FACT SHEET

The United States Environmental Protection Agency (EPA)
Plans To Reissue A National Pollutant Discharge Elimination System (NPDES) Permit to each of the following facilities:

Elk Valley Subdivision	City of Lava Hot Springs	Southside Sewer and Water District
City of Grangeville	City of Wilder	
City of Inkom	City of Montpelier	

Public Comment Period: October 27 – November 26, 2004

Technical Contact:
Robert Rau, email: rau.rob@epa.gov
phone: 206-553-6285, 1-800-424-4372 - within EPA Region 10

EPA Proposes To Reissue NPDES Permits
EPA proposes to reissue/issue NPDES permits to the facilities referenced above. The draft permits place conditions on the discharge of pollutants from each wastewater treatment plant to waters of the United States. In order to ensure protection of water quality and human health, the permits place 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 each permit

401 Certification for Facilities that Discharge to State Waters
EPA is requesting that the Idaho Department of Environmental Quality certify the NPDES permit for those facilities that discharge to state waters, under section 401 of the Clean Water Act. All of the facilities referenced above discharge to State Waters.

Public Comment
Persons wishing to comment on, or request a Public Hearing for the draft permit for any of these facilities 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 EPA's Region 10 office in Seattle, Washington, as described in the Public Comments Section of the attached Public Notice.

After the Public Notice expires, and all comments have been considered, EPA's Regional

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, EPA will address the comments and issue the permit. The permit will become effective 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 NPDES permits and related documents can be reviewed or obtained by visiting or contacting EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday (see address below). The draft permits, fact sheet, and other information can also be found by visiting the Region 10 website at "www.epa.gov/r10earth/water.htm."

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

The fact sheet and draft permits are also available at:

EPA Idaho Operations Office
1435 North Orchard Street
Boise, Idaho 83706
(208) 378-5746

Idaho DEQ, Boise Regional Office (for City of Wilder and Elk Valley Subdivision)
1445 N. Orchard Street
Boise ID, 83706-2239
(208) 373-0550

Idaho DEQ, Pocatello Regional Office (Cities of Inkom, Lava Hot Springs & Montpelier)
444 Hospital Way, #300
Pocatello, ID 83201
(208) 236-6160

Idaho DEQ, Lewiston Regional Office (for City of Grangeville)
1118 F Street
Lewiston, ID 83501
(208) 799-4370

Idaho DEQ, Coeur d'Alene Regional Office (for Southside Water and Sewer District)
2110 Ironwood Pkwy
Coeur d'Alene, ID 83814
(208) 769-1422

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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
BE	Biological evaluation
°C	Degrees Celsius
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
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
I/I	Inflow and Infiltration
lbs/day	Pounds per day
LTA	Long Term Average
mg/L	Milligrams per liter
ml	milliliters
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit
MPN	Most Probable Number
N	Nitrogen
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
OW	Office of Water
O&M	Operations and maintenance
POTW	Publicly owned treatment works
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
s.u.	Standard Units
TMDL	Total Maximum Daily Load
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 Services
UV	Ultraviolet radiation

WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WWTP	Wastewater treatment plant

I. APPLICANTS

This fact sheet provides information on the wastewater treatment plant draft permits for the following entities:

Facility	NPDES Permit Number
Elk Valley Subdivision	ID-002797-9
City of Grangeville	ID-002003-6
City of Inkom	ID-002024-9
City of Lava Hot Springs	ID-002182-2
City of Montpelier	ID-002558-5
Southside Water and Sewer District	ID-002804-5
City of Wilder	ID-002026-5

II. FACILITY INFORMATION

With the exception of the Elk Valley Subdivision, these draft permits are for the discharge of effluent from municipal wastewater treatment plants. The Elk Valley Subdivision is a privately owned treatment works. Each of these seven facilities treat primarily residential and commercial wastewater.

While each facility uses slightly different treatment methods, each generally provides primary and secondary treatment through wastewater stabilization and/or aeration ponds (lagoons). Disinfection is accomplished using chlorination or ultraviolet light. Where chlorination is used, none of the facilities incorporate dechlorination prior to discharge Information specific for each of the treatment facilities is provided in Appendix A.

III. RECEIVING WATER

Specific receiving water information available for each of the facilities is provided in Appendix A. The information includes:

- Receiving water body
- Subbasin
- Low flow conditions
- Beneficial uses of the water body
- Identification of water quality limited segments

A. Low Flow Conditions

Flow information from the United States Geological Survey (USGS) was used to determine the flow conditions for each of the receiving waters. Where data were available, the 1 day, 10 year low flow (1Q10) and the 7 day, 10 year low flow (7Q10) were calculated for each facility. If the facility discharges seasonally, the

low flow values represent the seasonal 1Q10 and 7Q10. Low flow conditions are used to do reasonable potential analyses, and to calculate water quality based effluent limits (see Appendix C and Appendix D).

B. Water Quality Standards

An NPDES permit must ensure that the discharge from the facility complies with the State water quality standards. Idaho's water quality standards[1] 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 cold water biota, contact recreation, etc.) 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. The anti-degradation policy represents a three tiered approach to maintain and protect various levels of water quality and uses. None of the seven facilities covered by this Fact Sheet discharge to Tribal waters.

Because the effluent limits in the draft permits are based on current water quality criteria, or technology-based limits that have been shown to not cause or contribute to an exceedance of water quality standards, the discharges as authorized in the draft permits will not result in degradation of the receiving water.

C. Water Quality Limited

Any waterbody for which the water quality does not, and/or is not expected to meet, applicable water quality standards is defined as a "water quality limited segment."

Section 303(d) of the Clean Water Act (CWA) requires states to develop a Total Maximum Daily Load (TMDL) management plan for water bodies determined to be water quality limited segments. The TMDL documents the amount of a pollutant a waterbody can assimilate without violating a state's water quality standards and allocates that load to known point sources and nonpoint sources. The allocations for point sources are then incorporated into the NPDES permit.

[1] Idaho's water quality standards are contained in *Water Quality Standards and Wastewater Treatment Requirements* (IDAPA 58.01.02.)

IV. 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 basis for the proposed effluent limits in the draft permit are provided in Appendix B.

B. Proposed Effluent Limitations

The following summarizes the proposed effluent limitations that are in the draft permits.

1. The pH range must be between 6.5 to 9.0 standard units.

2. 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.

