Reissuance of an Alaska Pollutant Discharge Elimination System (APDES) permit to

**UNITED STATES COAST GUARD**

For wastewater discharges from the

United States Coast Guard  
Base Kodiak Wastewater Treatment Facility  
Building N38  
USCG Base  
Kodiak, AK 99619

The Alaska Department of Environmental Conservation (the Department or DEC) has reissued an APDES individual permit (permit) to the United States Coast Guard. The permit authorizes and sets conditions on the discharge of pollutants from this facility 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 and outlines best management practices to which the facility must adhere.
This fact sheet explains the nature of discharges from the United States Coast Guard Base Kodiak Wastewater Treatment Facility (USCG Base Kodiak WWTF) and the development of the permit including:

- information on public comment, public hearing, and appeal procedures
- a listing of effluent limits and other conditions
- technical material supporting the conditions in the permit
- monitoring requirements in the permit

**Appeals Process**

The Department has both an informal review process and a formal administrative appeal process for final APDES permit decisions. An informal review request must be delivered within 20 days after receiving the Department’s decision to the Director of the Division of Water at the following address:

Director, Division of Water  
Alaska Department of Environmental Conservation  
**Mail:** P.O. Box 11180  
Juneau, AK 99811  
**In Person:** 410 Willoughby Avenue, Suite 303  
Juneau, AK 99811

Interested persons can review 18 AAC 15.185 for the procedures and substantive requirements regarding a request for an informal Department review.

See [http://dec.alaska.gov/commish/review-guidance/informal-reviews](http://dec.alaska.gov/commish/review-guidance/informal-reviews) for information regarding informal reviews of Department decisions.

An adjudicatory hearing request must be delivered to the Commissioner of the Department within 30 days of the permit decision, or a decision issued under the informal review process. An adjudicatory hearing will be conducted by an administrative law judge in the Office of Administrative Hearings within the Department of Administration. A written request for an adjudicatory hearing shall be delivered to the Commissioner at the following address:

Commissioner  
Alaska Department of Environmental Conservation  
**Mail:** P.O. Box 11180  
Juneau, AK 99811  
**In Person:** 555 Cordova Street  
Anchorage, AK 99501

Interested persons can review 18 AAC 15.200 for the procedures and substantive requirements regarding a request for an adjudicatory hearing. See [http://dec.alaska.gov/commish/review-guidance/adjudicatory-hearing-guidance](http://dec.alaska.gov/commish/review-guidance/adjudicatory-hearing-guidance) for information regarding appeals of Department decisions.

**Documents are Available**

The permit, fact sheet, application, and related documents can be obtained by visiting or contacting DEC between 8:00 a.m. and 4:30 p.m. Monday through Friday at the addresses below. The permit, fact sheet, application, and other information are located on the Department’s Wastewater Discharge Authorization Program website: [http://dec.alaska.gov/water/wastewater/](http://dec.alaska.gov/water/wastewater/).
| Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 555 Cordova Street Anchorage, AK 99501 (907) 269-6285 | Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program Mail: P.O. Box 111800 In Person: 410 Willoughby Avenue, Suite 303 Juneau, AK 99811-1800 (907) 465-5180 |
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1.0 INTRODUCTION

1.1 Applicant

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

Permittee: United States Coast Guard
Facility: USCG Base Kodiak WWTF
APDES Permit Number: AK0020648
 Facility Location: Building N38, USCG Base Kodiak, AK 99619
 Mailing Address: PO Box 195025, Kodiak, AK 99619-5025
 Facility Contact: Ms. Jennifer Nutt, Environmental Division Chief

1.2 Authority

Section 301(a) of the Clean Water Act (CWA) and 18 AAC 83.015 provide that the discharge of pollutants to water of the U.S. is unlawful except in accordance with an APDES permit. The individual permit reissuance is being developed per 18 AAC 83. A violation of a condition contained in the Permit constitutes a violation of the CWA and subjects the permittee of the facility with the permitted discharge to the penalties specified in Alaska Statutes (AS) 46.03.760 and AS 46.03.761.

1.3 Permit History

The Environmental Protection Agency (EPA) issued the USCG Base Kodiak WWTF a National Pollutant Discharge Elimination System (NPDES) permit in 1979, which expired in 1984. In 1988 DEC issued a State Waste Disposal Permit for domestic wastewater which expired in 1993. The permit was renewed in 1998 with the issuance of a permit that included domestic wastewater, groundwater, and surface water collected during site investigation and remediation of underground storage tanks and associated pipelines as well as waters from solid waste management units and hazardous waste management units.

EPA issued NPDES permit AK0020648 in 2005 which expired in 2010. The permit authorized the discharge of domestic wastewater, landfill leachate, and discharge from the liquid oily waste system (LOWS). In October 2009, authority to administer this permitting action transferred from EPA to DEC. On December 2, 2009, DEC received the USCG application for permit reissuance. In 2011 the USCG submitted a request for a mixing zone as an addendum to the November 2009 permit application. The USCG submitted an additional addendum in July 2012 in order to provide additional information and clarification regarding several non-domestic wastestreams. In January 2013, the USCG submitted a Draft Non-Domestic Wastewater Management Plan followed in October 2014 with an Engineering Wastewater Treatment Evaluation. In March 2016, the USCG submitted a technically complete APDES application. In March 2017, DEC reissued AK0020468 which expired February 28, 2022. Under the Administrative Procedures Act and state regulations at 18 AAC 83.155(c), an APDES permit may be administratively extended (i.e., continues in force and effect) provided that the permittee submits a timely and complete application prior to the expiration of the current permit. A timely and complete application for a new permit was submitted by the USCG in September 2021; therefore, the 2017 permit is administratively extended until such time a new permit is reissued.

2.0 BACKGROUND

2.1 Facility Information

USCG Base Kodiak began as Naval Air Station Kodiak in 1941. In 1947, Coast Guard Air Station was commissioned as an air detachment at the Navy Base which was followed in 1972 with the establishment of USCG Base Kodiak.
USCG Base Kodiak is a major shoreline installation of the USCG 17th District. The 17th district covers approximately 4,000,000 square miles and over 47,300 miles of shoreline including the Gulf of Alaska, Bristol Bay, Bering Sea, and the Pacific Ocean above 40° north latitude. The major tenant of USCG Base Kodiak is Air Station Kodiak. USCG Base Kodiak is also the home port for several cutters. Operations include search and rescue, enforcement of laws and treaties, marine environmental protection, aids to navigation, military defense, disaster control services and support, assistance to local, state, and federal agencies, and logistical support for outlying Coast Guard units.

The USCG Base Kodiak WWTF provides secondary treatment of domestic wastewater and treatment of landfill leachate and pretreated bilge and equipment wash water generated from Base operations. The WWTF is designed to treat a daily maximum 1.2 million gallons per day (MGD). Figure 1 depicts the location of the USCG Base Kodiak WWTF and outfall.
2.2 Wastewater Treatment
Wastewater from the collection system initially flows to an influent wet well for preliminary settling prior to the flowing to the influent pump station and headworks where two bar screens remove large debris. Two uncovered aeration basins, each with a capacity of 152,000 gallons provide aeration. Once aerated, the mixed liquor overflows weir gates to an aeration basin outlet distribution box and two clarifiers. Flow can be split between the two clarifiers, or it can be transferred to either clarifier for maintenance or cleaning purposes. The clarifiers operate in parallel during high flow periods; during low flow periods, only one clarifier may be in use. Mixed liquor settleable solids generated in the aeration basins settle out by gravity in the clarifiers. A portion of the settled sludge from the bottom of the clarifiers is pumped back to the headworks, downstream of the bar screens as returned sludge, mixes with incoming wastewater, and is subsequently sent to the aeration basins for treatment. The remaining waste sludge is pumped to the aerobic digester. Floating solids are removed from the clarifiers by an automated skimming arm and deposited into a scum pit. The scum contained in the pit is returned to the headworks for reprocessing. Clarified effluent flows by gravity to an ultraviolet (UV) channel for disinfection prior to final discharge to St. Paul Harbor. The UV light banks can be operated simultaneously or alternately with wastewater flowing consecutively through the two sets. A 152,000-gallon aerobic sludge digester reduces sludge volume and stabilizes organics contained in the sludge. When the digester basin is full, the digested solids slurry flows to a belt filter press which concentrates the solids prior to transporting to the City of Kodiak’s WWTF for composting. Figure 2 depicts the USCG Base Kodiak WWTF wastewater treatment process.
Figure 2- USCG Base Kodiak WWTF Process
2.3 Pollutants of Concern

Pollutants of concern contained in domestic wastewater include the conventional pollutants: 5-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), fecal coliform (FC) bacteria, pH, and oil and grease. Ammonia, copper, temperature, and whole effluent toxicity (WET) were detected in the effluent above maximum water quality criteria, and dissolved oxygen (DO) was detected in the effluent below minimum water quality criteria; therefore, DEC also identified these pollutants as pollutants of concern.

The expanded effluent monitoring that was required as a part of the permit reissuance application indicated the presence of chloroform (1.2 micrograms per liter (µg/L)) and dichlorobromo-methane (0.30 µg/L). Alaska Water Quality Standards at 18 AAC 70, do not contain specific water quality criteria for these parameters. The monitoring results did not indicate any additional pollutants of concern. Table 1 contains pollutants of concern that were either detected above daily maximum or below daily minimum water quality criteria.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Units</th>
<th>Maximum Observed Concentration</th>
<th>Water Quality Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC Bacteria</td>
<td>FC/100 mL</td>
<td>89</td>
<td>43 acute, 14 chronic</td>
</tr>
<tr>
<td>Total Ammonia as Nitrogen (N)</td>
<td>milligrams per liter (mg/L)</td>
<td>5.9</td>
<td>6.7 acute, 1.0 chronic</td>
</tr>
<tr>
<td>Copper</td>
<td>μg/L</td>
<td>32</td>
<td>5.8 acute, 3.7 chronic</td>
</tr>
<tr>
<td>Temperature</td>
<td>degrees Celsius (°C)</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>DO</td>
<td>mg/L</td>
<td>3.45</td>
<td>6 minimum, 17 maximum</td>
</tr>
<tr>
<td>WET</td>
<td>chronic toxic units (TUc)</td>
<td>&lt;4.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>
The USCG Base Kodiak WWTF also treats leachate, mostly from groundwater infiltration, from their closed landfill as well as wastewater from sumps and oil water separators from various USCG Base Kodiak operational sources including airport ground support buildings and hangars, the public works garage, the central heating plant, and the firehall. Wastestreams are typically the result of vehicle and equipment washing and snowmelt from stored aircraft and vehicles. The landfill, which closed in 1987 is estimated to contain 60% domestic, 20% commercial, 10% industrial, 5% construction, and 5% demolition refuse.

Landfill leachate was monitored in the last permit cycle for ammonia, metals, and pH in order to evaluate the pollutant loading that it contributes to the Base Kodiak WWTF. Pollutants with applicable marine water quality criteria that were required to be monitored and that were detected in the wastestream include ammonia (1.4 mg/L - 21 mg/L), arsenic (36.9 µg/L -50.9 µg/L), copper (undetected - 3 µg/L), cyanide (undetected - 6.6 µg/), lead (undetected - 0.19 µg/L (estimated)), manganese (4,010 µg/L - 5,050 µg/L), nickel (5.7 µg/L- 9.02 µg/L), and mercury (undetected - 0.079 µg/L (estimated)). The methods for cyanide as well as some of the methods for mercury were not sufficiently sensitive to definitively characterize the concentrations of these pollutants in the leachate. The permit will require that landfill leachate monitoring be conducted with a test method that quantifies the pollutants to a level lower than applicable water quality standards or use the most sensitive test method available. In order to continue to evaluate the contribution of these detected pollutants in the landfill leachate and their potential impact to the WWTF, these pollutants will continue to be monitored twice per year in the reissued permit.

Oily wastewater from non-domestic wastestream sumps and oil water separators is collected and pretreated at the Base’s LOWS prior to discharge to the domestic wastewater treatment plant. Pollutants of concern that may be present or suspected by the permittee to be present in these wastestreams include total aromatic hydrocarbons (TAH), total aqueous hydrocarbons (TAqH), semi-volatile organic compounds (SVOC), volatile organic compounds (VOC), metals, BODs, TSS, ammonia, and oil and grease. Rainwater that accumulates in the LOWS holding tank’s secondary containment is also discharged to the Base WWTF. If a sheen is present, the rainwater from the containment area is routed through the LOWS for treatment. The treated water from the LOWS is sampled for pH, total petroleum hydrocarbons, and BTEX (benzene, toluene, ethylbenzene, xylene) prior to conveyance to the WWTF, and if a sheen is present, water is not released unless the total petroleum hydrocarbons is less than 1 mg/L. Appendix E contains a list of non-domestic wastestream contributions to the USCG Base Kodiak WWTF.

2.4 Compliance History
DEC reviewed Discharge Monitoring Reports (DMRs) submitted from March 2017 through August 2021 to determine the facility’s compliance with effluent limits. Table 2 summarizes permit limit exceedances. Table 3 summarizes DEC Compliance and Enforcement actions at the USCG Base Kodiak WWTF.
Table 2 - Outfall 001A Effluent Limit Exceedances

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Basis</th>
<th>Permit Limit</th>
<th>Number of Exceedances</th>
<th>Maximum Reported Value</th>
<th>Date of Maximum Reported Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow</td>
<td>mgd</td>
<td>Daily maximum</td>
<td>1.5</td>
<td>2</td>
<td>1.7</td>
<td>November 2019</td>
</tr>
<tr>
<td>FC Bacteria</td>
<td>FC/100 mL</td>
<td>Daily maximum</td>
<td>43</td>
<td>1</td>
<td>89</td>
<td>May 2021</td>
</tr>
<tr>
<td>Copper</td>
<td>µg/L</td>
<td>Daily maximum</td>
<td>31.9</td>
<td>1</td>
<td>32.4</td>
<td>March 2017</td>
</tr>
<tr>
<td>DO</td>
<td>mg/L</td>
<td>Daily minimum</td>
<td>6</td>
<td>1</td>
<td>3.45</td>
<td>August 2019</td>
</tr>
</tbody>
</table>

Table 3 - Compliance and Enforcement Actions

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 26, 2018</td>
<td>Routine Inspection</td>
<td>A pH violation from September 2015 (from the prior 5-year permit term) and a copper exceedance from March 2017 were noted in the inspection report. The report also alleged that the permittee failed to report these exceedances on the 24-hour hotline and a non-compliance report had not been submitted for the copper exceedance.</td>
</tr>
</tbody>
</table>

3.0 EFFLUENT LIMITS AND MONITORING REQUIREMENTS

3.1 Basis for Permit Effluent Limits

Per 18 AAC 83.015, the Department prohibits the discharge of pollutants to waters of the U.S. unless the permittee has first obtained a permit issued by the APDES Program that meet the purposes of AS 46.03 and is in accordance with the CWA Section 402. Per these statutory and regulatory provisions, the Permit includes effluent limits that require the discharger to (1) meet standards reflecting levels of technological capability, (2) comply with 18 AAC 70 – Water Quality Standards (WQS), and (3) comply with other state requirements that may be more stringent.

