UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 155
Seattle, WA 98101

OFFICE OF THE REGIONAL ADMINISTRATOR

October 21, 2022

City of Wrangell's
Wastewater Treatment Plant
Application for a Modified NPDES Permit
Under Section 301(h) of the Clean Water Act

Tentative Decision of the Regional Administrator
Pursuant to 40 CFR Part 125, Subpart G

I have reviewed the attached evaluation analyzing the merits of the City of Wrangell's request and application for a variance from secondary treatment requirements of the Clean Water Act (the Act) pursuant to Section 301(h) of the Act for the Wrangell wastewater treatment plant. It is my tentative decision that the City of Wrangell be granted a variance pursuant to Section 301(h) of the Act for the Wrangell wastewater treatment plant in accordance with the terms, conditions, and limitations of the draft 301(h)-modified NPDES permit.

My decision is based on available information specific to the discharge from the Wrangell wastewater treatment plant. It is not intended to assess the need for secondary treatment in general, nor does it reflect on the necessity for secondary treatment by other publicly owned treatment works discharging to the marine environment.

Public notice and comment regarding this tentative decision and the accompanying draft NPDES permit is available to interested persons pursuant to 40 CFR Part 124. This tentative decision is subject to change based on information acquired during the public comment period. Following the public comment period on this tentative decision and accompanying draft NPDES permit, EPA Region 10 will issue a final decision under the procedures in 40 CFR Part 124.

/s/ October 24, 2022

Casey Sixkiller
Regional Administrator

City of Wrangell Wastewater Treatment Plant

Application For A Modified NPDES Permit Under Section 301(h) Of The Clean Water Act

Tentative Decision Document

October 2022

United States Environmental Protection Agency

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1) Introduction

The City of Wrangell, Alaska, ("the City," "the applicant," "Wrangell," or "the permittee") has requested a renewal of its variance (sometimes informally called a "waiver" or "modification") under Section 301(h) of the Clean Water Act (the Act or CWA), 33 USC 1311(h), from the secondary treatment requirements contained in Section 301(b)(1)(B) of the Act, 33 USC 1311(b)(1)(B).

The United States Environmental Protection Agency, Region 10 (EPA) approved the City of Wrangell's first request for modification of secondary treatment requirements and issued its first CWA Section 301(h)-modified NPDES permit on October 6, 1983 [AK0021466]. The most recent NPDES permit was issued on December 4, 2001, became effective on January 7, 2002, and expired on January 8, 2007 (hereinafter, referred to as the 2002 permit). A timely and complete NPDES application for permit reissuance was submitted by the permittee on April 25, 2006. Pursuant to Title 40 CFR Part 122.6, the permit has been administratively continued and remains fully effective and enforceable.

The variance is being sought for the City of Wrangell's Wastewater Treatment Plant ("WWTP" or "facility"), a publicly owned treatment works (POTW). The applicant is seeking a 301(h) variance to discharge wastewater receiving less-than-secondary treatment from a single outfall into Zimovia Straight. The effluent quality attainable by secondary treatment is defined at 40 CFR -Part 133 in terms of BOD_5, TSS, and pH. Pursuant to 40 CFR Part 133.102, secondary treatment requirements for TSS, BOD_5, and pH are as follows:

TSS: (1) The 30-day average concentration shall not exceed 30 mg/l;

(2) The 7-day average concentration shall not exceed 45 mg/l; and

(3) The 30-day average percent removal shall not be less than 85%.

BOD_5: (1) The 30-day average concentration shall not exceed 30 mg/l;

(2) The 7-day average concentration shall not exceed 45 mg/l; and

(3) The 30-day average percent removal shall not be less than 85%.

pH: The pH of the effluent shall be maintained within the limits of 6.0 to 9.0 pH standard units.

The City requested a modification for TSS and BOD_5, but not pH.

This document presents EPA Region 10's tentative findings and conclusions as to whether the applicant's proposed 301(h)-modified discharge (proposed discharge) will comply with the criteria set forth in Sections 301(h) of the Act, as implemented by the regulations at 40 CFR 125, Subpart G, and Alaska Water Quality Standards (Alaska WQS), as amended.

2) Decision Criteria

Under Section 301(b)(1)(B) of the Act, 33 USC 1311(b)(1)(B), POTWs in existence on July 1, 1977, are required to meet effluent limits based on secondary treatment as defined by the Administrator of EPA ("the Administrator"). Secondary treatment is defined by the Administrator in terms of three parameters: TSS, BOD_5, and pH. Uniform national effluent limitations for these pollutants were promulgated and included in National Pollutant Discharge Elimination System (NPDES) permits for POTWs issued under Section 402 of the CWA. POTWs were required to comply with these limitations by July 1, 1977.

Congress subsequently amended the Act, adding Section 301(h), which authorizes the Administrator, with State concurrence, to issue NPDES permits that modify the secondary treatment requirements of the Act with respect to certain discharges. P.L. 95-217, 91 Stat. 1566, as amended by P.L. 97-117, 95 Stat. 1623; and Section 303 of the Water Quality Act of 1987. Section 301(h) provides that:

> *[T]he Administrator, with the concurrence of the State, may issue a permit under section 402 [of the Act] which modifies the requirements of subsection (b)(1)(B) of this section [the secondary treatment requirements] with respect to the discharge of any pollutant from a publicly owned treatment works into marine waters, if the applicant demonstrates to the satisfaction of the Administrator that:*

(1) *there is an applicable water quality standard specific to the pollutant for which the modification is requested, which has been identified under section 304(a)(6) of [the CWA];*
(2) *the discharge of pollutants in accordance with such modified requirements will not interfere, alone or in combination with pollutants from other sources, with the attainment or maintenance of that water quality which assures protection of public water supplies and the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife, and allows recreational activities, in and on the water;*
(3) *the applicant has established a system for monitoring the impact of such discharge on a representative sample of aquatic biota, to the extent practicable, and the scope of the monitoring is limited to include only those scientific investigations which are necessary to study the effects of the proposed discharge;*
(4) *such modified requirements will not result in any additional requirements on any other point or nonpoint source;*
(5) *all applicable pretreatment requirements for sources introducing waste into such treatment works will be enforced;*
(6) *in the case of any treatment works serving a population of 50,000 or more, with respect to any toxic pollutant introduced into such works by an industrial discharger for which pollutant there is no applicable pretreatment requirement in effect, sources introducing waste into such works are in compliance with all applicable pretreatment requirements, the applicant has in effect a pretreatment program which, in combination with the treatment of discharges from such works, removes the same amount of such pollutant as would be removed if such works were to apply secondary treatment to discharges and if such works had no pretreatment program with respect to such pollutant;*
(7) *to the extent practicable, the applicant has established a schedule of activities designed to eliminate the entrance of toxic pollutants from nonindustrial sources into such treatment works;*
(8) *there will be no new or substantially increased discharges from the point source of the pollutant into which the modification applies above that volume of discharge specified in the permit; and*
(9) *the applicant at the time such modification becomes effective will be discharging effluent which has received at least primary or equivalent treatment and which meets the criteria established under [section 304(a)(1) of the CWA] after initial mixing in the waters surrounding or adjacent to the point at which such effluent is discharged.*

> *For the purposes of this subsection the phrase "the discharge of any pollutant into marine waters" refers to a discharge into deep waters of the territorial sea or the waters of the*

contiguous zone, or into saline estuarine waters where there is strong tidal movement and other hydrological and geological characteristics which the Administrator determines necessary to allow compliance with paragraph (2) of this subsection, and [section 101(a)(2) of the Act]. For the purposes of paragraph (9), "primary or equivalent treatment" means treatment by screening, sedimentation, and skimming adequate to remove at least 30 percent of the biological oxygen demanding material and of the suspended solids in the treatment works influent, and disinfection, where appropriate. A municipality which applies secondary treatment shall be eligible to receive a permit pursuant to this subsection which modifies the requirements of subsection (b)(1)(B) of this section with respect to the discharge of any pollutant from any treatment works owned by such municipality into marine waters. No permit issued under this subsection shall authorize the discharge of sewage sludge into marine waters. In order for a permit to be issued under this subsection for the discharge of a pollutant into marine waters, such marine waters must exhibit characteristics assuring that water providing dilution does not contain significant amounts of previous discharged effluent from such treatment works. No permit issued under this subsection shall authorize the discharge of any pollutant into saline estuarine waters which at the time of application do not support a balanced, indigenous population of shellfish, fish and wildlife, or allow recreation in and on the waters or which exhibit ambient water quality below applicable water quality standards adopted for the protection of public water supplies, shellfish, fish and wildlife or recreational activities or such other standards necessary to assure support and protection of such uses. The prohibition contained in the preceding sentence shall apply without regard to the presence or absence of a causal relationship between such characteristics and the applicant's current or proposed discharge. Notwithstanding any of the other provisions of this subsection, no permit may be issued under this subsection for discharge of a pollutant into the New York Bight Apex consisting of the ocean waters of the Atlantic Ocean westward of 73 degrees 30 minutes west longitude and westward of 40 degrees 10 minutes north latitude.

On August 9, 1994, EPA promulgated final regulations implementing these statutory criteria at 40 CFR Part 125, Subpart G. The regulations provide that a Section 301(h)-modified NPDES permit may not be issued in violation of 40 CFR 125.59(b) which requires, among other things, compliance with provisions of the Coastal Zone Management Act, as amended, 16 USC 1451 *et seq.*, the Endangered Species Act, as amended, 16 USC 1531 *et seq.*, Title III of the Marine Protection Research and Sanctuaries Act, as amended, 16 USC 1431 *et seq.*, the Magnuson-Stevens Fishery Conservation and Management Act, as amended, 16 USC 1801 *et seq.*, and any other applicable provisions of local, state, and federal laws or Executive Orders.

In accordance with 40 CFR 125.59(i), the decision to grant or deny a CWA Section 301(h) waiver shall be made by the Administrator[1] and shall be based on the applicant's demonstration that it has met all the requirements of 40 CFR 125.59 through 125.68, as described in this 301(h) Tentative Decision Document (301(h) TDD). EPA has reviewed all data submitted by the applicant in the context of applicable statutory and regulatory criteria and has presented its findings and conclusions in this 301(h) TDD.

[1] The authority to make tentative (and final) decisions on the eligibility of publicly owned treatment works for variances from the secondary treatment requirements of the Clean Water Act pursuant to Section 301(h) of the CWA has been delegated to the Regional Administrators.

3) SUMMARY OF FINDINGS

Based upon review of the data, references, and empirical evidence furnished by the applicant and other relevant sources, EPA Region 10 makes the following tentative findings regarding the statutory and regulatory criteria:

1. The applicant's proposed discharge will comply with Alaska WQS for dissolved oxygen and turbidity. [Section 301(h)(1); 40 CFR 125.61]
2. The applicant has demonstrated it can consistently achieve Alaska WQS and federal CWA Section 304(a)(1) water quality criteria at and beyond the zone of initial dilution (ZID). [CWA Section 301(h)(9); 40 CFR 125.62(a)]
3. The applicant's proposed discharge, alone or in combination with pollutants from other sources, will not adversely impact public water supplies or interfere with the protection and propagation of a balanced, indigenous population (BIP) of shellfish, fish, and wildlife, and will allow for recreational activities in and on the water. [CWA Section 301(h)(2); 40 CFR 125.62(b), (c), (d)]
4. The applicant has a well-established and adequate program to monitor the impact of its proposed discharge on aquatic biota and has demonstrated it has adequate resources to continue the program. These monitoring requirements will remain enforceable terms of the permit. [CWA Section 301(h)(3); 40 CFR 125.63]
5. The applicant's proposed discharge will not result in any additional treatment requirements on any other point or nonpoint sources. The applicant sent a letter to the Alaska Department of Environmental Conservation (ADEC) requesting indicating whether its proposed discharge will result in an additional treatment pollution control, or other requirement on any other point or nonpoint sources. [CWA Section 301(h)(4); 40 CFR 125.64]
6. The applicant will continue to implement its nonindustrial source control program, consisting of public outreach and education designed to minimize the amount of toxic pollutants that enter the treatment system from nonindustrial sources. [CWA Section 301(h)(7); 40 CFR 125.66]
7. There will be no new or substantially increased discharges from the point source of the pollutants to which the 301(h) variance applies above those specified in the permit. [CWA Section 301(h)(8); 40 CFR 125.67]
8. The discharge is not expected to conflict with applicable provisions of state, local, or other Federal laws or Executive Orders, including compliance with the Coastal Zone Management Act of 1972, as amended, 16 USC 1451 *et seq*.; the Endangered Species Act of 1973, as amended, 16 USC 1531 *et seq*.; Title III of the Marine Protection, Research and Sanctuaries Act, as amended, 16 USC 1431 *et seq*.; and the Magnuson-Stevens Fishery Conservation and Management Act, as amended, 16 USC 1801 *et seq.*
9. The applicant has demonstrated the proposed discharge will comply with federal primary treatment requirements. [CWA Section 301(h)(9); 40 CFR 125.60]

4) DECISION

Based upon the tentative findings in Section 3, above, EPA has concluded that the applicant's proposed discharge will comply with the requirements of CWA Section 301(h) and 40 CFR 125, Subpart G. Accordingly, EPA has tentatively decided to grant the applicant a CWA Section 301(h) variance, contingent upon satisfaction of the following conditions:

1. All requirements determined necessary by ADEC as part of its final CWA Section 401 Certification to ensure that the proposed discharge will comply with applicable provisions of state law, including WQS, in accordance with Section 401 of the CWA and the regulations at 40 CFR 124.53, 124.54 and 125.61(b)(2).
2. The determination by ADEC that the proposed discharge will not result in any additional treatment requirements on any other point or nonpoint sources, in accordance with 40 CFR 125.64.
3. The determination by the National Marine Fisheries Service that issuance of a 301(h)-modified permit will not jeopardize the continued existence of any threatened or endangered species or result in the destruction of critical habitat and does not conflict with applicable provisions of the Magnuson-Stevens Fishery Conservation and Management Act, as amended.

5) DESCRIPTION OF TREATMENT SYSTEM

The WWTP serves the community of Wrangell, Alaska, which has a population of approximately 2,100 people. According to the facility, peak design flow is 0.131 m3/sec (3 mgd) and average daily design flow is 0.026 m3/sec (0.6 mgd). In accordance with 40 CFR 125.58(c) the facility is a "small applicant." The collection system is a separate sanitary sewer system and effluent is entirely domestic in origin. The existing outfall (001) discharges to Zimovia Straight approximately 1500 feet offshore at a depth of 100 feet below mean lower low water (MLLW). The outfall location is at the following lat/long: 56.453298 -132.391262.

Raw sewage enters the WWTP through a mechanical screen where solids are automatically removed and bagged for disposal at the municipal landfill. Screened sewage then flows into a 3.6 mgd capacity aeration basin with a retention time of six days. Aeration is provided by fine bubble membrane diffusers attached to floating aeration chains which are moved across the basin by the air released from the diffusers. Aeration basin wastewater flows over V-shaped weirs where it then moves through a settling basin that has a detention time of two days. The effluent leaves the settling basin by gravity flow where it is then discharged into Zimovia Strait.

See Appendix A for facility figures, area maps, and the treatment process flow diagram.

6) DESCRIPTION OF RECEIVING WATERS

A. General Features

The WWTP discharges into the saline estuarine waters of Zimovia Straight, approximately 1500 feet from the shore of Cemetery Point and Heritage Harbor off the west side of Wrangell Island, Alaska. Zimovia Straight is a tidal estuary within the Alexander Archipelago east of Clarence Straight, bounded by Wrangell Island to the east, Etolin and Woronkovski Islands to the west, and the Stikine River delta to the north. Surface water densities near the outfall vary due to local freshwater inputs from nearby streams and rivers. The major freshwater input is the Stikine River, which discharges an annualized average flow of 55,078 ft^3/s, with the maximum average monthly discharge of 134,000 ft^3/s occurring in June (USGS 2019). The Stikine River also

contributes a substantial volume of suspended sediment to the estuary, with concentrations exceeding 1000 mg/L and volumes in excess of 250,000 tons a day during spring run-off (USGS 2022).

Zimovia Straight is classified in Alaska WQS as classes IIA(I)(ii)(iii), B(I)(ii), C and D, for use in aquaculture, seafood processing and industrial water supply, water contact and secondary recreation, growth and propagation of fish, shellfish, aquatic life and wildlife, and harvesting for consumption of raw mollusks or other raw aquatic life.

B. Currents and Flushing

According to NOAA, the mean tide range at Wrangell is 13.57 ft, with a diurnal range of 15.96 ft, and a mean tide level of 8.29 ft above MLLW (NOAA 2019a). At a monitoring station 1.6 miles east of Wrangell Harbor (Station 1257), the average maximum flood current is 0.8 knots with a bearing of 050° (northeast); the average minimum before flood is 0.1 knots with a bearing of 290° (west-northwest); and the average maximum ebb is 0.8 knots, with a bearing of 235° (southwest) (NOAA 2019b). It is likely local boundary conditions nearer to the outfall (i.e., Wrangell Island) result in currents that flow predominantly northwest (flood) and southeast (ebb) because local currents would be forced this direction by Wrangell Island.