3. Chlorine

   Each draft permit includes average monthly and maximum daily chlorine concentration limits (in units of mg/L), and average monthly and maximum daily chlorine loading limits (in units of lbs/day). The limits are facility specific. (Refer to Appendices C and D). Loading (in lbs/day) is calculated for each facility as:

   Loading = concentration (in mg/L) * design flow (in mgd) * 8.34

   where, 8.34 is a conversion factor.

   In some cases, the effluent concentration limit for chlorine is not quantifiable using EPA approved methods. In these cases, EPA will use the minimum level (ML) of 0.1 mg/L as the compliance evaluation level.

4. Table 1, below presents the proposed average monthly, average weekly, and instantaneous maximum effluent limits for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and *escherichia coli* (*E. coli*), and the percent removal requirements for BOD_5, and TSS.

Table 1: Monthly, Weekly and Instantaneous Maximum Effluent Limitations				
Parameters	**Average Monthly Limit**	**Average Weekly Limit**	**Percent Removal**	**Instantaneous Maximum Limit**
BOD_5 Concentration-Secondary Limits	30 mg/L	45 mg/L	85 %	---
BOD_5 Mass-Based Limits	Facility Specific[1]	Facility Specific[1]	---	---
TSS Concentration-Secondary Limits	30 mg/L	45 mg/L	85 %	---
TSS Mass-Based Limits	Facility Specific[1]	Facility Specific[1]	---	---
E. coli (colonies/100 ml) Primary Contact Recreation Waters[2]	126[3]	---	---	406
E. coli (colonies/100 ml) Secondary Contact Recreation Waters[4]	126[3]	---	---	576

Notes:
1 Loading (in lbs/day) is calculated for each facility as:
concentration (in mg/L) * design flow (in mgd) * conversion factor of 8.34
2 Applies to facilities that discharge to receiving waters that are protected for primary contact recreation
3 Based on the geometric mean of all samples taken during the month.
4 Applies to facilities that discharge to receiving waters that are protected for secondary contact recreation

V. MONITORING REQUIREMENTS

A. Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs) to the U.S. Environmental Protection Agency (EPA).

B. Effluent Monitoring

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 can be used for averaging if they are conducted using EPA approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits (MDLs) are less than the effluent limits.

Facilities described in this fact sheet range in size from a discharge of a few thousand gallons per day up to potentially 1 million gallons per day (mgd). Given this wide range in discharge volume, the draft permits require monitoring frequency and sample types which are reflective of the facility size as specified by design flow. Facilities with higher design flows are required to monitor more frequently than facilities with lower design flows. In addition, facilities with higher design flows are required to take 8-hour composite samples for BOD_5, TSS, and ammonia, whereas, smaller facilities are required to take grab samples for these parameters. If a facility discharges periodically, the monitoring schedule may be adjusted accordingly. Refer to Appendix A for specific monitoring adjustments.

Tables 2a through 2c present the typical monitoring requirements for the permittees in the draft permits. Specific monitoring requirements for each facility is identified in the permit, and may vary from that presented in Table 2 depending on the type of treatment system, previous monitoring requirements, and receiving water impairments. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

Table 2a: Effluent Monitoring Requirements (>0.5 - 1.0 mgd Design Flow)				
Parameter	**Unit**	**Sample Location**	**Sample Frequency[1]**	**Sample Type**
Flow	mgd	Effluent	continuous	recording
BOD_5	mg/L	Influent and Effluent	1/month	8-hour composite
	lbs/day	Influent and Effluent	1/month	calculation[2]
	% Removal	--	–	calculation[3]
TSS	mg/L	Influent and Effluent	1/month	8-hour composite
	lbs/day	Influent and Effluent	1/month	calculation[2]
	% Removal	--	–	calculation[3]
pH	standard units	Effluent	5/week	grab
E. coli	colonies/100 ml	Effluent	5/month	grab
Temperature[4,5]	°C	Effluent	1/month	grab
Chlorine[6]	mg/L	Effluent	5/week	grab
Total Ammonia as N[4]	mg/L	Effluent	1/month	8-hour composite
Total Phosphorus as P[4,5]	mg/L	Effluent	1/month	8-hour composite
Dissolved Oxygen[4,5]	mg/L	Effluent	1/month	grab

Notes:
1 The sampling frequency may differ in the permit if the facility discharges intermittently.
2 Maximum daily loading is calculated by multiplying the concentration in mg/L by the average daily flow in mgd and a conversion factor of 8.34.
3 Percent removal is calculated using the following equation:
(influent - effluent) ÷ influent * 100.
4 Monitoring is required for one year.
5 Monitoring is required only if the receiving water is water quality limited for the parameter.
6 Applies only to those facilities that chlorinate.

Table 2b: Effluent Monitoring Requirements (>0.1 - 0.5 mgd Design Flow)				
Parameter	**Unit**	**Sample Location**	**Sample Frequency[1]**	**Sample Type**
Flow	mgd	Effluent	1/week[2]	measure[2]
BOD_5	mg/L	Influent and Effluent	1/month	8-hour composite
	lbs/day	Influent and Effluent	1/month	calculation[3]
	% Removal	--	–	calculation[4]
TSS	mg/L	Influent and Effluent	1/month	8-hour composite
	lbs/day	Influent and Effluent	1/month	calculation[3]
	% Removal	--	–	calculation[4]
pH	standard units	Effluent	1/week	grab
E. coli	colonies/100 ml	Effluent	5/month	grab
Temperature[5,6]	°C	Effluent	1/month	grab
Chlorine[7]	mg/L	Effluent	1/ week	grab
Total Ammonia as N[5]	mg/L	Effluent	1/month	8-hour composite
Total Phosphorus as P[5,6]	mg/L	Effluent	1/month	8-hour composite
Dissolved Oxygen[5,6]	mg/L	Effluent	1/month	grab

Notes:
1 The sampling frequency may differ in the permit if the facility discharges intermittently.
2 If the permittee's current permit requires more frequent flow monitoring than what is listed in this table, then the flow monitoring requirement in the current permit will be retained in the draft permit.
3 Maximum daily loading is calculated by multiplying the concentration in mg/L by the average daily flow in mgd and a conversion factor of 8.34.
4 Percent removal is calculated using the following equation:
(influent - effluent) ÷ influent * 100.
5 Monitoring is required for one year only.
6 Monitoring is required only if the receiving water is water quality limited for the parameter.
7 Applies only to those facilities that chlorinate.