The CWA requires that the limits for a pollutant be the more stringent of either Technology-Based Effluent Limits (TBELs) or Water Quality-Based Effluent Limits (WQBELs). TBELs are set according to the level of treatment that is achievable using available technology. A WQBEL is designed to ensure that the WQS are met. WQBELs may be more stringent than TBELs. The permit contains a combination of both TBELs and WQBELs. The Department first determines if TBELs are required to be incorporated into the permit. TBELs for publicly owned treatment works (POTWs), which apply to the USCG Base Kodiak WWTF, are derived from the secondary treatment standards found in Title 40 Code of Federal Regulations (CFR) §133.102 and 40 CFR §133.105, adopted by reference 18 AAC 83.010(e). The following section summarizes the proposed effluent limits. A more expansive technical and legal basis for the proposed effluent limits is provided in Appendix A Basis for Effluent Limitations.

3.2 Basis for Effluent and Receiving Water Monitoring

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. Monitoring in a permit is required to determine compliance with effluent limits. Monitoring may also be required to gather effluent and surface water data to determine if
additional effluent limits are required and/or to monitor effluent impact on the receiving waterbody quality. The permittee is responsible for conducting the monitoring and for reporting results on NetDMR or with the application for reissuance, as appropriate, to the Department. Fact Sheet Sections 3.3 through 3.5 summarizes monitoring requirements DEC has determined necessary to implement in the permit.

3.3 Effluent Limits and Monitoring Requirements

Monitoring is required to determine compliance with effluent limitations and/or for use in future reasonable potential analyses (RPA). The permit requires monitoring of secondary treated domestic wastewater effluent that is discharged through Outfall 001A. Flow, BOD₅, TSS, pH, DO, FC bacteria, enterococci bacteria, ammonia, copper, TAH and TAqH all have associated effluent limits. See Appendix A for details regarding the basis of effluent limits for these parameters.

Monitoring frequencies are based on the nature and effect of a pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility’s performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples must be used in calculations and used for averaging if they are conducted using Department-approved test methods (generally found in 18 AAC 70 and 40 CFR Part 136 [adopted by reference in 18 AAC 83.010]) and if the method detection limits are less than the effluent limits. 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 monitoring in this permit is required to determine compliance with the effluent limits and to gather information for permit reissuance.

The USCG has demonstrated their ability to consistently reduce BOD₅ and TSS to levels below permit requirements; there have not been any violations of BOD₅ and TSS permit limits since the permit last became effective in 2017. Therefore, in order to reduce monitoring while maintaining a high level of environmental protection, DEC used EPA’s 1996 Interim Guidance for Performance-Based Reductions of NPDES Permit Monitoring Frequencies to reduce BOD₅ and TSS monitoring frequencies in the reissued permit from 1/week to 1/month. The USCG is expected to maintain the performance levels that were used as the basis for granting these monitoring reductions. If performance is not maintained DEC may require increased monitoring.

The prior permit required quarterly lead, nickel, and zinc monitoring. Between March 2017 and August 2021, the highest lead concentration was 0.49 µg/L (acute water quality criteria 8.5 µg/L, chronic 217 µg/L), the highest nickel concentration was 5.69 µg/L (acute water quality criteria 75 µg/L, chronic 8.3 µg/L) and the highest zinc concentration was 90.4 µg/L (acute water quality criteria 95 µg/L, chronic 86 µg/L). ProUCL, a statistical software program, identified 90.4 µg/L as an outlier and it was not included in the RPA. None of these pollutants have reasonable potential to exceed water quality criteria. Therefore, lead, nickel, and zinc will no longer be required to be monitored in the permit on a quarterly basis but will be required to be monitored for permit reissuance per Form 2A, Supplement A and will be re-evaluated during the next permit reissuance.

Temperature, mercury, cyanide, and oil and grease contain reporting only monitoring requirements. The following summarizes the monitoring requirements for these parameters.

3.3.1 Temperature

Alaska WQS at 18 AAC 70.020(b)(22) states that temperature for marine water for seafood processing, growth and propagation of fish, shellfish, other aquatic life, wildlife, and harvesting for consumption of raw mollusks or other raw aquatic life may not exceed 15 degrees Celsius (°C). DEC reviewed temperature monitoring data for from March 2017 to August 2021. During this period the temperature ranged from a minimum of 6° C to a maximum of 18° C. It is reasonable to assume that the discharge will continue to exceed water quality criteria. Temperature effluent limits are not included; however, DEC determined that temperature would meet water quality criteria at approximately 0.7 meters and fits within the mixing zone.
sized for copper. Monitoring and reporting the effluent’s temperature will continue as in the prior permit, five times per week.

3.3.2 Mercury

Alaska WQS at 18 AAC 70.020(b)(23) states that the concentration of substances in water may not exceed the numeric criteria for aquatic life for marine water shown in the Alaska Water Quality Criteria Manual. Mercury concentrations cannot exceed the marine human health aquatic organism criterion of 0.051 µg/L. DEC reviewed mercury monitoring data from March 2017 to August 2021. The highest mercury concentration was reported as undetected at 0.5 µg/L. However, detection levels used by the lab were often higher than the most stringent human health mercury water quality criterion; 14 of the 16 mercury results were reported as non-detects above 0.051µ/L. Use of this data in the reasonable potential analysis may erroneously indicate reasonable potential where none exists and lead to incorrect conclusions regarding the driving parameter of the mixing zone and resultant effluent limits. Therefore, DEC cannot make a definitive reasonable potential determination. To ensure that mercury laboratory analysis results are tested to levels below the most stringent mercury water quality criterion, Permit Section 1.2.6 requires USCG Base Kodiak to use a sufficiently sensitive EPA approved test method that quantifies mercury to a level lower than the water quality standards or use the most sensitive test method available. Mercury monitoring shall occur as in the prior permit, once per quarter and will be re-evaluated during the next permit reissuance for reasonable potential to exceed water quality criteria.

3.3.3 Cyanide

Alaska WQS at 18 AAC 70.020(b)(23) states that the concentration of substances in water may not exceed the numeric criteria for aquatic life for marine water shown in the Alaska Water Quality Criteria Manual. Both the acute and chronic aquatic life CN concentrations may not exceed 1.0 µg/L. DEC reviewed CN monitoring data from March 2017 to August 2021. The results were all estimates (which are considered non-detect in DEC’s guidance, APDES RPA and Effluent Limits Development Guide) or non-detects, but at levels above CN’s water quality criteria (1.0 µg/L acute and chronic). Use of this data in the reasonable potential analysis may erroneously indicate reasonable potential where none exists and lead to incorrect conclusions regarding the driving parameter of the mixing zone and resultant effluent limits. Therefore, DEC cannot make a definitive reasonable potential determination. Therefore, DEC cannot make a definitive reasonable potential determination. To ensure that cyanide laboratory analysis results are tested to levels below the most stringent cyanide water quality criterion, Permit Section 1.2.6 requires USCG Base Kodiak to use a sufficiently sensitive EPA approved test method that quantifies cyanide to a level lower than the water quality standards or use the most sensitive test method available. Cyanide monitoring shall occur as in the prior permit, once per quarter and will be re-evaluated during the next permit reissuance for reasonable potential to exceed water quality criteria.

3.3.4 Oil and Grease

Alaska WQS at 18 AAC 70.020(b)(17) Petroleum Hydrocarbons, Oil and Grease, states that TAqH in the water column may not exceed 15 µg/L and TAH in the water column may not exceed 10 µg/L. There may be no concentrations of petroleum hydrocarbons, animal fats, or vegetable oils in shoreline or bottom sediments that cause deleterious effects to aquatic life. Surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration.

Permit Section 1.2.3 states that the permittee must not discharge any floating solids, debris, sludge, deposits, foam, scum, or other residues that cause a film, sheen, or discoloration on the surface of the receiving water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.
Oil and grease is expected to be present in domestic wastewater. Components may include fatty matter from animal and vegetable sources and hydrocarbons. Oil and grease is also expected to be present in non-domestic wastestream contributions such as from vehicle washing. Oil and grease was required to be monitored in the last permit once per month June through August as it was anticipated that more frequent vehicle washing in the summer months would increase oil and grease influent concentrations. During the months of June-August of 2017-2021, USCG Base Kodiak reported the presence of oil and grease 12 times. Results ranged from 1.13 mg/L to 4.33 mg/L, with an average of 2.37 mg/L. Oily waste is separated from all of the wastewater generated from vehicle washing with an oil/water separator prior to conveyance to the LOWS where a combination of gravity settling, heat and chemical processes further separate oily waste from water. Water from the LOWS is not released to the WWTF prior to sampling for pH, total petroleum hydrocarbons, and BTEX. Additionally, if a sheen is present, water is not released unless the total petroleum hydrocarbons is less than 1 mg/L.

TAqH was required to be monitored quarterly. Results from March 2017 and August 2021 ranged from 0.044 µg/L to 2.7 µg/L. TAH, also monitored quarterly, ranged from 0.056 µg/L to 2.7 µg/L.

Alaska WQS at 18 AAC 70.020(b)(17) contains numeric water-quality criteria for TAqH and TAH but does not contain numeric criteria for overall oil and grease concentrations; only the narrative criteria, described above. Therefore, while compliance with numeric TAqH and TAH water-quality criteria can be evaluated, overall oil and grease numeric monitoring results cannot be compared with corresponding numeric water-quality criteria for compliance.

Therefore, considering the level of pretreatment provided for non-domestic wastestreams with both oil/water separators and the LOWS, and because there are no numeric oil and grease water quality criteria, rather than reporting a numeric oil and grease concentration, DEC will require the permittee to visually monitor for the presence of oil and grease in the effluent at the point of discharge once per month. Once per month monitoring incorporates potential year-round oil and grease contributions from both domestic and non-domestic wastestreams.
Table 4 contains Outfall 001A effluent limits and monitoring requirements and Table 5 contains effluent limits and monitoring requirement changes from the last permit issuance.

**Table 4- Outfall 001A Effluent Limits and Monitoring Requirements**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Effluent Limits</th>
<th>Monitoring Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Units a</td>
<td>Daily Minimum</td>
</tr>
<tr>
<td>Flow</td>
<td>mgd</td>
<td>N/A</td>
</tr>
<tr>
<td>Biochemical Oxygen Demand (BOD₅)</td>
<td>mg/L</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>lbs/day</td>
<td>N/A</td>
</tr>
<tr>
<td>Total Suspended Solids (TSS)</td>
<td>mg/L</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>lbs/day</td>
<td>N/A</td>
</tr>
<tr>
<td>BOD₅ &amp; TSS Minimum Percent (%) Removal</td>
<td>%</td>
<td>N/A</td>
</tr>
<tr>
<td>pH</td>
<td>SU</td>
<td>6.5</td>
</tr>
<tr>
<td>Temperature</td>
<td>°C</td>
<td>N/A</td>
</tr>
<tr>
<td>Dissolved Oxygen (DO)</td>
<td>mg/L</td>
<td>6.0</td>
</tr>
<tr>
<td>Fecal Coliform (FC) Bacteria</td>
<td>FC/100 mL</td>
<td>N/A</td>
</tr>
<tr>
<td>Enterococci Bacteria</td>
<td>cfu/100 mL</td>
<td>N/A</td>
</tr>
<tr>
<td>Total Ammonia, as Nitrogen</td>
<td>mg/L</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>lbs/day</td>
<td>N/A</td>
</tr>
<tr>
<td>Copper</td>
<td>µg/L</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>180</td>
</tr>
<tr>
<td>Mercury j</td>
<td>µg/L</td>
<td>N/A</td>
</tr>
<tr>
<td>Cyanide j</td>
<td>µg/L</td>
<td>N/A</td>
</tr>
<tr>
<td>Total Aqueous Hydrocarbons</td>
<td>µg/L</td>
<td>N/A</td>
</tr>
<tr>
<td>Total Aromatic Hydrocarbons</td>
<td>µg/L</td>
<td>N/A</td>
</tr>
</tbody>
</table>

AK0020648 USCG Base Kodiak WWTF
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Effluent Limits</th>
<th>Monitoring Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Units</td>
<td>Daily Minimum</td>
</tr>
<tr>
<td>Oil and Grease</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### Footnotes:

- **a.** Units: mgd = million gallons per day, mg/L = milligrams per liter, lbs/day = pounds per day, SU = standard units, °C = degrees Celsius, FC/100 mL = Fecal Coliform per 100 milliliters, cfu/100 mL = colony forming units per 100 milliliters, µg/L = micrograms per liter.
- **b.** lbs/day = concentration (mg/L) x flow (mgd) x 8.34 (conversion factor)
- **c.** Limits apply to effluent. Report average monthly influent concentration. Influent and effluent composite samples shall be collected during the same 24-hour period.
- **d.** See Appendix C for definition.
- **e.** Minimum % Removal = [(monthly average influent concentration in mg/L - monthly average effluent concentration in mg/L) / (monthly average influent concentration in mg/L)] x 100. The monthly average percent removal must be calculated using the arithmetic mean of the influent value and the arithmetic mean of the effluent value for that month.
- **f.** If more than one FC or enterococci bacteria sample is collected within the 30-day (monthly) period, the average result must be reported as the geometric mean. When calculating the geometric mean, replace all results of zero, 0, with a one, 1. The geometric mean of “n” quantities is the “nth” root of the quantities. For example, the geometric mean of 100, 200, and 300 is (100 x 200 x 300)^1/3 = 181.7.
- **g.** Not more than one sample, or if more than one FC bacteria sample is collected within the 30-day monthly reporting period, not more than 10% of the samples may exceed 43 FC/100 mL.
- **h.** Not more than one sample, or if more than one enterococci bacteria samples are collected during the 30-day monthly reporting period, not more than 10% of the samples may exceed a statistical threshold value of 130 cfu/100 mL.
- **i.** One sample shall be collected each month, May through September, on the same day that a FC bacteria sample is collected.
- **j.** Analytical test methods for cyanide and mercury must be quantified to levels lower than the most stringent corresponding marine water-quality criteria found in 18 AAC 70.
- **k.** Visually inspect the effluent and report the presence or absence of a film or sheen.

