FACT SHEET

The United States Environmental Protection Agency (EPA)
Proposes To Reissue
A National Pollutant Discharge Elimination System (NPDES) Permit to:

City of Firth
P.O. Box 37
Firth, Idaho 83236

NPDES Permit Number: ID00249888

Public Notice Start Date: October 2, 2012
Public Notice Expiration Date: November 1, 2012

Technical Contact: John Drabek, 206-553-8257, drabek.john@epa.gov
1-800-424-4372 ext. 3-8257 (within Region 10)
drabek.john@epa.gov

The EPA Proposes To Reissue NPDES Permit

The EPA proposes to reissue the NPDES permit to the facility referenced above. The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from each facility.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures
- a listing of proposed effluent limitations, and other conditions for each facility
- a map and description of the discharge locations
- technical material supporting the conditions in the permit

State Certification for Facilities that Discharge to State Waters

The EPA will request that the Idaho Department of Environmental Quality (IDEQ) certify the NPDES permit for this facility, under Section 401 of the Clean Water Act. Comments regarding the certification should be directed to:

Idaho Department of Environmental Quality
Pocatello Regional Office
444 Hospital Way, No. 300
Pocatello, ID 83201
ph: (208) 236-6160
fx: (208) 236-6168

Public Comment

Persons wishing to comment on, or request a Public Hearing for the draft permit for this facility may do so in writing by the expiration date of the Public Comment period. A request for a Public Hearing must state the nature of the issues to be raised as well as the requester's name, address and telephone number. All comments and requests for Public Hearings must be in writing and should be submitted to the EPA as described in the Public Comments Section of the attached Public Notice.

After the Public Notice expires and all comments have been considered, the EPA Region 10's Director for the Office of Water and Watersheds will make a final decision regarding permit reissuance. If no substantive comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If comments are received, the EPA will address the comments and issue the permit. In such a case, the permit will become effective at least 30 days after the issuance date unless an appeal is submitted to the Environmental Appeals Board within 30 days.

Documents are Available for Review.

The draft permit and fact sheet are posted on the Region 10 website at http://yosemite.epa.gov/r10/WATER.NSF/NPDES+Permits/DraftPermitsID Copies may also be requested by writing to the EPA at the Seattle address below, by e-mailing washington.audrey@epa.gov, or by calling Audrey Washington at 206-553-0523 or (800) 424-4372 ext 0523 (within Alaska, Idaho, Oregon, & Washington). Copies may also be inspected and copied at the offices below between 8:30 a.m. and 4:00 P.M., Monday through Friday, except federal holidays. In Seattle, visitors report to the 12th floor Public Information Center.

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OWW-130
Seattle, Washington 98101
(206) 553-0523 or
Toll Free 1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

EPA Idaho Operations Office
950 W Bannock, Suite 900
Boise, ID 83702
(208) 378-5746

Idaho Department of Environmental Quality
Pocatello Regional Office
444 Hospital Way, No. 300
Pocatello, ID 83201
ph: (208) 236-6160
fx: (208) 236-6168

For technical questions regarding the permit or fact sheet, contact John Drabek at the phone number or e-mail address at the top of this fact sheet. Those with impaired hearing or speech may contact a TDD operator at 1-800-833-6384 and ask to be connected to the appropriate phone number. Persons with disabilities may request additional services by contacting John Drabek.

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APPLICANT

This fact sheet provides information on the draft NPDES permit for the following entity:

Facility Name: City of Firth, Wastewater Treatment Plant

Mailing Address: P.O. Box 37, Firth, Idaho 83236

Facility Address: 106 East Center, Firth, Idaho 83236

Contact: Robert Dial, Public Works Director, (208) 346-6574

I. FACILITY INFORMATION

A. Facility Description

The City of Firth owns, operates and has maintenance responsibility for the City of Firth Wastewater Treatment Plant (facility), a publicly owned treatment works (POTW). The facility treats domestic sewage and commercial wastewater through a separate sanitary sewer system. There are no significant industrial dischargers to the facility. The service area includes the satellite community, the City of Basalt.

Primary treatment consists of screening. Secondary treatment is biological using lagoons, followed by ultraviolet disinfection; discharge is then through Outfall 001.

The current service population is estimated to be 860 people. The facility has a design flow rate of 0.80 mgd.

The average inflow and infiltration is estimated at 100,000 gallons per day during the summer months when irrigation canals feed water, causes the groundwater table to rise. To address this, the City regularly conducts television inspections in its sewer lines to locate problem lines for repair.

Permit History

The facility's previous permit became effective on August 1, 2004. A complete application for permit reissuance was submitted to the EPA on January 28, 2009. Since the permit was not reissued before the expiration date of July 31, 2009, the permit was administratively extended under 40 CFR 122.6.

B. Compliance History

A review of the discharge monitoring reports (DMRs) from January 2005 to April 2011 found the following violations from discharges through Outfall 001:

BOD_5

A BOD_5 violation in March 2011 of the average monthly concentration limit of 45 mg/L, with a discharge of 53 mg/L.

TSS

TSS violations of the average monthly concentration limit of 45 mg/L, with a discharge of 87 mg/L in April 2005; of 48 mg/L in February 2006; and a discharge of 61 mg/L in March

2006. A TSS violation of the average weekly concentration limit of 65 mg/L, with a discharge of 87 mg/L in April 2005.

BOD_5 Removal

Violations of the BOD_5 removal requirement of 65%, with 64% removal in May 2005, 51% removal in February 2007, 55% removal in February 2009, and 54% removal in March 2011.

TSS Removal

Violations of the percent TSS removal requirement of 65%, with 0.05**%** removal in May 2005, 50% removal in February 2006, 46% removal in March 2006, 61% removal in October 2008, and 52% removal in April 2011.

II. RECEIVING WATER

The treated effluent from the facility is discharged continuously through Outfall 001 to the Snake River, approximately at River Mile 780, which is identified in the Idaho *Water Quality Standards and Wastewater Treatment Requirements at* IDAPA 58.01.02.150.08. The discharge is in the American Falls Subbasin, HUC 17040206, (US-22, Snake River – River Mile 791 to American Falls Reservoir). The beneficial use classifications are: cold-water biota, salmonid spawning, primary contact recreation, aesthetics, wildlife habitats; and domestic, agricultural and industrial water supply. Outfall 001 is located at latitude 43° 18' 32" N and longitude 112° 11' 31" W.

