with the final effluent limits is achieved.
2	December 31, 2019	Wastewater Facility Upgrades: Phase I Upgrades include the following: • Modifications and additions to the existing secondary treatment system such that it is capable of biological phosphorus removal. • Installation of a new Primary Effluent Pump Station. • New Primary Anaerobic Digester. • New Solids Handling Facility with rotary drum thickeners and dewatering • centrifuges Deliverable: The permittee must submit by December 31, 2019 a written notice to DEQ and EPA stating that the applicable modifications are constructed and operational.
3	May 1, 2020	Achieve May-September TP interim limit not to exceed 0.5 mg/L (monthly average).
4	October 1, 2020	Achieve October-April TP interim limit not to exceed 1.5 mg/L (seasonal average).
5	See Below	Evaluate options available to achieve final effluent limitations including, but not limited to, treatment plant upgrades, effluent trading projects, seasonal re-use, and infiltration.
5A	December 31, 2020	Deliverable: No later than December 31, 2020, the permittee must submit to EPA and DEQ written notice of its decision on the final option that will be used to achieve the final effluent limits for TP, mercury and copper.
5B:	December 31, 2022	Deliverable: No later than December 31, 2022, the permittee must provide, in writing, to DEQ and EPA, a preliminary schedule of design upgrades and a preliminary construction schedule that will be used to achieve compliance with the final limits.

Table 3: Tasks Required Under the Schedules of Compliance for TP, Temperature, Mercury and Copper

Task No.	Deadline	Task Activity and Deliverable
6	September 30, 2026	Implement selected option(s) to achieve final effluent limitations for TP, mercury and copper. Dependent on the option(s) selected, tasks will include: • Securing funds for treatment facility upgrades. • Submission of a final schedule of design upgrades. • Submission to IDEQ and approval by IDEQ of final engineering plan. • Completion of construction. • Commissioning of facility upgrades. • Submission and approval of an alternative mitigation plan. • Implementation of alternative mitigation plan.
7	September 30, 2026	No later than August 31, 2026, the permittee must be in compliance with the final TP, mercury and copper effluent limits. The permittee must notify DEQ and EPA in writing when the final effluent limit is achieved.
8	September 30, 2031	No later than August 31, 2031, the permittee must be in compliance with the final temperature effluent limits. The permittee must notify DEQ and EPA in writing when the final effluent limit is achieved.

Table 4: Interim Effluent Limitations and Schedule for TP and Mercury

Parameter	Unit	Average Monthly Limit	Maximum Daily Limit	Season	Period
Phosphorus, Total as P	mg/L	Seasonal Average Limit[1,2]: 6.4		May 1 – September 30	Until September 30, 2019
	lb/day	Seasonal Average Limit[1,2]: 961			
	mg/L	0.50	—	May 1 – September 30	May 1, 2020 until final limit is achieved.
	lb/day	75	—		
	mg/L	Seasonal Average Limit[1,2]: 1.5		October 1 – April 30	October 1, 2020 until final limit is achieved.
	lb/day	Seasonal Average Limit[1,2]: 225			
Mercury, Total	µg/L	0.024	—	Year-round	Until September 30, 2026.
	lb/day	0.0036	—		

Notes:
1. The seasonal average total phosphorus concentration and load must be calculated as the sum of all daily discharges measured for total phosphorus during the listed season, divided by the number of daily discharges measured for total phosphorus during that season.
2. The seasonal average total phosphorus concentrations and loads must be reported on the DMRs for the last months of the corresponding seasons.

e) Additional Compliance Schedule Tasks for Temperature: The permittee must comply with the following Compliance Schedule requirements for temperature and complete the tasks and reports described below:

(i) No later than December 31, 2017 submit written notice to EPA and DEQ that it has permanently taken out of service one of the existing trickling filters at the Nampa WWTP.

(ii) Within fifteen months of the completion of the Phase I Upgrades, complete collection of one year of continuous temperature monitoring data and submit a report to DEQ and EPA including an evaluation of the effect of removal of one trickling filter and Phase 1 upgrades on effluent temperature.

(iii) No later than December 31, 2023, complete and submit to EPA and DEQ an evaluation of alternatives that the City may use to achieve the final temperature effluent limits. The evaluation should at a minimum consider: facility improvements, removal of trickling filters, alternative discharge locations, re-use of effluent and possible trading mechanisms such as offsite mitigation, including wetland and habitat restoration.

(iv) Starting in 2024, and continuing until final effluent limits are achieved, the permittee must submit a Report of Progress to EPA and DEQ detailing the evaluation of each available option, progress made toward achieving the final effluent limitation, and the series of actions that will be taken in the coming year. The Reports must be submitted by December 31st of each year.

(v) No later than June 30, 2025, the City must provide DEQ and EPA with a preliminary schedule of design upgrades and preliminary construction schedules for any additional treatment that will be used to achieve compliance with the final temperature effluent limits.

(vi) No later than June 30, 2026 the City must complete the preliminary design of any planned facility upgrades and/or a preliminary plan and schedule for an alternative temperature mitigation approach, which will address the City's effluent temperature limit. The preliminary design and/or plan will select the specific technology/technologies/activities to be used to meet the effluent temperature limits based on the previously completed alternatives evaluation.

(vii) No later than December 31, 2027, the City must complete and receive DEQ approval of the final design of any facility upgrades and/or alternative temperature mitigation plan to address the effluent temperature limits.

(viii) No later than December 31, 2029, the City must submit written notification to EPA and DEQ that it has completed construction of the facility upgrades at the Nampa WWTP and/or implement an alternative temperature mitigation plan.

(ix) No later than September 30, 2031, the permittee must be compliance with the final effluent limits for temperature. The permittee must

notify DEQ and EPA in writing when the final effluent limit is achieved.

f) Additional Compliance Schedule Tasks for Copper: The permittee must comply with the following compliance schedule requirements for copper and complete the tasks and reports described below:

(i) No later than December 31, 2019 submit to EPA and DEQ written notice that it has completed a wastewater characterization to determine sources of copper within the City's service area. This wastewater characterization will be completed in annual phases focused on different contributors within the City's wastewater system. The phases will continue until a likely source of copper has been determined in the system. The planned annual focus areas are noted below.

(a) Significant industrial users.

(b) Significant (categorical) industrial users.

(c) Minor industrial users, insignificant wet (ISW) and insignificant dry (ISD).

(d) Other commercial and residential customers.

(ii) No later than June 30, 2020, the City must submit a letter to DEQ if the City determines that no facility improvements or operational changes are necessary to meet the final effluent limits based on the results of the wastewater characterization.

(iii) No later than December 31, 2021 submit to EPA and DEQ written notice that it has completed an evaluation of alternative methods the City may use to achieve the final copper effluent limits, if necessary. The evaluation should consider facility improvements and pretreatment controls. The evaluation will be integrated in the City's TP alternatives evaluation as several of the proposed discharge options may impact the effluent copper concentrations.

(iv) No later than December 31, 2022, the City must provide to EPA and DEQ a preliminary schedule of design upgrades and preliminary construction schedules for the approach that will be used to achieve compliance with the final limits if facility improvements are necessary.

(v) If design upgrades are necessary to meet final copper effluent limitations, then by December 31, 2023 and of each year thereafter the permittee must provide a Report of Progress to DEQ and EPA which details the progress made toward achieving the final effluent limitation, and the series of actions that will be taken in the coming year.

(vi) No later than September 30, 2026, the permittee must be in compliance with the final effluent limits for copper. The permittee must notify DEQ and EPA in writing when the final effluent limit is achieved.

D. Whole Effluent Toxicity Testing Requirements

The permittee must conduct chronic toxicity tests on effluent samples from outfall 001. Testing must be conducted in accordance with subsections 1 through 10, below.

1. Toxicity testing must be conducted on 24-hour composite samples of effluent. In addition, a split of each sample collected must be analyzed for the chemical and physical parameters required in Part I.B, above, with a required effluent sampling frequency of once per month or more frequently, using the sample type required in Part I.B. For parameters for which grab samples are required in Part I.B, grab samples must be taken during the same 24-hour period as the 24-hour composite sample used for the toxicity tests. When the timing of sample collection coincides with that of the sampling required in Part I.B, analysis of the split sample will fulfill the requirements of Part I.B as well.

2. Chronic Test Species and Methods

   a) Chronic tests must be conducted twice per year. Sampling must take place at least once during each of the following seasons: December – February and March – November.

   b) The permittee must conduct short-term tests with the water flea, *Ceriodaphnia dubia* (survival and reproduction test), the fathead minnow, *Pimephales promelas* (larval survival and growth test), and a green alga, *Selenastrum capricornutum* (growth test) for the first three suites of tests. After this screening period, monitoring must be conducted using the most sensitive species, which is defined below.

      (i) The most sensitive species is the species which, during the screening period, produces the greatest maximum toxicity result in chronic toxic units (TU_c), which is defined in Part I.D.2.d, below.

      (ii) If all three species produce the identical maximum toxicity result (including no toxicity in 100% effluent) the permittee must use *Ceriodaphnia dubia* for subsequent tests.

      (iii) If two species produce the identical maximum toxicity result, which is greater than 1.0 TU_c and also greater than the maximum toxicity result of the third species, the permittee may use either of the two species producing the greater maximum toxicity result for subsequent tests.

   c) The presence of chronic toxicity must be determined as specified in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, EPA/821-R-02-013, October 2002.

   d) Results must be reported in TU_c (chronic toxic units), which is defined as follows:

      (i) For survival endpoints, $TU_c = 100/NOEC$.

      (ii) For all other test endpoints, $TU_c = 100/IC_{25}$.

(iii) IC_{25} means "25% inhibition concentration." The IC_{25} is a point estimate of the toxicant concentration, expressed in percent effluent, that causes a 25% reduction in a non-quantal biological measurement (e.g., reproduction or growth) calculated from a continuous model (e.g., Interpolation Method).

(iv) NOEC means "no observed effect concentration." The NOEC is the highest concentration of toxicant, expressed in percent effluent, to which organisms are exposed in a chronic toxicity test [full life-cycle or partial life-cycle (short term) test], that causes no observable adverse effects on the test organisms (i.e., the highest concentration of effluent in which the values for the observed responses are not statistically significantly different from the controls).

3. Quality Assurance

a) The toxicity testing on each organism must include a series of six test dilutions and a control. The dilution series must include 100%, 50%, 25%, 12.5%, and 6.25% effluent and the receiving water concentration (RWC). The RWCs are:

(i) 90% effluent for March – November.

(ii) 86% effluent for December – February.

b) All quality assurance criteria and statistical analyses used for chronic tests and reference toxicant tests must be in accordance with *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, EPA/821-R-02-013, October 2002, and individual test protocols.

c) In addition to those quality assurance measures specified in the methodology, the following quality assurance procedures must be followed:

(i) If organisms are not cultured in-house, concurrent testing with reference toxicants must be conducted. If organisms are cultured in-house, monthly reference toxicant testing is sufficient. Reference toxicant tests must be conducted using the same test conditions as the effluent toxicity tests.

(ii) If either of the reference toxicant tests or the effluent tests do not meet all test acceptability criteria as specified in the test methods manual, the permittee must re-sample and re-test within 14 days of receipt of the test results.

(iii) Control and dilution water must be receiving water or lab water, as appropriate, as described in the manual. If the dilution water used is different from the culture water, a second control, using culture water must also be used. Receiving water may be used as control and dilution water upon notification of EPA and IDEQ. In no case shall water that has not met test acceptability criteria be used for either dilution or control.

4. Reporting

   a) The permittee must submit the results of the toxicity tests with the discharge monitoring reports (DMRs). Results must be reported on the DMRs for the last month of the season in which the samples were taken.

   b) The report of toxicity test results must include all relevant information outlined in Section 10, Report Preparation, of *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, EPA/821-R-02-013, October 2002. In addition to toxicity test results, the permittee must report: dates of sample collection and initiation of each test; effluent flow rate at the time of sample collection; and the results of the monitoring required in Part I.B of this permit, for parameters with a required monitoring frequency of once per month or more frequently.

5. Preparation of initial investigation toxicity reduction evaluation (TRE) workplan: Within 90 days of the effective date of this permit, the permittee must submit to EPA a copy of the permittee's initial investigation TRE workplan. This plan shall describe the steps the permittee intends to follow in the event that chronic toxicity is detected at levels greater than the triggers in Part I.D.6 of this permit, and must include at a minimum:

   a) A description of the investigation and evaluation techniques that would be used to identify potential causes/sources of toxicity, effluent variability, treatment system efficiency;

   b) A description of the facility's method of maximizing in-house treatment efficiency, good housekeeping practices, and a list of all chemicals used in operation of the facility; and

   c) If a toxicity identification evaluation (TIE) is necessary, who will conduct it (i.e., in-house or other).

   d) The initial investigation TRE workplan must be sent to the following address:

      US EPA Region 10
      Attn: NPDES WET Coordinator
      1200 Sixth Avenue
      Suite 900 OWW-191
      Seattle, WA 98101-3140

6. Accelerated testing

   a) The chronic toxicity triggers are:

      (i) 1.12 TU_c for March – November.

      (ii) 1.17 TU_c for December – February.

7. If chronic toxicity is detected above the chronic toxicity triggers in Part I.D.6.a:

   a) The permittee must conduct six more bi-weekly (every two weeks) chronic toxicity tests, over a 12-week period. This accelerated testing shall be

initiated within 10 calendar days of receipt of the test results indicating the initial exceedance.

b) The permittee must notify EPA of the exceedance in writing at the address in Part I.D.5.d, above, within 5 calendar days of receipt of the test results indicating the exceedance. The notification must include the following information:

(i) A status report on any actions required by the permit, with a schedule for actions not yet completed.

(ii) A description of any additional actions the permittee has taken or will take to investigate and correct the cause(s) of the toxicity.

(iii) Where no actions have been taken, a discussion of the reasons for not taking action.

c) If none of the six accelerated chronic toxicity tests required under Part I.D.7.a exceed the applicable chronic toxicity trigger in Part I.D.6 of this permit, the permittee may return to the regular chronic toxicity testing cycle specified in Part I.D.2.a.

d) If any of the six accelerated chronic toxicity tests required under Part I.D.7.a exceed the applicable chronic toxicity trigger in Part I.D.6 of this permit, then the permittee must implement the initial investigation TRE workplan as described in Part I.D.8.

8. Implementation of Initial Investigation TRE Workplan

a) The permittee must implement the initial investigation TRE workplan within 48 hours of the permittee's receipt of the accelerated toxicity test result demonstrating an exceedance of the applicable chronic toxicity trigger in Part I.D.6 of this permit.

(i) If implementation of the initial investigation workplan clearly identifies the source of toxicity to the satisfaction of EPA (e.g., a temporary plant upset), the permittee may return to the regular chronic toxicity testing cycle specified in Part I.D.2.a.

(ii) If implementation of the initial investigation workplan does not clearly identify the source of toxicity to the satisfaction of EPA, then the permittee must begin implementation of further toxicity reduction evaluation (TRE) requirements in part I.D.9 below.

9. Detailed TRE/TIE

a) If implementation of the initial investigation workplan does not clearly identify the source of toxicity to the satisfaction of EPA, then, in accordance with the permittee's initial investigation workplan and EPA manual EPA 833-B-99-002 (*Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants*), the permittee must develop as expeditiously as possible a more detailed TRE workplan, which includes:

(i) Further actions to investigate and identify the cause of toxicity;

(ii) Actions the permittee will take to mitigate the impact of the discharge and to prevent the recurrence of toxicity; and

(iii) A schedule for these actions.

b) The permittee may initiate a TIE as part of the overall TRE process described in the EPA acute and chronic TIE manuals EPA/600/6-91/005F (Phase I), EPA/600/R-92/080 (Phase II), and EPA-600/R-92/081 (Phase III).

c) If the detailed TRE/TIE clearly identifies the source of toxicity to the satisfaction of EPA, the permittee may return to the regular chronic toxicity testing cycle specified in Part I.D.2.a.

10. Inconclusive TRE/TIE

a) If the detailed TRE described in Part I.D.9 is inconclusive, the permittee must conduct six bi-weekly (every two weeks) chronic toxicity tests, over a 12-week period. This accelerated testing shall be initiated within 10 calendar days of completing the detailed TRE/TIE.

b) If none of the six accelerated chronic toxicity tests required under Part I.D.10.a exceed the applicable chronic toxicity trigger in Part I.D.6 of this permit, the permittee may return to the regular chronic toxicity testing cycle specified in Part I.D.2.a.

c) If any of the six accelerated chronic toxicity tests required under Part I.D.10.a exceed the applicable chronic toxicity trigger in Part I.D.6 of this permit, then the permittee must repeat the TRE/TIE process described in Part I.D.9.

E. Surface Water Monitoring

The permittee must conduct surface water monitoring. Surface water monitoring must start by January 31, 2017 and continue for as long as this permit remains in effect. The program must meet the following requirements:

1. Monitoring stations must be established in Indian Creek at the following locations:

a) Above the influence of the facility's discharge.

b) Below the facility's discharge, at a point where the effluent and Indian Creek are completely mixed.

2. To the extent practicable, surface water sample collection must occur on the same day as effluent sample collection.

3. All ambient samples must be grab samples, except the following:

a) Temperature, which must be monitored using weekly grab samples until 1 year after the effective date of the final permit, with continuous monitoring thereafter.

b) pH, and dissolved oxygen, which must be monitored continuously.

4. For all receiving water monitoring, the permittee must use sufficiently sensitive analytical methods which meet the following:

a) The method must detect and quantify the level of the pollutant, or

b) The permittee must use a method that can achieve MLs less than or equal to those specified in Appendix A. The permittee may request different MLs. The request must be in writing and must be approved by EPA.

5. Quality assurance/quality control plans for all the monitoring must be documented in the Quality Assurance Plan required under Part II.B., "Quality Assurance Plan".

6. Submission of SW Monitoring

a) Surface water monitoring results must be reported on the monthly DMR.

The permittee must submit all surface water monitoring results for the previous calendar year for all parameters in an annual report to EPA and IDEQ by January 31st of the following year and with the application (see Part V.B of this permit, *Duty to Reapply*). The file must be in the format of one analytical result per row and include the following information: name and contact information of laboratory, sample identification number, sample location in latitude and longitude (decimal degrees format), or other real-world coordinate system (e.g., State Plane), method of location determination (i.e., GPS, survey etc.), date and time of sample collection, water quality parameter (or characteristic being measured), analysis result, result units, detection limit and definition (i.e., MDL etc.), analytical method, date completed, and any applicable notes.

Table 5: Surface Water Monitoring Requirements

Parameter and Units	Upstream Sampling Frequency	Downstream Sampling Frequency
Flow, CFS	1/week	—
BOD_5, mg/L	1/month	—
Dissolved Oxygen, mg/L	Continuous[1]	Continuous[1]
Total Phosphorus, µg/L	1/month	1/month
Total Nitrogen, mg/L	1/month	1/month
Chlorophyll a, µg/L	1/month	1/month
Temperature, °C Until 1 year after the effective date of the final permit.	1/week[3]	1/week[3]
Temperature, °C After 1 year after the effective date of the final permit.	Continuous	Continuous
pH, standard units	Continuous[1]	Continuous[1]
Turbidity, NTU	1/week	1/week
Hardness as $CaCO_3$, mg/L	—	1/month
Arsenic, total recoverable, µg/L	1/quarter[2]	—
Cadmium, dissolved, µg/L	1/quarter[2]	—
Chromium, all oxidation states, dissolved	1/quarter[2]	—
Chromium VI, dissolved	1/quarter[2]	—
Conductivity, µmhos/cm	—	1/quarter[2]
Copper, dissolved, µg/L	1/quarter[2]	—
Dissolved organic carbon, mg/L	—	1/quarter[2]
Lead, dissolved, µg/L	1/quarter[2]	—
Mercury, total recoverable, ng/L	1/quarter[2]	—

Table 5: Surface Water Monitoring Requirements		
Parameter and Units	**Upstream Sampling Frequency**	**Downstream Sampling Frequency**
Nickel, dissolved, µg/L	1/quarter[2]	—
Silver, dissolved, µg/L	1/quarter[2]	—
Zinc, dissolved, µg/L	1/quarter[2]	—
Notes: 1. Continuous monitoring for dissolved oxygen and pH is required during November 1, 2020 – October 31, 2021. 2. Quarters are defined as January – March, April through June, July – September, and October – December. Monitoring results for pollutants with a sample frequency of quarterly must be reported on the March, June, September and December DMRs. 3. Grab samples for temperature must be taken between 4:00 PM and 6:00 PM, and within 1 hour of an effluent sample.		

F. Methylmercury Requirements – Mercury Minimization Plan

The permittee must develop and implement a mercury minimization plan that identifies potential sources of mercury and the measures to reduce or eliminate mercury loading. Written notice must be submitted to the EPA and the IDEQ that the plan has been developed and implemented by April 30, 2017. Any existing mercury minimization plan may be modified for compliance with this section. The mercury minimization plan must include the following:

1. A Program Plan which includes the City's commitments for:
   a) Identification of potential sources of mercury that contribute to discharge concentrations;
   b) Reasonable, cost-effective activities to reduce or eliminate mercury loadings from identified sources;
   c) Tracking mercury source reduction implementation and mercury source monitoring;
   d) Monthly monitoring of POTW effluent;
   e) Twice per year monitoring of POTW influent;
   f) Resources and staffing.
2. Implementation of cost-effective control measures for direct and indirect contributors, and
3. An annual status report submitted to the US EPA, which includes:
   a) A list of potential mercury sources;
   b) A summary of actions taken to reduce or eliminate mercury discharges, with a goal of meeting water quality standards for methylmercury in fish tissue;
   c) Mercury source reduction implementation, mercury source monitoring results, and influent and effluent mercury monitoring results for the previous year;

d) Proposed adjustments to the Program Plan based on findings from the previous year.

G. Methylmercury Requirements – Fish Tissue Sampling

1. Applicability: The Permittee may satisfy the requirements of the Methylmercury Fish Tissue Monitoring program by arranging to participate in a cooperative effort with other NPDES permitted facilities or by developing and submitting an individual Methylmercury Monitoring Plan to the EPA and IDEQ

   a) Cooperative Fish Tissue Monitoring: The objective of the cooperative fish tissue monitoring is to collect reliable and more strategically located methylmercury fish tissue data, within a specific geographic area, to determine if fish tissue concentrations of methylmercury are compliant with Idaho's methylmercury fish tissue criterion of 0.3 mg/kg. The monitoring program may also be used to advise the public on safe levels of fish consumption. The requirements for participation are as follows:

      (i) Participation: Arrange to participate in a cooperative effort with other NPDES permitted facilities discharging to the Lower Boise River or to tributaries of the Lower Boise River. For more information, contact the City of Boise Public Works Department.

      (ii) Express interest in participating in the cooperative effort, in writing, to the City of Boise Public Works Department by October 31, 2017. The City of Boise is required to identify all participants (e.g., NPDES permitted facilities) funding the fish tissue monitoring program to the EPA. The USGS Monitoring Plan for Mercury in Fish Tissue (Monitoring Plan) must be updated each time a municipality or industrial facility joins the cooperative monitoring program, and the City of Boise must provide notice to the EPA and IDEQ each time each time a new NPDES permitted facility becomes part of the cooperative monitoring program.

      (iii) Follow the USGS Monitoring Plan, developed for the City of Boise and previously approved by the EPA and IDEQ, for the location and number of monitoring stations. Additional NPDES permitted facilities joining this effort can merge with the existing approved sampling schedule. One sample taken at each of the stations on the schedule in the Monitoring Plan will satisfy the monitoring requirements of any individual NPDES permitted facility involved in the cooperative effort.

      (iv) All participating NPDES permitted facilities must be named on the required report submitted to the EPA, the IDEQ and the Idaho Fish Consumption Advisory Board, as outlined in the City of Boise NPDES Permit, ID0023981.

   b) Individual Methylmercury Monitoring Plan: The objective of an individual facility's Methylmercury Monitoring Plan is to measure the NPDES discharger's compliance with Idaho's methylmercury fish tissue criterion. A

permitted facility may develop and submit an individual Methylmercury Monitoring Plan in lieu of joining the cooperative effort described in 1.a. above. The requirements for the individual Methylmercury Monitoring Plan are as follows:

(i) Participation: Develop and submit a Methylmercury Fish Tissue Monitoring Plan to the Director of the EPA Region 10 Office of Water and Watersheds and to IDEQ for review and approval by October 31, 2017. A failure to obtain approval of the Methylmercury Fish Tissue Monitoring Plan from the IDEQ or the Director of the Office of Water and Watersheds does not relieve the Permittee of the fish tissue monitoring requirements of this Permit.

(ii) Plan Requirements: At a minimum the plan must include the following elements:

(a) Monitoring stations where fish tissue samples will be collected: At least one monitoring station must be located in Indian Creek upstream from the discharge and at least one monitoring station must be located in Indian Creek downstream from the discharge;

(b) Name, address of organization collecting and analyzing fish tissue samples. The organization must have experience in the collection and analysis of methylmercury fish tissue samples.

(c) Develop a sampling plan that specifies sample target species, sample number and size, timing of sample collection, and all essential fish collection, handling, and shipping information for field sampling teams collecting fish. The plan must include a project description, detailed standard operating procedures (SOPs) for fish collection, and instructions for completing field forms and labels and for shipping fish samples. Protocols must be consistent with Chapter 4 of *Implementation Guidance for the Idaho Mercury Water Quality Criteria* (Idaho Department of Environmental Quality, 2005).

(d) Identify all protocols related to sample preparation methods and analytical methods to be used on samples.

(e) Identify data quality goals for all sample collection and handling activities and describe the Quality Assurance/Quality Control (QA/QC) techniques employed by field teams to support those goals.

(iii) Sample Frequency: Initial sampling must occur by October 31, 2018. Following the initial sampling event, monitoring must occur at least once every 2 years. After three (3) sampling cycles, locations should be sampled once every 5 years. Sample sites will be determined in consultation with IDEQ.

(iv) Water Column Mercury Sampling: At each sample location where fish are collected a surface water sample must be collected and analyzed

for total recoverable mercury using an analytical method which achieves a ML of 0.5 ng/L (0.0005 µg/L) or lower. EPA Guidance recommends Methods 1631E or 245.7 for analyzing mercury in water. This water column mercury sampling is required in addition to the receiving water mercury monitoring required in Part I.E of this Permit.

(v) Reporting Requirements: The Permittee must submit a report which lists the name, address and phone number of the entity collecting and analyzing samples; sample locations; target species used; sample size; time samples were collected; analytical methods used; results, and any other information relevant to the monitoring program. The Permittee must submit the report to the EPA, the IDEQ and the Idaho Fish Consumption Advisory Board by March 31st of the year following sampling.

(vi) Revisions to the Methylmercury Monitoring Plan: Any revisions to the Methylmercury Monitoring Plan must be approved by the IDEQ and the Director of the Office of Water and Watersheds.

