FACT SHEET

Public Comment Period Start Date: November 5, 2008
Public Comment Expiration Date: December 5, 2008

The United States Environmental Protection Agency (EPA)
Plans To Reissue A National Pollutant Discharge Elimination System (NPDES) Permit
And
Notice of State Certification

Naval Air Station Whidbey Island
Ault Field Wastewater Treatment Plant
115 W. Lexington St.
Oak Harbor, Washington 98278

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EPA Proposes To Reissue NPDES Permit

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

This Fact Sheet includes:

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

401 Certification for Facilities that Discharge to State Waters

EPA is requesting that the Washington State Department of Ecology (Ecology) certify the NPDES permit for this facility, under section 401 of the Clean Water Act. This Notice also serves as Public Notice of the intent of the State of Washington to consider certifying that the subject discharge will comply with the applicable provisions of Sections 208(e), 301, 302, 303, 306, and 307 of the Clean Water Act. The NPDES permit will not be issued until the certification requirements of Section 401 have been met.

Public Comment

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

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

Documents are Available for Review.

The draft NPDES 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). The draft permit, fact sheet, and other information can also be found by visiting the Region 10 website at "www.epa.gov/r10earth/water.htm."

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900, OWW-130
Seattle, Washington 98101
(206) 553-2108 or
1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permit are also available at:

EPA Washington Operations Office
300 Desmond Drive SE
Lacey, Washington 98503
(360)-407-7564 or (800) 917-0043

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ACRONYMS

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
AML	Average Monthly Limit
BAT	Best Available treatment technology economically achievable
BPT	Best Practicable Control Technology Currently Available
BOD_5	Biochemical oxygen demand, five-day
BE	Biological evaluation
^oC	Degrees Celsius
cfs	Cubic feet per second
CFR	Code of Federal Regulations
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
I/I	Inflow and Infiltration
lbs/day	Pounds per day
LTA	Long Term Average
mg/L	Milligrams per liter
ml	Milliliters
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit
MPN	Most Probable Number
N	Nitrogen
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
OW	Office of Water
O&M	Operations and maintenance
POTW	Publicly owned treatment works
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
s.u.	Standard Units
TMDL	Total Maximum Daily Load
TRE	Toxicity Reduction Evaluation
TSD	Technical Support document (EPA, 1991)
TSS	Total suspended solids
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Services
WLA	Wasteload allocation

WQBEL	Water quality-based effluent limit
WWTP	Wastewater treatment plant

I. APPLICANT

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

Ault Field Wastewater Treatment Plant
Naval Air Station Whidbey Island
NPDES Permit Number: WA-000346-8

Mailing Address:
1155 West Lexington St.
Building 113, Code N44
Oak Harbor, Washington 98278-3800

Facility Contact:
John Mosher (Installation Environmental Program Manager) 360-257-1009.
Calvin Canton (Environmental Engineer) 360-257-5631

II. FACILITY INFORMATION

The Naval Air Station Whidbey Island (NASWI) Ault Field Wastewater Treatment Plant (WWTP) collects sewage in a separate sanitary sewer collection system that serves the station and Deception Pass State Park. The wastewater treatment facility originally consisted of an aerated lagoon system. The wastewater treatment plant, which was upgraded in 1997, consists of a sequencing batch reactor (SBR) and a chlorine contact chamber. Each batch discharge lasts approximately 60 to 120 minutes depending on the operating conditions. The average discharge is about 80,000 gallons and occurs three to four times a day. Because the discharge operation is based on flow, the volume and duration varies. The plant operates year round, and except for emergency situations all operations are automatic. A process flow diagram is shown in Appendix A.

In 2005 a further upgrade was the installation of a new effluent pump vault to enable the discharge during high tides which limited outfall flow rate and overall treatment capacity. The new effluent pump vault eliminated this limitation by pumping effluent when the gravity flow is restricted due to high tide.

The system serves a population of 10,000, discharges 0.366 million gallons per day (MGD) and has a design flow rate of 0.85 MGD. The facility uses chlorine gas for disinfection. Loading from Deception Pass State Park is approximately 500 gallons per day.

Solids removed from the digesters are at 1.8 percent and a new sludge dewatering centrifuge operates at 3,200 revolutions per hour with Praestol k279KLX polymer augmentation to provide a solids content of 18 percent for composting.

Dechlorination is by sulfur dioxide (SO_2) gas supplied by two cylinders. A process flow diagram is shown in Appendix A. The pressure of the sulfur dioxide gas is regulated by

the sulfonators. Nonpotable water supply is controlled by a manually operated ball valve. The SO_2 gas and the nonpotable water mix at the ejector. The resulting solution flows to the chlorine contact basin entering the basin via the diffusers. From the chlorine contact basin the effluent is discharged to Puget Sound. Flow is measured at the influent headworks with a magmeter. An ISCO flow proportional sequential monitor is the point of compliance for all 24 hour composite samples.

This facility does not require a mandated 403 pretreatment program since (1) it is a federally owned treatment works, not a publically owned treatment works and, (2) even if it was a POTW it does not meet the criteria to trigger pretreatment requirements. The non-domestic flows are minor compared to domestic volumes. However, the facility does operate its own pretreatment program, which consists of an Industrial Wastewater Management plan, regular sampling and analysis, and a management structure in place to regulate non-domestic wastes. Table 1 below summarizes non-domestic wastewater flows discharged into NASWI's sanitary sewers. Pollution prevention by the NAS Whidbey Island reduced waste from non-domestic industrial users from one pick up per month to one pick up every four months. Contributing to this are recycling and reduction of hazardous waste and wastewater by using the most concentrated solvents only when necessary in the Aircraft Intermediate Maintenance Department.

Aircraft deicing operations are conducted at certain dedicated stations at the flight line. Spent deicing fluids (propylene glycol) are captured by placing gel mats over catch basins prior to deicing operation. After the treated plane leaves the site, the spent fluid is collected using vacuum trucks. The trucks temporarily deposit the fluid into one of two above ground storage tanks (AST) located along the flight line. When one of these ASTs is full, the waste is transferred to a larger AST for temporary storage prior to final off-site disposal. Everything is contained and nothing goes to the treatment plant or to Puget Sound.

Table 1: Summary of Non-Domestic Flows at NASWI

Stream Designation	Title	Description/Estimated Flow
1	Aircraft Intermediate Maintenance Department Aircraft Rinsate	Wastewater is generated during aircraft parts cleaning. Following degreasing, paint removal, and/or carbon removal, aircraft parts are rinsed to remove residual debris and solvent. Effluent is a mix of water, low levels of metals, grease, and solvents. Non-hazardous. Intermittent use is 40,000 gallons/year (gpy).
2	Aircraft and Equipment Washing	Wastewater is generated due to washing of all aircraft at the North and South Wash Racks using biodegradable cleaning compounds. Wastewater goes through oil/water separators prior to SBR treatment. Non-hazardous. Intermittent use is 1,300,000 gpy.
3	Aircraft Engine Wash	Wastewater is generated during washing of J-52 aircraft engines at the North and South Wash Rack. Non-hazardous. Intermittent use is 2,000 gpy.

Table 1: Summary of Non-Domestic Flows at NASWI		
4	Oil/Water Separators	Wastewater is generated from fuel farm and from oil/water separators from hangars 8, 9, 10, 12, and two Jet Engine Test Cells. Non-hazardous. Intermittent use is 700,000 gpy.
5	Non-Destructive Inspection Penetrate Rinses	Wastewater is generated during rinsing operations. Non-destructive inspection consists of inspection of metal parts to detect cracks. Chemical used in testing and identifying the cracks is an oil-based product with green dye and emulsifier. Shop is located at Aircraft Intermediate Maintenance Department. Intermittent use is 5,000 gpy.
6	Boiler/Compressor Blow Down	Wastewater is generated from the central heating steam plant. Non-hazardous waste. Intermittent use is 300 gpy.

Notes:

(a) Aircraft deicing – Residual from aircraft is collected by vacuum trucks and stored/shipped offsite.

(b) Aqueous Film Forming Foam – Diluted AFFF is used for fire suppression (both testing of fire suppression systems and actual discharges). Discharges due to testing or by accident are collected by vacuum trucks and generally shipped offsite.

(c) Estimates are based on non-domestic wastewater flow for calendar year 2005.

Wastewater from the water curtain paint booths and photographic silver office no longer discharge to the treatment plant and are removed by a waste hauler under separate permit.

The point of discharge consists of one 16-inch outfall pipe into the Strait of Juan De Fuca in Puget Sound at the approximate location: Latitude: 48° 21' 42" N; and Longitude: 122° 40' 28" W. The outfall is equipped with a two port Wye diffuser, is approximately 1,100 feet from shore, and is -7 feet Mean Lower Low Water (MLLW). A facility site map is shown in Appendix A.

The previous NPDES Permit for this facility became effective on January 12, 1998, and expired on January 13, 2003. NASWI submitted a permit application package on July 17, 2003 and submitted an update to the application in October 2006. Conditions and requirements from the previous permit have been administratively extended until the NPDES permit is re-issued.

EPA inspected the treatment plant and each industrial discharge source on May 7, 2008 and on May 23, 2006.

