ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT FACT SHEET – PRELIMINARY DRAFT

Permit Number: **AK0053392**

Ketchikan Pulp Company Ward Cove Landfill

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

Public Comment Period Start Date: DRAFT

Public Comment Period Expiration Date: DRAFT

Alaska Online Public Notice System

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Proposed issuance of an Alaska Pollutant Discharge Elimination System (APDES) permit to:

KETCHIKAN PULP COMPANY

For wastewater discharges from
Ketchikan Pulp Company Ward Cove Landfill
P.O. Box 6600
Ketchikan, AK 99901

The Alaska Department of Environmental Conservation (the Department or DEC) proposes to reissue an APDES individual permit (permit) to the Ketchikan Pulp Company (KPC). The permit authorizes and sets conditions on the discharge of pollutants from this facility to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facility and outlines best management practices to which the facility must adhere.

This fact sheet explains the nature of potential discharges from the KPC Ward Cove Landfill (KPC Landfill) and the development of the permit including:

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

Public Comment

Persons wishing to comment on or request a public hearing for the draft permit for this facility, may do so in writing by the expiration date of the public comment period.

Commenters are requested to submit a concise statement on the permit condition(s) and the relevant facts upon which the comments are based. Commenters are encouraged to cite specific permit requirements or conditions in their submittals.

A request for a public hearing must state the nature of the issues to be raised, as well as the requester's name, address, and telephone number. The Department will hold a public hearing whenever the Department finds on the basis of requests, a significant degree of public interest in a draft permit. The Department may also hold a public hearing if a hearing might clarify one or more issues involved in a permit decision or for other good reason, in the Department's discretion. A public hearing will be held at the closest practicable location to the site of the operation. If the Department holds a public hearing, the Director will appoint a designee to preside at the hearing. The public may also submit written testimony in lieu of or in addition to providing oral testimony at the hearing. A hearing will be tape recorded. If there is sufficient public interest in a hearing, the comment period will be extended to allow time to public notice the hearing. Details about the time and location of the hearing will be provided in a separate notice.

All comments and requests for public hearings must be in writing and should be submitted to the Department at the technical contact address, fax, or email identified above (see also the public comments section of the attached public notice). Mailed comments and requests must be postmarked on or before the expiration date of the public comment period.

After the close of the public comment period and after a public hearing, if applicable, the Department will review the comments received on the draft permit. The Department will respond to the comments received in a Response to Comments document that will be made available to the public. If no substantive comments are received, the tentative conditions in the draft permit will become the proposed final permit.

The proposed final permit will be made publicly available for a five-day applicant review. The applicant may waive this review period. After the close of the proposed final permit review period, the Department will make a final decision regarding permit issuance. A final permit will become effective 30 days after the Department's decision, in accordance with the state's appeals process at 18 Alaska Administrative Code (AAC) 15.185.

The Department will transmit the final permit, fact sheet (amended as appropriate), and the Response to Comments to anyone who provided comments during the public comment period or who requested to be notified of the Department's final decision.

Informal Reviews and Adjudicatory Hearings

A person authorized under a provision of 18 AAC 15 may request an informal review of a contested decision by the Division Director in accordance with 18 AAC 15.185 and/or an adjudicatory hearing in accordance with 18 AAC 15.195 – 18 AAC 15.340. See DEC's "Appeal a DEC Decision" web page https://dec.alaska.gov/commish/review-guidance/ for access to the required forms and guidance on the appeal process. Please provide a courtesy copy of the adjudicatory hearing request in an electronic format to the parties required to be served under 18 AAC 15.200. Requests must be submitted no later than the deadline specified in 18 AAC 15.

Documents are Available

The permit, fact sheet, application, and related documents can be obtained by visiting or contacting DEC between 8:00 a.m. and 4:30 p.m. Monday through Friday at the addresses below. The permit, fact sheet, application, and other information are located on the Department's Wastewater Discharge Authorization Program website: https://dec.alaska.gov/water/wastewater/

Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 555 Cordova Street **Anchorage**, AK 99501 (907) 269-6285	Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program **Mail**: P.O. Box 111800 **In Person**: 410 Willoughby Avenue, Suite 303 **Juneau**, AK 99811-1800 (907) 465-5180
Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 610 University Avenue **Fairbanks**, AK 99709 (907) 451-2183	

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1.0 APPLICANT

1.1 Applicant

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

Name of Facility:	Ketchikan Pulp Company Ward Cove Landfill
APDES Permit Number:	AK0053392
Facility Location:	409 Brusich Road, Ketchikan, AK
Mailing Address:	PO Box 6600 Ketchikan, AK 99901
Facility Contact:	Mr. Phillip Benning, Environmental Project Manager

1.2 Authority

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

1.3 Permit History

The KPC Landfill was originally permitted under National Pollutant Discharge Elimination System (NPDES) Permit AK0000922 in 1998 by the Environmental Protection Agency (EPA). The permit authorized the discharge of KPC Landfill leachate with other comingled treated wastewater originating from the grounds of the mill. In 2004, KPC constructed a new outfall and requested separate permits for their discharges. Subsequently, in August 2004, EPA issued AK0053392 for the landfill leachate. The 2004 permit, which expired in 2009, was administratively extended until May 1, 2013, when DEC reissued AK0053392 as an APDES permit. The APDES permit was subsequently reissued in 2020. The 2020 reissued permit expired in 2025. Under the Administrative Procedures Act and state regulations at 18 AAC 83.155(c), an APDES permit may be administratively extended (i.e., continues in force and effect) provided that the permittee submits a timely and complete application for a new permit prior to the expiration of the current permit. A timely application for a new permit was submitted by KPC on August 28, 2024; therefore, the 2020 permit is administratively extended until such time a new permit is reissued.

2.0 BACKGROUND

2.1 Facility Information

KPC owns and maintains the KPC Landfill, located northwest of Ketchikan, AK. The landfill opened in 1988 to serve the nearby mill, formerly owned by KPC and currently owned by Power Systems & Supply of Alaska. Construction of the leachate treatment system was completed in 1998. The KPC landfill is no longer used as a waste disposal site. The 16.9-acre landfill contains two waste disposal cells that were closed in accordance with State of Alaska solid waste regulations at 18 AAC 60. The first waste disposal cell was closed in 1998, and the second waste disposal cell was closed in 2001. Both cells contain primarily wood waste, boiler bottom ash, and fly ash from past mill operations. Fly ash is a lightweight component or byproduct of burning hog fuel (coarse chips and clumps of wood waste product) that rises with the flue gases and is captured by contaminant control equipment. Bottom ash is material that falls to

the bottom of the burner unit. Landfill leachate discharges to Ward Cove, and storm water from the landfill flows to Refuge and Ward Coves. Figure 1 shows the location of KPC Ward Cove Landfill.

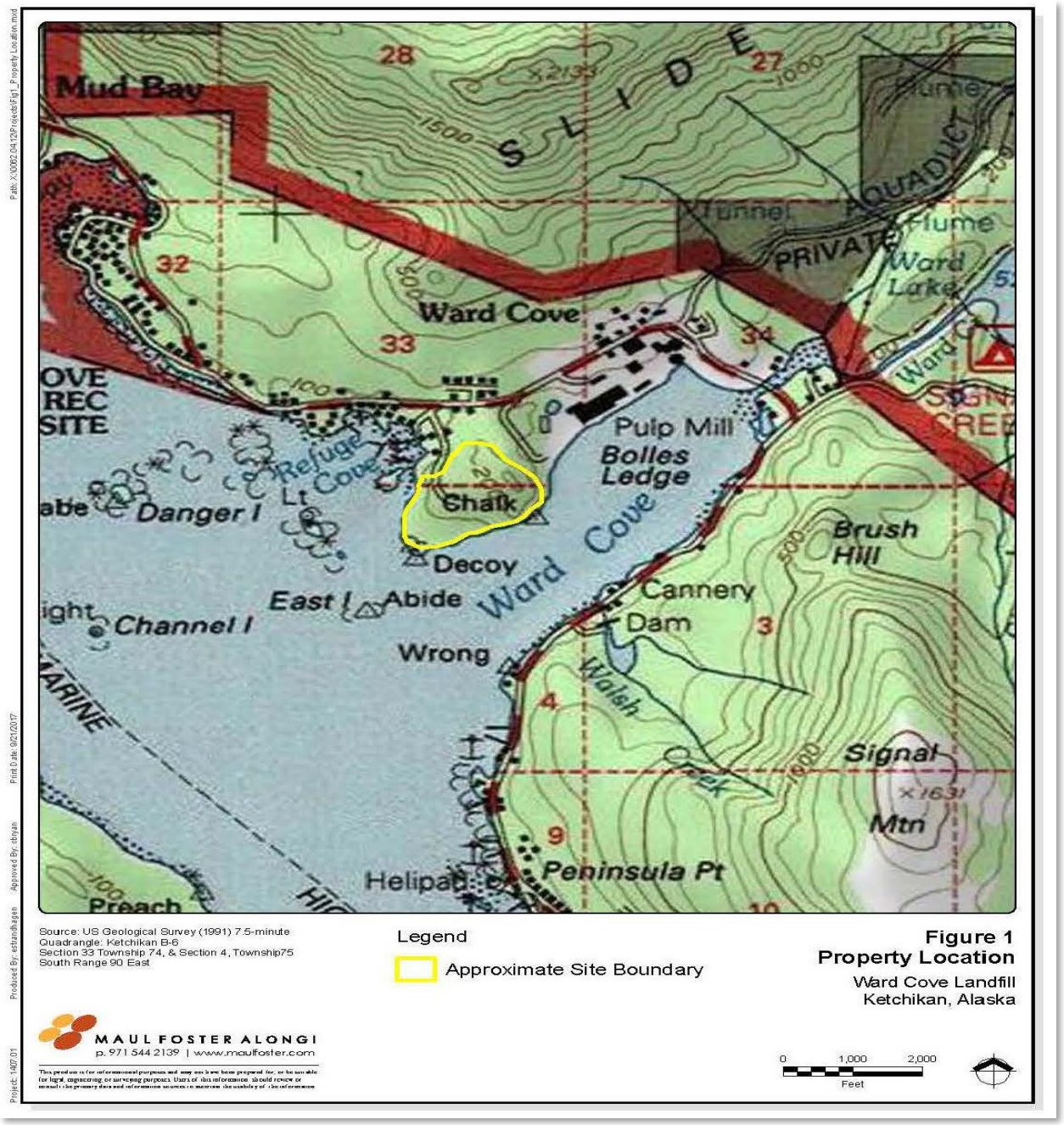

Figure 1: KPC Ward Cove Landfill Location

2.2 Wastewater Treatment

The ash cell was permitted for the disposal of boiler bottom and fly ash from burning hog fuel mixed with diesel, calcium filtrate, tree bark, and wood waste mixed with rock and soil and primary and secondary sludges on a limited basis. The second cell was permitted for disposal of hog fuel derived from the preparation of timber for the pulping process, along with smaller amounts of mud, rock, and dredged spoils. The entire landfill is now capped with a low permeability geosynthetic cover and vegetated with grass and legumes. The leachate collection system consists of piping installed during landfill closure. The piping collects ongoing leaching of residual materials in the landfill cells and conveys it via gravity to a

lined treatment lagoon. Baffle curtains in the lagoon create an aeration and settling basin. At a design flow capacity of 86,400 gallons per day (gpd), the settling basin provides more than 100 hours of retention time. Following the settling basin, the treated leachate is polished in a biofiltration swale where it passes over a vegetated substrate of topsoil mixed with muskeg, sand, and gravel that is overlain on top of clay. The biofiltration swale provides approximately five hours of retention time. Pipes convey the treated effluent from a collection sump located downstream of the biofiltration swale via gravity to Ward Cove through Outfall 001A, 200 feet from shore at a depth of 30 feet. Storm water runoff from the vegetated landfill cover and surrounding area is collected in a series of natural and constructed rock-lined ditches that are lined with limestone to incorporate a pH neutralization treatment. These constructed ditches create the head waters of intermittent storm water flows that discharge into the marine waters of Ward and Refuge Coves. Figure 2 depicts the KPC Landfill layout.