7) PHYSICAL CHARACTERISTICS OF THE DISCHARGE

A. Outfall/Diffuser Design and Initial Dilution

Pursuant to 40 CFR 125.62(a)(1), the outfall and diffuser must be located and designed to provide adequate initial dilution, dispersion, and transport of wastewater to meet all applicable WQS at and beyond the boundary of the ZID during periods of maximum stratification and during other periods when discharge characteristics, water quality, biological seasons, or oceanographic conditions indicate more critical situations may exist.

The WWTP outfall and diffuser are made of 12-inch diameter high density polyethylene pipe. The outfall is 1500 feet in length from MLLW, terminating in a 240-foot diffuser. The depth of the outfall is 100 feet at MLLW (i.e., on the bottom of Zimovia Strait). The diffuser has sixteen 12-inch ports spaced 16 feet apart on alternate sides of the pipe.

Zone of Initial Dilution (ZID)

Section 301(h)(9) of the CWA and 40 CFR 125.62 require 301(h) discharges to meet state WQS and federal CWA Section 304(a) criteria at the boundary of the ZID, which is the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports. The ZID may not be larger than allowed by mixing zone restrictions in applicable WQS. 40 CFR 125.58(dd). The dilution ratio achieved at the completion of initial mixing at the edge of the ZID is used to determine compliance with these requirements. Dilution is defined as the ratio of the total volume of the sample (ambient water plus effluent) to the volume of effluent in the sample. The ZID is not intended to describe the area bounding the entire mixing process or the total area impacted. Rather, the ZID, or region of *initial mixing*, is the area of rapid, turbulent mixing of the effluent and receiving water and results from the interaction between the buoyancy and momentum of the discharge and the density and momentum of the receiving water. Initial dilution is normally complete within several minutes after discharge. In guidance, EPA has operationally delimited the ZID to include the bottom area within a

horizontal distance equal to the water depth from any point on the diffuser and the water column above that area (301(h) TSD). Beyond the ZID boundary (i.e., after initial mixing is complete) the effluent is diluted further by passive diffusion processes and far-field ambient receiving water conditions. The ZID is not inclusive of this far-field mixing process.

The 2002 permit used a dilution factor of 880:1. EPA was unable to recreate this dilution factor using available effluent and receiving water data.

EPA modeled the current discharge to determine the dilution achieved at the edge of the ZID using recent effluent and receiving water data from 2016-2021 provided by the applicant. In accordance with the Amended Section 301(h) Technical Support Document (301(h) TSD), EPA used data reflecting critical discharge and receiving water conditions to determine dilution under critical conditions. The dilution modeling report is included in Appendix G.

According to the model, the discharge achieves initial mixing and a dilution of 112:1 about 40 feet from the outfall at a depth of approximately 80 feet within two minutes of discharge under critical discharge and receiving water conditions. EPA used the 112:1 dilution as the basis for determining compliance with 301(h)(9) and 40 CFR 125.62. Consistent with the recommendations in the 301(h) TSD for setting spatial boundaries for the ZID, EPA has established the spatial dimensions of the ZID to include the entire water column within 100 feet of any point of the 240-foot diffuser. This is the same ZID spatial boundary as the 2002 permit. In its draft 401 certification, ADEC authorized acute and chronic dilution factors of 3.9:1 and 29:1, respectively. These dilutions fall within the boundary of the ZID.

8) APPLICATION OF STATUTORY AND REGULATORY CRITERIA

The sections below describe the statutory and regulatory requirements of 301(h) discharges and explains the basis for certain Water Quality Based Effluent Limits in the draft permit.

A. Compliance with Primary or Equivalent Treatment Requirements [CWA Section 301(h)(9); 40 CFR 125.60]

Under CWA Section 301(h)(9) and 40 CFR 125.60, the applicant must demonstrate it will be discharging effluent that has received at least primary or equivalent treatment at the time the 301(h)-modified permit becomes effective. 40 CFR 125.58(r) defines primary or equivalent treatment as treatment by screening, sedimentation, and skimming adequate to remove at least 30 percent of the biochemical oxygen demanding material and other suspended solids in the treatment works influent, and disinfection, where appropriate. To ensure the effluent has received primary or equivalent treatment, the regulation at 40 CFR 125.60 requires the applicant to perform monitoring of their influent and effluent and assess BOD_5 and TSS removal rates based on a monthly average.

Applicants for 301(h) waivers request concentration and loading (lb/day) limits for BOD_5 and TSS based on what the facility can achieve. Therefore, the technology-based requirements for POTWs with 301(h) waivers are established on a case-by-case basis taking into consideration best professional judgement (BPJ), facility performance, the federal primary treatment standards, and state WQS.

1. Total Suspended Solids

EPA reviewed influent and effluent monitoring data for TSS between 2016 and 2021. A summary table and graphical representation of the data is provided below.

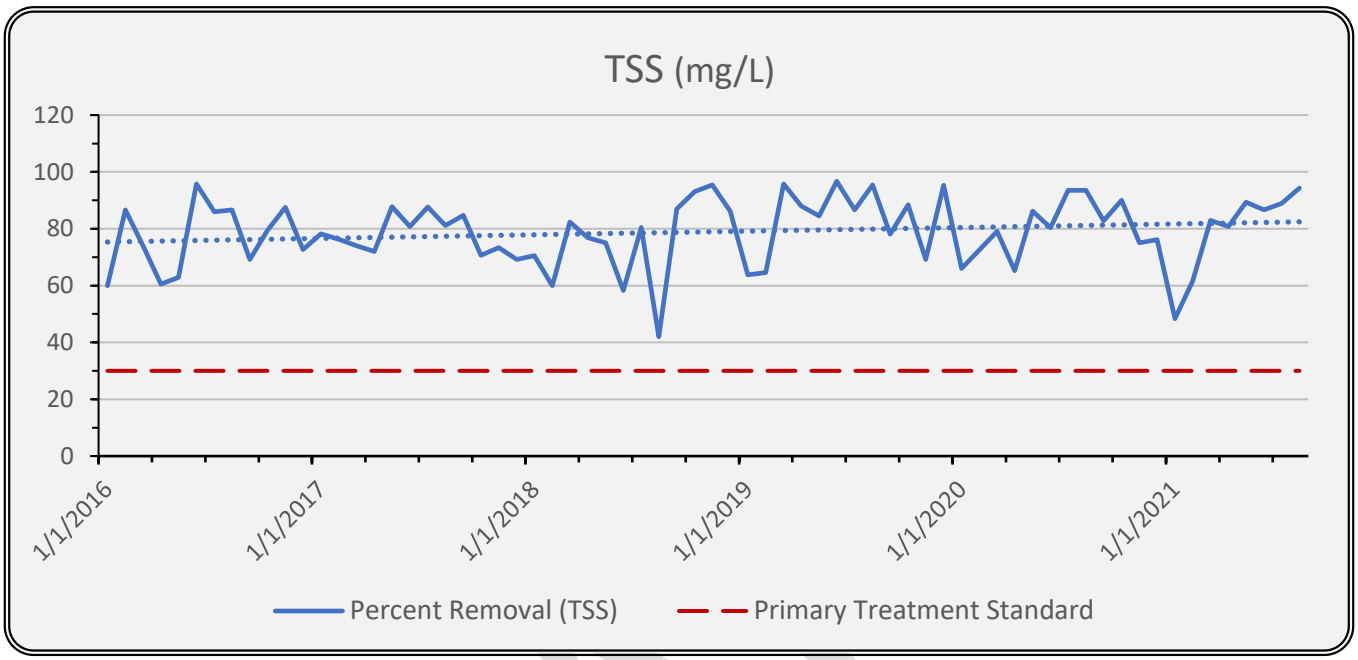

Figure 1: Minimum Monthly TSS Removal (2016-2021)

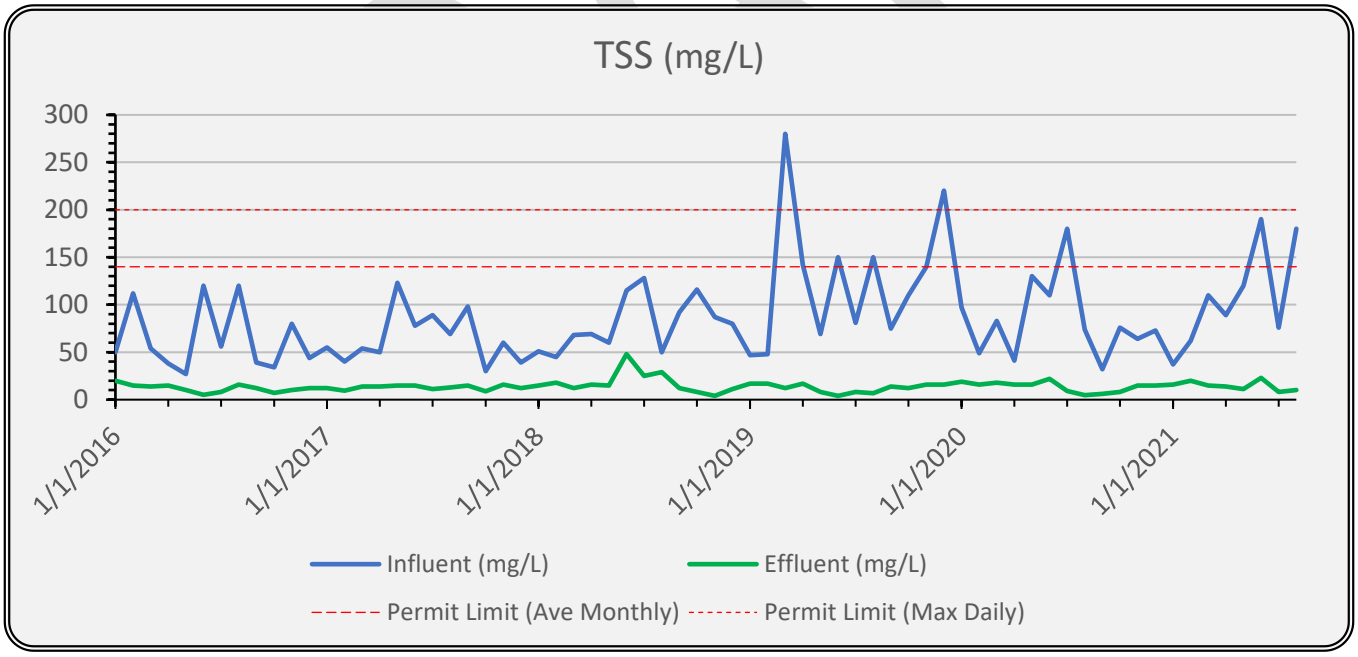

Figure 2: Monthly Influent and Effluent TSS Concentrations (mg/L)

The facility has achieved the minimum 30% removal requirement for TSS 100% of the time, with the lowest monthly removal being 42%. Between 2016 and 2021 the facility achieved an average of nearly 80% removal of TSS, with maximum percent removal efficiencies as high as 97%.

Table 1: INFLUENT AND EFFLUENT TSS DATA (2016-2021)

Statistic	Influent, TSS, mg/L, Mo. Avg	Effluent, TSS, mg/L, Max Daily[1]	Effluent, TSS, mg/L, Mo. Avg[1]	Percent Removal
LIMIT	---	200	140	≥30%
COUNT	68	68	68	68
MEAN	86.8	13.9	13.9	78.9
MINIMUM	27	4	4	42
MAX	280	48	48	96.7
STDV	48.6	6.43	6.43	12
CV	0.56	0.46	0.46	0.15
5th	32.9	4.8	4.8	59
95th	185.5	24.1	24.1	95.6
1) The 2002 permit required monthly influent/effluent TSS monitoring, so maximum and average reported values are identical				

The applicant has demonstrated it will be discharging effluent that has received at least primary or equivalent treatment for TSS when the 301(h)-modified permit becomes effective [301(h)(9) and 40 CFR 125.60].

2. Biochemical Oxygen Demand

EPA reviewed influent and effluent data for BOD_5 between 2016 and 2021. A summary table and graphical representation of the data is provided below.

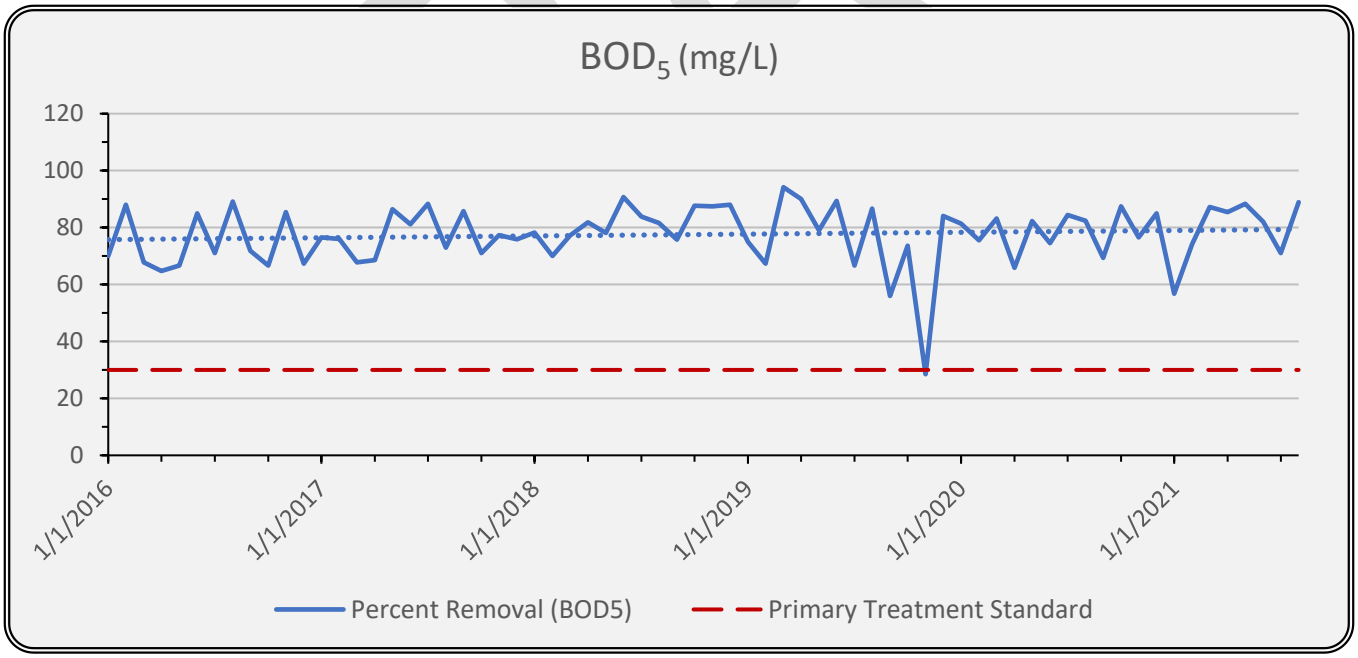

Figure 3: Minimum Monthly BOD_5 Removal (2016-2021)

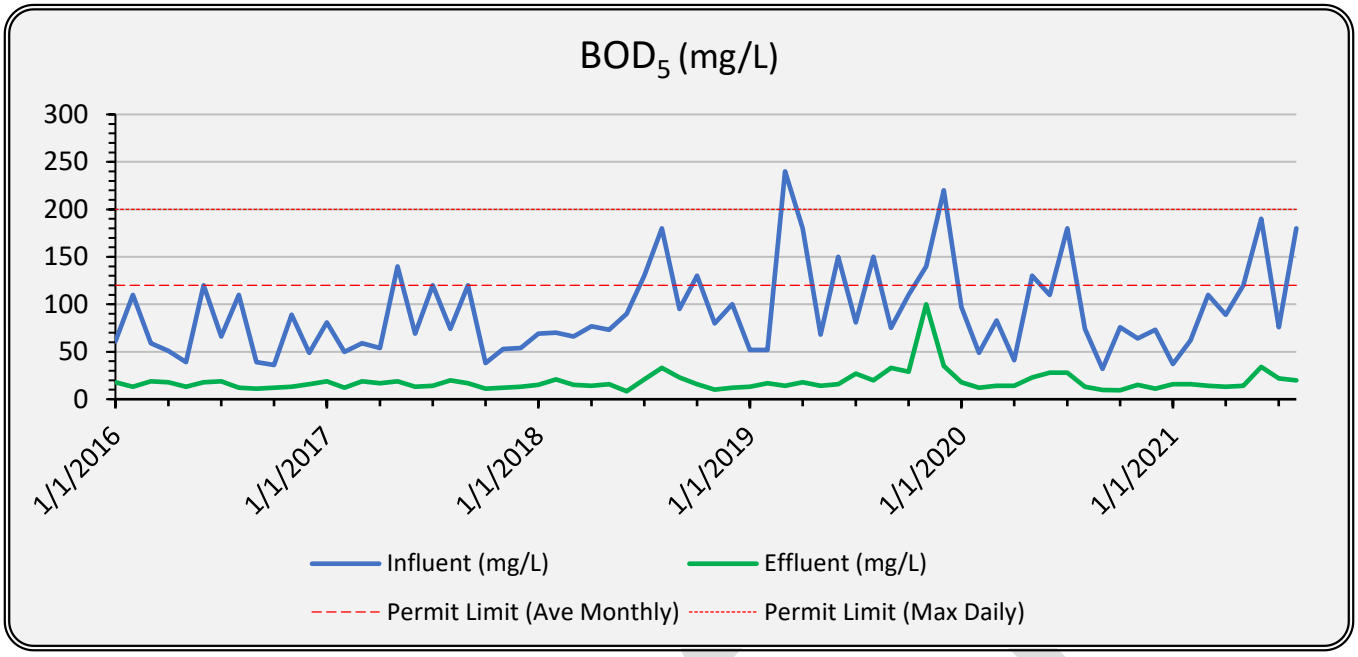

Figure 4: Monthly Influent and Effluent BOD_5 Concentrations (2016-2021)

The facility has achieved the minimum 30% removal requirement for BOD_5 nearly 100% of the time, with one month below 30% removal (28.5%, November 2019). This instance below 30% is believed to be the result of circumstanced beyond the applicants control related to significant and dilute influent from a major precipitation event during November 2019. Between 2016 and 2021 the facility achieved an average of 77.6% removal of BOD_5, with maximum percent removal efficiencies as high as 94.2%.