A. Low Flow Conditions

The *Technical Support Document for Water Quality-Based Toxics Control* (hereafter referred to as the TSD) (EPA, 1991) and the Idaho Water Quality Standards (WQS) recommend the flow conditions for use in calculating water quality-based effluent limits (WQBELs) using steady-state modeling. The TSD and the Idaho WQS state that WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years (7Q10) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years (1Q10) for acute criteria.

Because the chronic criterion for ammonia is a 30-day average concentration not to be exceeded more than once every three years, the EPA has used the 30B3 for the chronic ammonia criterion instead of the 7Q10. The 30B3 is a biologically-based flow rate designed to ensure an excursion frequency of no more than once every three years for a 30-day average flow rate. For human health criteria, the Idaho water quality standards recommend the 30Q5 flow rate for non-carcinogens, and the harmonic mean flow rate for carcinogens.

The 1Q10, 7Q10, 30B3, 30Q5 and harmonic mean flow rates of Snake River are 1,190 cfs, 1,400 cfs, 1,750 cfs, 1,870 cfs and 4,110 cfs, respectively. These calculations used data from the USGS station 13060000, Snake River near Shelley, Idaho, which is located at river mile 787.8 upstream from Blackfoot. The period of record for these calculations was 1971 to 2010**.**

B. Water Quality Standards

Section 301(b)(1)(C) of the Clean Water Act (CWA) requires the development of limitations in permits necessary to meet water quality standards by July 1, 1977. Federal regulations at 40 CFR 122.4(d) require that the conditions in NPDES permits ensure compliance with the

water quality standards of all affected States. A State's water quality standards are composed of use classifications, numeric and/or narrative water quality criteria and an anti-degradation policy. The use classification system designates the beneficial uses (such as drinking water supply, contact recreation, and aquatic life) that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the State to support the beneficial use classification of each water body.

Antidegradation

The EPA is required under Section 301(b)(1)(C) of the Clean Water Act (CWA) and implementing regulations (40 CFR 122.4(d) and 122.44(d)) to establish conditions in NPDES permits that ensure compliance with State water quality standards, including antidegradation requirements. The antidegradation analysis is conducted as part of the State's 401 certification. IDEQ has provided the EPA with an antidegradation analysis that complies with the State's antidegradation implementation procedures in the State's 401 certification.

C. Water Quality Limited Segment

A water quality limited segment (WQLS) is any waterbody where it is known that water quality does not meet applicable water quality standards or is not expected to meet applicable water quality standards. In accordance with section 303(d) of the CWA, States must identify waters not achieving water quality standards in spite of application of technology-based controls in NPDES permits for point sources. Such waterbodies are known as WQLSs, and the list of such waterbodies is called the "303(d) list."

The American Falls Reservoir was identified on the State of Idaho's 303(d) list because it did not attain the state water quality standards for sediment, phosphorus and dissolved oxygen. The Snake River in the area of Firth's discharge is also listed on Idaho's 303(d) list because it did not attain the state water quality standards for dissolved oxygen, nutrients, mercury and sediment. The IDEQ has prepared the *American Falls Subbasin Total Maximum Daily Load (TMDL) Plan: Subbasin Assessment and Loading Analysis May, 2012* (TMDL). The TMDL was submitted to EPA on May 9, 2012 for approval. The EPA approved the TMDL on August 6, 2012. Although the wastewater treatment plant contributes sediments to the Snake River, the facility appears to have little measurable effect on water quality.

The current WWTP has average effluent concentrations of TSS 19 mg/L, well below the Snake River target concentration of 60 mg/L and has a NPDES average monthly concentration limit of 45 mg/L. To insure no degradation of water quality, the proposed permit limits the TSS discharge to the existing annual TSS load of 8.0 tons per year. This load is based on the current average flow of one cfs and the average monthly effluent concentration limit of 30 mg/L. This limit is consistent with the wasteload allocation in the TMDL. Monthly and weekly effluent limits TSS will be established as required by 40 CFR §122.45(d)(2) to implement the waste load allocation.

As a tributary to the American Falls Reservoir, phosphorus loads from the Snake River contribute to nutrient levels in the reservoir. However, contributions from the Firth WWTP do not appear to affect the Snake River water quality to any significant degree. Effluent flows from the Firth WWTP from January 2000 to September 2003 averaged less than one cfs. In contrast, flows in the Snake River near Firth averaged 4,840 cfs (Water Years 1910-2002; Brennan et al. 2003). Comparing the current loads from the facility and target phosphorus

loads in the Snake River, Firth contributes less than 0.3 percent of the phosphorus load in the Snake River on an annual basis, indicating the point source does not impact the Snake River water quality to any significant degree.

The target phosphorus concentration for the Snake River in the American Falls subasin is 0.05 mg/L. Currently, the river is below that concentration. Nonetheless, effects on the reservoir by any potential significant increase in nutrient loading to the Snake River should be considered prior to approval of such discharge. Therefore, total phosphorus load for the Firth WWTP will be limited to the existing discharge rate of 0.48 tons of total phosphorus annually. The TMDL concluded that the nutrients from the Firth WWTP do not appear to be affecting beneficial uses in the Snake River; nonetheless, the wasteload allocation reflects no overall increase from current loading. Since it is likely the area will see future population growth, the current load allows for growth but, requires treatment beyond current levels to achieve this. Monthly and weekly effluent limits for total phosphorus are established as required by the 40 CFR §122.45(d)(2) to implement the waste load allocation (See Appendix B).

The critical period for nutrients affecting beneficial uses generally is the warmer months of summer and early fall. Nutrients promote growth of aquatic vegetation, which usually is at highest density in late summer - a time of high recreational use. When vegetative matter such as algae dies, it sinks to the bottom where microbial action uses oxygen to breakdown organic matter. Warmer water temperatures occur in summer, and because saturation levels of gases decline as temperature increases, decreased concentrations of dissolved oxygen result. These conditions stress aquatic biota when oxygen levels are low, and respiration of dense aquatic vegetation pushes dissolved oxygen concentrations lower. The tendency for the uptake of phosphorus as phosphates by sediment creates the potential for phosphorus availability throughout the growing season regardless of time of input. Phosphorus in sediment is directly available for uptake by rooted aquatic vegetation, and becomes available to algae or surface vegetative growth when phosphorus adsorbed to sediment is released into the water column under anoxic (no oxygen) conditions. Thus, phosphorus that entered a stream in February could be bioavailable to aquatic vegetation in a reservoir in July when conditions are conducive to algal or macrophytic growth.

Due to concern about American Falls Reservoir, which is on the 303(d) list for nutrients, no allowance for seasonal variation in nutrient loading is made.