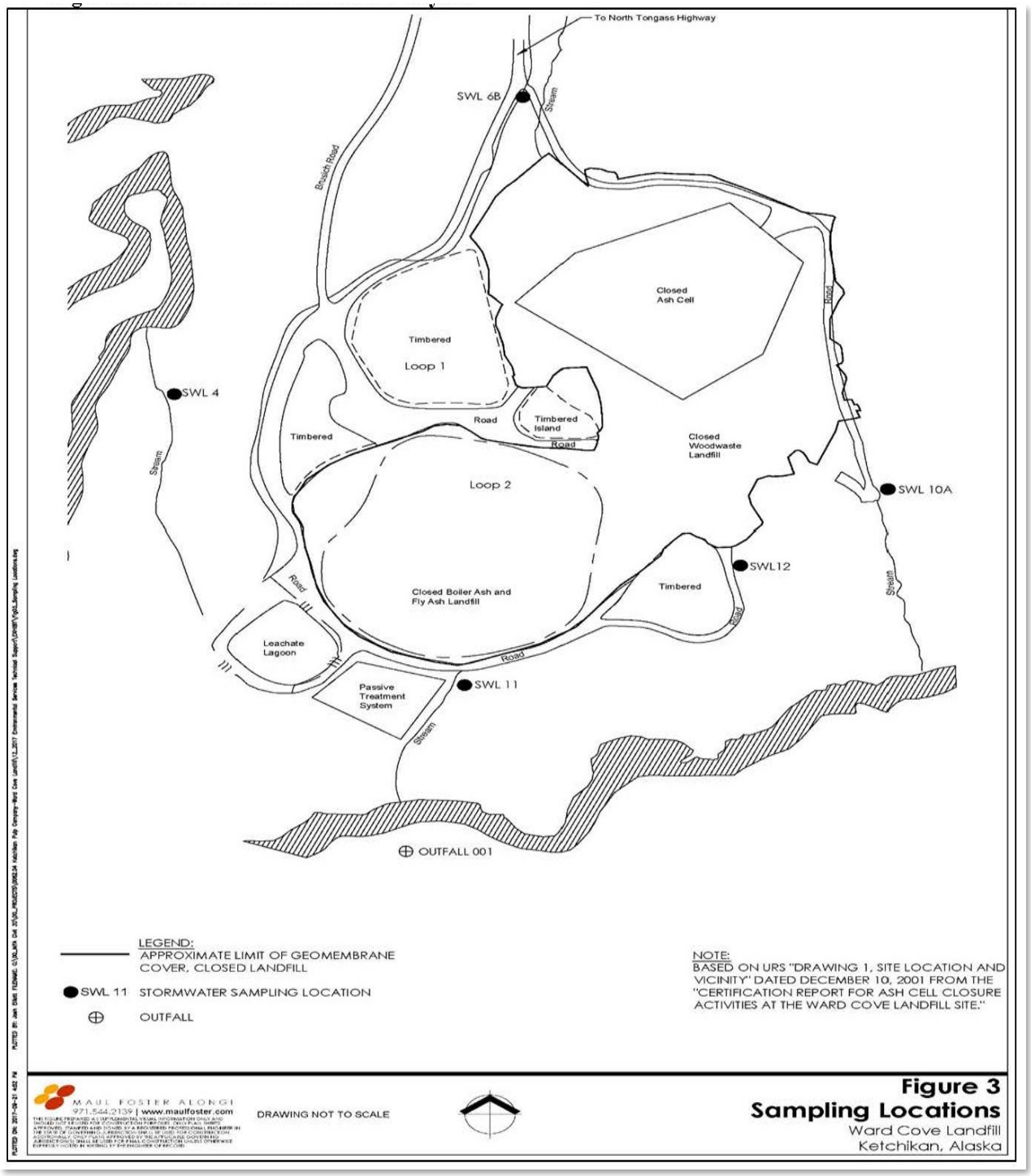

Figure 2: KPC Ward Cover Landfill Layout

2.3 Pollutants of Concern

2.3.1 Landfill Leachate

The KPC Landfill was used primarily for the disposal of wood waste and boiler ash and fly ash generated from coal. In general, wood waste leachate is dark in color and exerts a significant biological and chemical oxygen demand in water due to the decomposition of wood materials. Wood waste leachate can also contain various toxic compounds such as tropolones and resin acids

and nutrients, which can contribute to more chronic problems in receiving waters. Metals are the primary constituents of concern in the leachate from landfills containing coal combustion waste. Pollutants that were detected in the landfill leachate between March 2020 and March 2025 and their corresponding water quality criteria, or permit limit are depicted in Table 1.

Table 1- Pollutants Detected in Outfall 001A March 2020 -March 2025

Pollutant	Units	Maximum Observed Concentration	Water Quality Criteria or Permit Limit
Total Ammonia, as Nitrogen (N)	milligrams per liter (mg/L)	0.075	10 (maximum daily) 4.9 (monthly average)
Color	Color Units	45	15, or the natural condition, whichever is greater
Total Suspended Solids (TSS)	mg/L	9	88 (maximum daily) 27 (monthly average)
Manganese, total recoverable	micrograms per liter (µg/L)	2,270	100 (human health for consumption of aquatic organisms)
Zinc, total recoverable	µg/L	35	95.10 (acute) 86.14 (chronic)

2.3.2 Storm Water

Limestone-lined ditches surrounding the landfill create the headworks for storm water that drains, along with runoff from the surrounding areas to one of four intermittent streams that in turn flow to either Ward or Refuge Cove. At most, the distance from the limestone ditches to marine water, is approximately 250 feet. Because this is a relatively short distance, whereby the storm water will combine with marine water quickly, DEC is applying marine water quality criteria to the storm water discharges to Ward and Refuge Coves. Table 2 summarizes the maximum observed concentrations of pollutants detected in the four storm water discharge drainages between June 2020 and March 2025.

Table 2- Pollutants Detected in Storm Water June 2020 – March 2025

Pollutant	Units	SWL4	SWL6B	SWL11	SWL12	Water Quality Criteria
Color	Color Units	300	70	35	60	15 or the natural condition, whichever is greater
Copper, total recoverable	µg/L	N/A	4.87	8.69	5.02	3.7 (chronic) 5.8 (acute)
Manganese, total recoverable	µg/L	94.7	16.8	9.42	196	100 (human health)
Nickel, total recoverable	µg/L	2.04	12.4	13.4	9.48	8.3 (chronic) 74.6 (acute)

2.4 Compliance History

DEC reviewed Discharge Monitoring Reports (DMRs) from March 2020 to March 2025 to determine the facility's compliance with permit effluent limits. The leachate from the KPC Landfill met all permit effluent limits except for two manganese exceedances, 2,180 µg/L (September 2023) and 2,270 µg/L (September 2021).

3.0 EFFLUENT LIMITS AND MONITORING REQUIREMENTS

3.1 Basis for Permit Effluent Limits

The CWA requires that the limits for a particular pollutant be the more stringent of either technology-based effluent limits (TBELs) or water quality-based effluent limits (WQBELs). TBELs are set according to the level of treatment that is achievable using available technology. A WQBEL is designed to ensure that the water quality standards (WQS) of a waterbody are met. WQBELs may be more stringent than TBELs. The permit contains limits that are both TBELs and WQBELs. The applicable TBELs are based on EPA Effluent Limit Guideline (ELG) found at 40 Code of Federal Regulations (CFR) Part 445, Subpart B-Resource Conservation and Recovery Act (RCRA) Subtitle D Non-Hazardous Landfill and have been applied on a Best Professional Judgment (BPJ) basis. A detailed discussion of the basis for the effluent limits contained in the permit is provided in Appendix A.

3.2 Basis for Effluent and Receiving Water Monitoring

In accordance with AS 46.03.110(d), the Department may specify in a permit the terms and conditions under which waste material may be disposed. Monitoring in a permit is required to determine compliance with effluent limits. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limits are required and/or to monitor effluent impact on the receiving waterbody quality. The permittee is responsible for conducting the monitoring and for reporting results on NetDMR or with the application for reissuance, as appropriate, to the Department.

3.3 Effluent Limits and Monitoring Requirements

Monitoring is required to determine compliance with effluent limitations and/or for use in future reasonable potential analyses. The permit requires monitoring of the treated landfill leachate that is discharged through Outfall 001A. Limits are included for flow, total ammonia as N, TSS, 5-day biochemical oxygen demand (BOD_5), pH, manganese, and zinc. Color has a report monitoring results requirement and does not have associated effluent limits. See Appendix A for the basis of the effluent limits. The prior permit required an additional priority pollutant scan for Outfall 001A in the second and fourth years of the permit. Priority pollutants were not detected in either of the scans nor in the two previous permit issuances: therefore, DEC has determined that additional monitoring for priority pollutants other than what is required in APDES Form 2C, which the permittee must include with their application for reissuance, is no longer required.

The prior permit required monitoring of the storm water for metals identified as l Nos. 1-13 by the National Toxics Rule at 40 CFR 131.36. Monitoring occurred once during the second and fourth years of the permit. Additionally, all storm water locations were monitored for flow, color, pH, TSS, and manganese. Copper was monitored at SWL6B and SWL11.