Table 2: INFLUENT AND EFFLUENT BOD_5 DATA (2016-2021)

Statistic	Influent, BOD_5, mg/L, Mo. Avg	Effluent, BOD_5, mg/L, Max Daily[1]	Effluent, BOD_5, mg/L, Mo. Avg[1]	Percent Removal
LIMIT	---	200	120	≥30%
COUNT	68	68	68	68
MEAN	92.5	18.42	18.42	77.6
MIN	32	8.4	8.4	28.5
MAX	240	100	100	94.2
STDV	46.7	11.75	11.75	10.6
CV	0.50	0.64	0.64	0.14
5th	37.5	9.9	9.9	60.3
95th	185.5	33.6	33.6	89.7

1) The 2002 permit required monthly influent/effluent BOD_5 monitoring, so reported values for maximum and average are identical

The applicant has demonstrated it will be discharging effluent that has received at least primary or equivalent treatment for BOD_5 when the 301(h)-modified permit becomes effective [301(h)(9) and 40 CFR 125.60].

B. ATTAINMENT OF WATER QUALITY STANDARDS RELATED TO TSS AND BOD_5 [CWA Section 301(h)(1); 40 CFR 125.61]

Under 40 CFR 125.61, which implements Section 301(h)(1), there must be water quality standards (WQS) applicable to the pollutants for which the modification is requested, and the applicant must demonstrate that the proposed discharge will comply with these standards. The applicant has requested modified secondary treatment requirements for BOD_5, which affects dissolved oxygen (DO), and TSS, which affects the color or turbidity in the receiving water. The State of Alaska has WQS for DO and turbidity.

1. Turbidity and Light Transmittance/Attenuation

Alaska WQS applicable to the estuarine waters of Zimovia Strait provide that turbidity shall not exceed 25 nephelometric turbidity units (NTU), may not interfere with disinfection, may not cause detrimental effect on established levels of water supply treatment, and may not reduce the depth of the compensation point for photosynthetic activity by more than 10%. In addition, turbidity may not reduce the maximum secchi disc depth by more than 10%. Alaska WQS for turbidity can be found in Appendix E.

The applicant has been collecting annual receiving water data for turbidity and secchi depth. Sampling is conducted in August at the surface, mid-depth, and bottom of the receiving water at the following sites:

Site 1: 1000 feet northwest of the ZID
Site 2: 1000 feet southeast of the ZID
Site 3: <5 meters northwest of the ZID boundary
Site 4: <5 meters southeast of the ZID boundary

Sites 1 and 2 are considered reference sites and sites 3 and 4 are ZID boundary sites. Monitoring results are presented in Tables 3, 4, and 5 below.

Secchi depths were similar between reference sites 1 and 2 and ZID boundary sites 3 and 4, with minimum secchi depths of 1 foot observed in August 2021. The average of reference sites 1 and 2 was 4.9 feet, while the average for the ZID boundary sites was 4, approximately 18% lower.

Table 3: SECCHI DEPTH MONITORING

SECCHI (FT)		2016	2017	2018	2019	2020	2021	Ave	Max	Min
		Aug	Aug	Aug	Aug	Aug	Aug			
Stations	1	2.5	5	4.5	5	6	1	4	6	1
	2	11	4	6	5	6	3	5.8	11	3
	3	6.6	3	5	2.5	6	1	4	6.6	1
	4	6	3.5	5	2.5	5.5	1	3.9	6	1

Average receiving water turbidity values at reference sites 1 and 2 were 12.8, 4.7, and 4.9 NTU for surface, mid, and bottom depths respectively. Average values for ZID boundary sites 3 and 4 were 19, 6.1, and 4.9 NTU for surface, mid, and bottom depths, respectively. The maximum NTU values of 68.2 and 46.5 were observed in the surface samples collected at the ZID boundary and reference sites during the August 2021 sampling event, respectively, the same month of minimum secchi observations.

Table 4: ZID BOUNDARY TURBIDITY MONITORING

Year	Site	Surface	Mid	Bottom
2016	Site 3	7.83	2.85	1.61
	Site 4	7.72	1.1	1.22
2017	Site 3	4.59	1.7	3.43
	Site 4	4.68	1.98	3.05
2018	Site 3	8.82	1.7	2.32
	Site 4	8.25	1.74	2.39
2019	Site 3	14.3	9.26	8.72
	Site 4	17.8	9.35	9.49
2020	Site 3	7.91	16.1	7.27
	Site 4	10.2	13.8	8.9
2021	Site 3	68.2	7.2	5.03
	Site 4	67.7	6.98	4.96
Max		68.2	16.1	9.5
Min		4.6	1.1	1.2
Average		19.0	6.1	4.9

Table 5: REFERENCE SITE TURBIDITY MONITORING

Year	Site	Surface	Mid	Bottom
2016	Site 1	14.6	4.06	3.65
	Site 2	6.02	1.3	1.44
2017	Site 1	2.29	3.06	2.89
	Site 2	4.42	2.19	2.75
2018	Site 1	8.05	1.92	1.34
	Site 2	10.6	2.43	2.63
2019	Site 1	6.53	3.54	3.19
	Site 2	9.76	3.56	2.51
2020	Site 1	23.5	18.3	20.1
	Site 2	6.74	6.03	7.3
2021	Site 1	46.5	5.77	4.73
	Site 2	14.7	3.67	6.03
Max	--	46.5	18.3	20.1
Min	--	2.3	1.3	1.3
Average	--	12.8	4.7	4.9

EPA considers the low secchi readings and maximum reported surface NTU values to be the result of natural turbidity from the Stikine River and its significant loading of suspended sediment into the estuarine receiving waters of Zimovia Straight, not the result of the effluent discharge. Publicly available satellite imagery of the receiving waters off the west side of Wrangell Island clearly shows the large influence of suspended sediment originating from the Stikine River to the north. The available receiving water data also supports this

conclusion, with the clear presence of a lower salinity freshwater layer high in suspended sediment over the top of a higher salinity layer low in suspended sediment. Further, the dilution analysis performed for the WWTP discharge indicates the effluent plume becomes trapped at a depth of approximately 24 meters (~80 feet), thus preventing the discharge from traveling up through the water column and influencing suspended solids concentrations near the surface. This strongly indicates that differenced in Secchi depths observed between sites may be the result of local ambient conditions and such results should be interpreted with caution.

The change in suspended solids in the water column is indirectly related to turbidity measurements. To further assess the potential for the discharge to cause or contribute to a violation of Alaska WQS for turbidity and light transmittance, EPA determined the maximum change in suspended solids concentration of TSS in the discharge at the edge of the ZID using formula B-32 from the 301(h) TSD. The results show a 0.40 mg/L increase in suspended solids in the receiving water after initial dilution, or 0.8%.

As discussed in the 301(h) TSD, an increase in TSS of less than 10% after initial dilution is not expected to have a substantial impact on water quality.

Based on the above analyses, the proposed discharge is expected to comply with Alaska WQS for turbidity and light transmittance/attenuation. See Appendix E for the full equations.

2. Dissolved Oxygen

The effect of the effluent on ambient DO can occur in the nearshore and farfield as effluent mixes with the receiving water and the oxygen demand of the effluent BOD_5 load is exerted. Pursuant to 40 CFR 125.61(b)(1) and 125.62(a)(1), the applicant must demonstrate that the proposed discharge will comply with WQS for DO and that the outfall and diffuser are located and designed to provide adequate initial dilution, dispersion, and transport of wastewater such that the discharge does not exceed the WQS at and beyond the ZID. Alaska WQS for DO applicable to the estuarine waters of Zimovia Strait provide that DO may not be less than 5.0 mg/L except where natural conditions cause this value to be depressed, and in no case may DO levels exceed 17 mg/L [18 AAC 70.15(a)(i)]. Alaska WQS for DO are shown in in Appendix D.

In accordance with EPA's 301(h) TSD, EPA assessed attainment of the WQS for DO based on review of effluent (2016-2021) and receiving water monitoring data (2016-2021).

The 301(h) TSD rovides several procedures for assessing whether a proposed discharge will meet WQS for DO at the edge of the ZID. Methods include calculating the final DO concentration of the effluent at the edge of the ZID using discharge and receiving water data and assessing the accumulation of suspended solids around the outfall.

DO Concentration at the Edge of the ZID

EPA calculated the DO concentration at the ZID boundary using receiving water data provided by the applicant and the procedures described in Equation B-5 of the 301(h) TSD.

The discharge results in a maximum near field DO depletion at the ZID boundary of 0.06 mg/L, or a 0.7% reduction from ambient concentrations. The minimum DO concentration of the receiving water immediately following initial dilution is between 4.68 and 7.95 and varies by water depth (surface, mid, or bottom) and location (reference or outfall). Receiving water sampling data indicates the low DO measurements are the

result of natural conditions within the receiving water. For example, the lowest DO readings occur at the bottom of the water column at the reference sites, which are located approximately 1000 feet from the ZID and outside the influence of the discharge. Further, a 0.7% DO reduction at the completion of initial dilution would be very unlikely to result in the low DO measurements observed at the reference sites 1000 feet away.

Far Field DO Impacts

To assess the potential for far field impacts to DO, the final BOD_5 concentration after initial mixing was determined using the simplified procedures described in Appendix B of the 301(h) TSD and outlined in Appendix E of this 301(h) TDD. The calculation resulted in a final BOD_5 concentration of 1.3 mg/L after initial mixing, a concentration that is not anticipated to cause or contribute to any measurable far field DO impacts beyond the ZID.

Suspended Solids Accumulation

Impacts to DO concentrations resulting from the discharge of wastewater can also be assessed by examining the accumulation of suspended solids. 40 CFR 125.62 states that wastewater and particulates must be adequately dispersed following initial dilution so as not to adversely affect water use areas. The accumulation of suspended solids may lower DO in near-bottom waters and cause changes in the benthic communities. Accumulation of suspended solids in the vicinity of a discharge is influenced by the amount of solids discharged, the settling velocity distribution of the particles in the discharge, the plume height-of-rise, and current velocities. Hence, sedimentation of suspended solids is generally of little concern for small discharges into well-flushed receiving waters.

The questionnaire submitted by the applicant in 2006 states there are no known water quality issues associated with the accumulation of suspended solids from the discharge.

To evaluate the potential impact of solids sedimentation, a simplified approach for small dischargers that are not likely to have sediment accumulation related problems can be found in Figure B-2 of the 301(h) TSD. To use Figure B-2 of the 301(h) TSD to evaluate whether steady state solids accumulation will result in sufficient sediment accumulation to cause a 0.2 mg/L oxygen depression, the TSS mass emissions rate is needed, as well as plume height-of-rise. The mass emission or loading rate was calculated using the TSS concentration limit, facility design flow, and a conversion factor (Loading (lbs/day)) = 45 mg/L X 0.6 mgd X 8.34=225 lbs/day, or 102 kg/day). Plume height-of-rise was calculated to be 60 feet (18.2 meters) using the approach on page B-5 in the 301(h) TSD, which involves multiplying the water depth at the point of discharge (100 feet at MLLW) by 0.6. When a height-of-rise of 18.2 meters and a loading rate of 102 kg/day are input in Figure B-2, steady state accumulation is well below the line at which greater than 0.2 mg/L oxygen depression is expected. Per the 301(h) TSD, no further analysis is needed to demonstrate that accumulating solids will not result in unacceptable DO depressions.

Based on the above analyses of DO depletion and suspended solids accumulation, the proposed discharge is expected to comply with AK WQS for dissolved oxygen. For the complete equations used in this analysis refer to Appendix E.

C. Attainment of Other Water Quality Standards and Impact of the Discharge On Shellfish, Fish and Wildlife; Public Water Supplies; and Recreation
[CWA Section 301(h)(2); 40 CFR 125.62]

CWA Section 301(h)(2) requires that the proposed discharge not interfere, either alone or in combination with other sources, with the attainment or maintenance of that water quality which assures protection of public water supplies and protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife, and allows recreational activities in and on the water. Pursuant to 40 CFR 125.62(a), the applicant's outfall and diffuser must be located and designed to provide adequate initial dilution, dispersion, and transport of wastewater such that the discharge does not exceed, at and beyond the ZID, all applicable EPA-approved state WQS and, where no such standards exist, EPA's CWA Section 304(a)(1) aquatic life criteria for acute and chronic toxicity and human health criteria for carcinogens and noncarcinogens, after initial mixing in the waters surrounding or adjacent to the outfall. In addition, 40 CFR 125.59(b)(1) prohibits issuance of a 301(h)-modified permit that would not assure compliance with all applicable NPDES requirements of 40 CFR Part 122; under these requirements a permit must ensure compliance with all WQS.

Attainment of WQS for DO and turbidity was previously discussed. However, in accordance with 40 CFR 125.62(a), the applicant must also demonstrate that the proposed discharge will attain other WQS, including those for pH, temperature, toxic pollutants, and bacteria. EPA used Alaska WQS, the processes described in the 301(h) TSD and the 1991 *Technical Support Document for Water Quality-based Toxics Control,* and dilution factors of 3.9:1 (acute criteria) and 29:1 (chronic criteria) to determine whether the proposed discharge has the reasonable potential to cause or contribute to an excursion above Alaska WQS, to calculate WQBELs, and to assess compliance with CWA Section 301(h)(2) and 40 CFR 125.62. To determine reasonable potential, EPA compares the maximum projected receiving water concentration after mixing to the WQS for that pollutant. If the projected receiving water concentration exceeds the WQS, there is reasonable potential for that pollutant to cause or contribute to an excursion above Alaska WQS, and a WQBEL must be included in the permit. If a permittee is unable to meet their WQBEL it would fail to satisfy CWA Section 301(h)(9) and 40 CFR 125.62 and would be ineligible for a CWA Section 301(h) modification.

Pursuant to 40 CFR 125.62(a)(1)(iv), EPA's evaluation of compliance with WQS must be based upon conditions reflecting periods of maximum stratification and during other periods when discharge characteristics, water quality, biological seasons, or oceanographic conditions indicate more critical situations may exist, commonly referred to as critical conditions.

1. pH

The applicant did not request a CWA Section 301(h) modification for pH, but the proposed discharge must still meet the WQS for pH. Alaska's WQS provide that pH may not be less than 6.5 or greater than 8.5 and may not vary more than 0.2 pH unit outside of the naturally occurring range.

The effect of pH on the receiving water following initial dilution was estimated using Table 1. in the 301(h) TSD (*Estimated pH Values After Initial Dilution*).

EPA reviewed discharge monitoring report (DMR) data for pH between 2016 and 2021. The facility met the pH limits in the 2002 permit 100% of the time. The maximum, minimum, and average pH values observed were 7.8, 6.5, and 7.3 s.u., respectively. By utilizing the minimum measured effluent pH value of 6.5, an effluent alkalinity of 0.5 mq/L (suggested as reasonable for primary effluents with no industrial component on page 65

of the 301(h) TSD), a seawater temperature of 15°C (95th percentile of trapping depth temperature was 13.7° C), and an assumed initial dilution of 100 (actual initial dilution is 112:1), the expected resulting pH range after initial dilution is 6.99 to 8.49 over an assumed seawater pH range of 7.00 to 8.50. This is within the range of 6.5 to 8.5, does not vary more than 0.2 pH units outside the naturally occuring range, and therefore meets Alaska WQS for pH.

The proposed discharge is expected to comply with Alaska WQS for pH after iniitial mixing at the edge of the ZID.

2. Temperature

Alaska's most stringent WQS for water temperature provides that the discharge may not cause the weekly average temperature to increase more than 1°C. The maximum rate of change may not exceed 0.5 degree C per hour. Normal daily temperature cycles may not be altered in amplitude or frequency.

