Fact Sheet

NPDES Permit Number: AK-002001-0
Public Notice Start Date:
Public Notice Expiration Date:
Technical Contact: Mike Lidgard 206/553-1755 or
1-800-424-4372 (within Region 10)
lidgard.michael@epa.gov

The U.S. Environmental Protection Agency (EPA) Plans To Reissue A Wastewater Discharge Permit To:

The City of Skagway
PO Box 415
Point Street and Main
Skagway, Alaska 99840

and the State of Alaska proposes to Certify the Permit and Issue a Consistency Determination

EPA Proposes NPDES Permit Reissuance.

The EPA proposes to reissue a *National Pollutant Discharge Elimination System* (NPDES) permit to the City of Skagway. The draft permit sets conditions on the discharge of pollutants from the wastewater treatment plant to the Taiya Inlet. 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.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures
- a description of the current discharge
- a listing of past and draft effluent limitations, monitoring requirements, and other conditions
- a description of the discharge location, and
- detailed technical material supporting the conditions in the permit and supporting the tentative determination to issue an NPDES permit incorporating a section 301(h) variance.

Alaska State Certification.
The EPA requests that the Alaska Department of Environmental Conservation certify the NPDES permit to the City of Skagway Wastewater Treatment Plant under section 401 of the Clean Water Act. The EPA may not reissue the NPDES permit until the state has granted, denied, or waived certification. For more information concerning this review, please contact Clynda Case at (907) 465-5366 or 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801-1795 or Clynda_Case@envircon.state.ak.us.

Consistency Determination.
The State of Alaska, Office of Management and Budget, Division of Governmental Coordination (DGC), intends to review this action for consistency with the approved Alaska Coastal Management Program (ACMP). For more information concerning this review, please contact Lorraine Marshall at (907) 465-8790 or P.O. Box 110030, Juneau, Alaska 99811-0030.

Public Comment.
The EPA will consider all comments before reissuing the final permit. Those wishing to comment on the draft permit or request a public hearing may do so in writing by the expiration date of the Public Notice. All comments should include name, address, phone number, a concise statement of basis of comment and relevant facts upon which it is based. A request for public hearing must state the nature of the issues to be raised as well as the requester's name, address and telephone number. All written comments should be addressed to Mike Lidgard, NPDES Permits Unit, U.S. EPA Region 10, 1200 - 6th Avenue, OW-130, Seattle, WA 98101; submitted by facsimile to (206) 553-0165; or submitted via e-mail at lidgard.michael@epa.gov.

After the Public Notice expires and all significant comments have been considered, EPA's regional Director for the Office of Water will make a final decision regarding permit reissuance. If no comments requesting a change in the draft permit are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If significant comments are received, the EPA will address the comments and reissue the permit along with a response to comments. The permit will become effective 30 days after the issuance date, unless a request for an evidentiary hearing is submitted within 30 days.

Persons wishing to comment on State Certification should submit written comments by the public notice expiration date to the Alaska Department of Environmental Conservation c/o Clynda Case at (907) 465-5366 or 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801-1795 or Clynda_Case@envircon.state.ak.us.

Documents are Available for Review.
The draft NPDES permit 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). Draft permits, Fact Sheets, 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, OW-130
Seattle, Washington 98101
(206) 553-0523 or
1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permit are also available at:

EPA Alaska Operations Office
222 W. 7th Avenue #19
Anchorage, Alaska 99513-7588

Alaska Department of Environmental Conservation
410 Willoughby Avenue
Suite 303
Juneau, Alaska 99801-1795

For technical questions regarding the permit or fact sheet, contact Mike Lidgard at (206)553-1755 or lidgard.michael@epa.gov. Additional services can be made available to persons with disabilities by contacting Mike Lidgard.

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LIST OF ACRONYMS

ACMP	Alaska Coastal Management Program
ADEC	Alaska Department of Environmental Conservation
AML	Average Monthly Limit
BMP	Best Management Practices
BIP	Balanced Indigenous Population
BOD_5	five day Biochemical Oxygen Demand
BPT	Best Practicable control Technology currently available
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CV	Coefficient of Variation
CWA	Clean Water Act
DGC	Department of Governmental Coordination
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
EFH	Essential Fish Habitat
EPA	Environmental Protection Agency
FR	Federal Register
LTA	Long Term Average
MDL	Maximum Daily Limit or Method Detection Limit
mgd	Million gallons per day
mg/L	Milligrams per liter
MLLW	Mean Lower Low Water
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
POTW	Publicly Owned Treatment Works
QAP	Quality Assurance Plan
RP	Reasonable Potential
s.u.	Standard units
TMDL	Total Maximum Daily Load
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA 1991)
TSS	Total Suspended Solids
TVS	Total Volatile Solids
µg/L	Micrograms per liter
USFWS	United State Fish and Wildlife Service
USGS	United States Geological Survey
WET	Whole Effluent Toxicity
WLA	Wasteload Allocation
WWTP	Wastewater Treatment Plant
ZID	Zone of Initial Dilution

I. EXECUTIVE SUMMARY

On the basis of the conclusions presented in this fact sheet, the EPA has determined that the discharge from the City of Skagway (the permittee) Wastewater Treatment Plant will comply with the requirements of Section 301(h) of the Clean Water Act, as amended by the Water Quality Act of 1987 (the Act) and 40 CFR Part 125, Subpart G.

The City of Skagway is seeking a waiver of the secondary treatment requirements to discharge treated primary effluent from a treatment plant with a design flow of 0.63 million gallons per day (mgd). The outfall is to Taiya Inlet and is 410 feet from shore at roughly 55 feet below mean lower low water (MLLW).

The EPA followed the guidance provided by the Amended Section 301(h) Technical Support Document, EPA 842-B-94-007, September 1994, (301(h) TSD) for the evaluation of the discharge. EPA relied on information in the City of Skagway Section 301(h) re-application (Small Applicant Questionnaire, April 2001), as well as the results of the monitoring conducted under the existing NPDES permit.

Available monitoring data and an evaluation of the discharge characteristics support this tentative decision. Monitoring conducted under the current 301(h) permit has not shown any adverse impacts on solids accumulation, water quality standards, or the biological community in the vicinity of the discharge. Continuing water quality, biological, and effluent monitoring programs will be required under the draft permit in order to determine future compliance with the 301(h) criteria.

The applicant's receipt of a Section 301(h) waiver from secondary treatment is contingent upon the following conditions:

1. State certification under Section 401 of the Clean Water Act regarding compliance with State law and water quality standards, including a basis for the conclusions reached. The state may grant, deny, or waive its right to certify the permit.

2. State determination that the discharge will comply with the Alaska State Coastal Zone Management Program.

II. APPLICANT

City of Skagway Wastewater Treatment Plant (WWTP)

Mailing Address:
P.O. Box 415
Skagway, Alaska 99840

Facility Location:
Corner of Point and Main Street
Skagway, Alaska 99840

Contacts: Robert Ward Jr., City Manager
Tim Gladden, Plant Manager
Permit No. AK-002001-0

III. BACKGROUND

Section 301(b)(1)(B) of the Clean Water Act (CWA) of 1972 required all Publically Owned Treatment Works (POTWs) to comply with effluent limitations based upon secondary treatment by July 1, 1977. Despite all reasonable and diligent efforts, the City of Skagway could not achieve secondary treatment limitations in accordance with the July 1, 1977 deadline. Section 301(h) of the 1977 amendments of the CWA provides that "The Administrator, with the concurrence of the State, may issue a permit under section 402 which modifies the requirements of Section 301(b)(1)(B) ... with respect to the discharge of any pollutant from a publicly owned treatment works into marine waters..."

On June 15, 1979, EPA published the 301(h) regulations (40 CFR 125) in the Federal Register (44 FR 34784) establishing the criteria the EPA would use for issuing an NPDES permit with a variance from secondary treatment requirements. On November 26, 1982, the EPA published final amendments to the 301(h) regulations (47 FR 53666) which clarify, simplify, and update the regulations and application requirements. The CWA was amended again in 1987 to define primary treatment, add restrictions on discharges to impaired estuarine waters, and add urban area pretreatment requirements.

The city was first issued an NPDES permit for its wastewater treatment facility on July 10, 1974. The permit was modified by EPA on November 3, 1975, and again on September 21, 1978. The permit expired on March 3, 1979.

The city submitted its original application for a Section 301(h) waiver on September 13, 1979. In November 1982, the city submitted additional information on the proposed treatment level and outfall description, in response to EPA's request. A tentative decision was made on March 14, 1983, to issue a permit incorporating a section 301(h) variance. The permit was issued on September 6, 1983 and expired October 5, 1988. Following review of a subsequent application and monitoring data collected under the 1983 permit, the permit was reissued on May 16, 1996. The 1996 permit expired on May 17, 2001. The City submitted a timely application for renewal and, therefore, under the conditions of 40 CFR 122.6, the City is authorized to continue discharging under the terms of the existing permit until a new permit is re-issued.

IV. FACILITY AND OUTFALL DESCRIPTION

A. Wastewater Treatment Plant

The WWTP serves the city of Skagway (approximately 800 permanent residents) and 735,000 tourists between April and September (based on year 2000 data). The WWTP collection system is a separate system (not designed to carry stormwater or groundwater) however groundwater infiltration is known to cause peak flows. The existing WWTP is designed to treat an average flow of 0.63 mgd, however, the actual average daily discharge from August 1996 through April 2001 was approximately 0.325 mgd.

Existing treatment units provide screening using an inclined 0.06-inch mesh screen prior to sedimentation/grit removal in the aerated grit chamber. Settling and skimming are conducted in two primary clarifiers before progressing through two weirs where the effluent is combined and disinfected using sodium hypochlorite solution (from May through October only). The chlorine is mixed in an aerated mixing/contact chamber before contact dechlorination is accomplished using Calcium Thiosulfate. The chlorine residuals are metered using a flow-based pump controlled by the effluent flow meter. The effluent flow is measured using a Palmer Bowles flume before dishcarge to Taiya Inlet. The diffuser is a 12-inch-diameter, 5-foot-long vertical riser with four 6-inch diameter holes at the tip of the riser and one 6-inch-diameter hole in the top end plate. The City is in the process of building a new diffuser. The City is exploring installation of a twenty-five foot diffuser with eight, three inch ports (four on each side) positioned parallel to the ambient flow (out of harbor). The new diffuser should be operational by July 2002.

The sludge that is collected from bottom sumps of the two primary clarifiers using an air lift pump is transferred to an aerobic digester until approximately 5 - 7% solids is achieved. Then a polymer mix is blended and dewatered using two vertical screw presses. The resulting sludge cake, as well as the screenings and grit, are transported to the Municipal Solid Waste Facility via a six cubic yard dump truck where they are commingled with household refuse and incinerated.

B. Diffuser - Dilution

Pursuant to 40 CFR §125.62(a)(1), the outfall and diffuser must be located and designed to provide adequate initial dilution, dispersion, and transport of wastewater to meet all applicable water quality standards at and beyond the boundary of the zone of initial dilution (ZID) during periods of maximum stratification and during other periods when more critical situations may exist. The dilution is generally expressed as the ratio of the total volume of sample (effluent plus dilution water) to the volume of effluent in that sample.