### Table 5 - Outfall 001A Effluent and Monitoring Changes from Prior Permit

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Monthly Average</th>
<th>Weekly Average</th>
<th>Daily Maximum</th>
<th>Sample Location</th>
<th>Sample Frequency</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow</td>
<td>mgd</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>1.5</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>BOD$_5$</td>
<td>mg/L</td>
<td>Effluent limits unchanged. Monitoring frequency reduced from 1/week to 1/month.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSS</td>
<td>mg/L</td>
<td>Effluent limits unchanged. Monitoring frequency reduced from 1/week to 1/month.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enterococci Bacteria</td>
<td>cfu/100mL</td>
<td>Report</td>
<td>35</td>
<td>---</td>
<td>Report</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>Total Ammonia, as N</td>
<td>mg/L</td>
<td>9.05</td>
<td>6.0</td>
<td>---</td>
<td>9.0</td>
<td>26.11</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>lbs/day</td>
<td>91</td>
<td>60</td>
<td>---</td>
<td>90</td>
<td>261</td>
<td>190</td>
</tr>
<tr>
<td>Copper</td>
<td>µg/L</td>
<td>31.9</td>
<td>18</td>
<td>---</td>
<td>27</td>
<td>52.8</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>lbs/day</td>
<td>320</td>
<td>180</td>
<td>---</td>
<td>270</td>
<td>528</td>
<td>390</td>
</tr>
<tr>
<td>Lead</td>
<td>µg/L</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>Report</td>
<td>Quarterly Results</td>
<td>Form 2A , Supplement A</td>
</tr>
<tr>
<td>Nickel</td>
<td>µg/L</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>Report</td>
<td>Quarterly Results</td>
<td>Form 2A , Supplement A</td>
</tr>
</tbody>
</table>
### 3.4 Whole Effluent Toxicity Monitoring

Alaska WQS at 18 AAC 70.030 require that an effluent discharge to a waterbody may not impart chronic toxicity to aquatic organisms, expressed as 1.0 TUc, at the point of discharge, or if the Department 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. 18 AAC 83.435 requires that a permit contain limitations when a discharge has reasonable potential to cause or contribute to an exceedance of a WQS. 18 AAC 83.335 recommends chronic testing for facilities with dilution factors less than 100:1 at the boundary of the mixing zone, acute testing for facilities with dilution factors greater than 1000:1 at the boundary of the mixing zone, and either acute or chronic testing for dilution factors between 100:1 and 1000:1 at the boundary of the mixing zone.

WET tests are laboratory tests that measure total toxic effect of an effluent on living organisms. WET tests use small vertebrate and invertebrate species and/or plants to measure the aggregate toxicity of an effluent. WET testing is included in the permit to demonstrate any potential toxicity resulting from the WWTF discharge. The two different durations of toxicity tests are acute and chronic. Acute toxicity tests measure survival over a 96-hour exposure. Chronic toxicity tests measure reductions in survival, growth, and reproduction over a 7-day exposure.

The previous permit required that the permittees conduct chronic toxicity tests with the topsmelt (*Atherinops affinis*) (larval growth and survival) and either the Pacific oyster (*Crassostrea gigas*) or mussel (*Mytilus galloprovincialis*) (larval development). Testing was required to be conducted four times the first calendar year then annually after the first year. The organisms were tested at 1.6%, 3.1%, 6.25%, 12.5%, and 25% effluent. Chronic WET test results from March 2017 through March 2021 indicated no toxic effects at the highest concentration, 25% effluent for either the mussel or topsmelt. The TUc for each test for both species was reported as < 4.0 TUc.

Because there is reasonable potential for the effluent from the USCG Base Kodiak WWTF to exceed water-quality criteria for copper, which is classified as a toxic pollutant by EPA at 40 CFR 401.15, and because there are a number of non-domestic contributions to the WWTF, it is reasonable to assume that WET will exceed 1.0 TUc at the end of the pipe. Therefore, WET is included in the mixing zone sized for copper.

In order to reassess the toxicity of the effluent and to ensure compliance with 18 AAC 83.335, WET monitoring is required in the reissued permit. The WET monitoring dilution series must include the instream waste concentration (IWC), which corresponds to 12% effluent concentration at the boundary of the mixing zone. Two dilutions above, and two dilutions below the IWC must be included, with no concentrations greater than two times that of the next lower concentration. The permit requires accelerated WET testing if toxicity is greater than 12 TUc in any test. If toxicity exceeds the trigger of 12 TUc, six biweekly WET tests (every two weeks over a 12-week period) is required. If the permittee demonstrates through an evaluation of the facility operations that the cause of the exceedance is known and corrective actions have been implemented, only one accelerated test is required. If toxicity is greater than 12 TUc in any of the accelerated tests, the permittee must initiate a Toxicity Reduction Evaluation (TRE). A TRE is a site-specific process designed to identify the cause of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and confirm effluent toxicity reduction. The permittee may initiate a toxicity
identification evaluation (TIE) as a part of the TRE. A TIE is a set of procedures that characterize, identify, and confirm the specific chemicals responsible for effluent toxicity. TREs and TIEs must be performed in accordance with EPA guidance manuals (see Permit Section 1.4 for further details).

3.5 Additional Effluent Monitoring Requirements

The permittee must perform the additional effluent testing in the APDES application Form 2A, Section 11 as well as all applicable supplemental monitoring listed in Section 12. The permittee must submit the results of this additional testing with their application for renewal of this APDES permit. Monitoring results must be included with the application for permit reissuance and will be used as a screening tool to identify pollutants that may exceed State WQS.

In order to evaluate landfill leachate pollutant loading and its potential impact on the USCG Base Kodiak WWTF, the prior permit required the permittee to monitor landfill leachate twice per year for ammonia, metals, and pH. Detected pollutants included ammonia, arsenic, copper, cyanide, lead, manganese, nickel, and mercury. However, the analytical methods for cyanide and mercury were not sufficiently sensitive to definitively characterize the concentrations of these pollutants in the leachate. In order to continue to evaluate the contribution of the above detected pollutants in the landfill leachate and their potential impact on the WWTF effluent, these pollutants are required to be monitored twice per year in the reissued permit. Zinc is also required to be monitored as insufficient data had been collected by the permittee for an evaluation of zinc’s concentration in the leachate. The permit also requires that landfill leachate monitoring be conducted with a test method that quantifies the pollutants to a level lower than applicable water quality standards or use the most sensitive test method available.

4.0 RECEIVING WATERBODY

4.1 Description of Receiving Waterbody

St. Paul Harbor is located in the northwestern part of Chiniak Bay, a 13-mile-wide indentation in the northeast coast of Kodiak Island, between Crooked Island on the north and Cliff Point on the south. Womens Bay, a contiguous waterbody to St. Paul Harbor, lies to the southwest. Islets and reefs to the east of St. Paul Harbor and Womens Bay, restrict wave activity from the Gulf of Alaska. Tidal height in St. Paul Harbor ranges from 1.1 feet mean low water to 7.8 feet mean high water.

4.2 Outfall Location

The USCG Base Kodiak WWTF discharges secondary treated domestic wastewater approximately 1,062 feet offshore in St Paul Harbor (11 feet below mean low low water) at 57° 44’ 28.5” north latitude and 152° 28’ 43.2” west longitude.

4.1 Water Quality Standards

Section 301(b)(1)(C) of the CWA required the development of limits in permits necessary to meet water WQS by July 1, 1977. Per 18 AAC 83.435, APDES permits must include conditions to ensure compliance with WQS. Additionally, regulations in 18 AAC 70 require that the conditions in permits ensure compliance with the WQS. The State’s WQS are composed of waterbody use classifications, numeric and/or narrative water quality criteria, and an Antidegradation Policy. The use classification system identifies the designated uses that each waterbody is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the state to support the designated use classification of each waterbody. The antidegradation policy ensures that the existing uses and the level of water quality necessary to protect the uses are maintained and protected.
Waterbodies in Alaska are designated for all uses unless the water has been reclassified under 18 AAC 70.230 as listed under 18 AAC 70.230(e). Some waterbodies in Alaska can also have site-specific water quality criterion per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b). The receiving water for this discharge, St. Paul Harbor, has not been reclassified, nor have site-specific water quality criteria been established. Therefore, St. Paul Harbor must be protected for all marine water designated uses. The marine water designated uses are: water supply for aquaculture, seafood processing and industrial; contact and secondary recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life.

4.2 Water Quality Status of Receiving Water

Any part of a waterbody for which the water quality does not, or is not expected to, intrinsically meet applicable WQS is defined as a “water quality limited segment” and placed on the state’s impaired waterbody list. For an impaired waterbody Section 303(d) of the CWA requires states to develop a total maximum daily load (TMDL) management plan for the waterbody. The TMDL documents the amount of a pollutant a waterbody can assimilate without violating a state’s WQS and allocates that load to known point sources and nonpoint source. St. Paul Harbor is not included in Alaska’s 2018 Integrated Water Quality Monitoring and Assessment Report.

4.3 Mixing Zone Analysis

In accordance with 18 AAC 70.240, the Department may authorize a mixing zone in a permit. A chronic mixing zone is sized to protect the ecology of the waterbody as a whole and an acute mixing zone is sized to prevent lethality to passing organisms.

The USCG requested a mixing zone with their permit reissuance application and submitted the results of their mixing zone modeling to support their request. As a part of the mixing zone application and modeling review process, DEC reviewed the USCG’s mixing zone model using Cornell Mixing Zone Expert System (CORMIX) version 12.0 modeling software. CORMIX is a widely used and broadly accepted modeling tool for accurate and reliable point source mixing analysis. CORMIX predicts the distance at which a modeled parameter meets water quality criteria as well as the corresponding dilution at that point.

Copper was identified in the USCG Base Kodiak WWTF RPA as the pollutant requiring the most dilution to meet both chronic and acute water quality criteria. Ammonia, temperature, and WET also have reasonable potential to exceed water quality criteria and fit within the chronic and acute mixing zones sized for copper.

The chronic mixing zone sized for copper has a dilution of 12:1 and is defined as the area centered over the diffuser 6.6 meters long and 7.3 meters wide. The acute mixing zone for this discharge has a dilution of 7.4:1 and is defined as the area centered over the diffuser 4.8 meters long and 6.6 meters wide. Water quality criteria for ammonia, copper, temperature, and WET may be exceeded within the authorized chronic and acute mixing zones. Ammonia water quality criteria will be met at approximately 2.8 meters and temperature will be met at approximately 0.7 meters, and WET will be met at the boundary of the mixing zone.

According to EPA’s Technical Support Document for Water Quality-based Toxics Control, lethality to passing organisms would not be expected if an organism passing through the plume along the path of maximum exposure is not exposed to concentrations exceeding the acute criteria when averaged over a one-hour time period. Furthermore, the travel time of an organism drifting through the acute mixing zone must be less than approximately 15 minutes if a one-hour exposure is not to exceed the acute criterion. DEC determined that the travel time of an organism drifting through the acute mixing zone to be approximately 4 seconds; therefore, there will be no lethality to organisms passing through the acute mixing zone.

Appendix D outlines regulatory criteria that must be met for the Department to authorize a mixing zone. These criteria include the size of the mixing zone, treatment technology, existing uses of the waterbody, human
consumption, spawning areas, human health, aquatic life, and endangered species. The following summarizes this analysis:

4.3.1 Size

In accordance with 18 AAC 70.240, the mixing zone must be as small as practicable. In order to ensure that the mixing zone is as small as practicable, the permittees used CORMIX to model the chronic and acute mixing zones. DEC reviewed the permittee’s submittal and verified the modeling results in CORMIX.

18 AAC 70.240(b)(2) requires the Department to consider the characteristics of the effluent after treatment of the wastewater. The facility’s effluent monitoring data from March 2017 to August 2021 was evaluated to determine which parameters had reasonable potential to exceed water quality criteria and then which parameter required the most dilution to meet water quality criteria for the chronic and acute mixing zones. Copper required the most dilution to meet both chronic and acute aquatic life water quality criteria; therefore, copper, as the driver of the mixing zones, was modeled in CORMIX to determine the smallest practicable chronic mixing zone sizes.

In order to account for seawater intrusion into the diffuser and low effluent flow, the length of the diffuser and number and diameter of ports were reduced from actual dimensions in the model. These reductions are reflected in Table 6 and are consistent with recommendations made in the 2016 mixing zone modeling by MixZon, Inc, the proprietors of CORMIX. CORMIX assumes ports are operating at full capacity, but MixZon had indicated that the diffuser and diffuser ports were over-sized for the discharge, resulting in diffuser ports that may not be discharging at full capacity. To account for these conditions, MixZon recommended reducing the length of the diffuser and diameter of the ports by half.

While the mixing zone was initially modeled as a multiport, the plumes in the multiport run did not merge prior to attaining the criterion maximum concentration (CMC) and criterion continuous concentration (CCC) and the CORMIX 2 Multiport session report recommended running the model as a single port (CORMIX 1). Therefore, the permittee ran the model as a single port in order to analyze individual port jets/plumes, and ultimately, the single port model results were used as the basis for sizing the mixing zones. It is also assumed that because of low effluent flow, the fifth and sixth pairs of ports discharge little or no effluent. Therefore, modeling was conducted using the first four pairs of ports.

Based on the inputs CORMIX predicted the plume dimension and the distance from the port opening to the CMC and CCC locations. The plume’s slack tide dimension, 0.38 meters, was added to the effective length of the diffuser (6.55 meters) to obtain a width for the chronic mixing zone of 7.4 meters. The slack tide’s computed distance from the port opening to the CCC location, 3.3 meters, was applied to either side of the diffuser to obtain a length of 6.6 meters for the chronic mixing zone. The acute mixing zone was similarly calculated using the slack tide’s plume dimension (0.03 meters) and computed distance from the port opening to the CMC location (2.41 meters) to obtain an acute mixing zone size of 4.8 meters wide by 6.5 meters long.

Table 6 summarizes the basic CORMIX inputs that were used to model the chronic and acute mixing zones for copper. Ammonia and temperature were also evaluated in CORMIX to verify the distances to attainment of water quality criteria.
### Table 6- CORMIX Model Inputs

<table>
<thead>
<tr>
<th>Parameters Modeled</th>
<th>Maximum Expected Concentration</th>
<th>Ambient Concentration</th>
<th>Chronic Water Quality Criterion</th>
<th>Acute Water Quality Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>39 µ/L</td>
<td>0.58 µ/L</td>
<td>3.7 µg/L</td>
<td>5.8 µg/L</td>
</tr>
<tr>
<td>Ammonia</td>
<td>8.05 mg/L</td>
<td>0.13 mg/L</td>
<td>1.0 mg/L</td>
<td>6.7 mg/L</td>
</tr>
<tr>
<td>Temperature</td>
<td>18º C</td>
<td>12º C</td>
<td>15º C daily maximum</td>
<td></td>
</tr>
</tbody>
</table>

### Outfall and Receiving Waterbody Characteristics
- **Discharge Geometry**: submerged single port
- **Diffuser Length**: 6.55 meters
- **Discharge Location**: left bank, 324 meters to nearest bank
- **Number of Ports and Port Diameter**: 8 ports, 0.0736 meters
- **Port Height Above Channel Bottom**: 0.46 meters
- **Depth at Discharge**: 6.3 meters
- **Ambient Velocity**: 0.02 meters per second (m/sec) low tidal current, 0.107 m/sec high tidal current
- **Wind Velocity**: 5.86 m/sec

### Effluent Characteristics
- **Flow Rate**: 0.0066 cubic m/s
- **Effluent Density**: 999.744 kilograms per cubic meters

**Footnotes:**

a. CORMIX 2 Multiport recommended the use of CORMIX 1 Single Port due to the attainment of acute and chronic water quality criteria prior to the jets/plumes merging to form the slot analogy plume used for multiport diffusers.

b. Diffuser length reduced from an actual length of 10.7 meters (distance from first port to last port) to 6.55 meters to account for seawater intrusion.

c. Number of ports reduced from 12 to 8 due to seawater intrusion and low effluent flow to end ports. Diameter reduced by half to account for significant seawater intrusion.

d. Design flow 1.2 mgd, modeled as 1/8 of the flow to account for the 8 modeled ports.