Table 2c: Effluent Monitoring Requirements (up to 0.1 mgd Design Flow)				
Parameter	**Unit**	**Sample Location**	**Sample Frequency[1]**	**Sample Type**
Flow	mgd	Effluent	1/week[2]	measure[2]
BOD_5	mg/L	Influent and Effluent	1/month	grab
	lbs/day	Influent and Effluent	1/month	calculation[3]
	% Removal	--	–	calculation[4]
TSS	mg/L	Influent and Effluent	1/month	grab
	lbs/day	Influent and Effluent	1/month	calculation[3]
	% Removal	--	–	calculation[4]
pH	standard units	Effluent	1/week	grab
E. coli	colonies/100 ml	Effluent	5/month	grab
Temperature[5,6]	°C	Effluent	1/month	grab
Chlorine[7]	mg/L	Effluent	1/week	grab
Total Ammonia as N[5]	mg/L	Effluent	1/month	grab
Total Phosphorus as P[5,6]	mg/L	Effluent	1/month	grab
Dissolved Oxygen[5,6]	mg/L	Effluent	1/month	grab

Notes:
1 The sampling frequency may differ in the permit if the facility discharges intermittently.
2 If the current permit for a facility requires that the permittee monitor flow using a continuous recording, or requires a different monitoring frequency, this permit provision is retained in the draft permit.
3 Maximum daily loading is calculated by multiplying the concentration in mg/L by the average daily flow in mgd and a conversion factor of 8.34.
4 Percent removal is calculated using the following equation:
(influent - effluent) ÷ influent * 100.
5 Monitoring is required for one year.
6 Monitoring is required only if the receiving water is water quality limited for the parameter.
7 Applies only to those facilities that chlorinate.

C. Surface Water Monitoring

Table 3 presents the proposed surface water monitoring requirements for the draft permits. Specific monitoring requirements will vary for each facility depending on the impairment of the receiving water (see Appendix B, Section 4C). The permittees should work with the IDEQ Regional Office to establish the appropriate upstream monitoring location.

Table 3: Surface Water Monitoring Requirements

Parameter	Sample Location	Sample Frequency[2]	Sample Type
Total Ammonia as N	Upstream of treatment plant outfall	1/ quarter	grab
pH, standard units	Upstream of treatment plant outfall	1/quarter	grab
Temperature, °C	Upstream of treatment plant outfall	1/quarter	grab
Total Phosphorus as P [1]	Upstream of treatment plant outfall	1/quarter	grab
Total Inorganic Nitrogen [1]	Upstream of treatment plant outfall	1/quarter	grab
Dissolved Oxygen[1]	Upstream of treatment plant outfall	1/quarter	grab

Notes:
1 Monitoring is required only if the receiving water is water quality limited for the parameter.
2 The sampling frequency may differ in the permit if the facility discharges intermittently.

VI. SLUDGE (BIOSOLIDS) REQUIREMENTS

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

Until future issuance 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. The Part 503 regulations are self-implementing, which means that permittees must comply with them whether or

not a permit has been issued.

VII. OTHER PERMIT CONDITIONS

A. Quality Assurance Plan

The federal regulation at 40 CFR 122.41(e) requires the Permittee to develop procedures to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The Permittees are required to develop and implement a Quality Assurance Plan within 180 days of the effective date of the final permit. The Quality Assurance Plan shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan shall be retained on site and made available to EPA and IDEQ upon request.

B. Operation and Maintenance Plan

The permits require 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. Each Permittee is required to develop and implement an operation and maintenance plan for their facility within 180 days of the effective date of the final permit. The plan shall be retained on site and made available to EPA and IDEQ upon request.

C. Additional Permit Provisions

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

D. Compliance Schedule for Water Quality Based Effluent Limits

As part of the State review of the preliminary draft permits, a compliance schedule was recommended for some of the facilities to allow adequate time for the facility to install/implement any necessary modifications to meet the water quality based chlorine limits. These compliance schedules have been incorporated into the draft permits. The permits include an interim technology-based average monthly chlorine effluent limitation of 0.5 mg/L. The derivation of this technology-based limit is provided in Appendix B, Section A.2 of this Fact Sheet.

VIII. OTHER LEGAL REQUIREMENTS

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. EPA has evaluated the potential effects of the discharge from the treatment facilities on listed endangered and threatened species in the vicinity of the facilities were prepared. The results of this evaluation have determined that issuance of these permits will not affect any of the threatened or endangered species in the vicinity of the discharges.

B. Essential Fish Habitat

Essential fish habitat (EFH) is 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 EPA to consult with the National Marine Fisheries Service (NMFS) when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. The EPA has tentatively determined that the issuance of these permits will not affect any EFH species in the vicinity of the discharges, therefore consultation is not required for this action.

C. State Certification

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

D. Permit Expiration

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

Appendix A - Facility Information

	Elk Valley Subdivision
NPDES ID Number:	ID-002797-9
Mailing Address:	3561 N. Pine Featherville Rd. Pine, ID 83647
Facility Background:	The facility is a privately owned treatment works and applied for an NPDES permit in September 2000. A permit has never been issued, but a letter was provided by EPA and IDEQ outlining discharge limitations and monitoring requirements until a permit is effective. Several homes are currently on septic, and the system is expected to go operational late 2004.
Collection System Information	
Service Area:	Elk Valley Subdivision, Featherville Idaho
Service Area Population:	78
Collection System Type:	100% separated sanitary sewer
Facility Information	
Treatment Train:	Primary, secondary and advanced treatment through two sequential batch reactors followed by sand filtration and UV disinfection
Design Flow:	0.0093 mgd
Existing Flow:	Anticipated intermittent discharge (approx 7 times/day and 1,350 gal/discharge).
Months when Discharge Occurs:	Year round
Outfall Location:	latitude: 43° 35' 27" N, latitude: 115° 16' 27" W
Receiving Water Information	
Receiving Water:	South Fork, Boise River via an unnamed tributary for approximately 3 miles.
Subbasin:	South Fork Boise (HUC 17050113), Unit SW-13
Beneficial Uses:	Cold water communities, primary contact recreation, domestic water supply, salmonid spawning and special resource water.
Water Quality Limited Segment:	Subbasin assessment identified sediment and nutrients as pollutants of concern. TMDL has not been approved.
Low Flow:	No flow data available
Additional Notes	
Basis for BOD_5/TSS Limits:	Principal treatment process is not a trickling filter or a waste stabilization pond, therefore, secondary treatment limits required.