The maximum ocean temperature recorded at the trapping depth of the discharge during receiving water monitoring from 2016 to 2021 was 13.7°C, and the maximum recorded effluent temperature between 2016 and 2021 was 18.6°C. EPA conducted a mass balance analysis using these values and calculated a final receiving water temperature of 13.7°C after initial dilution. Based upon the above analysis the proposed discharge is expected to comply with Alaska WQS for temperature at the edge of the ZID.

3. Toxics

Alaska WQS for toxics for marine uses can be found in 18 AAC 70.020(b)(23) and the *Alaska Water Quality Criteria Manual for Toxics* (ADEC, 2008).

To assess whether the proposed discharge will comply with Alaska WQS for toxics after initial mixing, EPA reviewed DMR data collected between 2016 and 2021 and the results of three priority pollutant scans performed on the effluent on March 21, March 28, and April 5, 2006.

Several metals were reported above their respective detection limits. Using this data along with DMR data for ammonia, EPA performed reasonable potential analyses using the numeric criteria in the *Alaska Water Quality Criteria Manual* (ADEC 2008) and the processes outlined in the *Technical Support Document for Water Quality-based Toxics Control* (USEPA 1991).

Chlorine and ammonia are the only pollutants with the reasonable potential to cause or contribute to a violation of Alaska WQS after mixing. WQBELs have been developed and included in the draft permit for chlorine and ammonia.

The effluent limits for chlorine and ammonia are protective of Alaska WQS.

4. Bacteria

Alaska WQS for bacteria are found at 18 AAC 70.020(b)(14)(D).

Fecal Coliform

Alaska's most restrictive marine criterion for fecal coliform bacteria concentrations is in areas protected for the harvesting and use of raw mollusks and other aquatic life. The WQS specifies that the geometric mean of samples shall not exceed 14 MPN/100 mL, and that not more than 10 percent of the samples shall exceed:

- 43 MPN per 100 ml for a five-tube decimal dilution test;

- 49 MPN per 100 ml for a three-tube decimal dilution test;

- 28 MPN per 100 ml for a twelve-tube single dilution test;

- 31 CFU per 100 ml for a membrane filtration test 43 MPN/100 mL.

Because Zimovia Straight is protected for this use, this standard must be met at the edge of the ZID.

On August 2, 2001, ADEC provided a CWA Section 401 Certificate of Reasonable Assurance (401 certification) that included a mixing zone defined as an arc of a circle with a 1600-meter radius, centered on the outfall going from one shoreline to the other extending on either side of the outfall line, and extending from the marine bottom to the surface. ADEC also required in the preliminary certification that fecal coliform limits not exceed 200 FC/100 mL at the shoreline within the designated mixing zone, except in "Area A," a known community shellfish gathering area, where 14 FC/100mL as a monthly average and 43 FC/100mL as a daily max were to be met. The number of fecal coliform bacteria in the primary treated effluent was not to exceed a 30-day average of 1.0 million FC per 100 mL and a daily limit of 1.5 million FC per 100 mL of sample. Outside this mixing zone, the fecal coliform concentrations were not to exceed a maximum of 14 FC/100 mL for a monthly average and 43 FC/100 mL for a daily maximum. Facility DMR data from the past 5 years shows fecal coliform values ranges from 72 - 60,000 FC/100mL, with a 95th percentile of 48,300 FC/100mL and a geometric mean of 7910 FC/100mL. Summary statistics of DMR data are provided in Table 6 below.

Table 6: Fecal Coliform DMR Summary Data 2016-2021

	# of samples	Min	Max	95th Percentile	Average	Geomean
Fecal Coliform (FC/100mL)	**68**	**72**	**60,000**	**48,300**	**14,893**	**7410**

The 2002 permit required the facility to conduct fecal coliform sampling at four receiving water locations during April, June, August, and November, and at six intertidal locations monthly from May through August for the life of the permit. The results are presented in Table 7 below.

Table 7: Fecal Coliform Statistics by Station (2016-2021)

	# of samples	Max (FC/100mL)	Average (FC/100mL)	Geomean (FC/100mL)
Station 1	35	280.0	14.7	13.7
Station 2	35	30.0	3.7	15.1[1]
Station 3	35	55.0	6.9	10.7
Station 4	35	50.0	4.0	9.1
Station 5	35	26.0	3.0	7.6
Station 6	35	36.7	1.8	5.7
Station 7	35	10.0	1.0	6.6
Station 8	35	20.0	1.1	10.0
Station 9	35	10.0	0.9	5.0
Station 10	35	25.0	2.2	8.6
Station 11	35	20	1.7	7.8
Area A	35	13.3	5	7
[1]EPA used the maximum geometric mean of the available data as the background concentration (Cu)				

in the reasonable potential analysis and effluent limit calculations Station 1: 1.5 meters from shore along centerline of diffuser, at the head of Cemetary Point Station 2: 91 meters north of Site 1 Station 3: 91 meters south of Site 1 Station 4: south of Site 1, where 1600-meter mixing zone intersects shore Station 5: north of Site 1, where 1600-meter mixing zone intersects shore Station 6: northwest of the outfall at the 1600-meter mixing zone boundary Station 7: southeast of the outfall at the 1600-meter mixing zone boundary Station 8: northwest of the outfall in between the 1600-meter mixing zone and the 100-foot radius ZID Station 9: southeast of the outfall in between the 1600-meter mixing zone and the 100-foot radius ZID Station 10: 5 meters northwest of ZID boundary Station 11: 5 meters southeast of ZID boundary Area A: outside beach area of Point Shekesi, about 3,500 feet northeast of the outfall

The maximum fecal coliform result of 280 occurred at the intertidal shoreline area closest to the outfall, Station 1. The highest average and geometric mean results were reported at Stations 1, 2, and 3, the three intertidal stations closest to the outfall. CWA Section 301(h)(9) requires 301(h) discharges to meet WQS and federal CWA Section 304(a) criteria at the edge of the ZID. The current 1600-meter mixing zone for fecal coliform is inconsistent with the statutory or regulatory definition of a ZID: *the region of initial mixing surrounding or adjacent to the outfall.*

Consistent with CWA Section 301(h)(9) and 40 CFR 125.62, EPA used the 112:1 dilution achieved at the edge of the ZID to evaluate reasonable potential and assess compliance with CWA Section 301(h)(9) and 40 CFR 125.62. ADEC will not reauthorize the 1600-meter mixing zone for fecal coliform and the point of compliance for all bacteria limits is now the edge of the ZID.

Using effluent data from 2016 to 2021 and the same process and equations as those used for toxics, EPA conducted a reasonable potential analysis and determined fecal coliform has the reasonable potential to cause or contribute to a violation of Alaska WQS at the point of discharge. EPA calculated WQBELs for bacteria using Alaska WQS and the ZID dilution. For more information on the effluent limits for fecal coliform refer to the Fact Sheet.

The effluent limits developed for fecal coliform will be protective of Alaska WQS for fecal coliform, will meet the WQS at the edge of the ZID, and will satisfy the requirements of 301(h)(9) and 40 CFR 125.63(a).

Enterococcus Bacteria

Enterococci bacteria are indicator organisms of harmful pathogens recommended by the EPA to protect primary contact recreation for marine waters. The EPA Beaches Environmental Assessment and Coastal Health Act (BEACH Act) requires states and territories with coastal recreation waters to adopt enterococci bacteria criteria into their WQS. EPA approved Alaska's WQS for enterococcus in 2017. The 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.

The 2002 permit does not contain effluent limitation for enterococcus bacteria because there was no applicable enterococcus standard in effect when the permit was issued in December 2001.

40 CFR 122.44(d)(1) requires EPA to account for existing controls on discharges when determining whether a discharge has the reasonable potential to cause or contribute to an excursion of state WQS. The WWTP does

not currently disinfect its effluent, resulting in the high bacterial loads observed in the available fecal coliform data. The 2002 permit did not require enterococcus monitoring, but it reasons that the high fecal coliform loads observed are also indicative of high loads of other pathogens commonly found in WWTP effluents, including enterococcus. With the available fecal coliform data and lack of disinfection capacity at the facility, EPA has determined there is reasonable potential for the discharge to cause or contribute to a violation of Alaska WQS for enterococcus. EPA calculated WQBELs using Alaska WQS and the ZID dilution. For more information on the effluent limits for enterococcus refer to the Fact Sheet.

The effluent limits developed for enterococcus will be protective of Alaska WQS for enterococcus, will meet the WQS at the edge of the ZID, and will satisfy the requirements of 301(h)(9) and 40 CFR 125.63(a).

D. Impact of the Discharge on Public Water Supplies [40 CFR 125.62(b)]

40 CFR 125.62(b) requires that the applicant's proposed discharge must allow for the attainment or maintenance of water quality which assures protection of public water supplies and must not interfere with the use of planned or existing public water supplies. Based on the 2006 Questionnaire submitted by the applicant, there are no existing or planned public water supply intakes in the vicinity of the discharge, and EPA concludes that the applicant’s proposed discharge will have no effect on the protection of public water supplies and will not interfere with the use of planned or existing public water supplies.

E. Biological Impact of Discharge [40 CFR 125.62(c)]

40 CFR 125.62 requires that in addition to complying with applicable WQS, the proposed improved discharge must allow for the attainment or maintenance of water quality that assures the protection and propagation of a balanced indigenous population (BIP) of shellfish, fish, and wildlife. A BIP of shellfish, fish, and wildlife must exist immediately beyond the ZID and in all other areas beyond the ZID where marine life is actually or potentially affected by the applicant's discharge.

According to the applicant, the discharge will not cause adverse impacts to habitats of limited distribution or commercial or recreational fisheries. There have been no known cases of mass mortalities of fish or invertebrates, no increased incidence of disease in marine organisms, and no other known cases of adverse biological impacts. The application materials indicate the discharge does not cause or contribute to significant biological impacts. The discharge is relatively small in volume and is composed entirely of domestic wastewater, with limited quantities of toxics, and the facility has no industrial users. Acutely toxic conditions are not expected because the effluent achieves rapid mixing within minutes of discharge, minimizing the potential exposure area.

The 2002 permit required the facility to conduct biological monitoring, which consisted of a benthic survey and sediment analysis for total volatile solids (TVS) at the ZID boundary, within the ZID, and at two reference locations. Based on the results of the TVS analysis of sediment, it does not appear that excess organic sediment is accumulating around the outfall as compared to stations at the ZID boundary and reference sites. The results of the TVS analysis are presented in Appendix F. Based on visual observations of the benthic infauna collected in sediment samples, it does not appear that the Wrangell sewer outfall discharge is causing significant changes in the benthic community structure.

The Biological Monitoring Program from the 2002 permit is being retained in the draft permit.

F. Impact of Discharge on Recreational Activities [40 CFR 125.62(d)]

Under 40 CFR 125.62(d), the applicant's discharge must allow for the attainment or maintenance of water quality that allows for recreational activities beyond the ZID, including, without limitation, swimming, diving, boating, fishing, and picnicking, and sports activities along shorelines and beaches. There must be no federal, state, or local restrictions on recreational activities within the vicinity of the applicant's outfall unless such restrictions are routinely imposed around sewage outfalls.

In its 2006 Questionnaire, the applicant stated that no impacts on recreational activities were expected due to the proposed discharge. Swimming is not common in Zimovia Straight due to the cold-water temperatures and diving is expected to be rare due to the turbid nature of the receiving water. In its 2006 Questionnaire, the applicant indicated that recreational fishing for salmon and halibut occur in the receiving water as well as commercial crab fishing. No adverse effects have been reported.

The 2002 permit required signs to be placed on the shoreline near the 1600-meter fecal coliform mixing zone and the outfall line that states primary treated domestic wastewater is being discharged, mixing zones exist, and certain activities such as the harvesting of shellfish for raw consumption and bathing should not take place within the mixing zone. EPA has retained this language in the draft permit.

G. Establishment of Monitoring Programs [CWA 301(h)(3); 40 CFR 125.63]

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

1. Influent/Effluent Monitoring Program [40 CFR 125.63(d)]

40 CFR 125.63(d) requires an effluent monitoring program and the applicant proposes continuation of the current monitoring program. In addition to the 301(h)-specific monitoring requirements, Section 308 of the CWA and 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and receiving water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. Throughout the previous permit term (and the administratively continued period), the applicant faithfully submitted effluent monitoring data to the EPA as required by the 2002 permit.

Summary statistics of the effluent data submitted by the permittee between 2016 and 2021 is presented in Appendix C.

The draft permit retains largely the same effluent and influent monitoring requirements but includes the new requirement to monitor the effluent for copper. Consistent with 40 CFR 125.66, the draft permit also includes a new requirement for the permittee to perform an analysis of their effluent for all toxics and pesticides identified in 40 CFR Part 401.15 twice during the term of the new permit, once during the wet season and once during the dry season.

2. Receiving Water Quality Monitoring Program [40 CFR 125.63(c)]

40 CFR 125.63(c) requires that the receiving water quality monitoring program must provide data adequate to evaluate compliance with applicable WQS. The applicant proposes continuation of the current receiving water monitoring program. As in the case of effluent monitoring, NPDES permits include receiving water monitoring requirements to allow for compliance assessment, and to determine if additional effluent limitations and/or monitoring requirements are necessary in future permitting actions. Since the last permit reissuance, the applicant has faithfully submitted results of receiving water monitoring conducted in accordance with the terms of the 2002 permit.

EPA is retaining most of the receiving water monitoring program from the 2002 permit in the draft permit. Changes to the receiving water monitoring program include slight adjustments to the ZID boundary monitoring locations, the addition of enterococcus to the suite of parameters analyzed, the addition of one monitoring location over the center of the ZID, and the removal of sampling at the edge of the 1600-meter mixing zone (Stations 6 and 7). Sampling at the edge of the 1600-meter mixing zone is no longer required because the 1600-meter mixing zone is not being reauthorized by ADEC.

3. Biological Monitoring Program [40 CFR 125.63(b)]

40 CFR 125.63(b) requires a permittee to implement a biological monitoring program that provides data adequate to evaluate the impact of the applicant's discharge on the marine biota. Such a program should, at a minimum, allow for evaluation of any ecosystems impacts; any changes in the amount of organic material in the seafloor sediment; any changes to benthic communities; and the effectiveness/bases for permit conditions.

The Biological Monitoring Program in the 2002 permit consisted of a benthic survey and sediment analysis for TVS at the ZID boundary, within the ZID, and at two reference locations.

Based on the results of the TVS analysis of sediment, it does not appear that excess organic sediment is accumulating around the outfall as compared to stations at the ZID boundary and reference sites.

Based on visual observations of the benthic infauna collected in sediment samples, it does not appear that the Wrangell sewer outfall discharge is causing significant changes in the benthic community structure.

The Biological Monitoring Program from the 2002 permit is being retained in the draft permit.

H. Effect of Discharge on Other Point and Nonpoint Sources [CWA 301(h)(4); 40 CFR 125.64]

Under 40 CFR 125.64, which implements Section 301(h)(4) of the Act, the applicant's proposed discharge must not result in the imposition of additional treatment requirements on any other point or nonpoint source. The applicant reports that the proposed discharge would not place any additional treatment requirements on point or nonpoint sources. Pursuant to 40 CFR 125.64(b), the applicant is required to submit a determination signed by the State of Alaska indicating whether the applicant’s discharge will result in an additional treatment pollution control, or other requirement on any other point or nonpoint sources. The State determination must include a discussion of the basis for its conclusion. EPA cannot take final action on the 301(h)-modified permit until this determination is received.

I. Urban Area Pretreatment Program [CWA 301(h)(6); 40 CFR 125.65]

Under 40 CFR 125.65, dischargers serving a population greater than 50,000 are required to have a pretreatment program. As previously discussed, the Wrangell WWTP serves a population of approximately 2,100 people so this provisions in not applicable to this analysis.

J. Toxics Control Program [CWA 301(h)(7); 40 CFR 125.66]

1. Chemical Analysis and Toxic Pollutant Source Identification [40 CFR 125.66(a) and (b)]

Under 40 125.66(a) and (b), applicants are required to perform chemical testing for toxic pollutants and pesticides and identify the source of any parameters detected, respectively.

As previously discussed, the permittee conducted three toxic pollutant scans in 2006, the results of which EPA used in development of the draft permit. The applicant indicates that absent any industrial users the likely source of the copper observed in the 2006 toxic scans is copper drinking water piping and fixtures used throughout the service area. The new permit requires monthly copper monitoring of the effluent.

Pursuant to 40 CFR 125.66, the draft permit requires an updated toxics and pesticides scan and source identification analysis be submitted at the time of permit reapplication.

2. Industrial Pretreatment Program [40 CFR 125.66(c)]

40 CFR 125.66(c) requires that applicants that have known or suspected industrial sources of toxic pollutants shall have an approved pretreatment program in accordance with the requirements of 40 CFR Part 403 (Pretreatment Regulations). This requirement shall not apply to any applicant which has no known or suspected industrial sources of toxic pollutants or pesticides and so certifies to EPA. In 2022, the permittee provided an updated certification that there are no known industrial inputs into the treatment system. Because the facility has certified that there are no known industrial sources of toxic pollutants, under 40 CFR 125.66(c)(2), the facility is not required to have an approved pretreatment program.