DEC reviewed the monitoring results from March 2020- March 2025 as well as the Compounds Nos. 1-13 screening results and conducted a reasonable potential analysis (RPA) for each storm water location in which water quality criteria had been exceeded. Color demonstrated reasonable potential to exceed water quality criteria and required the most dilution to achieve water quality criteria at all the storm water location outfalls; therefore, color WQBELs were developed for each storm water location. See Appendices A and B.

TSS has predominately been reported as less than the method reporting level, 5 mg/L, at all locations except for 6 mg/L at SWL12 in September 2021 and 12 mg/L at SWL4, also in September 2021. Based

on these results, DEC has concluded that TSS is not a pollutant of concern in the storm water; therefore, the reissued permit does not require storm water TSS monitoring.

Copper and nickel were detected above water quality criteria in storm water at locations SWL6B, SWL11, and SWL12; therefore, copper and nickel monitoring are required twice per year. Copper and Nickel monitoring results from these storm water locations will be evaluated for reasonable potential to exceed water quality criteria in the next permit reissuance. Copper and nickel monitoring at SWL4 is not required, but copper and nickel concentrations at all storm water locations will be screened in the fourth year of the permit with other metals found in Compound Nos. 1-13 of the National Toxics Rule at 40 CFR 131.36.

The minimum pH observed from all storm water locations was 6.38 S.U. at SWL6B (the only pH value outside the water quality pH criteria minimum and maximum for all storm water locations) and the maximum observed pH observed was 7.93 S.U. at SWL4 and SWL6B. pH monitoring will continue in the reissued permit at all storm water locations.

The highest manganese observed concentrations at the storm water locations are as follows: SWL4 94.7 µg/L, SWL6B 16.8 µg/L, SWL11 9.42 µg/L, and SWL12 196 µg/L. Manganese monitoring shall continue twice per year at SWL4 and SWL12; however, DEC has determined that due to the non-detected concentrations or reported concentrations well below the manganese water quality criterion of 100 µg/L since 2005 at SWL6B and SWL11, manganese monitoring at SWL6B and SWL11 is no longer warranted; therefore manganese monitoring at these two storm water locations is not required in the reissued permit. Monitoring frequencies are based on the nature and effect of a pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples must be used in calculations and used for averaging if they are conducted using Department-approved test methods (generally found in 18 AAC 70 and 40 CFR Part 136 [adopted by reference in 18 AAC 83.010]) and if the method detection limits are less than the effluent limits.

Table 3 contains Outfall 001A landfill leachate limits and monitoring requirements and Tables 4-7 contain SWL4, SWL6B, SWL11, and SWL12 storm water limits and monitoring requirements. Tables 8 and 9 contain effluent limits and monitoring requirement changes from the last permit issuance.

Table 3- Outfall 001A Effluent Limits and Monitoring Requirements

Parameter [a]	Effluent Limits				Monitoring Requirements	
	Units [b]	Daily Minimum	Monthly Average	Daily Maximum	Sample Frequency	Sample Type
Flow	mgd	N/A	0.18	N/A	Continuous	Recorded
Total Ammonia, as N	mg/L	N/A	4.9	10	1/Year	Grab
	lbs/day [c]		7.4	N/A		Calculated
TSS	mg/L	N/A	27	88	1/Year	Grab
	lbs/day		41	N/A		Calculated
5-day Biochemical Oxygen Demand	mg/L	N/A	37	140	1/Year	Grab
	lbs/day		56	N/A		Calculated
pH	S.U.	6.5	N/A	8.5	1/Quarter	Grab
Manganese	µg/L	N/A	1,500	3,900	1/Quarter	Grab
	lbs/day		2,252	N/A		Calculated
Color [d]	Color Units	N/A	N/A	Report	1/Quarter	Grab
Zinc	µg/L	N/A	33	95	1/Year	Grab
	lbs/day		50	N/A		Calculated

Footnotes:

a. Metals as total recoverable.
b. mgd = million gallons per day, lbs/day = pounds per day, mg/L = milligram per liter, S.U.= standard pH units, µg/L = micrograms per liter
c. lbs/day = [(concentration (mg/L) x (flow in mgd)) x 8.34 (lbs/gal)]
d. Color measurement may be performed on site using 40 CFR 136 method procedures.

Table 4- SWL4 Monitoring Requirements

Parameter [a]	Storm Water Limits				Monitoring Requirements	
	Units [b]	Daily Minimum	Monthly Average	Daily Maximum	Sample Frequency	Sample Type
Flow	gpd	N/A	N/A	Report	2/Year [c, d]	Measured or Estimated
pH	S.U.	Report	N/A	Report	2/Year	Grab
Manganese	µg/L	N/A	N/A	Report	2/Year	Grab
Color [e]	Color Units	N/A	879	1,764	2/Year	Grab

Footnotes:

a. Metals as total recoverable.
b. gpd = gallons per day, S.U. = standard units, µg/L = micrograms per liter
c. Twice per year means one time between April and September and one time between October and March.
d. Samples shall be collected as soon as reasonably possible following the onset of a measurable storm event before mixing with receiving water. A measurable storm event means a rainfall event of at least 0.5 inch of precipitation in a 24-hour period that produces a discharge.
e. Color measurements may be performed on site using 40 CFR 136 method procedures.

Table 5-SWL6B Monitoring Requirements

Parameter [a]	Storm Water Limits				Monitoring Requirements	
	Units [b]	Daily Minimum	Monthly Average	Daily Maximum	Sample Frequency	Sample Type
Flow	gpd	N/A	N/A	Report	2/Year [c, d]	Measured or Estimated
pH	S.U.	Report	N/A	Report	2/Year	Grab
Color [e]	Color Units	N/A	234	470	2/Year	Grab
Copper	µg/L	N/A	N/A	Report	2/year	Grab
Nickel	µg/L	N/A	N/A	Report	2/year	Grab

Footnotes:

a. Metals as total recoverable.
b. gpd = gallons per day, S.U. = standard units, µg/L = micrograms per liter
c. Twice per year means one time between April and September and one time between October and March.
d. Samples shall be collected as soon as reasonably possible following the onset of a measurable storm event before mixing with receiving water. A measurable storm event means a rainfall event of at least 0.5 inch of precipitation in a 24-hour period that produces a discharge.
e. Color measurements may be performed on site using 40 CFR 136 method procedures.

Table 6- SWL11 Monitoring Requirements

Parameter [a]	Storm Water Limits				Monitoring Requirements	
	Units [b]	Daily Minimum	Monthly Average	Daily Maximum	Sample Frequency	Sample Type
Flow	gpd	N/A	N/A	Report	2/Year [c, d]	Measured or Estimated
pH	S.U.	Report	N/A	Report	2/Year	Grab
Color [e]	Color Units	N/A	103	206	2/Year	Grab
Copper	µg/L	N/A	N/A	Report	2/year	Grab
Nickel	µg/L	N/A	N/A	Report	2/Year	Grab

Footnotes:

a. Metals as total recoverable.
b. gpd = gallons per day, S.U. = standard units, µg/L = micrograms per liter
c. Twice per year means one time between April and September and one time between October and March.
d. Samples shall be collected as soon as reasonably possible following the onset of a measurable storm event before mixing with receiving water. A measurable storm event means a rainfall event of at least 0.5 inch of precipitation in a 24-hour period that produces a discharge.
e. Color measurements may be performed on site using 40 CFR 136 method procedures.

Table 7- SWL12 Monitoring Requirements

Parameter [a]	Storm Water Limits				Monitoring Requirements	
	Units [b]	Daily Minimum	Monthly Average	Daily Maximum	Sample Frequency	Sample Type
Flow	gpd	N/A	N/A	Report	2/Year [c, d]	Measured or Estimated
pH	S.U.	Report	N/A	Report	2/Year	Grab
Manganese	µg/L	N/A	N/A	Report	2/Year	Grab
Color [e]	Color Units	N/A	165	331	2/Year	Grab
Copper	µg/L	N/A	N/A	Report	2/year	Grab
Nickel	µg/L	N/A	N/A	Report	2/Year	Grab

Footnotes:

a. Metals as total recoverable.
b. gpd = gallons per day, S.U. = standard units, µg/L = micrograms per liter
c. Twice per year means one time between April and September and one time between October and March.
d. Samples shall be collected as soon as reasonably possible following the onset of a measurable storm event before mixing with receiving water. A measurable storm event means a rainfall event of at least 0.5 inch of precipitation in a 24-hour period that produces a discharge.
e. Color measurements may be performed on site using 40 CFR 136 method procedures.

Table 8- Outfall 001A Limits and Monitoring Requirement Changes from Prior Permit

Parameter	Units	Monthly Average		Daily Maximum		Sample Frequency	
		2020 Permit	2025 Permit	2020 Permit	2025 Permit	2020 Permit	2025 Permit
Zinc, as total recoverable	µg/L	33	Unchanged	95	Unchanged	2/Year	1/Year
	lbs/day	50		N/A	Unchanged		
Priority Pollutant Scan	N/A	N/A	N/A	Report	As required in APDES Form 2C with the application for permit reissuance.	Once during 4th year of the permit	As required in APDES Form 2C with the application for permit reissuance.

Footnote:

a. lbs/day = pounds per day, µg/L = micrograms per liter,

Table 9- Storm Water Limits and Monitoring Requirement Changes from Prior Permit

Parameter	Units [a]	Effluent Limits		Sampling Frequency	
		2020 Permit	2025 Permit	2020 Permit	2025 Permit
Color	Color Units	SWL4 Report	1,764 daily maximum limit (DML) 879 average monthly limit (AML)	1/Year	2/Year
		SWL6B Report	470 DML, 234 AML		
		SWL11 Report	206 DML, 103 AML		
		SWL12 Report	331 DML, 165 AML		
TSS	mg/L	Report	N/A	1/Year	N/A
Manganese	µg/L	SWL4 Report	Unchanged	1/Year	2/Year
		SWL6B Report	N/A		N/A
		SWL11 Report	N/A		N/A
		SWL12 Report	Unchanged		2/Year
Copper	µg/L	SWL12 N/A	Report	N/A	2/Year
Nickel	µg/L	SWL6B N/A	Report	N/A	2/Year
		SWL11 N/A	Report		
		SWL12 N/A	Report		
Compound Nos. 1-13 Metals at 40 CFR 131.36.	µg/L	Report	Unchanged	Once during the second and fourth year of the permit	Once during the fourth year of the permit.