The previous permit included the following monitoring requirements and effluent limits:

Table 2: Effluent Limitations from the Previous Permit				
Effluent Characteristics	**Units**	**Monthly Average**	**Weekly Average**	**Daily Maximum**
Biochemical Oxygen Demand,	mg/L (lbs/day)	30 (213)	45 (319)	---

Table 2: Effluent Limitations from the Previous Permit				
Effluent Characteristics	**Units**	**Monthly Average**	**Weekly Average**	**Daily Maximum**
BOD_5				
Total Suspended Solids, TSS	mg/L (lbs/day)	30 (213)	45 (319)	---
Fecal Coliform Bacteria	number/100 mL	200	400	---
Total Residual Chlorine	mg/L (lbs/day)	0.07 (1.0)		0.19 (2.9)
pH	Shall not be less than 6.0, nor greater than 9.0			

Table 3: Monitoring Requirements from the Previous Permit				
Parameter	**Units**	**Sample Location**	**Sampling Frequency**	**Type of Sampling**
Flow	MGD	Effluent	Continuous	Recording
BOD_5	mg/L and lbs/day	Influent and Effluent	1/week	24 hour composite
TSS	mg/L and lbs/day	Influent and Effluent	1/week	24 hour composite
pH	s.u.	Effluent	Daily	Grab
Fecal Coliform Bacteria	Number/100 mL	Effluent	1/week	Grab
Total Available Residual Chlorine	mg/L	Effluent	Daily	Grab

In its updated NPDES Permit Application dated October 31, 2006, the facility reported the following information:

- The facility has a design flow rate of 0.85 MGD capacity. This is the flow used to develop the mass loading limits.
- The facility's collection system consists only of separate sanitary sewers. No contribution from a combined storm was indicated. A separate Multi-Sector General Permit authorizes stormwater discharges.
- The facility treats waste with sequencing batch reactors to achieve secondary treatment. The reactor volume is 57,500 cubic feet with a detention time of 24 hours.
- The facility uses chlorine disinfection of effluent with a mean detention time of 91 minutes and 22 minutes at peak effluent flow

- Dechlorination is by sulphonation.
- The facility reported the following effluent testing information in the permit application:
    - Minimum pH: 6.2 s.u.
    - Maximum pH: 8.8 s.u.
    - Temperature of effluent - Maximum Daily value (Winter): 23 º C
    - Temperature of effluent - Maximum Daily value (Summer): 23 º C
    - Biochemical Oxygen Demand (BOD_5): maximum daily discharge, 41.0 mg/L; average daily discharge, 9 mg/L
    - Total Suspended Solids (TSS): maximum daily discharge, 33.0 mg/L; average daily discharge, 5 mg/L
    - Inflow and Infiltration (I/I) rate: 68,000 gallons per day

Monitoring data from January, 2002, through June, 2007, were reviewed to determine the facility's compliance with the previous effluent limits. Review of these data found no violations of its effluent limits and no exceedances of any limits within the past five years. Based on this review, the facility did not need to be considered for implementation of alternative permit limits, such as treatment equivalent to secondary limits.

III. RECEIVING WATER

The NASWI Ault Field WWTP discharges into the Strait of Juan de Fuca in Puget Sound.

A. Water Quality Standards

Section 301(b)(1)(c) of the CWA requires the development of limitations in permits necessary to meet water quality standards. Federal regulations in 40 CFR 122.4(d) prohibit the issuance of an NPDES permit which does not ensure compliance with the water quality standards of all affected States.

A State's water quality standards are composed of use classifications, numeric and narrative water quality criteria, and an anti-degradation policy. The use classification system designates the beneficial uses (such as cold water biota, contact recreation, etc.) that each water body is expected to achieve. The numeric and narrative water quality criteria are the criteria deemed necessary, by the State, to support the beneficial uses as well as to maintain and protect various levels of water quality and uses.

The receiving water is classified as Extraordinary Marine according to the State of Washington's water quality standards (found at WAC 173-201A as amended in November, 2006). Waters listed as extraordinary are designated for uses including industrial water supply; salmonid and other fish migration, rearing, spawning, and

harvesting; clam, oyster, and mussel and other shellfish rearing, spawning and harvesting; wildlife habitat; recreation (primary contact recreation, sport fishing, boating, and aesthetic enjoyment); and commerce and navigation.

Aquatic Life Uses & Associated Criteria for Puget Sound in the Vicinity of Naval Air Station Whidbey WWTP Discharge

Extraordinary Quality	
Temperature Criteria – Highest 1D MAX	13°C (55.4°F)
Dissolved Oxygen Criteria – Lowest 1-Day Minimum	7.0 mg/L
pH Criteria	pH must be within the range of 7.0 to 8.5 su with a human-caused variation within the above range of less than 0.2 units.

To protect **shellfish harvesting**, fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, and not have more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100 mL. Prior to the public comment period for the draft Permit, EPA also consulted with Mr. Bob Woolrich at the Washington State Department of Health (Office of Shellfish and Water Protection) concerning shellfish safety. Mr. Woolrich concluded that discharges are not likely to adversely affect shellfish.

The **recreational uses** are primary contact recreation. The recreational uses for this receiving water are identified in the table below:

Recreational Use	**Criteria**
Primary Contact Recreation	Fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies /100 mL.

The **miscellaneous marine water uses** are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

B. Water Quality Limited

Any waterbody for which the water quality does not meet applicable water quality standards is defined as a "water quality limited segment." Based on Ecology's map of 303d listed water bodies Rosario Straight is within five miles of the discharge and is the closest water body impaired. It is on Washington State's 1998 303(d) list (Washington State Department of Ecology, 1998) as impaired for

DO and temperature. However, the segment of Rosario Straight impaired is 35 miles away and no human caused impairments were identified and Ecology concluded that no actions were needed to mitigate these impairments.

EPA contacted the Northwest Office of the Washington State Department of Ecology to determine if there were any TMDLs completed or scheduled for Rosario Strait or in the Strait of Juan de Fuca in the vicinity of the discharge. The Office responded and indicated that there were no TMDLs completed or scheduled for the Strait of Juan de Fuca in the vicinity of the discharge. (E-mail from Dave Garland, Watershed Unit Supervisor, Ecology Northwest Regional Office, August 16, 2007).

IV. EFFLUENT LIMITATIONS

A. Basis for Permit Effluent Limits

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

B. Proposed Effluent Limitations

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

1. Removal requirements for BOD_5 and TSS: The monthly average effluent concentration must not exceed 15 percent of the monthly average influent concentration for of BOD_5 and TSS. Percent removal of BOD_5 and TSS must be reported on the Discharge Monitoring Reports (DMRs). For each parameter, the monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month. Influent and effluent samples must be taken over approximately the same time period.

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

3. Table 4 below presents the proposed average monthly, average weekly, and maximum effluent limits for BOD_5, TSS, pH, fecal coliform, total residual chlorine and the percent removal requirements for BOD_5, and TSS.

Table 4: Monthly, Weekly and Instantaneous Maximum Effluent Limitations				
Parameters	**Average Monthly Limit**	**Average Weekly Limit**	**Percent Removal**	**Daily Maximum**
BOD_5 Concentration-	30 mg/L	45 mg/L	85% (Min.)[3]	---
BOD_5 Mass-Based Limits[1]	213 lbs/day	319 lbs/day		---
TSS Concentration	30 mg/L	45 mg/L	85% (Min.)	---
TSS Mass-Based Limits[1]	213 lbs/day	319 lbs/day		---
Fecal coliform Bacteria[2] (colonies/100 ml)	200[2]	400	---	
Total Residual Chlorine	0.052 mg/L		---	0.132 mg/L
pH	6.0 to 9.0[4]			

Notes:
1.Loading is calculated by multiplying the concentration in mg/L by the average daily flow for the day of sampling in mgd and a conversion factor of 8.34. If the concentration is measured in µg/L, the conversion factor is 0.00834. For more information on calculating, averaging, and reporting loads and concentrations see the NPDES Self-Monitoring System User Guide (EPA 833-B-85-100, March 1985)
2. For fecal coliform bacteria, the permittee must report the geometric mean fecal coliform concentration. If any value used to calculate the geometric mean is less than 1, the permittee must round that value up to 1 for purposes of calculating the geometric mean. "Geometric mean" means either the nth root of a product of n factors, or the antilogarithm of the arithmetic mean of the logarithms of the individual sample values.
3. Percent removal is calculated using the following equation: ((influent - effluent) / influent) x 100
4. The pH must not be less than 6.0 standard units (s.u.) or greater than 9.0 standard units (s.u.).

V. MONITORING REQUIREMENTS

A. Basis for Effluent and Surface Water Monitoring

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

B. Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well

as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Ecology requested monitoring frequency for TSS, BOD and fecal coliform increased from one sample per month to two samples per month consistent with Ecology's monitoring frequency for SBRs. Permittees have the option of taking more frequent samples than are required under the permit. These samples can be used for averaging if they are conducted using EPA approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits (MDLs) are less than the effluent limits.

Table 5 presents the effluent monitoring requirements for the permittee in the draft permit. The draft permit includes effluent monitoring for several metals (arsenic, copper, lead, mercury, silver, and zinc) that the facility detected in its effluent. They were detected in the Expanded Effluent Testing for Part D of the reapplication required for a treatment works that discharges effluent to surface waters of the United States and is required to have a pretreatment program or has one in place. NASWI has a pretreatment program in place and testing for Part D is required**.** Only a single sample is required in Expanded Effluent Testing. The results are shown in Appendix A. Ecology requested a reasonable potential determination with one sample for each metal reported in the expanded effluent testing. None of the metals showed a reasonable potential to violate the state water quality standards with one sample (see Appendix B). Additional monitoring is needed to determine with any degree of confidence a reasonable potential and for good engineering design for any future control technology. The monitoring will be used to collect data for future reasonable potential analyses to determine if these metals are violating water quality standards. EPA is requiring five years of metals monitoring to provide the data necessary for a reasonable potential determination in the next permit reissuance. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

Table 5: Effluent Monitoring Requirements

Parameter	Unit	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Effluent	Continuous	Recording
BOD_5	mg/L	Influent and Effluent	2/week	24-hour composite
	lbs/day	Influent and Effluent	2/week	Calculation[1]
	% Removal	--	--	calculation[2]
TSS	mg/L	Influent and Effluent	2/week	24-hour composite