Pursuant to 40 CFR 126.66, the draft permit requires an updated industrial user survey be submitted at the time of permit reapplication.

3. Nonindustrial Source Control Program [40 CFR 125.66(d)]

40 CFR 125.66(d), which implements Section 301(h)(6) of the Act, requires the applicant to submit a proposed public education program designed to minimize the entrance of non-industrial toxic pollutants and pesticides into the POTW. The applicant must develop and implement additional nonindustrial source control programs on the earliest possible schedule. The requirement to develop and implement additional nonindustrial source control programs does not apply to a small Section 301(h) applicant that certifies there are no known or suspected water quality, sediment accumulation, or biological problems related to toxic pollutants or pesticides in its discharge.

The applicant provided this certification, as well as documentation that a public education program meeting the requirements of 40 CFR 125.66(d)(1) has been developed and implemented. The applicant publishes an annual Household Hazardous Waste bulletin in the newspaper, on a community bulletin board, and online. The applicant also advertises and hosts an annual collection event at the Wrangell Waste Transfer Station,

where the public is invited to bring in household hazardous wastes for proper disposal. Wrangell has satisfied the requirements for nonindustrial source control.

K. Effluent Volume and Amount of Pollutants Discharged [40 CFR 125.67]

Under 40 CFR 125.67, which implements Section 301(h)(7) of the Act, the applicant's proposed discharge may not result in any new or substantially increased discharges of the pollutant to which the modification applies above the discharge specified in the 301(h)-modified permit. The applicant has applied on the basis of the current discharge and does not propose any new or substantially increased discharges of TSS or BOD_5, the two parameters for which the facility has requested a waiver.

L. COMPLIANCE WITH OTHER APPLICABLE LAWS [40 CFR 125.59]

Under 40 CFR 125.59(b)(3), a 301(h)-modified permit may not be issued if such issuance would conflict with applicable provisions of state, local, or other federal laws or executive orders. As part of the application renewal, the applicant must demonstrate compliance with all applicable Alaska and federal laws and regulations, and executive orders which include the Coastal Zone Management Act, Marine Protection Research and Sanctuaries Act, and the Endangered Species Act.

1. Coastal Zone Management Act

Alaska withdrew from the voluntary National Coastal Zone Management Program on July 1, 2011 (NOAA 2019c). Therefore, this requirement is not applicable.

2. Marine Protection, Research, and Sanctuaries Act

Under 40 CFR 125.59(b)(3), no 301(h)-modified permit shall be issued if such issuance would conflict with Title III of the Marine Protection, Research, and Sanctuaries Act (MPRSA), 16 USC 1431 *et seq.*, which authorizes the Secretary of Commerce (i.e., NOAA) to designate and protect areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, educational or esthetic qualities as national marine sanctuaries. There are 14 national marine sanctuaries and 2 marine national monuments in the U.S., none of which are in Alaska (NOAA 2019d).

The draft permit is therefore expected to comply with Title III of the Marine Protection, Research, and Sanctuaries Act.

3. Endangered or Threatened Species

Under 40 CFR 125.59(b)(3), no 301(h)-modified permit shall be issued if such issuance would conflict with the Endangered Species Act (ESA), 16 USC 1531 *et seq.* The ESA requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS), or “the Services,” if any activity proposed to be permitted, funded, or undertaken could beneficially or adversely affect any threatened or endangered species (ESA-listed species) or designated critical habitat.

EPA has prepared a biological evaluation that identified the following species and/or critical habitat in the vicinity of the discharge using the following web-based applications. All lists will be verified with the Services.

- NOAA's Alaska Protected Resource Division Species Distribution Mapper: (https://alaskafisheries.noaa.gov/portal/apps/webappviewer/index.html?id=0c4a81f75310491d9010c17b6c081c81)
    - Western Distinct Population Segment (Western DPS or WDPS) Steller sea lions, and
    - Mexico DPS humpback whales
- USFWS' Information for Planning and Consultation (IPaC): https://ecos.fws.gov/ipac/
    - None

EPA has determined the draft permit may effect these ESA-listed species and/or their critical habitats and, pursuant to Section 7 of the ESA, will consult with the Services prior to taking final action.

4. Essential Fish Habitat

Under 40 CFR 125.59(b)(3), no 301(h)-modified permit shall be issued if such issuance would conflict with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), 16 USC 1801 *et seq*., which protects against adverse impacts to Essential Fish Habitat (EFH). The MSFCMA requires federal agencies to consult with NMFS when any activity proposed to be permitted, funded, or undertaken may have an adverse effect on designated EFH as defined by the Act. The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

EPA will prepare an EFH assessment to assess the impacts of the discharge on EFH. If the EFH assessment concludes there will be adverse impacts EPA will consult with the NMFS prior to final permit action.

M. STATE DETERMINATION AND CONCURRENCE [40 CFR 125.61(b)(2); 40 CFR 125.64(d)]

Under 40 CFR 125.61(b)(2), the applicant must provide a determination signed by the state or interstate agency(s) authorized to provide certification under 40 CFR 124.53 and 124.54 that the proposed discharge will comply with applicable provisions of state law, including WQS. This determination must include a discussion of the basis for the conclusion reached. Furthermore, pursuant to 40 CFR 124.53 and 124.54, the state must either grant a certification pursuant to Section 401 of the CWA or waive this certification before EPA may issue a 301(h)-modified permit. The applicant did not provide this certification at the time of application. EPA will request 401-certification and a determination under 40 CFR 125.61(b)(2) from ADEC during the public notice period of the draft permit.

40 CFR 125.64(d) requires applicants to provide a determination from the state or interstate agency(s) having authority to establish wasteload allocations indicating whether the applicant's discharge will result in an additional treatment pollution control, or other requirement on any other point or nonpoint sources. The state determination shall include a discussion of the basis for its conclusion. The applicant did not submit this determination with their application. EPA will request that this determination be included in ADEC's 401-certification of the permit.

9) References

ADEC. 2003. *18 AAC 70, Water Quality Standards, As Amended Through June 26, 2003.* Approved by the EPA in 2004. Available at: https://www.epa.gov/wqs-tech/water-quality-standards-regulations-alaska.

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USEPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* EPA/505/2-90-001.

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

NOAA. 2019a. High and Low Water Predictions West Coast of North and South America Including the Hawaiian Islands. Retrieved at https://tidesandcurrents.noaa.gov/tide_predictions.html

NOAA. 2019b. Tidal Current Tables 2020 Pacific Coast of North America and Asia. Retrieved at https://tidesandcurrents.noaa.gov/historic_tide_tables.html.

NOAA. 2019c. *Coastal Zone Management Programs*. Web. https://coast.noaa.gov/czm/mystate/.

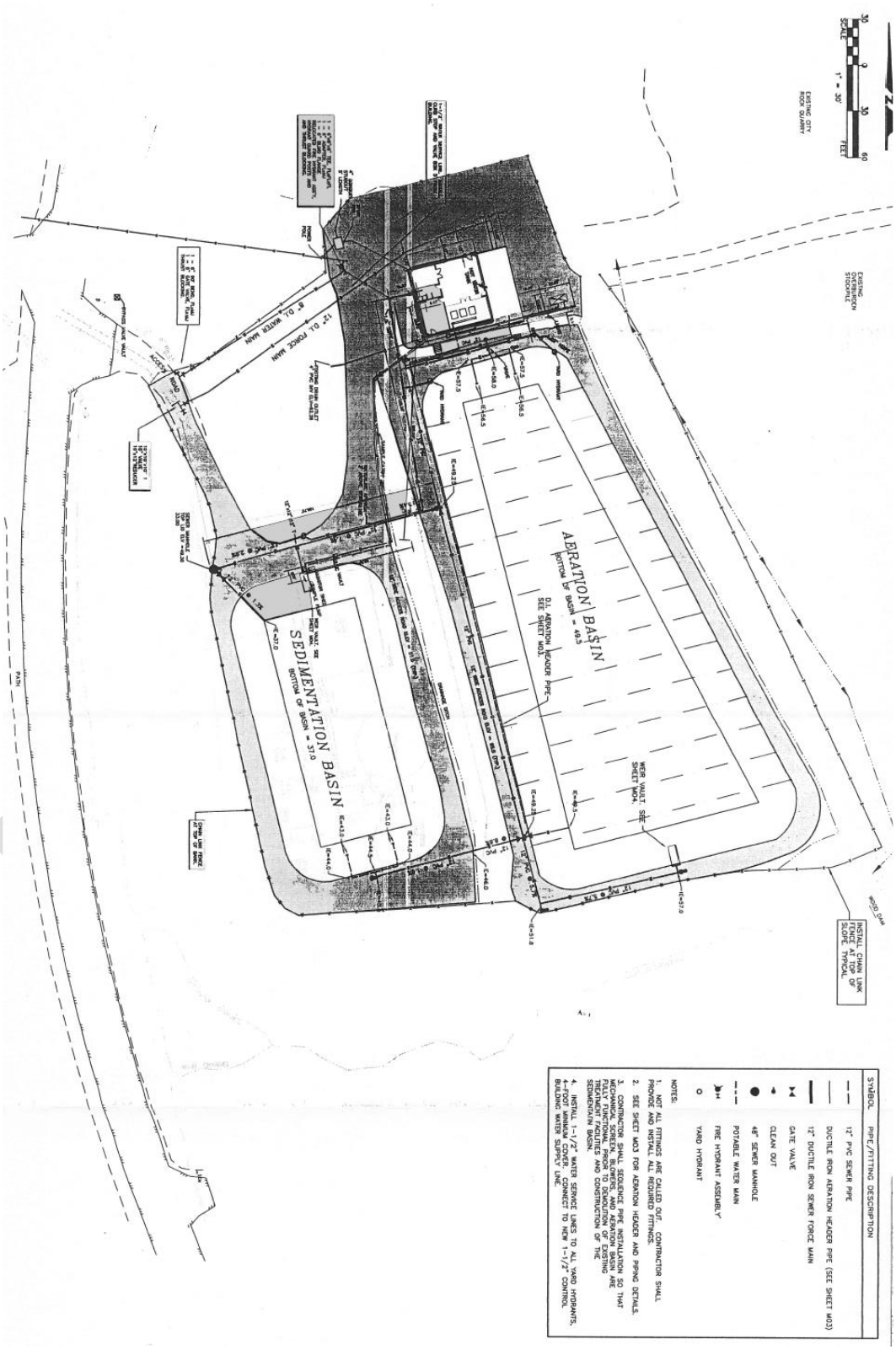
NOAA. 2019d. *National Marine Sanctuaries*. Web. https://sanctuaries.noaa.gov/.

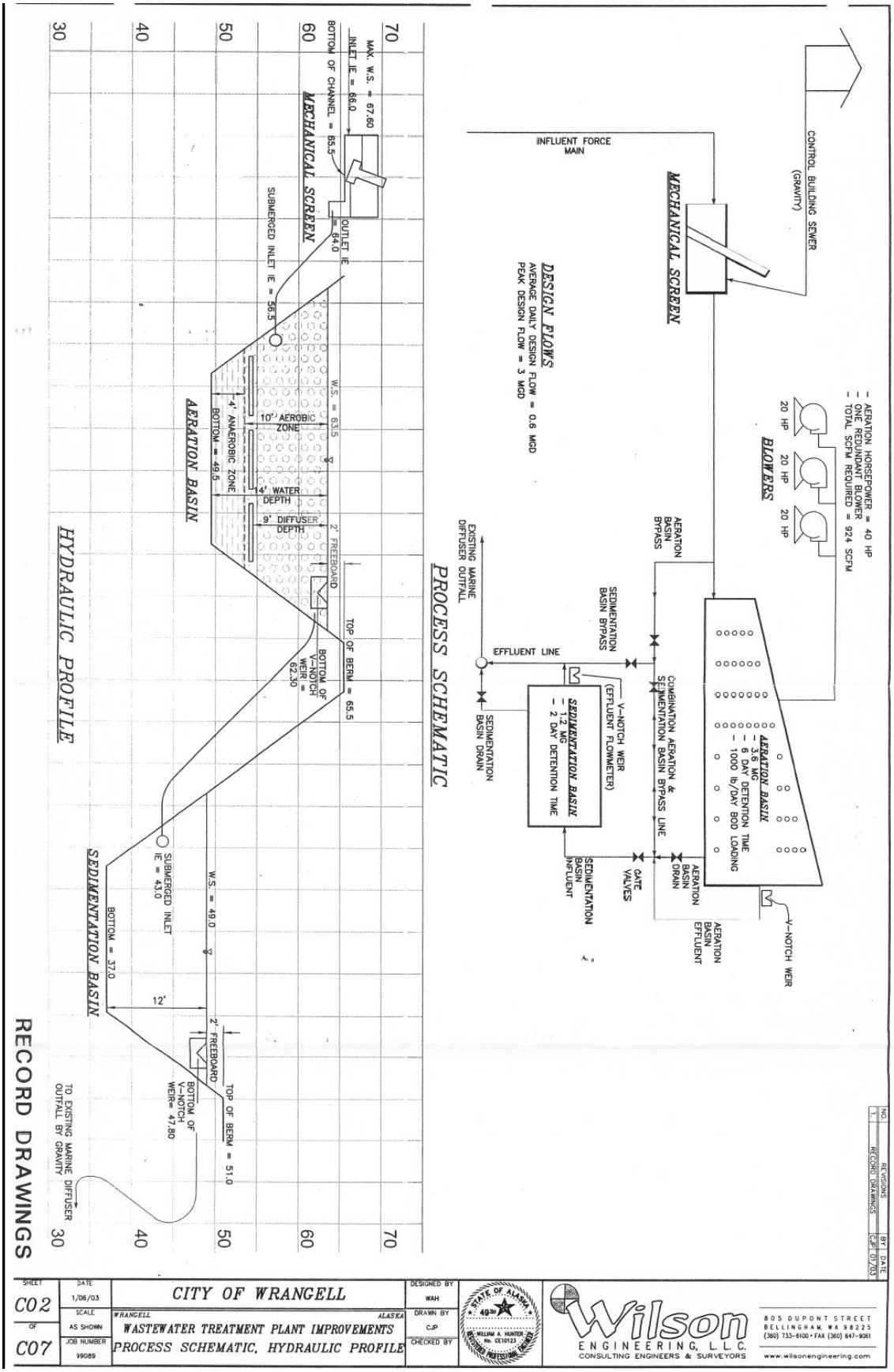
USGS. 2019. National Water Information System. USGS 15024800 Stikine R NR Wrangell AK. Retrieved at https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=15024800.

USGS. 2022. USGS Surface-Water Daily Statistics for the Nation. USGS 15024800 STIKINE R NR WRANGELL AK. Parameter 80154, Suspended Sediment. 1981-1983.