II. Special Conditions

A. Pretreatment Requirements

1. Implementation

The permittee must implement its pretreatment program in accordance with the legal authorities, policies, procedures, staffing levels and financial provisions described in its original approved pretreatment program submission entitled *Pretreatment Program for the City of Nampa, Idaho*, dated February 1982, any program amendments submitted thereafter and approved by EPA, and the general pretreatment regulations (40 CFR 403) and any amendments thereof. At a minimum, the permittee must carry out the following activities:

a) Enforce prohibitive discharge standards as set forth in 40 CFR 403.5(a) and (b), categorical pretreatment standards promulgated pursuant to Section 307(b) and (c) of the Act (where applicable), and local limitations and BMPs developed by the permittee in accordance with 40 CFR 403.5(c), whichever are more stringent and are applicable to non-domestic users discharging wastewater into the permittee's collection system. Locally derived limitations must be defined as pretreatment standards under Section 307(d) of the Act.

b) Implement and enforce the requirements of the most recent and EPA-approved portions of local law and regulations (e.g. municipal code, sewer use ordinance) addressing the regulation of non-domestic users.

c) Update its inventory of non-domestic users at a frequency and diligence adequate to ensure proper identification of non-domestic users subject to pretreatment standards, but no less than once per year. The permittee must notify these users of applicable pretreatment standards in accordance with 40 CFR 403.8(f)(2)(iii).

d) Issue, reissue, and modify, in a timely manner, industrial wastewater discharge permits to at least all Significant Industrial Users (SIUs) and categorical industrial users. These documents must contain, at a minimum, conditions identified in 40 CFR 403.8(f)(1)(iii), including Best Management Practices, if applicable. The permittee must follow the methods described in its implementation procedures for issuance of individual permits.

e) Develop and maintain a data management system designed to track the status of the permittee's non-domestic user inventory, non-domestic user discharge characteristics, and their compliance with applicable pretreatment standards and requirements. The permittee must retain all records relating to its pretreatment program activities for a minimum of three years, as required by 40 CFR 403.12(o), and must make such records available to EPA upon request. The permittee must also provide public access to information considered effluent data under 40 CFR 2.

f) Establish, where necessary, legally binding agreements with contributing jurisdictions to ensure compliance with applicable pretreatment requirements in 40 CFR Part 403 by industrial users within these jurisdictions. These legally binding agreements must identify the agency responsible for the various pretreatment implementation and enforcement activities in the contributing jurisdiction and outline the specific roles, responsibilities and pretreatment activities of each jurisdiction.

g) Carry out inspections, surveillance, and monitoring of non-domestic users to determine compliance with applicable pretreatment standards and requirements. A complete inspection of all SIUs and sampling of all SIUs' effluent must be conducted at least annually.

h) Require SIUs to conduct wastewater sampling as specified in 40 CFR 403.12(e) or (h). Frequency of wastewater sampling by the SIUs must be appropriate for the character and volume of the wastewater but no less than twice per year. Sample collection and analysis must be performed in accordance with 40 CFR 403.12(b)(5)(ii) through (v) and 40 CFR 136. In cases where the Pretreatment Standard requires compliance with a Best Management Practice or pollution prevention alternative, the permittee must require the User to submit documentation to determine compliance with the Standard. If the permittee elects to conduct all non-domestic user monitoring for any SIU instead of requiring self-monitoring, the permittee must conduct sampling in accordance with the requirements of this paragraph, and the requirements of 40 CFR 403.12(g)(2).

i) Enforce and obtain remedies for any industrial user noncompliance with applicable pretreatment standards and requirements. This must include timely and appropriate reviews of industrial reports to identify all violations of the user's permit, the local ordinance, and federal pretreatment standards and requirements. Once violations have been uncovered, the permittee must take timely and appropriate action to address the noncompliance. The permittee's

enforcement actions must follow its EPA-approved enforcement response procedures.

j) Publish, at least annually, in a newspaper or newspapers of general circulation that provides meaningful public notice within the jurisdiction(s) served by the POTW, a list of all non-domestic users which, at any time in the previous 12 months, were in significant noncompliance as defined in 40 CFR 403.8 (f)(2)(viii).

k) Maintain adequate staff, funds and equipment to implement its pretreatment program.

l) Conduct an analysis annually to determine whether influent pollutant loadings are approaching the maximum allowable headworks loadings calculated in the permittee's most recent local limits calculations. Any local limits found to be inadequate by this analysis must be revised. The permittee may be required to revise existing local limits or develop new limits if deemed necessary by EPA.

2. Spill Prevention and Slug Discharges

The permittee must implement an accidental spill prevention program to reduce and prevent spills and slug discharges of pollutants from non-domestic users.

a) Control mechanisms for SIUs must contain requirements to control slug discharges if determined by the POTW to be necessary [40 CFR 403.8(f)(1)(iii)(B)(6)].

b) SIUs must be evaluated for the need for a plan or other action to control slug discharges within 1 year of being designated an SIU. [40 CFR 403.8(f)(2)(vi)].

c) SIUs must notify the POTW immediately of any changes at their facilities affecting the potential for a slug discharge [40 CFR 403.8(f)(2(vi)].

3. Enforcement Requirement

Whenever EPA finds, on the basis of any available information, that the owner or operator of any source is introducing a pollutant into the POTW in violation of national pretreatment standards, including prohibited discharges, local limits, or categorical standards, or has caused interference or pass through, EPA may notify the owner or operator of the POTW of such violation. If, within 30 days after such notification has been sent by EPA to the POTW, the POTW fails to commence appropriate enforcement action to correct the violation, EPA may take appropriate enforcement action under the authority provided in section 309(f) of the Clean Water Act.

4. Modification of the Pretreatment Program

If the permittee elects to modify any components of its pretreatment program, it must comply with the requirements of 40 CFR 403.18. No substantial program modification, as defined in 40 CFR 403.18(b), may be implemented prior to receiving written authorization from EPA.

5. Local Limits Evaluation

By October 31, 2017, the permittee must submit to EPA a complete local limits evaluation pursuant to 40 CFR 403.5(c)(1). The study must take into account water quality in the receiving stream, inhibition levels for biological processes in the treatment plant, and sludge quality goals. The study must address at least the following pollutants: total recoverable arsenic, 5-day biochemical oxygen demand, total recoverable cadmium, total recoverable chromium, chromium VI, total recoverable copper, cyanide, total recoverable lead, total recoverable mercury, total recoverable molybdenum, total recoverable nickel, total recoverable selenium, total recoverable silver, total suspended solids, and total recoverable zinc and any other pollutants of concern. The permittee must address total ammonia as N if the POTW accepts indirect discharges of ammonia. Submitted results of the study must include proposed local limits, maximum allowable headworks loadings, all supporting calculations, and all assumptions.

6. Control of Undesirable Pollutants

   The permittee must not allow introduction of the following pollutants into the publicly owned treatment works (POTW):

   a) Pollutants which will create a fire or explosion hazard in the POTW, including, but not limited to, wastestreams with a closed cup flashpoint of less than 140 °F or 60 °C using the test methods specified in 40 CFR 261.21;

   b) Pollutants which will cause corrosive structural damage to the POTW, but in no case indirect discharges with a pH lower than 5.0, unless the POTW is designed to accommodate such indirect discharges;

   c) Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW (including the collection system) resulting in interference;

   d) Any pollutant, including oxygen demanding pollutants (BOD, etc.), released in an indirect discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW;

   e) Heat in amounts which inhibit biological activity in the POTW resulting in interference, but in no case heat in such quantities that the temperature at the POTW treatment plant exceeds 40 °C (104 °F) unless the Regional Administrator, upon request of the POTW, approves alternate temperature limits;

   f) Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

   g) Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems; and

   h) Any trucked or hauled pollutants, except at discharge points designated by the POTW.

7. Requirements for Industrial users

The permittee must require any industrial user of its treatment works to comply with any applicable requirements in 40 CFR 403 through 471.

8. Sludge and Toxic Organics Sampling Requirements

a) The permittee must sample sludge as specified in Table 6.

Table 6: Sludge Sampling Requirements

Parameter	Units	Sampling Frequency
Arsenic	mg/kg dry weight	2/year[1]
Cadmium	mg/kg dry weight	2/year[1]
Chromium	mg/kg dry weight	2/year[1]
Copper	mg/kg dry weight	2/year[1]
Lead	mg/kg dry weight	2/year[1]
Mercury	mg/kg dry weight	2/year[1]
Molybdenum	mg/kg dry weight	2/year[1]
Nickel	mg/kg dry weight	2/year[1]
Percent Solids	%	2/year[1]
Selenium	mg/kg dry weight	2/year[1]
Zinc	mg/kg dry weight	2/year[1]

Notes:
1. Sampling must be conducted twice per year, once during the period from April 1 through October 31, and once during the period from November 1 through March 31 each year. For each twice-per-year sampling event, the permittee must collect three samples within a calendar week. The permittee must report the results of sampling for these parameters on the March and October DMRs and in the pretreatment annual report required by Part II.A.9 of this permit.

b) Sludge samples must be taken as the sludge leaves the dewatering device or digesters.

c) Sludge Reporting: Metals concentrations in sludge must be reported in mg/kg, dry weight.

d) Reporting Results: Analytical results for each day's samples must be reported separately. Sample results must be submitted with the pretreatment annual report required in paragraph 9, below.

e) Toxic organics sampling: The permittee must perform chemical analyses of its influent, effluent, and sludge for all specific toxic organic pollutants listed in Table II of Appendix D of 40 CFR 122.

(i) Sample frequency: Sampling must be conducted twice per year, once during the period from April 1 through October 31, and once during the period from November 1 through March 31 each year. For each twice-per-year sampling event, the permittee must collect three samples within a calendar week. The permittee must report the results of sampling for these parameters on the March and October DMRs and in the pretreatment annual report required by Part II.A.9 of this permit.

(ii) Sample Type: The influent and effluent samples must be 24-hour composites, except when sampling volatiles.

(iii) Volatile Organics Sampling: eight discrete samples must be collected over the 24 hour day using 40 ml VOC vials with Teflon septa. During sampling, the flow from the discharge will be controlled to produce smooth laminar flow to prevent agitation and aeration of the sample. The VOC vials will be filled to the top such that there is a meniscus present. There must be no visible air space or air bubbles in the VOC vials when capped. A single analysis for volatile pollutants may be run for each monitoring day by compositing equal volumes of the individual discrete VOC vials (at the analytical laboratory using extreme care not to introduce air/air bubbles) directly into the GC purge and trap apparatus, with no less than 1 ml of each grab included in the composite. The composite sample must be analyzed immediately.

(iv) GC/MS Analysis: In addition to analyzing for pollutants specified in the previous paragraph, the permittee must make a reasonable attempt using GC/MS analytical techniques to identify and quantify the ten most abundant constituents of each effluent extract (excluding toxic organic pollutants and unsubstituted aliphatic compounds) shown to be present by peaks on the total ion plots (reconstructed gas chromatograms). Identification must be attempted through the use of the USEPA/NIH computerized library of mass spectra, with visual confirmation by an experienced analyst. Quantification may be an order-of-magnitude estimate based upon comparison with an internal standard. The permittee must report the results of the GC/MS analysis in the pretreatment annual report required by Part II.A.9 of this permit.

(v) Sample Handling: All samples must be prepared, preserved, shipped, and analyzed in accordance with the QAP and Part III.C of this permit, Monitoring Procedures.

9. Pretreatment Report

a) The permittee must submit an annual report pursuant to 40 CFR 403.12(i) that describes the permittee's program activities over the October through September report year. This report must be submitted to the following address no later than November 1st of each year:

Pretreatment Coordinator
U.S. Environmental Protection Agency
Region 10, OWW-191
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

b) The pretreatment report must be compiled following the Region 10 Annual Report Guidance. At a minimum, the report must include:

(i) An updated non-domestic user inventory, including those facilities that are no longer discharging (with explanation), and new dischargers, appropriately categorized and characterized. Categorical users should

have the applicable category noted as well as cases where more stringent local limits apply instead of the categorical standard.

(ii) Results of wastewater and sludge sampling at the POTW as specified in Part II.A.8 (above).

(iii) Calculations of removal rates for each pollutant for each day of sampling.

(iv) An analysis and discussion of whether the existing local limitations in the permittee's sewer use ordinance continue to be appropriate to prevent treatment plant interference and pass through of pollutants that could affect water quality or sludge quality. This should include a comparison between influent loadings and the most recent relevant maximum allowable headworks loadings calculated for the treatment plant.

(v) Status of program implementation, including:

(a) Any planned modifications to the pretreatment program that have been approved by EPA, including staffing and funding updates.

(b) A description of any interference, upset, or NPDES permit violations experienced at the POTW which were directly or indirectly attributable to non-domestic users, including:

(i) Date & time of the incident

(ii) Description of the effect on the POTW's operation

(iii) Effects on the POTW's effluent and biosolids quality

(iv) Identification of suspected or known sources of the discharge causing the upset

(v) Steps taken to remedy the situation and to prevent recurrence

(c) Listing of non-domestic users inspected and/or monitored during the report year with dates and an indication compliance status.

(d) Listing of non-domestic users planned for inspection and/or monitoring for the coming year along with associated frequencies.

(e) Listing of non-domestic users whose permits have been issued, reissued, or modified during the report year along with current permit expiration dates.

(f) Listing of non-domestic users notified of promulgated pretreatment standards and/or local standards during the report year as required in 40 CFR 403.8(f)(2)(iii).

(g) Listing of non-domestic users notified of promulgated pretreatment standards or applicable local standards who are on compliance schedules. The listing must include the final date of compliance for each facility.

(vi) Status of enforcement activities including:

(a) Listing of non-domestic users who failed to comply with applicable pretreatment standards and requirements, including:

(i) Summary of the violation(s).

(ii) Enforcement action taken or planned by the permittee.

(iii) Present compliance status as of the date of preparation of the pretreatment report.

(b) Listing of those users in significant noncompliance during the report year as defined in 40 CFR 403.8(f)(2)(viii) and a copy of the newspaper publication of those users' names.

(c) EPA may require more frequent reporting on those users who are determined to be in significant noncompliance.

B. Operation and Maintenance Plan

In addition to the requirements specified in Section IV.E. of this permit (Proper Operation and Maintenance), by January 31, 2017, the permittee must provide written notice to EPA and IDEQ that an operations and maintenance plan for the current wastewater treatment facility has been developed and implemented by January 31, 2017. The plan shall be retained on site and made available on request to EPA and IDEQ. Any changes occurring in the operation of the plant shall be reflected within the Operation and Maintenance plan.

C. Quality Assurance Plan (QAP)

The permittee must develop a quality assurance plan (QAP) for all monitoring required by this permit. The permittee must submit written notice to EPA and IDEQ that the Plan has been developed and implemented by January 31, 2017. Any existing QAPs may be modified for compliance with this section.

1. The QAP must be designed to assist in planning for the collection and analysis of effluent and receiving water samples in support of the permit and in explaining data anomalies when they occur.
2. Throughout all sample collection and analysis activities, the permittee must use the EPA-approved QA/QC and chain-of-custody procedures described in *EPA Requirements for Quality Assurance Project Plans* (EPA/QA/R-5) and *Guidance for Quality Assurance Project Plans* (EPA/QA/G-5). The QAP must be prepared in the format that is specified in these documents.
3. At a minimum, the QAP must include the following:

a) Details on the number of samples, type of sample containers, preservation of samples, holding times, analytical methods, analytical detection and quantitation limits for each target compound, type and number of quality assurance field samples, precision and accuracy requirements, sample preparation requirements, sample shipping methods, and laboratory data delivery requirements.

b) Map(s) indicating the location of each sampling point.

c) Qualification and training of personnel.

d) Name(s), address(es) and telephone number(s) of the laboratories used by or proposed to be used by the permittee.

4. The permittee must amend the QAP whenever there is a modification in sample collection, sample analysis, or other procedure addressed by the QAP.

5. Copies of the QAP must be kept on site and made available to EPA and/or IDEQ upon request.

D. Emergency Response and Public Notification Plan

1. The permittee must develop and implement an overflow emergency response and public notification plan that identifies measures to protect public health from overflows that may endanger health and unanticipated bypasses or upsets that exceed any effluent limitation in the permit. At a minimum the plan must include mechanisms to:

a) Ensure that the permittee is aware (to the greatest extent possible) of all overflows from portions of the collection system over which the permittee has ownership or operational control and unanticipated bypass or upset that exceed any effluent limitation in the permit;

b) Ensure appropriate responses including assurance that reports of an overflow or of an unanticipated bypass or upset that exceed any effluent limitation in the permit are immediately dispatched to appropriate personnel for investigation and response;

c) Ensure immediate notification to the public, health agencies, and other affected public entities (including public water systems). The overflow response plan must identify the public health and other officials who will receive immediate notification;

d) Ensure that appropriate personnel are aware of and follow the plan and are appropriately trained; and

e) Provide emergency operations.

2. The permittee must submit written notice to EPA and IDEQ that the plan has been developed and implemented by April 30, 2017. Any existing emergency response and public notification plan may be modified for compliance with this section.

III. Monitoring, Recording and Reporting Requirements

A. Representative Sampling (Routine and Non-Routine Discharges)

Samples and measurements must be representative of the volume and nature of the monitored discharge.

In order to ensure that the effluent limits set forth in this permit are not violated at times other than when routine samples are taken, the permittee must collect additional

samples at the appropriate outfall whenever any discharge occurs that may reasonably be expected to cause or contribute to a violation that is unlikely to be detected by a routine sample. The permittee must analyze the additional samples for those parameters limited in Part I.B. of this permit that are likely to be affected by the discharge.

The permittee must collect such additional samples as soon as the spill, discharge, or bypassed effluent reaches the outfall. The samples must be analyzed in accordance with paragraph III.C ("Monitoring Procedures"). The permittee must report all additional monitoring in accordance with paragraph III.D ("Additional Monitoring by Permittee").

B. Reporting of Monitoring Results

1. Electronic Copy Submissions

   a) The Permittee must submit all monitoring data and other reports electronically using NetDMR. Monitoring data must be submitted electronically to EPA no later than the 20th of the month following the completed reporting period. All reports required under this Permit must be submitted to EPA as a legible electronic attachment to the DMR. The Permittee must sign and certify all DMRs, and all other reports, in accordance with the requirements of Part V.E. of this Permit ("Signatory Requirements"). Once a Permittee begins submitting reports using NetDMR, it will no longer be required to submit paper copies of DMRs or other reports to EPA and IDEQ. NetDMR is accessed from http://www.epa.gov/netdmr.

   b) The Permittee must submit via NetDMR as electronic attachments to each DMR the results of individual analyses of effluent monitoring for the following parameters: total residual chlorine, temperature, total ammonia as N, total phosphorus as P, E. coli, and dissolved oxygen.

      (i) The data must include one result per row. The data must include the following columns: Parameter, date of sample collection, result value, analytical method, detection or quantification level, and remarks. The "remarks" column must be used to list relevant QA/QC information, if any, for each result.

      (ii) The electronic attachment must be in a format that can be opened by the Microsoft Excel 2013 spreadsheet program.[1]

2. Website Notification

   a) Website notification must begin on or before the DMR for the month of April 2017.

[1] Acceptable file formats include but are not limited to Microsoft Excel (filename extensions xls, xlw, xlsb, xlsm, or xlsx), OpenDocument Spreadsheet (filename extension ods), Extensible Markup Language (filename extension xml), and comma separated value (filename extension csv).

b) Within seven days of the submission of the NetDMR report to EPA, the Permittee shall post all influent, effluent and receiving water data as reported on DMRs and explanatory materials on its publicly-accessible website.

(i) The data must be displayed in tables viewable directly in an internet browser or as Portable Document Format (filename extension pdf) files. If the data are displayed as Portable Document Format files, the website must include a hyperlink to a website where the public may download software to open and view such files free of charge.

(ii) The permittee must clearly identify any and all effluent limit violations in the data displayed on its publicly-accessible website.

(iii) The DMR data shall remain on the website for a period of no less than three years.

c) The Permittee must report on its publicly-accessible website any instance of noncompliance for which 24-hour telephone reporting is required by Part III.G of this permit by posting to its publicly-accessible website the written submission required in Part III.G.2 of this permit within 7 days of submitting such written submission to EPA.

C. Monitoring Procedures

Monitoring must be conducted according to test procedures approved under 40 CFR 136, unless another method is required under 40 CFR subchapters N or O, or other test procedures have been specified in this permit or approved by EPA as an alternate test procedure under 40 CFR 136.5.

D. Additional Monitoring by Permittee

If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR 136 or as specified in this permit, the permittee must include the results of this monitoring in the calculation and reporting of the data submitted in the DMR.

Upon request by EPA, the permittee must submit results of any other sampling, regardless of the test method used.

E. Records Contents

Records of monitoring information must include:

1. the date, exact place, and time of sampling or measurements;
2. the name(s) of the individual(s) who performed the sampling or measurements;
3. the date(s) analyses were performed;
4. the names of the individual(s) who performed the analyses;
5. the analytical techniques or methods used; and
6. the results of such analyses.

F. Retention of Records

The permittee must retain records of all monitoring information, including, all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, copies of DMRs, a copy of the NPDES permit, and records of all data used to complete the application for this permit, for a period of at least five years from the date of the sample, measurement, report or application. This period may be extended by request of EPA or IDEQ at any time.

G. Twenty-four Hour Notice of Noncompliance Reporting

1. The permittee must report the following occurrences of noncompliance by telephone within 24 hours from the time the permittee becomes aware of the circumstances:
   a) any noncompliance that may endanger health or the environment;
   b) any unanticipated bypass that exceeds any effluent limitation in the permit (See Part IV.F., "Bypass of Treatment Facilities");
   c) any upset that exceeds any effluent limitation in the permit (See Part IV.G., "Upset Conditions"); or
   d) any violation of a maximum daily discharge limitation for applicable pollutants identified by Part I.B.2.
   e) any overflow prior to the treatment works over which the permittee has ownership or has operational control. An overflow is any spill, release or diversion of municipal sewage including:
      (i) an overflow that results in a discharge to waters of the United States; and
      (ii) an overflow of wastewater, including a wastewater backup into a building (other than a backup caused solely by a blockage or other malfunction in a privately owned sewer or building lateral) that does not reach waters of the United States.
2. The permittee must also provide a written submission within five days of the time that the permittee becomes aware of any event required to be reported under subpart 1 above. The written submission must contain:
   a) a description of the noncompliance and its cause;
   b) the period of noncompliance, including exact dates and times;
   c) the estimated time noncompliance is expected to continue if it has not been corrected; and
   d) steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
   e) if the noncompliance involves an overflow, the written submission must contain:

(i) The location of the overflow;

(ii) The receiving water (if there is one);

(iii) An estimate of the volume of the overflow;

(iv) A description of the sewer system component from which the release occurred (e.g., manhole, constructed overflow pipe, crack in pipe);

(v) The estimated date and time when the overflow began and stopped or will be stopped;

(vi) The cause or suspected cause of the overflow;

(vii) Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;

(viii) An estimate of the number of persons who came into contact with wastewater from the overflow; and

(ix) Steps taken or planned to mitigate the impact(s) of the overflow and a schedule of major milestones for those steps.

3. The Director of the Office of Compliance and Enforcement may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the NPDES Compliance Hotline in Seattle, Washington, by telephone, (206) 553-1846.

4. Reports must be submitted to the addresses in Part III.B ("Reporting of Monitoring Results").

H. Other Noncompliance Reporting

The permittee must report all instances of noncompliance, not required to be reported within 24 hours, at the time that monitoring reports for Part III.B ("Reporting of Monitoring Results") are submitted. The reports must contain the information listed in Part III.G.2 of this permit ("Twenty-four Hour Notice of Noncompliance Reporting").

I. Public Notification

The permittee must immediately notify the public, health agencies and other affected entities (e.g., public water systems) of any overflow which the permittee owns or has operational control; or any unanticipated bypass or upset that exceeds any effluent limitation in the permit in accordance with the notification procedures developed in accordance with Part II.D.

J. Notice of New Introduction of Toxic Pollutants

The permittee must notify the Director of the Office of Water and Watersheds and IDEQ in writing of:

1. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to Sections 301 or 306 of the Act if it were directly discharging those pollutants; and

2. Any substantial change in the volume or character of pollutants being introduced into the POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
3. For the purposes of this section, adequate notice must include information on:
   a) The quality and quantity of effluent to be introduced into the POTW, and
   b) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.
4. The permittee must notify the Director of the Office of Water and Watersheds at the following address:

   US EPA Region 10
   Attn: NPDES Permits Unit Manager
   1200 Sixth Avenue, Suite 900
   OWW-191
   Seattle, WA 98101-3140

K. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.

IV. Compliance Responsibilities

A. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification, or for denial of a permit renewal application.

B. Penalties for Violations of Permit Conditions

1. Civil and Administrative Penalties. Pursuant to 40 CFR Part 19 and the Act, any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $37,500 per day for each violation).
2. Administrative Penalties. Any person may be assessed an administrative penalty by the Administrator for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Pursuant to 40 CFR 19 and the Act, administrative penalties for Class I violations are not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act and the Federal Civil

Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $16,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $37,500). Pursuant to 40 CFR 19 and the Act, penalties for Class II violations are not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $16,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $187,500).

3. Criminal Penalties:

   a) Negligent Violations. The Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both.

   b) Knowing Violations. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

   c) Knowing Endangerment. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the Act, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.

   d) False Statements. The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be

punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. The Act further provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

C. Need To Halt or Reduce Activity not a Defense

It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this permit.

D. Duty to Mitigate

The permittee must take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper Operation and Maintenance

The permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by the permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

F. Bypass of Treatment Facilities

1. Bypass not exceeding limitations. The permittee may allow any bypass to occur that does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2 and 3 of this Part.
2. Notice.
   a) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it must submit prior written notice, if possible at least 10 days before the date of the bypass.
   b) Unanticipated bypass. The permittee must submit notice of an unanticipated bypass as required under Part III.G ("Twenty-four Hour Notice of Noncompliance Reporting").

3. Prohibition of bypass.

   a) Bypass is prohibited, and the Director of the Office of Compliance and Enforcement may take enforcement action against the permittee for a bypass, unless:

      (i) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

      (ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance; and

      (iii) The permittee submitted notices as required under paragraph 2 of this Part.

   b) The Director of the Office of Compliance and Enforcement may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph 3.a. of this Part.

G. Upset Conditions

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the permittee meets the requirements of paragraph 2 of this Part. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

2. Conditions necessary for a demonstration of upset. To establish the affirmative defense of upset, the permittee must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

   a) An upset occurred and that the permittee can identify the cause(s) of the upset;

   b) The permitted facility was at the time being properly operated;

   c) The permittee submitted notice of the upset as required under Part III.G, "Twenty-four Hour Notice of Noncompliance Reporting;" and

   d) The permittee complied with any remedial measures required under Part IV.D, "Duty to Mitigate."

3. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

H. Toxic Pollutants

The permittee must comply with effluent standards or prohibitions established under Section 307(a) of the Act for toxic pollutants and with standards for sewage sludge

use or disposal established under section 405(d) of the Act within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

I. Planned Changes

The permittee must give written notice to the Director of the Office of Water and Watersheds as specified in Part III.J.4 and IDEQ as soon as possible of any planned physical alterations or additions to the permitted facility whenever:

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source as determined in 40 CFR 122.29(b); or
2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in this permit.
3. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application site.

J. Anticipated Noncompliance

The permittee must give written advance notice to the Director of the Office of Compliance and Enforcement and IDEQ of any planned changes in the permitted facility or activity that may result in noncompliance with this permit.

K. Reopener

This permit may be reopened to include any applicable standard for sewage sludge use or disposal promulgated under section 405(d) of the Act. The Director may modify or revoke and reissue the permit if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or controls a pollutant or practice not limited in the permit.

V. General Provisions

A. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR 122.62, 122.64, or 124.5. The filing of a request by the permittee for a permit modification, revocation and reissuance, termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

B. Duty to Reapply

If the permittee intends to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. In accordance with 40 CFR 122.21(d), and unless permission for the application to be

submitted at a later date has been granted by the Regional Administrator, the permittee must submit a new application by May 4, 2021.

C. Duty to Provide Information

The permittee must furnish to EPA and IDEQ, within the time specified in the request, any information that EPA or IDEQ may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee must also furnish to EPA or IDEQ, upon request, copies of records required to be kept by this permit.