Table 5: Effluent Monitoring Requirements

Parameter	Unit	Sample Location	Sample Frequency	Sample Type
	lbs/day	Influent and Effluent	2/week	Calculation[1]
	% Removal	--	--	calculation[3]
Fecal coliform[3]	colonies/100 ml	Effluent	2/week	Grab
Total residual chlorine	mg/L	Effluent	1/day	Grab
Temperature[7]	ºC	Effluent	1/week	Grab
Total Ammonia as N	mg/L	Effluent	1/2 months	24-hour composite
pH	s.u.	Effluent	Daily	Grab
Arsenic	µg/L	Effluent	1/2 months	24-hour composite
Copper	µg/L	Effluent	1/2 months	24-hour composite
Lead	µg/L	Effluent	1/2 months	24-hour composite
Mercury	µg/L	Effluent	1/2 months	24-hour composite
Silver	µg/L	Effluent	1/2 months	24-hour composite
Zinc	µg/L	Effluent	1/2 months	24-hour composite
NPDES Application Form 2A Effluent Testing Data	mg/L	Effluent	3x/5 years	See footnote 4
NPDES Application Form 2A Expanded Effluent Testing	---	Effluent	3x/5 years	See footnote 5
NPDES Application Form 2A Whole Effluent Toxicity (WET)	TU_c	Effluent	4x/5 years	See footnote 6

Notes:
1. Maximum daily loading is calculated by multiplying the concentration in mg/L by the average daily flow in mgd and a conversion factor of 8.34.
2. Percent removal is calculated using the following equation: ((influent - effluent)/ influent)x100.
3. Geometric Mean Criterion: Based on a minimum of five (5) samples taken every three (3) to seven (7) days over a thirty (30) day period
4. For Effluent Testing Data, in accordance with instructions in NPDES Application Form 2A, Part B.6.
5. For Expanded Effluent Testing, in accordance with instructions in NPDES Application Form 2A, Part D.
6. For WET testing, in accordance with instructions in NPDES Application Form 2A, Part E and where one test is conducted in the summer and one is conducted in the winter.
7. Preferably temperature to be measured during the warmest period of the day.

C. Whole Effluent Toxicity Testing Requirements

Federal regulations at 40 CFR §122.44(d)(1) require that permits contain limits on whole effluent toxicity when a discharge has reasonable potential to cause or contribute to an exceedance of a water quality standard for toxicity.

Whole effluent toxicity (WET) tests are laboratory tests that measure total toxic effect of an effluent on living organisms. Whole effluent toxicity tests use small vertebrate and invertebrate species and/or plants to measure the aggregate toxicity of an effluent. There are two different types of toxicity test: acute and chronic. Acute toxicity tests measure survival over a short-term exposure (48- or 96-hour exposure, depending on the species). Chronic tests measure reductions in survival, growth, and reproduction over a 7-day exposure.

The previous permit required the NASWI facility to conduct two rounds of toxicity testing of the final effluent – one during the summer and one during the winter. The NASWI facility was required to conduct acute whole effluent toxicity tests with *Ceriodaphnia dubia* (the water flea) and *Pimpehales promelas* (the fathead minnow) and chronic tests with *Americamysis bahia* (the mysid shrimp, formerly *Mysidopsis bahia*). The NASWI facility submitted one round of WET testing data, completed in August 2006. The results showed no toxicity from the NASWI effluent No Observable Effect Concentration [NOEC] for *Ceriodaphnia dubia* > 100% effluent; NOEC for *Pimpehales promelas* > 100% effluent; NOEC for *Americamysis bahia* > 50% effluent [the highest concentration of effluent tested]). The proposed permit will continue the WET testing requirements to ensure that the facility effluent is not causing toxicity. The proposed permit requires testing for the reapplication in Form 2A Part E. This is quarterly testing for a 12-month period within the last one year of the permit cycle using multiple species (minimum of two species), or the results from four tests performed at least annually in the four and one-half years prior to the reapplication, provided the results show no appreciable toxicity.

VI. SLUDGE (BIOSOLIDS) REQUIREMENTS

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

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

VII. OTHER PERMIT CONDITIONS

A. Quality Assurance Plan

The federal regulation at 40 CFR 122.41(e) requires the permittee to develop procedures to ensure that the monitoring data submitted is accurate and to explain

data anomalies if they occur. The permittee is required to develop and implement a Quality Assurance Plan within 180 days of the effective date of the final permit. The Quality Assurance Plan shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan shall be retained on site and made available to EPA upon request.

B. Operation and Maintenance Plan

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

C. Additional Permit Provisions

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

VIII. OTHER LEGAL REQUIREMENTS

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife Service (FWS) if their actions could beneficially or adversely affect any threatened or endangered species.

On July 13, 2007, EPA contacted Martha Jensen of the FWS office in Lacey, Washington. Bull trout are listed but reside primarily in fresh water. On May 8th and 9th, 2008 EPA received a telephone call from Shandra O'Haleck at NOAA Fisheries - (360) 753-9530 who stated Chinook and steelhead are threatened species. The NOAA web site lists Chinook salmon, steelhead and Steller Sea Lion as threatened and Southern Resident Killer Whale and Humpback Whale as endangered.
Based on the following considerations, EPA concludes that this permit is not likely to adversely affect endangered or threatened species.

1. This permit requires compliance with the State of Washington Surface

Water Quality Standards, November, 2006 that protect aquatic organisms including threaten and endangered species

2. Secondary treatment

3. Chlorination

4. Dechlorination

5. Intermittent discharge

6. Utilization of an outfall diffuser

7. Outfall diffuser location at 1100 feet from shore

8. Relatively low actual flow of 0.366 MGD

9. High dilution rates into the very large Puget Sound receiving water

B. Essential Fish Habitat

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

Martha Jensen of the FWS office in Lacey and Shandra O'Haleck stated there is critical habitat for Chinook salmon along the shore to a depth of 30 feet MLLW and recommended outfalls at least 30 feet MLLW. Thirty feet is the end of the euphotic zone which is juvenile Chinook habitat. They both stated they like to see outfalls into Puget Sound go out beyond the 30 foot depth to insure that they are past the critical habitat. Critical habitat for Orcas start at 20 MLLW. The outfall is approximately 1100 feet from shore sufficient to prohibit an adverse effect.

Due to the same reasons listed in VIII.A. EPA concludes that issuance of this permit is not likely to adversely affect EFH.