Footnote:

a. mg/L= milligrams per liter, µg/L = micrograms per liter

3.4 Whole Effluent Toxicity (WET) Monitoring

Alaska WQS at 18 AAC 70.030 require that an effluent discharged to a water may not impart chronic toxicity to aquatic organisms, expressed as 1.0 chronic toxic unit (TUc), at the point of discharge, or if the Department authorizes a mixing zone in a permit, approval, or certification, at or beyond the mixing zone boundary, based on the minimum effluent dilution achieved in the mixing zone.

WET tests are laboratory tests that measure the total toxic effect of an effluent on living organisms. WET tests use small vertebrate and invertebrate species and/or plants to measure the aggregate toxicity of an effluent. There are two different durations of toxicity test: acute and chronic. Acute toxicity tests measure survival over a 96-hour exposure. Chronic toxicity tests measure reductions in survival, growth, and reproduction over a 7-day exposure. State regulation 18 AAC 83.335 recommends chronic testing for facilities with dilution factors less than 100:1 at the boundary of the mixing zone, acute testing for facilities with dilution factors greater than 1000:1 at the boundary of the mixing zone, and either acute or chronic for dilution factors between 100:1 and 1000:1 at the boundary of the mixing zone.

The previous permit required WET testing in the fourth year of the permit. DEC had determined that once in the fourth term as sufficient for WET monitoring at this closed landfill that will not have any new contributions of wood waste or boiler bottom ash and because there had been no observed effects of toxicity since KPC first monitored WET in 2005.

KPC conducted WET testing in March 2023 on the blue mussel (*Mytilus galloprovincialis*) (larval development test) and the purple sea urchin (*Strongylocentrotus purpuratus*) using a dilution series of 27%, 13%, 6.7%, 3.4%, and 1.7% and a control. The chronic toxicity trigger was defined in the permit as toxicity exceeding 15 TUc, corresponding to receiving water dilution of 6.7%. WET test results for the blue mussel indicated the no observed effect concentration (NOEC) at 27% effluent, corresponding to 3.7 TUc, and the WET test results for the purple sea urchin indicated the NOEC at 13% effluent, corresponding to 7.7 TUc.

In order to continue to screen the landfill leachate for toxicity, the permit again requires WET testing in the fourth year of the permit. Chronic toxicity tests (larval development) shall occur on a bivalve species using either the Pacific oyster (*Crassostrea gigas*) or the mussel (*Mytilius galloprovincialis*) depending on species availability, and an echinoderm, purple sea urchin (*Strongylocentrotus purpuratus*) or sand dollar (*Dendraster excentricus)* (fertilization test), depending upon the availability of the echinoderm. The permittee must conduct initial tests on both a bivalve species and an echinoderm species. After this screening procedure, any subsequent toxicity testing such as for accelerated testing, should be conducted on the more sensitive, either a bivalve or echinoderm, with species determined on availability.

The permit also requires accelerated WET testing if toxicity is greater than 15 TUc in any test. Four bi-weekly WET tests (every two weeks) over an eight-week period are required. If the permittee demonstrates through an evaluation of the facility operations that the cause of the exceedance is known and corrective actions have been implemented, only one accelerated test is required. If toxicity is greater than 15 TUc in any of the accelerated tests, the permittees must initiate a Toxicity Reduction Evaluation (TRE). A TRE is a site-specific process designed to identify the cause of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and confirm effluent toxicity reduction. The permittee may initiate a toxicity identification evaluation (TIE) as a part of the TRE. A TIE is a set of procedures that characterize, identify, and confirm the specific chemicals responsible for effluent toxicity. TREs and TIEs must be performed in accordance with EPA guidance manuals (see Section 1.5.4 of the permit for further details).

3.5 Additional Effluent and Storm Water Monitoring Requirements

3.5.1 Priority Pollutants

The discharge from Outfall 001A was monitored in the fourth year of the last permit term (2020) and in the second and fourth years of the permit in the two previous permit cycles to 2020 (2004 and 2012) for priority pollutants. Priority pollutants are those pollutants identified as Compound Nos. 1-126 by the National Toxics Rule at 40 CFR Part 131.36. DEC has determined that because results for all 126 priority pollutants since issuance of the 2004 NPDES permit have been reported as less than the laboratory's reporting limit and applicable water quality criteria, additional monitoring of priority pollutants other than as required in APDES Form 2C for existing manufacturing, commercial, mining and silvicultural operations, is not required in this permit reissuance. The permittee shall monitor and report according to the instructions contained within APDES Form 2C and submit the form to DEC with the application for permit reissuance.

3.5.2 Metals

DEC evaluated the monitoring results from each storm water location for reasonable potential to exceed water quality criteria and developed specific limits and monitoring requirements as warranted. Other than those parameters identified as having reasonable potential to exceed water quality criteria, all other metal monitoring results for all the storm water locations were reported as non-detect and/or below water-quality criteria. Therefore, DEC is reducing Compound Nos. 1-13 metals monitoring from once during the second and once during the fourth year of the permit to once in the fourth year of the permit. The monitoring results must be included with the application for permit reissuance and will be used as a screening tool to identify pollutants that may exceed State WQS.

4.0 RECEIVING WATERBODY

4.1 Description of Receiving Waterbody

Ward Cove is a bay on the west side of Revillagigedo Island approximately 5 miles northwest of Ketchikan in Southeast Alaska. Ward Cove opens onto Tongass Narrows, between Revillagigedo Island and Gravina Island. Ward Cove is approximately 1 mile long and 0.5 miles wide at its widest point. The water depth at the mouth is approximately 200 feet. Currents within Ward Cove have been identified as a counterclockwise circulation pattern with flows into the cove along the southeastern shoreline and flows out of the cove along the northwestern shore. Superimposed on this horizontal circulation pattern is an estuarine flow condition caused by the mixing of saline waters from Tongass Narrows with freshwater flows from Ward Creek. The mean tidal range is 13.3 feet, and spring tides reach 15.7 feet. Refuge Cove is a small cove that borders the landfill on the west that also opens onto Tongass Narrows.

4.2 Outfall Descriptions

The treated leachate from KPC Landfill Outfall 001A is discharged to Ward Cove. The 295-foot outfall line to Ward Cove consists of four bundled 6-inch diameter high-density polyethylene pipes. It terminates approximately 140 feet from mean lower low water.

Storm water runoff from the landfill cap is collected in a series of rock-lined ditches that drain to either Ward or Refuge Cove. Storm water monitoring locations are designated as outfalls SWL4, SWLB6, SWL11, and SWL12. SWL4 is a monitoring location for storm water draining from the west of the landfill. Storm water from this area drains to Refuge Cove. SWL6B is located along the northern boundary of the landfill and contains a combination of runoff from both a wooded area and the capped ash cell. Storm water from this area discharges to Refuge Cove. SWL11 is in a wooded area south of the leachate collection trench in the southern portion of the landfill site, and SWL12 is a monitoring location for runoff from the southeast face of the landfill cap. Storm water from SWL11 and SWL12 discharges to Ward Cove.

Table 10- KPC Landfill Outfall Locations

Outfall	Receiving Water	Latitude	Longitude
001A	Ward Cove	+55.4044167º	-131.729167º
SWL4	Refuge Cove	+55.401586º	-131.742258º
SWL6B	Refuge Cove	+55.4044707º	-131.740542º
SWL11	Ward Cove	+55.3999836º	-131.73976º
SWL12	Ward Cove	+55.400664º	-131.73732º

4.3 Water Quality Standards

Regulations in 18 AAC 70 require that the conditions in permits ensure compliance with WQS. The State's WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an antidegradation policy. The use classification system identifies the designated uses that each waterbody is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the State to support the designated use classification of each waterbody. The antidegradation policy ensures that the existing uses and the level of water quality necessary to protect the uses are maintained and protected.

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

The receiving waters for the discharge, Refuge and Ward Cove, have not been reclassified, nor have site-specific water quality criteria been established. Therefore, Refuge and Ward Cove must be protected for all marine water use classes listed in 18 AAC 70.020(a)(2). These marine water designated use classes consist of the following: water supply for aquaculture, seafood processing and industrial; contact and secondary recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life.

4.4 Water Quality Status of Receiving Water

Any part of a waterbody for which the water quality does not or is not expected to meet applicable WQS is defined as a "water quality limited segment" and placed on the state's impaired waterbody list. For an impaired waterbody, Section 303(d) of the CWA requires states to develop a Total Maximum Daily Load (TMDL) management plan for a waterbody determined to be water quality limited. The TMDL documents the amount of a pollutant a waterbody can assimilate without violating a state's WQS and allocates that load to known point sources and nonpoint sources.

According to the State of Alaska 2024 Integrated Water Quality Monitoring and Assessment Report, Ward Cove is classified as a Category 4a impaired waterbody for residues due to wood waste residues from pulp mill operations. Category 4a waterbodies are defined as being impaired but not needing a TMDL or as being impaired water with a final approved TMDL. In the case of Ward Cove, a TMDL was approved by EPA in 2007. The TMDL found that the KPC Landfill discharge was not considered relevant to the residues TMDL. Further information may be found at https://mywaterway.epa.gov/state/AK/water-quality-overview

4.5 Mixing Zone Analysis

In accordance with 18 AAC 70.240, the Department may authorize a mixing zone in a permit. A chronic mixing zone is sized to protect the ecology of the waterbody as a whole and an acute mixing zone is sized to prevent lethality to passing organisms. KPC requested the same mixing zone that had been authorized in their prior permit for Outfall 001A. DEC conducted an RPA on the effluent monitoring data from Outfall 001A using monitoring data from June 2020- March 2025. Manganese and color, as in the prior permit, both showed reasonable potential to exceed water quality criteria at the end of the pipe, with manganese, also as in the prior permit, requiring more dilution than color. DEC; therefore, developed WQBELs for manganese. The WQBELs (DML 6,900 µg/L, AML 2,270 µg/L) are less stringent than the previous permit's manganese limits (DML 3,900 µg/L, AML 1,500 µg/L).18 AAC 83.480 requires that interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit. Therefore, DEC selected the previous permit's manganese effluent limits as the effluent limits in the reissued permit. The mixing zone modeling in the prior permit resulted in a dilution of 15 which DEC used in the RPA to establish the WQBELs. Because the reissued permit's manganese limits will be the same as in the prior permit, the prior mixing zone applies to this permit reissuance. Color requires less dilution than manganese, and fits in the mixing zone sized for manganese.

DEC modeled the prior mixing zone and calculated dilution factors using CORMIX. Inputs to CORMIX included manganese's maximum expected effluent concentration (MEC), the manganese water quality criterion, ambient velocity, wind velocity, and outfall and diffuser specifications, such as the size, direction, and number of ports. Based on the inputs, CORMIX predicted the distance at which the parameters would meet water quality criteria as well as the corresponding dilution at that point. Table 9 contains a summary of the CORMIX modeling inputs.