This reach of the Snake River is impaired by mercury and IDEQ has not scheduled TMDL development to address this impairment listing. The WQS stipulate either that there be no further impairment of the designated or existing beneficial uses or that the total load of the impairing pollutant remains constant or decreases (IDAPA 58.01.02.055.04 and 58.01.02.055.05). IDEQ has no data to suggest that the discharge from the City of Firth is contributing to this impairment.

IDEQ has determined that this discharge permit will comply with these provisions of Idaho WQS.

III. EFFLUENT LIMITATIONS

A. Basis for Permit Effluent Limits

In general, the CWA requires that the limits for a particular pollutant be the more stringent of either technology-based effluent limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards of a waterbody are being met and they may be more stringent than technology-based effluent limits. The bases for the proposed effluent limits in the draft permit are provided in Appendix B of this document.

B. Proposed Effluent Limitations

Effluent limits and monitoring for the existing permit are provided in Table 1.

Table 1: Effluent Limitations and Monitoring Requirements from the Previous Permit - Outfall 001

Parameter	Units	Monthly Avg.	Weekly Avg.	Instantaneous Maximum Limit	Sample Frequency	Sample Type
Flow	MGD	---	---	---	Continuous	Recording
Biochemical Oxygen Demand (BOD_5)	mg/l	45	65	---	monthly	8-Hour Composite
	lbs/day	300[1]	434[1]	---		
Total Suspended Solids (TSS)[2]	mg/l	45	65	---	monthly	8-Hour Composite
	lbs/day	300[1]	434[1]	---		
E. coli Bacteria[2]	colonies/100 ml	126	---	406	5/month	Grab
Dissolved Oxygen[3]	mg/l	---	---	---	monthly	Grab
Total Phosphorus as P[3]	mg/l	---	---	---	monthly	8-Hour Composite
Total Ammonia as N[3]	mg/l	---	---	---	monthly	8-Hour Composite
pH	s.u.	6.5 – 9.0			5/week (Mon-Fri)	Grab

[1]The mass-based limits for BOD5 and TSS and flow monitoring apply to the total combined loading and flow from Outfall 001.
[2] The average monthly E. coli counts must not exceed a geometric mean of 126/100 ml based on a minimum of five samples taken every three to seven days within a calendar month.
[3]Monitoring shall be conducted once per month starting in January 2006 and lasting for one year.

The following summarizes the proposed effluent limitations that are in the draft permit:

1. There must be no discharge of any floating solids, visible foam in other than trace amounts, or oily wastes that produce a sheen on the surface of the receiving water.
2. Table 2 below presents the proposed effluent limitations.

Table 2
Effluent Limitations, Outfall 001-

Parameters	Average Monthly Limit	Average Weekly Limit	Minimum Percent Removal[1]	Maximum Daily Limit
BOD_5	45 mg/L	65 mg/L	65%	--
	300 lbs/day[2]	434 lbs/day[2]		--
TSS	45 mg/L	65 mg/L	65%	--
	79.2 lbs/day	187 lbs/day		--
E. coli Bacteria	126 colonies /100mL[3]	--	--	406 colonies /100mL[4]
Total Phosphorus as P	3.56 lbs/day[2]	5.01 lbs/day[2]	--	--
pH	6.5 – 9.0 standard units			

1. Percent removal is calculated using the following equation: ((influent - effluent) / influent) x 100, this limit applies to the average monthly values.
2. Loading limits are calculated by multiplying the concentration in mg/L by the design flow of 0.8 mgd and a conversion factor of 8.34 lbs/gallon.
3. The monthly average for *E. coli* is the geometric mean based on at least five samples taken every three to seven days during the month.
4. This is an instantaneous limit, applicable to each grab sample without averaging.

IV. MONITORING REQUIREMENTS

A. Basis for Effluent and Surface Water Monitoring Requirements

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring is also required to characterize the effluent to determine if additional effluent limitations are required.

B. Effluent Monitoring Requirements

Parameters

BOD_5, TSS, *E. coli*, Flow pH, and Total Phosphorus

The permit requires monitoring BOD_5, TSS, *E. coli*, flow and pH to determine compliance with the effluent limits; it also requires monitoring of the influent for BOD_5 and TSS to calculate monthly removal rates.

Effluent monitoring for total phosphorus is increased from monthly to weekly to determine compliance with the weekly effluent limits.

Ammonia

Monitoring for ammonia is again required, but will be extended to the life of the proposed permit with a frequency of once per month. Ammonia is a parameter commonly

monitored for POTWs to determine performance and will determine impacts to the Snake River. Based on analysis of existing data, ammonia does not have a reasonable potential to violate the water quality standards of the Snake River and a limit is not required.

Application Form 2A Monitoring

The City of Firth WWTP is a minor NPDES facility (i.e.,<1 MGD design flow). Monitoring for reapplication is required over a three-year period as required in NPDES Application Form 2A Effluent Testing Data.

Frequency

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples must be used for averaging if they are conducted using the EPA-approved test methods (generally found in 40 CFR 136) or as specified in the permit.

Table 3, below, presents the proposed effluent monitoring requirements for Firth. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. The samples must be representative of the volume and nature of the monitored discharge. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

Table 3
Effluent Monitoring Requirements, Outfall 001

Parameter	Unit	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Effluent	Continuous	Recording
BOD_5	mg/L	Influent and Effluent[1]	1/week	8-hour composite
	lbs/day	Effluent	1/week	Calculation
	% Removal	---	---	Calculation
TSS	mg/L	Influent and Effluent[1]	1/week	8-hour composite
	lbs/day	Effluent	1/week	Calculation
	% Removal	---	---	Calculation
pH	standard units	Effluent	5/week	Grab
E.coli Bacteria	colonies/100 ml	Effluent	5/month	Grab
Total Phosphorus as P	mg/L	Effluent	1/week	8-hour composite
	lbs/day			
Total Ammonia Nitrogen	mg/L	Effluent	1/ month	8-hour composite

Table 3
Effluent Monitoring Requirements, Outfall 001

Parameter	Unit	Sample Location	Sample Frequency	Sample Type
NPDES Application Form 2A Effluent Testing Data	mg/L	Effluent	1 each in 2nd, 3rd, & 4th years of the permit	See footnote 2

1. Influent and effluent composite samples shall be collected during the same 8-hour period.
2. For Effluent Testing Data, in accordance with instructions in NPDES Application Form 2A, Part B.6.

V. SLUDGE (BIOSOLIDS) REQUIREMENTS

The EPA Region 10 separates wastewater and sludge permitting. Under the CWA, the EPA has the authority to issue separate sludge-only permits for the purposes of regulating biosolids. The EPA may issue a sludge-only permit to each facility at a later date, as appropriate.