C. State Certification

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

D. Permit Expiration

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

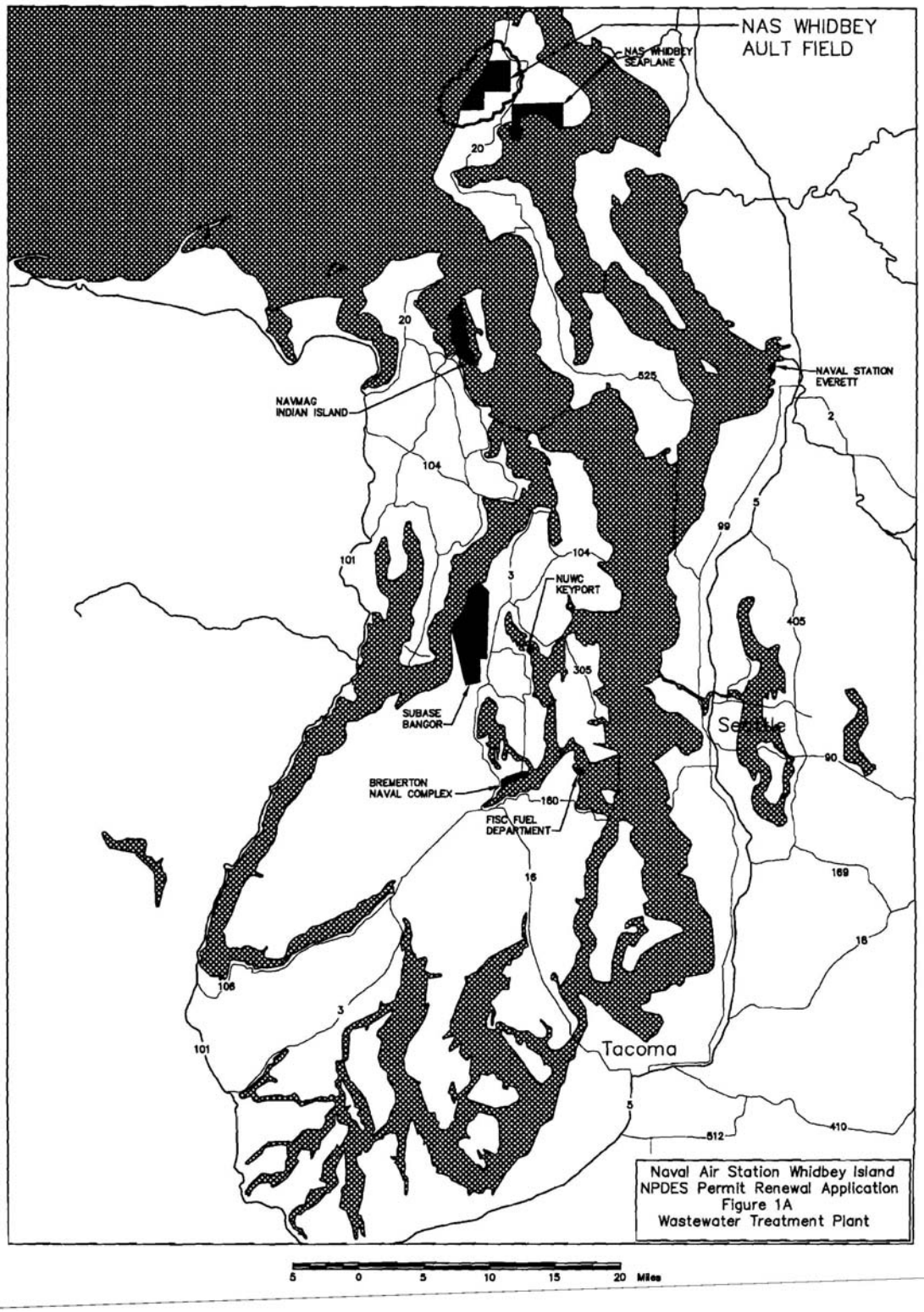
IV. REFERENCES

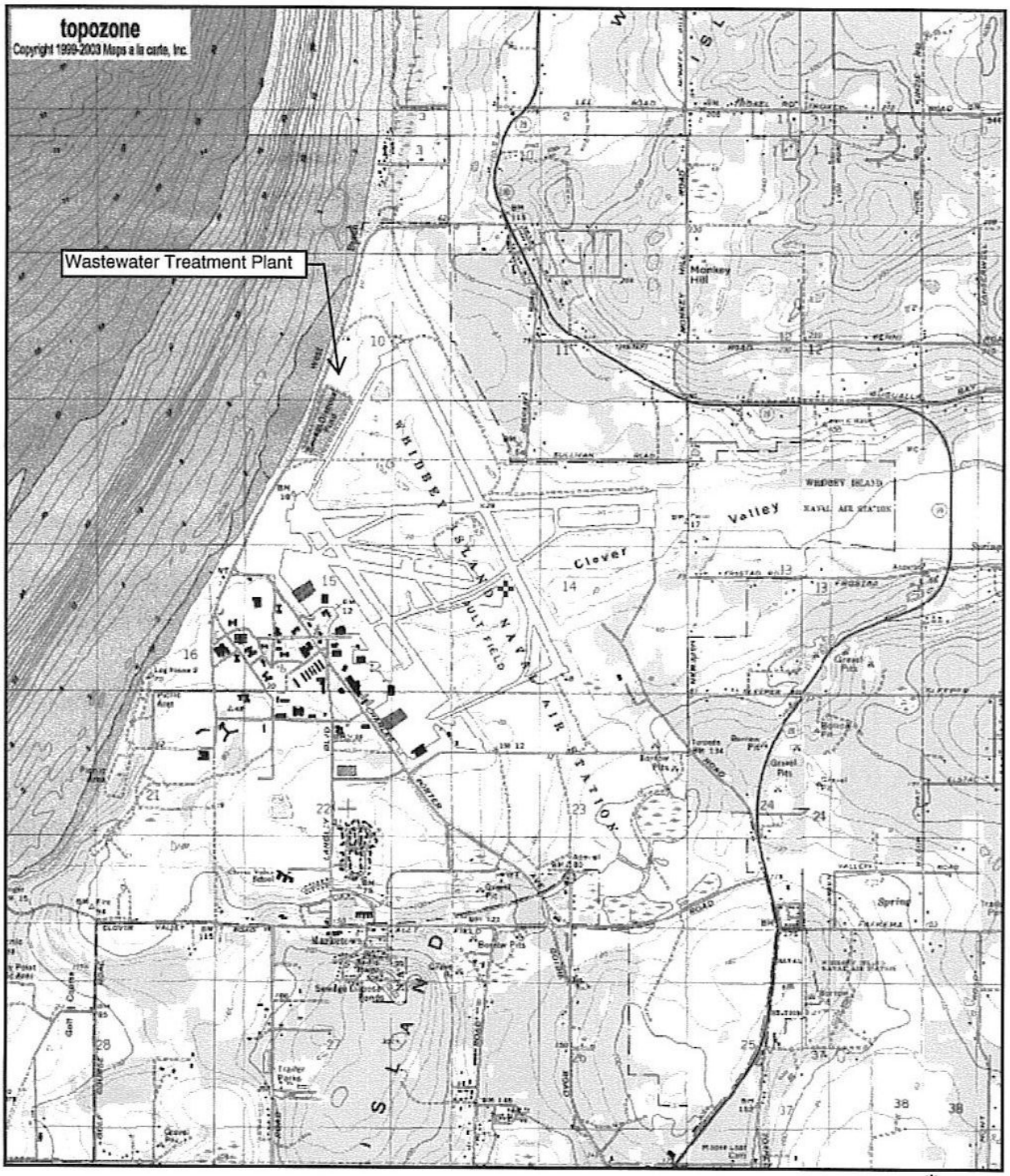
1. Washington Department of Ecology, 1998. 1998 303(d) list, available at http://www.ecy.wa.gov/programs/wq/303d/introduction.html.
2. Washington Department of Ecology, 2006. Chapter 173-201A WAC, Water Quality Standards for Surface Waters of the State of Washington, Publication Number 06-10-091.
3. 2006. *Permit Writer's Manual.* Publication Number 92-109
4. Whidbey Island Naval Air Station, 2006. Materials submitted for reissuance of NPDES permit.
5. Whidbey Island Naval Air Station, August 14, 2007. E-mail communication with Calvin Canton, Environmental Engineer.
6. U.S. EPA, 1991. Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001).
7. Discharge Analysis Report, Naval Air Station Whidbey Island Wastewater Treatment Plant, URS, January 2001.

Appendix A - Facility Information

Table A-1: Summary of Ault Field WWTP, Whidbey Island Naval Air Station	
	Ault Field WWTP **Whidbey Island Naval Air Station**
NPDES ID Number:	WA-000346-8
Mailing Address:	115 W. Lexington St. Oak Harbor, Washington 98278
Facility Background:	The facility's existing permit became effective January 1998 and expired in January 2003. The permit has been administratively extended since that time. The current permit application was received in October 2006.
Collection System Information	
Service Area:	Whidbey Island Naval Air Station and Deception Pass State Park in the state of Washington.
Service Area Population:	10,000
Collection System Type:	100% Separated Sanitary Sewer
Facility Information	
Treatment Train:	Secondary wastewater treatment plant using sequencing batch reactor (SBR) technology. Disinfection by chlorine gas.
Design Flow:	0.85 mgd
Existing:	0.366 mgd (based on 2006 updated application)
Months when Discharge Occurs:	Continuous
Outfall Location:	48^0 21' 42" N, 122^0 40' 28" W Strait of Juan De Fuca in Puget Sound, 1100 ft. from shore
Receiving Water Information	
Receiving Water:	Strait of Juan De Fuca in Puget Sound
Beneficial Uses:	Industrial water supply; salmonid and other fish migration, rearing, spawning, and harvesting; clam, oyster, and mussel and other shellfish rearing, spawning and harvesting; wildlife habitat; recreation (primary contact recreation, sport fishing, boating, and aesthetic enjoyment); and commerce and navigation

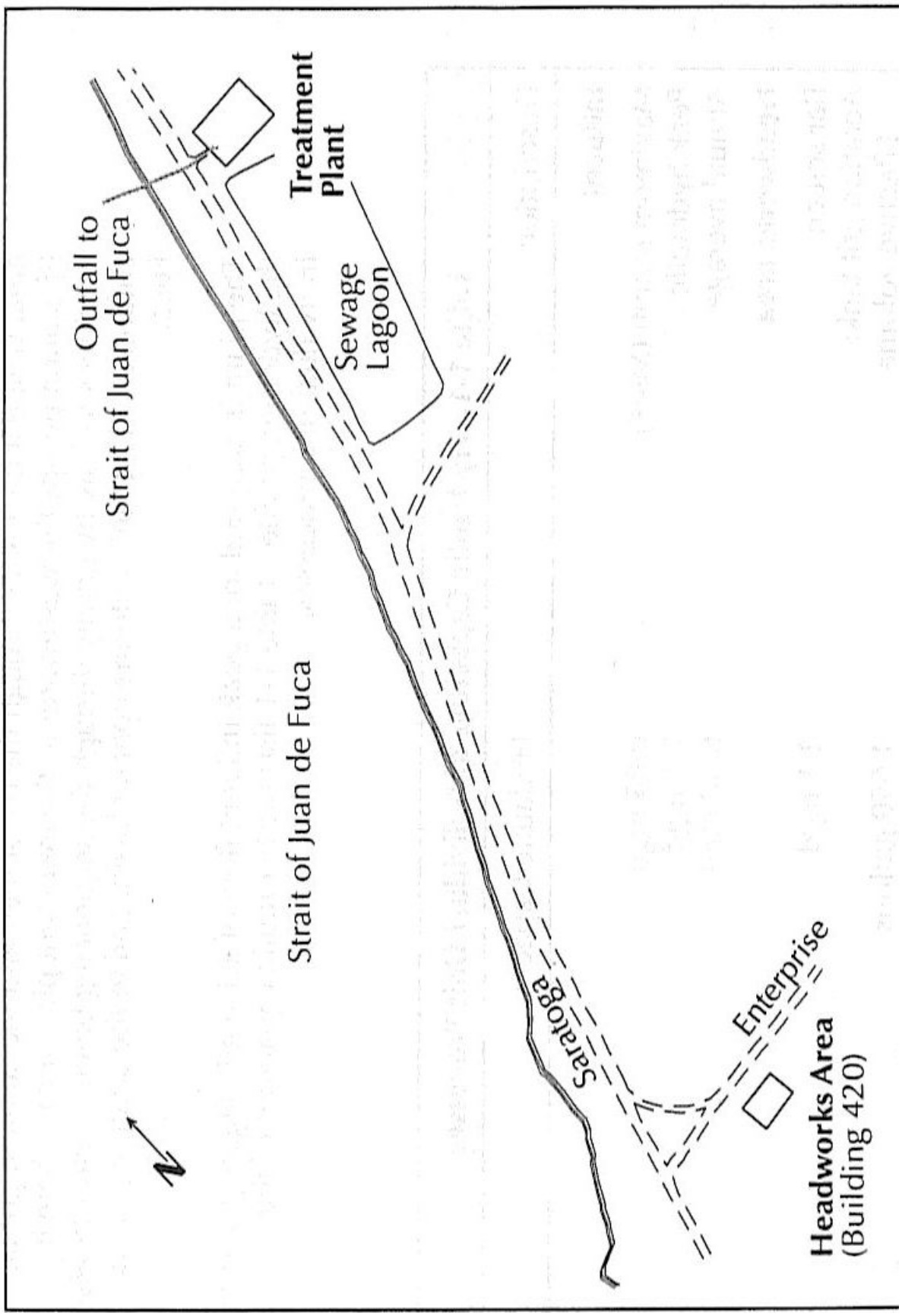
Basis for BOD_5/TSS Limits:	The facility can meet secondary treatment requirements for BOD_5 and TSS.