D. Other Information

When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or that it submitted incorrect information in a permit application or any report to EPA or IDEQ, it must promptly submit the omitted facts or corrected information in writing.

E. Signatory Requirements

All applications, reports or information submitted to EPA and IDEQ must be signed and certified as follows.

1. All permit applications must be signed as follows:
   a) For a corporation: by a responsible corporate officer.
   b) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.
   c) For a municipality, state, federal, Indian tribe, or other public agency: by either a principal executive officer or ranking elected official.
2. All reports required by the permit and other information requested by EPA or IDEQ must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
   a) The authorization is made in writing by a person described above;
   b) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company; and
   c) The written authorization is submitted to the Director of the Office of Compliance and Enforcement and IDEQ.
3. Changes to authorization. If an authorization under Part V.E.2 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part V.E.2 must be submitted to the Director of the Office of Compliance and

Enforcement and IDEQ prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this Part must make the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

F. Availability of Reports

In accordance with 40 CFR 2, information submitted to EPA pursuant to this permit may be claimed as confidential by the permittee. In accordance with the Act, permit applications, permits and effluent data are not considered confidential. Any confidentiality claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice to the permittee. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR 2, Subpart B (Public Information) and 41 Fed. Reg. 36902 through 36924 (September 1, 1976), as amended.

G. Inspection and Entry

The permittee must allow the Director of the Office of Compliance and Enforcement, EPA Region 10; IDEQ; or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

H. Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to persons or property or invasion of other private rights, nor any infringement of federal, tribal, state or local laws or regulations.

I. Transfers

This permit is not transferable to any person except after written notice to the Director of the Office of Water and Watersheds as specified in Part III.J.4. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Act. (See 40 CFR 122.61; in some cases, modification or revocation and reissuance is mandatory).

J. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Act.

VI. Definitions

1. "Act" means the Clean Water Act.
2. "Administrator" means the Administrator of the EPA, or an authorized representative.
3. "Average monthly discharge limitation" means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.
4. "Average weekly discharge limitation" means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.
5. "Best Management Practices" (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage areas.
6. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.
7. "Composite" - see "24-hour composite".
8. "Daily discharge" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for

purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

9. "Director of the Office of Compliance and Enforcement" means the Director of the Office of Compliance and Enforcement, EPA Region 10, or an authorized representative.
10. "Director of the Office of Water and Watersheds" means the Director of the Office of Water and Watersheds, EPA Region 10, or an authorized representative.
11. "DMR" means discharge monitoring report.
12. "EPA" means the United States Environmental Protection Agency.
13. "Geometric Mean" means the n^{th} root of a product of n factors, or the antilogarithm of the arithmetic mean of the logarithms of the individual sample values.
14. "Grab" sample is an individual sample collected over a period of time not exceeding 15 minutes.
15. "IDEQ" means the Idaho Department of Environmental Quality.
16. "Indirect Discharge" means the introduction of pollutants into a POTW from any non-domestic source regulated under section 307(b), (c) or (d) of the Act.
17. "Inhibition concentration", IC, is a point estimate of the toxicant concentration that causes a given percent reduction (p) in a non-quantal biological measurement (e.g., reproduction or growth) calculated from a continuous model (e.g., Interpolation Method).
18. "Interference" is defined in 40 CFR 403.3.
19. "Maximum daily discharge limitation" means the highest allowable "daily discharge."
20. "Method Detection Limit (MDL)" means the minimum concentration of a substance (analyte) that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.
21. "Minimum Level (ML)" means either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL). Minimum levels may be obtained in several ways: They may be published in a method; they may be sample concentrations equivalent to the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a lab, by a factor.

22. "NPDES" means National Pollutant Discharge Elimination System, the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits . . . under sections 307, 402, 318, and 405 of the CWA.
23. "Pass Through" means a Discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).
24. "QA/QC" means quality assurance/quality control.
25. "Regional Administrator" means the Regional Administrator of Region 10 of the EPA, or the authorized representative of the Regional Administrator.
26. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
27. "Significant Industrial User" means all industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR chapter I, subchapter N; and any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream which makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority as defined in 40 CFR 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)). Upon a finding that an industrial user meeting above the criteria has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority (as defined in 40 CFR 403.12(a)) may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.
28. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
29. "24-hour composite" sample means a combination of at least 8 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24 hour period. The composite must be flow proportional; either the time interval between each aliquot or the volume of each aliquot must be

proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot. Aliquots may be collected manually or automatically. For GC/MS Volatile Organic Analysis (VOA), aliquots must be combined in the laboratory immediately before analysis. Four (4) (rather than eight) aliquots or grab samples should be collected for VOA. Only one analysis is required.

Appendix A
Minimum Levels

The tables below list the maximum Minimum Level (ML) for pollutants not subject to concentration effluent limits in the permit. The permittee may request different MLs. The request must be in writing and must be approved by EPA.

CONVENTIONAL PARAMETERS

Pollutant & CAS No. (if available)	Minimum Level (ML) µg/L unless specified
Biochemical Oxygen Demand	2 mg/L
Soluble Biochemical Oxygen Demand	2 mg/L
Chemical Oxygen Demand	10 mg/L
Total Organic Carbon	1 mg/L
Total Suspended Solids	5 mg/L
Total Ammonia (as N)	50
Dissolved oxygen	0.1 mg/L calibrated accuracy
Temperature	0.2° C calibrated accuracy
pH	N/A

NONCONVENTIONAL PARAMETERS

Pollutant & CAS No. (if available)	Minimum Level (ML) µg/L unless specified
Total Alkalinity	5 mg/L as CaCO3
Chlorine, Total Residual	Until 1 year after the effective date of the final permit: 100 After 1 year after the effective date of the final permit: 50.0
Color	10 color units
Fluoride (16984-48-8)	100
Nitrate + Nitrite Nitrogen (as N)	100
Nitrogen, Total Kjeldahl (as N)	300
Soluble Reactive Phosphorus (as P)	10
Phosphorus, Total (as P)	10
Oil and Grease (HEM) (Hexane Extractable Material)	5,000
Salinity	3 practical salinity units or scale (PSU or PSS)
Settleable Solids	500 (or 0.1 mL/L)
Sulfate (as mg/L SO4)	0.2 mg/L

Pollutant & CAS No. (if available)	Minimum Level (ML) µg/L unless specified
Sulfide (as mg/L S)	0.2 mg/L
Sulfite (as mg/L SO3)	2 mg/L
Total dissolved solids	20 mg/L
Total Hardness	2.0 mg/L as CaCO3
Aluminum, Total (7429-90-5)	10
Barium Total (7440-39-3)	2.0
BTEX (benzene +toluene + ethylbenzene + m, o, p xylenes)	2
Boron Total (7440-42-8)	10.0
Cobalt, Total (7440-48-4)	0.25
Iron, Total (7439-89-6)	50
Magnesium, Total (7439-95-4)	50
Molybdenum, Total (7439-98-7)	0.5
Manganese, Total (7439-96-5)	0.5
Tin, Total (7440-31-5)	1.5
Titanium, Total (7440-32-6)	2.5

PRIORITY POLLUTANTS

Pollutant & CAS No. (if available)	Minimum Level (ML) µg/L unless specified
METALS, CYANIDE & TOTAL PHENOLS	
Antimony, Total (7440-36-0)	1.0
Arsenic, Total (7440-38-2)	0.5
Beryllium, Total (7440-41-7)	0.5
Cadmium, Total (7440-43-9)	0.25
Chromium (hex) dissolved (18540-29-9)	1.2
Chromium, Total (7440-47-3)	1.0
Copper, Total (7440-50-8)	2.0
Lead, Total (7439-92-1)	0.5
Mercury, Total (7439-97-6)	0.0005
Nickel, Total (7440-02-0)	0.5
Selenium, Total (7782-49-2)	1.0
Silver, Total (7440-22-4)	0.2
Thallium, Total (7440-28-0)	0.36
Zinc, Total (7440-66-6)	2.5

Pollutant & CAS No. (if available)	Minimum Level (ML) µg/L unless specified
Cyanide, Total (57-12-5)	10
Cyanide, Weak Acid Dissociable	10
Cyanide, Free Amenable to Chlorination (Available Cyanide)	10
Phenols, Total	50
2-Chlorophenol (95-57-8)	9.9
2,4-Dichlorophenol (120-83-2)	8.1
2,4-Dimethylphenol (105-67-9)	8.1
4,6-dinitro-o-cresol (534-52-1) (2-methyl-4,6,-dinitrophenol)	2.0
2,4 dinitrophenol (51-28-5)	2.0
2-Nitrophenol (88-75-5)	10.8
4-nitrophenol (100-02-7)	7.2
Parachlorometa cresol (59-50-7) (4-chloro-3-methylphenol)	9.0
Pentachlorophenol (87-86-5)	1.0
Phenol (108-95-2)	4.5
2,4,6-Trichlorophenol (88-06-2)	4.0
VOLATILE COMPOUNDS	
Acrolein (107-02-8)	10
Acrylonitrile (107-13-1)	2.0
Benzene (71-43-2)	2.0
Bromoform (75-25-2)	2.0
Carbon tetrachloride (56-23-5)	2.0
Chlorobenzene (108-90-7)	18
Chloroethane (75-00-3)	2.0
2-Chloroethylvinyl Ether (110-75-8)	2.0
Chloroform (67-66-3)	4.8
Dibromochloromethane (124-48-1)	2.0
1,2-Dichlorobenzene (95-50-1)	7.6
1,3-Dichlorobenzene (541-73-1)	7.6
1,4-Dichlorobenzene (106-46-7)	17.6
Dichlorobromomethane (75-27-4)	2.0
1,1-Dichloroethane (75-34-3)	2.0
1,2-Dichloroethane (107-06-2)	2.0

Pollutant & CAS No. (if available)	Minimum Level (ML) µg/L unless specified
1,1-Dichloroethylene (75-35-4)	2.0
1,2-Dichloropropane (78-87-5)	2.0
1,3-dichloropropene (mixed isomers) (1,2-dichloropropylene) (542-75-6) 6	2.0
Ethylbenzene (100-41-4)	21.6
Methyl bromide (74-83-9) (Bromomethane)	10.0
Methyl chloride (74-87-3) (Chloromethane)	2.0
Methylene chloride (75-09-2)	10.0
1,1,2,2-Tetrachloroethane (79-34-5)	2.0
Tetrachloroethylene (127-18-4)	12.3
Toluene (108-88-3)	18
1,2-Trans-Dichloroethylene (156-60-5) (Ethylene dichloride)	4.8
1,1,1-Trichloroethane (71-55-6)	11.4
1,1,2-Trichloroethane (79-00-5)	2.0
Trichloroethylene (79-01-6)	2.0
Vinyl chloride (75-01-4)	2.0
BASE/NEUTRAL COMPOUNDS	
Acenaphthene (83-32-9)	5.7
Acenaphthylene (208-96-8)	10.5
Anthracene (120-12-7)	5.7
Benzidine (92-87-5)	24
Benzyl butyl phthalate (85-68-7)	0.6
Benzo(a)anthracene (56-55-3)	0.6
Benzo(b)fluoranthene (3,4-benzofluoranthene) (205-99-2) 7	1.6
Benzo(j)fluoranthene (205-82-3) 7	1.0
Benzo(k)fluoranthene (11,12-benzofluoranthene) (207-08-9) 7	1.6
Benzo(r,s,t)pentaphene (189-55-9)	1.0
Benzo(a)pyrene (50-32-8)	1.0
Benzo(ghi)Perylene (191-24-2)	12.3
Bis(2-chloroethoxy)methane (111-91-1)	21.2
Bis(2-chloroethyl)ether (111-44-4)	1.0
Bis(2-chloroisopropyl)ether (39638-32-9)	0.6

Pollutant & CAS No. (if available)	Minimum Level (ML) µg/L unless specified
Bis(2-ethylhexyl)phthalate (117-81-7)	0.5
4-Bromophenyl phenyl ether (101-55-3)	5.7
2-Chloronaphthalene (91-58-7)	5.7
4-Chlorophenyl phenyl ether (7005-72-3)	12.6
Chrysene (218-01-9)	0.6
Dibenzo (a,h)acridine (226-36-8)	10.0
Dibenzo (a,j)acridine (224-42-0)	10.0
Dibenzo(a-h)anthracene (53-70-3)(1,2,5,6-dibenzanthracene)	1.6
Dibenzo(a,e)pyrene (192-65-4)	10.0
Dibenzo(a,h)pyrene (189-64-0)	10.0
3,3-Dichlorobenzidine (91-94-1)	1.0
Diethyl phthalate (84-66-2)	7.6
Dimethyl phthalate (131-11-3)	6.4
Di-n-butyl phthalate (84-74-2)	7.5
2,4-dinitrotoluene (121-14-2)	0.4
2,6-dinitrotoluene (606-20-2)	5.7
Di-n-octyl phthalate (117-84-0)	7.5
1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)	20
Fluoranthene (206-44-0)	0.6
Fluorene (86-73-7)	5.7
Hexachlorobenzene (118-74-1)	0.6
Hexachlorobutadiene (87-68-3)	1.0
Hexachlorocyclopentadiene (77-47-4)	1.0
Hexachloroethane (67-72-1)	1.0
Indeno(1,2,3-cd)Pyrene(193-39-5)	1.0
Isophorone (78-59-1)	6.6
3-Methyl cholanthrene (56-49-5)	8.0
Naphthalene (91-20-3)	4.8
Nitrobenzene (98-95-3)	5.7
N-Nitrosodimethylamine (62-75-9)	4.0
N-Nitrosodi-n-propylamine (621-64-7)	1.0
N-Nitrosodiphenylamine (86-30-6)	1.0
Perylene (198-55-0)	7.6
Phenanthrene (85-01-8)	16.2

Pollutant & CAS No. (if available)	Minimum Level (ML) µg/L unless specified
Pyrene (129-00-0)	5.7
1,2,4-Trichlorobenzene (120-82-1)	0.6
DIOXIN	
2,3,7,8-Tetra-Chlorodibenzo-P-Dioxin (176-40-16) (2,3,7,8 TCDD)	5 pg/L
PESTICIDES/PCBs	
Aldrin (309-00-2)	0.05
alpha-BHC (319-84-6)	0.05
beta-BHC (319-85-7)	0.05
gamma-BHC (58-89-9)	0.05
delta-BHC (319-86-8)	0.05
Chlordane (57-74-9)	0.05
4,4'-DDT (50-29-3)	0.05
4,4'-DDE (72-55-9)	0.05
4,4' DDD (72-54-8)	0.05
Dieldrin (60-57-1)	0.05
alpha-Endosulfan (959-98-8)	0.05
beta-Endosulfan (33213-65-9)	0.05
Endosulfan Sulfate (1031-07-8)	0.05
Endrin (72-20-8)	0.05
Endrin Aldehyde (7421-93-4)	0.05
Heptachlor (76-44-8)	0.05
Heptachlor Epoxide (1024-57-3)	0.05
PCB-1242 (53469-21-9)	0.5
PCB-1254 (11097-69-1)	0.5
PCB-1221 (11104-28-2)	0.5
PCB-1232 (11141-16-5)	0.5
PCB-1248 (12672-29-6)	0.5
PCB-1260 (11096-82-5)	0.5
PCB-1016 (12674-11-2)	0.5
Toxaphene (8001-35-2)	0.5

U.S. ENVIRONMENTAL PROTECTION AGENCY

Response to Comments on the Draft NPDES Permit for the City of Nampa

Permit No. ID0022063

September 2016

Overview

The EPA issued a draft National Pollutant Discharge Elimination System (NPDES) permit for the City of Nampa for public review and comment on July 23, 2015. The public comment period was scheduled to close on September 21, 2015, but was extended to October 21, 2015. The EPA received comments from the Idaho Conservation League (ICL), the City of Nampa (Nampa), the City of Boise (Boise), and Idaho Rivers United (IRU) during the public comment period.

Comments Received During the Public Comment Period

Comment #1 (ICL and IRU)

ICL stated there should be no seasonal variation in limits for copper, cyanide or mercury. ICL stated that the seasonal variations in effluent limits for these pollutants appear to be based on the seasonal variations in low flow scenarios in the receiving waters. ICL stated that since reducing the amount of these pollutants in the WWTP discharge is not a function of altered WWTP operations or upgrades – but rather influent reductions – there should be no seasonal variation in facility discharges of these pollutants. And, there should be no seasonal variations in metals and cyanide inflow.

In its comments on the draft NPDES permit for the City of Nampa, IRU stated that there is no acceptable justification for allowing a higher discharge of mercury, cyanide and copper in December, January and February.

Response #1

As stated by ICL in its comments, seasonal differences in water quality-based effluent limits in the draft permits for copper, cyanide and mercury are due, in part, to the fact that the EPA has calculated seasonal values for the critical low flows in the receiving waters.

In addition, water quality criteria for copper are dependent upon hardness, and seasonal changes in hardness were also considered in the calculation of effluent limits for these parameters. As discussed in Section 4.3.3.1 of the draft *Idaho Mixing Zone Implementation Guidance* (IDEQ 2015), establishing effluent limits for metals based on year-round critical conditions for both hardness and stream flow, without regard to seasonal variation, could result in effluent limits that are more stringent than necessary, because minimum hardness and minimum stream flow may not occur simultaneously. For example, as stated on Page B-2 of the fact sheet, there is a significant difference in the hardness in Indian Creek during April – October relative to November - March. Thus, it is reasonable for the EPA to consider seasonal variation in receiving water flow and hardness when calculating such limits.

The EPA does not have the information necessary to determine if there are seasonal variations in the influent concentrations or loads of metals or cyanide, however, such variations are possible. For example, influent loading of these parameters could vary because of inflow and infiltration during wet weather, or because of seasonal changes in loading from industrial users of the treatment plant.

The means of achieving compliance with a water quality-based effluent limit (i.e., influent reductions, improved treatment, or some combination of these) is irrelevant to the calculation of such limits. Water quality-based effluent limits are calculated based on the water quality criteria (which vary seasonally for copper, in response to seasonal changes in hardness) and the dilution afforded by the mixing zones

authorized by the State of Idaho (which varies seasonally in response to changes in stream flow). They are not based on the feasibility of treatment or other means of achieving compliance.

Effluent limits for each season were calculated based on seasonal critical conditions for discharge and receiving water flow, and, where applicable, hardness. The effluent limits will therefore ensure compliance with water quality standards for these pollutants at all times.

Comment #2 (ICL and IRU)

ICL has expressed support for the Lower Boise River TMDL: 2015 Total Phosphorus Addendum's conclusion to develop waste load allocations consistent with effluent concentrations of 0.1 mg/l in the May 1 – September 30 period and 0.35 mg/L in the October 1 – April 30 time period.

ICL stated their understanding that the maximum amount of TP that can be discharged by the WWTPs would be the appropriate seasonal concentration target (i.e., either 0.1 mg/l in the May 1 – September 30 period and 0.35 mg/L in the October 1 – April 30 time period) applied to the facility's design flow. For Nampa, this would result in a maximum discharges as follows, expressed as monthly averages: 15 lb/day TP during May 1 – September 30 and 52.6 lb/day during the October 1 – April 30 period.

ICL stated that the TMDL developed concentration based waste load allocations. Thus, the TP effluent limits in the permits need to be based on a combination of effluent concentration and discharge volume. It is not appropriate to only articulate the limits in terms of lb/day loading. Rather, the limits need to be expressed such that the discharges do not exceed a concentration of either 0.1 mg/l in the May 1 – September 30 period or 0.35 mg/L in the October 1 – April 30 time period and also does not exceed a total load discharge equivalent to those concentrations at the facilities' design flows.

ICL stated that, to be consistent with the TMDL, the concentration limits cannot be exceeded. This is the case even if the total loading is less than the values listed above.

ICL stated that, when the WWTPs discharge at flows less than their design flows, the difference between the design and actual effluent flows results in a diminished capacity for the Boise River to assimilate and/or dilute phosphorus. In order to keep this reduced dilution capacity from impairing TMDL compliance, the final effluent limits for the WWTPs must contain a concentration based limit.

During periods of lesser discharge flow from the facilities (i.e. less than the design flows) total loading has to be kept in check by requirements to not exceed the concentration of either 0.1 mg/l in the May 1 – September 30 period or 0.35 mg/L in the October 1 – April 30 time period.

See the NPDES permit for the City of Boise's West WWTP ID0023981 for an example of permit limits that are expressed as both a concentration and a load.

IRU stated that the Snake River and Boise TMDLs were developed based on concentrations of TP (0.01 mg/L and 0.35 mg/L seasonally) not on average monthly and average weekly limits of pounds per day. These plants are not operating at their design capacities and shouldn't be allowed to discharge the load for the design capacity. EPA should amend the permit to express total phosphorus limits in concentrations and load. To be consistent with the TMDL, the concentration limits cannot be exceeded. This is the case even if the total loading is less than the wasteload allocations. Also, EPA requires that effluent be monitored and reported in concentrations. Citizens must be able to check compliance with the permit monthly reports made to EPA.

Response #2

Federal regulations state that NPDES permits shall include effluent limitations that "are consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA pursuant to 40 CFR 130.7." The reference to 40 CFR 130.7 refers to the EPA's approval of TMDLs developed by States.

Federal regulations also state that, in general, "all pollutants limited in permits shall have limitations, standards or prohibitions expressed in terms of mass," although "pollutants limited in terms of mass additionally *may* be limited in terms of other units of measurement..." (40 CFR 122.45(f), emphasis added). Thus, in general, mass limits are mandatory, and limits in terms of other units of measurement are discretionary.

In the case of total phosphorus (TP) for the subject permit, effluent limits in terms of mass are sufficient to ensure consistency with the wasteload allocations (WLAs) for this facility in the EPA-approved *Lower Boise River TMDL: 2015 Total Phosphorus Addendum* (LBR TMDL TP Addendum) (IDEQ 2015).

The LBR TMDL TP Addendum does not establish concentration-based WLAs. The TP WLAs for the City of Nampa are as follows:

- May 1 – September 30 (Table 27, Page 93): 15.0 lb/day
- October 1 – April 30 (Table 34, Page 109): Nampa: 52.6 lb/day

The caption for Table 27 (which lists the May – September WLAs) reads, "Point source wasteload allocations for the lower Boise River, May 1–September 30. Wasteload allocations at TP concentrations of 0.1 mg/L are presented per day as monthly averages. DEQ intends that wasteload allocations are to be expressed as average monthly limits." The column heading for the October 1 – April 30 WLAs in Table 34 reads "Oct–Apr Average TP Allocation (lb/day as a monthly average) at TP Conc. = 0.35 mg/L."

Although the caption in Table 27 and the column heading in Table 34 state concentration values, the allocations themselves are listed in the tables exclusively as mass loading rates, in units of pounds per day. This is clear from the parenthetical in the column headings for the WLAs in Tables 27 and 34, which reads, "lb/day as a monthly average."

The EPA's interpretation of the LBR TMDL TP Addendum is that the concentrations are provided to explain how the mass wasteload allocations were calculated, i.e., the allocations were calculated "at" certain concentrations, and at the design flows of the point sources. Multiplying the concentrations by the design flows and the density of water yields the mass wasteload allocations in units of pounds per day.

These concentrations were also used, in combination with the design flows, to represent the point source discharges in the AQUATOX model (see the LBR TMDL TP Addendum at Section 5.4.3 and Appendix D). Because the design flows were used in the modeling, the entire loading allocated to the point sources by the mass WLAs was simulated in the modeling supporting the TMDL, and the establishment of a mass limit equal to the WLA is therefore consistent with the assumptions and requirements of these WLAs.

ICL stated that "when the WWTPs discharge at flows less than their design flows, the difference between the design and actual effluent flows results in a diminished capacity for the Boise River to

assimilate and/or dilute phosphorus." While the effluent flow rates of the subject POTWs influence the flows (and therefore the loading capacity) in the Boise River and its tributaries, the TMDL used appropriate conservative assumptions to determine the assimilative capacity, including using the 90th percentile low flow in the Boise River. Using a low flow rate for the river takes into account the variation in all of the factors that influence river flows, including variations in effluent flows from the subject POTWs. Thus, the Boise River's loading capacity for total phosphorus, as calculated and allocated in the TMDL, is not dependent upon a certain level of discharge flow from the POTWs.

The City of Boise's NPDES West Boise Wastewater Treatment Facility permit (#ID0023981) referenced by ICL was issued prior to the State of Idaho's development and the EPA's approval of the LBR TMDL TP Addendum. Thus, the TP effluent limits in that permit were not based on the LBR TMDL TP Addendum. Rather, the TP effluent limits in the City of Boise permit were based directly upon the State of Idaho's narrative criterion for nutrients (IDAPA 58.01.02.200.06), consistent with 40 CFR 122.44(d)(1)(vi) (see the Fact Sheet for the West Boise Wastewater Treatment Facility at Pages C-21 – C-26). As such, it is not appropriate to compare the TP effluent limits in the West Boise Wastewater Treatment Facility permit to the TP limits in the Nampa permit.

The fact that the TP effluent limits are expressed in terms of mass does not prevent citizens from checking compliance with the permit monthly per reports made to EPA. The mass TP limits are enforceable and the actual mass of TP discharged must be reported each month. Effluent data reported to the EPA is publicly available through the Discharge Monitoring Report (DMR) Pollutant Loading Tool[1], Envirofacts[2], and Enforcement and Compliance History Online (ECHO)[3].

Comment #3 (IRU)

IRU does not support the proposed schedule of compliance for total phosphorus. EPA should not allow Nampa 9 years and 11 months to comply with the Total Phosphorus limits. That's longer than a full permit cycle. Nampa has had more than a decade to figure out how to decrease phosphorous discharge, something that has been accomplished in less than 10 years by WWTPs across the nation including some in the Treasure Valley. These permit limitations are no surprise to anyone, and there's no reason to give them 6 years to complete final design.

Response #3

The EPA has reviewed the schedule of compliance for new water quality-based effluent limits for phosphorus authorized by the Idaho Department of Environmental quality in its Clean Water Act Section 401 certification and has determined, consistent with 40 CFR 122.47(a)(1), that the schedule requires compliance as soon as possible.

Consistent with 40 CFR 122.47(a)(3), the compliance schedule includes interim requirements and the dates for their achievement. The interim requirements are substantial, including such actions as implementing biological phosphorus removal, upgrades to solids handling, implementing process, obtaining funding, planning, design, and construction. The EPA believes each of these interim steps are necessary to ultimately achieve the final water quality-based effluent limits for TP. The EPA also

[1] http://cfpub.epa.gov/dmr/
[2] http://www.epa.gov/enviro/pcs-icis-overview
[3] https://echo.epa.gov/

believes that the time intervals between these interim requirements, and, in turn, the total amount of time allowed to achieve compliance, are reasonable.

Comment #4 (Nampa)

Nampa requested that the average weekly effluent limits for total phosphorus limits be removed from their permit.

Response #4

Federal regulations require that, for POTWs that discharge continuously, "all permit effluent limitations, standards, and prohibitions, including those necessary to achieve water quality standards, shall unless impracticable be stated as...average weekly and average monthly discharge limitations" (40 CFR 122.45(d)).

Thus, in order to remove the average weekly effluent limits for total phosphorus from the permits, the EPA would need to make a finding that it is "impracticable" to state the effluent limits as average weekly and average monthly discharge limitations.

The LBR TMDL TP Addendum establishes TP WLAs that are monthly averages. The draft permits also propose average weekly limits that are derived from the average monthly WLAs. As explained in Appendix F to the fact sheet, because attainment of the proposed average monthly effluent limits for TP will require upgrades to the POTW, the historic effluent variability for TP may not be representative of future effluent variability. Instead of using the historic effluent variability for TP to calculate average weekly limits, the EPA made an assumption regarding the future, post-upgrade effluent TP variability (as quantified by the coefficient of variation or CV).