In the absence of a sludge-only permit, sludge management and disposal activities at each facility continue to be subject to the national sewage sludge standards at 40 CFR Part 503 and any requirements of the State's biosolids program. Since the 40 CFR Part 503 regulations are self-implementing, the permittees must comply with them whether or not a permit has been issued.

VI. OTHER PERMIT CONDITIONS

A. Quality Assurance Plan Implementation

The federal regulation at 40 CFR 122.41(e) requires the permittee to develop procedures to ensure that the monitoring data submitted to the EPA are accurate and to explain data anomalies if they occur. The permittee is required to develop or update and implement a Quality Assurance Plan within 90 days of the effective date of the final permit. The Quality Assurance Plan shall consist of standard operating procedures that the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis and data reporting. The plan shall be retained on site and be made available to the EPA and IDEQ upon request.

B. Operation and Maintenance Plan Implementation

The permit requires the Permittee to properly operate and maintain all facilities and systems of treatment and control. Proper operation and maintenance is essential to meeting discharge limits, monitoring requirements, and all other permit requirements at all times. The Permittee is required to develop and implement an operation and maintenance plan for its facility within 180 days of the effective date of the final permit. The plan shall be retained on site and made available to the EPA and IDEQ upon request.

C. Sanitary Sewer Overflows and Proper Operation and Maintenance

Untreated or partially treated discharges from separate sanitary sewer systems are referred to as sanitary sewer overflows (SSOs). SSOs may present serious risks of human exposure when released to certain areas, such as streets, private property, basements, and receiving waters used for drinking water, fishing and shellfishing, or contact recreation. Untreated

sewage contains pathogens and other pollutants, which are toxic. SSOs are not authorized under this permit. Pursuant to the NPDES regulations, discharges from separate sanitary sewer systems authorized by NPDES permits must meet effluent limitations that are based upon secondary treatment. Further, discharges must meet any more stringent effluent limitations that are established to meet the EPA-approved state water quality standards.

The permit contains language to address SSO reporting and public notice and operation and maintenance of the collection system. The permit requires that the permittee identify SSO occurrences and their causes. In addition, the permit establishes reporting, record keeping and third party notification of SSOs. Finally, the permit requires proper operation and maintenance of the collection system. The following specific permit conditions apply:

Immediate Reporting – The permittee is required to notify the EPA of an SSO within 24 hours of the time the permittee becomes aware of the overflow. (See 40 CFR 122.41(l)(6))

Written Reports – The permittee is required to provide the EPA a written report within five days of the time it became aware of any overflow that is subject to the immediate reporting provision. (See 40 CFR 122.41(l)(6)(i)).

Third Party Notice – The permit requires that the permittee establish a process to notify specified third parties of SSOs that may endanger health due to likelihood of human exposure or of unanticipated bypasses and upsets that exceed any effluent limitation in the permit or that may endanger health due to a likelihood of human exposure. The permittee is required to develop, in consultation with appropriate authorities at the local, county, and/or state level, a plan that describes how, under various overflow (and unanticipated bypass and upset) scenarios, the public, as well as other entities, would be notified of overflows that may endanger health. The plan should identify all overflows that would be reported, to whom, and the specific information that would be reported. The plan should include a description of lines of communication and the identities of responsible officials. (See 40 CFR 122.41(l)(6)).

Record Keeping – The permittee is required to keep records of SSOs. The permittee must retain the reports submitted to the EPA and other appropriate reports that could include work orders associated with investigation of system problems related to a SSO, that describes the steps taken or planned to reduce, eliminate and prevent reoccurrence of the SSO. (See 40 CFR 122.41(j)).

Proper Operation and Maintenance – The permit requires proper operation and maintenance of the collection system. (See 40 CFR 122.41(d) and (e)). SSOs may be indicative of improper operation and maintenance of the collection system. The permittee may consider the development and implementation of a capacity, management, operation and maintenance (CMOM) program.

The permittee may refer to Guide for Evaluating Capacity, Management, Operation and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems (EPA 305-B-05-002). This guide identifies some of the criteria used by the EPA inspectors to evaluate a collection system's management, operation and maintenance program activities. Owners/operators can review their own systems against the checklist (Chapter 3) to reduce the occurrence of sewer overflows and improve or maintain compliance.

D. Electronic Submission of Discharge Monitoring Reports

The draft permit includes new provisions to allow the permittee the option to submit Discharge Monitoring Report (DMR) data electronically using NetDMR. NetDMR is a national web-based tool that allows DMR data to be submitted electronically via a secure Internet application. NetDMR allows participants to discontinue mailing in paper forms under 40 CFR § 122.41 and § 403.12. The permittee may use NetDMR after requesting and receiving permission from EPA Region 10.

Under NetDMR, all reports required under the permit are submitted to EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it is no longer required to submit paper copies of DMRs or other reports to EPA and IDEQ. EPA encourages permittees to sign up for NetDMR, and currently conducts free training on the use of NetDMR. Further information about NetDMR, including upcoming trainings and contacts, is provided on the following website: http://www.epa.gov/netdmr.

E. Additional Permit Provisions

Sections III, IV, and V of the draft permit contain standard regulatory language that must be included in all NPDES permits. Because they are based on federal regulations, they cannot be challenged in the context of an individual NPDES permit action. The standard regulatory language covers requirements such as monitoring, recording and reporting requirements, compliance responsibilities and other general requirements.

VII. OTHER LEGAL REQUIREMENTS

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA) and the U.S. Fish and Wildlife Service (FWS) if their actions could adversely affect any threatened or endangered species. In electronic mail dated January 21, 2009, NOAA Fisheries stated that there are no threatened or endangered species under NOAA's jurisdiction in the Snake River drainage upstream of the Hells Canyon Dam, which is located at river mile 247.5. The Firth WWTP is located more than 400 miles upstream from the nearest ESA-listed threatened or endangered species under NOAA's jurisdiction. Therefore, the reissuance of this permit will have no effect on any listed threatened or endangered species under NOAA's jurisdiction.

FWS listed species in Idaho include no listed species in Bingham County, the location of the City of Firth discharge. Therefore, the EPA concludes that discharges from the facility will have no effect on any listed species under the jurisdiction of either NOAA or FWS.

B. Essential Fish Habitat

Essential fish habitat (EFH) includes the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires the EPA to consult with NOAA National Marine Fisheries Service when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. The EFH regulations define an adverse effect as any impact which reduces quality or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site

specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

The area of the discharge is not designated critical habitat for Bull Trout as stated in 50 CFR Part 17 Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for Bull Trout in the Coterminous United States; Final Rule, October 18, 2010. The EPA determines that issuance of this permit has no affect on EFH.