Evaluation of critical initial dilutions involves modeling near-field plume dispersion during periods of operation during which maximum possible impact to the receiving water quality could occur. Potentially critical environmental conditions for the City of Skagway's discharge are summarized below:

- The period spanning the months of September through January is considered the period of maximum hydraulic loading, during which highest infiltration could occur.

- Dissolved oxygen which is widely regarded as the indicator of the water quality of a system, is lowest during August in the vicinity of Skagway.

- The months of May through July represent the period of maximum biological activity associated with migration of juvenile salmon.

- Stratification in Taiya Inlet is dependent on freshwater flows from the Taiya and Skagway rivers. Highest stratification is expected during the high runoff summer period from June through August, and the lowest stratification will occur during the winter months. High stratification in the summer is likely the most critical factor with respect to receiving water quality.

The applicant recently conducted modeling of the existing outfall to determine seasonal dilutions. The critical initial dilution for the winter season was determined through modeling to be 1:46.2. The critical season with respect to low dissolved oxygen, high stratification, and biological activity are the summer months from May through September. Modeling for the summer period calculated the critical initial dilution to be 1:28.6, confirming that the summer season is most critical with respect to receiving water concentration.

As discussed in the previous section, the City is constructing a new diffuser in order to improve dilution. The diffuser will be operational in July 2002. The City has modeled the new diffuser in order to determine available dilution. During critical, summer season conditions, the critical initial dilution ratio was determined to be 1:72.0. This modeling result has been reviewed by Alaska DEC (see Appendix D, letter from DEC) and has been used in this fact sheet in evaluating the impacts of the discharge and in developing limitations where appropriate. The dilution ratio was used for both the summer and winter season. Since previous modeling has shown that winter conditions result in a greater dilution than the summer season, use of the 1:72 dilution ratio during the winter period will be protective of water quality criteria at all times.

The City of Skagway's outfall is located at approximately 59° 26' 54.8" N, 135° 19' 36.6" W. See Appendix A for a general map of the treatment plant and discharge location.

V. RECEIVING WATERS

A. General Features

The facility discharges to the estuarine waters of Taiya Inlet, a deep fjord with an average depth of approximately 457 m. The Taiya Inlet is protected by the State of Alaska for marine water supply (aquaculture, seafood processing and industrial); water recreation (contact and secondary); growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life.

B. Circulation

Taiya Inlet supports a classic fjord type of two layer circulation. The classic fjord has a large saline lower layer and a very thin upper brackish layer. A small mass transfer between the lower and upper layer may be expected since the net flow out a fjord mostly occurs in the upper layers. The circulation of the inlet is dependent on tides and freshwater flow into the inlet. There are no obstructions to impede circulation near the outfall.

C. Currents and Flushing

The current application and the previous fact sheet to the 1996 permit describe the currents and flushing in Taiya Inlet. No new information has been gathered since last permit issuance. The data indicate that Taiya Inlet is a stratified fjord during summer months and a well-mixed fjord during winter months.

D. Zone of Initial Dilution (ZID)

The ZID is the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports. It can generally be considered to include the bottom area within a horizontal distance equal to the water depth from any point of the diffuser and the water column above that area. The ZID for the applicant's outfall is a circle of diameter D where $D = 1.0 + 2 \times (60 + 8.692) = 139.38$ feet, centered over the diffuser riser port centerline. In this calculation 60 ft is the water depth below MLLW, 8.692 is the mean tide level, and 1.0 is the outfall pipe diameter. Marine water quality criteria must be met at and beyond the ZID boundary. Additionally, state water quality standards must be met at the edge of the ZID for

those parameters to which the 301(h)modification applies (pH, biochemical oxygen demand, suspended solids).

VI. EFFLUENT LIMITATIONS

The EPA followed the Clean Water Act, State and federal regulations, EPA's 1991 *Technical Support Document for Water Quality-Based Toxics Control (TSD)*, and EPA's 301(h) TSD to develop the draft effluent limits. In general, the Clean Water Act requires that the effluent limits for a particular pollutant be the more stringent of either the technology-based or water quality-based limits. Appendix B provides the basis for the development of effluent limits.

Technology-based limits are established according to the level of treatment achievable using available technology. The EPA evaluates the technology-based limits to determine whether they are adequate to ensure that water quality standards are met in the receiving water. If the limits are not sufficient, the EPA must develop water quality-based limits. These limits are designed to prevent exceedances of the Alaska water quality standards in the Taiya Inlet. The draft permit includes technology-based limits for the percent removal of BOD_5 and TSS and water quality-based limits for BOD_5, TSS, pH, fecal coliform, chlorine, and copper.

Table 1 contains the draft permit limits for outfall 001 as well as those found in the 1996 permit for comparison purposes.

Table 1: Outfall 001 Effluent Limits				
Parameter	**Average Monthly**		**Maximum Daily**	
	1996	**Draft**	**1996**	**Draft**
BOD_5[1]				
May 1 - Sept 30				
mg/L	180	180	—	200
lbs/day	1200	950	—	1050
Oct 1 - April 30				
mg/L	80	80	—	100
lbs/day	533	420	---	530
TSS[1]				
May 1 - Sept 30				
mg/L	210	210	—	230
lbs/day	1400	1100	—	1210
Oct 1 - April 30				
mg/L	70	70	—	88
lbs/day	467	370	—	460
Fecal Coliform, colonies/100 ml	1.0×10^6	1.0×10^6	---	1.5×10^6
Total Residual Chlorine[2],				
µg/L	---	120	---	240
lbs/day	---	0.6	---	1.3
Total Copper, Summer				
µg/L	29	150	41	210
lbs/day	---	0.8	---	1.1
Winter				
µg/L	139	150	203	210
lbs/day	---	0.8	---	1.1

Note:
1 The average monthly percent removal shall be greater than or equal to 30 percent.
2 Chlorine limitations and monitoring are only applicable when the chlorine disinfection process is in use.

The draft permit requires that the pH of the WWTP effluent be within 6.0 and 9.0 s.u., as did the 1996 permit. The draft permit also requires dissolved oxygen to be between 2.0 and 17mg/L

The draft permit prohibits the discharge of waste streams that are not part of the normal operation of the facility, as reported in the permit application. The draft permit also requires that the discharge be free from floating, suspended, or submerged matter in concentrations that cause/may cause a nuisance.

The facility has the capability to disinfect the discharge with chlorine when necessary to comply with the fecal coliform limitations. Based on past performance, the facility anticipates intermittent disinfection during summer periods only. Water quality based chlorine limits have been developed and are applicable only when chlorine disinfection is in use. Details of the development of the limits can be found in Appendix B.

The facility must also meet a minimum 30% percent removal requirement for BOD_5 and TSS. This technology based requirement is also discussed in Appendix B.

VII. MUNICIPAL SEWAGE SLUDGE/BIOSOLIDS MANAGEMENT

EPA Region 10 has recently decided to separate the permitting of wastewater discharges and the disposal of biosolids. Under the Act, the EPA has the authority to issue separate "sludge only" NPDES permits for the purposes of regulating biosolids. The EPA has historically implemented the biosolids standards by inclusion of the requirements in facility's NPDES wastewater permit, the other option authorized by the Act.

A biosolids permit application (Form 2S) was submitted by the City as part of its Section 301(h) re-application in April 2001. The application indicates that the WWTP's biosolids are dewatered and co-incinerated at the Municipal Solid Waste Facility. The EPA will issue a sludge-only permit to the WWTP at a later date. This will likely be in the form of a general permit through which the EPA can cover multiple facilities.

Meanwhile, the environment will be protected since 1) the permittees sludge activities will continue to be subject to the national sewage sludge standards at 40 CFR 503 and 2) ADEC conducts a program to review and permit biosolids activities. Part 503 contains provisions relating to pollutants in sewage sludge, the reduction of pathogens in sewage sludge, the reduction of the characteristics in sewage sludge that attract vectors, the quality of the exit gas from a sewage sludge incinerator stack, the quality of sewage sludge that is placed in a municipal solid waste landfill unit, the sites where sewage sludge is either land applied or placed for final disposal, and sewage sludge incinerators. The Clean Water Act prohibits any use or disposal of biosolids not in compliance with these standards. The EPA has the authority under the Clean Water Act to enforce these standards directly, including in the absence of a permit. The Clean Water Act does not require the facility to have a permit prior to the use or disposal of its biosolids.

VIII. MONITORING REQUIREMENTS

Under 40 CFR § 125.63, which implements Section 301(h)(3) of the Act, the applicant must have a monitoring program designed to provide data to evaluate the impact of the discharge on the marine biota, demonstrate compliance with applicable water quality standards, and measure toxic substances in the discharge. The applicant must demonstrate the capability to implement these programs upon issuance of a 301(h) modified NPDES permit. In accordance with 40 CFR § 125.63(a)(2), the applicant's monitoring programs are subject to revision if required by the EPA.

A. Effluent Monitoring

Section 308 of the Act and federal regulation 40 CFR 122.44(i) require that monitoring be included in permits to determine compliance with effluent limitations. Monitoring may also be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on monthly Discharge Monitoring Reports (DMRs) to the EPA. Under Section 301(h)(3) of the Act, the applicant must have in place a system of monitoring the impact of the discharge on aquatic biota. 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.

The draft permit will require analyses of the effluent to determine compliance with permit limitations (flow, BOD_5, TSS, copper, chlorine, and pH) and analysis of the influent for BOD_5 and TSS to determine compliance with the percent removal primary treatment requirements. Table 2 presents the draft monitoring requirements. Effluent monitoring for Outfall 001 shall occur after the last treatment unit and prior to discharge to the Taiya Inlet. Sample frequencies are generally the same as the 1996 permit.

TABLE 2: Outfall 001 Monitoring Requirements

Parameter	Draft Sample Type	Draft Sample Frequency
Flow, mgd	recording	continuous
BOD_5, mg/L[1]	24-hour composite	2/month
TSS, mg/L[1]	24-hour composite	2/month
pH, standard units	grab	1/week

Parameter	Draft Sample Type	Draft Sample Frequency
Fecal Coliform Bacteria, colonies/100 ml	grab	1/month
Total Copper, µg/L[2]	24-hour composite	1/month
Temperature. °C	grab	1/week
Dissolved Oxygen, mg/L	grab	1/week
Total Residual Chlorine, µg/L[3]	24-hour composite	1/week
Total Ammonia as N, mg/L	24-hour composite	1/quarter (4/year)
Chronic Whole Effluent Toxicity, TU_c	See section VIII.C	2/permit cycle[4]
Toxic Pollutants and Pesticides	priority pollutant scan	1/permit cycle[5]

Notes:
1 Influent and effluent monitoring is required. The percent BOD_5 and TSS removal will be reported on the monthly DMR form.
2 The permittee shall conduct analysis for total recoverable metal.
3 Monitoring only required when disinfection process is in use.
4 Monitoring required during the first and fourth years of the permit.
5 Monitoring is only required during the fourth year of the permit term.

The applicant has certified that there are no industrial inputs to the collection system. As discussed in Appendix B, monitoring conducted during the previous permit term did detect toxics in the discharge, however, the toxics were at concentrations that do not have a reasonable potential to cause or contribute to exceedances of Alaska water quality standards. Due to the presence of the toxics at low concentrations, EPA is requiring a repeat of chemical analyses of the effluent for toxic pollutants in the fourth year of the permit only.