	City of Grangeville
NPDES ID Number:	ID-002003-6
Mailing Address:	225 W. North Street Grangeville, ID 83530
Facility Background:	The facility's existing permit became effective December 30, 1987. The current permit application was received in June 2001.
Collection System Information	
Service Area:	City of Grangeville
Service Area Population:	3,228
Collection System Type:	100% separated sanitary sewer
Facility Information	
Treatment Train:	Primary and secondary treatment consisting of an extended aeration activated sludge process followed by a chlorine contact basin.
Design Flow:	0.88 mgd
Existing Flow:	0.70 mgd (average daily flow rate)
Months when Discharge Occurs:	year round
Outfall Location:	latitude: 45° 56' 22.9" N, longitude: 116° 06' 44.2" W
Receiving Water Information	
Receiving Water:	Threemile Creek (tributary to S. Fork Clearwater)
Subbasin:	South Fork Clearwater (HUC 17060305), Unit C-10
Beneficial Uses:	Cold water communities, secondary contact recreation, and salmonid spawning.
Water Quality Limited Segment:	ID3291: Threemile Creek is listed for bacteria, dissolved oxygen, nutrients, sediment and temperature (TMDL approved). Wasteload allocations have been established for the Grangeville WWTP for phosphorous and temperature.
Low Flow:	No flow data
Additional Notes	
Tribal Information	The South Fork of the Clearwater River are tribal waters of the Nez Perce Indian Reservation.
Basis for BOD_5/TSS Limits:	Principal treatment process is not a trickling filter or a waste stabilization pond, therefore, secondary treatment limits required.

	City of Inkom
NPDES ID Number:	ID-002024-9
Mailing Address:	P.O. Box 60 365 N. Rapid Creek Rd. Inkom, ID 83245
Facility Background:	The facility's existing permit became effective February 15, 1988. The current permit application was received in January 1993.
Collection System Information	
Service Area:	City of Inkom
Service Area Population:	800
Collection System Type:	100% separated sanitary sewer
Facility Information	
Treatment Train:	Primary and secondary aerated lagoon system followed by chlorination.
Design Flow:	0.105 mgd
Existing Flow:	0.076 mgd (average daily flow rate)
Months when Discharge Occurs:	year round
Outfall Location:	latitude: 42° 47' 23" N, longitude: 112° 14' 24"W
Receiving Water Information	
Receiving Water:	Portneuf River
Subbasin:	Portneuf (HUC 17040208), Unit US-1
Beneficial Uses:	Cold water communities, secondary contact recreation and salmonid spawning
Water Quality Limited Segment:	Mainstem Portneuf River listed for sediment, nutrients, bacteria, and oil and grease. TMDL approved, Implementation Plan designates wasteload allocations for phosphorous and nitrogen; however, these numbers may be revised in 2005.
Low Flow:	7Q10 = 8.9, 1Q10 = 4.8 MGD (Pocatello Gauge)
Additional Notes	
Tribal Information	Approximately 10 miles downstream from the Inkom discharge are tribal waters of the Fort Hall Indian Reservation.
Basis for BOD_5/TSS Limits:	Principal treatment process is not a trickling filter or a waste stabilization pond, therefore, secondary treatment limits required.

	City of Lava Hot Springs
NPDES ID Number:	ID-002182-2
Mailing Address:	P.O. Box 187 115 West Elm Lava Hot Springs, Idaho 83246
Facility Background:	The facility's existing permit became effective July 29, 1982 The current permit application was received in September 1989.
Collection System Information	
Service Area:	City of Lava Hot Springs
Service Area Population:	520
Collection System Type:	100% separated sanitary sewer
Facility Information	
Treatment Train:	Primary and secondary lagoon system with aeration and chlorine disinfection. A Wastewater Facility Plan is being developed to upgrade the treatment system.
Design Flow:	0.343 mgd
Existing Flow:	Approximately 0.13 mgd.
Months when Discharge Occurs:	Surface water discharge from October to May. Land application from May to October
Outfall Location:	latitude: 42° 37' 25"N, longitude: 112° 01' 45"W
Receiving Water Information	
Receiving Water:	Portneuf River
Subbasin:	Portneuf (HUC 17040208), Unit US-16
Beneficial Uses:	Cold water communities, primary contact recreation, salmonid spawning, domestic drinking water, and special resource water
Water Quality Limited Segment:	Mainstem Portneuf River listed for sediment, nutrients, bacteria, and oil and grease. TMDL approved, Implementation Plan designates wasteload allocations for phosphorous and nitrogen; however, these numbers may be revised in 2005.
Low Flow:	7Q10 = 48.5 mgd, 1Q10 = 46.7 mgd (Topaz Gauge)
Additional Notes	
Basis for BOD_5/TSS Limits:	Principal treatment process is not a trickling filter or a waste stabilization pond, therefore, secondary treatment limits required.

	City of Montpelier
NPDES ID Number:	ID-002558-5
Mailing Address:	534 Washington St. Montpelier, Idaho 83254
Facility Background:	The City has applied for, but has never received an NPDES permit. A September 1982 letter from EPA to the City outlined effluent limitations until a permit becomes effective. An application was received on March 29, 2004.
Collection System Information	
Service Area:	City of Montpelier
Service Area Population:	2,800
Collection System Type:	Approximately 95% separate. Some local businesses have roof down spouts that drain to the sanitary sewer.
Facility Information	
Treatment Train:	Three facultative ponds followed by chlorination.
Design Flow:	0.5 mgd
Existing Flow:	0.36 mgd (daily average influent)
Months when Discharge Occurs:	May and October (each discharge approximately 30 days)
Outfall Location:	latitude: 42° 20' 14"N, longitude: 111° 20' 33"W
Receiving Water Information	
Receiving Water:	Bear River
Subbasin:	Bear Lake (HUC 16010201), Unit B-2
Beneficial Uses:	Cold water communities, primary contact recreation and salmonid spawning
Water Quality Limited Segment:	TMDL for nutrients and sediment under development (List ID: ID2253). Draft wasteload allocations have been established for phosphorous and TSS.
Low Flow:	No flow information
Additional Notes	
Basis for BOD_5/TSS Limits:	Data presented in the March 2004 NPDES application indicates that Montpelier can meet secondary treatment limits.