C. State Certification

Section 401 of the CWA requires the EPA to seek State certification before issuing a final permit. As a part of the certification, the State may require more stringent permit conditions or additional monitoring requirements to ensure that the permit complies with State water quality standards.

D. Permit Expiration

The permit will expire five years from the effective date of the permit.

VIII. DEFINITIONS AND ACRONYMS

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
AML	Average Monthly Limit
BOD_5	Biochemical oxygen demand, five-day
cfs	Cubic feet per second
CFR	Code of Federal Regulations
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
lbs/day	Pounds per day
LTA	Long Term Average
mg/L	Milligrams per liter
ml	milliliters
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit (depending on the context)
NOAA	National Oceanographic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OWW	Office of Water and Watersheds
O&M	Operations and maintenance
PTW	Publicly owned treatment works
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
s.u.	Standard Units

TRE	Toxicity Reduction Evaluation
TSD	Technical Support Document (EPA, 1991)
TSS	Total suspended solids
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UV	Ultraviolet radiation
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WWTP	Wastewater treatment plant

IX. REFERENCES

1. City of Firth, ID, NPDES permit, effective August 1, 2004 to July 31, 2009.
2. Idaho Administrative Procedures Act (IDAPA), 2006. Section 58, Water Quality Standards and Wastewater Treatment Requirements. Idaho Department of Environmental Quality Rules, Title 01, Chapter 02.
3. U.S. EPA, 1973. *Water Quality Criteria 1972* (EPA R3-73-033).
4. EPA. 1991. Technical Support Document for Water Quality-based Toxics Control. US Environmental Protection Agency, Office of Water, EPA/505/2-90-001.
5. EPA. 2010. *NPDES Permit Writers' Manual.* Environmental Protection Agency, Office of Wastewater Management, EPA-833-K-10-001.

Appendix A – Location Map

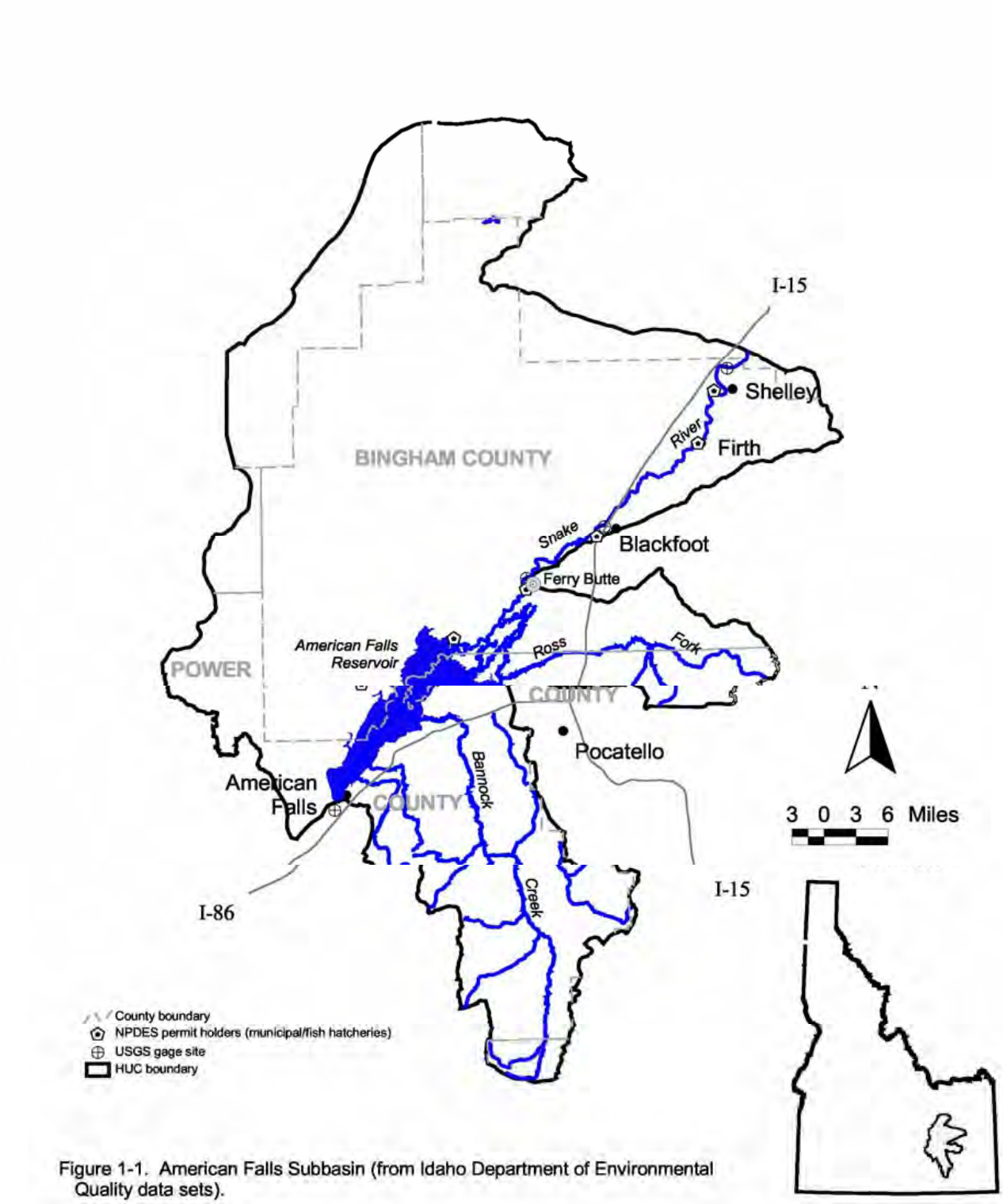

Figure 1-1. American Falls Subbasin (from Idaho Department of Environmental Quality data sets).

Appendix B – Basis for Effluent Limitations

The following discussion explains in more detail the statutory and regulatory basis for the technology and water quality-based effluent limits in the draft permit. Part A discusses technology-based effluent limits, Part B discusses water quality-based effluent limits in general, and Part C discusses facility specific water quality-based effluent limits.