10) Appendices

A. Facility Figures and Process Flow Diagram





RECORD DRAWINGS

NO.	REVISIONS	BY	DATE
1	RECORD DRAWINGS	CJP	01/03

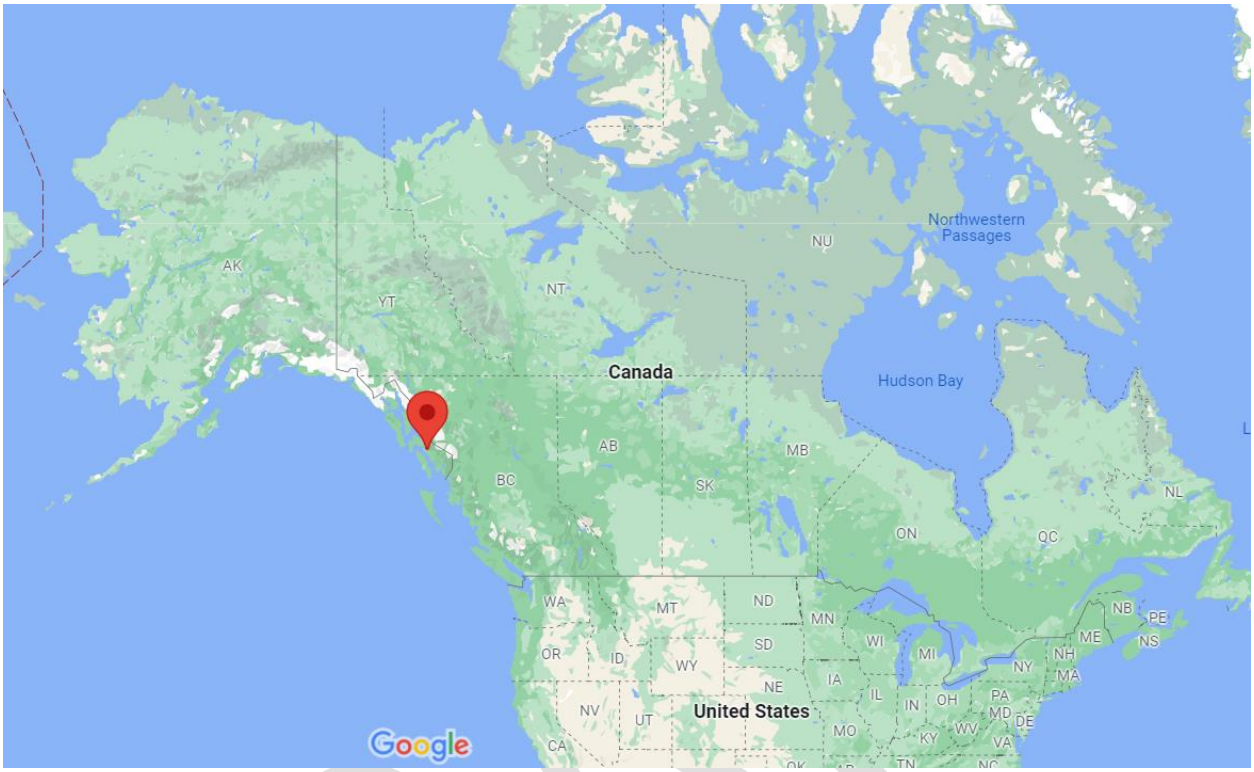
SHEET C02 OF C07	DATE 1/06/03	CITY OF WRANGELL	DESIGNED BY WAH
	SCALE AS SHOWN	WRANGELL ALASKA	DRAWN BY CJP
	JOB NUMBER 99089	WASTEWATER TREATMENT PLANT IMPROVEMENTS PROCESS SCHEMATIC, HYDRAULIC PROFILE	CHECKED BY

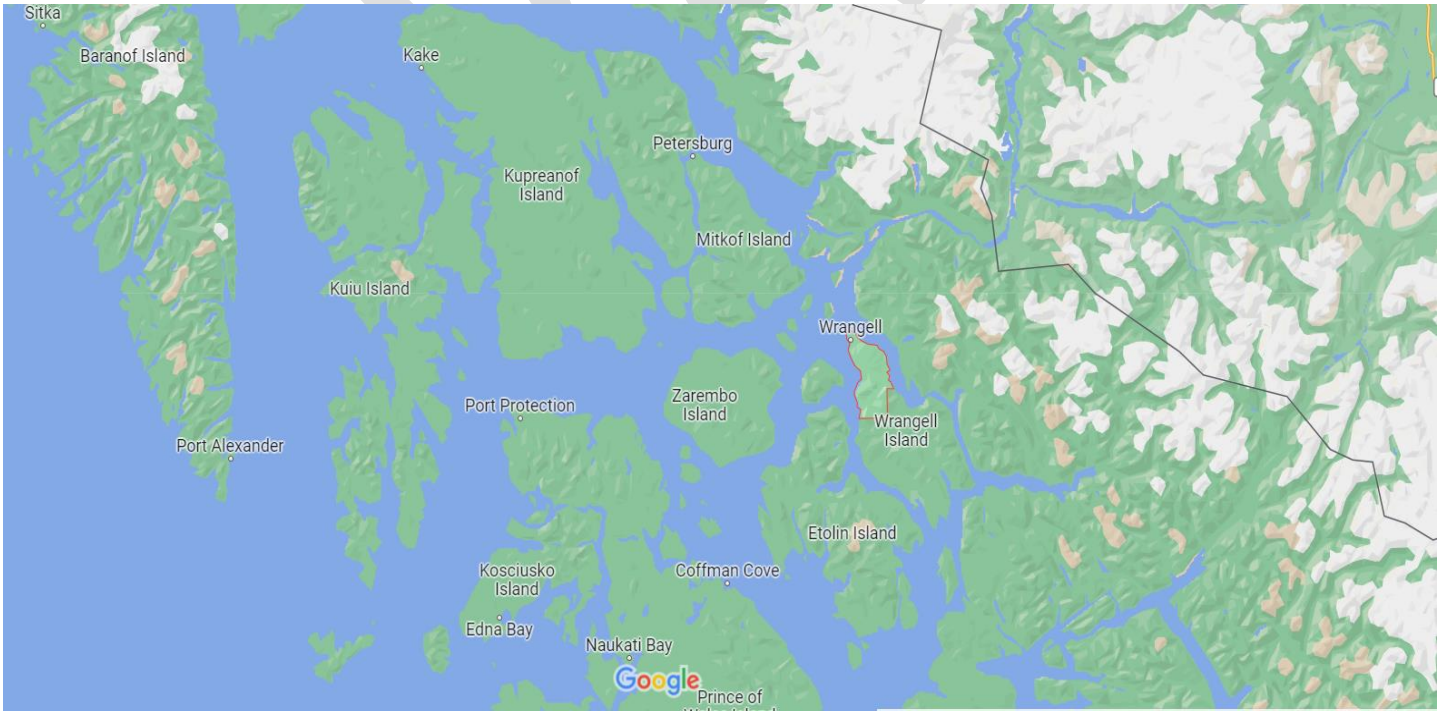
STATE OF ALASKA — 49TH — WILLIAM A. HUNTER JR. — No. CE10123 — REGISTERED PROFESSIONAL ENGINEER

Wilson ENGINEERING, L.L.C. — CONSULTING ENGINEERS & SURVEYORS

805 DUPONT STREET
BELLINGHAM, WA 98225
(360) 733-8100 • FAX (360) 647-9081
www.wilsonengineering.com

B. Outfall Location and Receiving Water Monitoring Maps





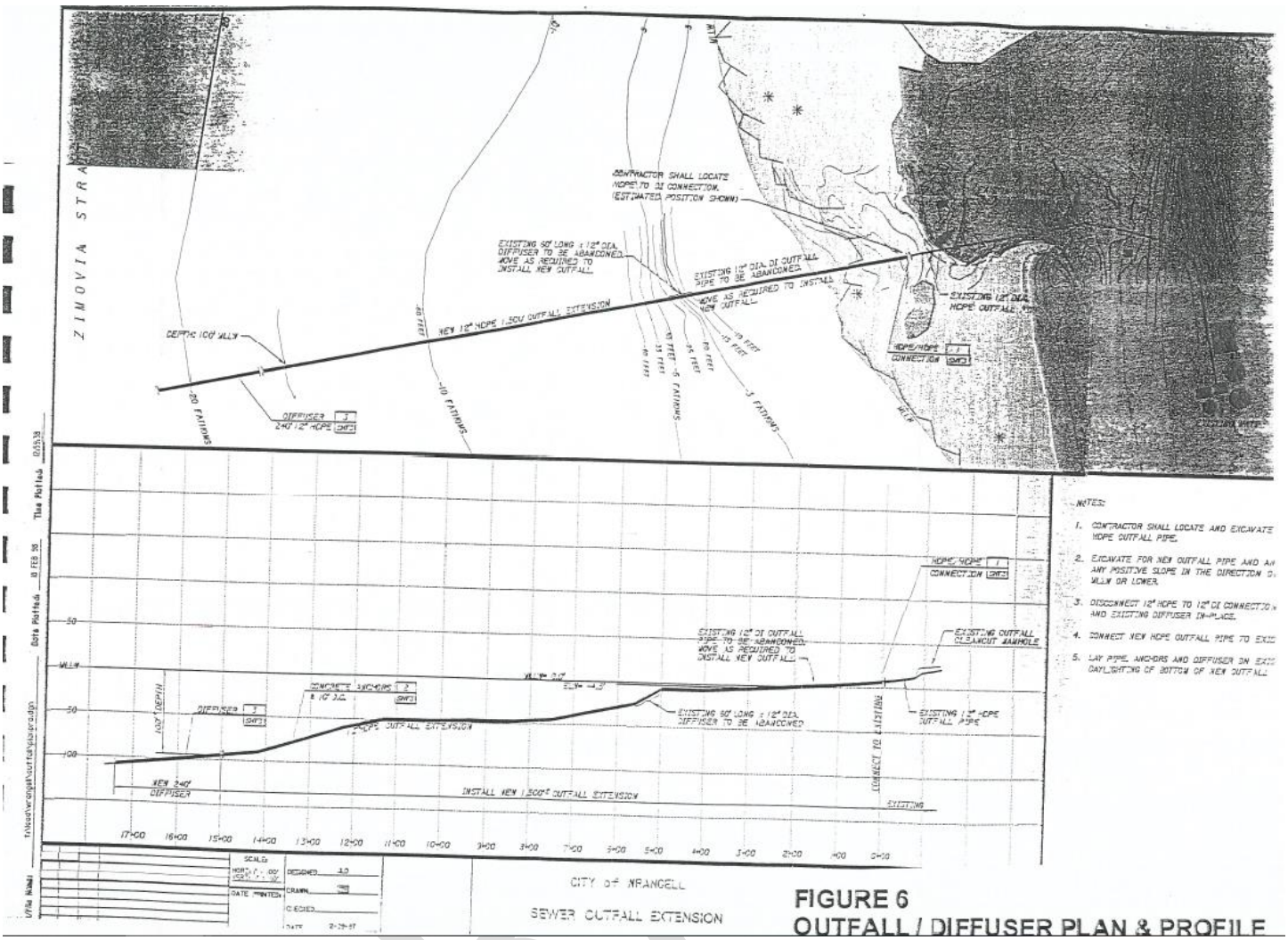
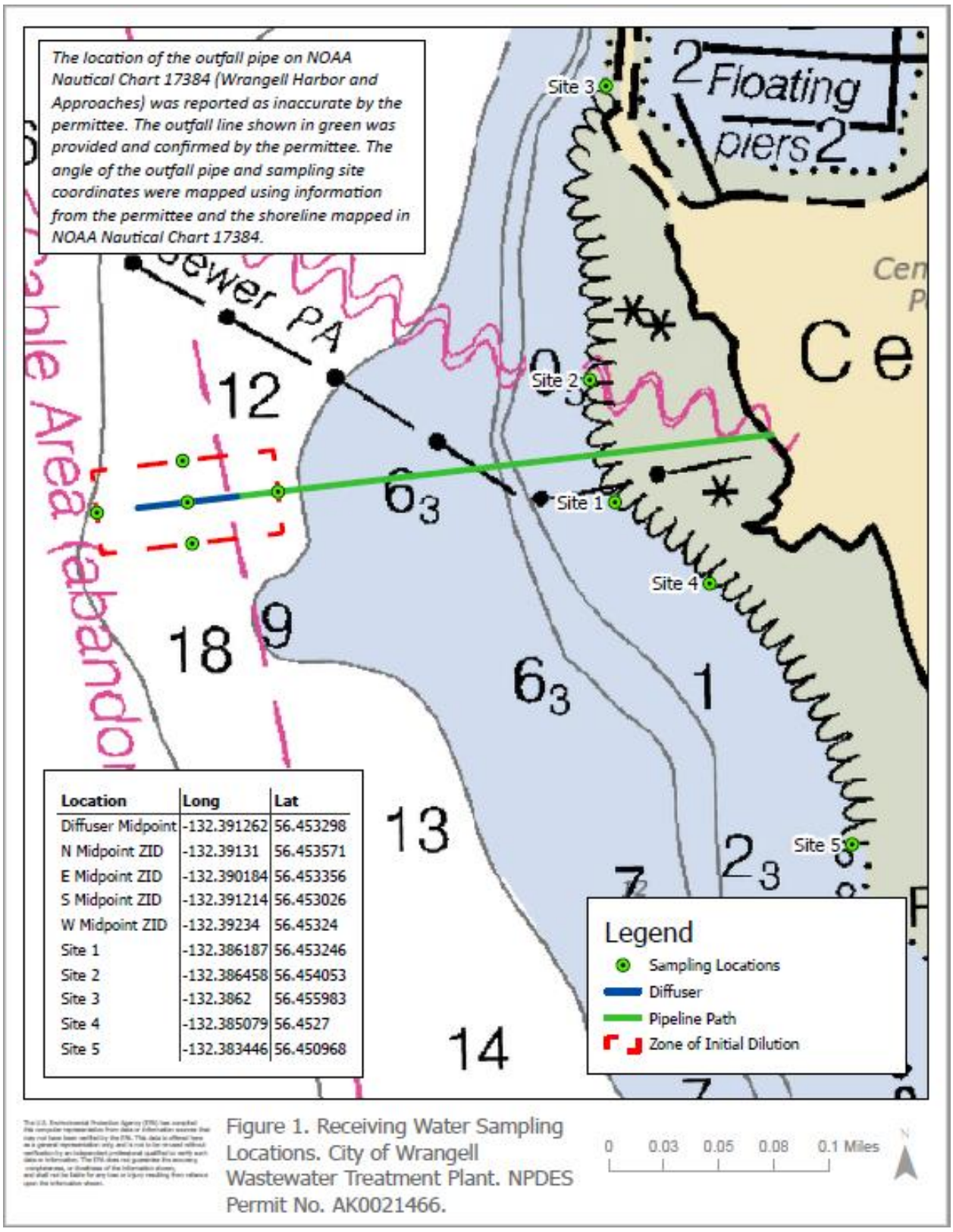


FIGURE 6
OUTFALL / DIFFUSER PLAN & PROFILE



Location	Long	Lat
Diffuser Midpoint	-132.391262	56.453298
N Midpoint ZID	-132.39131	56.453571
E Midpoint ZID	-132.390184	56.453356
S Midpoint ZID	-132.391214	56.453026
W Midpoint ZID	-132.39234	56.45324
Site 1	-132.386187	56.453246
Site 2	-132.386458	56.454053
Site 3	-132.3862	56.455983
Site 4	-132.385079	56.4527
Site 5	-132.383446	56.450968

Figure 1. Receiving Water Sampling Locations. City of Wrangell Wastewater Treatment Plant. NPDES Permit No. AK0021466.

Figure 1

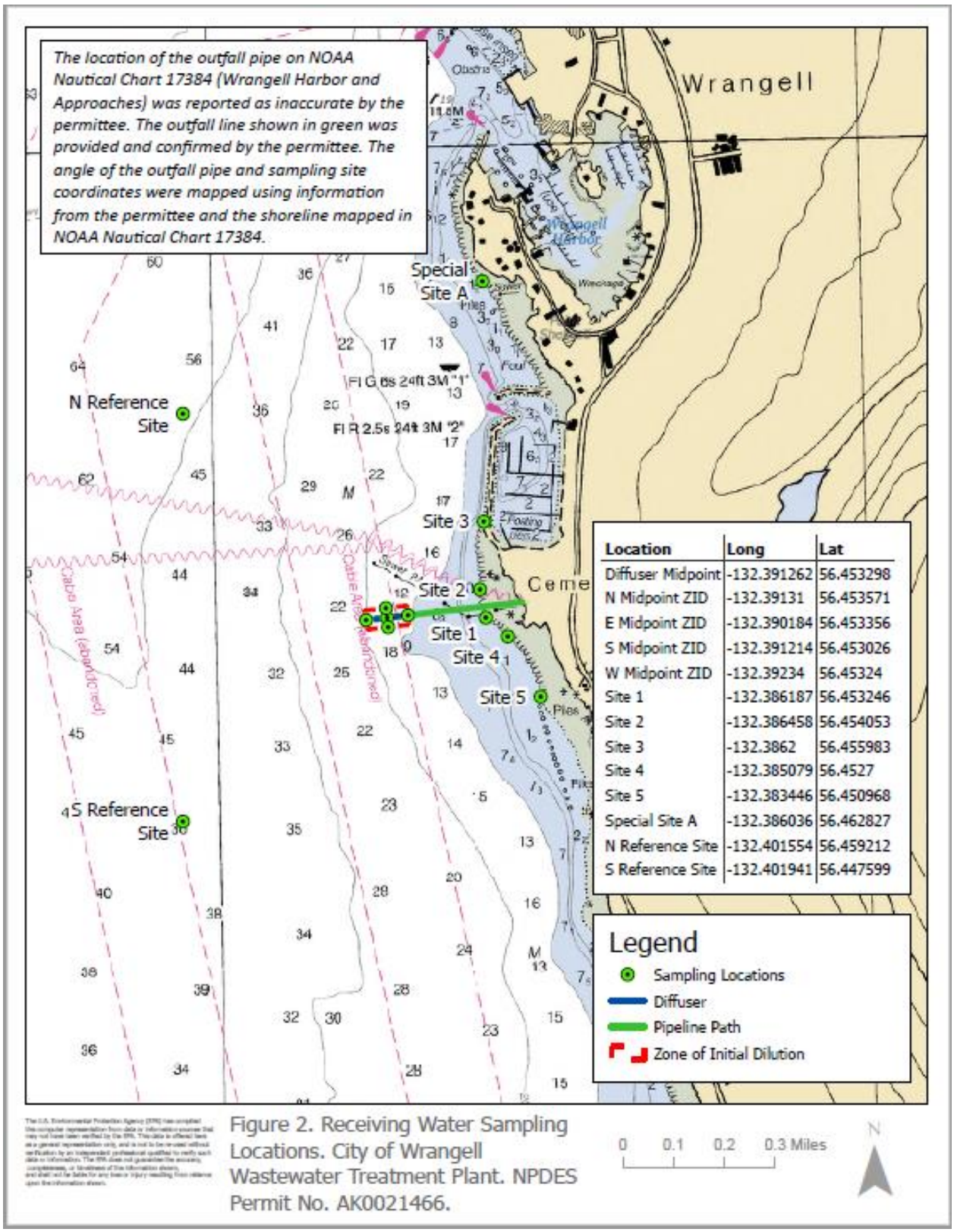


Figure 2. Receiving Water Sampling Locations. City of Wrangell Wastewater Treatment Plant. NPDES Permit No. AK0021466.