	Southside Water and Sewer District
NPDES ID Number:	ID-002804-5
Mailing Address:	50 Harbor View Sagle, Idaho 8860
Facility Background:	The facility will be a new discharger. Application was received February 2004. Currently land applies treated effluent in the summer (aerated lagoon, settling and chlorine injection) and uses lagoon storage in the winter.
Collection System Information	
Service Area:	Southside Water and Sewer District (Lakeshore Drive area of Sagle, Idaho).
Service Area Population:	750
Collection System Type:	100% separated sanitary sewer
Facility Information	
Treatment Train:	The new system (scheduled to become operational by 9/05) will be a hybrid of direct river discharge during winter months and slow rate land application during the irrigation season. Treatment will consist of settling and aeration lagoons followed by chlorination.
Design Flow:	0.165 mgd (estimated)
Existing Flow:	0.054 mgd (annual average daily flow)
Months when Discharge Occurs:	October through April
Outfall Location:	latitude: 48° 14' 12" N, longitude: 116° 34' 02"W (approx location of submerged outfall to be constructed in Murphy Bay)
Receiving Water Information	
Receiving Water:	Pend Oreille River
Subbasin:	Pend Oreille Lake (HUC 17010214), Unit P-2
Beneficial Uses:	Cold water communities, primary contact recreation and domestic drinking water.
Water Quality Limited Segment:	A temperature and sediment TMDL are currently being developed (List ID: ID5657). A nutrient TMDL has been developed for Lake Pend Oreille, and is being considered for the river.
Low Flow:	7Q10 = 2,123 mgd, 1Q10 = 1,482 mgd
Additional Notes	
Basis for BOD_5/TSS Limits:	Since this will be a newly constructed facility with no effluent data to evaluate, secondary treatment limits are required.

	City of Wilder
NPDES ID Number:	ID-002026-5
Mailing Address:	P.O. Box 687 219 3rd Street Wilder, Idaho 83676
Facility Background:	The facility's existing permit became effective September 1987. The current permit application was received in September 1992.
Collection System Information	
Service Area:	City of Wilder
Service Area Population:	1,450
Collection System Type:	100% separated sanitary sewer
Facility Information	
Treatment Train:	Primary and secondary treatment using 3 ponds. Settling and aeration ponds followed by sand filtration and chlorine disinfection.
Design Flow:	0.25 mgd
Existing Flow:	0.17 mgd (average influent)
Months when Discharge Occurs:	Year round
Outfall Location:	latitude: 43° 40' 39" N, longitude: 116° 54' 06"W
Receiving Water Information	
Receiving Water:	Wilder Ditch Drain (tributary of the Lower Boise River)
Subbasin:	Lower Boise (HUC 17050114)
Beneficial Uses:	Cold water communities and secondary contact recreation by default
Water Quality Limited Segment:	The Lower Boise River is listed as impaired for sediment, dissolved oxygen, oil and grease, nutrients, bacteria and temperature. A bacteria wasteload allocation (fecal coliform) has been derived for the Wilder WWTP. The current E. coli water quality standard is protective of the fecal wasteload allocation.
Low Flow:	No flow data
Additional Notes	
Basis for BOD_5/TSS Limits:	Principal treatment process is not a trickling filter or a waste stabilization pond, therefore, secondary treatment limits required.

Appendix B - Basis for Effluent Limitations

The Clean Water Act (CWA) requires Publicly Owned Treatment Works (POTW) to meet effluent limits based on available wastewater treatment technology. These types of effluent limits are called secondary treatment effluent limits. EPA may find, by analyzing the effect of an effluent discharge on the receiving water, that secondary treatment effluent limits are not sufficiently stringent to meet water quality standards. In such cases, EPA is required to develop more stringent water quality-based effluent limits which are designed to ensure that the water quality standards of the receiving water are met.

Secondary treatment effluent limits may not limit every parameter that is in an effluent. For example, secondary treatment effluent limits for POTWs have only been developed for five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH, yet effluent from a POTW may contain other pollutants such as bacteria, chlorine, ammonia, or metals depending on the type of treatment system used and the service area of the POTW (i.e., industrial facilities as well as residential areas discharge into the POTW). When technology based effluent limits do not exist for a particular pollutant expected to be in the effluent, EPA must determine if the pollutant may cause or contribute to an exceedance of the water quality standards for the water body. If a pollutant causes or contributes to an exceedance of a water quality standard, water quality-based effluent limits for the pollutant must be incorporated into the permit.

The following discussion explains in more detail the derivation of technology based effluent limits, and water quality based effluent limits. Part A discusses technology based effluent limits, Part B discusses water quality based effluent limits, and Part C discusses facility specific limits.

A. Technology Based Effluent Limits

1. BOD_5, TSS and pH

Secondary Treatment:

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as “secondary treatment,” that all POTWs were required to meet by July 1, 1977. EPA developed “secondary treatment” regulations which are specified in 40 CFR 133. These technology-based effluent limits apply to all municipal wastewater treatment plants, and identify the minimum level of effluent quality attainable by secondary treatment in terms of BOD_5, TSS, and pH. The secondary treatment effluent limits are listed in Table B-1.

Table B-1: Secondary Treatment Effluent Limits			
Parameter	**Average Monthly Limit**	**Average Weekly Limit**	**Range**
BOD_5	30 mg/L	45 mg/L	---
TSS	30 mg/L	45 mg/L	---
Removal Rates for BOD_5 and TSS	85%	---	---
pH	---	---	6.0 - 9.0 s.u.

Treatment Equivalent to Secondary:
The regulations include special considerations, referred to as "treatment equivalent to secondary", for waste stabilization ponds 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 described above (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 is consistently attained).

Reduced Percent Removal Requirements for Less Concentrated Influent Wastewater:
In accordance with 40 CFR § 133.103 (d), treatment works that receive less concentrated wastes from separate sewer systems can qualify to have their percent removal limits reduced provided that all of the following conditions are met:

- The facility can consistently meet its permit effluent concentration limits but cannot meet its percent removal limits because of less concentrated influent water
- The facility would have been required to meet significantly more stringent limitations than would otherwise be required by the concentration-based standards and
- The less concentrated influent is not the result of excessive inflow/infiltration (I/I).