B. Representative Monitoring

The draft permit has expanded the requirement in the federal regulations regarding monitoring (40 CFR 122.41[j]). This provision now specifically requires representative sampling whenever a bypass, spill, or non-routine discharge of pollutants occurs, if the discharge may reasonably be expected to cause or contribute to a violation of an effluent limit under the permit. This provision is included in the draft permit (Section II.A.) because routine monitoring could easily miss permit violations and/or water quality standards exceedences that could result from

bypasses, spills, or non-routine discharges. This requirement directs the permittee to conduct additional, targeted monitoring to quantify the effects of these occurrences on the final effluent discharge.

C. Whole Effluent Toxicity Monitoring

Whole effluent toxicity (WET) is a term used to describe the aggregate toxic effect of an aqueous sample (e.g., whole effluent wastewater discharge or ambient receiving water) as measured according to an organism's response upon exposure to the sample. Whole effluent toxicity tests are laboratory tests that replicate to the greatest extent possible the total effect and actual environmental exposure of aquatic life to effluent toxicants without requiring the identification of specific toxicants. The tests use small vertebrate and invertebrate species, and/or plants. The effluent concentration that results in the survival of 50% of test organisms during a 96-hour exposure determines the short-term (acute) toxicity. The highest effluent concentration that causes reduced growth or reduced reproduction of test organisms and/or plants during a 7-day exposure determines the long-term (chronic) toxicity.

EPA regulations at 122.44(d)(1) in effect require whole effluent data and criteria when characterizing effluents. The WET approach measures the aggregate effect of all toxicants in the effluent.

Federal regulation requires that permits contain limits on WET when a discharge has reasonable potential to cause or contribute to an exceedence of a water quality standard. Alaska State Water Quality Standard 18 AAC 70.030 states that "an effluent discharged to a water may not impart chronic toxicity to aquatic organisms, expressed as 1.0 chronic toxic unit, at the point of discharge (or if ADEC authorizes a mixing zone in a permit, approval, or certification, at or beyond the mixing zone boundary) based on the minimum effluent dilution achieved in the mixing zone. If the ADEC determines that an effluent has reasonable potential to cause or contribute to exceedance of this limit, the department will require whole effluent toxicity limitations as a condition of a permit, approval, or certification."

The previous permit required one WET test during the summer months of the first year of the permit. The results were submitted to EPA in 1996. The test included the blue mussel bivalve larvae test using static 48-hour exposure to effluent. The test was run at the following effluent concentrations: 70, 35, 18, 9.0, 4.0, 2.0, 1.0, 0.05, and 0%. The no observed effect concentration (NOEC) for the test was 2% effluent. The lowest observed effect concentration (LOEC) was 4% effluent.

The WET test result must be converted to chronic toxic units (TUc) in order to compare to the Alaska water quality criteria. By definition, the chronic toxic unit of the effluent is calculated as 100/NOEC, or 100/2 = 50 TUc for this test result. As

mentioned above, the Alaska water quality standard includes the toxicity criteria of 1.0TUc at the point of discharge or at the edge of the edge of the mixing zone if a mixing zone is authorized. For this facility, the draft authorized mixing zone provides a dilution ratio of 72:1 during the most critical summer season (1.4% effluent). Therefore, with consideration of the dilution available, the effluent would have to be less than 72 TUc in order to comply with the Alaska criteria at the edge of the mixing zone. Based on the single 1996 WET result, the discharge was in compliance with the water quality criteria since 50 TUc is less than the 72 TUc allowed prior to dilution.

The WET test result is below the level at which a limit would be required, however, testing has only been conducted once at this facility. Therefore, EPA proposes additional testing in order to quantify the toxicity of the effluent. Considering the size of the Skagway facility, EPA proposes testing once in the first and once in the fourth year after permit reissuance. Year one testing will provide immediate toxicity information of the discharge and year four testing will provide additional information just prior to the expiration date of the permit to assist in evaluating permit reissuance. Testing shall be conducted during the summer tourist season when loadings are greatest.

If any of the tests exceed the toxicity trigger (based on 72:1 dilution), additional testing will be required. If additional tests continue to demonstrate that the toxicity trigger is being exceeded, the permittee will be required to conduct a Toxicity Reduction Evaluation (TRE). A TRE is a site-specific study conducted to identify the cause of the toxicity and to evaluate toxicity control options. Successful implementation of a TRE could resolve any toxicity found in the discharge thereby avoiding a toxicity limitation in the next permit reissuance.

D. Receiving Water Quality Monitoring

40 C.F.R. § 125.63(c) requires that the receiving water quality monitoring program provide data adequate to evaluate compliance with applicable water quality standards. The same regulation also requires the monitoring program to measure for the presence of toxic pollutants which have been identified in the discharge. The draft permit proposes that the ambient water quality monitoring requirements established in the 1996 permit largely be retained. Differences from the previous permit include a reduction in monitoring frequency and addition of monitoring for the parameters total ammonia and copper.

The ambient monitoring frequency has been reduced to the summer season in years two and four after permit reissuance and during the winter of year three. Total ammonia was added since there is now an ammonia criteria for marine water and there is no receiving water data available for the for this parameter. Ammonia has

been measured in the discharge and is discussed further in Appendix B. Likewise, no receiving water data exists for copper which is a parameter limited by the permit. The data gathered for both copper and ammonia is necessary to determine compliance with Alaska water quality standards in the vicinity of the discharge. The ambient monitoring program was designed with consideration of the following factors: size of the facility, monitoring frequency for other 301(h) facilities in Southeast Alaska, the desire to track long-term trends, determination of compliance with Alaska water quality standards, projected growth in the community, results from monitoring during the previous permit cycle, and data needed to evaluate re-issuance of the 301(h) permit after permit expiration.

Ambient monitoring for turbidity, dissolved oxygen, pH, salinity, temperature, secchi disk depth, copper, and total ammonia shall occur at five locations. The five locations shall consist of two sampling stations on the boundary of the zone of initial dilution (ZID) on opposite sides of the boundary, one station within the ZID, and two reference stations. The ZID is applicable to all parameters except fecal coliform and is defined as a column of water centered over the outfall diffuser with a radius of 140 feet and depth equal to the water column. The reference stations shall be at least 200m from the ZID, at least 100m from each other, and at the same depth as the discharge. Sampling stations shall be established using an electronic navigational aid to insure that the same sampling stations are occupied during subsequent sampling events.

The program to monitor for fecal coliform bacteria has been retained from the previous permit, although, a provision has been included to reduce the frequency after two years of monitoring. If monitoring during the first two years demonstrates that the receiving water is in compliance with Alaska water quality standards, the frequency can be reduced to once per year during the third and subsequent years. The fecal coliform monitoring program was developed in order to determine compliance with Alaska water quality standards and also to track long-term trends. The fecal coliform mixing zone designated by the State of Alaska is defined as a circle of 1600 meter radius, centered on the outfall line and over the diffuser and extending from the marine bottom to the surface.

The ambient monitoring requirements are summarized in Table 3.

Table 3 Ambient Monitoring Requirements			
Parameter	**Station Location**	**Depth**	**Monitoring Frequency**
Turbidity, nephelometric turbidity units (NTU), Dissolved oxygen, mg/L, pH, s.u.	1)within the ZID 2)on boundary of ZID 3)on boundary of ZID opposite from station 2 4)reference site at least 200 m from the ZID and at depth of the discharge 5)reference site at least 200 m from the ZID and 100 m from station 4 and at the depth of the discharge	surface, mid-depth, and bottom	Once in the summer[1] during the 2nd and 4th year of permit and once in the winter during the 3rd year of the permit
Salinity, ppt, Temperature, °C	1)within the ZID 2)on boundary of ZID 3)on boundary of ZID opposite from station 2 4)reference site at least 200 m from the ZID AND at depth of the discharge 5)reference site at least 200 m from the ZID and 100 m from station 4 and at the depth of the discharge	every 3 m	Once in the summer[1] during the 2nd and 4th year of permit and once in the winter during the 3rd year of the permit
Total Ammonia as N, mg/L, Copper, µg/L, Secchi disk depth	1)within the ZID 2)on boundary of ZID 3)on boundary of ZID opposite from station 2 4)reference site at least 200 m from the ZID AND at depth of the discharge 5)reference site at least 200 m from the ZID and 100 m from station 4 and at the depth of the discharge	surface waters only (above 1.0 m)	Once in the summer[1] during the 2nd and 4th year of permit and once in the winter during the 3rd year of the permit
Fecal coliform [2], #/100ml	1) shoreline area of human use closest to the outfall 2) shoreline area outside of where the MZ touches the shoreline 3) outside of the open ocean edge of the MZ 4) Shoreline area of human use inside the MZ	surface waters only	Once a month in June, July, August, September, November, and April

Parameter	Station Location	Depth	Monitoring Frequency
Note: 1 The summer season is May 1 - September 30 while the winter season is October 1 - April 30. 2 Fecal coliform shall not exceed 200 FC/100 ML at the shoreline, within the designated mixing zone.			

E. Biological Monitoring Program for Total Volatile Solids and Benthic Infauna

40 C.F.R. 125.63(b) requires permittees to implement a biological monitoring program that provides data adequate to evaluate the impact of the applicant's discharge on the marine biota.

The objectives of the current biological monitoring program are outlined in the permit: "1) to monitor for discharge-related ecosystem impacts, 2) to evaluate whether the discharge causes changes in the amount of organic material in the seafloor sediment, 3) to determine whether the discharge has caused changes in the benthic community, 4) to assess whether changes in permit conditions are warranted, and 5) to provide data for evaluating the reissuance of this permit."

The current NPDES permit for the Skagway discharge required sediment sampling for total volatile solids (TVS) and benthic infauna in August of the fourth year of the permit. Sampling was required at two stations on the boundary of the ZID, two reference stations, and one station within the ZID. Three replicate sediment samples for TVS and five replicate samples for benthic infauna were required to be collected at each sampling station. A report was required to include results of the benthic community and TVS analysis as well as detailed field observation of the biological and sediment conditions at all of the sampled stations.

In order to fulfill the biological monitoring requirements of the permit, a diving survey was performed on August 21 - 23, 1999. The complete results are included as Appendix C of the City's NPDES permit application. The following is a summary of the results.

The dive survey of 1999 found that the sample stations surveyed can be divided into three habitat types. Sediments at sampling station 1 (reference site) and station 2 (ZID boundary) were characterized by a layer of very fine, loosely compacted floc-like sediment above fine silt and sand sediment with occasional cobbles. There was little obvious difference in the fine sediment layer between these two stations. The highest species diversity was observed at reference station 1. Numerous clumps of mussels and other macro invertebrates were observed. Numerous clumps of mussels were also observed at station 2. There was a distinct difference between sediments at station 2 on the edge of the ZID and station 3 within the ZID. Station 2 had a

much more defined layer of surface silt than station 3, which was characterized by mixed gravel and sand with cobbles. "This habitat has low species diversity and abundance most likely attributable to frequent disturbance, substrate movement and scouring. Even though this sample station is located within the ZID there is a noticeable lack of fine sediment buildup. The most likely factor contributing to the frequent disturbance and sediment movement at this site is the Alaska State Ferry traffic." (Skagway WWTP Biological Survey). The ocean floor nearest to where the Skagway river enters the Inlet represents the third habitat type (ZID boundary station 4 and reference station 5). This habitat type is characterized by sand substrate, frequent disturbance and almost complete lack of macro invertebrate species. This is most likely due to frequent disturbance of sandy sediments due to cruise ship and ferry traffic and freshwater dilution due to the Skagway River. A strong bottom current was observed carrying leaf debris and other detrital material at station 5.