DEC conducted an RPA using monitoring data from March 2020-March 2025 for each of the storm water locations and determined that color at each location both exceeded water quality criteria and required the most dilution of other pollutants in the discharge. Therefore, DEC established color WQBELs for each storm water location. Other monitored pollutants found in concentrations above water quality criteria but requiring less dilution than color to meet waste quality criteria, are included in each storm water location's mixing zone as warranted. Mixing zones were modeled for each of the storm water locations.

The following mixing zones are authorized in Ward and Refuge Coves:

Outfall 001A: A chronic mixing zone for manganese, color, and whole effluent toxicity is authorized in Ward Cove. The chronic mixing zone, centered on the outfall, has a dilution of 15:1 and measures 4.3 feet long by 2.3 feet wide. There are no parameters with acute water quality criteria associated with this outfall; therefore, an acute mixing zone has not been established.

SWL4: A chronic mixing zone is authorized for color in Refuge Cove. The chronic mixing zone, centered on the storm water outlet, has a dilution of 68.8:1 and measures 110 meters long by 46 meters wide. There are no parameters with acute water quality criteria associated with this outfall; therefore, an acute mixing zone has not been established.

SWL6: A chronic mixing zone is authorized for color, copper, and nickel in Refuge Cove. The chronic mixing zone, centered on the storm water outlet, has a dilution of 18.2:1 and measures 45 meters long by 21 meters wide. An acute mixing zone is authorized for copper and nickel and is defined as centered on the storm water outlet measuring 12 meters long by 8.8 meters wide with a dilution of 2.1:1.

SWL11: A chronic mixing zone is authorized for color, copper and nickel in Ward Cove. The chronic mixing zone, centered on the storm water outlet, has a dilution of 7.9:1 measuring 31 meters long and 16 meters wide. An acute mixing zone is authorized for copper and nickel and is defined as centered on the storm water outlet measuring 20 meters long by 12 meters wide with a dilution of 3.8:1.

SWL12: A chronic mixing zone is authorized for color, manganese, copper, and nickel in Ward Cove. The chronic mixing zone, centered on the storm water outlet, has a dilution of 14:1 and measures 41 meters long by 19 meters wide. An acute mixing zone is authorized for copper and nickel and is defined as centered on the storm water outlet measuring 0.86 meters long by 0.84 meters wide with a dilution of 1:1.

According to EPA's Technical Support Document for Water Quality-based Toxics Control, lethality to passing organisms would not be expected if an organism passing through the plume along the path of maximum exposure is not exposed to concentrations exceeding the acute criteria when averaged over a one-hour time period. Furthermore, the travel time of an organism drifting through the acute mixing zone must be less than approximately 15 minutes if a one-hour exposure is not to exceed the acute criterion. DEC determined that the travel time of an organism drifting through the SWL6B and SWL12 acute mixing zones to be less than one second and SWL11 as approximately less than seven seconds; therefore, there will be no lethality to organisms passing through the acute mixing zones.

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

4.5.1. Size

18 AAC 70.240 states that mixing zones must be as small as practicable. Outfall 001A manganese was modeled in CORMIX to determine the smallest practicable mixing zone size. Manganese's MEC, water quality criterion, and ambient concentrations were entered into CORMIX. Manganese requires the most dilution to meet human health for consumption of aquatic organisms. Color requires less dilution than manganese and fits within the mixing zone sized for manganese. The color water quality criterion may be exceeded within the authorized manganese mixing zone but will be met prior to the boundary of the mixing zone.

The November 2005 Ward Cove Landfill Site Leachate Treatment System Gravity Outfall Installation Report contains record drawings documenting that the outfall pipe consists of four bundled six-inch diameter high density polyethylene pipes approximately 295 feet in length. The discharge ports were ultimately installed approximately two feet above the bottom of Ward Cove slanted approximately 45 to 60 degrees from vertical. Each of the four outfall pipes is covered by an orifice plate which constricts each pipe opening to a diameter of 1.3 inches. Given the proximity of the discharge ports to each other and the inability to model the diffuser as it exists in the CORMIX modelling software, DEC modelled the multi-port diffuser with CORMIX 1 for single port discharges using a port diameter of 0.0664 meters (2.6 inches). CORMIX advises modelling a single port that has the equivalent port area as all four ports on the diffuser. This avoids overestimating the dilution a single port would offer over the four ports that exist on the diffuser. Additionally, the exit velocity of the 0.664-meter port diameter is the same as that of the 0.03302-meter (1.3 inch) port diameter. The 0.0664-meter diameter port is the calculated diameter of a circle with the same surface area as four circular 1.3-inch diffuser ports (5.32 square inches). A circle with an area of 5.32 square inches has a diameter of 2.6 inches, therefore a 2.6-inch (0.0644 meter) diameter port was modelled.

The permittee's prior application presented current speed summaries from a 1998 study performed by ENSR Consulting and Engineering. 10th and 90th percentile ambient currents were 0.01 meters/second (m/s) and 0.05 m/s respectfully. The final mixing model that DEC selected indicated that at the 90th percentile current conditions the maximum observed effluent flow rates required the most time and space for the discharge plume to achieve the manganese water quality criterion.

Tables 11-14 contain inputs that were used in the Outfall 001A and storm water mixing zone models.

Table 11- CORMIX Outfall 001A Model Inputs

Parameter Modeled	Discharge Excess Concentration	Water Quality Criterion Excess
Manganese	1,462.23 µg/L (MEC 1,464 µg/L - ambient 1.8 µg/L)	98.2 µg/L (water quality criterion 100 µg/L - ambient 1.8 µg/L)
Outfall and Receiving Waterbody Characteristics		
Discharge Configuration	42.6-meter-long outfall with submerged single port diffuser	
Average Depth at Discharge	8.36 meters	
Number & Size of Ports	Single port diameter 0.066 meters	
Port Height above Seabed	0.6096 meters	
Density - Type A Linear Stratification	surface density 1,017.64 kilograms per cubic meter (kg/m^3) bottom density 1,021.24 kg/m^3	
Ambient Velocity	0.0557 meters per second 90th percentile current	
Wind Velocity	2 meters per second	
Effluent Characteristics		
Flow Rate	0.1 million gallons per day	
Density	1,022.77 kg/m^3	

Table 12- CORMIX SWL4 Model Inputs

Parameter Modeled	Discharge Excess Concentration	Water Quality Criterion
Color	875.03 Color Units	15 Color Units
Channel and Ambient Characteristics		
Discharge Configuration	Flush with bank	
Channel Average Width	10.8 ft	
Channel Depth	2.7 ft	
Discharge Angle	60º	
Discharge Density	62.38 lb/ft^3	
Ambient Velocity	0.1/0.9 m/s	
Wind Velocity	8.9 ft/s	

Table 13-CORMIX SWL6B Model Inputs

Parameter Modeled	Discharge Excess Concentration	Water Quality Criterion
Color	231.77 Color Units	15 Color Units
Channel and Ambient Characteristics		
Discharge Configuration	Flush with bank	
Channel Average Width	14.4 ft	
Channel Depth	4.0 ft	
Discharge Angle	90º	
Discharge Density	62.38 lb/ft^3	
Ambient Velocity	0.1/0.9 m/s	
Wind Velocity	8.9 ft/s	

Table 14- CORMIX SWL11 Model Inputs

Parameter Modeled	Discharge Excess Concentration	Water Quality Criterion
Color	100.13 Color Units	15 Color Units
Channel and Ambient Characteristics		
Discharge Configuration	Flush with bank	
Channel Average Width	4.3 ft	
Channel Depth	2.2 ft	
Discharge Angle	90º	
Discharge Density	62.38 lb/ft^3	
Ambient Velocity	0.1/0.9 m/s	
Wind Velocity	8.9 ft/s	

Table 15- CORMIX SWL12 Model Inputs

Parameter Modeled	Discharge Excess Concentration	Water Quality Criterion
Color	173.27 Color Units	15 Color Units
Channel and Ambient Characteristics		
Discharge Configuration	Flush with bank	
Channel Average Width	2.8 ft	
Channel Depth	1.3 ft	
Discharge Angle	90º	
Discharge Density	62.38 lb/ft^3	
Ambient Velocity	0.1/0.9 m/s	
Wind Velocity	8.9 ft/s	

4.5.2. Technology

According to 18 AAC 70.240(c)(1), the most effective and technological and economical feasible should be used to disperse, treat, remove, and reduce pollutants. The leachate from the landfill is passively treated in an aeration and quiescent basin and polished by a biofiltration swale. The leachate collection system consists of piping installed during landfill and ash cell closure. The piping collects ongoing leaching of residual materials in the landfill cells and coveys it via gravity to a leachate lagoon southwest of the boiler ash landfill. The lagoon is lined with cushion fabric and geosynthetic material. Curtain baffles in the lagoon create a passive aeration basin and two parallel settling basins. The leachate treatment system consists of a passive aeration basin in the leachate lagoon that promotes oxidation of organic and inorganic dissolved constituents; a quiescent basin in the leachate lagoon that promotes organic and inorganic solids settling; and a biofiltration swale, which allows wastewater to flow over a vegetated substrate of topsoil mixed with muskeg, sand and gravel, on top of clay. Storm water runoff from the vegetated landfill cover and surrounding area is collected in a series of natural and constructed rock-lined ditches that are lined with limestone to incorporate a pH neutralization treatment.

4.5.3 Existing Use

In accordance with 18 AAC 70.240(c)(2) and (3) and 18 AAC 70.240(c)(4)(B) and (C), the mixing zones have been appropriately sized to fully protect the existing uses of Ward and Refuge Coves.

Monitoring results indicate that the discharges neither partially nor completely eliminates an existing use of the waterbody outside of mixing zone boundaries. Mixing zone modeling suggests that the flushing is adequate to ensure full protection of uses of the waterbody outside of the mixing zones. Results of WET tests performed indicate that toxicity should not exist at levels that might result in biological impairment or cause an effect or damage to the ecosystem that DEC considers so adverse that a mixing zone is not appropriate.

4.5.4 Human Consumption

18 AAC 70.240(d)(6) states the pollutants discharged cannot produce objectionable color, taste, or odor in aquatic resources harvested for human consumption. There is no indication that the pollutants discharged have produced objectionable color, taste, or odor in aquatic resources harvested for human consumption.