Draft Permit Limits:
When available, monitoring data collected over the past five years from each facility was evaluated to determine if any considerations were necessary in designating effluent limits for BOD_5 and TSS (such as treatment equivalent to secondary limits or reduced percent removal requirements).

This data review indicated that for facilities utilizing trickling filters or waste stabilization ponds as their principle treatment process, effluent concentration could consistently achieve secondary treatment limits. Therefore considerations for "treatment equivalent to secondary"or "less concentrated influent wastewater" were not necessary.

2. Chlorine

A technology-based average monthly chlorine effluent limitation of 0.5 mg/L for wastewater treatment plants is derived from standard operating practices. The Water Pollution Control Federation's Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/L limit on a monthly average basis. In addition to average monthly limits (AMLs), NPDES regulations require effluent limits for POTWs to be expressed as average weekly limits (AWLs) unless impracticable. The AWL is derived as 1.5 times the AML, resulting in an AWL for chlorine of 0.75 mg/L.

3. Mass-based Limits

The federal regulation at 40 CFR § 122.45 (f) require BOD_5, TSS, and chlorine limitations to be expressed as mass based limits using the design flow of the facility. The mass based limits are expressed in lbs/day and are calculated as follows:

Mass based limit (lbs/day) = concentration limit (mg/L) x design flow (mgd) x 8.34

B. Water Quality-Based Effluent Limits

The following discussion is divided into four sections. Section 1 discusses the statutory basis for including water quality-based effluent limits in NPDES permits, section 2 discusses the procedures used to determine if water quality-based effluent limits are needed in an NPDES permit, section 3 discusses the procedures used to develop water quality-based effluent limits, and section 4 discusses the specific water quality based limits.

1. 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. Discharges to state/tribal waters must also comply with limitations imposed by the state/tribe as part of its certification of NPDES permits under section 401 of the CWA.

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 or tribal water quality standard, including both numeric and 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 established through a TMDL.

2. Reasonable Potential Analysis

When evaluating the effluent to determine if water quality-based effluent limits are needed based on chemical specific numeric criteria, 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 specific chemical, 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 area of receiving water to provide dilution of the effluent, these areas are called mixing zones. Mixing zone allowances will increase the 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 receiving water is below the chemical specific numeric criterion necessary to protect the designated uses of the water body. Mixing zones must be authorized by the Idaho Department of Environmental Quality.

3. Procedure for Deriving Water Quality-Based Effluent Limits

The first step in developing a water quality based permit 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 contribute to an exceedance of the criterion. The wasteload allocations have been determined for pH and *E. coli* in this way because the state does not generally authorize mixing zones for these pollutants. For these particular parameters, the wasteload allocation translates directly into the effluent limit without any statistical conversion.

4. Specific Water Quality-Based Effluent Limits

(a) Toxic Substances

The Idaho Water Quality Standards require surface waters of the state to be free from toxic substances in concentrations that impair designated uses. Because there are no significant industrial discharges to the facilities, and concentrations of priority pollutants from cities without a significant industrial component are low, it is anticipated that toxicity will not be a problem in the facility discharges. Therefore, water quality-based effluent limits have not been proposed for the draft permits.

(b) Floating, Suspended or Submerged Matter/Oil and Grease

The Idaho Water Quality Standards 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 permits that states there must be no discharge of floating solids or visible foam or oil and grease other than trace amounts.

(c) Excess Nutrients - Phosphorous and Nitrogen

The Idaho Water Quality Standards require surface waters of the state be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses.

If a facility discharges to a receiving water listed as water quality limited for nutrients but a TMDL has not been developed, the draft permit requires effluent and receiving water monitoring for phosphorus and nitrogen. This information can be used by the State when it develops the TMDL. However, if a nutrient wasteload allocation from an EPA approved TMDL is available then it is incorporated into the draft permit.

(d) Sediment/Total Suspended Solids (TSS)

The draft permits include technology-based limits for TSS. However, if a facility discharges to a receiving water listed as water quality limited for sediment, the sediment wasteload allocation from the TMDL (if approved by the EPA) is incorporated into the draft permit limits.

(e) pH

The Idaho Water Quality Standards 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 before the effluent is discharged to the receiving water. The technology-based effluent limits for pH are 6.0 - 9.0 standard units. These limits must be met before the effluent is discharged to the receiving water. To ensure that both water quality-based requirements and technology-based requirements are met, the draft permits incorporate the lower range of the water quality standards (6.5 standard units) and the upper range of the technology-based limits (9.0 standard units).

(f) Dissolved Oxygen (DO)

The Idaho Water Quality Standards require the level of DO to exceed 6 mg/L at all times for water bodies that are protected for aquatic life use. Further, during salmonid spawning and incubation periods, the one day minimum intergravel DO must exceed 5 mg/L and the seven day average intergravel DO must exceed 6 mg/L.

If a facility discharges to a receiving water listed as water quality limited for DO but a TMDL has not been developed, the draft permit requires effluent and receiving water monitoring for DO. This information can be used by the State when it develops the TMDL. However, if a DO wasteload allocation from an EPA approved TMDL is available then it is incorporated into the draft permit.

(g) Temperature

The Idaho Water Quality Standards require ambient water temperatures of 22°C or less with a maximum daily average of no greater than 19°C for cold water biota protection. In addition, water temperatures of 13°C or less with a maximum daily average not greater than 9°C are required for salmonid spawning use during the spawning and incubation periods.

If a facility discharges to a receiving water listed as water quality limited for temperature but a TMDL has not been developed, the draft permit requires effluent and receiving water monitoring for temperature. This information can be used by the State when it develops the TMDL. However, if a temperature wasteload allocation from an EPA approved TMDL is available then it is incorporated into the draft permit.

(h) Ammonia

The Idaho Water Quality Standards contain water quality criteria to protect aquatic life, including salmonids, against short term and long term adverse impacts from ammonia. Currently, there are no ammonia data for the facilities to determine if ammonia may cause or contribute to a water quality standard violation. Since the data are not available to determine if water quality-based effluent limits are required for ammonia, the draft permits do not propose effluent limits for ammonia. However, the draft permits require effluent sampling for ammonia, and surface water sampling for ammonia, pH, and temperature. These data will be used to determine if an ammonia limit is needed for the effluent discharge for the next permit.