Due to the frequent disturbance of sediments in the Skagway Harbor area and strong tidal fluctuations, there is little evidence of organic material buildup in sediments around the outfall and diffuser. The TVS results indicate that the organic content of the surface sediments was the greatest closest to the small boat harbor on the eastern side of Skagway Harbor where there is less disturbance from large ships. In conclusion, the outfall appears to be having a negligible impact on the surrounding substrate (i.e., significant changes in organic particulate loading) and habitat (i.e., benthic community) in comparison to the frequent sediment disturbance from ship traffic. The biological monitoring results do not indicate that the discharge is causing significant changes in organic loading or the benthic community at this time.

In order to meet the regulatory requirement to implement a biological monitoring program and in order to gather adequate data to evaluate the impact of the applicant's discharge on the marine biota, the draft permit requires the permittee to repeat sediment analysis for total volatile solids (TVS) and benthic surveys in August during the 4th year of the permit. The TVS sediment testing will be useful in confirming whether the discharge continues to not have an adverse effect on the marine biota. The benthic surveys track whether populations are affected by the discharge and provide a record to evaluate long-term trends in the discharge area. The testing shall utilize similar methods and collection points as the 1996 permit. Samples shall continue be taken at the following five stations: within the ZID; two stations at the boundary of the ZID at opposite sides; two reference stations in opposite directions from the outfall and at the same depth as the outfall.

F. Effect of Discharge on Other Point and Nonpoint Sources

Under 40 CFR 125.64, which implements Section 301(h)(4) of the Act, the applicant's discharge must not result in the imposition of additional treatment requirements on any other point or nonpoint source. As indicated in the permittee's

application, there are no known regulated point or nonpoint sources in the vicinity of the discharge. Prior to permit issuance, ADEC must also determine that the discharge will not affect treatment requirements for any other point or nonpoint sources.

IX. OTHER PERMIT CONDITIONS

A. Toxics Control Program

1. Chemical Analysis and Identification of Sources

Under 40 CFR 125.66(a), applicants are required to perform chemical testing for toxic pollutants and pesticides, unless they certify to the Agency that there are no known or suspected toxic pollutants, and verify this certification by performing an industrial user survey.

The results of the facility's 1999 priority pollutant scan indicated nine compounds present in the effluent. After analysis, only copper showed a reasonable potential to violate water quality standards at the edge of the ZID. As a result, a limitation for copper is included in the draft permit (see Appendix C for derivation).

2. Industrial Pretreatment Program

40 CFR 125.66(c) requires that applicants which have known or suspected industrial sources of toxic pollutants shall either have or develop an approved pretreatment program in accordance with the requirements of 40 CFR Part 403 (Pretreatment Regulations). This program is subject to revision as may be required by EPA. The applicant provided certification stating that there are no known or suspected sources of toxic pollutants to the sewer system, therefore, the applicant is not required to develop an industrial pretreatment program.

3. Nonindustrial Source Control Program

40 CFR 125.66(d), which implements Section 301(h)(6) of the Act, requires the applicant to implement a public education program designed to minimize the entrance of nonindustrial toxic pollutants and pesticides into the POTW and to develop a nonindustrial source control program. In addition, the permittee must have a schedule of activities for identifying nonindustrial sources of toxic pollutants and pesticides and for developing and implementing control programs, to the extent practicable.

A small section 301(h) applicant, which certifies there are no known or suspected water quality, sediment accumulation, or biological problems related to toxic pollutants or pesticides in its discharge, is required only to develop the public education program. The City of Skagway has provided this certification.

A public education program has been implemented by the City. Information is also made available when new utility hookups are requested. This public education program will be continued under the draft permit and information shall be distributed to the public at a minimum by the following dates:

Advertisement in local newspaper:	June 15 of alternate years starting with year one
Distribution of public education pamphlets to citizens:	June 15 of alternate years starting with year two

In addition to advertising the above elements by use of a local newspaper and public education pamphlets, at least one sign shall be placed on the shoreline near the fecal coliform mixing zone and the outfall line. The sign shall state that primary treated domestic wastewater is being discharged, that mixing zones exist, and certain activities should not take place within the mixing zones. The sign shall also have the name and owner of the facility, approximate location and size of the mixing zone and give a facility contact phone number for additional information. The sign is required as a condition of the preliminary State of Alaska certification of the permit (see Appendix D).

The permit requires the City to report annually (with the December DMR) to the EPA on the progress of the public education program.

B. Effluent Volume and Amount of Pollutants Discharged

Under 40 CFR §125.67, which implements section 301(h)(7) of the Act, the permittee's discharge may not result in any new or substantially increased discharges of the pollutant to which the modification applies above the discharge specified in the 301(h) permit.

Skagway's draft permit is designed for an average flow of 0.63 mgd. The draft concentration and mass-based effluent limitations for BOD_5 and TSS and pH range are at least as stringent as the 1996 permit limits and therefore comply with the §125.67 requirement.

C. Quality Assurance Plan

Federal regulation 40 CFR 122.41(e) requires the permittee to develop a Quality Assurance Plan (QAP) to ensure that the monitoring data submitted are accurate and to explain data anomalies if they occur. The permittee is required to develop a QAP within 90 days of the effective date of the permit. The QAP shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting.

D. Operation & Maintenance Plan

Section 402 of the Act and federal regulations 40 CFR 122.44(k)(2) and (3) authorize the EPA to require best management practices (BMPs) in NPDES permits. BMPs are measures for controlling the generation of pollutants and their release to waterways. For municipal facilities, these measures are typically included in the facility's Operation & Maintenance (O&M) plan. These measures are important tools for waste minimization and pollution prevention.

The draft permit requires the City of Skagway to incorporate appropriate BMPs into their O&M plan within 180 days of the effective date of the permit. Specifically, the permittee must consider spill prevention and control and optimization of chemical use. The City's public education program is already currently aimed at controlling the introduction of household hazardous materials to the sewer system and is an example of an appropriate BMP. The City should also consider ways to encourage the conservation of water as part of the O&M plan. The O&M plan must be revised as new practices are developed during the permit term.

E. Additional Permit Provisions

In addition to facility-specific requirements, sections II, III, and IV of the draft permit contain "boilerplate" requirements. Boilerplate is standard regulatory language that applies to all permittees and must be included in NPDES permits. Because they are federal regulations, they cannot be challenged in the context of an NPDES permit action. The boilerplate covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and general requirements.

X. OTHER LEGAL REQUIREMENTS

Pursuant to 40 CFR 125.59(b)(3), a modified NPDES permit may not be issued unless the discharge complies with applicable provisions of state, local, or other federal laws or Executive Orders, including the Coastal Zone Management Act, 16 U.S.C. 1451 et seq., the Endangered Species Act, 16 U.S.C. 1531 et seq., and the Marine Protection, Research, and Sanctuaries Act 16 U.S.C. 1431 et seq.

A. State Coastal Zone Management Program

The EPA has determined that the activities authorized by this permit are consistent with local and state Coastal Management Plans. The draft permit and Fact Sheet containing this consistency determination will be submitted to the State of Alaska Division of Governmental Coordination for state interagency review at the time of public notice. The requirements for State Coastal Zone Management Review and approval must be satisfied before the permit may be reissued.

B. Endangered and Threatened Species

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 the actions could beneficially or adversely affect any threatened or endangered species. The EPA has tentatively determined that the discharge authorized by this permit is not likely to adversely affect the listed threatened and endangered species which have been identified by the services.

The EPA requested lists of threatened and endangered species from the NMFS and USFWS. Although replies to the requests were not received, EPA determined the humback whale (Megaptera novaeangliae) to be listed as endangered, and the Steller sea lion (Eumetopias jubatus) to be listed as threatened. This determination was made by review of recent correspondence with the services regarding a number of other NPDES actions completed in Southeast Alaska within the past year, and from review of the ESA evaluation conducted when the permit was last reissued in 1995.

In a letter to the City of Skagway in 1994, the NMFS stated that the Steller sea lion and the humback whale occur in marine and estuarine waters throughout Southeast Alaska. The Service, however, stated that the humback whale is uncommon in upper Taiya Inlet and that no critical habitat exists for the Steller sea lion in the upper portions of the Inlet. Although no critical habitat for the Steller sea lion has been identified in the vicinity of the discharge, the NMFS did note that the species is a frequent visitor to the waters of the upper Taiya Inlet.

In the 1994 correspondence the NMFS also stated that they did not believe that the City of Skagway discharge of municipal sewage waste will adversely affect either of the listed species. EPA agrees that this finding is still applicable based on the information presented in this fact sheet and the fact that there have been no significant changes at the facility. Modeling and ambient monitoring shows that the facility does not have a significant effect on dissolved oxygen or suspended solids in the vicinity of the discharge and that all Alaska water quality standards are met within a relatively short mixing zone around the outfall. Recent biological monitoring required by the existing permit has found no adverse environmental

impact on the sediments or benthic community in the harbor area as a result of the discharge. The draft permit proposes continued monitoring of the effluent along with continued ambient and biological monitoring in the vicinity of the outfall.

The EPA will provide NMFS and USFWS with copies of the draft permit and fact sheet during the public notice period. Any comments received from these agencies regarding this determination will be considered prior to reissuance of the permit.

C. Essential Fish Habitat

The Magnuson-Stevens Act (January 21, 1999) requires federal agencies to consult with the National Marine Fisheries Service (NMFS) when any activity proposed to be permitted, funded, or undertaken by a federal agency may have an adverse effect on designated Essential Fish Habitat (EFH) as defined by the Act. The EFH regulations define an *adverse effect* as any impact which reduces quality and/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 EFH species for the area of the discharge include chinook (king), sockeye (red), pink, and chum salmon, and a number of groundfish species (Habitat Assessment Reports for Essential Fish Habitat, NMFS, 1998). A recent NMFS letter identifying EFH species for a similar nearby facility (City of Haines) specifically listed salmon, flatfish, rockfish, and sculpin as species using near-shore habitats which potentially could be degraded by insufficient treatment of waste-water or by chlorine residuals.

For the following reasons, EPA has tentatively determined that issuance of this NPDES permit to the City of Skagway is not likely to adversely affect any EFH in the vicinity of the discharge. The proposed permit has been developed to protect all aquatic life species in the receiving water in accordance with the Alaska water quality standards, including meeting Alaska water quality standards at the edge of the zone of initial dilution. The facility has a relatively small zone of initial dilution as described in the fact sheet. EPA believes that the Alaska water quality criteria for the protection of aquatic life should protect both the managed EFH species and their prey. The effluent is treated wastewater of domestic origin with no industrial component. Chlorine, used as a disinfection agent at this facility during the summer months only, will be below Alaska water quality marine criteria at the edge of the mixing zone.

EPA will provide NMFS with copies of the draft permit and fact sheet during the public notice period. Any comments received from NMFS regarding EFH will be considered prior to reissuance of this permit.