4.5.5 Spawning Areas

The mixing zones are authorized in the marine waters of Ward and Refuge Coves. 18 AAC 70.240(f), which prohibits authorizing mixing zones in streams, rivers or other flowing fresh waters used for anadromous or resident fish spawning, does not apply.

4.5.6 Human Health

18 AAC 70.240(d)(1) states that the mixing zones must not contain bioaccumulating, bioconcentrating or persistent chemicals above natural or significant adverse levels. 18 AAC 70.240(d)(2) states that the mixing zone may not present an unacceptable risk to human health from carcinogenic, mutagenic, teratogenic, or other effects as determined using risk assessment methods approved by DEC and consistent with 18 AAC 70.025.

An analysis of the effluent data that was included with KPC's application for permit reissuance and the results of the RPA conducted on pollutants of concern indicate that the level of treatment is protective of human health. The effluent data was then used in conjunction with applicable water quality criteria, which serve the purpose of protecting human and aquatic life, to size the mixing zones to ensure all water quality criteria are met in the waterbody at the boundary of the mixing zone.

Manganese concentrates in the edible potions of mollusks. The manganese WQBEL for Outfall 001A ensures the protection of human health.

4.5.7 Aquatic Life and Wildlife

In accordance with 18 AAC 70.240, the mixing zones authorized in the permit shall be protective of aquatic life and wildlife. CORMIX modeling incorporated the most stringent water quality criteria in the models for protection of the growth and propagation of fish, shellfish, other aquatic life, and wildlife, and all water quality criteria will be met at the boundary of the authorized mixing zone. CORMIX models of the outfalls indicates that high dilution occurs relatively rapidly, and pollutants discharged will have a relatively short residence time in the mixing zones prior to mixing to water quality criteria levels.

4.5.8 Endangered Species

In accordance with 18 AAC 70.240(c)(4)(F), the mixing zones will not cause an adverse effect on threatened or endangered species. DEC consulted the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) websites to identify any threatened or endangered species under their jurisdiction in the vicinity of the KPC Landfill Outfalls. See Fact Sheet Section 8.2 The permit

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

5.0 ANTIBACKSLIDING

18 AAC 83.480 requires that "interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit."
18 AAC 83.480(c) also states that a permit may not be reissued "to contain an effluent limitation that is less stringent than required by effluent guidelines in effect at the time the permit is renewed or reissued."

EPA's *Interim Guidance for Performance-Based Reduction of NPDES Monitoring Frequencies (EPA, 1996),* states that monitoring requirements are not considered effluent limitations under the CWA, and therefore Antibacksliding prohibitions would not be triggered by reductions in monitoring frequencies.

Effluent limitations may be relaxed under 18 AAC 83.480, CWA Section 402(o) and CWA Section 303(d)(4). 18 AAC 83.480(b) allows relaxed limitations in renewed, reissued, or modified permits when there have been material and substantial alterations or additions to the permitted facility that justify the relaxation, or where new information is available that justifies the relaxation, or if the Department determines that technical mistakes were made.

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

6.0 ANTIDEGRADATION

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

Using the policy and corresponding implementation methods, the Department determines a tier protection level, whereby a higher numbered tier indicates a greater level of water quality protection. Tier 1 and Tier 2 classification and protection level are on a parameter-by-parameter basis. A Tier 3 protection level applies to a designated water. At this time, no Tier 3 waters have been designated in Alaska.

18 AAC 70.015(a)(1) states that the existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected (Tier 1 protection level).Ward Cove is listed as impaired (Category 4a) on DEC's 2024 Integrated Water Quality Monitoring and Assessment Report; however, the discharge from the KPC Landfill has been determined to not contribute to the impairment as specified in the 2007 TMDL for Ward Cove (See Fact Sheet Section 5.4). Refuge Cove is not listed as impaired in DEC's 2024 Integrated Water Quality Monitoring and Assessment Report; accordingly, this antidegradation analysis conservatively assumes that the Tier 2 protection level applies to both Ward and Refuge Coves for all parameters, consistent with 18 AAC 70.016(c)(1).

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

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

> ***18 AAC 70.016(b)(5)***
>
> ***(A)*** *existing uses and the water quality necessary for protection of existing uses have been identified based on available evidence, including water quality and use related data, information submitted by the applicant, and water quality and use related data and information received during public comment;*
>
> ***(B)*** *existing uses will be maintained and protected; and*
>
> ***(C)*** *the discharge will not cause water quality to be lowered further where the department finds that the parameter already exceeds applicable criteria in 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b).*

The water quality criteria, upon which the permit effluent limits are based, serve the specific purpose of protecting the existing and designated uses of the receiving water. Per 18 AAC 70.020 and 18 AAC 70.050, all marine waterbodies are protected for all uses; therefore, the most stringent water quality criteria found in 18 AAC 70.020 and in the DEC Toxics manual apply and were evaluated. This will ensure existing uses and the water quality necessary for protection of existing uses of the receiving waterbody are fully maintained and protected.

Pollutants of concern in the discharge that are associated with the KPC Landfill are summarized in Fact Sheet Section 2.3. Effluent limitations and conditions are established after comparing TBELs and WQBELs and applying the more restrictive of these limits. Water quality criteria, upon which the permit WQBELs are based, serve the specific purpose of protecting the existing and designated uses of the receiving water. WQBELs are set equal to the most stringent water quality criteria available for any of the protected water use classes. This also ensures that the resulting water quality at and beyond the boundary of an authorized mixing zone fully protects all existing and designated uses of the receiving waterbody as a whole. The KPC Landfill permit includes TBELs and/or WQBELs or monitoring requirements for pollutants of concern that have exceeded or have the potential to exceed water-quality criteria. The permit requires KPC to review and update the facility's BMP Plan and Storm Water Pollution Prevention Plan to minimize the discharge of pollutants to Ward and Refuge Coves.

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

18 AAC 70.016(c)

(c) ***Tier 2 analysis for the lowering or potential lowering of water quality not exceeding applicable criteria.*** *Tier 2 applies when the water quality for a parameter in a water of the United States within this state does not exceed the applicable criteria under 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b) and receives the protection under 18 AAC 70.015(a)(2).*

> ***(3)*** *the department will not conduct a Tier 2 antidegradation analysis for*
>
> ***(A)*** *reissuance of a license or general or individual permit for a discharge that the applicant is not proposing to expand;*

In 2014, DEC conservatively assumed that the discharge from the Ward Cove WWTF was a discharge to a Tier 2 waterbody and accordingly conducted a Tier 2 antidegradation analysis. DEC determined that the Ward Cove WWTF permit would meet the Antidegradation Policy and the Department's July 14, 2010, *Policy and Procedure Guidance for Interim Antidegradation Implementation Methods* requirements. The *Interim Guidance* has been superseded by the 18 AAC 70.016 regulations.

18 AAC 70.016(c)(2)(A) states that when evaluating development of a license or general or individual permit for a discharge, the department will conduct a Tier 2 antidegradation analysis for a proposed new or expanded discharge. 18 AAC 70.990(75) states that new or expanded with respect to discharges means discharges that are regulated for the first time or discharges that are expanded such that they could result in an increase in a permitted parameter load or concentration or other changes in discharge characteristics that could lower water quality or have other adverse environmental impacts. Discharge is further defined in 18 AAC 83.990(22) as a discharge of a pollutant.

All pollutants discharged from Outfall 001A regulated under the permit were also regulated under the prior permit, therefore, the discharge is not considered a new discharge. The discharge from Outfall 001A authorized under AK0053392 is not expanded from the previous permit. There will not be an increase in a permitted parameter load, concentration, or other changes in discharge characteristics that could lower water quality of have other adverse environmental impacts.

18 AAC 70.016(c)(3)(A) states that the Department will not conduct a Tier 2 antidegradation analysis for reissuance of a license or general or individual permit for a discharge that the applicant is not proposing to expand. Therefore, consistent with 18 AAC 70.016(c)(2)(A) and 18 AAC 70.16(c)(3)(A), DEC is not conducting a Tier 2 antidegradation analysis for the discharge from Outfall 001A for this permit reissuance.

18 AAC 70.016(c)(7)(A –F) *if, after review of available evidence, the department finds that the proposed discharge will lower water quality in the receiving water, the department will not authorize a discharge unless the department finds that*

18 AAC 70.016(c)(7)(A) *the reduction of water quality meets the applicable criteria of 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b), unless allowed under 18 AAC 70.200, 18 AAC 70.210, or 18 AAC 70.240;*

Permit Section 1.2.2 requires that the discharge shall not cause or contribute to a violation of the WQS at 18 AAC 70 except if excursions are allowed in the permit and the excursions are authorized in accordance with applicable provisions in 18 AAC 70.200-70.240 (e.g. mixing zones). As a result of the facility's reasonable potential to exceed water quality criteria for color at each of the storm water locations (SWL4, SWL6B, SWL11, SWL12), manganese at SWL12, and copper and nickel at SWL6B, SWL11 and SWL12, mixing zones are authorized in the KPC Landfill Leachate permit in accordance with 18 AAC 240. The resulting end-of-pipe limitations and monitoring requirements in the permit (Tables 3-6) protect WQS and therefore will not violate the water quality criteria found at 18 AAC 70.020.

Alaska WQS at 18 AAC 70.030 requires that an effluent discharged to a waterbody may not impart chronic toxicity to aquatic organisms, expressed as 1.0 TUc, at the point of discharge, or if the Department authorizes a mixing zone in a permit, approval, or certification, at or beyond the mixing zone boundary, based on the minimum dilution achieved in the mixing zone.

DEC has authorized a mixing zone for Outfall 001A with a dilution of 15 and subsequently assigned a chronic toxicity trigger based on the minimum effluent dilution achieved in the mixing zone of 15 TUc. If the WET trigger is met the KPC Landfill will not violate the WET limit in 18 AAC 70.030.

The driving parameter for all storm water locations is color, a non-toxic pollutant. All other monitored pollutants fit within the mixing zones sized for color. WET testing is not required at these locations.

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

DEC determined that the reduction in water quality will not violate the criteria of 18 AAC 70.20(b), 18 AAC 70.030, or 18 AAC 70.236(b) and that the finding is met.

18 AAC 70.016(c)(7)(B) *each requirement under (b)(5) of this section for a discharge to a Tier 1 water is met.*

See 18 AAC 70.016(b)(5) analysis and finding above.