A. Technology-Based Effluent Limits

The CWA requires POTWs to meet requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," which all POTWs were required to meet by July 1, 1977. The EPA has developed and promulgated "secondary treatment" effluent limitations, which are found in 40 CFR 133.102. These technology-based effluent limits apply to all POTWs and identify the minimum level of effluent quality attainable by application of secondary treatment in terms of BOD_5, TSS and pH. The regulations include special considerations, referred to as "treatment equivalent to secondary," for POTWs with waste stabilization ponds (lagoons) and trickling filters. The regulations allow alternative limits for BOD_5 and TSS for facilities using trickling filters or waste stabilization ponds, provided the following requirements are met (40 CFR 133.101(g), and 40 CFR 133.105(d)):

- The BOD_5 and TSS effluent concentrations consistently achievable through proper operation and maintenance of the treatment works exceed the minimum level of the effluent quality that would be required under Secondary Treatment Effluent Limits.
- A trickling filter or waste stabilization pond is used as the principal treatment process.
- The treatment works provide significant biological treatment of municipal wastewater (i.e., a minimum of 65% reduction of BOD_5 and TSS is consistently attained).

With regard to the first criterion, consistent with the Compliance History section in the main text of this Fact Sheet, based on DMR data from February 2005 to April 2011, in only a few cases were limits violated for BOD_5 and TSS, or for percent removal of those parameters. In addition, the City of Firth WWTP does use a waste stabilization pond (lagoon) as the principal treatment process. Moreover, the 95th percentile values for monthly average BOD_5 and TSS were 40.8 mg/L and 44.4 mg/L, respectively. These values were within the average monthly limits in the current permit (45 mg/L for each parameter). But they are higher than the corresponding monthly limits required under Secondary Treatment Effluent Limits, which are 30 mg/L for each parameter.

With regard to the third criterion Firth achieves 65 percent removal of BOD_5 and TSS.

Therefore, the limits established in the current permit, which will be continued in the draft reissued permit, are the limits in 40CFR 133.105(a) for BOD_5 and (b) for TSS Treatment Equivalent to Secondary shown in Table B-1.

Table B-1: Treatment Equivalent to Secondary Effluent Limits (40 CFR 133.105)			
Parameter	**Average Monthly Limit**	**Average Weekly Limit**	**Range**
BOD_5	45 mg/L	65 mg/L	---
TSS	45 mg/L	65 mg/L	---
Removal Rates for BOD_5 and TSS	65% (minimum)	---	---
pH	---	---	6.0 - 9.0 s.u.

Mass-based Limits

The federal regulations at 40 CFR 122.45(b) and (f) require that POTW limitations to be expressed as mass-based limits using the design flow of the facility. The mass-based limits, expressed in lbs/day, are calculated as follows based on the design flow:

Mass-based limit (lbs/day) = concentration limit (mg/L) × design flow (mgd) × 8.34
For each of BOD_5 and TSS, the corresponding mass-based limits are:

Average Monthly Limit (AML) = 45 x 0.8 x 8.34 = 300 lb/day
Average Weekly Limit (AWL) = 65 x 0.8 x 8.34 = 434 lb/day.

B. Water Quality-Based Effluent Limits

Statutory Basis for Water Quality-Based Limits

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards by July 1, 1977.

The NPDES regulation 40 CFR 122.44(d)(1), implementing Section 301 (b)(1)(C) of the CWA, requires that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state/tribal water quality standard, including state/tribal narrative criteria for water quality.

The regulations require that this evaluation be made using procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that water quality standards are met and must be consistent with any available wasteload allocation.

Reasonable Potential Analysis

When evaluating the effluent to determine if water quality-based effluent limits based on chemical specific numeric criteria are needed, a projection of the receiving water concentration downstream of where the effluent enters the receiving water for each pollutant of concern is

made. The chemical-specific concentration of the effluent and receiving water and, if appropriate, the dilution available from the receiving water are factors used to project the receiving water concentration. If the projected concentration of the receiving water exceeds the numeric criterion for a limited parameter, then there is a reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standard, and a water quality-based effluent limit is required.

Sometimes it is appropriate to allow a small volume of receiving water to provide dilution of the effluent; these volumes are called mixing zones. Mixing zone allowances will increase the allowable mass loadings of the pollutant to the water body and decrease treatment requirements. Mixing zones can be used only when there is adequate receiving water flow volume and the concentration of the pollutant of concern in the receiving water is below the numeric criterion necessary to protect the designated uses of the water body. Mixing zones must be authorized by the State. The State of Idaho authorized a mixing zone of 25 percent of the receiving water resulting in an acute dilution ratio of 240 to 1 and a chronic dilution ratio of 284 to 1 (see calculations below).

The chronic ammonia criterion is expressed as a 30-day average not to be exceeded more than once every three years. The 30B3 is a biologically based design flow intended to ensure an excursion frequency of once every three years for a 30-day average flow rate. The averaging period (30 days) and the excursion frequency (3 years) are consistent with the chronic ammonia criterion. This results in a dilution ratio of 354.

Low flow values are based on USGS Station 13060000 data from 1979 to 2010 for the Snake River near Shelley. Low flow values are 1190 cfs for 1Q10, 1400 cfs for 7Q10 and 1750 cfs for 30B3.

$$D = \frac{Q_e + Q_u(MZ)}{Q_e}$$

D = Dilution Ratio

Q_e = Effluent flow rate (set equal to the design flow of the WWTP)

Q_u = Receiving water low flow rate upstream of the discharge (1Q10, 7Q10 or 30B3)

MZ = is the fraction of the receiving water flow available for dilution.

Qe = maximum effluent flow = 0.80 mgd

Q_u = 1Q10 = upstream acute critical low flow = 1190 CFS = 769 mgd

$$\text{Acute dilution ratio} = \frac{0.80 + 769(0.25)}{0.80} = 240$$

Q_u = 7Q10 = upstream chronic critical low flow = 1400 CFS = 904 mgd

$$\text{Chronic dilution ratio} = \frac{0.80 + 904(0.25)}{0.80} = 284$$

Q_u = 30B3 = ammonia upstream chronic critical low flow = 1750 CFS = 1131 mgd

$$\text{Ammonia Chronic dilution ratio} = \frac{0.80 + 1131(0.25)}{0.80} = 354$$

Procedure for Deriving Water Quality-based Effluent Limits

The first step in developing a water quality-based effluent limit is to develop a wasteload allocation (WLA) for the pollutant. A wasteload allocation is the concentration or loading of a pollutant that the permittee may discharge without causing or contributing to an exceedance of water quality standards in the receiving water.

In cases where a mixing zone is not authorized, either because the receiving water already exceeds the criterion, the receiving water flow is too low to provide dilution, or the State does not authorize one, the criterion becomes the WLA. Establishing the criterion as the wasteload allocation ensures that the permittee will not cause or contribute to an exceedance of the criterion. The following discussion details the specific water quality-based effluent limits in the draft permit.