D. Marine Protection, Research, and Sanctuaries Act

The discharge is not located in a federal marine sanctuary nor is it located in a sanctuary designated under Title III of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended, or the Coastal Zone Management Act of 1972, as amended.

E. State Certification

Section 401 of the Clean Water Act requires EPA to seek certification from the State that the permit is adequate to meet State water quality standards before issuing a final permit. The regulations allow for the State to stipulate more stringent conditions in the permit, if the certification cites the Clean Water Act or State law references upon which that condition is based. In addition, the regulations require a certification to include statements of the extent to which each condition of the permit can be made less stringent without violating the requirements of State law.

Alaska State law (Title 18, Alaska Administrative Code, Section 72.050) requires secondary treatment for all POTWs that discharge to natural surface waters unless a modification of the secondary treatment requirement is granted in accordance with Section 301(h) of the Clean Water Act.

Section 301(h) of the Act and 40 CFR §125.59(i)(2) provides that a waiver from secondary treatment may not be granted until the State grants, denies, or waives it right to certify under section 401 of the Act. Certification indicates compliance with applicable provisions of local law. The State will make this determination upon review of the final permit. ADEC has reviewed the draft permit and has provided draft "State of Alaska Certification Stipulations" and "recommendation and suggestions". The letter containing the stipulations is attached to this fact sheet as Appendix D. The stipulations provided in the preliminary certification have been included in the public review draft permit.

F. Permit Expiration

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

REFERENCES

EPA 1991. Technical Support Document for Water Quality-based Toxics Control. Office of Water Enforcement and Permits, Office of Water Regulations and Standards. Washington, D.C., March 1991. EPA/505/2-90-001.

Amended Section 301(h) Technical Support Document, EPA 842-B-94-007, September 1994.

EPA, 1996a. EPA Region 10 Guidance For WQBELs Below Analytical Detection/Quantitation Level. NPDES Permits Unit, EPA Region 10, Seattle, WA, March, 1996.

APPENDIX A - SKAGWAY WASTEWATER TREATMENT PLANT DISCHARGE LOCATION

The map has been included as a separate file due to the amount of memory required to download it.

APPENDIX B - STATUTORY AND REGULATORY BASIS FOR EFFLUENT LIMITATIONS

Sections 101, 301(b), 304, 308, 401, 402, and 405 of the Clean Water Act provide the basis for the effluent limitations and other conditions in the draft permit. The EPA evaluates discharges with respect to these sections of the CWA and the relevant NPDES regulations to determine which conditions to include in the draft permit.

In general, the EPA first determines which technology-based limits must be incorporated into the permit. Then, the EPA evaluates the effluent quality expected to result from these controls, to see if they could result in any exceedances of the water quality standards in the receiving water. If exceedances could occur, EPA must include water quality-based limits in the permit. The draft permit limits reflect whichever requirements (technology-based or water quality-based) are more stringent. The limits that EPA is proposing in the draft permit are found in Section VI of this fact sheet. This Appendix describes the technology-based and water quality-based evaluation for the Skagway WWTP.

I. Technology-based Evaluation

The 1972 Clean Water Act required that POTWs meet performance-based requirements based on available wastewater treatment technology. Section 301 of the Clean Water Act established a required performance level, referred to as "secondary treatment," that all POTWs were required to meet by July 1, 1977.

More specifically, Section 301(b)(1)(B) of the Clean Water Act requires that EPA develop secondary treatment standards for POTWs as defined in Section 304(d)(1) of the Clean Water Act. Based on this statutory requirement, EPA developed secondary treatment regulations which are specified in 40 CFR Part 133.102. These technology-based regulations apply to all municipal WWTPs and identify the minimum level of effluent quality attainable by secondary treatment in terms of BOD_5, TSS, and pH. Section 301(h) of the Act provides for a waiver from secondary treatment, if the permittee meets several specific criteria, including a requirement to achieve primary treatment. Primary treatment is defined in the Act as 30 percent removal of BOD and TSS from the influent.

Applicants for 301(h) waivers request concentration and loading (lb/day) limits for BOD_5 and TSS based on what the facility is capable of achieving. Therefore, the requirements for POTWs with 301(h) waivers are established on a case-by-case basis. In the case of Skagway, the requested effluent limits are 180 mg/L monthly average for BOD_5 and 210 mg/L monthly average for TSS from May 1 through September 30, and 80 mg/L for BOD_5 and 70 mg/L for TSS from October 1 through April 30. Using the design flow of 0.63 mgd, the projected mass emission levels and corresponding concentration limitations are as follows:

Table B-1. BOD_5 and TSS Limitations		
Constituent	Concentration Limitations (Monthly Average)	Mass Limitations (Monthly Average)
BOD_5, May 1 - September 30	180 mg/L	950 lbs/day
October 1 - April 30	80 mg/L	420 lbs/day
TSS, May 1 - September 30	210 mg/L	1100 lbs/day
October 1 - April 30	70 mg/L	370 lbs/day

The loading limits were calculated by multiplying the concentration limitation by the design flow of 0.63 mgd, and by a unit conversion factor (8.34). The loading limits differ from the previous permit even though the concentration limits have not changed. The previous permit loading limits were apparently based on an erroneous flow value. Section III below evaluates the water-quality impact of these proposed limitations.

The State of Alaska DEC has reviewed a preliminary draft of the NPDES permit and concurs with the proposed monthly limitations. As part of the review the state also provided a stipulation that the draft permit include maximum daily limitations for BOD_5 and TSS. The stipulation along with a rationale was provided in a letter which is included as Appendix D to this fact sheet. The State review is essentially a preliminary certification of the permit. The stipualtion has been included in the draft permit.

Percent Removal Requirements. Pursuant to Section 301(h)(9) of the Act and 40 C.F.R. 125.60, the applicant must be discharging effluent that has received at least primary or equivalent treatment by the time the modified permit becomes effective. Primary or equivalent treatment is defined as "...treatment by screening, sedimentation, and skimming adequate to remove 30 percent of the biochemical oxygen demanding material and of the suspended solids in the treatment works influent..."

The regulation requires that the primary treatment requirement for 30 percent removal be based on a monthly averaging basis. 40 C.F.R. 125.60(c)(2), however, does allow the Administrator to approve an applicant's request of 30 percent removal of BOD on an averaging basis different from monthly (e.g. quarterly) providing that the applicant has demonstrated that:

(i) The applicant's POTW is adequately designed and well operated;

(ii) The applicant will be able to meet all requirements under section 301(h) of the CWA and the subpart G regulations with the averaging basis selected; and,

(iii) The applicant cannot achieve 30 percent removal on a monthly average basis because of circumstances beyond the applicant's control.

Circumstances beyond the applicant's control may include seasonally dilute influent BOD concentrations due to relatively high (although nonexcessive) inflow and infiltration; relatively high soluble to insoluble BOD ratios on a fluctuating basis; or cold climates resulting in cold influent. Circumstance beyond the applicant's control shall not include less concentrated wastewater due to excessive inflow and infiltration (I&I). The determination of whether the less concentrated wastewater is the result of excessive I&I will be based on the definition of excessive I&I in 40 C.F.R. 35.2005(b)(16) plus the additional criterion is nonexcessive if the total flow to the POTW (i.e., wastewater plus inflow plus infiltration) is less than 275 gallons per capita per day.

During issuance of the previous permit (1996) the permittee requested a quarterly averaging period for the 30 percent removal requirement. No influent data was available at that time to evaluate the above conditions and the quarterly period request was granted. Since issuance of the 1996 permit, percent removal has been determined on a monthly basis.

The permittee again request an averaging period longer than monthly for the percent removal requirement. In order to grant the request, the conditions cited above must be met, particularly the requirement that the 30 percent removal can not be met due to circumstances beyond the applicants control. Table B-2 summarizes the monthly data collected during the previous permit cycle.

Table B-2. Average Monthly BOD_5 and Flow Data from 08/96 - 04/01

Month	Average BOD_5 Influent Concentration, mg/L	Number of Months with <30% Removal	Average Flow, mgd
January	59	1	0.34
February	60	0	0.33
March	74	1	0.33
April	118	3	0.34
May	122	1	0.36
June	150	2	0.38
July	207	1	0.36
August	145	1	0.34
September	126	4	0.31
October	70	2	0.28
November	68	2	0.27
December	86	1	0.29

One of the circumstances beyond the applicants control which was cited in the regulation is cold climate leading to cold influent. Review of Table B-2 shows that the months with less than 30% removal occur throughout the year not only during the cold season. In fact, every month of the year was below 30% removal at least once during the existing term with the exception of February.

Another circumstance which would be beyond the applicants control and cited in the regulation is seasonally dilute influent due to nonexcessive inflow and infiltration (I&I). I&I would most likely occur in the rain season and, or along with, spring thaw. The data in the table shows influent concentration is low but relatively consistent from October through March, and then increases steadily over the spring and summer season. The influent concentration appears to be directly correlated with the tourist season and does not show a typical seasonal I&I pattern. The average monthly flow appears to directly correlate with the tourist season and is relatively consistent through the non-tourist season. The facility has equal difficulty meeting the 30% removal requirement in the summer when the influent concentration is high as in other months when influent is more dilute, suggesting that seasonal dilution of the influent is not the cause of not meeting the percent removal requirement..

Even if seasonal I&I was diluting the influent and preventing meeting the 30% removal requirement on a monthly basis, the regulation does not allow a longer averaging period due to dilute influent if I&I is excessive. Excessive I&I was defined above as total flow to the POTW being greater than 275 gallons per capita per day. Based on a service area population of 800 during the winter, this criterion would require a flow of less than 0.22 mgd. As shown in the table, the average monthly flows always exceed 0.22 mgd, indicating that the system may have excessive I/I. Excessive I&I could be contributing to the facility not meeting the 30% removal on a monthly averaging basis.

Review of the data from the last five years fails to show that any circumstances exists which are beyond the control of the applicant which would justify approval of an averaging period greater than monthly for the 30% removal requirement. Therefore, the monthly averaging basis for this primary treatment requirement is included in the draft permit. The data shows that excessive I&I may be occurring in this system thereby excluding the circumstance of dilute influent as a justification for an averaging period greater than monthly.

II. Water Quality-based Evaluation

For 301(h) dischargers, water quality-based permit limits must consider the following four separate provisions which overlap to some extent.

- 40 CFR 122.44(d)(1) requires that permits include limits on 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 water quality standard, including state narrative criteria for water quality." This provision applies to all NPDES permits.

- 40 CFR §125.62(a)(1) states that the permittee must demonstrate that its discharge will not result in exceedances of state water quality standards at the edge of the ZID. This provision is specific to permits with 301(h) waivers.

- Section 301(h)(9) of the Act requires that the discharge meet water quality criteria established under section 304(a)(1) of the Act at the edge of the ZID. Section 304(a)(1) of the Act establishes water quality criteria for toxic pollutants. Where a state has adopted numeric criteria for a given pollutant, that criterion can be used in place of the 304(a)(1) criteria. On December 22, 1992, EPA promulgated numeric criteria for toxic pollutants for the State of Alaska in the National Toxics Rule (40 CFR 131.36). Therefore, compliance with 40 CFR 122.44(d)(1) also results in compliance with this provision.