---

### 4.3.2 Technology

In accordance with 18 AAC 70.240(c)(1), the most effective technological and economical methods should be used to disperse, treat, remove, and reduce pollutants. The USCG Base Kodiak WWTF wastewater treatment system provides secondary treatment of domestic wastewater using an activated sludge secondary treatment system. Settling basins prior to the headworks and bar screens provide preliminary treatment followed by aeration, clarification, and UV disinfection. The treatment methods incorporated at the USCG Base Kodiak WWTF are commonly employed and accepted for treatment of similar discharges throughout the United States.

### 4.3.3 Existing Use

In accordance with 18 AAC 70.240(c)(2) and (3) and 18 AAC 70.240(c)(4)(B) and (C), the mixing zone has
been appropriately sized to fully protect the existing uses of St. Paul Harbor. St. Paul Harbor’s existing uses and biological integrity have been maintained and protected under the terms of the previous permit and shall continue to be maintained and protected under the terms of the reissued permit. Water quality criteria are developed to specifically protect the uses of the waterbody as a whole. Because water quality criteria for pollutants that demonstrated reasonable potential to exceed water quality criteria will be met prior to or at the boundary of the mixing zones, designated and existing uses in St. Paul Harbor that are beyond the boundary of the mixing zones will be maintained and protected.

4.3.4 Human Consumption
In accordance with the conditions of the permit, and in accordance with 18 AAC 70.240(d)(6) the pollutants discharged cannot produce an objectionable color, taste, or odor in aquatic resources harvested for human consumption. There is no indication that the pollutants discharged have produced objectionable color, taste, or odor in aquatic resources harvested for human consumption. Signs are required to be posted to inform the public that certain activities such as harvesting of aquatic life for raw consumption should not take place in the mixing zone.

4.3.5 Spawning Areas
In accordance with 18 AAC 70.240(f), a mixing zone is not authorized in an area of anadromous fish spawning or resident fish for spawning redds for Arctic Grayling (Thymallus arcticus), northern pike (Esox lucius), inconnu/sheefish (Stenodus leucichthys) and all other whitefish in Alaska belonging to genera Prosopium and Coregonus, Arctic char (Salvelinus alpinus), Dolly Varden (S. malma), brook trout (S. fontinalis), rainbow trout (Oncorhynchus mykiss), cutthroat trout (O. clarkia), burbot Lota, landlocked coho salmon (O.kisutch), Chinook salmon (O. tshawytscha), and sockeye salmon (O. nerka).

The Alaska Department of Fish and Game’s (ADF&G) Catalog of Waters Important for Spawning, Rearing, or Migration of Anadromous Fishes available at https://www.adfg.alaska.gov/static-sf/AWC/PDFs/2020int_CATALOG.pdf does not identify St. Paul Harbor near the USCG Base Kodiak WWTF outfall as important for the spawning, rearing, or migration of anadromous fishes.

4.3.6 Human Health
In accordance with 18 AAC 70.240(d)(1), the mixing zone must not contain bioaccumulating, bioconcentrating, or persistent chemicals above natural or significantly adverse levels. 18 AAC 70.240(d)(2), states that the mixing zone must not present an unacceptable risk to human health from carcinogenic, mutagenic, teratogenic, or other effects as determined using risk assessment methods approved by DEC and consistent with 18 AAC 70.025. An analysis of the effluent data that was included with the USCG’s application for permit reissuance, DMRs, and the results of the RPA conducted on pollutants of concern indicated that the level of treatment at their WWTF is protective of human health. The effluent data was used in conjunction with applicable water quality criteria, which serve the purpose of protecting human and aquatic life, to size the mixing zone to ensure all water quality criteria are met in the waterbody at the boundary of the mixing zone.

4.3.7 Aquatic Life and Wildlife
In accordance with 18 AAC 70.240, the mixing zone authorized in the permit shall be protective of aquatic life and wildlife. The mixing zone does not form a barrier to migratory fish species or fish passage, nor will it result in a reduction of fish population levels. A toxic effect will not occur in the water column, sediments, or biota outside the boundaries of the mixing zones. The CORMIX mixing zone modeling conducted for this discharge incorporated the most stringent water quality criteria in the models for protection of the growth and propagation of fish, shellfish, other aquatic life, and wildlife, and all water quality criteria will be met at the boundary of the authorized mixing zones.
4.3.8 Endangered Species

In accordance with 18 AAC 70.240(c)(4)(F), the mixing zone will not cause an adverse effect on threatened or endangered species. The United States Fish and Wildlife Service (USFWS) did not respond to DEC’s request for them to identify any threatened or endangered species. DEC reviewed their website at https://ecos.fws.gov/ipac/ which showed that the area near the USCG Base Kodiak WWTF outfall may contain the threatened Northern Sea Otter and Steller’s Eider, and the endangered Short-tailed Albatross.

DEC also consulted the National Marine Fisheries Service (NMFS) endangered species mapper at https://www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper which showed that the area near the USCG Base Kodiak WWTF may contain the endangered Steller Sea Lion, and the Humpback, North Pacific Right, and Fin Whales.

DEC will provide a copy of the permit and fact sheet to the USFWS and NMFS when it is public noticed. Any comments received from the agencies regarding endangered species will be considered prior to issuance of the permit.

See Section 8.1 of the fact sheet for more information regarding endangered species.

5.0 ANTIBACKSLIDING

18 AAC 83.480 requires that “interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit, unless the circumstances on which the previous permit was based have materially and substantially changed since the permit was issued, and the change in circumstances would cause for permit modification or revocation and reissuance under 18 AAC 83.135.” 18 AAC 83.480(c) also states that a permit may not be reissued “to contain an effluent limitation that is less stringent than required by effluent guidelines in effect at the time the permit is renewed or reissued.”

Effluent limitations may be relaxed as allowed under 18 AAC 83.480, CWA §402(o) and CWA §303(d)(4). 18 AAC 83.480(b) allows relaxed limitations in renewed, reissued, or modified permits when there have been material and substantial alterations or additions to the permitted facility that justify the relaxation, or, if the Department determines that technical mistakes were made. EPA’s Interim Guidance for Performance-Based Reduction of NPDES Monitoring Frequencies (EPA, 1996), states that monitoring requirements are not considered effluent limitations under the CWA, and therefore Antibacksliding prohibitions would not be triggered by reductions in monitoring frequencies.

The effluent limitations in this permit reissuance are consistent with 18 AAC 83.480. Therefore, the permit effluent limitations, standards, and conditions in AK0020648 are as stringent as in the previously issued permit. Accordingly, no further backsliding analysis is required for this permit reissuance.

6.0 ANTIDEGRADATION

Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the waterbody's designated uses, WQBELs may be revised as long as the revision is consistent with the State's Antidegradation policy. The State’s Antidegradation policy is found in the 18 AAC 70 QBS regulations at 18 AAC 70.015. The Department’s approach to implementing the Antidegradation policy is found in 18 AAC 70.016 Antidegradation implementation methods for discharges authorized under the federal Clean Water Act. Both the Antidegradation policy and the implementation
methods are consistent with 40 CFR 131.12 and approved by EPA. This section analyzes and provides rationale for the Department’s decisions in the permit issuance with respect to the Antidegradation policy and implementation methods.

Using the policy and corresponding implementation methods, the Department determines a Tier 1 or Tier 2 classification and protection level on a parameter-by-parameter basis. A Tier 3 protection level applies to a designated water. At this time, no Tier 3 waters have been designated in Alaska.

18 AAC 70.015(a)(1) states that the existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected (Tier 1 protection level).

St. Paul Harbor is not listed as impaired (Category 4 or 5) in Alaska’s 2018 Integrated Water Quality Monitoring and Assessment Report; therefore, this antidegradation analysis conservatively assumes that the Tier 2 protection level applies to all parameters, consistent with 18 AAC 70.016(c)(1).

18 AAC 70.015(a)(2) states that if the quality of water exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality must be maintained and protected, unless the Department authorizes a reduction in water quality (Tier 2 protection level).

The Department may allow a reduction of water quality only after the specific analysis and requirements under 18 AAC 70.016(b)(5)(A–C), 18 AAC 70.016(c), 18 AAC 70.016(c)(7)(A–F), and 18 AAC 70.016(d) are met. The Department’s findings are as follows:

18 AAC 70.016(b)(5)

(A) existing uses and the water quality necessary for protection of existing uses have been identified based on available evidence, including water quality and use related data, information submitted by the applicant, and water quality and use related data and information received during public comment;

(B) existing uses will be maintained and protected; and

(C) the discharge will not cause water quality to be lowered further where the department finds that the parameter already exceeds applicable criteria in 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b).

18 AAC 70.020 and 18 AAC 70.050 specify the protected water use classes for the State; therefore, the most stringent water quality criteria found in 18 AAC 70.020 and in the Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (DEC 2008) apply and were evaluated. This will ensure existing uses and the water quality necessary for protection of existing uses of the receiving waterbody are fully maintained and protected.

The permit places limits and conditions on the discharge of pollutants. The limits and conditions are established after comparing TBELs and WQBELs and applying the more restrictive of these limits. The water quality criteria, upon which the permit effluent limits are based, serve the specific purpose of protecting the existing and designated uses of the receiving water. WQBELs are set equal to the most stringent water quality criteria available for any of the protected water use classes. This also ensures that the resulting water quality at and beyond the boundary of any authorized mixing zone will fully protect all existing and designated uses of the receiving waterbody as a whole.

The Department concludes the terms and conditions of the permit will be adequate to fully protect and maintain the existing uses of the water and that the findings under 18 AAC 70.016(b)(5) are met.

18 AAC 70.016(c)(7)(A–F) if, after review of available evidence, the department finds that the proposed discharge will lower water quality in the receiving water, the department will not authorize a discharge unless the department finds that
The reduction of water quality meets the applicable criteria of 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b), unless allowed under 18 AAC 70.200, 18 AAC 70.210, or 18 AAC 70.240;

Permit Section 1.2.2 requires that the discharge shall not cause contamination of surface or ground waters or a violation of the WQS at 18 AAC 70 except if excursions are allowed in the permit and the excursions are authorized in accordance with applicable provisions in 18 AAC 70.200 – 70.240 (e.g., variance, mixing zone). As a result of the facility’s reasonable potential to exceed water quality criteria for ammonia, copper, temperature, and WET, a mixing zone is authorized in the USCG Base Kodiak WWTF’s permit in accordance with 18 AAC 70.240. The resulting effluent end-of-pipe limitations and monitoring requirements in the permit (See Table 2) protect WQS, and therefore, will not violate the water quality criteria found at 18 AAC 70.020.

Alaska WQS at 18 AAC 70.030 requires that an effluent discharged to a waterbody may not impart chronic toxicity to aquatic organisms, expressed as 1.0 TUC, at the point of discharge, or if the Department 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.

The Department has authorized a chronic mixing zone for this permit with a dilution of 12:1, and subsequently assigned a chronic toxicity trigger based on the minimum effluent dilution achieved in the mixing zone of 12 TUC. If the WET trigger is met, the USCG Base Kodiak WWTF will not violate the WET limit in 18 AAC 70.030.

There are no site-specific criteria associated with 18 AAC 70.236(b). The permit does not authorize short term variances or zones of deposit under 18 AAC 70.200 or 18 AAC 70.210.

DEC determined that the reduction in water quality will not violate the criteria of 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b) and that the finding is met.

18 AAC 70.016(c)(7)(B) each requirement under (b)(5) of this section for a discharge to a Tier 1 water is met; See 18 AAC 70.016(b)(5) analysis and findings above.

18 AAC 70.016(c)(7)(C) point source and state-regulated nonpoint source discharges to the receiving water will meet requirements under 18 AAC 70.015(a)(2)(D); to make this finding the department will (i) identify point sources and state-regulated nonpoint sources that discharge to, or otherwise impact, the receiving water; and (ii) consider whether there are outstanding noncompliance issues with point source permits or required state-regulated nonpoint source best management practices, consider whether receiving water quality has improved or degraded over time, and, if necessary and appropriate, take actions that will achieve the requirements of 18 AAC 70.015(a)(2)(D); and (iii) coordinate with other state or federal agencies as necessary to comply with (i) and (ii) of this subparagraph;

The requirements under 18 AAC 70.015(a)(2)(D) state:

(D) all wastes and other substances discharged will be treated and controlled to achieve
(i) for new and existing point sources, the highest statutory and regulatory requirements; and
(ii) for nonpoint sources, all cost-effective and reasonable best management practices;

The highest statutory and regulatory requirements are defined at 18 AAC 70.015(d):
(d) For purposes of (a) of this section, the highest statutory and regulatory requirements are
(1) any federal technology-based effluent limitation identified in 40 C.F.R. 122.29 and 125.3, revised as of July 1, 2017, and adopted by reference;
(2) any minimum treatment standards identified in 18 AAC 72.050;
(3) any treatment requirements imposed under another state law that is more stringent than a requirement of this chapter; and
(4) any water quality-based effluent limitations established in accordance with 33 U.S.C. 1311(b)(1)(C) (Clean Water Act, sec. 301(b)(1)(C)).

The first part of the definition includes all federal technology-based effluent limit guidelines (ELGs) including “For POTWs, effluent limitations based upon…Secondary Treatment” at 40 CFR § 125.3(a)(1) defined at 40 CFR § 133.102, adopted by reference at 18 AAC 83.010(e). The ELGs set standards of performance for existing and new sources and are incorporated in the permit.

The second part of the definition references the minimum treatment standards for domestic wastewater discharges found at 18 AAC 72.050. The conditions of this permit require the permittee to meet or exceed the minimum treatment standards described in 18 AAC 72.050. The USCG Base Kodiak WWTF provides secondary treatment of domestic wastewater using an activated sludge process with UV disinfection. The Department finds that this requirement is met.

The third part of the definition refers to treatment requirements imposed under another state law that are more stringent than 18 AAC 70. Other regulations beyond 18 AAC 70 that apply to this permitting action include 18 AAC 15 and 18 AAC 72. Neither the regulations in 18 AAC 15 and 18 AAC 72, nor another state law that the Department is aware of impose more stringent requirements than those found in 18 AAC 70.

The fourth part of the definition refers to WQBELs. WQBELs are designed to ensure that the WQS of a waterbody are met and may be more stringent than TBELs. Section 301(b)(1)(C) of the CWA requires the development of limits in permits necessary to meet WQS by July 1, 1977. WQBELs included in APDES permits are derived from EPA-approved 18 AAC 70 WQS. APDES regulation 18 AAC 83.435(a)(1) requires that permits include WQBELs that can “achieve WQS established under CWA §303, including state narrative criteria for water quality.” The permit requires compliance with the 18 AAC 70 and includes WQBELs developed for copper and ammonia that are protective of water quality criteria at the boundary of the mixing zone.