Figure 2

C. Summary Statistics of Discharge Monitoring Data (2016-2021)

Parameter	BOD5, 20 deg. C (mg/L)	BOD5, 20 deg. C (mg/L)		BOD5 20 deg. C (lbs/day)		BOD5 (% removal)	TSS (mg/L)	TSS (mg/L)		TSS (lbs/day)		TSS (% removal)	Fecal coliform, MPN, 44.5 C (#/100mL)		Flow (mgd)		Nitrogen, ammonia total	D.O. (mg/L)		pH (S.U.)		Temp (C)
Statistical Basis	INFLUENT	DAILY MAX	MO AVG	DAILY MX	MO AVG	Min % Removal	INFLUENT	DAILY MX	MO AVG	DAILY MX	MO AVG	Min % Removal	DAILY MX	MO GEO	DAILY MAX	MO AVG	DAILY MX	MAXIMUM	MINIMUM	MAX	MIN	MO AVG
Effluent Limitation	N/A	200	120	1001	601	30	N/A	200	140	1001	701	30	1500000	1000000	3.6	0.6		17	2	8.5	6.5	N/A
1/1/2016	61	18	18	39.8	39.8	70	50	20	20	44.3	44.3	60	12000	12000	0.745	0.382	13	9.2	6.99	7.61	7.16	4.83
2/1/2016	110	13	13	31.7	31.7	88	112	15	15	36.6	36.6	86.6	16000	16000	0.695	0.359		7.94	5.15	7.6	7.16	6.45
3/1/2016	59	19	19	47	47	67.8	54	14	14	34.63	34.63	74.07	30000	30000	0.533	0.346		7.05	5.09	7.62	7.28	4.01
4/1/2016	51	18	18	72.4	72.4	64.7	38	15	15	60.34	60.34	60.5	44000	44000	0.822	0.343	4.4	9.8	5.02	7.57	7.19	10.71
5/1/2016	39	13	13	41	41	66.6	27	10	10	31.7	31.7	62.9	18000	18000	0.645	0.34		9.2	5.06	7.54	7.06	13.13
6/1/2016	120	18	18	41.6	41.4	85	120	5	5	11.5	11.5	95.8	90	90	0.311	0.247		6.5	3.35	7.68	7.4	17.2
7/1/2016	66	19	19	31.9	31.9	71	56	8	8	13.4	13.4	86	6000	6000	0.45471	0.292	24	5.84	2.67	7.67	7.24	18.4
8/1/2016	110	12	12	27.82	27.82	89.09	120	16	16	37.09	37.09	86.67	790	790	0.45523	0.26		5.97	4.39	7.78	7.4	17.63
9/1/2016	39	11	11	23.2	23.2	71.79	39	12	12	25.3	25.3	69.23	2100	2100	0.909	0.452		8.09	4.46	7.64	7.26	14.76
10/1/2016	36	12	12	21.7	21.7	66.6	34	7	7	12.68	12.68	79.4	1200	1200	0.584	0.282	9	7.37	4.6	7.65	7.13	9.8
11/1/2016	89	13	13	24.36	24.36	85.39	80	10	10	18.73	18.73	87.5	4100	4100	0.79265	0.379		8.32	3.95	7.62	7.28	7.62
12/1/2016	49	16	16	43.3	43.3	67.35	44	12	12	59	59	72.73	51000	51000	1.26693	0.435		10.62	7.27	7.61	6.99	3.39
1/1/2017	81	19	19	48.2	48.2	76.54	55	12	12	30.44	30.44	78.18	30000	30000	0.689	0.408	9.9	10.58	6.52	7.66	7.07	3.43
2/1/2017	50	12	12	33.75	33.75	76	40	9.5	9.5	26.72	26.72	76.25	25000	25000	0.896	0.379		8.47	6.35	7.55	7.02	3.07
3/1/2017	59	19	19	47	47	67.8	54	14	14	34.63	34.63	74.07	30000	30000	0.533	0.346		7.05	5.09	7.62	7.28	4.01
4/1/2017	54	17	17	45.45	45.45	68.52	50	14	14	37.43	37.43	72	6800	6800	0.625	0.317	11	6.03	3.55	7.6	7.17	9.25
5/1/2017	140	19	19	50.79	50.79	86.43	123	15	15	40.1	40.1	87.8	24000	24000	0.92952	0.368		7.03	4.45	7.59	7.02	12.24
6/1/2017	69	13	13	31.51	31.51	81.16	78	15	15	36.36	36.36	80.77	4500	4500	0.448	0.348		6.9	4.84	7.64	7.04	14.49
7/1/2017	120	14	14	42.04	42.04	88.33	89	11	11	33.03	33.03	87.64	860	860	0.50068	0.374	18	6.51	4.6	7.67	7.12	15.87
8/1/2017	74	20	20	62.14	62.14	72.97	69	13	13	40.39	40.39	81.16	25000	25000	1.23953	0.429		7.19	4.89	7.67	7.13	16.47
9/1/2017	120	17	17	35.01	35.01	85.8	98	15	15	30.89	30.89	84.69	20000	20000	1.352	0.439		7.8	4.69	7.7	7.06	14.2
10/1/2017	38	11	11	22.1	22.1	71.05	30	8.8	8.8	17.68	17.68	70.67	2000	2000	0.579	0.382	8.9	8.36	5.49	7.56	6.68	10.43
11/1/2017	53	12	12	29.89	29.89	77.36	60	16	16	39.85	39.85	73.33	4600	4600	0.515	0.316		8.76	5.3	7.56	7.12	5.16
12/1/2017	54	13	13	48.12	48.12	75.9	39	12	12	44.42	44.42	69.23	7300	7300	0.63	0.375		7.62	5.27	7.42	7.08	5.52
1/1/2018	69	15	15	41.18	41.18	78.26	51	15	15	41.18	41.18	70.59	7500	7500	0.701	0.358	10	8.3	5	7.46	7	5.34
2/1/2018	70	21	21	46.01	46.01	70	45	18	18	39.44	39.44	60	23000	23000	0.45522	0.317		9.04	6.46	7.58	7.05	2.26
3/1/2018	66	15	15	34.17	34.17	77.27	68	12	12	27.34	27.34	82.35	2800	2800	0.488	0.355		7.91	4.5	7.39	7.05	4.54
4/1/2018	77	14	14	27.5	27.5	81.8	69	16	16	31.5	31.5	76.8	2000	2000	0.56	0.286	15	9.33	4.2	7.49	7.01	8.15
5/1/2018	73	16	16	38.26	38.26	78.08	60	15	15	35.87	35.87	75	23000	23000	0.372	0.273		8.03	4.71	7.54	7.18	12.8
6/1/2018	90	8.4	8.4	17.35	17.35	90.67	115	48	48	99.17	99.17	58.26	12000	12000	0.335	0.235		7.3	4.2	7.63	7.4	16.04
7/1/2018	130	21	21	41.21	41.21	83.85	128	25	25	73.38	73.38	80.47	26000	26000	0.75165	0.283	28	7.71	5.63	7.75	6.5	17.76
8/1/2018	180	33	33	52.8	52.8	81.6	50	29	29	46.4	46.4	42	8800	8800	0.658	0.294		9.47	4.67	6.95	6.52	18.12
9/1/2018	95	23	23	56.08	56.08	75.79	92	12	12	29.26	29.26	86.96	20000	20000	0.87436	0.317		7.93	5.48	7.56	6.71	14.06
10/1/2018	130	16	16	26.37	26.37	87.69	116	8	8	13.18	13.18	93.1	72	72	0.855	0.351	14	8.8	5.63	7.6	7.26	10.71
11/1/2018	80	10	10	26.53	26.53	87.5	87	4	4	10.61	10.61	95.4	950	950	0.58014	0.41		8.05	5.8	7.52	7.34	8.64
12/1/2018	100	12	12	26.7	26.7	88	80	11	11	24.5	24.5	86.2	21000	21000	0.828	0.372		8.38	6.07	7.57	7.18	5.84
1/1/2019	52	13	13	30.03	30.03	75	47	17	17	39.27	39.27	63.83	15000	15000	0.83966	0.427	11	8.97	6.23	7.54	7.26	4.44
2/1/2019	52	17	17	40.16	40.16	67.31	48	17	17	40.16	40.16	64.58	36000	36000	0.36737	0.298		10.5	5.47	7.57	7.36	2.17
3/1/2019	240	14	14	27.92	27.92	94.17	280	12	12	23.93	23.93	95.71	3200	3200	0.42106	0.274		8.48	4.22	7.73	7.25	4.64
4/1/2019	180	18	18	27.2	27.2	90	142	17	17	25.7	25.7	88	21000	21000	0.421	0.288	17	8.48	4.22	7.64	7.3	8.86
5/1/2019	68	14	14	25.07	25.07	79	69	8	8	14.33	14.33	84.5	3600	3600	0.379	0.234		5.95	4.42	7.69	7.36	14.18
06/30/2019	150	16	16	24.6	24.6	89.3	150	4	4	6.16	6.16	96.7	160	160	0.575	0.264		6.85	4.5	7.67	7.18	16.05
07/31/2019	81	27	27	43.57	43.57	66.67	81	8	8	12.91	12.91	86.67	4500	4500	0.25781	0.212	4.8	9.42	7.19	7.57	7.33	18.63
08/31/2019	150	20	20	39.44	39.44	86.67	150	6.8	6.8	13.41	13.41	95.47	23000	23000	0.56346	0.31		9.42	4.71	7.45	7.19	17.09
09/30/2019	75	33	33	100.98	100.98	56	75	14	14	27.61	27.61	78.13	24000	24000	0.56346	0.362		7.75	4.83	7.23	6.51	14.78
10/31/2019	110	29	29	69.7	69.7	73.6	110	12	12	28.8	28.8	88.5	60000	60000	0.652	0.391	7.4	7.66	4.6	7.39	7.16	10.23
11/30/2019	140	100	100	296.7	296.7	28.5	140	16	16	47.4	47.4	69.2	21000	21000	0.786	0.559		7.39	5.41	7.36	7.1	9.06
12/31/2019	220	35	35	74.9	74.9	84.09	220	16	16	34.24	34.24	95.35	2300	2300	0.6799	0.412		9.2	5.42	7.5	7.12	5.59
01/31/2020	97	18	18	41.06	41.06	81.4	97	19	19	43.3	43.3	66.07	2700	2700	1.034	0.426	9.8	8.52	5.87	7.63	7.23	3.11
02/29/2020	49	12	12	47.5	47.5	75.5	49	16	16	63.4	63.4	72.4	30000	30000	0.762	0.459		9.87	7.43	7.68	7	4.67
03/31/2020	83	14	14	41.31	41.31	83.13	83	18	18	53.11	53.11	79.07	3100	3100	0.667	0.321		9.24	3.66	7.79	7.15	4.97
04/30/2020	41	14	14	26.72	26.72	65.85	41	16	16	30.54	30.54	65.22	14000	14000	0.48746	0.287	16	6.31	4.25	7.6	7.13	7.81
05/31/2020	130	23	23	47.13	47.13	82.31	130	16	16	32.78	32.78	86.21	4000	4000	0.4149	0.249		6.31	4.25	7.6	7.13	13.28
06/30/2020	110	28	28	79.34	79.34	74.55	110	22	22	62.34	62.34	80.36	45000	45000	0.43317	0.315		6.18	4.26	7.75	7.04	14.5
07/31/2020	180	28	28	51.34	51.34	84.44	180	9.2	9.2	16.87	16.87	93.48	58000	58000	0.78302	0.333	21	6.17	4.63	7.52	6.78	16.41
08/31/2020	74	13	13	46.33	46.33	82.43	74	4.7	4.7	16.75	16.75	93.56	680	680	0.711	0.453		7.8	5.49	7.54	7.27	15.57
09/30/2020	32	9.8	9.8	30.69	30.69	69.38	32	6	6	18.79	18.79	82.86	6600	6600	0.71189	0.3		7.8	5.28	7.61	7.35	14.2
10/31/2020	76	9.5	9.5	27.01	27.01	87.5	76	8	8	22.74	22.74	90	1800	1800	1.176	0.37	10	8.86	6.04	7.74	7.49	10.35
11/30/2020	64	15	15	44.4	44.4	76.56	64	15	15	44.4	44.4	75	35000	35000	1.88	0.497		9.02	6.4	7.6	7.44	6.91
12/31/2020	73	11	11	43.7	43.7	84.93	73	15	15	59.59	59.59	76.19	12000	12000	1.88	0.442		8.73	4.26	7.31	6.88	6.04
01/31/2021	37	16	16	57.42	57.42	56.76	37	16	16	57.42	57.42	48.39	27000	27000	0.7975	0.434	9.6	9.07	4.07	7.35	6.9	5.58
02/28/2021	62	16	16	29.21	29.21	74.19	62	20	20	36.51	36.51	61.54	5700	5700	0.762	0.36		8.5	5.15	7.31	6.85	3.46
03/31/2021	110	14	14	32.03	32.03	87.27	110	15	15	34.32	34.32	82.95	12000	12000	0.84164	0.436		8.6	5.96	7.23	6.72	5.29
04/30/2021	89	13	13	46	46	85.39	89	14	14	49.5	49.5	80.82	8400	8400	0.619	0.315	7.7	8.17	3.66	7.23	6.51	7.92
05/31/2021	120	14	14	38.75	38.75	88.3	120	11	11	30.44	30.44	89.4	4100	4100	0.341	0.27		6.67	4.45	7.61	6.99	12.5
06/30/2021	190	34	34	64.9	64.9	82.1	190	23	23	43.9	43.9	86.7	3300	3300	0.604	0.281		5.79	4.16	7.59	7.08	15.9
07/31/2021	76	22	22	36.73	36.73	71.05	76	8	8	13.36	13.36	88.89	5400	5400	0.36394	0.243	21	5.28	4.05	7.55	6.8	17.71
08/31/2021	180	20	20	35.2	35.2	88.9	180	10	10	17.6	17.6	94.3	7700	7700	0.494	0.314		5.21	4.1	7.54	6.87	16.85
Average	92.53	18.42	18.42	44.75	44.75	77.56	86.84	13.85	13.85	34.27	34.27	78.89	14892.68	14892.68	0.69	0.35	13.07	7.95	5.00	7.56	7.09	10.22
Maximum	240.00	100.00	100.00	296.70	296.70	94.17	280.00	48.00	48.00	99.17	99.17	96.70	60000.00	60000.00	1.88	0.56	28.00	10.62	7.43	7.79	7.49	18.63
Minimum	32.00	8.40	8.40	17.35	17.35	28.50	27.00	4.00	4.00	6.16	6.16	42.00	72.00	72.00	0.26	0.21	4.40	5.21	2.67	6.95	6.50	2.17
Count	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	68.00	23.00	68.00	68.00	68.00	68.00	68.00
Std Dev	46.71	11.75	11.75	34.53	34.53	10.56	48.56	6.43	6.43	16.78	16.78	12.02	14639.29	14639.29	0.31	0.07	6.10	1.29	0.97	0.15	0.23	5.15
CV	0.50	0.64	0.64	0.77	0.77	0.14	0.56	0.46	0.46	0.49	0.49	0.15	0.98	0.98	0.45	0.20	0.47	0.16	0.19	0.02	0.03	0.50
99th Percntile	226.60	56.45	56.45	165.57	165.57	91.83	239.80	35.27	35.27	81.89	81.89	96.10	58660.00	58660.00	1.88	0.52	27.12	10.59	7.32	7.78	7.46	18.48
95th Percentile	185.50	33.55	33.55	77.34	77.34	89.69	185.50	24.10	24.10	62.92	62.92	95.60	48300.00	48300.00	1.31	0.46	27.20	10.22	7.10	7.75	7.40	17.96
5th Percentile	37.45	9.89	9.89	22.60	22.60	60.33	32.90	4.84	4.84	12.03	12.03	59.04	394.00	394.00	0.34	0.24	4.48	5.81	3.60	7.23	6.51	3.09

D. Alaska WQS

Alaska WQS for Turbidity for Marine Uses

Water Quality Standards for Designated Uses	
POLLUTANT & WATER USE	**CRITERIA**
(24) TURBIDITY, FOR MARINE WATER USES	
(A) Water Supply (i) aquaculture	May not exceed 25 nephelometric turbidity units (NTU).
(A) Water Supply (ii) seafood processing	May not interfere with disinfection.
(A) Water Supply (iii) industrial	May not cause detrimental effects on established levels of water supply treatment.
(B) Water Recreation (i) contact recreation	Same as (24)(A)(i).
(B) Water Recreation (ii) secondary recreation	Same as (24)(A)(i).
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	May not reduce the depth of the compensation pointfor photosynthetic activity by more than 10%. May not reduce the maximum secchi disk depth by more than 10%.
(D) Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life	Same as (24)(C).