- 40 CFR § 125.61 implements Section 301(h)(1) of the Act. This provision applies only to those parameters for which a modification is requested (i.e., BOD and TSS). Under this provision, there must be a water quality standard applicable to each pollutant for which the modification is requested (i.e., BOD and TSS or surrogates) and the applicant must demonstrate that the proposed modified discharge will result in compliance with these standards at the edge of the ZID.

III. Pollutant-specific Analysis

The following section outlines the basis for each of the effluent limitations, or lack of limitations, in the draft permit.

A. Biochemical Oxygen Demand / Dissolved Oxygen

The Alaska State Water Quality Standards applicable to marine waters provide that for estuarine water, the concentration of dissolved oxygen (DO) shall not be less than 5.0 mg/L except where natural conditions cause this value to be depressed. Monitoring conducted by the permittee in recent years demonstrates compliance with water quality standards. In fact, DO values in the harbor area, including monitoring within the ZID, range from 9.6-16 mg/L.

The most critical season with respect to DO concentrations is the summer season. This is the period of maximum stratification, high temperatures, and minimum initial dilution. The amended 301(h) TSD provides the following equation for

determining the DO depletion caused by the BOD of the effluent. This equation was used to calculate the DO concentration (DO_f) in the waste field at the completion of initial dilution, using the following recommended worst-case assumptions.

$DO_f = DO_a + (DO_e - IDOD - DO_a)/S_a$ (mg/L)

DO_a =	Ambient DO concentration (minimum average water column DO concentration measured in the vicinity of the outfall) 9.6 mg/L
DO_e =	Effluent DO concentration 0.0 mg/L (represents the worst possible case effluent, monitoring data is not available)
IDOD =	Immediate DO demand 2.0 mg/L (from Table B-3 in the amended 301(h) TSD, page B-15)
S_a =	Initial dilution (72.0:1)

The minimum DO concentration of the receiving water immediately following initial dilution (DO_f) is 9.4 mg/L, a depletion of 0.2 mg/L from the ambient DO. The facility is, therefore, not causing or contributing to exceedances of the water quality criteria.

The applicant also evaluated the far-field effect of the effluent BOD using the simplified oxygen depletion model from the TSD. The evaluation is provided in the permitting application section 3.B.2. The evaluation shows that even during critical receiving water conditions, the DO concentration remains above the water quality criteria. Ambient monitoring for DO has been retained in the draft permit to assure future compliance with water quality standards.

The draft permit does require a minimum effluent limitation for dissolved oxygen of 2.0 mg/L and a maximum effluent limitation of 17 mg/L. This requirement is an Alaska DEC stipulation (Appendix D).

B. Turbidity and/or Light Attenuation

Alaska water quality standards applicable to marine waters in Taiya Inlet in the vicinity of the outfall provide that turbidity shall not exceed 25 nephelometric turbidity units (NTU) and shall not reduce the depth of the compensation point for photosynthetic activity by more than 10%. In addition, the turbidity shall not reduce the maximum Secchi disc depth by more than 10%.

Water quality monitoring conducted by the permittee under the current permit from 1997-1999 has shown that receiving water turbidities range from 1-26 NTU. Additionally, there is no significant differences in turbidity or Secchi disc measurements between the stations near the outfall and the reference stations. Secchi disc measurements showed values ranging from 0.99 to 4.0 m.

C. Total Suspended Solids

The change in suspended solids in the water column is indirectly related to turbidity measurements. During the summer, ambient suspended solids concentrations in the vicinity of Skagway are estimated to vary between 14 and 20 mg/L. Average effluent TSS concentration is 48.2 mg/L, based on data from 1996 through 2000. The final suspended solids concentration after initial dilution is given by the following equation:

$$SS_f = SS_a + (SS_e - SS_a)/S_i$$

Where
SS_f = final suspended solids concentration, mg/L
SS_a = ambient suspended solids concentration, mg/L
SS_e = effluent suspended solids concentration, mg/L
S_i = initial dilution

Using a summertime critical dilution ratio of 1:72.0 and an ambient concentration of 20 mg/L, the above equation results in a final solids concentration of 20 + (48.2 - 20)/72.0 = 20.4 mg/L. This represents a small increase of 2 percent over the ambient concentrations. During the winter, ambient solids concentration is estimated at 2 mg/L. The final solids concentration in winter is 2 + (48.2 - 2)/72.0 = 2.6. Although this represents a 30 percent increase in the solids concentration, an increase of 0.6 mg/L is small relative to annual variation of suspended solids concentration from 2 mg/L to 20 mg/L. Therefore, the effect of Skagway's discharge on the suspended solids concentrations in the receiving waters may be considered insignificant.

D. pH

40 CFR 133.102 requires that effluent pH be within the technology-based range of 6.0 to 9.0 standard units (s.u.) for POTWs. In addition, the Alaska water quality standards for the protection of aquatic life requires that ambient pH be in the range of 6.5 to 8.5 s.u. and that pH not vary more than 0.1 standard unit from natural conditions.

The effluent pH from 1996 through 2001 ranged between 6.23 and 7.98 s.u. with an average value of 6.88 s.u. The draft permit incorporates a range limit from 6.0 to 9.0 s.u. consistent with the previous permit. The Alaska DEC also stipulates this pH range in its preliminary certification of the permit (see Appendix D).

E. Fecal Coliform Bacteria

Alaska's most restrictive criterion for fecal coliform (FC) bacteria concentrations is for areas protected for shellfish harvesting. The criterion specifies that the median fecal coliform value not exceed 14 Most Probable Number (MPN)/100 ml, and that not more than 10 percent of the samples shall exceed 43 MPN/100 ml. Because the Taiya Inlet is protected for shellfish harvesting, the discharge in the current permit must result in this standard being met at the edge of the fecal coliform mixing zone, if a mixing zone is certified by ADEC.

Over the existing permit term, the facility reported monthly average fecal coliform concentrations of 2.05 million fecal coliform per 100 ml. The previous permit limit was a monthly average of 1 million fecal coliform per 100 ml. Review of the effluent data shows that the facility consistently has compliance problems with the fecal coliform limitation during the summer tourist season. In light of the fecal compliance problem, the city has recently installed a chlorination and de-chlorination system. The facility anticipates using the chlorination system in the summer tourist season only. The Alaska Department of Environmental Conservation has provided the permittee with a mixing zone for fecal coliform that is defined as a 1600-meter radius circle, centered on the outfall, over the diffuser. In review of the draft permit (Appendix D), the state has stipulated an average monthly limit of 1.0×10^6 FC/100 ml, and a maximum daily limit of 1.5×10^6 FC/100 ml as complying with state water quality standards. These limitations have been included in the draft permit.

Ambient monitoring of fecal coliform from September 1986 through September 2000 shows that there have been exceedance above the ambient Alaska water quality standards within the harbor. All the exceedances of limitations occurred during the tourist season prior to operation of the chlorination system. Within the ZID, 7 of 18 samples exceeded the 43 MPN/100 ml criterion. Nearly all the samples at the ZID boundary and beyond complied with water quality standards. Along with the fecal coliform limits, and expected chlorination of the effluent, the draft permit also includes continuation of the water column, intertidal (shoreline), and offshore fecal coliform monitoring requirements. The ambient monitoring program will continue to provide information to evaluate compliance with Alaska fecal coliform water quality standards.

F. Toxic Pollutants

As discussed above, water quality-based limits must be established that result in compliance with water quality standards at the edge of the ZID.

The regulations at 40 CFR 122.44(d)(1) implement section 301(b)(1)(C) of the Clean Water Act. These regulations require that NPDES 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 water quality standard, including State narrative criteria for water quality." The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation (WLA).

EPA generally uses the following approach when determining whether water quality-based limits are needed:

a. Determine the appropriate water quality criteria.
b. Determine whether there is "reasonable potential" to exceed the criteria.
c. If there is "reasonable potential", develop a waste load allocation (WLA) for the discharge.
d. Develop effluent limitations for the permit based on the WLA.

To determine if the discharge has a "reasonable potential" to cause or contribute to an exceedence of the water quality criteria for a given pollutant, EPA compares applicable water quality criteria to the maximum receiving water concentrations for a particular pollutant. If the maximum receiving water concentration exceeds the criteria, there is "reasonable potential" and a water quality-based effluent limit must be included in the permit.

EPA used the recommendations in Chapter 3 of the *Technical Support Document for Water Quality-based Toxics Control* (TSD, EPA 1991) to conduct this "reasonable potential" analysis for the City of Skagway WWTP.

The maximum receiving water concentration is determined using the following mass balance equation.

$C_r = (C_e / D) + C_b$ where,

C_r = receiving water concentration of the effluent at the edge of the ZID
C_e = maximum projected effluent concentration
= maximum reported effluent value X reasonable potential multiplier
C_b = background concentration of pollutant

D = dilution factor, 72.0:1

The maximum projected effluent concentration (C_e) in the mass balance equation is represented by the highest reported concentration measured in the effluent multiplied by a reasonable potential multiplier. The reasonable potential multiplier accounts for uncertainty in the data. The multiplier decreases as the number of data points increases and variability of the data decreases. Variability is measured by the coefficient of variation (CV) of the data. When there is not enough data to reliably determine a CV, the TSD recommends using 0.6 as a default value. A partial listing of reasonable potential multipliers can be found in Table 3-1 of the TSD.

The resulting maximum projected effluent concentration is then divided by the minimum critical dilution. This product represents the maximum effluent concentration at the edge of the ZID. The maximum effluent concentration at the edge of the ZID is then added to the background concentration, $C_{b,}$ which is represented by the 95th percentile value from the background data set. The sum, C_r, represents the projected maximum receiving water concentration at the edge of the ZID. This concentration is compared to the water quality criterion to determine whether a water-quality based effluent limitation is needed. If the receiving water concentration exceeds the water-quality criteria then a water-quality based effluent limitation is developed.

Table B-2 shows the values used to calculate a maximum potential receiving water concentration and compared to the most stringent criteria for toxics.

Table B-2. Determination of Need for Water-Quality Based Limits

Parameter	Max Report Effluent (µg/l)	Reasonable Potential Multiplier	Dilution Ratio	Max Potential RWC, C_r (µg/l)	Most Stringent WQ Criteria (µg/l)	WQ Based Limit Required?
Total Ammonia as N	21,000	3.2	1:72.0	933	2000	No
Copper	220	1.6	1:72.0	4.9	2.9	Yes
Lead	2.9	4.2[1]	1:72.0	0.2	5.6	No
Zinc	57	4.2[1]	1:72.0	3.3	86	No

Notes:

1 When less than 10 data points are available, the TSD recommends using a coefficient of variation of 0.6.

2 The following parameters were identified in the toxic pollutant and pesticide scan but were below the most stringent water quality standard even before consideration of available dilution and, therefore, no limits are required: chloroform, toluene, phenol, Bis(2-ethylhexyl) phthalate, 1-4-Dichlorobenzene, diethylphthalate.

The maximum potential receiving water concentrations for copper exceeds the most stringent Alaska water quality criteria, therefore, an effluent limitation is necessary. Effluent limitations are not necessary for the other toxics identified in the discharge since there is no reasonable potential to exceed criteria.