USGS Oak Harbor (WA) Quadrangle
Projection is UTM Zone 10 NAD83 Datum

Naval Air Station Whidbey Island
NPDES Permit Renewal Application
Figure 1C
Wastewater Treatment Plant


Outfall to
Strait of Juan de Fuca
Treatment
Plant
Sewage
Lagoon
Strait of Juan de Fuca
Saratoga
Enterprise
Headworks Area
(Building 420)
N

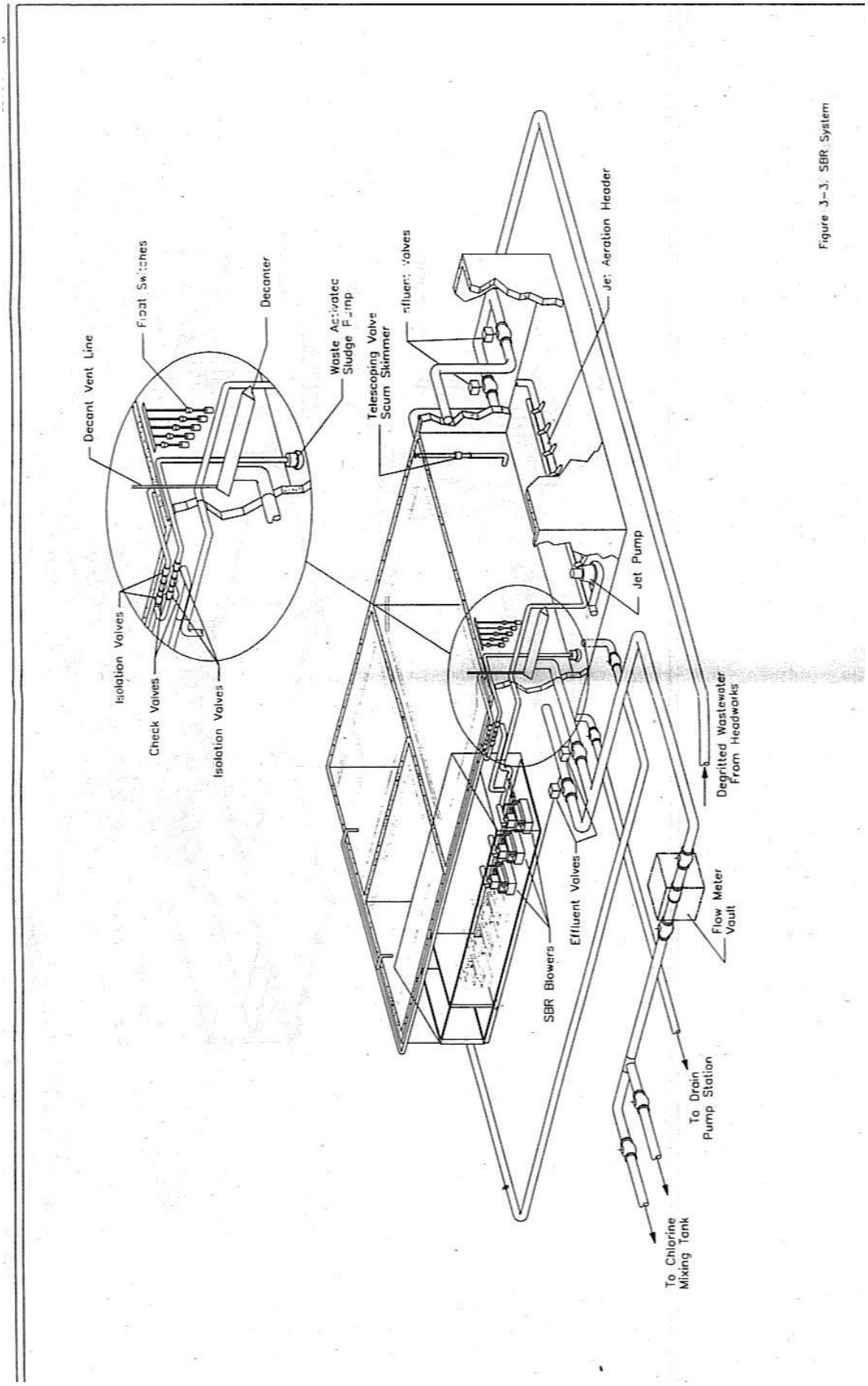
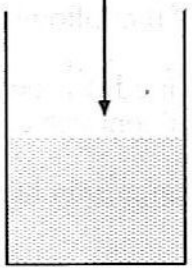


Figure 3-3. SBR System

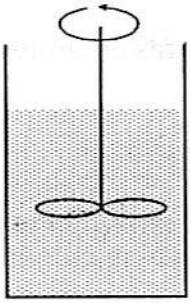
Figure 3-2.
An Overview of the SBR Process

Fill cycle

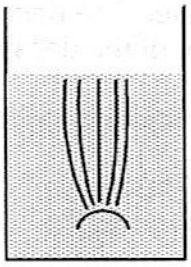
De-gritted wastewater from the aeration grit tank fills the SBR tank.



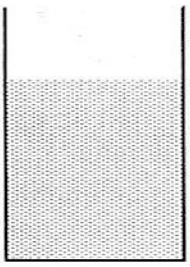
React cycle



Anaerobic mix:
The jet pumps are on to mix the liquor.

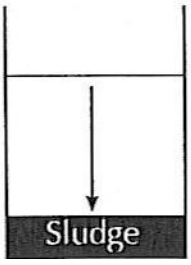


Aerobic mix:
The blowers supply oxygen to the micro-organisms, and the jet pumps are still mixing.

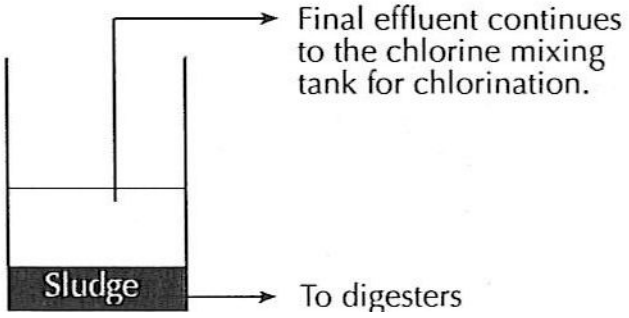


Anoxic mix:
Both blowers and jet pumps are shut off.

Settle cycle



Decant and waste sludge cycles



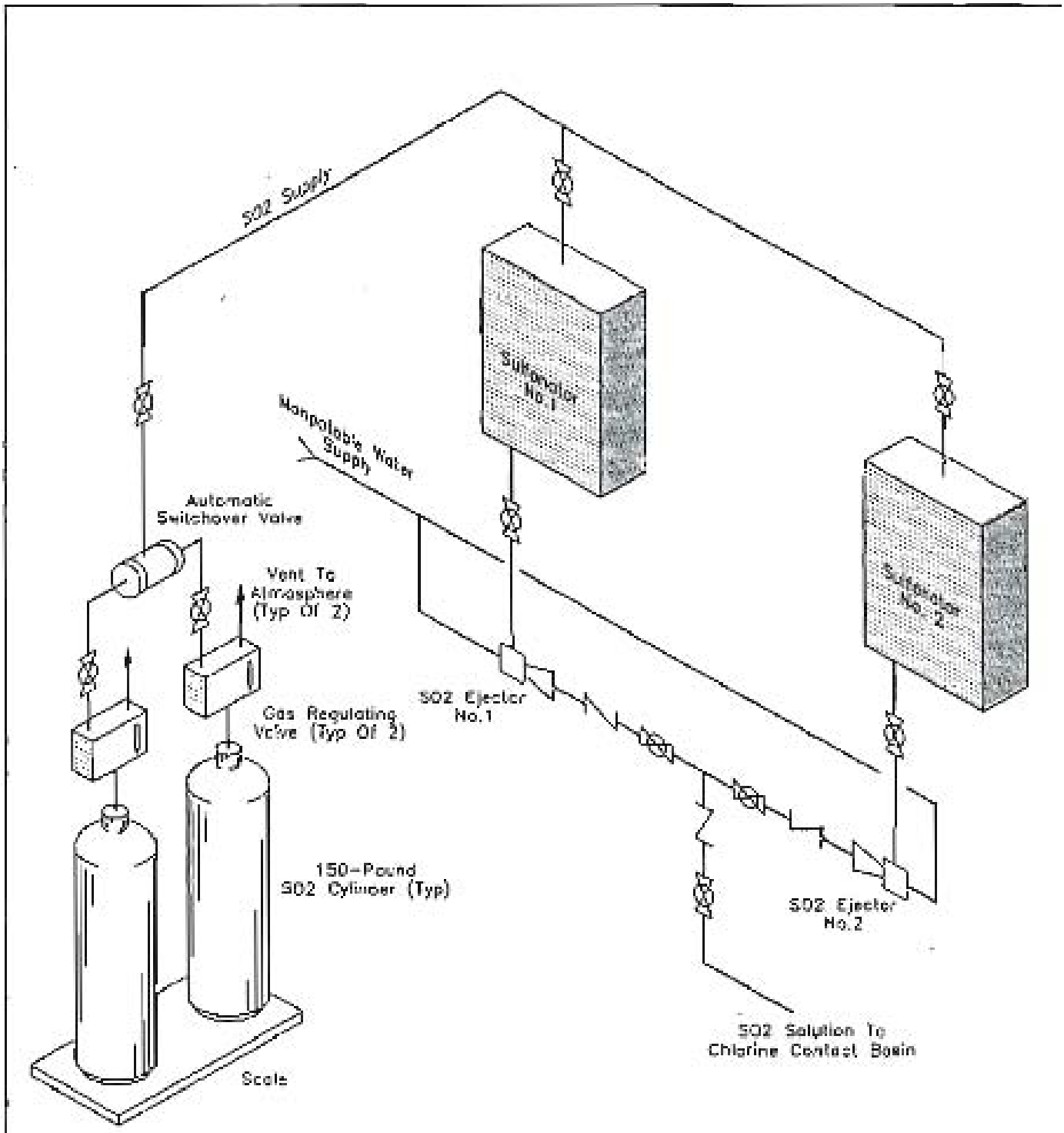


Figure 5-6. How The Dechlorination System Works

FACILITY NAME AND PERMIT NUMBER:

Naval Air Station Whidbey Island WA-000346-8

Form Approved 1/14/99
OMB Number 2040-0086

SUPPLEMENTAL APPLICATION INFORMATION

PART D. EXPANDED EFFLUENT TESTING DATA

Refer to the directions on the cover page to determine whether this section applies to the treatment works.