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

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

(D) all wastes and other substances discharged will be treated and controlled to achieve

(i) for new and existing point sources, the highest statutory and regulatory requirements; and

(ii) for nonpoint sources, all cost-effective and reasonable best management practices;

The highest statutory and regulatory requirements are defined at 18 AAC 70.015(d):

(d) For purposes of (a) of this section, the highest statutory and regulatory requirements are

(1) any federal technology-based effluent limitation identified in 40 C.F.R. 122.29 and 125.3, revised as of July 1, 2017 and adopted by reference;

(2) any minimum treatment standards identified in 18 AAC 72.050;

(3) any treatment requirements imposed under another state law that is more stringent than a requirement of this chapter; and

(4) any water quality-based effluent limitations established in accordance with 33 U.S.C. 1311(b)(1)(C) (Clean Water Act, sec. 301(b)(1)(C)).

The first part of the definition includes all federal technology-based ELGs. When TBELs do not exist for a particular pollutant expected to be in an effluent, the Department must determine if the pollutant causes or contributes to an exceedance of WQBELs which are designed to ensure that the WQS of the receiving waterbody are met. DEC determined that that color at all four storm water locations exceed water quality criteria. DEC, therefore, developed color WQBELs for each storm water location.

The second part of the definition references the minimum treatment standards found at 18 AAC 72.050, which refers to domestic wastewater discharges only. The permit does not authorize the discharge of domestic wastewater; therefore, a finding under this section is not applicable.

The third part of the definition refers to treatment requirements imposed under another state law that are more stringent than 18 AAC 70. The correct operation of equipment, visual monitoring, and implementing BMPs, as well as other permit requirements, will control the discharge and satisfy all applicable federal and state requirements. The Department is not aware of other state regulations beyond 18 AAC 70 that apply to this permitting action and impose more stringent requirements than those found in 18 AAC 70.

The fourth part of the definition refers to water quality-based effluent limitations (WQBELS). A WQBEL is designed to ensure that the Water Quality Standards (WQS) of a water body are met and may be more stringent than TBELs. Section 301(b)(1)(C) of the CWA requires the development of limits in permits necessary to meet WQS by July 1, 1977. WQBELs included in APDES permits are derived from EPA-approved 18 AAC 70 WQS. APDES regulation 18 AAC 83.435(a)(1) requires that permits include WQBELs that can "achieve water quality standard established under CWA §303, including state narrative criteria for water quality. The permit requires compliance with the 18 AAC 70 WQS, including storm water limits for color and monitoring for other applicable WQS pollutants.

After reviewing the applicable statutory and regulatory requirements, including 18 AAC 70, 18 AAC 72, and 18 AAC 83, the Department finds that the storm water discharge authorized under AK0053392 meets the highest applicable statutory and regulatory requirements and that the finding is met.

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

(i) a lowering of water quality under 18 AAC 70.015(a)(2)(A) is necessary; when one or more practicable alternatives that would prevent or lessen the degradation associated with the proposed discharge are identified, the department will select one of the alternatives for implementation; and

(ii) the methods of pollution prevention, control, and treatment applied to all waste and other substances to be discharged are found by the department to be the most effective and practicable;

KPC's submitted the following responses on their storm water location Antidegradation Form 2G applications:

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

The receiving waterbodies, Ward (SWL11, SWL12) and Refuge Coves (SWL4, SWL6B) should have a Tier 2 protection level as defined under 18 AAC70.016(c)(2)(A)-(E).

Parameter of Concern:

SWL4 Color

SWL6B Color and copper

SWL11 Color and copper

SWL12 Color and manganese

Concentration and Persistence:

SWL4 Color MEC 877.6 color units. Does not persist.

SWL6B Color MEC 234 color units, copper MEC 7.27 µg/L. They do not persist.

SWL11 Color MEC 102.4 color units, copper MEC 12.51 µg/L. They do not persist.

SWL12 Color MEC 175.5 color units, manganese MEC 197.91 µg/L. They do not persist.

Potential Impacts:

SWL4 Color can negatively impact aesthetics, light penetration and temperature absorption.

SWL6B Color can negatively impact aesthetics, light penetration and temperature absorption. Copper can impair a salmon's sense of smell, which impairs their ability to navigate, find food and avoid predators.

SWL11 Color can negatively impact aesthetics, light penetration and temperature absorption. Copper can impair a salmon's sense of smell, which impairs their ability to navigate, find food and avoid predators.

SWL12 Color can negatively impact aesthetics, light penetration and temperature absorption. Elevated concentrations of manganese can cause oxidative stress, tissue damage, and immune suppression in aquatic life. Manganese can accumulate in seafood and pose a potential human health risk if consumed at high rates.

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

1 and 2.

The antidegradation applications are for expanded discharges that require a Tier 2 analysis.

3.A. Identification of receiving water quality and accompanying environmental impacts on the receivingwater for each of the practicable alternatives:

Ward and Refuge Cove water quality standard for color will be exceeded within the mixing zone. Color that is present in stormwater discharged from the closed and capped landfill is likely from natural sources, since the drainage areas are vegetated and stormwater does not come into contact with the waste stored under the cap. Color exceeding water quality standards is therefore not an indication of pollution; however, color can negatively impact aesthetics, light penetration and temperature absorption.

Copper can impair a salmon's sense of smell, impairing their ability to navigate, find food and avoid predators. Copper does not negatively impact human health at the concentrations detected in stormwater discharged from this outfall. Elevated concentrations of manganese can cause oxidative stress, tissue damage, and immune suppression in aquatic life.

3.B. Evaluation of the cost for each of the practicable alternatives, relative to the degree of water qualitydegradation:

1. Reduction of color in stormwater discharged to the receiving waters would require an active treatment system, including pumping, chemical flocculation, mixed media filtration and adsorptive media filtration. The stormwater management system consists of open, vegetated channels that flow by gravity. Installation of the active treatment system would require power, chemical storage and a significant footprint, as well as an operator. Since the landfill is closed and not in operation, an operator is not available and the installation of the treatment system is not economically achievable. The cost would likely exceed $1,000,000 per discharge channel.

2. Reduction of color and copper [and manganese] in stormwater could also require the above noted active treatment system (chemical treatment, settling and mixed media filtration) combined with membrane filtration instead of adsorptive media filtration. This would require power, chemical storage

and a significant footprint, as well as an operator. The cost would likely exceed $1,500,000 per discharge channel and is not economically achievable.

3. Reduction of color and copper [and manganese] in stormwater could also be accomplished via constructed treatment wetlands. Construction of these wetlands would require significant land disturbance (removal of native vegetation, regrading and wetland vegetation planting) to construct and although treatment wetlands are more passive than the above-noted alternatives, it would nevertheless require extensive inspections and maintenance. The cost would likely exceed $750,000 per discharge channel and is not economically achievable.

3.C. Identification of a proposed practicable alternative that prevents or lessens water quality degradation while also considering accompanying cross-media environmental impacts:

No practical and economically achievable alternatives have been identified, since the active treatment system required to remove color is not economically achievable and would require significant site improvements to provide power to the system. This system would also require storage of treatment chemicals, which would pose a potential risk to the environment if a spill occurred or significant land disturbance and footprint.

18 AAC 70.016(c)(7)(E) *except if not required under (4)(F) of this subsection, the social or economic importance analysis provided under (4)(G) and (5) of this subsection demonstrates that a lowering of water quality accommodates important social or economic development under 18 AAC 70.015(a)(2)(A);*

Form 2G Section 4 (Question 4)- Social or Economic Importance (18 AAC 70.16(c)(5))

Social Importance Analysis with community services provided and public health or safety improvements selected:

The stormwater outfalls that require a mixing zone drain the closed landfill area. The landfill provided services to the local community by properly managing the wastes generated by the community, protecting public health and safety.

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

The discharges to Ward and Refuge Coves are not to a designated Tier 3 water.

18 AAC 70.016(c)(7)(F) *18 AAC 70.015 and this section have been applied consistent with 33 U.S.C. 1326 (Clean Water Act, sec. 316) with regard to potential thermal discharge impairments.*
Discharges authorized under the permit are not associated with a potential thermal discharge impairment; therefore, the finding is not applicable.

7.0 OTHER PERMIT CONDITIONS

7.1 Quality Assurance Project Plan (QAPP)

The permittee is required to update, implement, and maintain the facility QAPP. The QAPP shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples; laboratory analysis; precision and accuracy requirements; data reporting, including method

detection/reporting limits; and quality assurance/quality control criteria. The permittee is required to amend the QAPP whenever any procedure addressed by the QAPP is modified. The QAPP shall be retained electronically or physically at the facility's office of record and made available to DEC upon request.

7.2 Best Management Practices (BMP) Plan

In accordance with AS 46.03.110 (d), the Department may specify in a permit the terms and conditions under which waste material may be disposed of. The permittee must review, update as necessary, and implement its BMP Plan as required in Permit Section 2.2 within 120 days of the effective date of the permit. The BMP Plan prevents or minimizes the potential for the release of pollutants to waters and lands of the State of Alaska through plant site runoff, spillage or leaks, or erosion. The permit contains specific BMPs that must be included in the BMP Plan. The BMP Plan shall be retained electronically or physically at the facility's office of record and made available to the Department upon request.

7.3 Storm Water Pollution Prevention Plan (SWPPP)

In accordance with AS 46.03.110 (d), the Department may specify in a permit the terms and conditions under which waste material may be disposed of. The SWPPP contains storm water control measures that reduce or eliminate pollutants in storm water. The SWPPP is incorporated into the KPC Landfill Leachate BMP Plan.

7.4 Electronic Discharge Monitoring Report

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

Phase II of the E-Reporting rule will integrate electronic reporting for all other reports required by the Permit (e.g., Annual Reports and Certifications) and implementation is expected to begin December 2020. Permittees should monitor DEC's E-Reporting Information website (https://dec.alaska.gov/water/compliance/electronic-reporting-rule) for updates on Phase II of the E-Reporting Rule and will be notified when they must begin submitting all other reports electronically. Until such time, other reports required by the Permit may be submitted in accordance with Appendix A – Standard Conditions.

7.5 Standard Conditions

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

8.0 OTHER LEGAL REQUIREMENTS

8.1 Ocean Discharge Criteria

Section 403(a) of the CWA, Ocean Discharge Criteria, prohibits the issuance of a permit under Section 402 of the CWA for a discharge into the territorial sea, the water of the contiguous zone, or the oceans except in compliance with Section 403. Permits for discharges seaward of the baseline of the territorial seas must comply with the requirements of Section 403, which include development of an Ocean Discharge Criteria Evaluation (ODCE).

An interactive map depicting Alaska's baseline plus additional boundary lines is available at https://alaskafisheries.noaa.gov/mapping/arcgis/rest/services/NOAA_Baseline/MapServer. The map is provided for information purposes only. The U.S. Baseline committee makes the official determinations on baseline. Ocean Discharge Criteria are not applicable for marine discharges to areas located landward of the baseline of the territorial sea.