G. Ammonia

The existing 1996 permit required effluent monitoring of total ammonia since ammonia is a common constituent of POTW effluent and no previous effluent data was available. The State of Alaska water quality standards for marine discharges (18 AAC 70.020(b)(footnote 5) includes a water quality criteria for ammonia, which is dependant on temperature, salinity, and pH (Federal Register 5/4/89). The applicable chronic ammonia criteria is 2.0 mg/l when assuming the following conditions which are based on recent ambient monitoring (summer conditions); temperature 10°C, salinity 10g/kg, and pH 8.0s.u. The effluent ammonia ranged from 0.4 - 21 mg/L. Using the maximum effluent value, along with a reasonable potential multiplier and a 1:72.0 dilution, the maximum potential receiving water concentration is below the most stringent criteria as shown in Table B-2, therefore, no limit is included in the permit. Monitoring will be continued at the low frequency of the existing permit.

H. Floating, Suspended or Submerged Matter

The state water quality standard 18 AAC 70.020(b)(2) requires that the permittee not discharge floating solids, debris, sludge, foam, scum, or other residues which produce a film, sheen, or discoloration on the surface of the receiving water. This condition was included in the 1996 permit and has been retained in the draft permit.

IV. Antidegradation

In addition to water quality-based limitations for pollutants that could cause or contribute to exceedances of standards, EPA must consider the State's antidegradation policy. This policy is designed to protect existing water quality when the existing quality is better than that required to meet the standard and to prevent water quality from being degraded below the standard when existing quality just meets the standard. For high quality waters,

antidegradation requires that, before any degradation is authorized, the State must find that allowing lower water quality is necessary to accommodate important economic or social development. This means that, if water quality is better than necessary to meet the water quality standards, increased permit limits can be authorized only if they do not cause degradation or if the State makes the determination that it is necessary. Reissuance of this permit will not result in additional pollutant loading to the receiving water, therefore, reissuance is consistent with the State of Alaska's antidegradation policy (18 AAC 70.010(c)].

V. Maintenance of that Water Quality which Assures Protection of Public Water Supplies, a Balanced Indigenous Population of Shellfish, Fish, and Wildlife, and Recreational Activities in and on the Water [40 CFR § 125.62]

A. Transport and Dispersion of Diluted Wastewater and Particulates

40 CFR § 125.62 states that wastewater and particulates must be adequately dispersed following initial dilution so as not to adversely affect water use areas. Assuring compliance with this section requires an analysis of solids accumulation.

The accumulation of suspended solids may lower dissolved oxygen concentrations in near-bottom waters and cause changes in the benthic communities. Accumulation of suspended solids in the vicinity of a discharge is influenced by the amount of solids discharged, the settling velocity distribution of the particles in the discharge, the plume height-of-rise, and current velocities. Sedimentation of suspended solids is generally of little concern for discharges into very well-flushed receiving waters.

The discharge of Skagway's effluent has not caused, and is not expected to cause, adverse solids accumulation or have a significant impact on sediment dissolved oxygen demand. The permittee estimated a steady-state sediment accumulation of less than 25 g/m^2 for particles from the outfall using the procedures specified in the amended TSD. The estimate is based on an average value of mass loading over the tabulated four years of discharge of 60.1 kg/day. Using this mass loading rate and a value of plume height of rise of 11.0 m (0.6 times water depth of 18.3 m), the steady-state sediment deposition is less than 25 g/m^2. The amended TSD indicates that no biological impacts are expected to occur when the deposition is less than 25 g/m^2 and, therefore, is not considered significant.

B. **Impact of the Discharge on Public Water Supplies**

40 C.F.R. § 125.62(b) requires that the applicant's discharge allow for the attainment or maintenance of water quality which assures protection of public water supplies and not interfere with the use of planned or existing public water

supplies. There are no existing or planned public water supply intakes in the vicinity of the discharge.

C. **Biological Impact of Discharge**

40 CFR § 125.62(c) requires that in addition to complying with applicable water quality standards, the discharge must comply with any additional requirements necessary to maintain water quality which provides for the protection and propagation of a balanced indigenous population (BIP) of fish, shellfish, and wildlife. Specifically, this requirement means that a BIP must exist immediately beyond the boundary of the ZID and in all areas beyond the ZID that are actually or potentially affected by the applicant's discharge.

The guidelines in the TSD indicate that the potential for adverse biological impacts due to the sewage effluent is low since the outfall is located in relatively deep water and strong, fairly steady currents provide adequate dilution. Transport and dispersion of the diluted wastewater following initial dilution should continue to prevent accumulation of sewage-derived solids which could have adverse effects on benthic communities.

The applicant's total volatile solids (TVS) data collected in August 1989 indicated that the area near the existing outfall is not a site of elevated TVS levels; the station with the highest recorded TVS levels were collected at a reference site. All of the reported TVS values were reasonable values for coastal sediments.

Biological monitoring was conducted within the ZID and surrounding areas in August of 1999 as required by the permit. The purpose of the project was to determine if the discharge was causing changes in the amount of organic material in sediments around the outfall and if there were any resulting changes in the benthic community structures. The biological monitoring consisted of three elements: 1) collection of TVS samples, 2) collection of benthic infauna samples for preservation and archiving, and 3) visual observation of benthic community.

The results of the survey are included in the City's 301(h) application and are summarized in the fact sheet in Section VIII.E. The survey found no noticeable accumulation of sediments of organic material resulting from the discharge nor any adversely affected species noted in the survey final report.

D. **Biological Impacts for Saline Estuaries Regarding Benthic Populations within the ZID, Migratory Pathways within the ZID, and Accumulation of Toxic Pollutants or Pesticides within the ZID**

40 C.F.R. § 125.62(c)(4) requires that for discharges within a saline estuary, the benthic populations within the ZID may not differ from the BIP immediately beyond the ZID. The discharges may also not interfere with estuarine migratory pathways within the ZID, and the discharge may not result in the accumulation of toxic pollutants or pesticides at levels which exert adverse effects on the biota within the ZID.

In the previous permit reissuance EPA concluded that the discharge would likely have no adverse impact on the shellfish, fish, and wildlife within and beyond the ZID based on the following: 1) The discharge is located at a depth sufficient to allow for thorough dilution of the effluent, 2) the steady-state accumulation of suspended solids is predicted to be low and, 3) toxic are absent or present only in low concentrations in the effluent. Analysis presented in this fact sheet and monitoring conducted during the existing permit term continue to support each of the above findings and the overall conclusion of no adverse impact on benthic populations.

E. Impact of Discharge on Recreational Activities

40 C.F.R. § 125,62(d) requires that the discharge have no impact on recreational activities outside the ZID. The applicant stated that most of the recreational or commercial fishing occurs in Lynn Canal, south of Chilkoot Inlet, and commercial fisheries near Skagway are extremely limited. No significant commercial or recreational fisheries or fish migratory pathways have been identified in the discharge vicinity. There are no known cases of fish mortalities or adversely affected fisheries that have been linked to Skagway's discharge.

Adverse impacts on the recreational activities occurring in Taiya Inlet due to the discharge are not likely. There are no known federal, state, or local restrictions on recreational activities in the area.

APPENDIX C - EFFLUENT LIMIT CALCULATION FOR TOTAL COPPER AND TOTAL RESIDUAL CHLORINE

This appendix describes how the water quality-based effluent limits were calculated for total copper and total residual chlorine. The calculations were performed according to procedures outlined in Chapter 5 of the TSD.

Total Copper:

Step 1 - Determine the appropriate water quality criteria

The State water quality criteria is determined based on the designated use of the receiving water. Taiya Inlet is protected by the State of Alaska for the following uses: marine water supply (aquaculture, seafood processing and industrial); water recreation (contact and secondary); growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life.

The acute total recoverable copper criterion of 2.9 µg/L was adopted by reference by ADEC from EPA's July 29, 1985 *Water Quality Criteria*. The chronic criterion of 4.0 µ*g/L* was adopted by reference from EPA's November 28, 1980 *Ambient Water Quality Criteria*.

Step 2 - Determine whether there is "reasonable potential" to exceed the criteria

There is reasonable potential (RP) to exceed water quality criteria if the maximum projected downstream concentration of the pollutant exceeds the criterion. The maximum projected copper concentration is calculated using the following mass-based equation.

$$C_d = \frac{C_e}{\text{Dilution}} + C_u$$ where,

C_d = receiving water concentration downstream of the effluent discharge
C_e = maximum projected effluent concentration (350 µg/L)
= maximum reported effluent concentration (220 µg/L) X reasonable potential multiplier (1.6)
(In calculating the reasonable potential multiplier EPA used a coefficient of variation of 0.53 based on monitoring conducted from August 1996 through April 2001).
C_u = upstream concentration of pollutant (0 mg/L)
Dilution = the mixing zone dilution allowed by the state (72:1)

C_d = 350 (µg/L) / 72 = 4.9 µg/L

Because the downstream or edge of mixing zone concentration is greater than the Alaska water quality criterion, total copper limits must be included in the permit.

Step 3 - Calculate Wasteload Allocations

Acute and chronic waste load allocations (WLA_{acute} or $WLA_{chronic}$) are calculated using the same mass balance equation used to calculate the concentration of the pollutant at the edge of the mixing zone. However, C_d becomes the criterion and C_e is replaced by the WLA_{acute} or $WLA_{chronic}$. The WLAs define the appropriate concentration of pollutant allowed in the effluent.

$WLA = (C_d - C_u) * Dilution = C_d * Dilution$

$WLA_{acute} = 2.9\mu g/L * 72 = 208.8$
$WLA_{chronic} = 4.0\mu g/L * 72 = 288.0$

Step 4 - Develop Permit Limits

a) Convert the WLAs to Long Term Averages (LTAs)

The acute and chronic WLAs are converted to acute and chronic LTA concentrations (LTA_{acute} and $LTA_{chronic}$) using the following equations from Section 5.4 of EPA's TSD:

$LTA_{acute} = WLA_{acute} \text{ X } e^{[0.5\sigma^2 - z\sigma]}$ where,

CV = coefficient of variation of the effluent concentration, standard deviation/mean = 0.526
σ^2 = $\ln(CV^2 + 1) = 0.244$
z = 2.326 for 99th percentile probability basis

$LTA_{acute} = 208.8\mu g/L * .373 = 77.9\ \mu g/L$

$LTA_{chronic} = WLA_{chronic} \text{ X } e^{[0.5\sigma^2 - z\sigma]}$ where,

CV = coefficient of variation of the effluent concentration= 0.526
σ^2 = $\ln(CV^2/4 + 1) = 0.066$
z = 2.326 for 99th percentile probability basis

$LTA_{chronic} = 288.0\mu g/L * .581 = 167.3\ \mu g/L$

b) Calculate Average Monthly and Maximum Daily Permit Limits

To protect a water body 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).