However, the EPA has determined that it is impracticable to state the TP effluent limits as average weekly limitations at this time, since, if the actual effluent variability is significantly different than the EPA's assumptions, then the average weekly limits will not be appropriate.

Because the future, post-upgrade effluent variability is unknown, it is impracticable for the EPA to properly calculate average weekly effluent limits for TP at this time. Thus, the EPA has deleted the proposed average weekly TP limits from the final permit. Since the WLAs are expressed as monthly averages, average monthly limits are adequate to ensure that the effluent limits are consistent with the assumptions and requirements of the TMDL's WLAs.

Comment #5 (Nampa)

Nampa requested in their comments that the EPA not include *Selenastrum capricornutum* in the screening for the most sensitive species in the whole effluent toxicity (WET) testing requirements.

Nampa stated that the whole effluent toxicity (WET) testing requirements list short-term tests using *Selenastrum capricornutum* (growth test). *Selenastrum capricornutum* is a green algae and is sensitive to low-level nutrients (i.e. reductions to permit levels for TP could cause impaired growth). The City's NPDES permit is being driven by a TMDL aimed at reducing algae in the Lower Boise River. Therefore, it seems somewhat counterintuitive that the WET testing could become problematic if other goals in the permit are achieved. The City believes that because two other indicator organisms used for WET testing (*Ceriodaphnia dubia* and *Pimephales promelas*) provide a sufficient assurance that the City's discharge will not impact aquatic species.

Response #5

The TSD states that, "to provide sufficient information for making permitting decisions, EPA recommends a minimum number of three species, representing three different phyla (e.g., a fish, an invertebrate, and a plant) be used to test an effluent for toxicity" (Section 1.3.4, Page 16).

The only plant for which there is a chronic whole effluent toxicity test approved by the EPA for nationwide use is EPA Method 1003.0, which is a growth test for the green alga *Selenastrum capricornutum* (40 CFR 136.3, Table IA). Thus, in order to ensure consistency with the TSD's recommendation to test a minimum of three species representing three different phyla, the EPA has required *Selenastrum capricornutum* to be included in the screening for the most sensitive species.

Regarding the City of Nampa's statement that "reductions to permit levels for TP could cause impaired growth" of algae in a toxicity test, it should be noted that, in the WET test method for *Selenastrum capricornutum*, nutrients including phosphorus are added to the effluent sample, so that all test treatments and controls will contain at a minimum the concentration of nutrients in the stock culture medium (see EPA Method 1003.0 at section 14.10.1.2.7). This will ensure that a false positive for effluent toxicity will not occur due to nutrient limitation.

Comment #6 (Boise, Nampa)

The City of Boise and City of Nampa stated that all of the analytes listed in Appendix A can have a method detection limit (MDL) but the ten (10) analytes listed below cannot have a minimum level (ML) as defined in the NPDES permits due to the required EPA method (e.g., titration) or reporting format (e.g., 7 day average) of the parameter.

- Biochemical Oxygen Demand
- Soluble Biochemical Oxygen
- Total Suspended Solids
- Dissolved Oxygen
- Temperature (max 7 day avg)
- Oil and Grease (HEM)
- Salinity
- Settleable Solids
- Total Dissolved Solids
- Total Hardness

ML values for 10 pollutants listed above should be listed as MDL or sensitivity of the instrument/detector for the parameter (e.g.+/- 0.2 C for temperature).

Response #6

The draft permit includes a definition of the term "minimum level" that is consistent with the definition in the glossary of the *U.S. EPA NPDES Permit Writers' Manual* (EPA 2010). However, in 2014, the EPA promulgated a revised definition of the term "minimum level" in the sufficiently sensitive methods final rule (79 FR 49001). The revised definition reads:

> *The term "minimum level" refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL). Minimum levels*

may be obtained in several ways: They may be published in a method; they may be sample concentrations equivalent to the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a lab, by a factor.

The EPA also explained in the sufficiently sensitive methods rule that the terms "quantitation limit," "reporting limit," and "level of quantitation" are synonymous with "minimum level" (79 FR 49001).

Since the revised definition allows for the minimum level to be obtained in several ways, including multiplying the MDL (as published in a method or determined by a lab) by a factor, then minimum levels can be determined for any analyte for which an MDL can be determined. Thus, minimum levels can, in fact, be determined for all of the analytes in Appendix A.

As explained in the response to comment #9, below, Appendix A specifies the required level of sensitivity for monitoring, which is independent and distinct from the statistics that are to be reported. The EPA has deleted the parenthetical "(max. 7-day avg.)" from the entry for temperature in Appendix A.

For dissolved oxygen and temperature, the EPA has edited appendix A to require a "calibrated accuracy," instead of a minimum level, consistent with the USGS *National Field Manual for the Collection of Water-Quality Data*, (USGS 2015). The *National Field Manual for the Collection of Water-Quality Data* states that thermistors should have a "calibrated accuracy within 0.1 °C to 0.2 °C" and amperometric and optical dissolved oxygen probes should have a "calibrated accuracy within ±0.1 mg/L DO" (USGS 2015). In the final permit, the EPA has specified that temperature measurements must have a calibrated accuracy within 0.2 °C and that dissolved oxygen probes must have a calibrated accuracy within 0.1 mg/L.

Comment #7 (Boise, Nampa)

The City of Boise and City of Nampa stated that the requirement to run a calibration point at the ML is consistent with the new and updated 600 series organic methods in the Proposed 2015 MUR to 40 CFR 136. However, these methods are not yet approved and it is extremely difficult finding a commercial laboratory capable of running the MUR method.

Response #7

As explained in the response to comment #6, above, under the revised definition of "minimum level" in the sufficiently sensitive methods final rule (79 FR 49001), which has been incorporated into the final permit, the ML need not be based on the lowest calibration standard. The final permit does not require running a calibration point at the ML.

Comment #8 (Boise, Nampa)

The minimum level requirements of "Attachment/Appendix A Minimum Levels" restrict the options of NPDES approved methods listed at 40 CFR Part 136: Table IB. The following methods could utilize calibration curves meeting the definition of a ML, however, the values listed are more appropriate for a MDL due to the low concentration specified. In addition, the ML requirement prevents the use of the most commonly used methods which are titrations or test kits that are analyzed on factory calibrated spectrophotometers.

- Chemical Oxygen Demand
- Total Alkalinity
- Chlorine, Total Residual

ML values in Table A for these parameters should be listed as MDLs.

Response #8

As explained in the response to comment #6, above, under the revised definition of "minimum level" in the sufficiently sensitive methods final rule (79 FR 49001), which has been incorporated into the final permit, the ML need not be based on a calibration curve.

The EPA believes the minimum levels specified in Appendix A for chemical oxygen demand, total alkalinity, and total residual chlorine, are achievable. See also the response to Comment #30.

Comment #9 (Boise, Nampa)

The City of Boise and City of Nampa stated that the minimum level requirement for a statistical average is inappropriate for "Temperature (max 7 day avg)" in the "Attachment/Appendix A: Minimum Levels." ML and MDL are related to instrument sensitivity for T (+/- 0.2 C) and is not applicable or appropriate for a 7 day average temperature. ML needs to be removed from Appendix A for maximum 7 day average temperature.

Response #9

The EPA agrees that the parenthetical "(max. 7-day avg.)" should be deleted from the listing for temperature in Appendix A. Appendix A specifies the required level of sensitivity for monitoring, which is independent and distinct from the statistics that are to be reported. The statistics that are to be reported for temperature are specified elsewhere in the permit. As explained in the response to comment #6, above, in the final permit, the EPA has specified that temperature measurements must have a calibrated accuracy within 0.2 °C.

Comment #10 (Boise, Nampa)

The City of Boise and City of Nampa stated that the minimum levels in Appendix A to the draft permits need to be adjusted, for several reasons.

EPA's proposed draft Methods Update Rule (MUR)[4] seeks to increase the MLs (and MDLs) for many of the parameters listed in Appendix A to reflect "real world" water quality and analytical conditions (e.g. matrices ranging from clean receiving waters to "dirty" receiving water) instead of ultra clean and unrealistic matrices (e.g. MLs for a pollutant in distilled water) used for development of the MLs contained in the draft permits.

The minimum level requirements of "Attachment/Appendix A Minimum levels" appear to be based on published MDLs in EPA methods. The ML values are determined by multiplying the published MDL by 3.18. These EPA methods used MDL calculation methodology are inconsistent with the "2015 Proposed Methods Update Rule (MUR)" (80 FR 8956).

[4] EPA Methods Update Rule-2015, webpage includes February 9, 2015 Federal Register Notice, Fact Sheet, and background materials; http://www2.epa.gov/cwa-methods/methods-update-rule-2015

The published MDLs for EPA methods need to be revised using EPA methods to be compliant with the draft MUR. Compliance with the new methods in MUR will increase MDLs for many methods. Since the basis for the values assigned in "Attachment/Appendix A Minimum Levels" are not consistent with 2015 MUR requirements, they create a significant liability for permittees and are inappropriate for use in NPDES permits.

The Proposed 2015 MUR also proposes significant changes in the organic EPA 600 series methods which require matrix specific MDLs. Commercial labs will need to determine MDLs in various wastewater matrices, which will increase MDLs and MLs.

If the GC/MS EPA methods 624 and EPA 625 for purgeables and base neutrals and acids, respectively, were used for the organics listed in Appendix A, confirmation of the analytes is not needed, however the ML values would need to be increased for this method to be available for a permittee to use.

The proposed new or updated organic EPA 600 series methods contained in the draft 2015 MUR allow blank subtraction in samples, which will have an impact on the ML and should be reflected in Appendix A.

Many of the issues in the Proposed 2015 MUR to 40 CFR 136 have been addressed by the National Environmental Laboratory Accreditation Conference (NELAC) Institute and directly impact organic methods, which are proposed to increase and should be the ML requirement contained in NPDES permits.

The MLs listed in the Proposed 2015 MUR to 40 CFR 136 for EPA methods 624 & 625 are 2-15 times higher than the levels listed in Appendix A.

Response #10

The MLs in the draft permits were not calculated by multiplying published MDLs by 3.18. Rather they were based on MLs required by the Washington State Department of Ecology in its NPDES permits, which were in turn based on a survey of laboratories conducted in 2008. Thus, the EPA believes that the MLs proposed in Appendix A are achievable. If the permittees cannot achieve the MLs in the final permit, the permittee may request different MLs.

However, for many pollutants, the MLs proposed in EPA Methods 608.3, 624.1 and 625.1 in the draft MUR are lower than the most-stringent water quality criterion in effect in Idaho, or the EPA-recommended Clean Water Act Section 304(a) water quality criteria. For other pollutants, the State of Idaho has not established a water quality criterion for the pollutant and the EPA has not established a 304(a) criterion. Methods with an ML at or below the applicable water quality criterion are considered "sufficiently sensitive" (79 FR 49013).

The EPA has therefore revised the MLs in Appendix A to the permits to be equal to the MLs published in the draft MUR, for the pollutants listed in Table 1, below. If the ML proposed in the draft permit was higher than that published in the draft MUR, but less than the most stringent Idaho water quality criterion, then the ML proposed in the draft permit was retained.

Table 1: Pollutants for which the Methods Update Rule (MUR) Minimum Level (ML) is less than Applicable Water Quality Criteria							
Pollutant	**CAS #**	**Draft Permits ML (µg/L)**	**Draft MUR ML (µg/L)**	**Most Stringent ID WQC (µg/L)**	**Most Stringent CWA WQC (µg/L)**	**Most Stringent WQC (µg/L)**	**Ratio of WQC to draft MUR ML**
1,1,1-Trichloroethane	71-55-6	2	11.4	11000	—	11000	**965**
1,1-Dichloroethane	75-34-3	2	0.047	—	—	N/A	**N/A**
1,2-Trans-Dichloroethylene (Ethylene dichloride)	156-60-5	2	4.8	120	—	120	**25.0**
2,4-Dichlorophenol	120-83-2	1	8.1	9.6	93	9.6	**1.19**
2,4-Dimethylphenol	105-67-9	1	8.1	110	—	110	**13.6**
2,6-dinitrotoluene	606-20-2	0.4	5.7	—	—	N/A	**N/A**
2-Chloronaphthalene	91-58-7	0.6	5.7	330	—	330	**57.9**
2-Chlorophenol	95-57-8	2	9.9	30	—	30	**3.03**
2-Nitrophenol	88-75-5	1	10.8	—	—	N/A	**N/A**
4-Bromophenyl phenyl ether	101-55-3	0.4	5.7	—	—	N/A	**N/A**
4-Chlorophenyl phenyl ether	7005-72-3	0.5	12.6	—	—	N/A	**N/A**
4-nitrophenol	100-02-7	1	7.2	—	—	N/A	**N/A**
Acenaphthene	83-32-9	0.4	5.7	26	—	26	**4.56**
Acenaphthylene	208-96-8	0.6	10.5	—	—	N/A	**N/A**
alpha-Endosulfan (Endosulfan I)	959-98-8	0.05	0.033	0.056	0.93	0.056	**1.70**
Anthracene	120-12-7	0.6	5.7	110	9600	110	**19.3**
Benzo(ghi)Perylene	191-24-2	1	12.3	—	—	N/A	**N/A**
beta-Endosulfan (Endosulfan II)	33213-65-9	0.05	0.024	0.056	0.93	0.056	**2.33**
Bis(2-chloroethoxy)methane	111-91-1	21.2	15.9	—	—	N/A	**N/A**
Chlorobenzene	108-90-7	2	18	89	680	89	**4.94**
Chloroform	67-66-3	2	4.8	61	5.7	5.7	**1.19**
Diethyl phthalate	84-66-2	7.6	5.7	200	23000	200	**35.1**
Dimethyl phthalate	131-11-3	6.4	4.8	600	313000	600	**125**
Di-n-butyl phthalate	84-74-2	1	7.5	8.2	2700	8.2	**1.09**
Di-n-octyl phthalate	117-84-0	0.6	7.5	—	—	N/A	**N/A**
Endosulfan sulfate	1031-07-8	0.05	0.021	9.9	0.93	0.93	**44.3**
Endrin aldehyde	7421-93-4	0.05	0.033	0.38	0.76	0.38	**11.5**
Ethylbenzene	100-41-4	2	21.6	32	3100	32	**1.48**
Fluorene	86-73-7	0.6	5.7	21	1300	21	**3.68**
Isophorone	78-59-1	1	6.6	330	8.4	8.4	**1.27**
Methyl bromide (Bromomethane)	74-83-9	10	8.4	130	48	48	**5.71**
Naphthalene	91-20-3	0.6	4.8	—	—	N/A	**N/A**
Nitrobenzene	98-95-3	1	5.7	12	17	12	**2.11**
Parachlorometa cresol (4-chloro-3-methylphenol)	59-50-7	2	9	350	—	350	**38.9**
Phenanthrene	85-01-8	0.6	16.2	—	—	N/A	**N/A**
Phenol	108-95-2	4	4.5	3800	21000	3800	**844**
Pyrene	129-00-0	0.6	5.7	8.1	960	8.1	**1.42**
Toluene	108-88-3	2	18	47	6800	47	**2.61**

Comment #11 (Boise and Nampa)

Mercury is a bioaccumulative pollutant that is a global pollutant[5] and impacts many waters of the United States, including Idaho, the Boise River and Brownlee Reservoir[6]. Idaho fish consumption advisories[7] for mercury have been issued for the Boise River (catfish at Parma, Idaho), Brownlee Reservoir (Carp, Catfish, Crappie, and Perch), and statewide (large and smallmouth bass), making mercury an important permitting issue for all point sources discharging mercury to the Boise River.

Municipal wastewater treatment facilities are generally a minor source of mercury, however they do have a role to play in the control of mercury and the protection of human health[8,9]. The proposed Mercury Minimization Plan and Watershed based Fish Tissue testing requirements proposed in the draft permits appear to be appropriate and are actions municipalities already are or are willing to implement to protect human health and the environment.

Response #11

Thank you for your comment.

Comment #12 (Boise and Nampa)

Boise and Nampa stated that the aquatic life criterion is satisfied and provides no basis for reasonable potential, mercury numeric limits, or monitoring requirements.

The Nampa Fact Sheet and draft permit evaluates and proposes the need for mercury limitations and monitoring requirements using two Idaho water quality standards for mercury, the 12 ng/l aquatic organism criterion[10] and the 0.3 mg/kg methylmercury fish tissue based human health criterion[11] approved by EPA in 2008.

The 12 ng/l aquatic life mercury criterion was incorrectly applied to determine the reasonable potential to exceed, numeric mercury limits, and monitoring requirements.

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[5] United Nations Environment Programme Global Mercury Assessment 2013, available at: http://www.unep.org/PDF/PressReleases/GlobalMercuryAssessment2013.pdf

[6] Idaho Fish Consumption Advisory Program, Boise River listing for Catfish (no more the 3-11 meals per month depending on age and pregnancy, statewide large and small mouth bass advisory of no more than 2-8 meals per month with no other fish consumption; http://healthandwelfare.idaho.gov/Health/EnvironmentalHealth/FishAdvisories/tabid/180/Default.aspx

[7] Idaho Fish Consumption Advisories, Idaho Fish Consumption Advisory Program, http://healthandwelfare.idaho.gov/Health/EnvironmentalHealth/FishAdvisories/tabid/180/default.aspx

[8] Mercury Pollutant Minimization Program Guidance, USEPA Region 5, November 2004.

[9] USEPA, 2010, Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, 221 p, http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1007BKQ.TXT

[10] IDAPA 58.01.02- Water Quality Standards and Wastewater Treatment Requirements, 2004; Section 58.01.02.210.01.a.8, Mercury aquatic life criterion, CCC, B2, footnote g "g. If the CCC for total mercury is exceeded more than once in a three (3) year period in ambient water, the edible portion of aquatic species of concern must be analyzed to determine whether the concentration of methyl mercury exceeds the FDA action level (one (1.0) mg/kg). If the FDA action level is exceeded, the Director must notify the EPA regional administrator, initiate a review and as appropriate, revision of its mercury criterion in these water quality standards, and take other appropriate action such as the issuance of fish consumption advisory for the affected area."

[11] Idaho's Water Quality Standards, IDAPA 58.01.02, IAC 2011, http://adminrules.idaho.gov/rules/current/58/0102.pdf

The Nampa mercury limitations are based on the 12 ng/l aquatic life criterion. If the 12 ng/l criterion is exceeded in the receiving stream more than once every three years, the criterion requires fish tissue testing of the edible portion of consumed species to determine whether the concentration exceeds the 1.0 mg/kg FDA action level. If the 1 mg/kg action level is exceeded, actions to control mercury discharges and notify the public are required.[12]

The reasonable potential analysis appears to use only the water column concentration portion of the 12 ng/l criterion without evaluating the edible fish tissue portion of the criterion using local fish tissue data to determine compliance or non-compliance with the standard, if there is reasonable potential to exceed the state water quality standard, in the determination of numeric limit or other controls, and in determination of associated monitoring requirements.

Historical and recent fish tissue data have been collected and reported by USGS, the Idaho Fish Consumption Advisory Program[13], and the City of Boise Methylmercury Fish Tissue Sampling Program for the Lower Boise River, Snake River and Brownlee Reservoir. The data show fish tissue mercury values range from 0.06 to 0.33 mg/kg methylmercury for samples collected in the Boise and Snake Rivers and Brownlee Reservoir[14]. These levels are well below the 1.0 mg/kg FDA action level and demonstrate compliance with the aquatic life mercury criterion.

Analysis of the applicable 2004 mercury aquatic life criterion continuous concentration of 12 ng/l and footnote g, when correctly evaluated, shows that the 12 ng/l criterion is satisfied at all locations within the Lower Boise Watershed, the Snake River below the confluence with the Boise, and Brownlee Reservoir. No reasonable potential exists to exceed the mercury aquatic life water quality criterion, therefore, no numeric limitations, additional actions or public notification are necessary to satisfy the mercury aquatic life criterion.

The basis and development of numeric mercury limitations contained in Nampa draft permit is incorrect and there is no basis provided for numeric limitations, additional actions or additional monitoring. The Fact Sheet needs to be corrected to reflect that the applicable aquatic life criterion for mercury is satisfied.

Response #12

The commenters are correct that the EPA applied both the aquatic life chronic criterion or criterion continuous concentration (CCC) of 12 ng/L (0.012 µg/L) and the 0.3 mg/kg human health criterion for methylmercury in fish tissue. This is because both of these criteria are in effect for Clean Water Act purposes in Idaho.

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[12] 1DAPA 58.01.02-Water Quality Standards and Wastewater Treatment Requirements, 2004; Section 58.01.02.210.01.a.8, Mercury aquatic life criterion, CCC, 82, footnote g "g. If the CCC for total mercury is exceeded more than once in a three (3) year period in ambient water, the edible portion of aquatic species of concern must be analyzed to determine whether the concentration of methyl mercury exceeds the FDA action level (one (1.0) mg/kg). If the FDA action level is exceeded, the Director must notify the EPA regional administrator, initiate a review and as appropriate, revision of its mercury criterion in these water quality standards, and take other appropriate action such as the issuance of fish consumption advisory for the affected area."

[13] Idaho Fish Consumption Advisories, Idaho Fish Consumption Advisory Program, http://healthandwelfare.idaho.gov/Health/EnvironmentalHealth/FishAdvisories/tabid/180/default.aspx

[14] 2013 Boise River Watershed Based Methylmercury Fish Tissue Sampling Report, Boise City Public Works, 22p. and 2014 Boise River Watershed Based Methylmercury Fish Tissue Sampling Report, Boise City Public Works, 11p.

On December 12, 2008, the EPA disapproved the State of Idaho's removal of its aquatic life water quality criteria for mercury in the water column[15]. The aquatic life water column criteria for total recoverable mercury that the EPA approved in 1997 remain in effect for Clean Water Act purposes (40 CFR 131.21). These criteria are an acute criterion or criterion maximum concentration (CMC) of 2.1 µg/L and a chronic criterion or criterion continuous concentration (CCC) of 0.012 µg/L (12 ng/L). Because these criteria remain in effect for Clean Water Act purposes, the EPA must implement these criteria in NPDES permits (40 CFR 131.21(d)). The numeric effluent limits for mercury in the draft permits for Nampa are based on these criteria.

The commenters point out that, in a footnote to the table of water quality criteria, the Idaho Water Quality Standards had stated the following:

> *If the CCC for total mercury is exceeded more than once in a three (3) year period in ambient water, the edible portion of aquatic species of concern must be analyzed to determine whether the concentration of methyl mercury exceeds the FDA action level (one (1.0) mg/kg). If the FDA action level is exceeded, the Director must notify the EPA regional administrator, initiate a review and as appropriate, revision of its mercury criterion in these water quality standards, and take other appropriate action such as the issuance of fish consumption advisory for the affected area.*

This now-repealed provision of the Idaho WQS concerns sampling for fish tissue to be performed in response to exceedances of the water column mercury CCC, and could result in revisions to the water column mercury criteria. It does not modify the numeric criteria (i.e., the CMC of 2.1 µg/L and CCC of 12 ng/L), which were used as the basis for numeric effluent limits for mercury in the Nampa permit.

The commenters assert that the fact that fish tissue concentrations are below the Food and Drug Administration (FDA) action level of 1.0 mg/kg in the receiving waters demonstrates compliance with the 12 ng/L numeric aquatic life CCC. The commenters then conclude, based on fish tissue concentrations below the FDA action level, that there is no reasonable potential to exceed the 12 ng/L CCC. The EPA disagrees with these assertions for the following reasons.

First, the fact that fish tissue concentrations of methylmercury have not exceeded the FDA action level of 1.0 mg/kg does not necessarily mean that the 12 ng/L CCC, with its associated averaging period and allowable excursion frequency, is attained. The 12 ng/L CCC was based on achieving the 1.0 mg/kg FDA action level, using a bioconcentration factor of 81,700 (EPA 1985). However, bioaccumulation of mercury is highly variable and is influenced by a number of factors, including the age or size of the organism; food web structure; water quality parameters such as pH, DOC, sulfate, alkalinity, and dissolved oxygen; mercury loadings history; proximity to wetlands; watershed land use characteristics; and waterbody productivity, morphology, and hydrology (EPA 2010). Furthermore, bioaccumulation of mercury in fish occurs gradually over the lifetime of the fish, whereas the 12 ng/L CCC has an averaging period of only 4 days, with an excursion frequency of once every three years (EPA 1985). Infrequent, short-term excursions above the 12 ng/L CCC would have a small effect on concentrations of methylmercury in fish tissue, as long as the average concentration of mercury was low. However, such

[15] http://www.deq.idaho.gov/media/451688-epa_letter_mercury_criterion_disapproval.pdf

excursions would nonetheless violate the 12 ng/L CCC (unless they occurred less frequently than once every three years).

Second, even if an exceedance of the 12 ng/L CCC has not occurred in the receiving waters, this would not necessarily mean that a particular discharge would not need to have effluent limits based on the 12 ng/L CCC. Limits must be established not only if a discharge *causes* excursions above water quality standards, but also if a discharge has the *reasonable potential to cause or contribute* to excursions above water quality standards (40 CFR 122.44(d)(1)(i, iii)). In determining whether the subject discharges had the reasonable potential to cause or contribute to excursions above the 12 ng/L CCC, the EPA used the procedures in Section 3.3 of the TSD. Consistent with 40 CFR 122.44(d)(1)(ii), these procedures account for existing controls on point and nonpoint sources of pollution and the variability of the pollutant in the effluent. In this case, since a mixing zone was authorized by the State of Idaho for mercury, the EPA also considered the dilution of the effluent in the receiving water.

Using these procedures, the EPA determined that the discharges from the City of Nampa wastewater treatment plant has the reasonable potential cause or contribute to excursions above the 12 ng/L mercury CCC. Therefore, the EPA must establish effluent limits that are derived from and ensure compliance with the 12 ng/L mercury CCC (40 CFR 122.44(d)(1)(vii)(A)).

Comment #13 (Boise and Nampa)

The Idaho Methylmercury Human Health water quality criterion for fish tissue (0.3 mg/kg) is 3.3 times more stringent than the aquatic life 12 ng/l criterion when correctly evaluated[16]. The Human Health criterion therefore is more stringent and the appropriate criterion for evaluation of reasonable potential, limits or other actions, and monitoring requirements. Idaho and EPA have developed guidance for implementation of the human health criterion. The Fact Sheet needs to use the Human Health mercury criterion for the evaluation of reasonable potential, associated controls, and monitoring requirements for mercury.

The Idaho Mercury Human Health criterion was adopted with implementation guidance[17] that addresses how it would be applied to municipal wastewater treatment facilities, including additional actions and recommended monitoring frequencies based on the level of fish tissue mercury within the watershed. EPA[18] developed methylmercury human health implementation guidance that is essentially identical to the Idaho guidance.

The Fact Sheet needs to be significantly modified and use the lower and appropriate 0.3 mg/kg EPA approved Idaho Methylmercury Human Health criterion and associated Idaho Methylmercury Criteria

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[16] IDAPA 58.01.02 -Water Quality Standards and Wastewater Treatment Requirements, 2004; Section 58.01.02.210.01.a.8, Mercury aquatic life criterion, CCC, B2, footnote g "g. If the CCC for total mercury is exceeded more than once in a three (3) year period in ambient water, the edible portion of aquatic species of concern must be analyzed to determine whether the concentration of methyl mercury exceeds the FDA action level (one (1.0) mg/kg). If the FDA action level is exceeded, the Director must notify the EPA regional administrator, initiate a review and as appropriate, revision of its mercury criterion in these water quality standards, and take other appropriate action such as the issuance of fish consumption advisory for the affected area."