(i) Escherichia Coli (E. coli)

According to the Idaho Water Quality Standards, waters designated for primary contact recreation are not to contain *E. coli* significant to the public health in concentrations exceeding:

a. A single sample of four hundred and six (406) *E. coli* organisms per one hundred ml; or
b. A geometric mean of one hundred and twenty six (126) *E. coli* organisms per one hundred ml based on a minimum of five samples taken, every three to five days, over a thirty day period.

Waters that are designated for secondary contact recreation are not to contain *E. coli* in concentrations exceeding:

a. A single sample of five hundred and seventy six (576) *E. coli*

organisms per one hundred ml; or

b. A geometric mean of one hundred and twenty six (126) *E. coli* organisms per one hundred ml based on a minimum of five samples taken, every three to five days, over a thirty day period.

It is anticipated that mixing zones will not be authorized for bacteria, therefore, this criteria must be met before the effluent is discharged to the receiving water. The proposed water quality-based effluent limits in the draft permits include an average monthly limit of 126 organisms/100 ml and an instantaneous maximum limit of either 406 organisms/100 ml or 576 organisms/100 ml, depending on whether the facility is discharging to waters designated for primary or secondary contact recreation.

(j) Total Residual Chlorine

The Idaho Water Quality Standards contain water quality criteria to protect aquatic life against short term and long term adverse impacts from chlorine. Several of the facilities use chlorine disinfection. A reasonable potential analysis was conducted for each of these facilities to determine if the discharge has the potential to exceed Idaho Water Quality Standards. The results indicate that some facilities do have the potential to exceed water quality criteria while others do not. Therefore, the draft permits include either water quality or and technology based effluent permit limitations (whichever is more stringent). For facilities that do not chlorinate, chlorine is not expected to be present in the discharge and therefore no total residual chlorine limits have been included in those draft permits.

Appendix C - Reasonable Potential Determination

To determine if a water quality based effluent limitation is required, the receiving water concentration of pollutants is determined downstream of where the effluent enters the receiving water. If the projected receiving water concentration is greater than the applicable numeric criterion for a specific pollutant, there is reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standard and an effluent limit must be incorporated into the NPDES permit. The receiving water concentration is determined using the following mass balance equation:

$C_d * Q_d = (C_e * Q_e) + (C_u * Q_u)$, which can be rearranged as follows:

$$C_d = \frac{(C_e * Q_e) + (C_u * Q_u)}{Q_d}$$

C_d = receiving water concentration downstream of the effluent discharge
Q_d = receiving water flow downstream of the effluent discharge ($Q_e + Q_u$)
C_e = maximum projected effluent concentration
Q_e = maximum effluent flow
C_u = upstream concentration of pollutant
Q_u = upstream low flow

Flow Conditions / Mixing Zones

The Idaho *Water Quality Standards and Wastewater Treatment Requirements* at IDAPA 58.01.02.060(01)(e) allow twenty-five percent (25%) of the receiving water to be used for dilution for aquatic life criteria. The flows used to evaluate compliance with the criteria are:

- The 1 day, 10 year low flow (1Q10). This flow is used to protect aquatic life from acute effects. It represents the lowest daily flow that is expected to occur once in 10 years.

- The 7 day, 10 year low flow (7Q10). This flow is used to protect aquatic life from chronic effects. It the lowest 7 day average flow expected to occur once in 10 years.

In accordance with state water quality standards, only the Idaho Department of Environmental Quality may authorize mixing zones. The reasonable potential calculations are based on an assumed mixing zone of 25% for aquatic life. If the State does not authorize a mixing zone in its 401 certification, the permit limits will be re-calculated to ensure compliance with the standards at the point of discharge.

When a mixing zone (%MZ) is allowed, the mass balance equation becomes:

$$C_d = \frac{(C_e * Q_e) + (C_u * (Q_u * \%MZ))}{Q_e + (Q_u * \%MZ)}$$

Maximum Projected Effluent Concentration

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. The technology-based chlorine limit is 0.5 mg/L (average monthly limit). At a minimum, facilities must meet the technology-based effluent limit. When doing a reasonable potential calculation to determine if the technology-based chlorine limit would be protective of water quality standards it was assumed that the maximum projected effluent concentration was 0.5 mg/L (500 µg/L).

Reasonable Potential Calculations

The following is an example to illustrate the calculations used to determine if chlorine has the reasonable potential to cause or contribute to an exceedance of the State water quality standard. Table C-1 summarizes the results of the reasonable potential calculations for each facility.

Information and assumptions for this example are:

- Facility is discharging at a maximum chlorine concentration of 500 ug/L (C_e)
- Wastewater Treatment Plant Design Flow = 5 mgd (Q_e)
- Low Flow Conditions (Q_u):
  - 1Q10 = 50 mgd (used to evaluate acute conditions)
  - 7Q10 = 200 mgd (used to evaluate chronic conditions)
- The upstream concentration of chlorine is assumed to be zero since there are no sources of chlorine upstream of the discharge (C_u).
- Percent of the river available for mixing is 25%

(1) Determine if there is a reasonable potential for the acute aquatic life criterion to be violated.

MZ = 25% (0.25)
C_e = 500 µg/L
Q_e = 5 mgd
C_u = 10 µg/L
Q_u = 50 mgd

$$C_d = \frac{(500 * 5) + (0 * (50 * 0.25))}{5 + (50 * 0.25)} = 142.9 \text{ µg/L}$$

Since 142.9 µg/L is greater than the acute aquatic life criterion (19 µg/L), there is a reasonable potential for the effluent to cause an exceedance to the water quality standard. Therefore, a water quality based effluent limit for chlorine is required.

(2) Determine if there is a reasonable potential for the chronic aquatic life criterion to be violated.

MZ = 25% (0.25)
C_e = 500 µg/L
Q_e = 5 mgd
C_u = 10 µg/L
Q_u = 200 mgd

$$C_d = \frac{(500 * 5) + (0 * (200 * 0.25))}{5 + (200 * 0.25)} = 45.5 \text{ µg/L}$$

Since 45.5 µg/L is greater than the chronic aquatic life criterion (11 µg/L), there is a reasonable potential for the effluent to cause an exceedance to the water quality standard. Therefore, a water quality based effluent limit for chlorine is required.