Effluent Testing: 1.0 mgd and Pretreatment Works. If the treatment works has a design flow greater than or equal to 1.0 mgd or it has (or is required to have) a pretreatment program, or is otherwise required by the permitting authority to provide the data, then provide effluent testing data for the following pollutants. Provide the indicated effluent testing information and any other information required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analyses conducted using 40 CFR Part 136 methods. In addition, these data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. Indicate in the blank rows provided below any data you may have on pollutants not specifically listed in this form. At a minimum, effluent testing data must be based on at least three pollutant scans and must be no more than four and one-half years old.

Outfall number: **001** (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
METALS (TOTAL RECOVERABLE), CYANIDE, PHENOLS, AND HARDNESS.											
ANTIMONY	<50	ug/l							1	6010B/200.7	50
ARSENIC	2.6	ug/l	0.008	lb/day					1	200.8	0.5
BERYLLIUM	<5.0	ug/l							1	6010B/200.7	5.0
CADMIUM	<5.0	ug/l							1	6010B/200.7	5.0
CHROMIUM	<5.0	ug/l							1	6010B/200.7	5.0
COPPER	3.5	ug/l	0.011	lb/day					1	200.8	0.1
LEAD	0.74	ug/l	0.002	lb/day					1	200.8	0.02
MERCURY	4.9	ng/l	0.000	lb/day					1	1631E	1.0
NICKEL	<20	ug/l							1	6010B/200.7	20
SELENIUM	<1.0	ug/l							1	200.8	1.0
SILVER	0.03	ug/l	0.000	lb/day					1	200.8	0.02
THALLIUM	<0.05	ug/l							1	200.8	0.05
ZINC	71	ug/l	0.217	lb/day					1	6010B/200.7	10
CYANIDE	<0.01	mg/l							1	335.4	0.01
TOTAL PHENOLIC COMPOUNDS	<0.01	mg/l							1	420.1	0.01
HARDNESS (AS CaCO3)	108	mg/l	na	na					1	130.2	2
Use this space (or a separate sheet) to provide information on other metals requested by the permit writer											

FACILITY NAME AND PERMIT NUMBER:

Naval Air Station Whidbey Island WA-000346-8

Form Approved 1/14/99
OMB Number 2040-0086

Outfall number: **001** (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
VOLATILE ORGANIC COMPOUNDS											
ACROLEIN	<50	ug/l							1	624	50
ACRYLONITRILE	<10	ug/l							1	624	10
BENZENE	<5.0	ug/l							1	624	5.0
BROMOFORM	<5.0	ug/l							1	624	5.0
CARBON TETRACHLORIDE	<5.0	ug/l							1	624	5.0
COLORBENZENE	<5.0	ug/l							1	624	5.0
CHLOROBIDBROMO-METHANE	<5.0	ug/l							1	624	5.0
CHLOROETHANE	<5.0	ug/l							1	624	5.0
2-CHLORO-ETHYLVINYL ETHER	<10	ug/l							1	624	10
CHOLOROFORM	<5.0	ug/l							1	624	5.0
DICHLOROBROMO-METHANE	<5.0	ug/l							1	624	5.0
1,1-DICHLOROETHANE	<5.0	ug/l							1	624	5.0
TRANS-1,2-DICHLORO-ETHYLENE	<5.0	ug/l							1	624	5.0
1,1-DICHLOROPROPANE	<5.0	ug/l							1	624	5.0
ETHYLBENZENE	<5.0	ug/l							1	624	5.0
METHYL BROMIDE	<5.0	ug/l							1	624	5.0
METHYL CHLORIDE	<5.0	ug/l							1	624	5.0
METHYLENE CHLORIDE	<5.0	ug/l							1	624	5.0
1,1,2,2-TETRACHLORO-ETHANE	<5.0	ug/l							1	624	5.0
TETRACHLORO-ETHYLENE	<5.0	ug/l							1	624	5.0
TOLUENE	<5.0	ug/l							1	624	5.0

FACILITY NAME AND PERMIT NUMBER:

Naval Air Station Whidbey Island WA-000346-8

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Outfall number: **001** (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
1,1,1-TRICHLOROETHANE	<5.0	ug/l							1	624	5.0
1,1,2-TRICHLOROETHANE	<5.0	ug/l							1	624	5.0
TRICHLOROETHYLENE	<5.0	ug/l							1	624	5.0
VINYL CHLORIDE	<5.0	ug/l							1	624	5.0
Use this space (or a separate sheet) to provide information on other metals requested by the permit writer											
ACID-EXTRACTABLE COMPOUNDS											
P-CHLORO-M-CRESOL	<9.6	ug/l							1	625	9.6
2-CHLOROPHENOL	<9.6	ug/l							1	625	9.6
2,4-DIMETHYLPHENOL	<9.6	ug/l							1	625	9.6
4,6-DINITRO-O-CRESOL	<24	ug/l							1	625	9.6
2,4-DINITROPHENOL	<24	ug/l							1	625	24
2-NITROPHENOL	<9.6	ug/l							1	625	9.6
4-NITROPHENOL	<24	ug/l							1	625	24
PENTA CHLOROPHENOL	<24	ug/l							1	625	24
PHENOL	<9.6	ug/l							1	625	9.6
2,4,6-TRICHLORO PHENOL	<9.6	ug/l							1	625	9.6
Use this space (or a separate sheet) to provide information on other metals requested by the permit writer											
BASE-NEUTRAL COMPOUNDS											
ACENAPHTHENE	<9.6	ug/l							1	625	9.6
ACENAPHTYLENE	<9.6	ug/l							1	625	9.6
ANTHRACENE	<9.6	ug/l							1	625	9.6
BENZIDINE	<48	ug/l							1	625	9.6
BENZO(A) ANTHRACENE	<9.6	ug/l							1	625	9.6
BENZO(A)PYRENE	<9.6	ug/l							1	625	9.6

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Outfall number: **001** (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
3.4 BENZO-FLUORANTHENE	<9.6	ug/l							1	625	9.6
BENZO(GHI)PERYLENE	<9.6	ug/l							1	625	9.6
BENZO(K)FLUORANTHENE	<9.6	ug/l							1	625	9.6
BIS (2-CHLORO ETHOXY) METHANE	<9.6	ug/l							1	625	9.6
BIS (2-CHLOROETHYL)-ETHER	<9.6	ug/l							1	625	9.6
BIS (2-CHLOROISO-PROPYL) ETHER	<9.6	ug/l							1	625	9.6
BIS (2-ETHYLHEXYL) PHTHALATE	<9.6	ug/l							1	625	9.6
4-BROMOPHENYL PHENYL ETHER	<9.6	ug/l							1	625	9.6
BUTYL BENZYL PHTHALATE	<9.6	ug/l							1	625	9.6
2-CHLORO NAPHTHALENE	<9.6	ug/l							1	625	9.6
4-CHLORPHENYL PHENYL ETHER	<9.6	ug/l							1	625	9.6
CHRYSENE	<9.6	ug/l							1	625	9.6
DI-N-BUTYL PHTHALATE	<9.6	ug/l							1	625	9.6
DI-N-OCTYL PHTHALATE	<9.6	ug/l							1	625	9.6
DIBENZO(A,H) ANTHRACENE	<9.6	ug/l							1	625	9.6
1,2-DICHLORO BENZENE	<9.6	ug/l							1	625	9.6
1,3-DICHLORO BENZENE	<9.6	ug/l							1	625	9.6
1,4-DICHLORO BENZENE	<9.6	ug/l							1	625	9.6
3,3-DICHLORO BENZIDINE	<24	ug/l							1	625	24
DIETHYL PHTHALATE	<9.6	ug/l							1	625	9.6
DIMETHYL PHTHALATE	<9.6	ug/l							1	625	9.6
2,4-DINITROTOLUENE	<9.6	ug/l							1	625	9.6
2,6-DINITROTOLUENE	<9.6	ug/l							1	625	9.6
1,2-DIPHENYLHYDRAZINE	<9.6	ug/l							1	625	9.6

FACILITY NAME AND PERMIT NUMBER:

Naval Air Station Whidbey Island WA-000346-8

Form Approved 1/14/99
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Outfall number: **001** (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
FLUORANTHENE	<9.6	ug/l								625	9.6
FLUORENE	<9.6	ug/l								625	9.6
HEXACHLORO BENZENE	<9.6	ug/l								625	9.6
HEXACHLOROBUT ADIENE	<9.6	ug/l								625	9.6
HEXACHLOROCYCLO-PENTADIENE	<20	ug/l								625	20
HEXA CHLOROETHANE											
INDENO(1,2,3-CD) PYRENE	<9.6	ug/l								625	9.6
ISOPHORONE	<9.6	ug/l								625	9.6
NAPHTHALENE	<9.6	ug/l								625	9.6
NITROBENZENE	<9.6	ug/l								625	9.6
N-NITROSODI-N-PROPYLAMINE	<9.6	ug/l								625	9.6
N-NITROSODI-METHYLAMINE	<24	ug/l								625	24
N-NITROSODI-PHENYLAMINE	<9.6	ug/l								625	9.6
PHENANTHRENE	<9.6	ug/l								625	9.6
PYRENE	<9.6	ug/l								625	9.6
1,2,4-TRICHLOROBENZENE	<9.6	ug/l								625	9.6

Appendix B - Basis for Effluent Limitations

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

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

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

A. Technology Based Effluent Limits

1. BOD5, TSS and pH

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

Table B-1 below illustrates the technology based effluent limits for “Secondary Treatment” effluent limits:

Table B-1: Secondary Treatment Effluent Limits (40 CFR 133.102)			
Parameter	**Average Monthly Limit**	**Average Weekly Limit**	**Range**
BOD_5	30 mg/L	45 mg/L	---
TSS	30 mg/L	45 mg/L	---
Removal Rates for BOD_5 and TSS	85% (minimum)	---	---
pH	---	---	6.0 - 9.0 s.u.