[17] Implementation Guidance for the Idaho Mercury Water Quality Criteria, April 2005, IDEQ, 212 pages, https://www.deq.idaho.gov/media/639808-idaho_mercury_wq_guidance.pdf

[18] Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, EPA 2010, 221 p, http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1007BKQ.TXT

Implementation Guidance[19] for the evaluation of the reasonable potential to exceed standards, the appropriate limitations or controls, and the associated monitoring requirements.

Using the Idaho Methylmercury criterion, Idaho and EPA Methylmercury Implementation Guidance, effluent data, and recent fish tissue data (2000-present) from all sources, reasonable potential does appear to be triggered (e.g. quantifiable mercury in the effluent and >24 mg/kg fish tissue below facilities), additional actions do appear to be required (e.g. Mercury Minimization Plans), and watershed based fish tissue and effluent monitoring does appear to be justified.

The Fact Sheet for the draft Nampa NPDES permit needs to be corrected to provide the basis for additional mercury controls and monitoring limits.

Response #13

The commenters' statement that the Idaho methylmercury human health water quality criterion for fish tissue (0.3 mg/kg) is 3.3 times more stringent than the aquatic life 12 ng/l CCC appears to be based on the fact that the 12 ng/L CCC was based on the FDA action level of 1.0 mg/kg, which is 3.3 times the human health criterion. However, since the 12 ng/L CCC is a water column criterion as opposed to a fish tissue criterion, this statement would be true in terms of water column concentrations of mercury only if the bioaccumulation factor was equal to the bioconcentration factor of 81,700 that was used to develop the 12 ng/L aquatic life criterion from the 1.0 mg/kg FDA action level. Bioaccumulation of mercury is highly variable and is influenced by a number of factors, including the age or size of the organism; food web structure; water quality parameters such as pH, DOC, sulfate, alkalinity, and dissolved oxygen; mercury loadings history; proximity to wetlands; watershed land use characteristics; and waterbody productivity, morphology, and hydrology (EPA 2010). Furthermore, bioaccumulation of mercury in fish occurs gradually over the lifetime of the fish, whereas the 12 ng/L CCC has an averaging period of only 4 days (EPA 1985), with an allowed excursion frequency of once every three years. Infrequent, short-term excursions above the 12 ng/L CCC would have a small effect on concentrations of methylmercury in fish tissue, as long as the average concentration of mercury was low. However, such excursions would nonetheless violate the 12 ng/L CCC (unless they occurred less frequently than once every three years).

As discussed in the fact sheet, the EPA has, in fact, implemented the Idaho methylmercury human health criterion in the subject permit in a manner consistent with the IDEQ and EPA guidance referenced by the commenters. See the fact sheet at Pages 23-24.

As explained in the response to comment #12, the EPA must also establish water quality-based effluent limits for mercury if the discharges have the reasonable potential to cause or contribute to excursions above the 12 ng/L CCC, which is the case for Nampa.

Comment #14 (IRU)

National Pollution Discharge Elimination System permits are issued for a period of five years for many good reasons, first and foremost being the opportunity provided every five years to improve permit conditions to better protect the rivers of the United States. In the sixteen years since the City of Meridian Wastewater Treatment plant was last permitted, significant events have occurred that, if they

[19] Implementation Guidance for the Idaho Mercury Water Quality Criteria, April 2005, IDEQ, 212 pages, https://www.deq.idaho.gov/media/639808-idaho_mercury_wq_guidance.pdf

had been considered every five years as required, would have decreased pollution of Indian Creek and the Boise River starting in 2004. These events include the approval of Total Maximum Daily Loads for Indian Creek, the Boise and the Snake rivers, the collection of relevant water quality data by US Geological Survey and others, many EPA-approved reports on the status of Idaho's water quality, and advancements in wastewater treatment technology. During those eleven years, unlimited amounts of phosphorus and other pollutants have been allowed to be discharged to Indian Creek contributing to the impairment of Indian Creek and the Boise and Snake rivers.

Idaho Rivers United does not support administrative extensions of NPDES permits and asks EPA to ensure the timely renewal of this permit five years from issuance.

Response #14

Although the commenter referenced the permit for the City of Meridian in this comment, the EPA assumes that the commenter intended to reference the permit for City of The City of Nampa, since this comment appeared in a letter providing other comments on the draft permit for the City of Nampa.

EPA has issued the permit as expeditiously as possible. Administrative extension of this permit was provided in accordance with federal regulations (40 CFR 122.6).

Comment #15 (IRU)

Idaho Rivers United supports the permit's year round limits on discharge of Total Phosphorus to Indian Creek.

As was made clear in the Fact Sheet, nuisance levels of periphyton can occur in the Boise River during what EPA previously called the non-growing season (October – April) and Total Phosphorus in the Boise River continuously exceeds the 70 µg/L load allocation in the Snake River Hells Canyon TMDL. The Nampa WWTP releases phosphorus-laden effluent continuously, pollution that has had significant negative impacts on the health of Indian Creek, and the Boise and Snake rivers for decades, and these limits are long-overdue.

Response #15

Thank you for your comment.

Comment #16 (ICL)

We do not support a 9 year 11 month compliance schedule for cyanide since attaining the cyanide limits is likely a matter of limiting inflow rather than installing treatment equipment.

The EPA has determined that this WWTP has the reasonable potential to violate water quality limits for cyanide. As such, EPA must issue effluent limits for cyanide to the Nampa WWTP in this permit. However, the EPA has not included interim cyanide limits. This oversight needs to be rectified and interim limits need to be established.

Response #16

Neither the draft permit nor the final permit include a compliance schedule for the new water quality-based effluent limits for weak acid dissociable cyanide. As such, no interim limits have been established for cyanide. The permit contains only final, water quality-based effluent limits for cyanide, which become effective immediately upon the effective date of the final permit.

Comment #17 (ICL)

Although the DEQ provided (and EPA approved) that Nampa could increase its WLA for TSS by allocating to Nampa some of the TSS that had been reserved for growth in the prior Lower Boise Sediment TMDL, it is not appropriate for the EPA to incorporate this change into the City of Nampa's TSS effluent limit. In this instance, because the receiving water, Indian Creek, continues to violate water quality standards for sedimentation and siltation, this increase in allowable TSS discharges represents backsliding, irrespective of the changed conditions at the WWTP. Increasing the TSS effluent limit will cause and/or contribute to a violation of water quality standards.

Response #17

The TSS effluent limits in the permit are consistent with the City's wasteload allocations in the *Lower Boise River TMDL* (IDEQ 1999) and in the *Lower Boise River TMDL 2015 Sediment and Bacteria Addendum* (IDEQ 2015). The 2015 Sediment and Bacteria Addendum addressed the impairment for sedimentation and siltation in Indian Creek and has been approved by the EPA. Therefore the effluent limits for TSS are as stringent as necessary to protect water quality in both Indian Creek and the Boise River, are consistent with applicable waste load allocations in an approved TMDL, and do not constitute permit backsliding. *See* CWA section 303(d)(4).

Comment #18 (Nampa)

In Part I.B, Table 1, footnote #7, the proposed permit requires that temperature data be gathered via thermistors, which the City does not currently own. The software for the device must then be used to generate (export) a spreadsheet or text file, to be submitted monthly to the EPA as an electronic attachment to the City's DMRs. Since the City does not possess the technology, the City requests that DEQ provide a one-year compliance schedule for this requirement that will allow the City time to procure necessary equipment.

Response #18

The EPA agrees that it is reasonable to allow one year to begin continuous temperature monitoring of the effluent and receiving water. The final permit requires an effluent temperature sample frequency of five times per week and a receiving water temperature sample frequency of once per week, for the first year. For the effluent, this monitoring frequency is the same as the monitoring frequency for pH, which is also measured with a grab sample. For the receiving water, this monitoring frequency is the same as the monitoring frequency for turbidity, which is also measured with a grab sample. The permit also requires that grab samples for temperature be taken from 4 – 6 PM and that receiving water temperature samples be taken within 1 hour of an effluent sample.

Beginning one year after the effective date of the final permit, the final permit requires continuous monitoring of the effluent and receiving water temperature, as proposed in the draft permit.

Comment #19 (Nampa)

In Part I.B.3.b of the draft permit, the surface water monitoring requirements detail that the permittee must record a visual observation of the receiving water in the vicinity of where the effluent meets the surface water. This requirement does not specify any scientific data gathering other than viewer observation. The City requests adding more objective criteria to this section to provide more defensible description of surface water characteristics or removing this requirement. The following language is suggested as an addition to this section:

The permittee must observe the surface of the receiving water in the vicinity of where the effluent enters the surface water. The permittee must maintain a written log of the observation which includes the date, time, observer, and whether there is presence of floating, suspended or submerged matter. The log must be retained and made available to EPA or IDEQ upon request. The log should note, as a binary, yes/no response, whether there is presence of floating, suspended or submerged matter and include a picture taken at the time of observation.

Response #19

The EPA agrees with the language suggested by the commenter and has edited the final permit accordingly. In the final permit, the EPA has replaced the word "should" with "must" and the word "picture" with "photograph" in the last sentence of the permittee's suggested language.

Comment #20 (Nampa)

In Table 3 of the draft permit, the City does not agree with the Category 5 listing of Indian Creek for temperature and the resulting NPDES permit limits. As described in the Petition for Administrative Review regarding the 2012 Integrated Report filed by the City before the Idaho Board of Environmental Quality on March 4, 2014, "The department's (DEQ's) final 2012 Integrated Report made a substantial and significant change from the draft Report because the relevant sections of Indian Creek are now added for temperature on the §303(d) list." The City believes that there is insufficient reliable scientific data to support this impairment finding and that the technical basis for this listing warrants further evaluation and modeling.

Response #20

The State of Idaho's decision to list Indian Creek as impaired due to temperature in its 2012 Integrated Report is beyond the scope of the proposed permitting action. The basis for the temperature limits in the draft permit is explained in Appendix G to the Fact Sheet and is independent from the State of Idaho's Category 5 temperature listing for Indian Creek.

Comment #21 (Nampa)

The proposed permit requires complete collection of one-year of continuous temperature monitoring data prior to the removal of a trickling filter. The City has already commenced with the Phase I Upgrades to comply with the proposed interim total phosphorus limit. The initial step of this project was the removal of a trickling filter. Therefore, the City cannot collect the required data and requests that this provision be removed.

Response #21

The EPA believes the City is referring to Part I.C.3.d.i of the draft permit, which reads, "Within fifteen (15) months of the EDP, complete collection of at least one year of continuous temperature monitoring data and submit an evaluation of current monthly temperature variations to DEQ and EPA." It is not stated in the draft or final permits that these data must be collected prior to the removal of a trickling filter.

This requirement was included in the draft permit because it was a requirement in the State of Idaho's draft Clean Water Act Section 401 certification of the permit. The final permit includes similar conditions that are included in the State of Idaho's final Clean Water Act Section 401 certification.

Comment #22 (Nampa)

In Part I.D.7.d of the draft permit, the City recommends the following language change: "If implementation of the initial investigation workplan clearly identifies the source of toxicity to the satisfaction of EPA (e.g., a temporary plant upset), ~~and~~ **OR** none of the six accelerated chronic toxicity tests required under Part 1.D.7.b are above the applicable average monthly limit in Part I.B of this permit, the permittee may return to the regular chronic toxicity testing cycle specified in Part I.C.2.a." This change will both protect water quality and not overly burden the City should it be able to ascertain the source of the toxicity or verify through additional testing that the effluent is not toxic.

Response #22

The issue raised by this comment is whether it is necessary to complete a toxicity reduction evaluation (TRE) if an exceedance of a WET trigger occurs during routine testing but not during subsequent accelerated testing.

According to the *EPA Regions 8, 9 and 10 Toxicity Training Tool* (Denton et al. 2007), accelerated testing and a TRE/TIE should occur stepwise (Page 88). That is to say, the TRE work plan should be initiated in response to an exceedance of a WET trigger during accelerated testing, instead of being undertaken concurrently with the accelerated testing.

The EPA has edited the WET testing language in the final permit to follow this stepwise approach. The EPA believes this achieves the intent of the language change proposed by the commenter.

The *EPA Regions 8, 9 and 10 Toxicity Training Tool* also states that, "EPA Regions 9 and 10 recommend that an initial TRE/TIE Work Plan be developed by the permittee within 60-90 days of the effective date of the permit." The EPA has edited part I.D.5 of the permit to allow 90 days to complete the initial investigation TRE workplan.

Comment #23 (Nampa)

Regarding Part II.A.8.e.iv on Page 28 of the draft permit, The GC/MS Analysis has never been performed by the City. The City understands the procedure detailed in the draft permit for the GC/MS Analysis, however it is unclear what has to be done following completion of the analysis. The City requests that DEQ clarify the steps taken after collection has been performed.

Response #23

The final permit has been edited to state that the City must report the results of the GC/MS analysis in the annual pretreatment report.

Comment #24 (Nampa)

The City is requesting clarification as to the intent of including reporting requirements for biosolids in the pretreatment section of the NPDES permit. This information has historically been included as a stand-alone section under the NPDES permit.

Response #24

As stated in the fact sheet at Page 22, EPA Region 10 separates wastewater and sludge permitting. Thus there is no stand-alone section for biosolids in the permit. However, among the objectives of the national pretreatment program are "to prevent the introduction of pollutants into POTWs which will interfere with the operation of a POTW, including interference with its use or disposal of municipal

sludge" and "to improve opportunities to recycle and reclaim municipal and industrial wastewaters and sludges" (40 CFR 403.2). Section 4.3 of the EPA's *Local Limits Development Guidance* (EPA 2004) recommends sampling of POTW sludge as part of the development of local limits and on an ongoing basis. Thus, it is appropriate to include sludge sampling requirements in the pretreatment section of the permit.

Comment #25 (Nampa)

The City would like to clarify the following requirement for routine sampling in Part III.A of the permit: "In order to ensure that the effluent limits set forth in this permit are not violated at times other than when routine samples are taken, the permittee must collect additional samples at the appropriate outfall whenever any discharge occurs that may reasonably be expected to cause or contribute to a violation that is unlikely to be detected by a routine sample."

It is our understanding that this sampling is needed under extreme conditions, such as an upset condition. Under such a condition, our primary goal is returning the plan to normal operating conditions as quickly as possible. In light of this priority, please clarify the frequency the City is supposed to collect additional samples.

Response #25

The intent of the second and third paragraph of Part III.A of the permit is to ensure representative sampling, consistent with the first paragraph of Part III.A and with 40 CFR 122.41(j). It is not possible to specify the appropriate frequency for the additional sampling required in the second and third paragraph of Part III.A, because the appropriate frequency will depend on the severity and duration of the event compelling the additional sampling.

Comment #26 (Nampa)

The City requests that EPA amend Part IV.F.1 of the permit to define "bypass" as presented in this section. The City strives to operate the Nampa WWTP as efficiently as possible while protecting water quality. To this end, the City optimizes the unit processes online based on influent loadings, current process operations, and effluent requirements. Therefore, the following modifications to this section are suggested:

> *1. Bypass not exceeding limitations. The permittee may allow any bypass of an entire unit process to occur that does not cause effluent limitations to be exceeded. Unit processes may be bypassed for essential maintenance or to optimize the operations of the facility provided that effluent limitations are not exceeded but ~~only if it also is for essential maintenance to assure efficient operation.~~ These bypasses are not subject to the provisions of paragraphs 2 and 3 of this Part.*

Response #26

Part IV.F of the permit implements 40 CFR 122.41(m). The first paragraph of 40 CFR 122.41 reads, in relevant part:

> *The following conditions apply to all NPDES permits. ... All conditions applicable to NPDES permits shall be incorporated into the permits either expressly or by reference.*

Thus, the EPA cannot edit the language of Part IV.F of the permit as requested by the commenter.

The permit does, in fact, include a definition of the term "bypass," in Part VI. The definition of "bypass" in the permit is identical to the definition in 40 CFR 122.41(m) and reads "'Bypass' means the intentional diversion of waste streams from any portion of a treatment facility."

Seasonal effluent limitations which allow the facility to shut down a specific pollution control process during certain periods of the year are not considered to be a bypass. Any variation in effluent limits accounted for and recognized in the permit which allows a facility to dispense with some unit processes under certain conditions is not considered bypassing (49 FR 38037).

Comment #27 (IRU)

When do the interim limits take effect? Why did EPA select 6.4 mg/L for the first 5 years and 500 µg/L for the second five years (May 1 – Sept 30)? Why did EPA establish an interim limit of 1,500 µg/L for Oct. 1 – April 30? Why aren't they seasonal like the final limits? Why are the final limits pounds per day and the interim limits mg/L or µg/L? Why are the limits for the first 5 years in mg/L and for the 2nd 5 years in µg/L?

Response #27

Interim limits for total phosphorus (TP) and mercury take effect immediately upon the effective date of the final permit unless otherwise stated in the permit.

The EPA did not "select" the interim limits, rather, they were specified by the State of Idaho in its draft Clean Water Act Section 401 certification of the permit. The interim May – September TP limits are lowered to 500 µg/L (0.5 mg/L) and an additional interim limit of 1,500 µg/L (1.5 mg/L) from October – April is established after five years because, by that time, as shown in Table 3 of the draft permit, the Phase I facility upgrades will have been completed, thus allowing the City to achieve lower effluent concentrations of phosphorus.

Regarding the commenter's question about the units for the interim TP concentration limits, the EPA agrees that it would be preferable for all of the interim TP concentration limits to be expressed using the same units. The EPA has expressed all of the interim TP concentration limits in units of mg/L.

The final water quality-based effluent limits for TP are expressed in terms of mass (lb/day) because they are based on the mass WLAs in the *Lower Boise River TMDL: 2015 Total Phosphorus Addendum* (IDEQ 2015). The interim limits are specified in the State of Idaho's Clean Water Act Section 401 certification. The State of Idaho is not required to establish interim limits expressed in terms of mass simply because the final effluent limits are expressed in terms of mass. However, federal regulations state that, in general, effluent limits shall be expressed in terms of mass, although pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations (40 CFR 122.45(f)). Therefore, in the final permit, the EPA has established interim TP and mercury effluent limits in terms of mass, in addition to the concentration limits that were proposed in the draft permit. The interim mass limits are calculated from the interim concentration limits based on the design flow of the POTW (18 mgd), consistent with 40 CFR 122.45(b).

Because the interim limits for TP are, in fact, seasonal (similar to the final effluent limits), the EPA assumes that the commenter's question of why the interim limits are not seasonal is in reference to the interim effluent limits for mercury. The interim limits are specified in the State of Idaho's Clean Water

Act Section 401 certification. The State of Idaho is not required to establish seasonal interim limits simply because the final effluent limits are seasonal.

Comment #28 (IRU)

EPA should not permit Nampa to increase their current discharge. According to the 2015 Total Phosphorus TMDL Addendum, the Nampa WWTP discharge of Total Phosphorus is 4.97 mg/L. The proposed interim limit is 6.4 mg/L. EPA needs to set the interim limit for the first 5 years to no greater than 4.97 mg/L.

Response #28

The commenter appears to be referring to Table 15 of the Lower Boise River TMDL: 2015 Total Phosphorus Addendum. This table lists the City of Nampa's mean TP concentration as 4.97 mg/L. Footnote b to this table specifies that this is the TP concentration that was measured between May 1, 2012 and September 30, 2012.

At other times, the City's TP concentration has been considerably higher. The effluent concentration of TP was greater than 6.4 mg/L about 3% of the time during 2010 and 2011. Furthermore, the City of Nampa currently does not have any treatment in place specifically for phosphorus. Because 6.4 mg/L is within the range of TP discharges measured by the City, the EPA believes an annual average of 6.4 mg/L is a reasonable interim limit for TP, until planned treatment enhancements can be completed.

Comment #29 (IRU)

EPA should require twice-per-year effluent monitoring for chlorpyrifos to determine if this pesticide of concern is entering Indian Creek through the WWTP.

Response #29

The EPA does not agree that effluent monitoring for chlorpyrifos is necessary. The State of Idaho has not adopted water quality criteria for chlorpyrifos and it is not among the parameters that must be reported on the NPDES permit application form for POTWs (40 CFR 122.21(j)(4)). Although some streams in the Lower Boise watershed were listed in the State of Idaho's 2012 303(d)/305(b) integrated report as being impaired because of chlorpyrifos, neither Indian Creek nor the Boise River were listed as such. Therefore, the EPA has no basis to require effluent monitoring for chlorpyrifos.

Comment #30 (Nampa)

The City is requesting additional clarification as to the reasoning that DEQ used to justify a lower compliance evaluation level for chlorine in the revised permit (50 mg/L) as opposed to the 1999 permit (100 mg/L).

Response #30

The commenter provided incorrect units for the chlorine compliance evaluation level in both the 1999 permit and the draft permit. The correct units are µg/L, as opposed to mg/L.

Currently approved methods have method detection limits for chlorine as low as 10 µg/L (e.g., Standard Method 4500 Cl-G). Thus, the EPA believes a minimum level of 50 µg/L is attainable for chlorine.

Comment #31 (Nampa)

On Page 19, in Section V.B, the fact sheet states, "The draft permit proposes more frequent monitoring for ammonia because the permittee has had difficulty complying with the effluent limits for ammonia in the prior permit." The Nampa WWTP has consistently met the effluent ammonia limits from the previous permit as shown in Table 1 of the Fact Sheet. Based on the data presented in this table, the Nampa WWTP has exceeded its effluent ammonia limit 5 times over a six year period, which equates to 0.2%. The above referenced sentence should be removed from the Fact Sheet.

Response #31

The fact sheet is a final document and will not be edited.

The EPA believes the referenced statement on Page 19 of the fact sheet is accurate. Although the violations have not been frequent, the permittee has violated the ammonia limits in the 1999 permit at times, with the most recent violation in September 2013. The September 2013 violation was not captured in the summary provided in Table 1 of the fact sheet, as Table 1 was based on a database query performed on May 17, 2013.

The EPA believes the proposed effluent monitoring frequency for ammonia of twice per week is appropriate.

Comment #32 (Nampa)

The Pretreatment Requirements section should be updated to reflect the information submitted in the most recent, 2014, Pretreatment Annual Report.

Response #32

The fact sheet is a final document and will not be edited.

Comment #33 (ICL)

We do not support the provision of this draft permit that provides for a 9 year 11 month compliance schedule for copper.

EPA and DEQ have justified a 9 year 11 month compliance schedule for total phosphorus based on the time (and funding) needed to evaluate and implement various potential facility upgrades.

However, the achievement of final effluent limits for copper is not based on pending facility upgrades. Rather, copper compliance is based on the city identifying the contributing facilities and developing and implementing a pollutant minimization plan. There are a limited number of generally well-understood types of facilities (like circuit board manufactures) that typically discharge copper into the influent of WWTPs. Whereas total phosphorus compliance will require years of complicated construction at the WWTP, copper compliance will require that the city simply change the behavior of a limited number of facilities discharging to the WWTP. There is no justification for such a protracted compliance schedule for copper and it should be greatly shortened or completely eliminated.

We do not support the provision in this draft permit that provides for a 9 year 11 month compliance schedule for mercury.

EPA and DEQ have justified a 9 year 11 month compliance schedule for total phosphorus based on the time (and funding) needed to evaluate and implement various potential facility upgrades.

However, the achievement of final effluent limits for mercury is not based on pending facility upgrades. Rather, mercury compliance is based on the city developing and implementing a Mercury Minimization Plan. Developing such a plan should not take the city too long – as this is pretty standard and the city will undoubtedly be benefiting from the many other Mercury Minimization Plans that have been created in Idaho and across the United States. There are a limited number of generally well-understood types of facilities that typically discharge mercury into the influent of WWTPs. Whereas total phosphorus compliance will require years of complicated construction at the WWTP, mercury compliance will require that the city simply change the behavior of a limited number of facilities discharging to the WWTP. There is no justification for such a protracted compliance schedule for mercury and it should be greatly shortened or completely eliminated.

Response #33

The EPA believes it is reasonable for the compliance schedules for copper and mercury to be the same length as the compliance schedule for TP. As stated in the State of Idaho's draft Clean Water Act Section 401 certification, "it is anticipated that the addition of biological nutrient removal and improved tertiary filtration implemented for phosphorus removal will provide some level of enhanced removal for metals as general effluent quality is improved."

Copper is abundant in the Earth's crust and thus occurs naturally in water. Copper is a common material for water pipes. Thus, domestic users of the City of Nampa's POTW likely contribute copper to the POTW and therefore it is unlikely that it could be controlled entirely through reductions in inflow. Thus it is reasonable for the compliance schedule for copper to be the same length as the compliance schedule for TP.

The EPA agrees that the development and implementation of the mercury minimization plan will likely reduce discharges of mercury from the City of Nampa WWTP. However, it is unclear whether the reductions realized from the mercury minimization plan will be adequate to consistently achieve the final numeric water quality-based effluent limits for mercury for outfall 001. Similar to copper, the EPA expects that enhanced biological nutrient removal and improved tertiary filtration will result in reductions in mercury discharges. Thus, it is reasonable for the compliance schedule for mercury to be the same length as the compliance schedule for TP.

Comment #34 (ICL)

The EPA has determined that this WWTP has the reasonable potential to violate water quality limits for copper. As such, EPA must issue effluent limits for copper to the Nampa WWTP in this permit. However, the EPA has not included interim copper limits. This oversight needs to be rectified and interim limits need to be established.

Response #34

As stated by the commenter, the EPA has determined that the City of Nampa WWTP has the reasonable potential to cause or contribute to excursions above water quality standards for copper. The permit includes water quality-based effluent limits for copper, however, these limits are subject to a compliance schedule and do not take effect immediately upon the effective date of the final permit.

The federal regulations concerning compliance schedules state that for compliance schedules longer than one-year "the schedule shall set forth interim requirements and the dates for their achievement"

(40 CFR 122.47(a)(3)). However, nothing in the federal compliance schedule rule nor the State of Idaho's compliance schedule authorizing provision requires interim effluent limitations. The compliance schedule authorized by the State of Idaho has interim requirements and the dates for their achievement as required by 40 CFR 122.47(a)(3).

Federal regulations speak to interim effluent limitations at 40 CFR 122.44(l). This regulation states that, "interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under § 122.62.)" The previous permit for the City of Nampa did not have any effluent limits for copper. Thus, in this case, 40 CFR 122.44(l) does not require interim effluent limits for copper.

Comment #35 (Nampa)

The City appreciates DEQ and EPA's diligent work and cooperation in developing this document. The City supports the DEQ's goal of improving water quality in the Lower Boise River watershed.

Response #35

Thank you for your comment.

Comment #36 (Nampa)

The chlorine, total ammonia, and total hardness minimum levels listed by DEQ cannot be measured by the City's lab equipment. If DEQ decides to continue with using this approach for these constituents, the City requests that a one year compliance schedule be established to allow the City time to acquire the equipment capable of testing at said minimum levels.

Response #36

Regarding effluent monitoring for ammonia, the permit requires only that the City "must achieve a minimum level (ML) less than the effluent limitation" (Part I.B.6.a). The most stringent effluent limit for ammonia in the permit is 1.31 mg/L. The permit does not require receiving water monitoring for ammonia. Thus, the City need not achieve the 50 µg/L minimum level for ammonia in Appendix A.