TABLE C-1: Reasonable Potential Determination (Chlorine)

Facility	Max. Projected Effluent Conc. (C_e), µg/L	Effluent Flow (Q_e), mgd	Upstream concentration (C_u), µg/L	Upstream Flow[1] (Q_u), mgd		Mixing Zone Size (MZ)	Downstream concentration, C_d, µg/L		Does C_d exceed acute or chronic criteria?
				1Q10	7Q10		Acute	Chronic	
Elk Valley Subdivision	500	0.0093	0	no data		na[2]	500	500	no[3]
City of Grangeville	500	0.88	0	no data		na[2]	500	500	yes
City of Inkom	500	0.105	0	4.8	8.9	25%	40	22	yes
City of Lava Hot Springs	500	0.343	0	46.7	48.5	25%	4	4	no
City of Montpelier	500	0.5	0	no data		na[2]	500	500	yes
Southside District	500	0.165	0	1,482	2,123	25%	0.0001	0.00009	no
City of Wilder	500	0.25	0	no data		na[2]	500	500	yes

Note:
1. Receiving waters with no flow data were assumed to have a low flow of 0.
2. na = not applicable. Because the low flow was assumed to be zero, there is no water available for mixing.
3. Treatment system uses ultraviolet light for disinfection. No chlorine limit necessary

To support the implementation of EPA's regulations for controlling the discharge of toxicants, EPA developed the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001, March 1991). The following is a summary of the procedures recommended in the TSD in deriving water quality-based effluent limitations for pollutants. This procedure translates water quality criteria for chlorine and ammonia to "end of the pipe" effluent limits.

Step 1- Determine the WLA

The acute and chronic aquatic life criteria are converted to acute and chronic waste load allocations (WLA_{acute} or $WLA_{chronic}$) for the receiving waters based on the following mass balance equation:

$$Q_dC_d = Q_eC_e + Q_uC_u$$

Q_d = downstream flow = $Q_u + Q_e$
C_d = aquatic life criteria that cannot be exceeded downstream
Q_e = effluent flow
C_e = concentration of pollutant in effluent = WLA_{acute} or $WLA_{chronic}$
Q_u = upstream flow
C_u = upstream background concentration of pollutant

Rearranging the above equation to determine the effluent concentration (C_e) or the wasteload allocation (WLA) results in the following:

$$C_e = WLA = \frac{Q_dC_d - Q_uC_u}{Q_e} = \frac{C_d(Q_u + Q_e) - Q_uC_u}{Q_e}$$

when a mixing zone is allowed, this equation becomes:

$$C_e = WLA = \frac{C_d(Q_u \times \%MZ) + C_dQ_e}{Q_e} - \frac{Q_uC_u(\%MZ)}{Q_e}$$

Step 2 - Determine the LTA

The acute and chronic WLAs are then converted to Long Term Average concentrations (LTA_{acute} and $LTA_{chronic}$) using the following equations:

$$LTA_{acute} = WLA_{acute} * e^{[0.5\sigma^2 - z\sigma]}$$

where,
σ^2 = $\ln(CV^2 + 1)$
z = 2.326 for 99^{th} percentile probability basis
CV = coefficient of variation = standard deviation/mean

$LTA_{chronic} = WLA_{chronic} * e^{[0.5\sigma^2 - z\sigma]}$

where,

σ^2 = $\ln(CV^2/4 + 1)$
z = 2.326 for 99th percentile probability basis
CV = coefficient of variation = standard deviation/mean

Step 3 - Most Limiting LTA

To protect a waterbody from both acute and chronic effects, the more limiting of the calculated LTA_{acute} and $LTA_{chronic}$ is used to derive the effluent limitations. The TSD recommends using the 95th percentile for the Average Monthly Limit (AML) and the 99th percentile for the Maximum Daily Limit (MDL).

Step 4 - Calculate the Permit Limits

The maximum daily limit (MDL) and the average monthly limit (AML) are calculated as follows (assuming the $LTA_{chronic}$ is the more restrictive limitation):

$MDL = LTA_{chronic} * e^{[z\sigma - 0.5\sigma^2]}$
where,
σ^2 = $\ln(CV^2 + 1)$
z = 2.326 for 99th percentile probability basis
CV = coefficient of variation

$AML = LTA_{chronic} * e^{[z\sigma_n - 0.5\sigma_n^2]}$
where,
σ^2 = $\ln(CV^2/n + 1)$
z = 1.645 for 95th percentile probability basis
CV = coefficient of variation = standard deviation/mean
n = number of sampling events required per month for chlorine (either 4 or 20 depending on design flow)

The results of the above calculations for each of the facilities are summarized in Table D-1 below.

TABLE D-1: Effluent Limit Calculation (Chlorine)

Facility	Criteria (µg/L)		CV	Q_u (mgd)		MZ	Q_e (mgd)[1]	C_u (µg/L)	WLA (µg/L)		LTA (µg/L)		MDL (µg/L)	AML (µg/L)
	Acute	Chronic		1Q10	7Q10				Acute	Chronic	Acute	Chronic		
Elk Valley Subdivision	Facility utilizes ultraviolet light for disinfection. Residual chlorine permit limits are not necessary													
City of Grangeville	19	11	0.6	no data		na[2]	0.88	0	19	11	6	6	18.1	7.2
City of Inkom	19	11	0.6	4.8	8.9	25%	0.105	0	236	244	76	129	236	118
City of Lava Hot Springs	Facility shows no reasonable potential to exceed water quality criteria for chlorine (see Table C-1). Technology based permit limits apply.													
City of Montpelier	19	11	0.6	no data		na[2]	0.5	0	19	11	6	6	18.1	7.2
Southside District	Facility shows no reasonable potential to exceed water quality criteria for chlorine (see Table C-1). Technology based permit limits apply.													
City of Wilder	19	11	0.6	no data		na[2]	0.5	0	19	11	6	6	18.1	7.2

Q_u = upstream flow
CV = coefficient of variation
MZ = mixing zone
Q_e = effluent flow
C_u = upstream concentration
WLA = wasteload allocation
LTA = long term average
MDL = maximum daily limit
AML = average monthly limit

Notes:
1. Receiving waters with no flow data were assumed to have a low flow of 0.
2. na = not applicable. Because flow data was not available, low flow was assumed to be zero, there is no water available for mixing.

Appendix E - Location of Facilities