The previous permit contained secondary treatment limits. Evaluation of the facility's effluent monitoring data from the last five years demonstrates that the facility could consistently achieve secondary treatment limits. Therefore, secondary treatment limits are continued in the proposed permit, and there is no need to consider alternative limits, such as "treatment equivalent to secondary" limits.

2. Mass-based Limits

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

Mass based limit (lbs/day) = concentration limit (mg/L) x design flow (mgd) x 8.34
For BOD_5 and TSS:
Average Monthly Limit = 30 mg/L x 0.85 mgd x 8.34 = 212.7 lbs/day
Average Weekly Limit = 45 mg/L x 0.85 mgd x 8.34 = 319.0 lbs/day

3. Chlorine (Total Residual)

Section 402(a)(1) of the federal Clean Water Act and 40 CFR Part 122.44(a)(1) require technology based effluent limitations based on case by case determinations. The process control, operation and maintenance for both chlorination and dechlorination by sulphonation achieved the existing effluent limitations consistently over the last three years of the permit. These levels are a monthly average effluent limitation of 0.070 mg/L and an instantaneous concentration of 0.19 mg/L total residual chlorine.

B. Water Quality-Based Effluent Limits

The following discussion is divided into four sections. Section 1 discusses the statutory basis for including water quality based effluent limits in NPDES permits, Section 2 discusses the procedures used to determine if water quality based effluent limits are

needed in an NPDES permit, Section 3 discusses the procedures used to develop water quality based effluent limits, and Section 4 discusses the specific water quality based limits.

1. Statutory Basis for Water Quality-Based Limits

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards by July 1, 1977. Discharges to state/tribal waters must also comply with limitations imposed by the state/tribe as part of its certification of NPDES permits under section 401 of the CWA.

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

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

2. Reasonable Potential Analysis

When evaluating the effluent to determine if water quality-based effluent limits are needed based on chemical specific numeric criteria, a projection of the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern is made. The chemical specific concentration of the effluent and receiving water and, if appropriate, the dilution available from the receiving water are factors used to project the receiving water concentration. If the projected concentration of the receiving water exceeds the numeric criterion for a specific chemical, then there is a reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standard, and a water quality-based effluent limit is required.

Sometimes it is appropriate to allow a small area of receiving water to provide dilution of the effluent, these areas are called mixing zones. Mixing zone allowances will increase the mass loadings of the pollutant to the water body, and decrease treatment requirements. Mixing zones can be used only when there is adequate receiving water flow volume and the receiving water is below the chemical specific numeric criterion necessary to protect the designated uses of the water body. Mixing zones must be authorized by Ecology.

3. Procedure for Deriving Water Quality-Based Effluent Limits

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

Mixing Zone

In cases where a mixing zone is not authorized, either because the receiving water already exceeds the criterion, the receiving water flow is too low to provide dilution, or the state does not authorize one, the criterion becomes the WLA. Establishing the criterion as the wasteload allocation ensures that the permittee will not contribute to an exceedance of the criterion. The following discussion details the specific water quality-based effluent limits in the draft permit with the expectation that the Department of Ecology would certify the final permit including 20.7 foot acute and 207 foot chronic mixing zones providing an acute dilution factor of 10.2 to 1 and a chronic dilution factor of 62.0 to 1.

The mixing zone analysis by URS was submitted by NASWI with the application. Ecology pre-certified the mixing zone. The dilution model UM in the 3PLUMES interface was used for this analysis. The model was developed and supported by EPA (1993), and is by far the most commonly used model for predicting dilution for buoyant wastewater discharges to marine waters in Washington. It is recommended by Ecology (2000) for marine discharge applications.

For most wastewater treatment plants, NPDES permit protocols call for acute dilution to be determined at the peak effluent flow for the facility, and chronic dilution at the maximum monthly flow. According to the 1993 Facility Plan (Paramtrix) and the NPDES permit for the treatment plant, the peak daily flow is 1.75 mgd and the maximum month design flow is 0.85 mgd.

However, the NASWI treatment plant is an SBR that discharges effluent on a batch basis. Effluent discharges intermittently at a relatively constant rate of approximately 2.16 mgd (105,000 gallons over a 70-minute decant cycle). Ecology protocols call for the modeling to be conducted at the actual effluent flow rate of 2.16 mgd at the appropriate acute or chronic current speed. The effluent decant cycle lasts for over one hour, so the acute dilution is taken directly from the model results. The chronic dilution is adjusted upward from the model results by the ratio of the actual flow rate to the maximum four-day, time averaged flow rate.

The maximum four-day, time averaged flow rate since the SBR plant came online in April 1998 occurred between December 30, 1998 and January 2, 1999. The four-day average flow on these dates was 0.66 mgd. Therefore, model runs at 2.16 mgd and median current speed will determine chronic dilution, with the result multiplied by the ratio of 2.16 mgd and median current speed will determine chronic dilution, with

the result multiplied by the ratio of 2.16 mgd to 0.66 mgd, or 3.27.

Ecology (2000) current speed protocol required dilution factors to be determined at the lowest 10th percentile current speed for the acute mixing zone. Chronic dilution factors are to be determined at the median current speed. NOAA publishes tidal current predictions for Puget Sound. The nearest tidal current station is located 1.8 miles southwest of West Point on Whidbey Island (the entrance to Deception Pass), which is about 1.2 miles directly offshore of NAS Whidbey Island.

Current speed was measured near the outfall on June 28, 2000, with drogues tracked by GP. Winds were calm during the drogue study. Predicted current speeds for the NOAA station 1.8 miles SW of West Point are used to develop current statistics for modeling dilution at the NAS Whidbey Island outfall. Based on a 29-day cycle in September 2000, the lowest 10th percentile and median current speeds used in the modeling are 0.04 m/sec and 0.26 m/sec, respectively.

Four runs were made at acute current speed and four at chronic current speed (one for each of the four seasonal stratification profiles). The results were essentially equivalent for each density profile, suggesting that stratification is not important at this outfall site. The reason is that the effluent plume surfaces at all times regardless of the ambient density profile. Moreover there is no nearby river that would provide for significant stratification. Since the plume always surfaces dilution is relatively constant throughout the year at the NASWI outfall.

4. Specific Water Quality-Based Effluent Limits

(a) pH

The Washington water quality criterion for extraordinary marine waters specifies a pH range of 7.0 to 8.5 standard units, with human-caused variation within the above range of less than 0.2 units (WAC 173-201A-210(1)(f)). In the previous permit, the technology based limit allowed the range of pH from 6.0 to 9.0; in the permit application, the facility reported its Maximum Daily Value for pH as 6.2 (minimum) to 7.9 (maximum). EPA does not expect the relatively small volume of effluent to change the pH of marine waters in the Strait of Juan de Fuca because of the chronic dilution (62.0 to 1) of the effluent in the receiving water. Using a program for calculating pH, extreme inputs were used such as the lowest pH value of effluent (6.0 and 9.0 units) and the measured hardness converted to alkalinity from the program. The analysis projected that pH changed by 0.03 units at the edge of the chronic mixing zone during the lowest measured ambient pH and the highest pH authorized. The highest measured ambient pH is changed by 0.06 units with the lowest authorized pH of 6.0. Neither violates the Washington State Water Quality Standards. The effluent limitation will remain 6.0 to 9.0 standard units.

(b) Ammonia

Washington's Saltwater Acute and Chronic Criteria for Ammonia provides single values for acute and chronic (i.e., not equations) and both values are based upon EPA's 1989 criteria guidance *Ambient Water Quality Criteria for Ammonia (Saltwater)-1989* (EPA 440/5-88-004), available at: http://www.epa.gov/waterscience/criteria/library/ambientwqc/ammoniasalt1989.pdf This criteria states "All of the following concentrations are un-ionized ammonia (NH3) because NH3, not the ammonium ion (NH4+), has been demonstrated to be the more toxic form of ammonia."

The acute criteria is 0.233 mg/L unionized ammonia and the chronic criteria is 0.035 mg/L unionized ammonia. This criteria is in Water Quality Standards for Surface Waters of the State of Washington, WAC 173-201A-240 in Table 240(3), Toxics Substances Criteria. The language in footnote "hh" to this table has an editorial mistake. The footnote states that the marine criteria of 0.233 and 0.035 are expressed as total ammonia. Ecology has acknowledged that this is a mistake and it will be corrected in a future revision of the Water Quality Standards.

Chapter 6 of Ecology's Permit Writer's Manual states:

"The design flow for dissolved oxygen, fecal coliform, pH, turbidity, and temperature is the maximum monthly flow which may be estimated for existing facilities by using the discharge data for a period of the last three years for the months in which the critical flow is likely to occur."

Appendix 6 of Ecology's Permit Writer's Manual states:

"Temperature, pH, and hardness are the most noteworthy examples of other parameters, which may not be considered pollutants of concern, but are required to determine the toxic effects of other pollutants (*e.g.,* ammonia). A complete data set should include at least three years of DMR or ambient data corresponding to the critical season. If annual data (from all months) are used to select the value, then the 95th or 5th percentile value from the frequency distribution should be used."

Over the last three years the worst case ammonia criteria expressed as total ammonia from pH, salinity and temperature measurements occurred in May, 2006 at Admiralty Inlet Monitoring Station 2. This concentration is 4.1 mg/L acute total ammonia and 0.63 mg/L chronic total ammonia.

The Washington State permit writer's manual recommends the 90^{th} percentile values for pH and temperature and the 10^{th} percentile for salinity over the last three years. This results in criteria expressed as a total ammonia concentration of 6.0 mg/L acute and 0.89 mg/L chronic.

This is considered the critical period. With this criteria calculated water quality based limits would be an average monthly limit of 50.3 mg/L and a daily maximum limit of 61.2 mg/L before NASWI at the point of discharge.