After review of the applicable statutory and regulatory requirements, including 18 AAC 70, 18 AAC 72, and 18 AAC 83, the Department finds that the discharge from the USCG Base Kodiak WWTF meets the highest applicable statutory and regulatory requirements and that the finding is met.

18 AAC 70.016(c)(7)(D) (i-ii) the alternatives analysis provided under (4)(C-F) of this subsection demonstrates that

(i) a lowering of water quality under 18 AAC 70.015(a)(2)(A) is necessary; when one or more practicable alternatives that would prevent or lessen the degradation associated with the proposed discharge are identified, the department will select one of the alternatives for implementation; and
(ii) the methods of pollution prevention, control, and treatment applied to all waste and other substances to be discharged are found by the department to be the most effective and practicable.

The following is derived from the USCG Base Kodiak’s Antidegradation Form 2G submittal:

Form 2G Sections 1 and 3- Facility Information (18 AAC 70.16(a)(5)(A-G)), Tier 1 Protection Level and Analysis (18 AAC 70.16(a)(b)):

The receiving waterbody, St. Paul Harbor should have a Tier 2 protection level as defined under 18 AAC 70.016(c)(2)(A)-(E). Copper and ammonia are pollutants of concern.

Concentrations and Persistence:
Copper: 1.65 µg/L – 32.4 µg/L, high persistence (does not readily decay, degrade, transform, volatilize, hydrolyze, or photolyze)
Ammonia: 0.04 mg/L – 5.9 mg/L, low persistence (can decay, degrade, transform, volatilize, hydrolyze, or photolyze more readily)

**Potential Impacts:**

Copper: at elevated concentrations is toxic to marine life and can bioaccumulate in marine life and impact growth and reproduction; can cause adverse effects in fish, invertebrates, plants, and amphibians

Ammonia: can cause nutrient eutrophication of a waterbody, indirectly affecting aquatic life; accumulation in marine life can be toxic

**Form 2G Section 4– (Questions 1 and 2) Tier 2 Protection and Analysis (18 AAC 70.016(c)):**

1 and 2. Discharge is existing and previously authorized under a permit that has not yet expired. The existing discharge has not been terminated and will not be expanded therefore a Tier 2 analysis is not necessary.

**Form 2G Section 5 (Question 1)- Protection Level and Analysis (18 AAC 70.16(d))**

The discharge is not to a designated Tier 3 water.

The Department has determined that a Tier 2 analysis is not required. The discharge is existing and has not expanded from the prior permit issuance; there are no newly regulated pollutants and the effluent limits for copper and ammonia are more restrictive than in the prior permit. Therefore, a practicable alternative analysis under 18 AAC 70.016(c)(7)(D)(i) is not required.

The methods of prevention, control, and treatment of domestic wastewater the Department finds to be most effective and reasonable are currently in use at the facility and include meeting federal (40 CFR 133) and State (18 AAC 72.050) secondary treatment requirements as well as UV disinfection of the effluent prior to discharge.

Oil and water separators pre-treat many of the non-domestic wastestream contributions prior to conveyance of the water to the LOWS where further pretreatment occurs. Water from the LOWS is not released to the WWTF prior to testing, and, if a sheen is present, unless the total petroleum hydrocarbons is less than 1 mg/L.

Aircraft and vehicle washing accounts for a number of the non-domestic wastestream sources. In 1982 EPA considered regulating car washes that discharge as a point source but concluded that regulation of direct dischargers was not necessary as the amount and toxicity of the pollutants present in car wash discharge was insignificant and that when discharged to a POTW, that the POTW provides adequate treatment.

The heating plant at USCG Base Kodiak generates steam to heat a portion of the Base but does not produce steam for the generation of electricity; therefore, the Steam Electric Power Generating Effluent Guidelines do not apply to this discharge.

EPA’s Development Document for the Landfills Effluent Guidelines studied whether discharge of landfill wastewater would either pass through a POTW untreated or interfere with a POTW’s operations and therefore justify Pretreatment Standards. The result of EPA’s evaluation showed that POTWs could adequately treat discharges of landfill pollutants.

The reissued permit contains an Operation and Maintenance Plan (O&M Plan) requirement that includes specific best management pollution prevention measures and controls to prevent and/or minimize the generation and release of pollutants from the USCG Base Kodiak WWTF.

The Department has determined that the methods of pollution prevention, control, and treatment applied to all waste and other substances to be discharged are found by the department to be the most effective and practicable; therefore 18 AAC 70.016(c)(7)(D)(ii) finding is met.
18 AAC 70.016(c)(7)(F) 18 AAC 70.015 and this section have been applied consistent with 33 U.S.C. 1326 (Clean Water Act, sec. 316) with regard to potential thermal discharge impairments.

Discharges authorized under the permit are not associated with a potential thermal discharge impairment; therefore, the finding is not applicable.

7.0 OTHER PERMIT CONDITIONS

7.1 Quality Assurance Project Plan (QAPP)

The permittees are required to update, implement, and maintain their QAPP. The QAPP shall consist of standard operating procedures the permittees must follow for collecting, handling, storing, and shipping samples; laboratory analysis; precision and accuracy requirements; data reporting, including method detection/reporting limits; and quality assurance/quality control criteria. The permittees are required to amend the QAPP whenever any procedure addressed by the QAPP is modified. The plan shall be retained either electronically or physically at the facility’s office of record and made available to DEC upon request.

7.2 Operations and Maintenance Plan

The permittees are required to properly operate and maintain all facilities and systems of treatment and control. Proper operation and maintenance are essential to meet discharge limitations, monitoring requirements, and all other permit requirements. The permittees are required to update, implement, and maintain the O&M Plan and ensure that it includes appropriate best management practices and pollution prevention measures. The plan shall be retained either electronically or physically at the facility’s office of record and made available to DEC upon request.

7.3 Electronic Discharge Monitoring Report

The permittees must submit DMR data electronically through NetDMR per Phase I of the E-Reporting Rule (40 CFR 127) upon the effective date of the permit. Authorized persons may access permit information by logging into the NetDMR Portal (https://cdxnodengn.epa.gov/oeca-netdmr-web/action/login). DMRs submitted in compliance with the E-Reporting Rule are not required to be submitted as described in permit Appendix A – Standard Conditions unless requested or approved by the Department. Any DMR data required by the Permit that cannot be reported in a NetDMR field (e.g., mixing zone receiving water data), shall be included as an attachment to the NetDMR submittal. DEC has established an e-Reporting Information website at https://dec.alaska.gov/water/compliance/electronic-reporting-rule that contains general information about this new reporting format. Training materials and webinars for NetDMR can be found at https://netdmr.zendesk.com/home.

Phase II of the E-Reporting rule will integrate electronic reporting for all other reports required by the Permit (e.g., Annual Reports and Certifications) and implementation is expected to occur during the term of the permit. Permittees should monitor DEC’s E-Reporting Information website (http://dec.alaska.gov/water/compliance/electronic-reporting-rule) for updates on Phase II of the E-Reporting Rule and will be notified when they must begin submitting all other reports electronically. Until such time, other reports required by the Permit may be submitted in accordance with permit Appendix A – Standard Conditions.
7.4 Standard Conditions

Appendix A of the permit contains standard regulatory language that must be included in all APDES permits. These requirements are based on the regulations and cannot be challenged in the context of an individual APDES permit action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

8.0 OTHER LEGAL REQUIREMENTS

8.1 Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies to consult with the USFWS and NMFS to determine whether their actions could beneficially or adversely affect any threatened or endangered species or habitats. NMFS is responsible for administration of the ESA for listed cetaceans, seals, sea lions, sea turtles, anadromous fish, marine fish, marine plants, and corals. All other species (including polar bears, walrus, and sea otters) are administered by the USFWS.

As a state agency, DEC is not required to consult with these federal agencies regarding permitting actions; however, DEC voluntarily contacted the agencies to notify them of the proposed permit issuance and to obtain listings of threatened and endangered species near the discharge.

DEC contacted USFWS and the NMFS on October 6, 2021 and requested them to identify any threatened or endangered species under their jurisdiction in the vicinity of the USCG Base Kodiak WWTF outfall.

USFWS did not respond; however, DEC reviewed their website at https://ecos.fws.gov/ipac/ which showed that the area near the USCG Base Kodiak WWTF outfall may contain the threatened Northern Sea Otter and Steller’s Eider, and the endangered Short-tailed Albatross.

NMFS directed DEC to their endangered species mapper at https://www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper which showed that the area near the USCG Base Kodiak WWTF may contain the endangered Steller Sea Lion, and the Humpback, North Pacific Right, and Fin Whales.

The fact sheet and the permit will be provided to the agencies for review during the public notice period and any comments received from these agencies will be considered prior to issuance of the permit.

8.2 Essential Fish Habitat (EFH)

The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) designates EFH in waters used by anadromous salmon and various life stages of marine fish under NMFS jurisdiction. EFH refers to those waters and associated river bottom substrates necessary for fish spawning, breeding, feeding, or growth to maturity—including aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish. Spawning, breeding, feeding, or growth to maturity covers a species’ full life cycle necessary for fish from commercially-fished species to spawn, breed, feed, or grow to maturity. 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.

Section 305(b) of the Magnuson-Stevens Act 916 USC 1855(b)) requires federal agencies to consult NMFS when any activity proposed to be permitted, funded, or undertaken by a federal agency may have an adverse effect on designated EFH as defined by the Act. As a State agency, DEC is not required to consult with NMFS regarding permitting actions, but voluntarily contacts NMFS to notify them of the proposed permit issuance and to obtain listings of EFH in the area.
DEC contacted NMFS on October 6, 2021 to provide them the opportunity to share concerns with DEC regarding EFH. NMFS directed DEC to the National EFH Mapper (https://www.habitat.noaa.gov/apps/efhmapper/) which showed that the area near the USCG Base Kodiak WWTF could be an EFH area for Gulf of Alaska Groundfish, and Bering Sea/Aleutian Islands Groundfish.

This fact sheet and the permit will be provided to NMFS for review during the public notice period and any comments received from NMFS will be considered prior to issuance of the permit.

8.3 Sludge (Biosolids) Requirements

Sludge means any solid, semi-solid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. State and federal requirements regulate the management and disposal of sewage sludge (biosolids). The permittee must consult both state and federal regulations to ensure proper management of the biosolids and compliance with applicable requirements.

8.3.1 State Requirements

The Department separates wastewater and biosolids permitting. The permittee should contact the Department’s Solid Waste Program for information regarding state regulations for biosolids. The permittee can access the Department’s Solid Waste Program web page (https://dec.alaska.gov/eh/solid-waste) for more information and who to contact.

8.3.2 Federal Requirements

EPA is the permitting authority for the federal sewage sludge regulations at 40 CFR Part 503. Biosolids management and disposal activities are subject to federal requirements in Part 503. The Part 503 regulations are self-implementing, which means that a permittee must comply with the regulations even if no federal biosolids permit has been issued for the facility.

A POTW is required to apply for an EPA biosolids permit. The permittee should ensure that a biosolids permit application has been submitted to the EPA. In addition, the permittee is required to submit a biosolids permit application to the EPA for the use or disposal of sewage sludge at least 180 days before this APDES permit expires in accordance with 40 CFR §122.21(c)(2) and §122.21(q) (see also 18 AAC 83.110(c) and 18 AAC 83.310, respectively). The application form NPDES Form 2S can be found on the EPA website www.epa.gov under NPDES forms. The completed NPDES Form 2S should be submitted to:

U.S. Environmental Protection Agency,  
Region 10, NPDES Permits Unit OWW-130,  
Attention: Biosolids Contact,  
1200 Sixth Avenue, Suite 900,  
Seattle, WA 98101-3140.  
The EPA Region 10 telephone number is 1-800-424-4372.

Information about EPA’s biosolids program and CWA Part 503 is available at www.epa.gov and either search for ‘biosolids’ or go to the EPA Region 10 website link and search for ‘NPDES Permits’.

8.4 Permit Expiration

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


ADEC, 2018. 18 AAC 70, Water quality standards, as amended through April 6, 2018.


APPENDIX A. BASIS FOR EFFLUENT LIMITATIONS

A.1 Statutory and Regulatory Basis

18 Alaska Administrative Code (AAC) 70.010 prohibits conduct that causes or contributes to a violation of the water quality standards (WQS). 18 AAC 15.090 requires that permits include terms and conditions to ensure criteria are met, including operating, monitoring, and reporting requirements.

The regulations require the permitting authority to make this evaluation using procedures that 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 waterbody. The limits must be stringent enough to ensure that WQS are met and must be consistent with any available wasteload allocation. The Clean Water Act (CWA) requires a Publicly Owned Treatment Works (POTWs) to meet effluent limits based on available wastewater treatment technology, specifically, secondary treatment effluent limit standards found at Title 40 Code of Federal Regulations (CFR) 133, adopted by reference at 18 AAC 83.010(e). The Alaska Department of Environmental Conservation (Department or DEC) may find, by analyzing the effect of an effluent discharge on the receiving waterbody, that secondary treatment effluent limits are not sufficiently stringent to meet Alaska WQS. In such cases, the Department is required to develop more stringent water quality-based effluent limits (WQBELs), which are designed to ensure that the WQS of the receiving waterbody are met.

Secondary treatment effluent limits for POTWs do not limit every pollutant that may be present in the effluent. Limits have only been developed for five-day biochemical oxygen demand (BOD5), total suspended solids (TSS), and pH. Effluent from a POTW may contain other pollutants, such as bacteria, ammonia, or metals, depending on the type of treatment system used and the quality of the influent to the POTW. When technology-based effluent limits (TBELs) do not exist for a pollutant expected to be present in the effluent, the Department must determine if the pollutant may cause or contribute to an exceedance of a water-quality criterion for the waterbody. If a pollutant causes or contributes to an exceedance of a water-quality criterion, a WQBEL for the pollutant must be established in the permit. Table A-1 summarizes the basis for effluent limits contained in the permit. Further details for each effluent limit follow in this section.
Table A-1- Basis for Effluent Limits

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<th>Parameter</th>
<th>Units a</th>
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<th>Weekly Average</th>
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</table>

Footnotes:

a. Units: mgd = million gallons per day, mg/L = milligrams per liter, lbs/day = pounds per day, SU= standard units, FC/100 mL = Fecal Coliform per 100 milliliters, cfu/100 mL = colony forming units per 100 milliliters, µg/L= micrograms per liter

b. Not more than one sample, or if more than ten enterococci bacteria samples are collected during the 30-day monthly reporting period, not more than 10% of the samples may exceed a statistical threshold value of 130 cfu/100 mL.