Regarding hardness, the City has stated that the City can achieve a minimum level of 1 – 2 mg/L as $CaCO_3$. As stated in the fact sheet, the 5th percentile hardness of Indian Creek downstream from the discharge is 120 mg/L as CaCO3 from April – October and 200 mg/L as $CaCO_3$ from November –March. Thus, the EPA expects that an ML of 2 mg/L as $CaCO_3$ will adequately characterize the hardness of the effluent and receiving water. In the final permit, the EPA has changed the ML for hardness to 2 mg/L as $CaCO_3$.

The EPA agrees that it is reasonable to allow the required ML and compliance evaluation level for chlorine to remain at 100 µg/L for 1 year, to allow the City time to acquire new equipment to be able to comply with the 50 µg/L ML and compliance evaluation level proposed in the draft permit.

Comment #37 (Nampa)

The total phosphorus limits in the proposed draft NPDES permit will require significant investment by the City to address. The most recent estimate for this investment is approximately $90 million. Therefore, the City supports EPA's inclusion of a 10-year compliance schedule for phosphorus. This will

allow the City adequate time to plan, fund, design, and construct the required facilities to meet these new, more stringent total phosphorus limits.

Response #37
Thank you for your comment.

Comment #38 (Nampa)
The City believes that the proposed winter interim limit of 1.5 mg/L total phosphorus is appropriate given the City's implementation plan. This revised limit allows the City to continue forward with its current construction and funding plan without incurring unplanned additional costs for chemical treatment.

Response #38
Thank you for your comment.

Comment #39 (Nampa)
The temperature limits in the proposed draft NPDES permit will require significant investment by the City to address. Therefore, the City supports EPA's inclusion of a 15-year compliance schedule for temperature. This will allow the City adequate time to plan, fund, design, and construct the required facilities to meet these new, stringent temperature limits.

Response #39
Thank you for your comment.

Comment #40 (Nampa)
The City supports the inclusion of a 10-year compliance schedule for mercury as outlined in Table 3 and Table 4. The primary means for controlling mercury is through behavior modification for dischargers resulting from the completion of the Mercury Minimization Plan. However, if the results of the mercury minimization efforts do not result in the required reductions, the City would need to investigate alternative methods to meeting this stringent limit. If these alternatives require capital upgrades, the City would need sufficient time for evaluation, funding, design, and construction of these facilities. Therefore, the 10-year compliance schedule for mercury is appropriate to allow time for the development of the Mercury Minimization Plan, measurement of its effectiveness, and the implementation of other alternatives if necessary.

Response #40
Thank you for your comment.

Comment #41 (Nampa)
The City supports the inclusion of a 10-year compliance schedule for copper. As described in Section 1.C.3.e, the City intends to identify influent sources of copper in a step-wise fashion focusing first on likely contributors and wastewater characterization. Following the completion of this study, it may be necessary to construct capital facilities to meet the limit, which will require time to plan, fund, design, and construct. For these reasons, a 10-vear compliance schedule for copper is appropriate.

Response #41
Thank you for your comment.

Comment #42 (Nampa)

The weekly phosphorus limit noted in Table I and described further in Appendix F of the Fact Sheet is based on an arbitrary assumption of the coefficient of variation of effluent phosphorus concentrations. As noted in the research cited in Comment # 13, there is significant statistical variability is a characteristic of all nutrient removal plants and that this variability has to be considered in both identifying appropriate technologies in engineering the plants as well as determining appropriate limits in a regulatory setting process. While the City does not support the inclusion of weekly limits for phosphorus (Comment # 13}, preliminary biological process modeling has shown significant variability in projected effluent discharge concentrations resulting from variable influent loading conditions. Therefore, the City requests that a coefficient of variation (CV} of 1.2, which is the upper bound of the typical range, be used for the calculation of weekly limits. This assumption is consistent with other facilities operating similar processes in the area. Assuming this CV, the City believes the following are appropriate weekly limits should they be deemed necessary:

May-September: 15 lb/day x 2.35 = 35.25 lb/day

October-April: 52.6 lb/day x 2.35 2 123.6 lb/day

Response #42

As explained in the response to comment #4, the EPA has determined that it is impracticable to establish average weekly limits for total phosphorus at this time. Thus, the issue of the coefficient of variation that should be used to calculate average weekly limits is moot.

Comment #43 (Nampa)

The City is working towards uploading all monitoring data and other reports electronically using NetDMR. These DMRs from the City website will be available for public viewing. The City is requesting a period of six months to allow IT staff to configure the City website so that DMRs can be uploaded and viewed effectively.

Response #43

The EPA agrees that is acceptable to allow six months from the effective date of the final permit for the City to configure its website for posting of effluent data.

Comment #44 (Nampa)

The City requests that it not be included in EPA's pilot project for 'next generation compliance' efforts. The City is faced with a number of new requirements, each requiring significant capital costs, as a result of the requirements of the renewed NPDES permit. With this level of commitment, participating in this pilot project is an overly onerous requirement for the City. Furthermore, similar requirements have not been included for the City of Meridian, who is facing a similar level of investment.

Response #44

The EPA has not removed the next generation compliance requirements from the permit. However, as stated in the response to comment #28, the EPA has allowed six months from the effective date of the permit for the City to configure its website for posting of effluent data.

The EPA does not agree that these requirements are overly onerous. The permit language allows for effluent data to be displayed in tables viewable directly in an internet browser or as Portable Document

Format (PDF) files. A PDF file can be created in a number of ways, including by scanning a DMR that was submitted to the EPA or by "printing" to PDF from a spreadsheet or word processing program.

As explained on Page 28 of the Fact Sheet, part of the basis for including the next generation compliance requirements in this permit was to address environmental justice. As explained on Page 30 of the Fact Sheet for the City of Meridian draft permit, the Meridian WWTP is not located within or near any Census block groups that are potentially overburdened.

Comment #45 (Nampa)

The proposed permit states that the City must report any instance of noncompliance for which 24-hour telephone reporting is required by Part III.G of this permit on its publicly-accessible website within 24 hours from the time the City becomes aware of the circumstances. The City is requesting clarification as to what is required to be reported as part of this permit requirement.

Response #45

The draft permit language that the City is referring to in this comment reads as follows:

> *The Permittee must report any instance of noncompliance for which 24-hour telephone reporting is required by Part III.G of this permit on its publicly-accessible website within 24 hours from the time the permittee becomes aware of the circumstances.*

The EPA agrees that this draft language is unclear as to what must be reported on the website. Therefore, the EPA has changed this requirement to read as follows:

> *The Permittee must report on its publicly-accessible website any instance of noncompliance for which 24-hour telephone reporting is required by Part III.G of this permit by posting to its publicly-accessible website the written submission required in Part III.G.2 of this permit within 7 days of submitting such written submission to EPA.*

Part III.G.2 of the permit specifies the required content of the written submission that must follow 24-hour telephone reporting, thus clarifying what must be posted to the website as well. The EPA believes that the additional detail provided in the written submission (which would likely not be known within 24 hours of becoming aware of noncompliance) would be more meaningful to the public than the cursory information that would be known within 24 hours.

Comment #46 (Nampa)

The priority pollutants, volatile compounds, base/neutral compounds, dioxins, and pesticides/PCBs have testing parameters that the City cannot currently test. If DEQ decides to continue with using this approach for these constituents, the City requests that a 1-year compliance schedule be established to allow the City time to acquire the equipment capable of testing these parameters.

Response #46

There are some priority pollutants with twice per year sampling requirements as part of the pretreatment requirements in the prior permit (Part I.D), specifically copper, cyanide, mercury, arsenic, cadmium, chromium, lead, nickel, selenium, silver, and zinc. The EPA expects that the City should be able to continue sampling for these pollutants twice per year.

The EPA agrees that monitoring for other priority pollutants, volatile compounds, base/neutral compounds and pesticides may begin within 1 year of the effective date of the final permit.

The permit does not require any analysis for dioxin or PCBs.

Comment #47 (Nampa)

The fact sheet states, "The facility produces Class B biosolids which are usually applied to land in southeastern Canyon County." The Nampa WWTP discontinued land application and currently disposes of biosolids at the Simco Road Landfill. This information should be updated to reflect current operations.

Response #47

The Fact Sheet is a final document, the purpose of which is to explain the conditions proposed in the draft permit. It will not be edited.

Comment #48 (IRU)

It should be stated that the monitoring is required while the permit is in effect.

Response #48

All of the permit conditions, including monitoring requirements, are effective and enforceable as long as the permit is in effect, including any period of time during which the permit is administratively continued under 40 CFR 122.6. It is not necessary to state this.

Comment #49 (IRU)

IRU supports all of the effluent monitoring requirements.

Response #49

Thank you for your comment.

Comment #50 (IRU)

Idaho Rivers United supports the surface water monitoring requirements, especially the requirement that the monitoring must continue for as long as the permit remains in effect.

Response #50

Thank you for your comment.

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Appendix B: Pioneer Irrigation District Agreement

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Golden Eagle Building
1101 W. River St., Ste. 110
P.O. Box 7985
Boise, Idaho 83707
Tel. (208) 629-7447

Challis Office
1301 E. Main Ave.
P.O. Box 36
Challis, Idaho 83226
Tel. (208) 879-4488

Twin Falls Office
236 River Vista Place
Suite 301
Twin Falls, Idaho 83301
Tel. (208) 969-9585

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** Also licensed in Washington*

March 8, 2018

Mark Hilty
Hamilton, Michaelson & Hilty, LLP
1303 - 12th Avenue Road
Nampa, Idaho 83686

Re: Recycled Water Discharge and Use Agreement

Dear Mark:

Enclosed for your records is one of the two duplicate, fully executed, originals of the *Recycled Water Discharge And Use Agreement*, between the City of Nampa and Pioneer Irrigation District, dated March 7, 2018. Pioneer will retain the second duplicate original for its records.

Very truly yours,

Andrew J. Waldera

AJW/dll
Enclosures
cc: Pioneer Irrigation District

RECYCLED WATER DISCHARGE AND USE AGREEMENT

This RECYCLED WATER DISCHARGE AND USE AGREEMENT ("Agreement") is made and entered into as of the date of the latest signature on the signature pages of this Agreement, by and between the City of Nampa ("City") and Pioneer Irrigation District ("Pioneer") for the purpose of allowing the discharge of recycled water from the Nampa Wastewater Treatment Plant to Pioneer's Phyllis Canal.

WHEREAS, City owns, operates and maintains a public wastewater collection and treatment system which provides wastewater and collection services for City customers; and

WHEREAS, City owns and operates the Nampa Wastewater Treatment Plant ("NWWTP") located at 340 W Railroad St., Nampa, Idaho 83687, to treat collected wastewater; and

WHEREAS, Pioneer owns and operates the Phyllis Canal, passing within approximately one-half (1/2) mile from the NWWTP, which provides irrigation water to lands located within the Pioneer service area; and

WHEREAS, City currently discharges treated wastewater from the NWWTP to Indian Creek pursuant to an NPDES discharge permit issued by the U.S. Environmental Protection Agency ("EPA"), Permit No. ID0022063, which permit is current and in good standing; and

WHEREAS, the City desires to have the option to seasonally discharge Class A recycled water to Pioneer's Phyllis Canal ("Recycled Water") as necessary to provide NPDES permit compliance flexibility related to City's Indian Creek discharges; and

WHEREAS, Pioneer desires to seasonally receive Recycled Water from the City as a supplemental source of irrigation water supply; and

WHEREAS, City and Pioneer agree that it is in the best interests of the citizens and landowners of both entities to enter into a long-term agreement providing terms for the discharge and use of Recycled Water from the NWWTP to the Phyllis Canal.

NOW, THEREFORE, in consideration of the foregoing, it is mutually agreed by the parties that:

SECTION A -CITY OBLIGATIONS

1. City, at its sole cost, shall design, construct and maintain necessary improvements to connect the outflow of the NWWTP to the Phyllis Canal. City shall obtain written approval of piping and connection plans and designs from Pioneer prior to beginning construction of the improvements necessary to make the connection.

2. Upon connection, the City shall be authorized to discharge up to 41 cfs (annual average) of Recycled Water, or more if approved in subsequent writing by Pioneer. The timing of discharges shall be governed by the following provisions:

a. For discharges that occur during times when Pioneer is using the Phyllis Canal for irrigation water delivery ("Irrigation Season"), City shall forecast and provide Pioneer the estimated flow rates and duration of any anticipated Recycled Water discharge to the Phyllis Canal on a weekly basis for the upcoming week so that Pioneer can coordinate its canal operations accordingly.

b. If City desires to discharge Recycled Water at times other than during the Irrigation Season such discharges shall be coordinated with, and approved in advance by, Pioneer so as to ensure compatibility with Pioneer's canal operations, maintenance schedules and obligations. Provided, however, that in the absence of an emergency beyond Pioneer and City's reasonable control, Pioneer shall plan its canal operations, maintenance schedules and obligations to accommodate the discharge of Recycled Water to the Phyllis Canal under this Agreement every year between May 1 and October 1.

c. City may commence discharges as soon as the 2026 Irrigation Season but cannot commit to any specific commencement date. City anticipates at this time that discharges will be underway by, or before, the Irrigation Season for the year 2031.

3. Unless otherwise agreed to in writing by the parties and approved by the Idaho Department of Environmental Quality ("DEQ"), all Recycled Water discharged to Pioneer's Phyllis Canal shall meet or exceed the water quality requirements for Class A Recycled Water as specified in IDAPA 58.01.17, Recycled Water Rules. However, it is understood that all non-water quality-related requirements such as signage, setbacks and recycled water piping will not be applicable. The City shall also be responsible for meeting any more stringent requirements, if required, by DEQ.

4. City, at its sole cost, will be responsible for operation and maintenance of all piping, pumping and other conveyance facilities from the NWWTP to the point of discharge to the Phyllis Canal. City shall ensure that at all times a functioning and accurate measurement device is installed, maintained and operating downstream of the NWWTP but upstream from the point of connection to the Phyllis Canal for purposes of measuring discharges. The measuring device shall be automated, capable of sending Pioneer flow data in real time so that Pioneer can detect and track/monitor discharge flow fluctuations and coordinate its canal operation and maintenance activities accordingly. Pioneer shall have the right to inspect and verify the functionality and accuracy of the measuring device upon request. City also agrees to explore additional discharge automation opportunities in the future in cooperation with Pioneer, which automation may, for example, link instantaneous City Recycled Water discharge data with Pioneer Phyllis Canal diversions at the Boise River and other canal input locations effectively mitigating canal flow fluctuations.

5. City shall comply with any and all applicable local, state, and/or federal laws, rules

and regulations, including obtaining any and all permits necessary, concerning the construction and maintenance of the connection facilities and the discharge of Recycled Water to the Phyllis Canal.

6. The City shall conduct effluent testing in accordance with all applicable laws, rules, regulations and permits concerning its discharge of Recycled Water to the Phyllis Canal. The test results shall be shared with Pioneer via electronic media on a monthly basis. The City shall notify Pioneer within 24 hours of determination that the City is out of compliance with any Class A Recycled Water quality requirement and shall take steps reasonably necessary to cease all discharges into the Phyllis Canal until City has established it is able to discharge consistent with Class A water quality requirements/criteria. City shall immediately cease discharge if the City or Pioneer determines that City's discharge fails to meet Class A Recycled Water standards in accordance with IDAPA 58.01.17, or otherwise presents an immediate health risk to Pioneer patrons.

7. Up to a maximum amount of $5,000, City agrees to pay all attorney fees, and any other fees and costs incurred by Pioneer from and after October 1, 2017 in connection with the negotiation, preparation and execution of this Agreement and any related agreements and other documents, within forty five (45) days of the City receiving itemized invoices. The billing shall be sent directly to the City, attention Public Works Director.

8. City shall use its best efforts to obtain all necessary discharge permits and upon obtaining said permits shall complete design and construction of piping and other construction necessary to enable it to discharge into the Phyllis Canal. City anticipates construction shall be complete no later than March 15, 2031.

9. City reserves the right to serve itself and its own municipal irrigation system customers with Recycled Water, provided such use is compliant with all applicable laws, rules and regulations, including Idaho Code Sections 67-6537 and 31-3805.

10. City shall comply with any request by Pioneer to suspend discharges in the event of an emergency or other circumstance which requires Pioneer to dewater or reduce flows in its canal system.

SECTION B -PIONEER OBLIGATIONS

1. Subject to the provisions of this Agreement, Pioneer agrees to allow the City to do all things reasonably necessary to connect the Recycled Water outflow of the NWWTP to the Phyllis Canal at the point(s) shown on **Exhibit A** attached hereto and incorporated by reference herein. Pioneer shall review and provide written comment and/or approval of City-prepared piping and connection plans and designs prior to the City beginning construction of the improvements necessary to make the connection. Pioneer will grant the City all necessary licenses and easements to allow for construction and maintenance of the connection consistent with its (Pioneer's) review of facility encroachments under Idaho Code Section 42-1209.

2. Upon connection, Pioneer authorizes the City to discharge up to 41 cfs (annual

average) of Recycled Water to the Phyllis Canal each year consistent with Section A.2, above.

3. Pioneer acknowledges that the City is not obligated, nor does it guarantee, to provide any Recycled Water flow to Pioneer. Pioneer also acknowledges that the City needs the use of the Phyllis Canal for effluent temperature mitigation and that Pioneer will handle, manage and convey discharged Recycled Water as an integrated part of its irrigation operations.

4. Pioneer shall actively cooperate with City in obtaining all permits and approvals from DEQ necessary for the discharge contemplated under this Agreement. It is the parties' intent under this Agreement to obtain a recycled wastewater re-use permit from DEQ under IDAPA 58.01.17. The parties are not obligated to seek or obtain an NPDES permit authorizing the discharge of Recycled Water to the Phyllis Canal contemplated herein. To the contrary, the parties find any NPDES permit requirement unnecessary and inconsistent with Idaho's Water Quality Standards.

SECTION C -MISCELLANEOUS PROVISIONS

1. This Agreement shall continue in force until terminated by either party as provided herein.

2. Due to the substantial up-front costs incurred by the City in making the connection from its NWWTP to the Phyllis Canal and City's corresponding long-term NPDES Permit compliance requirements, during the first twenty-five (25) years of this Agreement Pioneer may only terminate this Agreement if: 1) the City is determined to be in material breach; or 2) the discharge of Recycled Water into the Phyllis Canal will require Pioneer to obtain and comply with an NPDES permit for its operations; or 3) the acceptance of the Recycled Water imposes additional requirements or restrictions upon Pioneer, including water quality monitoring or reporting not otherwise currently required of it that cannot or will not be performed by City or by mutual agreement between City and Pioneer; or 4) termination is required pursuant to an administrative or judicial order; or 5) the discharge of Recycled Water causes (or threatens to cause) Pioneer to be in violation of any law, rule or regulation of any governmental agency having or asserting jurisdiction over Pioneer and its facilities and activities. After twenty-five (25) years, Pioneer may terminate this Agreement with or without cause by providing at least five (5) years written notice to the City of intent to terminate. At termination, City will take all necessary steps, at its own expense, to cease the Recycled Water discharge and disconnect the City piping from the Phyllis Canal.

3. The City may terminate this Agreement if Pioneer is determined to be in material breach of this Agreement, or without cause by providing at least ten (10) years written notice to Pioneer of its intent to terminate. In the event either party claims a material breach of this Agreement, the parties shall enter into a dispute resolution process, which shall include good faith negotiations attempting to resolve the dispute in a manner saving and continuing the terms of this

Agreement.

4. This Agreement shall be declared null and void should the City and Pioneer fail to obtain any necessary approvals, including permits, licenses or easements, for the discharge of Recycled Water to the Phyllis Canal.

5. The City shall defend, indemnify and save and hold harmless Pioneer from and for any and all losses, claims, actions, judgments for damages, or injury to persons or property and losses and expenses arising or resulting from the City's discharge of Recycled Water under this Agreement not caused by or arising out of the negligent conduct of Pioneer or its agents, contractors or employees. Pioneer shall defend, indemnify and save and hold harmless City from and for any and all losses, claims, actions, judgments for damages, or injury to persons or property and losses and expenses arising or resulting from the conveyance of the Recycled Water following its discharge into the Phyllis Canal not caused by or arising out of the negligent conduct of City or its agents, contractors or employees. Nothing herein shall be construed as a waiver of the parties' respective rights, claims, or defenses under the Idaho Tort Claims Act.

6. If necessary or desired, and expressly agreed to by the parties, Pioneer and City shall cooperatively educate and inform the public and Pioneer patrons of the benefits and advantages realized by Pioneer and City as a result of this Agreement.

7. No waiver or modification of this Agreement shall be valid unless it is in writing and signed by each of the parties hereto.

8. This Agreement shall be binding upon, and inure to the benefit of, the parties and their heirs, successors, and assigns.

9. If either party hereto shall be determined to be in material breach of any of the terms hereof, such party shall pay to the non-defaulting party all of the non-defaulting party's costs and expenses, including reasonable attorneys' fees, incurred by such party in enforcing the terms of this Agreement, subject to the good faith dispute resolution requirements of Section C.3, above.

10. This Agreement constitutes the entire Agreement between the parties with respect to the subject matter hereof. This Agreement supersedes any and all other Agreements, whether or not in writing, between the parties with respect to the subject matter hereof.

11. This Agreement shall be subject to and governed by the law of the State of Idaho. Exclusive jurisdiction and venue for the interpretation and enforcement of this Agreement lies in

the District Court for the Third Judicial District, Canyon County, Idaho.

12. The headings in this Agreement are inserted for convenience only and shall not be considered in interpreting the provisions hereof. The recitals are a part of this Agreement and contractual.

13. If any part of this Agreement is held to be illegal or unenforceable by a court of competent jurisdiction, the remainder of this Agreement shall be given effect to the fullest extent reasonably possible.

14. The failure of a party to insist on the strict performance of any provision of this Agreement or to exercise any right or remedy upon a breach hereof shall not constitute a waiver of any provision of this Agreement or limit such party's right to enforce any provision or exercise any right.

15. City shall not allow any liens as a result of any labor performed or materials supplied in connection with its activities under this Agreement to attach to the Phyllis Canal, its corresponding irrigation easement and right-of-way, or to any other adjacent lands or easements held by Pioneer.

16. The parties hereto agree that nothing herein contained shall be construed to create a joint venture, partnership, or other similar relationship which might subject any party to liability for the debts and/or obligations of the other, except as otherwise expressly agreed in this Agreement. No director, officer, staff member, agent, or designee of either party hereto shall incur any liability hereunder to the other party hereto, or to any other party in such person's individual capacity by reason of such person's actions hereunder or execution hereof.

17. Notwithstanding anything to the contrary in this Agreement, City acknowledges and agrees that it is solely responsible for the operation and maintenance of the NWWTP, and all related infrastructure, including the Recycled Water discharge pipeline contemplated in this Agreement. City also acknowledges and agrees that it is solely responsible for achieving and maintaining any and all applicable regulatory compliance regarding the operation of the NWWTP including, without limitation, NPDES Permit No. ID0022063. Pioneer shall not be liable for any costs or expenses associated with the NWWTP or its related infrastructure, or for any costs or expenses related to the regulatory burdens thereof including, without limitation, any fines, penalties, expenses, fees or costs arising from any regulatory enforcement actions commenced against City in relation thereto.

18. All notices shall be given in writing to the other party at their address set forth

below, and shall be effective upon receipt:

Pioneer: Pioneer Irrigation District
P.O. Box 426
Caldwell, ID 83606
Attn: Superintendent

Nampa: City of Nampa
411 3rd Street So.
Nampa, Idaho 83651
Attention: Public Works Director

19. This Agreement shall not be used or construed as creating or establishing, or entitling any third party to create or establish, any water right in connection with the Recycled Water.

20. The parties represent and warrant that the person signing this Agreement on behalf of each party has been duly authorized to do so, and is fully vested with the authority to bind that party in all respects.

THE PARTIES hereto have executed this Agreement effective as of the latest date of execution set forth below.

THE CITY OF NAMPA, IDAHO

By _____
Deborah Kling, Mayor
Dated 3-5-18

ATTEST :

_____
City Clerk

PIONEER IRRIGATION DISTRICT

By _____
Alan Newbill President
Dated 3/7/2018

ATTEST :

_____
Secretary

Locations are approximate and require further investigation.