NASWI collected only one discharge sample for ammonia during the previous permit cycle. This sample had a concentration of 3.06 mg/L total ammonia. With this one data point there is no reasonable potential to violate the state water quality acute standard of 6.0 mg/L total ammonia utilizing the dilution factors derived from the approved mixing zone. There is also no reasonable potential to violate the chronic criteria of 0.89 mg/L total ammonia. One sample is inadequate to determine with any confidence the reasonable potential to violate the water quality standard. EPA will review the data after one year to determine if a reasonable potential exists.

A finding of reasonable potential to violate the ammonia standard is unlikely due to the large mixing zone and results of four SBRs in Washington.

The SBR at Langley achieved 0.56 mg/L ammonia over five years,

Kittitas with an SBR achieved 2 mg/L and 4 mg/L monthly and weekly ammonia averages.

The McCleary POTW SBR is discharging at 0.59 mg/L at the 90th percentile and

The City of Illwaco POTW SBR discharges at 0.17 mg/L at the 95th percentile level.

These values are well within point of discharge calculated limits of 50.3 and 61.2 mg/L.

(c) Temperature

In WAC 173-201A-210(1)(c), the Washington water quality standards limit ambient water temperature to 13.0 degrees C for marine water; when natural conditions exceed 13.0 degrees C, no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3 degrees C. The point of compliance with temperature is at the edge of the chronic mixing zone at critical conditions. Critical conditions are at the highest ambient water temperatures.

The highest ambient temperature measured at Admiralty Inlet Station 2 in Puget Sound is 12.4 degrees C. The highest temperature of the effluent as

reported in the permit application is 23 degrees C over three years. The chronic dilution ratio is 62.

Ecology's Water Quality Program Guidance for implementing the temperature standards states no reasonable potential exists to exceed the temperature criterion where:

(Criterion + 0.3) > (Criterion + (Teffluent95 – Criterion)/DF).

13.3 > (13 + (23 – 13)/62.0) = 13.16

There is no potential to violate Washington State's Water Quality Standards for temperature; therefore, no effluent limit for temperature is warranted. Effluent temperature monitoring is proposed for the draft permit for comparison with past effluent and to generate an expanded data set.

(d) Fecal coliform bacteria

In WAC 173-201A-210(2)(b) and 173-201A-210(3)(b), the Washington water quality criteria for extraordinary marine water requires that the fecal coliform levels shall both not exceed a geometric mean of 14 colonies/100 mL and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceed 43 colonies/100 mL. The criteria are to be met at the edges of the mixing zones. The facility reported in its permit application that its effluent had the highest maximum daily discharge for fecal coliform of 110 colonies/100 mL and its average daily discharge is 15.4 colonies/100 mL. Page VI-19 of Ecology's Permit Writer's Manual states "A municipal permittee meeting the technology-based limitations would require minimal dilution to be able to meet the water quality standards for fecal coliform." NASWI meets this criteria and had a mixing zone. Due to the high dilution rates, EPA determines that the effluent limits in the previous permit are protective and therefore should be retained: 200 count/100 mL for monthly average, and 400 count/100 mL for a weekly average.

(e) Chlorine (Total Residual)

In WAC 173-201A-240(3), the Washington water quality criteria for marine water limit total residual chlorine at 13 µg/L as a 1-hour average concentration for acute criteria, not to be exceeded more than once every three years on the average; it is further limited to 7.5 µg/L as a 4-day average concentration for chronic criteria, not to be exceeded more than every three years on an average. The Washington water quality criteria have to be met at the edge of the mixing zone. The approved mixing zone found that the dilution factor for the acute mixing zone is 10.2:1, and the dilution factor for the chronic mixing zone is 62.0:1. Based on EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD)

and tsdcal1007 the daily maximum concentration for a water quality based limit at the point of discharge to protect the acute criteria is 132 µg/L. The daily maximum technology based effluent limit (acute limit) is the existing limit of 190 µg/L (0.19 mg/L). The monthly average discharge limit to protect the chronic criteria is 51.7 µg/L (0.0517 mg/L). The technology based limit is 70 µg/L (0.070 mg/L) from the existing permit. The more stringent of the technology based and surface water quality based effluent limitations is the surface water quality based limitations.

NASWI never exceeded a monthly average 40 µg/L and will be able to meet the surface water quality standard of 51.7 µg/L). NASWI exceeded a daily maximum of 80µg/L only twice in the last three years and will be able to meet the surface water quality standard of 132 µg/L.

Reasonable Potential

				State Water Quality Standard		Max concentration at edge of...											
	Metal Criteria Translator as decimal	Metal Criteria Translator as decimal	Ambient Concentration (metals as dissolved)	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	LIMIT REQ'D?	Effluent percentile value		Max effluent conc. measured (metals as total recoverable)	Coeff Variation		# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
Parameter	Acute	Chronic	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*			*Pn*	*ug/L*	*CV*	*s*	*n*			
Ammonia Nitrogen	1.00	1.00	0.00	6000.00	890.00	2713.37	446.39	NO	0.99	0.010	3060.00	0.60	0.55	1	9.04	10.2	62.0
Arsenic	1.00	1.00	0.00	360.00	190.00	1.58	0.26	NO	0.99	0.050	2.60	0.60	0.55	1	6.20	10.2	62.0
Copper	0.83	0.83	0.00	4.80	3.10	1.77	0.29	NO	0.99	0.050	3.50	0.60	0.55	1	6.20	10.2	62.0
Lead	0.95	0.95	0.00	210.00	8.10	0.43	0.07	NO	0.99	0.050	0.74	0.60	0.55	1	6.20	10.2	62.0
Mercury	0.85	0.85	0.00	1.80	0.03	0.0025	0.0004	NO	0.99	0.050	0.00	0.60	0.55	1	6.20	10.2	62.0
Silver	0.85	0.85	0.00	1.90	1.90	0.02	0.00	NO	0.99	0.050	0.03	0.60	0.55	1	6.20	10.2	62.0
Zinc	0.95	0.95	0.00	90.00	81.00	40.81	6.71	NO	0.99	0.050	71.00	0.60	0.55	1	6.20	10.2	62.0

Water Quality Based Limits

	Acute Dil'n Factor	Chronic Dil'n Factor	Metal Criteria Translator	Metal Criteria Translator	Ambient Concentration	Water Quality Standard Acute	Water Quality Standard Chronic	Average Monthly Limit (AML)	Maximum Daily Limit (MDL)	Comments		
PARAMETER			Acute	Chronic	*ug/L*	*ug/L*	*ug/L*	ug/L	ug/L			
Ammonia	10.2	62.0	1.00	1.00	0.00	6000	890	**50317**	**61200**	**Theoretical**		
Chlorine	10.2	62.0	1.00	1.00	0.00	13	7.5	**50.7**	**132.6**			
	Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations							Statistical variables for permit limit calculation				
	WLA Acute	WLA Chronic	LTA Acute	LTA Chronic	LTA Coeff. Var. (CV)	LTA Prob'y Basis	Limiting LTA	Coeff. Var. (CV)	AML Prob'y Basis	MDL Prob'y Basis	# of Samples per Month	
PARAMETER	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*decimal*	*decimal*	*ug/L*	*decimal*	*decimal*	*decimal*	*n*	
Ammonia	61200	55180.00	19650.3	29103.8	0.60	0.99	19650.3	0.60	0.95	0.99	0.50	1.00
Chlorine	133	465.00	42.6	245.3	0.60	0.99	42.6	0.60	0.95	0.99	30.00	1.00

Calculation of seawater fraction of un-ionized ammonia from Hampson (1977). Un-ionized ammonia criteria for salt water are from WAC 173-201A and EPA 440/5-88-004.
Admiralty Inlet Monitoring Station No. 2

INPUT

1. Temperature (deg C):	Measured May, 2006	9.4
2. pH:	Measured May, 2006	8.5
3. Salinity (g/Kg):	Measured May, 2006	30.0

OUTPUT

1. Unionized ammonia NH3 criteria (mgNH3/L)	
Acute:	0.233
Chronic:	0.035
2. Total ammonia nitrogen criteria (mgN/L)	
Acute:	4.161
Chronic:	0.625

Calculation of seawater fraction of un-ionized ammonia from Hampson (1977). Un-ionized ammonia criteria for salt water are from WAC 173-201A and EPA 440/5-88-004.

INPUT		
1. Temperature (deg C):	90th Percentile	11.5
2. pH:	90th Percentile	8.3
3. Salinity (g/Kg):	10th Percentile	30.0

OUTPUT	
1. Unionized ammonia NH3 criteria (mgNH3/L)	
Acute:	0.233
Chronic:	0.035
2. Total ammonia nitrogen criteria (mgN/L)	
Acute:	5.968
Chronic:	0.896

Calculation of pH of a mixture in seawater.
Based on the CO2SYS program (Lewis and Wallace, 1998)
http://cdiac.esd.ornl.gov/oceans/co2rprt.html

INPUT

1. MIXING ZONE BOUNDARY CHARACTERISTICS	
Dilution factor at mixing zone boundary	62.000
Depth at plume trapping level (m)	2.100
2. BACKGROUND RECEIVING WATER CHARACTERISTICS	
Temperature (deg C):	9.90
pH:	7.70
Salinity (psu):	30.00
Total alkalinity (meq/L)	2.11
3. EFFLUENT CHARACTERISTICS	
Temperature (deg C):	23.00
pH:	9.00
Salinity (psu)	0.00
Total alkalinity (meq/L):	2.15

4. CLICK THE 'calculate" BUTTON TO UPDATE OUTPUT RESULTS >>> calculate

OUTPUT

CONDITIONS AT THE MIXING ZONE BOUNDARY	
Temperature (deg C):	10.11
Salinity (psu)	29.52
Density (kg/m^3)	1022.67
Alkalinity (mmol/kg-SW):	2.06
Total Inorganic Carbon (mmol/kg-SW):	2.02
pH at Mixing Zone Boundary:	7.73