To derive the MDL and the AML for copper the calculations would be as follows:

$MDL = LTA_{acute} \text{ X } e^{(z\sigma - 0.5\sigma^2)}$ where,

CV = coefficient of variation = 0.526
σ^2 = $\ln(CV^2 + 1) = 0.244$
z = 2.326 for 99th percentile probability basis

MDL = 77.9µg/L * 2.68 = 209 µg/L

$AML = LTA_{acute} \text{ X } e^{(z\sigma - 0.5\sigma^2)}$ where,
CV = coefficient of variation = 0.526
σ^2 = $\ln(CV^2/n + 1) = 0.066$
z = 1.645 for 95th percentile probability basis
n = number of sampling events required per month = 4

AML = 77.9µg/L * 1.95 = 152 µg/L

Mass-based concentration limits were calculated by multiplying the concentration limit by the design flow (0.63 mgd) and the 8.34 conversion factor.
MDL = (0.63 mgd) X (8.34) X (mg/L) = 1.1 lbs/day
AML = (0.63 mgd) X (8.34) X (mg/L) = 0.8 lbs/day

Total Residual Chlorine:
Water Quality Criteria

The acute chlorine criterion is 13µg/L and the chronic criterion is 2.0 µg/L.

Calculate Wasteload Allocations

$WLA = (C_d - C_u) * \text{Dilution} = C_d * \text{Dilution}$

WLA_{acute} = 13µg/L * 72 = 936
$WLA_{chronic}$ = 2 µg/L * 72 = 144

Develop Permit Limits

a) Convert the WLAs to Long Term Averages (LTAs)

The acute and chronic WLAs are converted to acute and chronic LTA concentrations (LTA_{acute} and $LTA_{chronic}$) using the following equations from Section 5.4 of EPA's TSD:

$LTA_{acute} = WLA_{acute} \text{ X } e^{[0.5\sigma^2 - z\sigma]}$ where,

CV = coefficient of variation of the effluent concentration, standard deviation/mean = 0.6
σ^2 = $\ln(CV^2 + 1) = 0.244$
z = 2.326 for 99th percentile probability basis

LTA_{acute} = 936 µg/L * .321 = 300.5 µg/L

$LTA_{chronic} = WLA_{chronic} \text{ X } e^{[0.5\sigma^2 - z\sigma]}$ where,

CV = coefficient of variation of the effluent concentration= 0.6
σ^2 = $\ln(CV^2/4 + 1) = 0.066$
z = 2.326 for 99th percentile probability basis

$LTA_{chronic}$ = 144µg/L * .527 = 75.9 µg/L

b) Calculate Average Monthly and Maximum Daily Permit Limits

To protect a water body 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).

To derive the MDL and the AML for chlorine the calculations would be as follows:

$MDL = LTA_{chronic} \text{ X } e^{(z\sigma - 0.5\sigma^2)}$ where,

CV = coefficient of variation = 0.6
σ^2 = $\ln(CV^2 + 1) = 0.244$
z = 2.326 for 99th percentile probability basis

MDL = 75.9µg/L * 3.11 = 240 µg/L

$AML = LTA_{chronic} \text{ X } e^{(z\sigma - 0.5\sigma^2)}$ where,

CV = coefficient of variation = 0.6
σ^2 = $\ln(CV^2/n + 1) = 0.066$
z = 1.645 for 95th percentile probability basis
n = number of sampling events required per month = 4

AML = 75.9µg/L * 1.55 = 120 µg/L

Mass-based concentration limits were calculated by multiplying the concentration limit by the design flow (0.63 mgd) and the 8.34 conversion factor.

MDL = (0.63 mgd) X (8.34) X (mg/L) = 1.3 lbs/day

AML = (0.63 mgd) X (8.34) X (mg/L) = 0.6 lbs/day

APPENDIX D - STATE OF ALASKA REVIEW OF THE PRE-DRAFT NPDES PERMIT

DIVISION OF AIR AND WATER QUALITY
Wastewater Discharge Permits Program

April 18, 2002

Mr. Mike Lidgard
NPDES Permits Unit
U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, WA 98101

RE: State of Alaska Review of Pre-draft NPDES Permit No. AK-002001-0

Dear Mr. Mike Lidgard;

I have reviewed the above referenced pre-draft NPDES Permit and Fact Sheet for the City of Skagway. I have the following comments and recommendations.

Draft Permit

State of Alaska Certification Stipulations

1) The ADEC will require a flow rate limitation of 0.53 mgd for a monthly average and 0.63 mgd for a daily maximum.

   Rationale: In accordance with State Regulations 18 AAC 70.045, the Department will consider the characteristics of the effluent, including flow rate, when determining the appropriateness and size of a mixing zone. Restricting the amount of flow will assure that the size of the mixing zone is appropriate and that the treatment capacity of the facilities is not exceeded.

2) The ADEC will require a biochemical oxygen demand (BOD5) monthly average limitation of 80 mg/L, and a daily maximum limitation of 100 mg/L in the effluent during the time period October 1 through April 30. During the time period May 1 through September 30, a monthly average limitation of 180 mg/L and daily maximum of 200mg/L, sampled at once per month.

Rationale: In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that all applicable criteria will be met.

3) The ADEC will require a Total Suspended Solids monthly average limitation of 70 mg/L, and a daily maximum limitation of 88 mg/L in the effluent during the time period October 1 through April 30. During the time period May 1 through September 30, a monthly average limitation of 210 mg/L and daily maximum of 230 mg/L, sampled at once per month.

   Rationale: In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that all applicable criteria will be met

4) The State of Alaska certification of this permit will require effluent limitations for Fecal Coliform Bacteria of 1.0 million per 100 ml for a monthly average and 1.5 million per 100 ml for a daily maximum. Sampled at one time per month.

   Rationale: In accordance with State Regulations 18 AAC 70.045, the Department will consider the characteristics of the effluent, including flow rate, when determining the appropriateness and size of a mixing zone. Restricting the amount of flow will assure that the size of the mixing zone is appropriate and that the treatment capacity of the facilities is not exceeded.

5) The ADEC will designate a Mixing Zone (MZ) for Fecal Coliform Bacteria contained in the discharge from the City of Skagway Wastewater Treatment Facility. The mixing zone is defined as 1600-meter radius circle, centered on the outfall, over the diffuser.

   Rationale: In accordance with State Regulations 18 AAC 70.240, the Department has authority to designate mixing zones in permits or certifications. This mixing zone will ensure that the most stringent water quality standard limitations for fecal coliform bacteria; 14 FC/100 ml, 30 day average, (not more than 10% of the samples may exceed 43 FC/100 ml.), is met at all points outside of the mixing zone.

6) The ADEC will designate a Zone of Initial Dilution (ZID) for dissolved oxygen, pH, total chlorine, nutrients, temperature, metals and whole effluent toxicity (WET). The ZID is defined as a 139-meter radius, centered on the outfall line and over the diffuser, extending from the diffuser to the surface. The ZID provides a dilution of 72:1. The most stringent limits for the parameters listed in the State of Alaska Water Quality Standards must be met at

the edge of the ZID, (except for fecal coliform bacteria which must be met outside of the mixing zone)

Rationale: In accordance with State Regulations 18 AAC 70.240, the Department has authority to designate mixing zones in permits or certifications. This mixing zone will ensure that the most stringent water quality standard limitations for all parameters, (except fecal coliform bacteria) are met at all points outside of the ZID.

7) The ADEC will require monitoring at the outside edge of the mixing zone for fecal coliform bacteria. The samples must be collected from minimum of four locations; 3 shoreline samples [1- shoreline area of human uses closest to the outfall, 2- Shoreline area outside edge where mixing zone touches shore, 3- Shoreline area of human use inside the mixing zone] and 1 on the outside ocean edge of the mixing zone. Sampling to be performed six times per year, during the first two years of the permit (April, June, July, August, September & November). Upon no violations, (that are attributable to the quality of the discharged effluent), of the monthly average of 14 FC/100 mL or the daily maximum of 43 FC/100 mL at the edge of the mixing zone, monthly average of 200 FC/100mL for shoreline samples, the monitoring may be decreased to once per year at the six stations. The monitoring shall be performed on the same days as the water quality monitoring during years 3, 4 and 5 of the permit.

Rationale: In accordance with State Regulations 18 AAC 70.245, the Department has authority to ensure that existing uses of the waterbody outside the mixing zone are maintained and fully protected. The specified monitoring will provide evidence to the Department that the treatment and mixing zone size is adequate and also provide assurance to receiving water users that they may conduct their activities outside of the mixing zone without fear of damaging effects caused by the discharge.

8) The ADEC will require that fecal coliform numbers shall not exceed 200 FC/100 ML at the shoreline within the designated mixing zone.

Rationale: In accordance with State Regulations 18 AAC 70.020, the Department has authority to protect classes of use of the state's water. The limitation (200 FC/100 ML) is protective of the water quality for secondary recreation.

9) ADEC will require Fecal Coliform Bacteria limitations of 14FC/100 ml for a monthly average and 43 FC/100 ml for a daily maximum be met at the outside edge of the mixing zone.

Rationale: In accordance with State Regulations 18 AAC 70.020, the Department has authority to protect classes of use of the state's water. The limitations are protective of the most stringent State of Alaska Water Quality Standards for Fecal Coliform Bacteria.

10) ADEC will require that a pH of effluent limitation of 6.0 to 9.0 S.U.; with 6.5 to 8.5 S.U. required to be met at the edge of the ZID.

Rationale: In accordance with State Regulations 18 AAC 70.020, the Department has authority to protect classes of use of the state's water. The limitations are protective of the most stringent State of Alaska Water Quality Standards for pH.

11) The ADEC will require a minimum effluent limitation for dissolved oxygen (DO) of 2.0 mg/L and a maximum effluent limitation of 17 mg/L; with 6.0 mg/L required to be met at the surface (first 1-meter) edge of the ZID.

Rationale: In accordance with State Regulations 18 AAC 70.020, the Department has authority to protect classes of use of the state's water. The limitations are protective of the most stringent State of Alaska Water Quality Standards for dissolved gas.

12) The ADEC will require a maximum chlorine effluent limit of 0.144 mg/L; with 0.002 mg/L required to be met at the edge of the ZID.

Rationale: In accordance with State Regulations 18 AAC 70.020, the Department has authority to protect classes of use of the state's water. The limitations are protective of the most stringent State of Alaska Water Quality Standards for total residual chlorine.

13) The ADEC will require that signs be placed on the shoreline near the mixing zone and outfall line. The signs should state that treated domestic wastewater is being discharged, the name and owner of the facility and the approximate location and size of the mixing zone. The signs should inform the public that certain activities, such as the harvesting of shellfish for raw consumption and bathing should not take place in the mixing zone and give a contact number for additional information.

Rationale: In accordance with AS 46.03.110, (d), the department may specify in a permit the terms and conditions under which waste material may be disposed of. The notification requirement is intended to inform and provide assurances to the public that the wastewater is being treated in accordance with Alaska Water Quality Standards, 18 AAC 70.

State of Alaska Recommendations and Suggestions

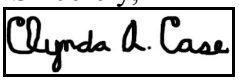
1.) Fecal Coliform (FC) Ambient Water Quality Monitoring Requirements. – Number of samples collected per station is not specified for FC. Suggest: One grab samples per station.

2.) Old permit (May 16, 1996) delineates on page 6 of 38 that monitoring requirement will be removed if shown not to present a reasonable potential to exceed. Skagway has shown this.

Skagway is no longer reporting ammonia on DMR's. Skagway should request reduced ammonia monitoring after 2 years or incorporate as part of the permit, decreased monitoring to quarter upon no exceedences.

Please free to contact me at this office if you have any questions or wish to discuss the departments review of this permit further. Thank you.

Sincerely,



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