Appendix C: Indian Creek Background Flow Data

Table C-1. May 2012 Indian Creek Flow and Water Quality Data						
Date	Flow	Temperature	NO_2-NO_3	TKN	Total Nitrogen	Total Phosphorus
	cfs	°C	mg/l	mg/l	mg/l	mg/l
5/1/2012	64	14.3	–	–	–	–
5/2/2012	63	9.8	–	–	–	0.17
5/3/2012	72	–	–	–	–	–
5/4/2012	77	–	–	–	–	–
5/5/2012	72	–	–	–	–	–
5/6/2012	75	–	–	–	–	–
5/7/2012	77	14.4	–	–	–	–
5/8/2012	68	–	–	–	–	–
5/9/2012	56	11.4	2.14	0.49	2.63	0.13
5/10/2012	51	–	–	–	–	–
5/11/2012	42	–	–	–	–	–
5/12/2012	42	–	–	–	–	–
5/13/2012	43	–	–	–	–	–
5/14/2012	43	–	–	–	–	–
5/15/2012	46	16.5	–	–	–	–
5/16/2012	45	13.8	–	–	–	0.24
5/17/2012	45	–	–	–	–	–
5/18/2012	48	–	–	–	–	–
5/19/2012	48	–	–	–	–	–
5/20/2012	48	–	–	–	–	–
5/21/2012	47	17.5	–	–	–	–
5/22/2012	48	–	–	–	–	–
5/23/2012	49	12.5	–	–	–	0.20
5/24/2012	49	–	–	–	–	–
5/25/2012	51	–	–	–	–	–
5/26/2012	60	–	–	–	–	–
5/27/2012	63	–	–	–	–	–
5/28/2012	57	–	–	–	–	–
5/29/2012	51	–	–	–	–	–
5/30/2012	51	13.6	–	–	–	0.24
5/31/2012	50	15.5	–	–	–	–
Average	**55**	**13.9**	**2.14**	**0.49**	**2.63**	**0.20**

Table C-2. June 2012 Indian Creek Flow and Water Quality Data						
Date	Flow	Temperature	NO_2-NO_3	TKN	Total Nitrogen	Total Phosphorus
	cfs	°C	mg/l	mg/l	mg/l	mg/l
6/1/2012	49	–	–	–	–	–
6/2/2012	50	–	–	–	–	–
6/3/2012	47	–	–	–	–	–
6/4/2012	56	–	–	–	–	–
6/5/2012	44	15.3	–	–	–	–
6/6/2012	47	11.7	–	–	–	0.20
6/7/2012	44	–	–	–	–	–
6/8/2012	44	–	–	–	–	–
6/9/2012	47	–	–	–	–	–
6/10/2012	49	–	–	–	–	–
6/11/2012	47	18.0	–	–	–	–
6/12/2012	45	–	–	–	–	–
6/13/2012	42	15.4	4.80	0.61	5.41	0.19
6/14/2012	50	–	–	–	–	–
6/15/2012	38	–	–	–	–	–
6/16/2012	38	–	–	–	–	–
6/17/2012	39	–	–	–	–	–
6/18/2012	38	18.1	–	–	–	–
6/19/2012	28	–	–	–	–	–
6/20/2012	32	14.3	–	–	–	0.20
6/21/2012	36	–	–	–	–	–
6/22/2012	24	–	–	–	–	–
6/23/2012	24	–	–	–	–	–
6/24/2012	24	–	–	–	–	–
6/25/2012	24	–	–	–	–	–
6/26/2012	24	17.6	–	–	–	–
6/27/2012	26	15.0	–	–	–	0.24
6/28/2012	29	–	–	–	–	–
6/29/2012	28	–	–	–	–	–
6/30/2012	30	–	–	–	–	–
Average	**38**	**15.7**	**4.80**	**0.61**	**5.41**	**0.21**

Table C-3. July 2012 Indian Creek Background Flow Data						
Date	Flow	Temperature	NO2-NO3	TKN	Total Nitrogen	Total Phosphorus
	cfs	°C	mg/l	mg/l	mg/l	mg/l
7/1/2012	32	–	–	–	–	–
7/2/2012	31	19.9	–	–	–	–
7/3/2012	29	18.0	–	–	–	0.23
7/4/2012	29	–	–	–	–	–
7/5/2012	32	–	–	–	–	–
7/6/2012	30	–	–	–	–	–
7/7/2012	31	–	–	–	–	–
7/8/2012	33	–	–	–	–	–
7/9/2012	34	–	–	–	–	–
7/10/2012	33	19.0	–	–	–	–
7/11/2012	50	18.6	3.87	0.43	4.30	0.26
7/12/2012	54	–	–	–	–	–
7/13/2012	58	–	–	–	–	–
7/14/2012	59	–	–	–	–	–
7/15/2012	61	–	–	–	–	–
7/16/2012	62	–	–	–	–	–
7/17/2012	55	18.1	–	–	–	--
7/18/2012	54	18.5	–	–	–	0.21
7/19/2012	36	–	–	–	–	–
7/20/2012	33	–	–	–	–	–
7/21/2012	34	–	–	–	–	–
7/22/2012	34	–	–	–	–	–
7/23/2012	35	–	–	–	–	–
7/24/2012	34	18.3	–	–	–	-
7/25/2012	31	17.8	–	–	–	0.22
7/26/2012	30	–	–	–	–	–
7/27/2012	28	–	–	–	–	–
7/28/2012	27	–	–	–	–	–
7/29/2012	28	–	–	–	–	–
7/30/2012	29	–	–	–	–	–
7/31/2012	28	–	–	–	–	–

Table C-4. August 2012 Indian Creek Flow and Water Quality Data						
Date	Flow	Temperature	NO_2-NO_3	TKN	Total Nitrogen	Total Phosphorus
	cfs	°C	mg/l	mg/l	mg/l	mg/l
8/1/2012	29	18.2	4.47	0.68	5.15	0.26
8/2/2012	29	19.1	–	–	–	–
8/3/2012	28	–	–	–	–	–
8/4/2012	29	–	–	–	–	–
8/5/2012	29	–	–	–	–	–
8/6/2012	28	–	–	–	–	–
8/7/2012	29	19.6	–	–	–	–
8/8/2012	30	18.4	–	–	–	0.32
8/9/2012	31	–	–	–	–	–
8/10/2012	31	–	–	–	–	–
8/11/2012	31	–	–	–	–	–
8/12/2012	35	–	–	–	–	–
8/13/2012	39	–	–	–	–	–
8/14/2012	42	18.4	–	–	–	–
8/15/2012	42	–	–	–	–	–
8/16/2012	41	17.9	–	–	–	0.23
8/17/2012	41	–	–	–	–	–
8/18/2012	41	–	–	–	–	–
8/19/2012	44	–	–	–	–	–
8/20/2012	47	–	–	–	–	–
8/21/2012	46	18.5	–	–	–	–
8/22/2012	45	17.6	–	–	–	0.26
8/23/2012	45	–	–	–	–	–
8/24/2012	45	–	–	–	–	–
8/25/2012	47	–	–	–	–	–
8/26/2012	54	–	–	–	–	–
8/27/2012	62	–	–	–	–	–
8/28/2012	60	–	–	–	–	–
8/29/2012	50	17.1	–	–	–	0.24
8/30/2012	50	17.5	–	–	–	–
8/31/2012	53	–	–	–	–	–
Average	**40**	**18.2**	**4.47**	**0.68**	**5.15**	**0.26**

Table C-5. September 2012 Indian Creek Flow and Water Quality Data						
Date	Flow	Temperature	NO_2-NO_3	TKN	Total Nitrogen	Total Phosphorus
	cfs	°C	mg/l	mg/l	mg/l	mg/l
9/1/2012	53	–	–	–	–	–
9/2/2012	53	–	–	–	–	–
9/3/2012	54	–	–	–	–	–
9/4/2012	53	–	–	–	–	–
9/5/2012	54	16.0	–	–	–	0.19
9/6/2012	54	–	–	–	–	–
9/7/2012	53	–	–	–	–	–
9/8/2012	56	–	–	–	–	–
9/9/2012	70	17.4	–	–	–	–
9/10/2012	70	–	–	–	–	–
9/11/2012	70	–	–	–	–	–
9/12/2012	70	14.1	3.07	0.45	3.52	0.20
9/13/2012	69	15.5	–	–	–	–
9/14/2012	71	–	–	–	–	–
9/15/2012	71	–	–	–	–	–
9/16/2012	69	–	–	–	–	–
9/17/2012	70	–	–	–	–	–
9/18/2012	70	15.5	–	–	–	–
9/19/2012	70	14.4	–	–	–	0.17
9/20/2012	71	–	–	–	–	–
9/21/2012	72	–	–	–	–	–
9/22/2012	71	–	–	–	–	–
9/23/2012	71	–	–	–	–	–
9/24/2012	72	–	–	–	–	–
9/25/2012	72	16.0	–	–	–	–
9/26/2012	72	15.8	–	–	–	0.17
9/27/2012	72	–	–	–	–	–
9/28/2012	72	–	–	–	–	–
9/29/2012	71	–	–	–	–	–
9/30/2012	71	–	–	–	–	–
Average	**66**	**15.6**	**3.07**	**0.45**	**3.52**	**0.18**

Appendix D: Phyllis Canal Background Data

Table D-1. Phyllis Canal Background Data									
Date	Temperature	TDS	Total P	Ortho P (as P)	TKN	NH_3	NO_3-NO_2	NO_3	TN
	°C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
4/25/2007			0.16			0.02		0.1	
5/2/2007			0.39			0.07		<0.1	
6/6/2007			0.41			0.06		<0.1	
7/11/2007			0.33			0.70		<0.1	
8/8/2007			0.30			0.16		1.0	
9/12/2007			0.39			0.18		1.1	
10/3/2007			0.43			0.04		1.2	
4/16/2008			0.50			0.04	1.75	1.8	
4/30/2008			0.40			0.04			
5/13/2008			0.32			0.03	1.20	1.3	
5/13/2008	10.5		0.32	0.25	0.60	0.03	1.20		1.80
5/28/2008			0.28			0.06	1.65	0.2	
5/28/2008	12.0		0.28	0.15	0.40	0.06	0.65		1.05
6/10/2008			0.24			0.01	0.68	0.4	
6/10/2008	12.2		0.24	0.18	0.30	0.01	0.68		0.98
6/25/2008			0.36			0.01	1.34	0.9	
6/25/2008	15.2		0.36	0.27	0.60	0.01	1.34		1.94
7/1/2008			0.34			0.11	1.03	0.7	
7/1/2008	17.0		0.34	0.25	0.50	0.11	1.03		1.53
7/16/2008			0.26			0.10	0.99	0.6	
7/16/2008	17.1		0.26	0.20	0.50	0.10	0.99		1.49
8/12/2008			0.31			0.14	1.68	1.3	
8/12/2008	18.0		0.31	0.25	0.30	0.14	1.68		1.98
8/27/2008			0.33			0.03	1.62	1.2	
8/27/2008	16.5		0.33	0.31	0.40	0.03	1.62		2.02
9/9/2008	17.0		0.33	0.30	0.05	0.04	1.50		1.55
9/24/2008			0.26			0.10	1.12	0.9	
9/24/2008	15.0		0.26	0.27	0.50	0.10	1.12		1.62
10/7/2008			0.24			0.05	1.06	0.6	
10/7/2008	15.2		0.24	0.23	0.50	0.05	1.06		1.56
5/14/2009			0.26			0.30		0.6	
6/4/2009			0.22			0.10		0.3	
6/18/2009			0.14			0.09		0.3	
6/24/2009			0.14			0.08		0.3	
7/8/2009			0.25			0.05		0.4	
7/22/2009			0.34			0.04		0.9	
8/12/2009			0.32			0.04		0.7	
8/26/2009			0.32			0.05		1.0	
9/30/2009			0.29			0.02		0.8	

Table D-1. Phyllis Canal Background Data									
Date	Temperature	TDS	Total P	Ortho P (as P)	TKN	NH_3	NO_3-NO_2	NO_3	TN
	°C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
2007–2009 Average	**15.1**		**0.30**	**0.24**	**0.42**	**0.09**	**1.23**	**0.77**	**1.6**
8/20/2018	19.0	140	0.08		0.32		2.03		2.35
8/21/2018	19.1	134	0.07		0.32		1.72		2.04
8/22/2018	20.1	136	0.11		0.28		1.71		1.99
8/23/2018	20.1	126	0.07		0.30		3.53		3.83
8/24/2018	19.5	140	0.07		0.34		1.67		2.01
8/25/2018	20.5	135	0.18		0.32		1.71		2.03
8/27/2018	18.3	134	0.08		0.33		1.51		1.84
8/28/2018	19.2	104	0.06		0.28		1.63		1.91
8/29/2018	17.7	134	0.03		0.31		1.30		1.61
8/30/2018	19.0	136	0.09		0.46		1.60		2.06
8/31/2018	20.1	106	0.04		0.33		1.24		1.57
9/1/2018	17.8	125	0.11		0.36		1.42		1.78
9/3/2018	19.8	111	0.06		0.29		1.10		1.39
9/4/2018	18.2	122	0.07		0.31		1.33		1.64
9/5/2018	19.4	145	0.08		0.33		1.40		1.73
9/6/2018	21.6	166	0.08		0.36		1.72		2.08
9/7/2018	19.2	130	0.06		0.33		1.67		2.00
9/8/2018	20.0	144	0.08		0.41		1.82		2.23
9/10/2018	17.7	170	0.08		0.45		1.47		1.92
9/11/2018	17.7	153	0.08		0.36		1.69		2.05
9/12/2018	17.8	148	0.06		0.31		1.48		1.79
9/13/2018	16.6	169	0.14		0.38		1.48		1.86
9/14/2018	17.4	147	0.08		0.42		1.51		1.93
9/15/2018	17.7	164	0.06		0.39		1.65		2.04
2018 Average	**18.9**	**138**	**0.08**		**0.35**		**1.64**		**1.99**
Overall Average	**17.7**	**138**	**0.22**	**0.24**	**0.37**	**0.09**	**1.44**	**0.77**	**1.86**

Appendix E: Groundwater Quality Modelling Documentation

Recycled Water Reuse Permit Application
Appendix E
Groundwater Quality Modelling

Prepared for
City of Nampa
Nampa, Idaho
April 24, 2019

Limitations:

This document was prepared solely for City of Nampa in accordance with professional standards at the time the services were performed and in accordance with the contract between City of Nampa and Brown and Caldwell dated January 1, 2009. This document is governed by the specific scope of work authorized by City of Nampa; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by City of Nampa and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

Table of Contents

List of Tables

Section 1: Introduction and Background

Contaminant transport modeling was conducted to assess impact to groundwater from canal seepage for nitrate and total dissolved solids (TDS). Modeling was conducted with the Water Reuse/Land Treatment System (WR/LTS) model obtained from the Idaho Department of Environmental Quality (IDEQ). The WR/LTS model tool consists of two modules, the Nutrient/Hydraulic Balance module and the Groundwater Contaminant Transport module and is conventionally used to estimate groundwater impacts from reuse water applied to agricultural land. The Nutrient/Hydraulic Balance module calculates constituent loading rates, crop uptake and groundwater constituent loss, hydraulic loading rate, and percolate analyte concentration and volume. The percolate concentration and volume are then used as inputs into the Groundwater Contaminant Transport module that calculates groundwater constituent concentration at a defined downgradient location (IDEQ, 2018).

Predicting impacts to groundwater chemistry resulting from canal seepage receiving Class A recycled water from the Nampa Wastewater Treatment Plant (WWTP) is an atypical application of the model that does not require the Nutrient/Hydraulic Balance module. Percolate volume and analyte concentration that would have been generated from the Nutrient/Hydraulic Balance Module are analytical estimates. Percolate concentration was estimated as the concentrations in the Phyllis Canal after the addition of Class A recycled water. Section 7.5.2 of the Preliminary Technical Report provides additional detail. Percolate volume was estimated using published canal seepage estimates, canal flow rate, and areal extent and is described in Section 3. Other Groundwater Contamination Transport inputs define the geology, aquifer characteristics, and orientation of the source relative to groundwater flow.

The Groundwater Contaminant Transport module guidance instructs the user to define the land treatment swath that is a polygon oriented with groundwater flow direction. The swath length parallel and perpendicular to groundwater flow are key parameters for modeling impacts. The swath would be the perimeter of the field in the agricultural water reuse scenario typical of the model application. In this canal seepage application, two swaths were defined along the Phyllis Canal downstream of the injection point of treated effluent and upstream of other return flows to the canal. One swath was defined in a portion of the canal that flows perpendicular to groundwater flow direction and another in a portion of the canal that flows parallel to groundwater flow. Swath orientation to groundwater flow is the predominant input variable in the Groundwater Contaminant Transport module, and the selection of reaches flowing parallel and perpendicular to groundwater provides impact endmembers.

Section 2: Background Groundwater Quality

Background groundwater quality was determined with analyte data contained in the State of Idaho's Environmental Data Management System (EDMS). The EDMS is a database of well construction/location data and groundwater quality data that can be assessed using a web-based interactive map. Wells were identified in the vicinity of anticipated impact and included wells directly upgradient of the Class A Recycled water discharge location (Figure 10). Well and analyte data was filtered to include only wells in the shallow aquifer (80 feet or less) and a water quality sampling date within the past 10 years for NO_3. Using the filters applied to nitrate data in the EDMS results in only one TDS data point. To capture a range of TDS results in the shallow aquifer, well depth was filtered to 100 feet or less, and the sample date range was filtered to include the past 30 years. The TDS dataset spans 1991 – 2011. Nitrate and TDS results are included in Table E-1. Background analyte concentration is a model input and is calculated as the average of the filtered data.

A total of 26 wells were identified in the region of interest. When the dataset was filtered for well depth and sampling date, the background nitrate concentration was calculated from nine samples and the TDS were estimated with five data points. Background nitrate concentration was estimated to be 7.3 mg/L and the TDS concentration to be 512 mg/L. Both background analyte concentration estimates are above the canal water concentrations.

Table E-1. Background Groundwater Analyte Data

Analyte	Well Depth (ft)	Sample Date	Concentration (mg/L)
Nitrate	83	2017-06-28	4.8
	67	2014-07-16	7.3
	48	2016-07-07	7.6
	80	2015-06-23	8.8
	80	2012-09-11	8.4
	69	2012-09-11	7.7
	78	2012-09-26	6.0
	38	2012-09-11	0.31
	80	2012-09-18	5.1
	Median		7.3
Total dissolved solids	48	2011-06-27	538
	92	2001-06-28	279
	83	2007-06-29	501
	63	1998-07-08	512
	90	1991-08-27	533
	Median		512

Section 3: Model Inputs

The Groundwater Contaminant Transport module requires mixing zone depth, hydrogeologic, and groundwater transport data inputs. Known input parameters were entered while less certain parameters were estimated and a sensitivity analysis conducted to determine range of potential impacts. Mixing zone depth inputs include the treatment swath dimensions, percolate volume, percolate constituent concentration, and background groundwater constituent concentration. The percolate volume and constituent concentration are typically retrieved from the Nutrient/Hydraulic Balance module. In this application, percolate constituent concentration was calculated using the constituent concentration in the effluent and canal water. Percolate volume was estimated from published local canal loss rate (12 percent to 20 percent)[1] and assumed treatment

[1] Carlson, R.A., and C.R. Petrich. 1999. New York Canal geologic cross section, seepage gain/loss data and ground water hydrographs: compilation and interim findings. Treasure Valley Hydrologic Project Open File Report. 6 p. Berenbrock, C. 1999. Streamflow gains and losses in the Lower Boise River Basin, Idaho, 1996–97. U.S. Geological Survey Water Resources Investigations Report 99-4105.

swath volume with a 5 foot water column (1,700 feet x 25 feet x 5 feet). Hydrogeologic inputs are the hydraulic conductivity (high, low range), hydraulic gradient, aquifer material, aquifer porosity, and aquifer thickness. Groundwater transport calculation spatial and temporal inputs are required; however, the soil and chemical properties do not apply for the conservative species modeled (nitrate and TDS).

Table E-2. Model Inputs

Input Parameter	Value	Units	Discussion of Sensitivity	Input Value Justification
Land treatment swath length parallel to groundwater flow	1,700 x 25	ft	Model highly sensitive to parameter	Swath dimensions for the sections parallel to and perpendicular to groundwater flow. 25 ft is canal width. Swath is shown on Figure 11.
Land treatment swath width perpendicular to groundwater flow	25 x 1,700	ft	Model highly sensitive to parameter	Swath dimensions for the sections parallel to and perpendicular to groundwater flow. 25 ft is canal width.
Percolate volume	7.2 - 12	in/acre	Model sensitive to value, higher value more dilution and larger spatial scale to background	Value estimated on published canal loss estimates [1] and calculated using canal loss estimate (acre-foot) and distributed along length of treatment swath
Percolate constituent concentration: (nitrate, TDS)	Nitrate 5.75 TDS 213	mg/L	Model sensitive to value	Preliminary Technical Report Section 7.5.2.
Upgradient groundwater concentration: (nitrate, TDS)	Nitrate 7.3 TDS 512	mg/L	Model sensitive to value	Statistical estimation based on available data
Aquifer hydraulic conductivity: high range, low range	100; 500	mg/L	Model highly sensitive to parameter, accounted for in the model by default	Value range from the IWRRI Treasure Valley Groundwater model study and taken from the IDEQ Guidance for Reclamation and Reuse of Municipal and Industrial Wastewater
Aquifer hydraulic gradient	0.002	Unitless	Model sensitive to value	Estimated from localized groundwater contours [2]
Aquifer material	Silt, clay, sand		Model sensitive to parameter	Select from drop down menu in tool, simulations run with each primary aquifer material shown on Figure 11.
Aquifer effective porosity (enter suggested or other value as a percent)	26–60	%	Model sensitive to parameter	Recommended ranges dependent on aquifer material selected.
Aquifer thickness	85	ft	Model insensitive to parameter	Estimated with analyte data processing
Spatial coordinates of concern (x,y,z)	100, 0, 0	ft	Model insensitive to parameter	Hypothetical downgradient point of concern
Depth of vertical profile to calculate and observe	110.5	ft	Model insensitive to parameter	Model Guide suggests 1.3 times aquifer depth
Time that the source is discharging	100,000	days	Model sensitive to parameter	Steady state conditions simulated with high value
AREAL model calculation domain (length, width)	1,000, 1,700	ft	Model insensitive to parameter	Dimension of area modeled, entered dimensions of swath

[1] *Carlson, R.A., and C.R. Petrich. 1999. New York Canal geologic cross section, seepage gain/loss data and ground water hydrographs: compilation and interim findings. Treasure Valley Hydrologic Project Open File Report. 6 p. Berenbrock, C. 1999. Streamflow gains and losses in the Lower Boise River Basin, Idaho, 1996–97. U.S. Geological Survey Water Resources Investigations Report 99-4105.*

[2] *Petrich, C., Urban, S. 2004. Idaho Water Resources Research Institute Research Report: Characterization of Ground Water Flow in the Lower Boise River Basin. IWRRI-2004-01.*

Section 4: Results

The Groundwater Contaminant Transport module results in a vertical and lateral dilution of background groundwater concentration for nitrate and TDS. This is the expected result because percolate concentration is less than background groundwater concentration. The model is highly sensitive to land treatment swath orientation. Mixing and dilution is exaggerated when the canal is oriented parallel to groundwater flow direction, and mixing is greatly reduced when the swath is perpendicular to groundwater flow. The model is slightly sensitive to changes in hydrogeological/aquifer characteristics. Sensitivity analysis of uncertain input parameters modified the spatial extent of dilution, but in all cases, dilution was in the near field with increasing concentrations to background level at distance.

Section 5: Summary

Groundwater chemistry impacts resulting from canal seepage representative of the reuse permit scenario were evaluated with the use of the IDEQ's WR/LTS model. Two solutes were analyzed, nitrate and TDS. This application of the WR/LTS model is unconventional and required method modification, most notably the omission of the Nutrient/Hydraulic Balance module as a precursor to the Groundwater Contaminant Transport module. The percolate volume and concentration that are outputs of the Nutrient/Hydraulic Balance module were analytically derived. Background groundwater quality was estimated using available data on the State of Idaho's EDMS database, and the percolate solute concentrations were below background. The model results showed a dilution of nitrate and TDS concentration that gradually increased to background levels at distance.

Section 6: Supporting Figures

Figures in this section are included to support assumptions used for model inputs as described in Section 3.

6.1 Well Logs

Well logs were available for two of the wells in the immediate proximity of the modeled sections of the canal. These logs provide information for aquifer material, aquifer thickness, aquifer hydraulic conductivity, aquifer effective porosity, and depth of vertical profile to calculate and observe. Well logs are included below. Geologic information for the broader area is provided in Figure 11.

834815

Office Use Only
Well ID No. 405342
Inspected by
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

Form 238-7 6/02 (03)

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

1. WELL TAG NO. D 0039350
DRILLING PERMIT NO.
Water Right or Injection Well No.

2. OWNER:
Name Daniel Reece
Address 1104 Smith Ave
City Nampa State Id Zip 83651

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 3 North ☒ or South ☐
Rge. 3 East ☐ or West ☒
Sec. 20 ____ 1/4 SE 1/4 (40 acres) NE 1/4 (160 acres)
Gov't Lot ____ County Canyon
Lat: : : Long: : :
Address of Well Site behind 1104 Smith Ave
City Nampa
(Give at least name of road + Distance to Road or Landmark)
Lt. ____ Blk. ____ Sub. Name

4. USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other

6. DRILL METHOD:
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
Bentonite	0	20	950 #	overbore

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) 73'
Was drive shoe seal tested? ☐ Y ☒ N How?

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6"	+2	73	250	Steel	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe ____ Length of Tailpipe ____
Packer ☐ Y ☐ N Type

9. PERFORATIONS/SCREENS PACKER TYPE
Perforation Method
Screen Type & Method of Installation none - open

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
3 ft. below ground Artesian pressure ____ lb.
Depth flow encountered ____ ft. Describe access port or control devices:
well cap

12. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
100			1 hour

Water Temp. 64° Bottom hole temp.
Water Quality test or comments: Iron .5 PH 7.5
Grains 8 Depth first Water Encounter 20'

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
10	0	16	top soil		
"	16	20	Sand		
6	20	21	Sand	X	
"	21	45	coarse Sand w/clay	X	
"	45	54	Sandy clay	X	
"	54	62	Fractured clay	X	
"	62	72	Sandy clay	X	
"	72	73	coarse sand	X	
"	73	94	lava rock	X	
"	94	97	red clay	X	

RECEIVED
AUG 0 1 2005
WATER RESOURCES
WESTERN REGION

Completed Depth 97 (Measurable)
Date: Started 07-20-05 Completed 07-21-05

14. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.
Company Name Adamson Pump & Drill Firm No. 457
Principal Driller Dave Adamson Date 07-21-05
and
Driller or Operator II Dave Adamson Date 07-21-05
Operator I ____ Date ____
Principal Driller and Rig Operator *Required*.
Operator I must have signature of Driller/Operator II.

FORWARD WHITE COPY TO WATER RESOURCES

Form 238-7
1/78

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

USE TYPEWRITER OR BALLPOINT PEN

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

1. WELL OWNER

Name Mc DOMALD'S (BILL HALL)

Address NAMPA, IDAHO

Owner's Permit No. _____

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Abandoned (describe method of abandoning) _____.

3. PROPOSED USE

☒ Domestic ☐ Irrigation ☐ Test ☐ Municipal
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other _____ (specify type)

4. METHOD DRILLED

☒ Rotary ☒ Air ☐ Hydraulic ☐ Reverse rotary
☐ Cable ☐ Dug ☐ Other _____

5. WELL CONSTRUCTION

Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____

Thickness	Diameter	From	To
.250 inches	6 inches +	1'6" feet	69'2" feet
_____ inches	_____ inches	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet

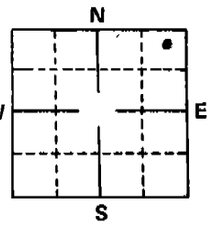
Was casing drive shoe used? ☒ Yes ☐ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch
Size of perforation _____ inches by _____ inches

Number	From	To
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet

Well screen installed? ☐ Yes ☒ No
Manufacturer's name _____
Type _____ Model No. _____
Diameter ____ Slot size ____ Set from _____ feet to _____ feet
Diameter ____ Slot size ____ Set from _____ feet to _____ feet
Gravel packed? ☐ Yes ☒ No ☐ Size of gravel _____
Placed from _____ feet to _____ feet
Surface seal depth 20' Material used in seal: ☐ Cement grout ☒ Puddling clay ☒ Well cuttings
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing ☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld ☐ Cemented between strata
Describe access port _____

6. LOCATION OF WELL

Sketch map location must agree with written location. 63



Subdivision Name _____
Lot No. _____ Block No. _____
County CANYON
N. E.¼ N. E.¼ Sec. 21, T. 3 N/S, R. 2 E/W.

7. WATER LEVEL

Static water level 17 feet below land surface.
Flowing? ☐ Yes ☒ No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature _____ °F. Quality _____

8. WELL TEST DATA

☐ Pump ☐ Bailer ☒ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped
75		2

9. LITHOLOGIC LOG

103128

Hole Diam.	Depth From	Depth To	Material	Water Yes	Water No
8"	0'	6"	pavement		x
8"	6"	2'	sand and gravel		x
8"	2'	12'	sand with clay layers		x
8"	12'	24'	sand and gravel		x
6"	24'	30'	snd		x
6"	30'	56'	sand and clay layers		x
6"	56'	67'	sand with some gravel	x	
6"	67'	103'	rock	x	
6"	103'		sand and gravel	x	

RECEIVED
NOV 15 1979
Department of Water Resources
Western Regional Office

RECEIVED
APR 11 1980
Department of Water Resources

10.

Work started 6-11-79 finished 6-11-79

11. DRILLERS CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name BILL DOTY WELL DRILLING Firm No. 42
Address Rt. 7 CALDWELL, IDAHO Date 8-31-79
Signed by (Firm Official) Bill Doty
and
(Operator) [illegible]

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

6.2 Dispersion Graphs

Horizontal and vertical dispersion of percolate constituent concentrations are plotted on the following graphs.