A.2 Secondary Treatment Effluent Limitations

The CWA requires a POTW to meet 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. The secondary treatment standards in 40 CFR §133.102,
which the Department has adopted in 18 AAC 83.010(e), are TBELs that apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by application of secondary treatment in terms of BOD$_5$, TSS, and pH. In addition to the federal secondary treatment regulations in 40 CFR Part 133, the State of Alaska at 18 AAC 72.990(59) contains BOD$_5$ and TSS maximum daily characteristics. The secondary treatment limits are listed in Table A-2.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Average Monthly Limit</th>
<th>Average Weekly Limit</th>
<th>Daily Maximum Limit</th>
<th>Average Monthly Minimum Removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD$_5$</td>
<td>mg/L</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>85%</td>
</tr>
<tr>
<td>TSS</td>
<td>mg/L</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>SU</td>
<td>6.0 – 9.0 SU at all times</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A.3 Water Quality-Based Effluent Limitations

WQBELs included in Alaska Pollutant Discharge Elimination System (APDES) permits are derived from WQS. APDES regulation 18 AAC 83.435(a)(2) requires that permits include WQBELs that can achieve WQS established under CWA Section 303, including state narrative criteria for water quality. The State’s WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an antidegradation policy. The use classification system identifies the designated uses that each waterbody is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the state to support the designated use classification of each waterbody. Designated uses are those uses specified in WQS for each waterbody or segment whether or not they are being attained [40 CFR Section 131.3(f)]. Existing uses are those uses actually attained in a waterbody on or after November 28, 1975, whether or not they are included in the WQS [40 CFR Section 131.3].

Waterbodies in Alaska are designated for all uses unless the water has been reclassified under 18 AAC 70.230 as listed under 18 AAC 70.230(e). Some waterbodies in Alaska can also have site-specific water quality criteria per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b).

The receiving waterbody for the discharge, St. Paul Harbor, has not been reclassified, nor have site-specific water quality criteria been established. Therefore, St. Paul Harbor must be protected for all marine water designated uses. The marine water designated uses are: water supply for aquaculture, seafood processing and industrial; contact and secondary recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life.

A.3.1 Reasonable Potential Analysis

The Department used the process described in the Technical Support Document for Water Quality-Based Toxics Control (Environmental Protection Agency, 1991) and DEC’s guidance, APDES Permits Reasonable Potential Analysis and Effluent Limits Development Guide (June 30, 2014) to evaluate the USCG Base Kodiak WWTF’s effluent. Discharge monitoring reports from March 2017 to August 2021 and Form 2A Application to Discharge Effluent and Expanded Effluent Testing Data were reviewed to identify pollutants of concern. Pollutants of concern are those pollutants that already have a TBEL or WQBEL for a particular pollutant, pollutants with a total maximum load waste load allocation or watershed analysis, pollutants identified as present in the effluent through monitoring, or those pollutants that are likely to be present in the effluent based on the nature of the operation. The monitoring of the United States Coast Guard Base Kodiak Wastewater Treatment Facility’s (USCG Base Kodiak WWTF) effluent as reported in the above documents, revealed the presence of ammonia and copper at levels above water quality criteria; therefore, these pollutants are pollutants of concern and were selected for further reasonable potential analysis (RPA).
When evaluating the effluent to determine if WQBELs based on chemical-specific numeric criteria are needed, the Department projects the receiving waterbody concentration for each pollutant of concern downstream of where the effluent enters the receiving waterbody. The chemical-specific concentration of the effluent and receiving waterbody and, if appropriate, the dilution available from the receiving waterbody, are factors used to project the receiving waterbody concentration. If the projected concentration of the receiving waterbody exceeds the numeric criterion for a limited parameter, then there is a reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standard, and a WQBEL must be developed.

The Department may authorize a small volume of receiving water to provide dilution of the effluent; this volume is called a mixing zone. Mixing zone allowances will increase the allowable mass loadings of the pollutant to the waterbody. A mixing zone can be used only when there is adequate receiving waterbody flow volume, and the concentration of the pollutant of concern in the receiving waterbody is below the numeric water quality criterion necessary to protect the designated uses of the waterbody.

A.3.2 Specific Water Quality-Based Effluent Limits in the USCG Base Kodiak WWTF Permit

A.3.2.1 pH

Alaska WQS at 18 AAC 70.020(b)(18)(C) states that the pH water quality criteria for aquaculture and the growth and propagation of fish, shellfish, other aquatic life, and wildlife for marine water may not be less than 6.5 or greater than 8.5 standard units (SU).

DEC reviewed pH monitoring data from March 2017 to August 2021. During this time period the facility consistently met the above stated pH water-quality criteria. The minimum pH value reported was 6.5 SU and the maximum pH value reported was 7.6 SU. Therefore, the pH water quality-based limits contained in the prior permit (6.5 SU daily minimum, 8.5 SU daily maximum) are carried forward in the reissued permit.

A.3.2.2 Dissolved Oxygen (DO)

Alaska WQS at 18 AAC 70.020(b)(15)(A)(i) Aquaculture states that surface marine DO concentrations for aquaculture, contact recreation, secondary recreation, the harvesting for consumption of raw mollusks or other raw aquatic life, and the growth and propagation of fish, shellfish, other aquatic life, and wildlife, must not be less than 6.0 milligrams per liter (mg/L) and that in no case may DO levels exceed 17 mg/L.

DEC reviewed DO monitoring data from March 2017 to August 2021. During this period, with the exception of one reported concentration of 3.5 mg/L, the facility consistently met the above stated DO water-quality criteria. With the exception of the 3.5 mg/L excursion from water quality criteria, DO daily concentrations ranged from a minimum of 6.0 mg/L to a maximum of 11 mg/L. Therefore, the DO water quality-based limits contained in the prior permit (6.0 mg/L daily minimum, 17 mg/L daily maximum) are carried forward in the reissued permit.

A.3.2.3 Fecal Coliform (FC) Bacteria

Alaska WQS at 18 AAC 70.020(b)(14)(D) states that the FC bacteria criteria for the harvesting for consumption of raw mollusks or other raw aquatic life the geometric mean of samples may not exceed 14 FC/100 mL, and not more than 10% of the samples may exceed a FC most probable number of 43 FC/100 mL.

DEC reviewed FC bacteria monitoring data from March 2017 to August 2021. During this period, with the exception of one reported concentration of 89 FC/100 mL, the facility consistently met the above stated FC Bacteria water-quality criteria. Excluding the one exceedance, the daily maximum results ranged from 1 FC/100 mL (which was flagged as non-detect in laboratory reports) to 36 FC/100 mL. Twenty-two of the 54 daily maximum reported results were reported at the non-detect 1 FC/100 mL concentration. Therefore, the
FC Bacteria water quality-based limits contained in the prior permit (14 FC/100 mL monthly average, 43 FC/100 mL daily maximum) are carried forward in the reissued permit.

### A.3.2.4 Enterococci Bacteria

Alaska WQS at 18 AAC 70.020(b)(14)(B) for contact recreation specifies that the enterococci bacteria concentration shall not exceed 35 enterococci cfu/100mL, and not more than an 10% of the samples may exceed a concentration of 130 enterococci cfu/100mL. Contact recreation is defined as activities in which there is direct and intimate contact with water. These activities typically only take place during the summer season, May to September.

DEC reviewed enterococci bacteria monitoring data from March 2017 to August 2021. During this period, the facility consistently met the above stated Enterococci Bacteria water-quality criteria. Daily maximum results ranged from 1 colony forming units per 100 milliliters (cfu/100 mL) to 10 cfu/100 mL. It is reasonable to assume that the USCG Base Kodiak WWTF will continue to produce effluent with similar enterococci bacteria concentrations. Therefore, Enterococci Bacteria water quality criteria (35 cfu/100 mL monthly average, 130 cfu/100 mL daily maximum), rather than the report monitoring results of the prior permit, are applied in the reissued permit.

### A.3.2.5 Total Ammonia, as Nitrogen

Alaska WQS at 18 AAC 70.020(b)(23) states that the concentration of substances in water may not exceed the numeric criteria in the Alaska Water Quality Criteria Manual. Total ammonia is the sum of ionized (NH4+) and un-ionized ammonia (NH3). Temperature, pH, and salinity affect which form, NH4+ or NH3 is present. NH3 is more toxic to aquatic organisms than NH4+ and predominates with higher temperature and pH. Biological wastewater treatment processes reduce the amount of total nitrogen in domestic wastewater; however, without advanced treatment, wastewater effluent may still contain elevated levels of ammonia as nitrogen. Excess ammonia as nitrogen in the environment can lead to dissolved oxygen depletion, eutrophication, and toxicity to aquatic organisms.

DEC used the 85th percentile of the pH, temperature, and salinity receiving water data collected by the USCG from St. Paul Harbor to establish an acute ammonia water quality criterion of 6.7 mg/L and a chronic ammonia water quality criterion of 1.0 mg/L. Effluent ammonia monitoring from March 2017 to August 2021 daily maximum results ranged from 0.04 mg/L to 5.9 mg/L.

Because the USCG Base Kodiak WWTF’s ammonia monitoring results indicated exceedances for both acute and chronic water quality criteria; ammonia was selected for RPA which demonstrated that there is reasonable potential for ammonia to exceed water quality criteria at the end of pipe. Since there is reasonable potential for ammonia to exceed water quality criteria at the end of the pipe, WQBELs were developed for ammonia (daily maximum 19 mg/L, average monthly 6.0 mg/L) that are protective of water quality criteria at the boundary of the mixing zone.

18 AAC 83.530(d) requires effluent limits from a continuously discharging POTW to be stated as average weekly and average monthly limits unless impracticable. Secondary treatment standards at 18 AAC 83.605 establishes average weekly limits (AWL) as being 1.5 times the average monthly limit (AML). Following this precedent, the AWL for ammonia is derived by multiplying ammonia’s AML of 6.0 mg/L 1.5 times to obtain an AWL of 9.0 mg/L. See Appendix B for details on reasonable potential determination and Appendix C for details on permit limit derivation.

### A.3.2.6 Copper, total recoverable

Alaska WQS at 18 AAC 70.020(b)(23) states that the concentration of substances in water may not exceed the numeric criteria for aquatic life for marine water shown in the Alaska Water Quality Criteria Manual. The acute aquatic life copper concentration (total recoverable) may not exceed 5.8 micrograms per liter (µg/L) and the chronic aquatic life copper concentration (total recoverable) may not exceed 3.7 µg/L.
DEC reviewed Copper monitoring data from March 2017 to August 2021. Results ranged from 1.7 µg/L to 32 µg/L. The reasonable potential analysis conducted on the data demonstrates that there is reasonable potential for copper to exceed water quality criteria. Since there is reasonable potential for copper to exceed water quality criteria at the end of the pipe, WQBELs were developed for copper (daily maximum 39 µg/L, average monthly 18 µg/L) that are protective of water quality criteria at the boundary of the mixing zone.

18 AAC 83.530(d) requires effluent limits from a continuously discharging POTW to be stated as average weekly and average monthly limits unless impracticable. Secondary treatment standards at 18 AAC 83.605 establishes AWLs as being 1.5 times the AML. Following this precedent, the AWL for copper is derived by multiplying ammonia’s AML of 18 µg/L 1.5 times to obtain an AWL of 27 µg/L. See Appendix B for details on reasonable potential determination and Appendix C for details on permit limit derivation.

A.3.2.7 Petroleum Hydrocarbons

Alaska WQS at 18 AAC 70.020(b)(17) for aquaculture and the growth and propagation of fish, shellfish, other aquatic life, and wildlife, states that total aqueous hydrocarbons (TAqH) in the water column may not exceed 15 µg/L and total aromatic hydrocarbons (TAH) in the water column may not exceed 10 µg/L.

DEC reviewed TAqH and TAH monitoring data from March 2017 to August 2021. During this period, the facility consistently met the above stated TAqH and TAH water-quality criteria. TAqH daily maximum results ranged from 0.044 µg/L to 2.7 µg/L, TAH daily maximum results ranged from 0.056 µg/L to 2.7 µg/L. Therefore, the TAqH and TAH water quality-based limits of the prior permit are carried forward in the reissued permit.
APPENDIX B. REASONABLE POTENTIAL DETERMINATION

The following describes the process the Alaska Department of Environmental Conservation (the Department or DEC) used to determine if the discharge authorized in the draft permit has the reasonable potential to cause or contribute to a violation of Alaska Water Quality Standards (WQS). The Department used the process described in the Technical Support Document (TSD) for Water Quality-Based Toxics Control (Environmental Protection Agency, 1991) and DEC’s guidance, Alaska Pollutant Discharge Elimination System Permits Reasonable Potential Analysis and Effluent Limits Development Guide (June 30, 2014) (RPA Guide) to determine the reasonable potential for any pollutant to exceed a water quality numeric criterion.

To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, the Department compares the maximum projected receiving waterbody concentration to the criteria for that pollutant. Reasonable potential to exceed exists if the projected receiving waterbody concentration exceeds water quality criteria, and a water quality-based effluent limit (WQBEL) must be included in the permit (18 Alaska Administrative Code 83.435).

The ambient concentration in the mass balance equation is based on a reasonable worst-case estimate of the pollutant concentration upstream from the discharge. For criteria that are expressed as maxima, the 85th percentile of the ambient data is generally used as an estimate of the worst case. If ambient data is not available, DEC uses 15% of the most stringent given pollutant’s criteria as a worst-case example. Copper is used as an example to demonstrate the reasonable potential determination process.

B.1 Mass Balance

For a discharge to a flowing waterbody, the maximum projected receiving waterbody concentration is determined using a steady state model represented by the following mass balance equation:

\[ C_d Q_d = C_e Q_e + C_u Q_u \]  \hspace{1cm} (Equation B-1)

Where,

- \( C_d \) = Receiving waterbody concentration downstream of the effluent discharge
- \( C_e \) = Maximum projected effluent concentration
- \( C_u \) = Assumed receiving waterbody ambient concentration
- \( Q_d \) = Receiving waterbody flow rate = \( Q_e + Q_u \)
- \( Q_e \) = Effluent flow rate (set equal to the design flow of the wastewater treatment facility)
- \( Q_u \) = Receiving waterbody flow rate

When the mass balance equation is solved for \( C_d \), it becomes:

\[ C_d = \frac{C_e Q_e + C_u Q_u}{Q_e + Q_u} \]  \hspace{1cm} (Equation B-2)

The above form of the equation assumes that the discharge is rapidly and completely mixed with the receiving waterbody. If a mixing zone based on a percentage of the critical flow in the receiving waterbody is authorized based on the assumption of incomplete mixing with the receiving waterbody, the equation becomes:

\[ C_d = \frac{C_e Q_e + C_u (Q_u \times MZ)}{Q_e + (Q_u \times MZ)} \]  \hspace{1cm} (Equation B-3)

Where, \( MZ \) = the fraction of the receiving waterbody flow available for dilution.
Where mixing is rapid and complete, MZ is equal to 1 and equation B-2 is equal to equation B-3 (i.e., all of the critical low flow volume is available for mixing). If a mixing zone is not authorized, dilution is not considered when projecting the receiving waterbody concentration, and

\[ C_d = C_e \]  \hspace{1cm} \text{(Equation B-4)}

In other words, if a mixing zone is not authorized, the Department considers only the concentration of the pollutant in the effluent regardless of the upstream flow and concentration. If the concentration of the pollutant in the effluent is less than the WQS numeric criteria, the discharge cannot cause or contribute to a water quality violation for that pollutant. In this case, the mixing or dilution factor (% MZ) is equal to zero and the mass balance equation is simplified to \( C_d = C_e \).