C. Facility-Specific Water Quality-based Limits

Once the WLA has been developed, the EPA applies the statistical permit limit derivation approach described in Chapter 5 of the TSD to obtain daily maximum and monthly average permit limits. This approach takes into account effluent variability (using the CV), sampling frequency and the difference in time frames between the monthly average and daily maximum limits.

Floating, Suspended or Submerged Matter/Oil and Grease

The Idaho water quality standards (IDAPA 58.01.02.200.05) require surface waters of the State to be free from floating, suspended or submerged matter of any kind in concentrations causing nuisance or objectionable conditions that may impair designated beneficial uses. A narrative condition is proposed for the draft permit that states there must be no discharge of floating solids or visible foam or oil and grease other than trace amounts.

pH

The Idaho water quality standards (IDAPA 58.01.02.250.01.a) require surface waters of the State to have a pH value within the range of 6.5 - 9.5 standard units. It is anticipated that mixing zones will not be authorized for the water quality-based criterion for pH. Therefore, this criterion must be met when the effluent is discharged to the receiving water. The technology-based effluent limits for pH are 6.0 - 9.0 standard units. To ensure that both water quality-based requirements and technology-based requirements are met, the draft permit incorporates the more stringent lower limit of the water quality standards (6.5 standard units) and the more stringent upper limit of the technology-based limits (9.0 standard units).

Ammonia, Total (as Nitrogen)

The Idaho water quality standards contain criteria for the protection of aquatic life from the toxic effects of ammonia (IDAPA 58.01.02.250.01.d.). The water quality standards apply the criteria for early life stages to water bodies (IDAPA 58.01.02.250.01.d.(3)). The criteria are dependent on pH and temperature, because the fraction of ammonia present as the toxic, un-ionized form increases with increasing pH and temperature. Therefore, the criteria become more stringent as pH and temperature increase. Fresh water ammonia criteria are calculated according to the equations in Table B-2.

Table B-2 Water Quality Criteria for Ammonia

Acute Criterion	Chronic Criterion
$\frac{0.275}{1+10^{7.204-pH}}+\frac{39}{1+10^{pH-7.204}}$	$\left(\frac{0.0577}{1+10^{7.688-pH}}+\frac{2.487}{1+10^{pH-7.688}}\right)\times MIN\left(2.85,1.45\times10^{0.028\times(25-T)}\right)$

The 95th percentiles of pH and temperature data are used to derive the acute and chronic criteria.

95th Percentile Ambient pH	8.54
95th Percentile Ambient Temperature °C	19.1
Highest Background Ammonia mg/L	0.15
Highest Discharge Ammonia mg/L	15.9
Coefficient of Variation	0.418

The coefficient of variation (CV) of the data and the highest observed effluent value are based on effluent data collected by the City of Firth from January through December 2006. Receiving water data upstream of the discharge outfall were provided by the City of Firth, based on monitoring data from February 2005 to December 2008.

The ammonia acute standard is 1.98 mg/L and the chronic standard is 0.76 mg/L.

The reasonable potential analysis shows that there is no reasonable potential for the facility's discharge to cause or contribute to an exceedance of the acute or chronic criterion, therefore, effluent limits for ammonia are not required. Ammonia is a parameter commonly monitored for POTWs to determine performance. Monitoring will again be required, but will be expanded to the duration of the permit.

Escherichia coli (E. coli) Bacteria

The Snake River at the point of discharge is designated for primary contact recreation. Waters of the State of Idaho that are designated for recreation are not to contain *E. coli* bacteria in concentrations exceeding 126 organisms per 100 ml as a geometric mean based on a minimum of five samples taken every three to seven days over a thirty day period (IDAPA 58.01.02.251.01.a). The permit contains a monthly geometric mean effluent limit for *E. coli* of 126 organisms per 100 ml and a monitoring schedule to determine compliance.

The Idaho water quality standards also state that for primary contact recreation a single water sample that exceeds 406 organisms/100 ml indicates a likely exceedance of the geometric mean criterion, although it is not, in and of itself, a violation of water quality standards. (IDAPA § 58.01.02.251.01.b.ii).

The goal of a water quality-based effluent limit is to ensure a low probability that water quality standards will be exceeded in the receiving water as a result of a discharge, while considering the variability of the pollutant in the effluent (EPA, 1991). Because a single sample value exceeding 406 organisms/100 ml may indicate an exceedance of the geometric mean criterion, the EPA has included an instantaneous (single grab sample) maximum effluent limit for *E. coli* of 406 organisms/ 100 ml, in addition to a monthly geometric mean limit of 126 organisms/100 ml, which directly implements the water quality criterion for *E. coli*. This will ensure that the discharge will have a low probability of exceeding the geometric mean criterion for *E. coli* and provide warning of and opportunity to avoid possible non-compliance with the geometric mean criterion.

Total Suspended Solids

The receiving water to which the City of Firth discharges, is water quality limited for sediment. The City of Firth discharges 8.0 tons/year of suspended sediment (Total Suspended Solids) and will be capped to prevent any increases in loading to the Snake River.

In translating this wasteload into permit limits, the EPA followed procedures in the Technical Support Document (TSD). The first step in developing limits is to determine the time frame over which the WLAs apply. In general, the period over which a criterion applies is based on the length of time the target organism can be exposed to the pollutant without adverse effect. For example, aquatic life criteria generally apply as one-hour averages (acute criteria) or four-day averages (chronic criteria). In the case of total suspended solids, the target organisms are aquatic organisms and TSS affects them by (1) killing them directly, (2) reducing growth rates and resistance to disease, by preventing successful development of eggs and larvae, (3) modifying natural movement or migration patterns, or (4) reducing the natural availabilities of food. The period over which this effect occurs is uncertain. However, since TSS is not a toxic pollutant, the EPA believes that using the WLA as a long term annual average (LTA) is appropriate.

The NPDES regulations at 40 CFR §122.45(d) require that permit limits for publicly owned treatment works (POTWs) be expressed as average monthly limits (AMLs) and average weekly limits (AWLs), unless impracticable. The WLA must be statistically converted to average monthly and average weekly permit limits.

The objective in setting effluent limits is to establish limits that will result in the effluent meeting the WLA under normal operating conditions virtually all the time. Developing both an AML and AWL for POTWs is consistent with the requirements of the EPA regulations and assures that the long-term average loading requirements of TSS to the river system, as specified in the management plan, are being met. Having both an AML and AWL also ensures good performance of the treatment system. Setting an AWL establishes an upper bound on effluent values used to determine the monthly average and provides a measure of effluent compliance during operational periods between monthly sampling.