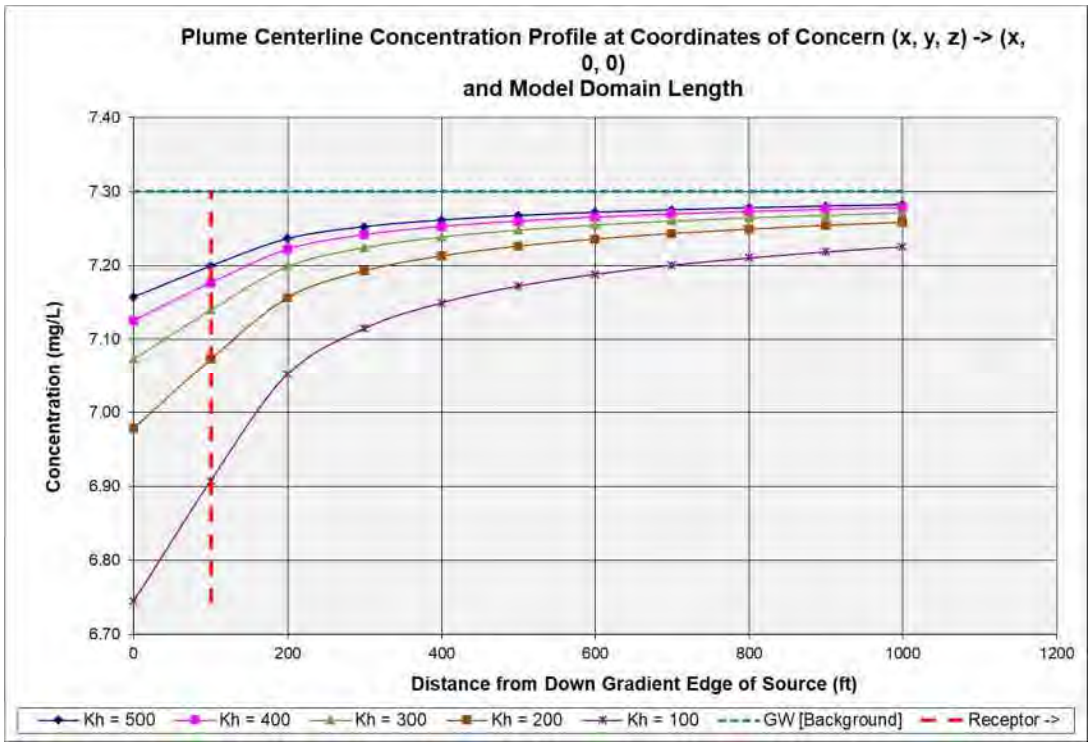


Figure E-1. NO_3 Concentration Profiles Treatment Swath Parallel to Groundwater Flow

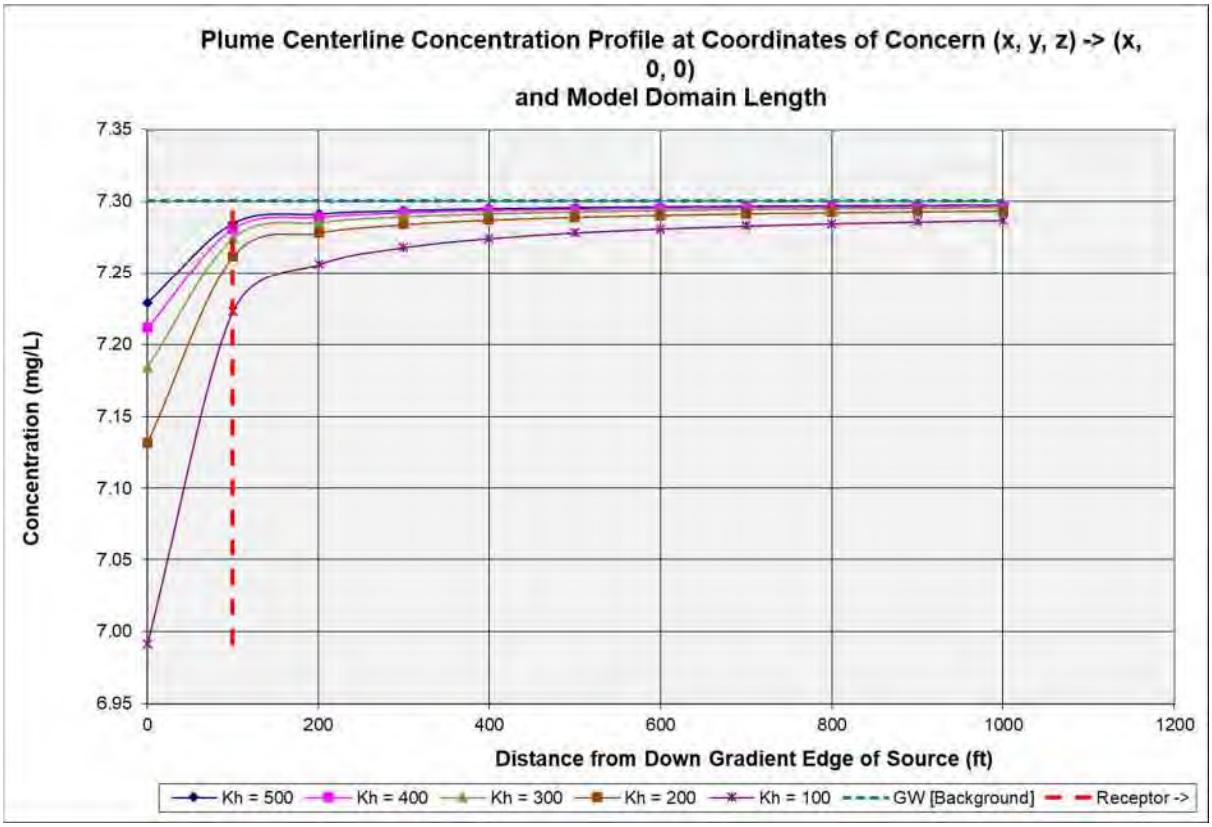


Figure E-2. NO_3 Concentration Profiles Treatment Swath Perpendicular to Groundwater Flow

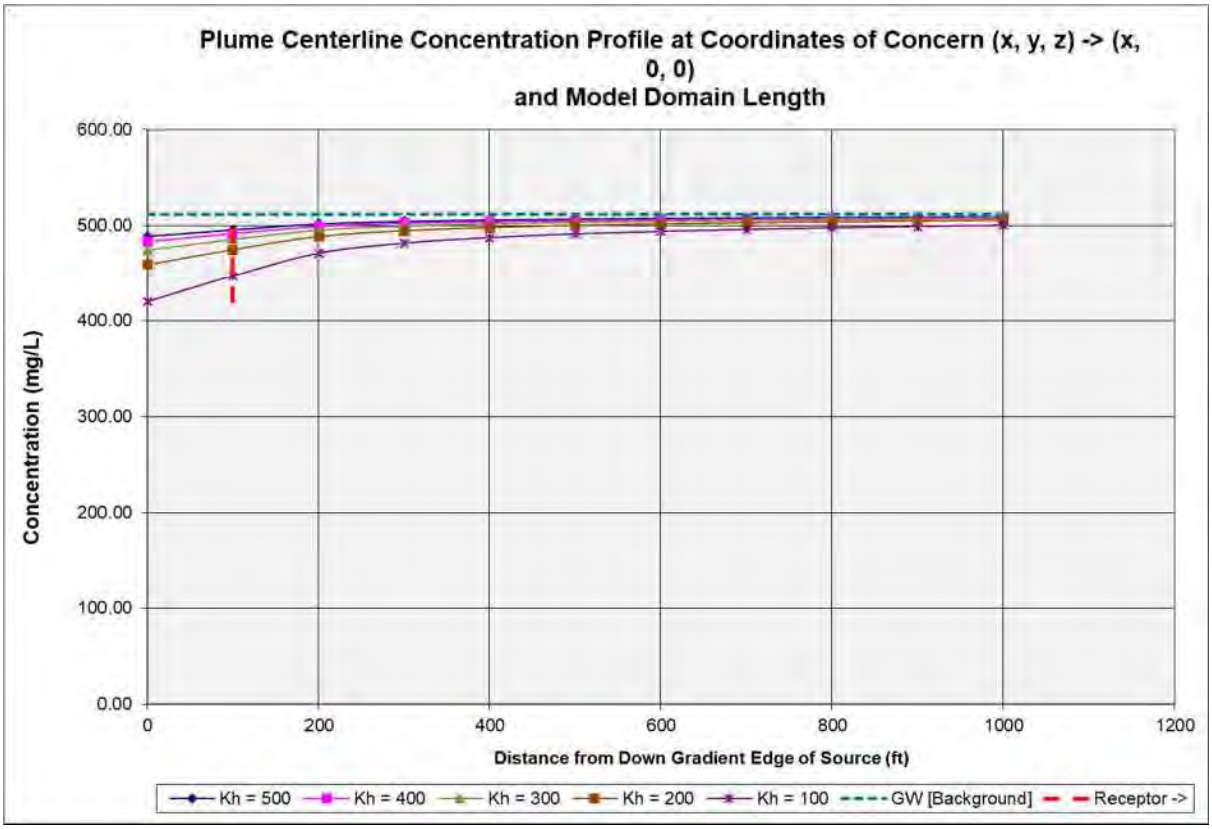


Figure E-3. TDS Concentration Profiles Treatment Swath Parallel to Groundwater Flow

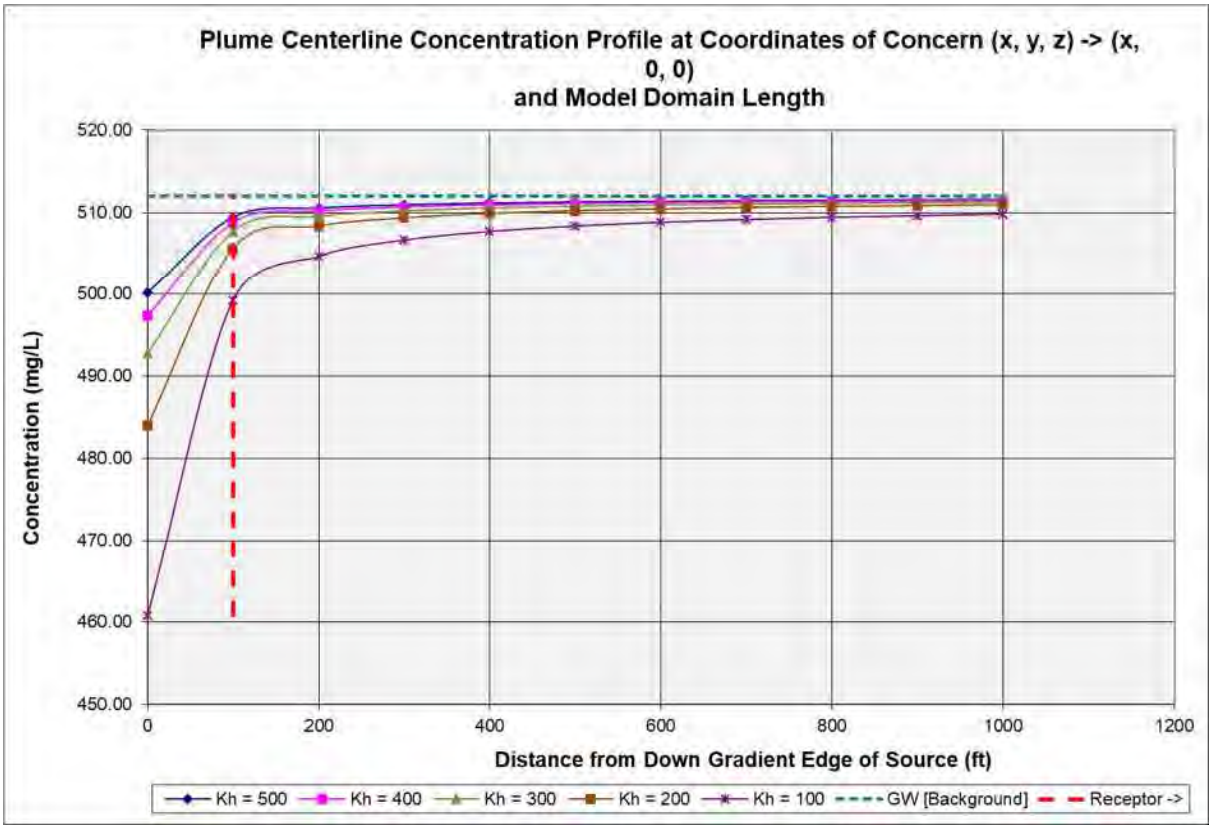


Figure E-4. TDS Concentration Profiles Treatment Swath Perpendicular to Groundwater Flow

Appendix F: Available Water and Irrigation Water Requirement Documentation

Recycled Water Reuse Permit Application
Appendix F
Crop Nutrient and Water Uptake

Prepared for
City of Nampa
Nampa, Idaho
March 19, 2019

Table of Contents

List of Tables

Section 1: Irrigation Water Requirement

Land uses and crop types were used to determine Irrigation Water Requirement (IWR) in the areas served by the Phyllis Canal downstream from the proposed recycled water discharge location. Table F-1 shows the acreage of each land use/crop type as derived from land use GIS data in the USDA National Agricultural Statistics Service Cropland Data Layer from 2017 (NASS, 2017). These include developed land (turf grass), alfalfa, grass pasture, winter (grain) wheat, snap and dry beans-seed, peas-seed, corn–moderate season, sugar beets, grass hay, and mixed vegetables.

Table F-1. Land Use/Crop Type Acreage

Land Use/Crop Type	Acreage
Developed/open space	5,336
Developed/low intensity	3,986
Alfalfa	2,985
Grass/pasture	2,528
Developed/medium intensity	1,168
Winter wheat	878
Dry beans	714
Peas	248
Corn	1,458
Sugar beets	543
Developed/high intensity	200
Fallow/idle cropland [1]	294
Other hay/non-alfalfa	192
Mixed vegetables: sum of all land uses under 40 acres	1,642
Total acreage	22,172

Source: National Agricultural Statistics Service: Cropscape program (NASS, 2017).

[1] Area not included in irrigation acreage for loading analysis.

The developed/turf grass classification was comprised of 4 subcategories. These included developed/open space, developed low intensity, developed medium intensity and developed high intensity. To conservatively estimate the available land for irrigation in each category this analysis de-rated the GIS land acreage for each of these subcategories. It was assumed that developed open space only had 80% of the land available for irrigation, developed low intensity assumed that 40% of the land was available for irrigation while developed medium intensity and developed high intensity assumed 30% and 20% available land for irrigation, respectively. The sum of these areas in acres make up the land used for IWR in Table F-2 below. For each of the other major classifications, the whole acreage was assumed to be available for irrigation. IWR is calculated for these in Tables F-3 through F-11

The IWR was calculated using a growing season from May 1 to September 30. The precipitation deficit data for each crop is from the Nampa Station (PN-AM—NMPI) of the University of Idaho Kimberly Research and

Extension Center, ET Idaho Program (UI, 2019). The precipitation deficit is the difference between the potential evapotranspiration and the amount of effective precipitation (water that infiltrates into the soil and can be accessed by plant roots). To paraphrase the Kimberly Research and Extension Center; the precipitation deficit is synonymous with the net IWR when occurring during the growing season and generally is the most appropriate "ET" parameter to use for irrigation system design.

The monthly mean value in mm/day was used for this analysis. This value was converted to mm/month. Next, an assumed irrigation efficiency of 0.60 was applied for all developed/turf grass land; this is a conservative value based on EPA's claim that 50% of water used for residential irrigation is wasted due to evaporation, window, or runoff (UESPA, 2017). An assumed irrigation efficiency of 0.60 – 0.70 was used for all other non-developed land uses, based on expected irrigation application method (Irmak, 2011). The monthly precipitation deficit was divided by the irrigation efficiency to determine the IWR for each month in acre-inches. This value was then divided by the available acreage and finally converted into a total monthly IWR in million gallons for each crop type. This process was repeated for each of the land uses/crop types in Table F-1.

Table F-2 Irrigation Water Requirements for Developed/Turf Grass

Month	mm/day	days/month	mm/month	mm/in	Irrigation Efficiency	IWR (Inches)	ac-in/ac	gal/ac-in	Acres [1]	MGAL
May	4.48	31	138.88	25.4	0.6	9.11	9.11	27,150	6,252	1,547
June	5.69	30	170.70	25.4	0.6	11.20	11.20	27,150	6,252	1,901
July	6.7	31	207.70	25.4	0.6	13.63	13.63	27,150	6,252	2,313
August	5.74	31	177.94	25.4	0.6	11.68	11.68	27,150	6,252	1,982
Sept	3.9	30	117.00	25.4	0.6	7.68	7.68	27,150	6,252	1,303
Total			812.22			53.30	53.30			9,046

[1] *Acreage reductions by land use:*

Irrigation acreage for developed, open space, reduced by 20% for loading analysis.

Irrigation acreage for developed, low density, reduced by 60% for loading analysis.

Irrigation acreage for developed, medium density, reduced by 70% for loading analysis.

Irrigation acreage for developed, high density, reduced by 80% for loading analysis.

Table F-3 Irrigation Water Requirements for Alfalfa

Month	mm/day	days/month	mm/month	mm/in	Irrigation Efficiency	IWR (Inches)	ac-in/ac	gal/ac-in	Acres	MGAL
May	5.02	31	155.62	25.4	0.7	8.75	8.75	27,150	2,985	709
June	5.04	30	151.20	25.4	0.7	8.50	8.50	27,150	2,985	689
July	5.96	31	184.76	25.4	0.7	10.39	10.39	27,150	2,985	842
August	5.46	31	169.26	25.4	0.7	9.52	9.52	27,150	2,985	772
Sept	3.91	30	117.30	25.4	0.7	6.60	6.60	27,150	2,985	535
Total			778.14			43.76	43.76			3,547

Table F-4 Irrigation Water Requirements for Grass Pasture										
Month	mm/day	days/month	mm/month	mm/in	Irrigation Efficiency	IWR (Inches)	ac-in/ac	gal/ac-in	Acres	MGAL
May	3.71	31	115.01	25.4	0.6	7.55	7.55	27,150	2528	518
June	4.77	30	143.10	25.4	0.6	9.39	9.39	27,150	2528	644
July	5.47	31	169.57	25.4	0.6	11.13	11.13	27,150	2528	764
August	4.34	31	134.54	25.4	0.6	8.83	8.83	27,150	2528	606
Sept	2.5	30	75.00	25.4	0.6	4.92	4.92	27,150	2528	338
Total			637.22			41.81	41.81			2,870

Table F-5 Irrigation Water Requirements for Winter Grain Wheat										
Month	mm/day	days/month	mm/month	mm/in	Irrigation Efficiency	IWR (Inches)	ac-in/ac	gal/ac-in	Acres	MGAL
May	5.44	31	168.64	25.4	0.7	9.48	9.48	27,150	878	226
June	4.7	30	141.00	25.4	0.7	7.93	7.93	27,150	878	189
July	0.85	31	26.35	25.4	0.7	1.48	1.48	27,150	878	35
August	0.63	31	19.53	25.4	0.7	1.10	1.10	27,150	878	26
Sept	0.29	30	8.70	25.4	0.7	0.49	0.49	27,150	878	12
Total			364.22			20.48	20.48			488

Table F-6 Irrigation Water Requirements for Snap and Dry Beans (seed)										
Month	mm/day	days/month	mm/month	mm/in	Irrigation Efficiency	IWR (Inches)	ac-in/ac	gal/ac-in	Acres	MGAL
May	0.02	31	0.62	25.4	0.7	0.03	0.03	27,150	714	1
June	3.46	30	103.80	25.4	0.7	5.84	5.84	27,150	714	113
July	7.24	31	224.44	25.4	0.7	12.62	12.62	27,150	714	245
August	2.42	31	75.02	25.4	0.7	4.22	4.22	27,150	714	82
Sept	-0.04	30	-1.20	25.4	0.7	-0.07	-0.07	27,150	714	0
Total			402.68			22.65	22.65			441

Table F-7 Irrigation Water Requirements for Peas (seed)										
Month	mm/day	days/month	mm/month	mm/in	Irrigation Efficiency	IWR (Inches)	ac-in/ac	gal/ac-in	Acres	MGAL
May	4.64	31	143.84	25.4	0.7	8.09	8.09	27,150	248	54
June	4.3	30	129.00	25.4	0.7	7.26	7.26	27,150	248	49
July	0.68	31	21.08	25.4	0.7	1.19	1.19	27,150	248	8
August	-0.01	31	-0.31	25.4	0.7	-0.02	-0.02	27,150	248	0
Sept	-0.1	30	-3.00	25.4	0.7	-0.17	-0.17	27,150	248	0
Total			290.61			16.34	16.34			111

Table F-8 Irrigation Water Requirements for Corn (field, moderate season length)										
Month	mm/day	days/month	mm/month	mm/in	Irrigation Efficiency	IWR (Inches)	ac-in/ac	gal/ac-in	Acres	MGAL
May	0.44	31	13.64	25.4	0.7	0.77	0.77	27,150	1,458	30
June	3.84	30	115.20	25.4	0.7	6.48	6.48	27,150	1,458	256
July	7.73	31	239.63	25.4	0.7	13.48	13.48	27,150	1,458	534
August	6.42	31	199.02	25.4	0.7	11.19	11.19	27,150	1,458	443
Sept	2.81	30	84.30	25.4	0.7	4.74	4.74	27,150	1,458	188
Total			651.79			36.66	36.66			1,451

Table F-9 Irrigation Water Requirements for Sugar Beets										
Month	mm/day	days/month	mm/month	mm/in	Irrigation Efficiency	IWR (Inches)	ac-in/ac	gal/ac-in	Acres	MGAL
May	1.87	31	57.97	25.4	0.7	3.26	3.26	27,150	543	48
June	6.47	30	194.10	25.4	0.7	10.92	10.92	27,150	543	161
July	8.47	31	262.57	25.4	0.7	14.77	14.77	27,150	543	218
August	6.78	31	210.18	25.4	0.7	11.82	11.82	27,150	543	174
Sept	3.97	30	119.10	25.4	0.7	6.70	6.70	27,150	543	99
Total			843.92			47.46	47.46			700

Table F-10 Irrigation Water Requirements for Grass Hay										
Month	mm/day	days/month	mm/month	mm/in	Irrigation Efficiency	IWR (Inches)	ac-in/ac	gal/ac-in	Acres	MGAL
May	5.11	31	158.41	25.4	0.6	10.39	10.39	27,150	192	54
June	6.13	30	183.90	25.4	0.6	12.07	12.07	27,150	192	63
July	6.37	31	197.47	25.4	0.6	12.96	12.96	27,150	192	68
August	5.47	31	169.57	25.4	0.6	11.13	11.13	27,150	192	58
Sept	3.36	30	100.80	25.4	0.6	6.61	6.61	27,150	192	34
Total			810.15			53.16	53.16			277

Table F-11 Irrigation Water Requirements for Mixed Vegetables										
Month	mm/day	days/month	mm/month	mm/in	Irrigation Efficiency	IWR (Inches)	ac-in/ac	gal/ac-in	Acres	MGAL
May	2.49	31	77.19	25.4	0.7	4.34	4.34	27,150	1,642	194
June	5.96	30	178.80	25.4	0.7	10.06	10.06	27,150	1,642	448
July	7.25	31	224.75	25.4	0.7	12.64	12.64	27,150	1,642	564
August	6.07	31	188.17	25.4	0.7	10.58	10.58	27,150	1,642	472
Sept	3.57	30	107.10	25.4	0.7	6.02	6.02	27,150	1,642	269
Total			776.01			43.65	43.65			1,946

Section 2: Total Water Available

Table F-12 contains an approximate accounting of the irrigation water that is typically available to the PID service area downstream from the proposed recycled water discharge location (with the irrigation water that will be made available by the City's recycled water reuse program) and the estimated irrigation water requirement (IWR) for the land use and crop types in the service area.

The following formula was used determine the approximate volume of irrigation water that is typically available in the PID service area below the proposed recycled water discharge location.

$$\begin{aligned} &Typical\ volume\ in\ the\ Phyllis\ Canal\ at\ the\ proposed\ discharge\ location \\ &+ Recycled\ water\ from\ the\ Nampa\ WWTP \\ &+ Pumping\ and\ inputs\ from\ drains\ and\ tailwaters\ of\ neighboring\ irrigation\ districts \\ &- Losses\ to\ groundwater\ from\ the\ bottom\ of\ the\ Phyllis\ Canal\ and\ Laterals \\ &- Losses\ to\ the\ atmosphere\ from\ the\ water\ surface\ in\ the\ Phyllis\ Canal\ and\ Laterals \\ &= \boldsymbol{Total\ Water\ Available} \end{aligned}$$

Table F-12. Irrigation Water Available and Required per Month (M) During period of Recycled Water Discharge							
Month	Typical volume in the Phyllis Canal [1] (MG/Month)	Recycled water [2] (MG/Month)	Inputs from drains [3] (MG/month)	Conveyance losses to groundwater [4] (MG/Month)	Conveyance losses to atmosphere [4] (MG/Month)	Total Water Available (MG/Month)	Total Water Required [5] (MG/Month)
May	4,000	620	1,403	(1,191)	(7.8)	4,824	3,382
June	3,871	600	1,357	(1,152)	(9.1)	4,667	4,515
July	4,000	620	1,403	(1,191)	(10.2)	4,822	5,589
August	4,000	620	1,403	(1,152)	(8.7)	4,863	4,614
September	3,871	600	1,357	(1,191)	(6.2)	4,631	2,774
Total Growing Season	19,742	3,060	6,922	(5,876)	(42)	23,806	20,874

[1] *See Preliminary Technical Report Section 7.5.1.4.*

[2] *Planned recycled water flow rate: 31cfs (20 MGD).*

[3] *See Preliminary Technical Report Table 7-2.*

[4] *See Table F-13.*

[5] *Sum of Values in Tables F-2 – F-11.*

Water losses are expected from unlined and uncovered canals and laterals. Literature estimates for canal water loss through seepage exist for the Nampa area and are included in Carlson and Petrich, 1999 and Berenbrock, 1999. These sources were used to determine typical loss per acre to groundwater from the Phyllis Canal and lateral diversions from the Phyllis Canal. Values are shown in Table F-13. Losses to the atmosphere were calculated in a manner similar to the IWR calculations in Appendix F Section 1. These calculations are shown in Table F-14. Results are included in Table F-13.

Canal and lateral acreages were measured in GIS using georeferenced orthographic imagery. Most of the Phyllis Canal and the major laterals exhibit a nearly rectangular channel geometry. Therefore, surface area and bottom area are assumed to be equal. Laterals that do not surface were assumed to be piped, and therefore are not included in groundwater loss calculations or loss to atmosphere calculations.

Table F-13. Losses from Phyllis Canal and Laterals		
Canal/Lateral	Surface/bottom area (acres)	Loss to groundwater (MG/day)
Phyllis Canal	47	29.4
15.0 Lateral	3.85	2.4
Stevens Lateral	1.8	1.1
Stone Lateral	2.26	1.4
McCarthy Lateral	0.45	0.3
25.1 Lateral	3.12	2
Douglas Lateral	0.09	0.1
Torbett Lateral	0.52	0.3
Smiley Lateral	0.55	0.4
Whittig Lateral	0.34	0.2
Talcott Lateral	0.23	0.1

Table F-13. Losses from Phyllis Canal and Laterals		
Canal/Lateral	Surface/bottom area (acres)	Loss to groundwater (MG/day)
Shelp Lateral	0.36	0.2
Pipe Gulch Laterals	0.82	0.5
Totals	61.4	38.4

Table F-14. Evaporative Loss from Phyllis Canal and Laterals								
Month	mm/day [1]	days/month	mm/month	mm/in	Water Loss (ac-in/acre)	gal/ac-in	Acres	MGAL
May	3.85	31	119.35	25.4	4.70	27,150	61.4	7.83
June	4.6	30	138.00	25.4	5.43	27,150	61.4	9.06
July	4.99	31	154.69	25.4	6.09	27,150	61.4	10.15
August	4.29	31	132.99	25.4	5.24	27,150	61.4	8.73
Sept	3.14	30	94.20	25.4	3.71	27,150	61.4	6.18
Total			639.23		25.17			42.0

[1] *Evapotranspiration rates taken from Nampa Station (PN-AM—NMPI) of the University of Idaho Kimberly Research and Extension Center, ET Idaho Program (UI, 2019).*