Equation B-2 can be simplified by introducing a dilution factor (D):

\[ D = \frac{Q_e + Q_u}{Q_e} \]  \hspace{1cm} \text{(Equation B-5)}

After the D simplification, this becomes:

\[ C_d = \frac{(C_e - C_u)}{D} + C_u \]  \hspace{1cm} \text{(Equation B-6)}

### B.2 Maximum Projected Effluent Concentration

To calculate the maximum projected effluent concentration, the Department used the procedure described in section 3.3 of the TSD, “Determining the Need for Permit Limits with Effluent Monitoring Data” and the process described in section 2.4 of DEC’s RPA Guide. In this procedure, the 99th percentile of the effluent data is the maximum projected effluent concentration which is used in the calculation of the maximum projected receiving waterbody concentration.

Since there are a limited number of data points available, the 99th percentile is calculated by multiplying the maximum observed effluent concentration (MOC) by a reasonable potential multiplier (RPM). The RPM is the ratio of the 99th percentile concentration to the MOC and accounts for the statistical uncertainty in the effluent data. The RPM is calculated from the coefficient of variation (CV) of the data and the number of data points. The CV is defined as the ratio of the standard deviation of the data set to the mean. When fewer than 10 data points are available, the TSD and DEC’s RPA Guide recommends assuming that the CV is equal to 0.6. A CV value of 0.6 is a conservative estimate that assumes a relatively high variability. In the example of copper, the Department used ProUCL, a statistical software program, to determine a CV of 0.6976. ProUCL indicated that the data set follows a Non-Parametric (Kaplan-Meier) statistical distribution. Therefore, the RPM equation in section 2.4.2.1 of the RPA Guide is used to determine the RPM for copper.

\[ RPM = \frac{\hat{\mu}_n + z_{99} \hat{\sigma}}{\hat{\mu}_n + p_n \hat{\sigma}} \]  \hspace{1cm} \text{(Equation B-7)}

Where,

- \( z_{99} \) = the z – statistic at the 99th percentile = 2.326
- \( \hat{\mu}_n \) = mean calculated by ProUCL = 8.976
- \( \hat{\sigma} \) = the standard deviation calculated by ProUCL = 6.262
- \( p_n \) = the z – statistic at the 95th percent confidence level of \((1 - 0.95)^{\frac{1}{n}} = 0.954\)
- \( n \) = number of valid data samples = 63
RPM = 1.2

The maximum expected concentration (MEC) is determined by multiplying the MOC by the RPM:

\[ MEC = (RPM)(MOC) \]

(Equation B-8)

MOC = 32.4 micrograms per liter (µg/L)

In the case of copper,

\[ MEC = (1.2)(32.4) = 38.8 \, \text{µg/L} \]

**Comparison with ammonia water quality criteria**

In order to determine if RP exists for this discharge to exceed water quality criteria, the highest projected concentration is compared with the most stringent water quality criteria.

MEC = 39 mg/L > 5.8 µg/L (acute copper criterion) and 3.7 µg/L (chronic copper criterion)

YES, there is RP for copper to violate water quality criteria

Since there is RP for the effluent to cause an exceedance of water quality criteria for protection of aquatic life, and because copper is the parameter requiring the most dilution of pollutants that demonstrate reasonable potential to exceed water quality criteria, a WQBEL for copper is required. See Appendix C for that calculation.

Table B-1 summarizes the data, multipliers, and criteria used to determine reasonable potential to exceed water quality criteria for copper and ammonia. For each parameter, the MEC equals the maximum observed effluent concentration times the RPM producing a number based on wastewater treatment facility performance, which was used to determine if there is a reasonable potential for the effluent to exceed WQS.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Max Observed Effluent Conc.</th>
<th>Number of Samples</th>
<th>Coefficient of Variation (CV)</th>
<th>Reasonable Potential Multiplier (RPM)</th>
<th>Max Expected Effluent Conc. (MEC)</th>
<th>Most Stringent Water Quality Criterion</th>
<th>Reasonable Potential (yes or no)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper (µg/L)</td>
<td>32</td>
<td>63</td>
<td>0.7</td>
<td>1.2</td>
<td>39</td>
<td>5.8 (acute) 3.7 (chronic)</td>
<td>yes</td>
</tr>
<tr>
<td>Ammonia as N (milligrams per liter)</td>
<td>5.9</td>
<td>51</td>
<td>2.2</td>
<td>1.4</td>
<td>8.1</td>
<td>6.7 (acute) 1.0 (chronic)</td>
<td>yes</td>
</tr>
</tbody>
</table>
APPENDIX C. SELECTION OF EFFLUENT LIMITS

If the Alaska Department of Environmental Conservation (the Department or DEC) does not authorize a mixing zone, water quality standards (WQS) numeric criteria are applied at the end of the pipe, and technology-based effluent limits (TBELs) are selected for those parameters that are solely technology based.

When DEC authorizes a mixing zone, parameters are identified in the mixing zone that will require dilution to meet WQS numeric criteria. If there are TBELs for an identified parameter in the mixing zone, TBELs apply at the end of the pipe, and WQS numeric criteria for that parameter, apply at the boundary of the mixing zone. If the reasonable potential analysis (RPA) requires the development of water-quality based effluent limits (WQBELs) for specific parameters in order to protect human health criteria at the boundary of the mixing zone, WQBELs are applied as end-of-pipe effluent limits. Those parameters that are not identified in the authorized mixing zone, must meet applicable water quality numeric criteria at the end of pipe. In the absence of water quality criteria for a particular pollutant, such as for 5-day biochemical oxygen demand (BOD₅) and total suspended solids (TSS), TBELs are applied as end-of-pipe effluent limits.

In the case of the United States Coast Guard Base Kodiak Wastewater Treatment Facility (USCG Base Kodiak WWTF), copper demonstrated reasonable potential to exceed at the end of pipe and required the most dilution to meet water quality criteria at the boundary of the authorized mixing zone; therefore, the Department developed WQBELs for copper.

C.1 Effluent Limit Calculation

Once the Department determines that the effluent has a reasonable potential to exceed a WQS, a WQBEL for the pollutant is developed. The Department used the process described in the Technical Support Document (TSD) for Water Quality-Based Toxics Control (Environmental Protection Agency, 1991) and DEC’s guidance, Alaska Pollutant Discharge Elimination System RPA and Effluent Limits Development Guide (June 30, 2014) (RPA Guide) to calculate WQBELs for copper. The first step in calculating WQBELs is the development of a wasteload allocation (WLA) for the pollutant.

C.2 Mixing Zone-based WLA

When the Department authorizes a mixing zone for the discharge, the WLA is calculated using the available dilution, background concentrations of the pollutant, and the WQS. For human health criteria, the WLA is applied directly as an average monthly limit (AML). The daily maximum limit (DML) is then calculated from the AML by applying a multiplier.

C.3 “End-of-Pipe” WLAs

In many cases, there is no dilution available, either because the receiving waterbody exceeds the criteria or because the Department does not authorize a mixing zone for a particular pollutant. When there is no dilution available, the criterion becomes the WLA. Establishing the criterion as the WLA ensures that the permittee’s discharge does not contribute to an exceedance of the criterion. When a human health criterion applies to a pollutant, the chronic dilution factor is used to calculate a WLA.

C.4 Permit Limit Derivation

The Department applies the statistical approach described in Chapter 5 of the TSD to calculate the DML and the AML. This approach considers effluent variability (using the coefficient of variation (CV)) and sampling frequency.

The DML is based on the CV of the data and the probability basis, while the AML is dependent on these two variables and the monitoring frequency. As recommended in the TSD, the Department used a probability basis of 95% for the AML calculation and 99% for the DML calculation.
The following is a summary of the steps to derive WQBELs from WQS numeric criteria for pollutants that have reasonable potential to exceed water quality numeric criteria. These steps are found in the RPA Guide and the guidance’s accompanying Microsoft Excel RPA Tool. The guidance and tool were used to calculate the DML and AML for copper in the USCG Base Kodiak WWTF permit. Copper is illustrated below as an example.

**Step 1- Determine the WLA**

The first step in developing a WQBEL is to develop a WLA for the pollutant. A WLA is the concentration or loading of a pollutant that the permittee may discharge without causing or contributing to an exceedance of water quality criteria or a total maximum daily load in the receiving waterbody.

In cases where a mixing zone is not authorized, either because the receiving waterbody already exceeds the criterion, the receiving waterbody flow is too low to provide dilution, or for some other reason one is not authorized, the criterion becomes the WLA. Establishing the criterion as the WLA ensures that the permittee will not cause or contribute to an exceedance of the criterion.

The acute and chronic aquatic life criteria are converted to WLAs using the following equation:

\[
WLA_{a,c,hh} = (WQC_{a,c,hh})(D_{a,c,hh}) + C_s(1 - D_{a,c,hh})
\]

\[
WLA_{a,c,hh} = WQC_{a,c,hh}\left(\frac{Q_d + Q_s}{Q_d}\right) + C_s\left(1 - \left[\frac{Q_d + Q_s}{Q_d}\right]\right)
\]

Where:
- \(D_{a,c,hh} = \text{Dilution} = \frac{(Q_d + Q_s)}{Q_d}\)
- \(D_{hh} = \text{Dilution [Human Health]} = D_c \text{ (Dilution [Chronic Aquatic Life])}\)
- \(Q_d = \text{Critical Discharge Flow}\)
- \(C_s = \text{Critical Upstream Concentration}\)
- \(WLA_{a,c} = \text{Wasteload Allocation (acute, ammonia)}\)
- \(WQC_{a,c} = C_r = \text{Water Quality Criterion (acute, chronic)}\)

For copper,
- \(D_a = 7.4\)
- \(D_c = 12\)
- \(C_s = 0.58 \text{ micrograms per liter (µg/L)}\)
- \(WLA_a = 39 \text{ µg/L}\)
- \(WQC_c = 38 \text{ µg/L}\)

**Step 2 - Determine the Long-Term Average (LTA)**

The WLAs are converted to LTAs using multipliers that are derived from equations in section 5.4 of the TSD:

\[
LTA_a = WLA_a \times \exp(0.5 \sigma_a^2 - z_{99} \sigma)
\]

\[
LTA_c = WLA_c \times \exp(0.5 \sigma_c^2 - z_{99} \sigma)
\]

Where:
- \(z_{99} = \text{the z - statistic at the } 99^{th} \text{ percentile} = 2.326\)
- \(LTA_a \text{ only: } \sigma = \ln[CV^2 + 1]^{1/2}\)
\[ LTA_a \text{ only: } \sigma^2 = \ln(CV^2 + 1) \]

\[ LTA_c \text{ only: } \sigma^4 = \ln \left( \frac{(CV^2)}{4} + 1 \right)^{1/2} \]

\[ LTA_c \text{ only: } \sigma^2 = \ln \left( \frac{(CV^2)}{4} + 1 \right) \]

\[ CV = \text{coefficient of variation} \]

For copper:
\[ CV = 0.6976 \]
\[ LTA_a = 11 \, \mu g/L \]
\[ LTA_c = 19 \, \mu g/L \]

**Step 3 – Choosing the More Limiting LTA**

To protect a waterbody from both acute and chronic effects, the more limiting of the two LTAs is used to derive the effluent limits. In the case of copper, the \( LTA_a \) is more limiting.

**Step 4 - Calculate the Permit Limits**

The DML and AML are calculated using the following equations that are found in Table 5-2 of the TSD:

\[ DML_{\text{aquatic life}} = LTA \ast \exp(z_99 \sigma - 0.5 \sigma^2) \]

Where:
\[ z_{99} = \text{the } z - \text{statistic at the } 99^{th} \text{percentile} = 2.326 \]
\[ \sigma_n = \ln(CV^2 + 1)^{1/2} \]
\[ \sigma^2_n = \ln(CV^2 + 1) \]
\[ CV = \text{coefficient of variation} \]

\[ AML_{\text{aquatic life}} = LTA \ast \exp(z_{95} \sigma_n - 0.5 \sigma^2_n) \]

Where:
\[ z_{95} = \text{the } z - \text{statistic at the } 95^{th} \text{percentile} = 1.645 \]
\[ \sigma_n = \ln \left( \frac{(CV^2)}{n} + 1 \right)^{1/2} \]
\[ \sigma^2_n = \ln \left( \frac{(CV^2)}{n} + 1 \right) \]
\[ CV = \text{coefficient of variation} \]
\[ n = \text{number of samples per month} \]
For copper:

\[
CV = 0.6976 \\
n = 63 \\
DML = 39 \mu g/L \\
AML = 18 \mu g/L
\]

C.5 Mass-Based Limits

Alaska Pollutant Discharge Elimination System regulations at 18 Alaska Administrative Code (AAC) 83.540 require that effluent limits be expressed in terms of mass unless they cannot appropriately be expressed by mass, if it is infeasible, or if the limits can be expressed in terms of other units of measurement. In addition, 18 AAC 83.520 requires that effluent limits for a publicly owned treatment works be calculated based on the design flow of the facility. Expressing limitations in terms of concentration as well as mass encourages the proper operation of a facility at all times. The mass-based limits are expressed in pounds per day and are calculated as follows:

\[
\text{mass-based limit (pounds (lbs)/day)} = \text{concentration limit (milligrams per liter)} \times \text{design flow (million gallons per day (mgd))} \times 8.34 \text{ (lbs/gallon)}
\]

C.6 Flow

Flow is based on the hydraulic design capacity of the WWTF (flow rate as gallons or mgd) and is determined by a professional engineer and approved by the Department during the WWTF plan review process conducted per 18 AAC 72. A flow limit based on the design capacity ensures that the WWTF operates within its capabilities to receive and properly treat sustained average flow quantities and specific pollutants. Based on updated information from the facility, the daily maximum flow rate has been adjusted in the reissued permit from 1.5 mgd to 1.2 mgd.