Calculating the Average Monthly Limit

8.0 tons/yr x 2000 lb/ton ÷ 365 days/yr = 43.8 lb/day (annual average)

Assume LTA = 43.8 lb/day

AML = LTA x $\exp[z\sigma_n - 0.5\sigma_n^2]$ (from Table 5-2 of the TSD)

Where:

CV = coefficient of variation = 0.860 (based on 60 samples reported as monthly average monitoring data under the current permit during February 2005 to April 2011)

n = 4 (number of samples in a month)

$\sigma_4^2 = \ln((CV^2/n)+1) = \ln((0.86^2/4) + 1) = 0.170$

$\sigma_4 = 0.412$

z = percentile exceedance probability for AML (95%) = 1.645

AML = 43.8 x exp[(1.645 x 0.412) – (0.5 x 0.170)] = 79.2 lb/day

Calculating the Average Weekly Limit

The AWL is calculated from the following relationship with the AML (from Table 5-3 of the TSD):

$$AWL = \frac{\exp[z_m\sigma - 0.5\sigma^2]}{\exp[z_a\sigma_4 - 0.5\sigma_4^2]} \times AML$$

Where CV = 0.86, the same value as above because sampling was required monthly

$\sigma^2 = \ln(CV^2 + 1) = \ln(0.86^2 + 1) = 0.554$

$\sigma = 0.744$

z_m = percentile exceedance probability for AWL (99%) = 2.326

z_a = percentile exceedance probability for AML (95%) = 1.645

$$AWL = \frac{\exp[(2.326 \times 0.744) – (0.5 \times 0.554]}{\exp[(1.645 \times 0.412) – (0.5 \times 0.170)]} \times 79.2 \text{ lb/day}$$

AWL = 187 lb/day

These water quality based loading limits are compared with the technology based loading limits for TSS in Table B-3 Below.

Table B-3
Comparison of Technology-based and Water Quality-based Limits for TSS

Parameter	Average Monthly Limit	Average Weekly Limit
Technology-based	300 lb/day	434 lb/day
Water Quality-based	79.2 lb/day	187 lb/day
Most Stringent	**79.2 lb/day**	**187 lb/day**

The most stringent limits above are selected and applied in the draft permit as the final effluent limits. The technology-based concentration standards are also applied; the facility must meet both. If it is discharging at flows that approach the design flow rate of 0.8 mgd, the mass-based average monthly loading limit will be more stringent and limiting.

Total Phosphorus (as P)

As discussed on Page 8 of the fact sheet, the WLA for phosphorus is an annual average value of 0.487 tons per year. However, effluent limits in NPDES permits for POTWs that discharge continuously must be expressed as average monthly and average weekly limits (40 CFR 122.45(d)(2)).

As stated in Section 5.3.1 of the *Technical Support Document for Water Quality-based Toxics Control* or TSD, when the averaging periods for effluent limits differ from those of the water quality criteria (and therefore the wasteload allocation, which is calculated from the water quality criteria), it is necessary to use statistics to develop permit limits that consider effluent variability while ensuring a low probability that the WLA will be exceeded.

Since the wasteload allocation is an annual average value, EPA will consider it to be a long term average. In Table 5-2, the TSD contains an equation for calculating an average monthly permit limit that is consistent with a long term average wasteload allocation, along with a table of results for the equation for various values of the coefficient of variation (CV) and various sampling frequencies. In this case, the coefficient of variation is equal to 0.251. EPA proposes a sampling frequency for phosphorus of one time per week. This will result in at least 4 phosphorus samples per month.

The probability basis is probability that the permittee will comply with the average monthly effluent limit, if the permittee's long term average and coefficient of variation are consistent with the assumptions used in the calculation of the average monthly limit. In general, for toxics permitting, the TSD recommends the use of the 95th percentile (5% exceedance probability) for the average monthly limit. This is a conservative approach, which is justified when establishing effluent limits for toxic pollutants, but this conservative approach, which is justified when establishing effluent limits for toxic pollutants, is not necessary when establishing effluent limits for nutrients, where the goal is to achieve a certain annual average loading or concentration. Therefore, EPA has used the 99th percentile (1% exceedance probability) to calculate the average monthly limit.

The wasteload allocation for the City of Firth for Total Phosphorus is 0.487 tons per year.

Calculating the Average Monthly Limit

0.487 tons/yr x 2000 lb/ton ÷ 365 days/yr = 2.67 lb/day (annual average)

Assume LTA = 2.67 lb/day

AML = LTA x $\exp[z\sigma_n - 0.5\sigma_n^2]$ (from Table 5-2 of the TSD)

Where:

CV = coefficient of variation = 0.251 (based on 11 samples for Total Phosphorus taken in 2006)

n = 4 (number of samples in a month)

$\sigma_4^2 = \ln((CV^2/n)+1) = \ln((0.251^2/4) + 1) = 0.0156$

$\sigma_4 = 0.125$

z = percentile exceedance probability for AML (99%) = 2.3262

AML = 2.67 x exp[(2.3262 x 0.125) – (0.5 x 0.0156)] = 3.56 lb/day

Using procedures in the TSD an average weekly limit is derived.

Calculating the Average Weekly Limit

The AWL is calculated from the following relationship with the AML (from Table 5-3 of the TSD):

$$AWL = \frac{\exp[z_m\sigma - 0.5\sigma^2]}{\exp[z_a\sigma_4 - 0.5\sigma_4^2]} \times AML$$

Where CV = 0.251

$\sigma^2 = \ln(CV^2 + 1) = \ln(0.251^2 + 1) = 0.061$

$\sigma = 0.247$

z_m = percentile exceedance probability for AWL (99%) = 2.326

z_a = percentile exceedance probability for AML (95%) = 1.645

$$AWL = \frac{\exp[(2.326 \times 0.247) – (0.5 \times 0.061]}{\exp[(1.645 \times 0.125) – (0.5 \times 0.0156)]} \times 3.56 \text{ lb/day}$$

AWL = 5.01 lb/day

REASONABLE POTENTIAL FOR AQUATIC LIFE

		State Water Quality Standard		Max concentration at edge of...										
	Ambient Conc.	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	**LIMIT REQ'D?**	Effluent percentile value		Max effluent conc. measure	Coeff Variation	# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
Parameter	*mg/L*	*mg/L*	mg/L	*mg/L*	*mg/L*			*Pn*	*mg/L*	*CV*	*n*			
Total Ammonia Nitrogen	0.15	1.98	0.76	0.294	0.247	**NO**	0.99	0.658	15.9	0.418	11	2.18	240	354

Appendix C – IDEQ Draft 401 Certification