Alaska WQS for Dissolved Gas for Marine USes

Water Quality Standards for Designated Uses	
POLLUTANT & WATER USE	**CRITERIA**
(15) DISSOLVED GAS, FOR MARINE WATER USES	
(B) Water Supply (i) aquaculture	Surface dissolved oxygen (D.O.) concentration in coastal water may not be less than 6.0 mg/l for a depth of one meter except when natural conditions cause this value to be depressed. D.O. may not be reduced below 4 mg/l at any point beneath the surface. D.O. concentrations in estuaries and tidal tributaries may not be less than 5.0 mg/l except where natural conditions cause this value to be depressed. In no case may D.O. levels exceed 17 mg/l. The concentration of total dissolved gas may not

	exceed 110% of saturation at any point of sample collection.
(A) Water Supply (ii) seafood processing	Not applicable.
(A) Water Supply (iii) industrial	Not applicable.
(C) Water Recreation (i) contact recreation	Same as (15)(A)(i).
(B) Water Recreation (ii) secondary recreation	Same as (15)(A)(i).
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Same as (15)(A)(i).
(D) Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life	Same as (15)(A)(i).

Alaska WQS for pH for Marine Uses

Water Quality Standards for Designated Uses	
POLLUTANT & WATER USE	**CRITERIA**
(18) pH, for marine water uses (variation of pH for waters naturally outside the specified range must be toward the range)	
(A) Water Supply (i) Aquaculture	May not be less than 6.5 or greater than 8.5, and may not vary more than 0.2 pH unit outside of the naturally occurring range.
(A) Water Supply (ii) seafood processing	May not be less than 6.0 or greater than 8.5.
(A) Water Supply (iii) industrial	May not be less than 5.0 or greater than 9.0
(D) Water Recreation (i) contact recreation	May not be less than 6.0 or greater than 8.5. If the natural pH condition is outside this range, substances may not be added that cause any increase in buffering capacity of the water.
(B) Water Recreation (ii) secondary recreation	Same as (18)(A)(iii).

(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Same as (18)(A)(i).
(D) Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life	Same as (18)(A)(ii).

Alaska WQS for Temperature for Marine Uses

Water Quality Standards for Designated Uses	
POLLUTANT & WATER USE	**CRITERIA**
(22) TEMPERATURE, FOR MARINE WATER USES	
(C) Water Supply (i) aquaculture	May not cause the weekly average temperature toincrease more than 1° C. The maximum rate of change may not exceed 0.5° C per hour. Normal daily temperature cycles may not be altered inamplitude or frequency.
(A) Water Supply (ii) seafood processing	May not exceed 15° C.
(A) Water Supply (iii) industrial	May not exceed 25° C.
(E) Water Recreation (i) contact recreation	Not applicable.
(B) Water Recreation (ii) secondary recreation	Not applicable.
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Same as (22)(A)(i).
(D) Harvesting for Consumptionof Raw Mollusks or Other Raw Aquatic Life	Same as (22)(A)(i).

Alaska WQS for Toxics for Marine Uses

Water Quality Standards for Designated Uses	
POLLUTANT & WATER USE	**CRITERIA**
(23) TOXIC AND OTHER DELETERIOUS ORGANIC AND INORGANIC SUBSTANCES, FOR MARINE WATER USES	
(D) Water Supply (i) aquaculture	Same as (23)(C).

(A) Water Supply (ii) seafood processing	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* (see note 5). Substances may not be introduced that cause, or can reasonably be expected to cause, either singly or in combination, odor, taste, or other adverse effects on the use.
(A) Water Supply (iii) industrial	Concentrations of substances that pose hazards to worker contact may not be present.
(F) Water Recreation (i) contact recreation	There may be no concentrations of substances in water, that alone or in combination with other substances, make the water unfit or unsafe for the use.
(B) Water Recreation (ii) secondary recreation	Concentrations of substances that pose hazards to incidental human contact may not be present.
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	The concentration of substances in water may not exceed the numeric criteria for aquatic life for marine water and human health for consumption of aquatic organisms only shown in the *Alaska Water Quality Criteria Manual* (see note 5), or any chronic and acute criteria established in this chapter, for a toxic pollutant of concern, to protect sensitive and biologically important life stages of resident species of this state. There may be no concentrations of toxic substances in water or in shoreline or bottom sediments, that, singly or in combination, cause, or reasonably can be expected to cause, adverse effects on aquatic life or produce undesirable or nuisance aquatic life, except as authorized by this chapter. Substances may not be present in concentrations that individually or in combination impart undesirable odor or taste to fish or other aquatic organisms, as determined by either bioassay or organoleptic tests.
(D) Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life	Same as (23)(C).

Alaska WQS for Bacteria for Marine Uses

Water Quality Standards for Designated Uses	
POLLUTANT & WATER USE	**CRITERIA**
(14) BACTERIA, FOR MARINE WATER USES, (see note 1)	
(E) Water Supply (i) aquaculture	For products normally cooked, the geometric mean of samples taken in a 30-day period may not exceed 200fecal coliform/100 ml, and not more than 10% of the samples may exceed 400 fecal coliform/100 ml. For products not normally cooked, the geometric mean ofsamples taken in a 30-day period may not exceed 20 fecal coliform/100 ml, and not more than 10% of the samples may exceed 40 fecal coliform/100 ml.
(A) Water Supply (ii) seafood processing	In a 30-day period, the geometric mean of samples may not exceed 20 fecal coliform/100 ml, and not more than 10% of the samples may exceed 40 fecal coliform/100 ml.
(A) Water Supply (iii) industrial	Where worker contact is present, the geometric meanof samples taken in a 30-day period may not exceed 200 fecal coliform/100 ml, and not more than 10% of the samples may exceed 400 fecal coliform/100 ml.
(G) Water Recreation (i) contact recreation	In a 30-day period, the geometric mean of samples may not exceed 35 enterococci CFU/100 ml, and notmore than 10% of the samples may exceed a statistical threshold value (STV) of 130 enterococci CFU/100 ml.
(B) Water Recreation (ii) secondary recreation	In a 30-day period, the geometric mean of samples may not exceed 200 fecal coliform/100ml, and not more than 10% of the samples may exceed 400 fecal coliform/100ml.
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Not applicable.
(D) Harvesting for Consumptionof Raw Mollusks or Other Raw Aquatic Life	The geometric mean of samples may not exceed 14 fecal coliform/100 ml; and not more than 10% ofthe samples may exceed; - 43 MPN per 100 ml for a five-tube decimal dilution test; - 49 MPN per 100 ml for a three-tube decimal dilution test; - 28 MPN per 100 ml for a twelve-tube single dilution test; - 31 CFU per 100 ml for a membrane filtrationtest (see note 14).

E. Equations and Analysis

1. Part 8.B.1: Attainment of TSS Standard

EPA calculated the maximum change in the concentration of TSS at the edge of the ZID using formula B-32 from the 301(h) TSD. The maximum daily TSS limitation of 45 mg/L and the modeled critical initial dilution of 112:1 were used in the equation. The results show a 0.40 mg/L increase in suspended solids in the receiving water after initial dilution, or 0.8%.

Formula B-2

$SS = SS_e/S_a$

where,

SS = change in suspended solids concentration following initial dilution

SS_e = effluent suspended solids concentration (45 mg/L)

S_a = critical initial dilution (112:1)

45/112 = 0.4 mg/L

2. Part 8.B.2: Attainment of DO Standard

EPA calculated the final concentration of DO at the boundary of the ZID using equation B-5 from the 301(h) TSD. The analysis is presented in Table 8 below.

Table 8: Dissolved Oxygen Analysis

Dissolved Oxygen in mg/L	Surface	Mid	Bottom	Notes
Ambient DO concentration (DO_a) = (reference sites)	**7.95**	**5.33**	**4.68**	minimum observed at two reference sites
Ambient DO concentration (DO_a) = (ZID boundary sites)	**8.11**	**5.61**	**4.98**	minimum observed at two outfall sites
Effluent DO concentration (DO_e) =	**3.6**	**3.6**	**3.6**	5th Percentile
Immediate DO demand (IDOD) =	**2.0**	**2.0**	**2.0**	Table B-3 301(h) TSD[1]
Initial dilution (S_a) =	**112**	**112**	**112**	Dilution modeling results
Final DO at Reference Sites $DO_f = DO_a - (DO_a + IDOD - DO_e)/S_a$ = (using reference site ambient DO)	**7.89**	**5.30**	**4.65**	Equation B-5 from 301(h) TSD, using reference site ambient DO
Assuming 0 mg/L effluent (worst-case) $DO_f = DO_a - (DO_a + IDOD - DO_e)/S_a$ =	**7.86**	**5.26**	**4.62**	Worst-Case
FINAL DO at ZID Boundary $DO_f = DO_a - (DO_a + IDOD - DO_e)/S_a$ = (using ZID boundary ambient DO)	**8.05**	**5.57**	**4.95**	Equation B-5 from 301(h) TSD, using outfall site ambient DO
Depletion at Refence Sites	**-0.06 (0.7%)**	**-0.03 (0.6%)**	**-0.03 (0.6%)**	
Depletion at ZID Boundary Sites	**-0.06 (0.7%)**	**-0.04 (0.7%)**	**-0.03 (0.6%)**	

[1] Primary facility, effluent BOD_5 50-100 mg/L, travel time 0-100 minutes.

The final BOD_5 after initial dilution was also calculated to assess the potential for far field DO impacts using a simplified procedure from Appendix B of the 301(h) TSD. The maximum reported average monthly BOD_5 value is first converted to ultimate BOD_5 by multiplying it by the constant 1.46. The ultimate BOD_5 is then divided by the initial dilution factor (112) to determine the final BOD_5 after initial dilution.

Max BOD_5: 100 mg/L

Ultimate BOD_5: 100 mg/L x 1.46= 146 mg/L

Final BOD_5: $\frac{146 \text{ mg/L}}{112} = 1.3 \text{ mg/L } BOD_5$

A final BOD_5 concentration of 1.3 mg/L after initial dilution is not expected to cause or contribute to any measurable far field DO impacts.

3. Part 8.C.3. Toxics Analysis

The following mass-balance equation was used to determine whether the discharge has reasonable potential to cause or contribute to an excursion above Alaska WQS:

$$Cd = \frac{Ce + [\, Cu\, (\, Sa - 1\,)\,]}{Sa} \quad \text{where}$$

Cd = Resultant magnitude or predicted concentration at edge of mixing zone, µg/L

Ce = Maximum projected effluent concentration, µg/L

Cu = Background receiving water concentration, µg/L

Sa = dilution factor

The maximum projected effluent concentration (Ce) in the mass balance equation is represented by the highest reported concentration measured in the effluent multiplied by a reasonable potential multiplier. The reasonable potential multiplier accounts for uncertainty in the data. The multiplier decreases as the number of data points increases and variability of the data decreases. Variability is measured by the coefficient of variation (CV) of the data. When there is not enough data to reliably determine a CV (n<10), the TSD recommends using 0.6 as a default value. A partial listing of reasonable potential multipliers can be found in Table 3-1 of the TSD. The resulting maximum projected effluent concentration is then divided by the minimum critical dilution. This product represents the maximum effluent concentration at the edge of the ZID. The maximum effluent concentration at the edge of the ZID is then added to the background concentration, Cu, which is represented by the 95th percentile value from the background data set (the 5th percentile value is used for DO). The sum Cd represents the projected maximum receiving water concentration at the edge of the ZID. This concentration is compared to the water quality criterion to determine whether a water-quality based effluent limitation is needed. If the receiving water concentration at the edge of the ZID exceeds the water-quality criteria a water-quality based effluent limitation is

developed. If a permittee is unable to meet their WQBEL they would fail to satisfy CWA 301(h)(9) and 40 CFR 125.62 and would be ineligible for a 301(h)-modified permit.

A summary of the reasonable potential analyses is presented in Table 9. The Table footnotes indicate the criterion source used to evaluate reasonable potential (i.e., the criterion in effect for Clean Water Act purposes). Chlorine is the only constituents that demonstrated reasonable potential. A WQBEL for chlorine have been developed and included in the draft permit. The effluent limits developed for chlorine are protective of Alaska WQS, and the proposed discharge is expected to comply with Alaska WQS for toxics after initial mixing, satisfying the requirements of CWA 301(h)(9) and 40 CFR 125.62. For more information on the process used to develop effluent limits refer to Part IV of the Fact Sheet.

Table 9: Reasonable Potential Analysis for Toxic Pollutants in the Effluent

Parameter	n	Max Value (µg/L)	TSD Multiplier at 95th Percentile	Max Ce (µg/L)	Cu (µg/L)	Sa (dilution factor)	Cd (µg/L)	WQC (µg/L)	RP[1] (Y/N)
Arsenic	2	1.5	7.4	11.4	0.0	3.9 (acute) 29 (chronic)	0.1	36.0[2]	N
Chlorine[3]	--	750	4.7	3552.0	0.0	3.9 (acute) 29 (chronic)	317.1	13[2]	Y
Chromium VI	1	1.5	13.2	19.1	0.0	3.9 (acute) 29 (chronic)	1.7	50[2]	N
Copper[4]	3	51.2	5.6	286.7	1.1	3.9 (acute) 29 (chronic)	3.2	3.1[2]	N[4]
Lead	3	1.4	5.6	7.8	0.0	3.9 (acute) 29 (chronic)	0.7	8.1[2]	N
Nickel	3	3.7	5.6	20.7	0.7	3.9 (acute) 29 (chronic)	2.5	8.2[2]	N
Silver	1	1.6	13.2	21.1	0.0	3.9 (acute) 29 (chronic)	1.6	1.9[2]	N[4]
Zinc	2	110.0	3.8	418.0	1.1	3.9 (acute) 29 (chronic)	4.2	81.0[2]	N
Ammonia	23	28,000.0	1.9	53,200.0	0.2	3.9 (acute) 29 (chronic)	471.0	1,200.0[2,5]	N

1. RP based on formula:

$$Cd = \frac{Ce + [\, Cu\, (\, Sa - 1\,)\,]}{Sa}$$

Where:
n= number of samples
Max Value = Max facility-reported effluent concentration in µg/L
TSD X = Multiplier using 95th Percentile, CV of 0.6, and n=2 (except for ammonia, where CV=0.4 and n=211) found in EPA's *Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001, March 1991).*
Max Ce = Max effluent concentration X TSD multiplier
Ce = Max effluent concentration
Cu = Background receiving water concentration in µg/L
Sa = dilution factor
Cd = Resultant magnitude or predicted concentration at edge of mixing zone, µg/L
WQC= Most stringent Alaska marine water quality criterion in µg/L (see additional footnotes)
RP= Reasonable Potential to exceed WQC after mixing

2. Saltwater criteria from *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances, May 15, 2003.*
3. Chlorine data was not available; EPA used an assumed Ce of 750 µg/L. See Part IV.A.2 of the Fact Sheet.
4. See Part IV.A.3.c of the Fact Sheet for a discussion of the RPA for copper and silver.
5. Saltwater chronic ammonia criteria were derived from Table IX in *Alaska Water Quality Criteria Manual for Toxic And Other Deleterious Organic and Inorganic Substances* using a temperature of 15 °C (facility surface water monitoring 95th percentile value for trapping depth was 13.7 °C in 2019), a salinity of 10 g/kg (facility surface water monitoring 5th percentile was 5.7 ppt or g/kg at the trapping depth in 2017), and a pH of 8.0 (facility surface water monitoring 95th percentile value was 7.9 between 2016-2021). CV was calculated using the 23 data points.

F. TVS Survey Results

Table 10: Total Volatile Solids Results (2006)

Sample Location	Date & Time	Method	Total Volatile Solids (TVS)	Units
Station 1-TVS #1 Outfall	8/22/06 16:26	SM2540G	4.5	%
Station 1-TVS #2 Outfall	8/22/06 16:50	SM2540G	4.4	%
Station 2-TVS #1 1000' NW	8/22/06 15:55	SM2540G	4.4	%
Station 2-TVS #2 1000' NW	8/22/06 16:09	SM2540G	4.5	%
Station 3-TVS #1 1000' SE	8/22/06 14:51	SM2540G	4.6	%
Station 3-TVS #2 1000' SE	8/22/06 14:55	SM2540G	4.4	%
Station 4-TVS #1 NW ZID Boundary	8/22/06 15:13	SM2540G	4.4	%
Station 4-TVS #2 NW ZID Boundary	8/22/06 15:25	SM2540G	4.3	%
Station 5-TVS #1 SE ZID Boundary	8/22/06 14:15	SM2540G	4.4	%
Station 5-TVS #2 SE ZID Boundary	8/22/06 14:32	SM2540G	4.3	%

Station 1: Outfall; Stations 2/3: Reference; Stations 4/5: ZID boundary

G. Dilution Modeling Report

The dilution model is available on our website with the other permit documents: https://www.epa.gov/npdes-permits/npdes-permit-wrangell-wastewater-treatment-plant-alaska