C.7 Effluent Limit Summary

Table C-1 provides a summary and reference to those parameters in the USCG Base Kodiak WWTF that contain effluent limits at the point of discharge.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Fact Sheet Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>BODs</td>
<td>Appendix A-Section A.2</td>
</tr>
<tr>
<td>TSS</td>
<td>Appendix A-Section A.2</td>
</tr>
<tr>
<td>pH</td>
<td>Appendix A-Section A.3.2.1</td>
</tr>
<tr>
<td>Dissolved Oxygen</td>
<td>Appendix A-Section A.3.2.2</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria</td>
<td>Appendix A-Section A.3.2.3</td>
</tr>
<tr>
<td>Enterococci Bacteria</td>
<td>Appendix A-Section A.3.2.3</td>
</tr>
<tr>
<td>Total Ammonia, as Nitrogen</td>
<td>Appendix A-Section A.3.2.4</td>
</tr>
<tr>
<td>Copper, total recoverable</td>
<td>Appendix A-Section A.3.2.5</td>
</tr>
<tr>
<td>Total Aqueous Hydrocarbons and</td>
<td>Appendix A-Section A.3.2.6</td>
</tr>
<tr>
<td>Total Aromatic Hydrocarbons</td>
<td></td>
</tr>
</tbody>
</table>

Table C-1- Summary of Effluent Limitations
APPENDIX D. MIXING ZONE ANALYSIS CHECKLIST

The purpose of the Mixing Zone Checklist is to guide the permit writer through the mixing zone regulatory requirements to determine if all the mixing zone criteria at 18 AAC 70.240 are satisfied, as well as provide justification to authorize a mixing zone in an Alaska Pollutant Discharge Elimination System permit. See Fact Sheet Section 4.3 for the United States Coast Guard Base Kodiak Wastewater Treatment Facility mixing zone analysis.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
<th>Resources</th>
<th>Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>Is the mixing zone as small as practicable?</td>
<td>Technical Support Document for Water Quality-Based Toxics Control</td>
<td>18 AAC 70.240(k)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DEC's Reasonable Potential Analysis Guidance</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Environmental Protection Agency’s Permit Writers’ Manual</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CORMIX</td>
<td></td>
</tr>
<tr>
<td>Technology</td>
<td>Were the most effective technological and economical methods used to disperse, treat, remove, and reduce pollutants?</td>
<td>18 AAC 70.240(c)(1)</td>
<td></td>
</tr>
<tr>
<td>Low Flow Design</td>
<td><strong>For streams, rivers, or other flowing fresh waters.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Determine low flow calculations or documentation for the applicable parameters.</td>
<td></td>
<td>18 AAC 70.240(l))</td>
</tr>
<tr>
<td>Existing Use</td>
<td>Does the mixing zone…</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) maintain and protect designated and existing uses of the waterbody as a whole?</td>
<td>18 AAC 70.240(c)(2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>If yes, mixing zone may be approved as proposed or authorized with conditions.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) impair overall biological integrity of the waterbody?</td>
<td></td>
<td>18 AAC 70.240(c)(3)</td>
</tr>
<tr>
<td></td>
<td><strong>If yes, mixing zone may be approved as proposed or authorized with conditions.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3) create a public health hazard that would preclude or limit existing uses of the waterbody for water supply or contact recreation?</td>
<td></td>
<td>18 AAC 70.240(c)(4)(B)</td>
</tr>
<tr>
<td>Criteria</td>
<td>Description</td>
<td>Resources</td>
<td>Regulation</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------</td>
<td>---------------------</td>
</tr>
<tr>
<td></td>
<td>(4) preclude or limit established processing activities or established commercial, sport, personal use, or subsistence fish and shellfish harvesting? If yes, mixing zone may be approved as proposed or authorized with conditions.</td>
<td></td>
<td>18 AAC 70.240(c)(4)(C)</td>
</tr>
<tr>
<td>Human consumption</td>
<td>Does the mixing zone…</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) produce objectionable color, taste, or odor in aquatic resources harvested for human consumption? If yes, mixing zone may be approved as proposed or authorized with conditions.</td>
<td></td>
<td>18 AAC 70.240(d)(6)</td>
</tr>
<tr>
<td>Spawning Areas</td>
<td>Does the mixing zone…</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) discharge in a spawning area for anadromous fish or Arctic grayling, northern pike, rainbow trout, lake trout, brook trout, cutthroat trout, whitefish, sheefish, Arctic char (Dolly Varden), burbot, and landlocked coho, chinook, and sockeye salmon?</td>
<td></td>
<td>18 AAC 70.240(f)</td>
</tr>
<tr>
<td></td>
<td><strong>If yes, mixing zone prohibited.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Health</td>
<td>Does the mixing zone…</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) contain bioaccumulating, bioconcentrating, or persistent chemical above natural or significantly adverse levels? If yes, mixing zone may be approved as proposed or authorized with conditions.</td>
<td></td>
<td>18 AAC 70.240(d)(1)</td>
</tr>
<tr>
<td></td>
<td>2) contain chemicals expected to present an unacceptable risk to human health from carcinogenic, mutagenic, teratogenic, or other effects as determined using risk assessment methods approved by the Department? If yes, mixing zone may be approved as proposed or authorized with conditions.</td>
<td></td>
<td>18 AAC 70.240(d)(2)</td>
</tr>
<tr>
<td></td>
<td>(5) occur in a location where the department determines that a public health hazard reasonably could be expected? If yes, mixing zone may be approved as proposed or authorized with conditions.</td>
<td></td>
<td>18 AAC 70.240(k)(4)</td>
</tr>
<tr>
<td>Criteria</td>
<td>Description</td>
<td>Resources</td>
<td>Regulation</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>Aquatic Life</td>
<td>Does the mixing zone…</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) result in a reduction in fish or shellfish population levels? If yes, mixing zone may be approved as proposed or authorized with conditions.</td>
<td></td>
<td>18 AAC 70.240(c)(4)(d)</td>
</tr>
<tr>
<td></td>
<td>(2) form a barrier to migratory species or fish passage? If yes, mixing zone may be approved as proposed or authorized with conditions.</td>
<td></td>
<td>18 AAC 70.240(c)(4)(G)</td>
</tr>
<tr>
<td></td>
<td>(3) result in undesirable or nuisance aquatic life? If yes, mixing zone may be approved as proposed or authorized with conditions.</td>
<td></td>
<td>18 AAC 70.240(d)(5)</td>
</tr>
<tr>
<td></td>
<td>(4) result in permanent or irreparable displacement of indigenous organisms? If yes, mixing zone may be approved as proposed or authorized with conditions.</td>
<td></td>
<td>18 AAC 70.240(c)(4)(E)</td>
</tr>
<tr>
<td></td>
<td>(5) result in a reduction in fish or shellfish population levels? If yes, mixing zone may be approved as proposed or authorized with conditions.</td>
<td></td>
<td>18 AAC 70.240(c)(4)(D)</td>
</tr>
<tr>
<td></td>
<td>(6) prevent lethality to passing organisms; or exceed acute aquatic life criteria at and beyond the boundaries of a smaller initial mixing zone surrounding the outfall, the size of which shall be determined using methods approved by the Department?</td>
<td></td>
<td>18 AAC 70.240(d)(7) 18 AAC 70.240(d)(8)</td>
</tr>
<tr>
<td></td>
<td>(7) cause a toxic effect in the water column, sediments, or biota outside the boundaries of the mixing zone? If yes, mixing zone may be approved as proposed or authorized with conditions.</td>
<td></td>
<td>18 AAC 70.240(c)(4)(A)</td>
</tr>
<tr>
<td>Criteria</td>
<td>Description</td>
<td>Resources</td>
<td>Regulation</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------</td>
<td>-----------------------------------------</td>
</tr>
</tbody>
</table>
| Endangered Species | Are there threatened or endangered species (T/E spp) at the location of the mixing zone?  
If yes, are there likely to be adverse effects to T/E spp based on comments received from the United States Fish and Wildlife Service or National Oceanic and Atmospheric Association?  
If yes, will conservation measures be included in the permit to avoid adverse effects?  
**If yes, mixing zone may be approved as proposed or authorized with conditions.** |           | 18 AAC 70.240(c)(4)(F)                 |
## Appendix E- Non-domestic Wastestreams

<table>
<thead>
<tr>
<th>Source</th>
<th>Wastestream</th>
<th>Daily Minimum Flow (gpd)</th>
<th>Daily Maximum Flow (gpd)</th>
<th>Discharge Frequency</th>
<th>Pretreatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hangar 1 (Building 14)</td>
<td>Lockheed C-130 Jayhawk helicopter (C-130) airframe washing</td>
<td>0</td>
<td>5,000</td>
<td>Intermittent (weekly)</td>
<td>Sump/Sediment Trap</td>
</tr>
<tr>
<td></td>
<td>C-130 engine compressor cleaning</td>
<td>0</td>
<td>200</td>
<td>Intermittent (weekly)</td>
<td>None</td>
</tr>
<tr>
<td>Hangar 2 (Building 20)</td>
<td>Boat wash</td>
<td>0</td>
<td>20</td>
<td>Intermittent (infrequent in summer only)</td>
<td>Grit chamber</td>
</tr>
<tr>
<td>Hangar 3 (Building 15)</td>
<td>Sikorsky MH-60 Jayhawk helicopter (MH-60), Eurocopter MH-65 Dolphin helicopter (MH-65) airframe washing</td>
<td>500</td>
<td>2,000</td>
<td>Intermittent (daily)</td>
<td>Oil Water Separator/ Liquid Oily Waste System (OWS/LOWS)</td>
</tr>
<tr>
<td></td>
<td>MH-60, MH-65 engine washing</td>
<td>0</td>
<td>8</td>
<td>Intermittent (as needed)</td>
<td>OWS/LOWS</td>
</tr>
<tr>
<td></td>
<td>MH-60, MH-65 engine compressor washing</td>
<td>0</td>
<td>15</td>
<td>Intermittent (daily)</td>
<td>OWS/LOWS</td>
</tr>
<tr>
<td>Fuel Pier (Building 621)</td>
<td>Stormwater</td>
<td>0</td>
<td>18,000</td>
<td>Intermittent (when raining)</td>
<td>OWS/LOWS</td>
</tr>
<tr>
<td>Old Power Plant (Building 12)</td>
<td>Basement sump</td>
<td>0</td>
<td>45,000</td>
<td>Intermittent (as needed)</td>
<td>OWS/LOWS</td>
</tr>
<tr>
<td>USCG Landfill</td>
<td>Landfill leachate</td>
<td>41,000</td>
<td>95,000</td>
<td>Continuous</td>
<td>None</td>
</tr>
<tr>
<td>Liquid Oily Waste System (Building N56)</td>
<td>Treated oily wastewater and secondary containment water (stormwater)</td>
<td>0</td>
<td>15,000</td>
<td>Intermittent (as needed)</td>
<td>OWS, chemical treatment, filtration</td>
</tr>
<tr>
<td>Source</td>
<td>Wastestream</td>
<td>Daily Minimum Flow (gpd)</td>
<td>Daily Maximum Flow (gpd)</td>
<td>Discharge Frequency</td>
<td>Pretreatment</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>--------------------------------------------</td>
<td>--------------------------</td>
<td>--------------------------</td>
<td>----------------------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Public Works Garage (Building N1)</td>
<td>Vehicle washing, corrosion control coupon station</td>
<td>5,700</td>
<td>10,000</td>
<td>Continuous</td>
<td>Sediment trap, OWS/LOWS</td>
</tr>
<tr>
<td>Fire Burn Pit</td>
<td>Firewater</td>
<td>0</td>
<td>2,500</td>
<td>Intermittent (once annually)</td>
<td>OWS/LOWS</td>
</tr>
<tr>
<td>Ground Support Building (Building N66)</td>
<td>Vehicle and boat washing</td>
<td>0</td>
<td>3,000</td>
<td>Intermittent</td>
<td>OWS/LOWS</td>
</tr>
<tr>
<td>Central Heating Plant (Building N24)</td>
<td>Waterside boiler cleaning</td>
<td>0</td>
<td>400</td>
<td>Intermittent (4 boilers, each annually)</td>
<td>OWS/LOWS</td>
</tr>
<tr>
<td></td>
<td>Continuous blowdown</td>
<td>0</td>
<td>200</td>
<td>Intermittent (daily)</td>
<td>Flash tank, OWS/LOWS</td>
</tr>
<tr>
<td></td>
<td>Manual bottom blowdown</td>
<td>20</td>
<td>400</td>
<td>Intermittent (1–3 times a day)</td>
<td>Flash tank, OWS/LOWS</td>
</tr>
<tr>
<td></td>
<td>Demineralizer cleaning</td>
<td>0</td>
<td>400</td>
<td>Intermittent (every two weeks)</td>
<td>OWS/LOWS</td>
</tr>
<tr>
<td>Firehall (Building N64)</td>
<td>Vehicle washing</td>
<td>0</td>
<td>300</td>
<td>Intermittent (daily)</td>
<td>OWS/LOWS</td>
</tr>
<tr>
<td></td>
<td>Bay floor washing</td>
<td>0</td>
<td>540</td>
<td>Intermittent (every other day)</td>
<td>OWS/LOWS</td>
</tr>
<tr>
<td>Auto Hobby Shop Boiler Room (Building 614)</td>
<td>Continuous boiler blowdown</td>
<td>0</td>
<td>2</td>
<td>Intermittent (daily)</td>
<td>Flash tank</td>
</tr>
<tr>
<td></td>
<td>Manual bottom blowdown</td>
<td>0</td>
<td>25</td>
<td>Intermittent (weekly)</td>
<td>Flash tank</td>
</tr>
<tr>
<td>Health Care Facility/Dental Clinic (Building N46)</td>
<td>Mercury amalgam wash</td>
<td>0</td>
<td>1</td>
<td>Intermittent</td>
<td>Amalgam filter</td>
</tr>
<tr>
<td>Source</td>
<td>Wastestream</td>
<td>Daily Minimum Flow (gpd)</td>
<td>Daily Maximum Flow (gpd)</td>
<td>Discharge Frequency</td>
<td>Pretreatment</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>--------------------------</td>
<td>--------------------------</td>
<td>------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Kodiak Airport</td>
<td>Alaska Department of Transportation and Public Facilities vehicle maintenance – snowmelt and oily wastewater</td>
<td>0</td>
<td>180</td>
<td>Intermittent (daily)</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Snow removal equipment building – snowmelt</td>
<td>0</td>
<td>100</td>
<td>Intermittent (daily in winter)</td>
<td>OWS/LOWS</td>
</tr>
<tr>
<td></td>
<td>Chemical deicer equipment storage and mixing</td>
<td>0</td>
<td>100</td>
<td>Intermittent (daily in winter)</td>
<td>OWS/LOWS</td>
</tr>
<tr>
<td></td>
<td>Avis vehicle washing</td>
<td>0</td>
<td>900</td>
<td>Intermittent (daily)</td>
<td>OWS/LOWS</td>
</tr>
</tbody>
</table>

Footnotes:
1. For the Hangar 1 minimum and maximum daily volumes, the values shown are based on the following assumptions:
   • For airframe washing, a maximum daily volume of 5,000 gallons was obtained by assuming a single wash generating from 2,000 to 5,000 gallons.
   • A minimum daily volume of 0 gallons was assumed for days where no airframes were washed.
   • For engine compressor washing, a maximum daily volume of 200 gallons was obtained by assuming the average discharge of 200 gallons per week is generated by a single wash. A minimum daily volume of 0 gallons was assumed for days where no engine compressors were washed.
2. For the Hangar 3 minimum and maximum daily volumes, the values shown are based on the following assumptions:
   • Airframe washing generates 500 gallons per wash. A minimum of one wash is assumed per day and a maximum of four washes per day is based on 20 washes per week.
   • For engine compressor washing, the maximum daily volume of 15 gallons was determined calculating the daily average flow from the weekly average of 72 gallons, assuming a five-day work week.
3. The Old Power Plant pump discharged 63 times over 19 months (June 11, 2020 - January 15, 2022) averaging 18,080 gallons per cycle.