DEC's review of the baseline line maps shows that KPC's outfalls are situated landward of the baseline of the territorial sea; therefore, Section 403 of the CWA does not apply to the permit, and an ODCE analysis is not required to be completed for this permit reissuance. Further, the permit requires compliance with WQS such that 40 CFR 125.122(b) is met and therefore the discharge is presumed not to cause unreasonable degradation of the marine environment.

8.2 Endangered Species Act

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

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

DEC accessed USFWS's website at Listed Species to gain an approximate determination that the endangered Short-tailed Albatross may occur in the area surrounding Refuge and Ward Coves.

DEC also accessed NOAA's website at Alaska Fisheries to gain an approximate determination that the area surrounding Refuge and Ward Coves is designated Stellar Sea Lion critical habitat.

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

8.3 Essential Fish Habitat

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

The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site-specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

DEC accessed NOAA's EFH Mapper at https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska and gained an approximate determination that the area could be EFH for chum, pink, coho, sockeye, and chinook salmon.

Section 305(b) of the Magnuson-Stevens Act 916 USC 1855(b)) requires federal agencies to consult NMFS when any activity proposed to be permitted, funded, or undertaken by a federal agency may have an adverse effect on designated EFH as defined by the Act. As a State agency, DEC is not required to consult with NMFS regarding permitting actions, but voluntarily contacts NMFS to notify them of the proposed permit issuance and to obtain listings of EFH in the area.

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

8.4 Permit Expiration

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

9.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC), 2022. 18 AAC 70, Water quality standards, as amended through April 26, 2024.

ADEC, 2022. Alaska water quality criteria manual for toxic and other deleterious organic and inorganic substances, as amended through September 8, 2022.

ADEC, 2024. Integrated Water Quality Monitoring and Assessment Report Accessed February 13, 2025.

ADEC, 2014. Alaska Pollutant Discharge Elimination System permits reasonable potential analysis and effluent limits development guide.

Doneker, Robert and Jirka, Gerhard. 2020. CORMIX user manual, U.S. Environmental Protection Agency, EPA-823-K-07-001, February 2020.

National Oceanic and Atmospheric Administration (NOAA Fisheries). Alaska protected resources division species distribution mapper https://alaskafisheries.noaa.gov/portal/apps/webappviewer/index.html?id=446543503a2e4660b0f5ee55e6407d27 Accessed October 30, 2024.

NOAA Fisheries. Essential Fish Habitat in Alaska. https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska. Accessed October 30, 2024.

U.S. Environmental Protection Agency. 1991. Technical support document for water quality-based toxics control, EPA/505/2-90-001, USEPA Office of Water, Washington D.C., March 1991.

U.S. Fish and Wildlife Service. Environmental conservation online system. Listed Species. Accessed October 30, 2024.

APPENDIX A- BASIS FOR EFFLUENT LIMITATIONS

The Clean Water Act (CWA) requires that the effluent limit for a particular pollutant be the more stringent of either technology-based effluent limits (TBELs) or water quality-based effluent limits (WQBELs). TBELs are established by the Environmental Protection Agency (EPA) for many industries in the form of Effluent Limitation Guidelines (ELG) and are based on available pollution control technology. The Alaska Department of Environmental Conservation (DEC or the Department) adopts the subject ELGs by reference in 18 Alaska Administrative Code (AAC) 83.010. TBELs are national in scope and establish performance standards for all facilities within an industrial category or subcategory. The Department may find, by analyzing the effect of an effluent discharge on the receiving waterbody, that TBELs are not sufficiently stringent to meet water quality standards (WQS). In such cases, the Department is required to develop more stringent WQBELs, which are designed to ensure that the WQS of the receiving waterbody are met. When TBELs do not exist for a particular pollutant expected to be in the effluent, the Department must determine if the pollutant may cause or contribute to an exceedance of a WQS for the waterbody. If a pollutant causes or contributes to an exceedance of a WQS, a WQBEL for the pollutant must be established in the permit.

The permit contains WQBELs for those parameters that demonstrated reasonable potential to exceed water quality criteria at the end of the pipe as well as best professional judgment (BPJ) TBELs.

A.1 Statutory and Regulatory Basis

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

The regulations require the permitting authority to make this evaluation using procedures that account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving waterbody. The limits must be stringent enough to ensure that WQS are met and must be consistent with any available waste load allocation (WLA).

A.2 Technology Based Effluent Limitations

A.2.1 Mass-Based Limitations

Alaska Pollutant Discharge Elimination System (APDES) regulations at 18 AAC 83.540 require that effluent limits be expressed in terms of mass unless they cannot appropriately be expressed by mass, if it is infeasible, or if the limits can be expressed in terms of other units of measurement. Expressing limitations in terms of concentration as well as mass encourages the proper operation of a facility at all times. The mass based limits are expressed in pounds per day (lbs/day) and are calculated as follows:

Mass based limit (lbs/day) = concentration limit (mg/L) × design flow (mgd) × 8.34[1]

A.2.2 Effluent Limitation Guidelines

Section 301(b) of the CWA requires industrial dischargers to meet applicable TBELs established by the EPA. These are enforceable through their incorporation into an APDES permit. For dischargers in industrial categories for which EPA has not yet issued an ELG, and for types of discharges not covered by applicable ELGs, BPJ is used to establish TBELs.

EPA promulgated ELGs for landfills point source categories at 40 Code of Federal Regulations (CFR) Part 445, which include TBELs for the point source category, Subpart B, Resource Conservation and Recovery Act (RCRA) Subtitle D, Non-Hazardous Waste Landfill. This ELG has an exception for discharges from captive landfills – landfills operated in conjunction with other commercial or industrial

[1] 8.34 is a conversion factor with units (pounds x liters) / (milligrams x gallons x 10^6)

operations, when the landfill only receives wastes generated by the associated commercial or industrial operation. While the Ketchikan Pulp Company Ward Cove Landfill (KPC Landfill) is a point source from a landfill containing non-hazardous waste, it also fits the exception for captive landfills provided for in the ELG. The landfill is located on the same site as where mill operations took place and was dedicated to receiving waste only from that industrial facility.

Two other promulgated ELGs were reviewed as to their applicability to the KPC Landfill, 40 CFR Part 429 – Timber Products Processing Point Source Category and 40 CFR Part 430 – The Pulp, Paper, and Paperboard Point Source Category. 40 CFR Part 429 is applicable to any timber products processing operation, and any plant producing insulation board with wood as the major raw material, which discharges or may discharge process wastewater pollutants to the waters of the United States, or which introduces or may introduce process wastewater pollutants into a publicly owned treatment works. 40 CFR Part 430 is applicable to any pulp, paper, or paperboard mill that discharges or may discharge process wastewater pollutants to the waters of the United States, or that introduces or may introduce process wastewater pollutants into a publicly owned treatment works.

Process wastewater is defined in 40 CFR Part 401.11 – General definitions, as any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product. For facilities subject to 40 CFR 430, Subparts B – Bleached Paper grade Kraft and Soda Subcategory, and 40 CFR 430, Subpart E – Paper grade Sulfite Subcategory, process wastewater includes leachate from landfills. However, the KPC Landfill did not receive waste from either of these types of facilities defined in Subparts B or E. The Department has determined that ELGs 40 CFR Part 429 and 40 CFR Part 430 do not apply to the KPC Landfill discharge.

According to 40 CFR 125.3(c)(2) technology based treatment requirements may be imposed on a case-by-case basis under section 402(a)(1) of the Act when a promulgated ELG has not been developed that applies to the discharge. Case-by-case TBELs are developed using BPJ. The appropriate technology for the category or class of point source based on available information is to be considered when developing case-by-case TBELs. Factors to be considered are:

- The reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits,
- A comparison of the cost and level of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources,
- The age of equipment and facilities involved,
- The process employed,
- The engineering aspects of the application of various types of control techniques, process changes, and non-water quality environmental impacts.

The Department determined that there are no ELGs under development that would be applicable to a facility similar to the KPC Landfill and that the availability of information for developing case-by-case TBELs is too limited to adequately make cost and technology comparisons for an informed professional judgment. The ELG found at 40 CFR Part 445, Subpart B, RCRA Subtitle D, Non-Hazardous Waste Landfill, provides the most meaningful guidance for developing effluent limits for the leachate treatment process at the KPC Landfill. Therefore, these effluent guidelines have been applied on a BPJ basis to Outfall 001A and are consistent with the previous permit. Benzoic acid, p-Cresol, phenol and α-Terpineol were removed as BPJ TBELs in the prior permit. Table A.1 provides the effluent limits attainable by the application of BPJ.

Table A.1- Outfall 001A Technology-Based Effluent Limits

Parameter	Units	Average Monthly	Daily Maximum
BOD_5	milligrams per liter (mg/L)	37	140
TSS	mg/L	27	88
Total Ammonia, as Nitrogen (N)	mg/L	4.9	10
Zinc	micrograms per liter (µg/L)	110	200
pH	Within the range 6 to 9 standard pH units (S.U.)		

A.3 Water Quality Based Effluent Limitations

WQBELs included in APDES permits are derived from WQS. APDES regulation 18 AAC 83.435(a)(2) requires that permits include WQBELs that can achieve WQS established under CWA Section 303, including state narrative criteria for water quality. The State's WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an antidegradation policy (See Section 7.0, Antidegradation). The use classification system identifies the designated uses that each waterbody is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the state to support the designated use classification of each waterbody. Designated uses are those uses specified in WQS for each waterbody or segment whether or not they are being attained [40 CFR Section 131.3(f)]. Existing uses are those uses actually attained in a waterbody on or after November 28, 1975, whether or not they are included in the WQS [40 CFR Section 131.3].

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

The receiving waters for the discharge, Ward and Refuge Coves, have not been reclassified, nor have site-specific water quality criteria been established. Therefore, Ward and Refuge Coves must be protected for all marine water use classes listed in 18 AAC 70.020(a)(2). These marine water designated use classes consist of the following: water supply for aquaculture, seafood processing and industrial; contact and secondary recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life.

A.3.1 Specific Water Quality-Based Effluent Limits

A.3.1.1 Total Ammonia (as N)

Total ammonia is the sum of ionized (NH_4^+) and un-ionized ammonia (NH_3). Temperature, pH, and salinity affect which form, NH_4^+ or NH_3 is present. NH_3 is more toxic to aquatic organisms than NH_4^+ and predominates with higher temperature and pH. NH_3 is less toxic with increased salinity. Biological wastewater treatment processes reduce the amount of total nitrogen in wastewater; however, without advanced treatment, wastewater effluent may still contain elevated levels of ammonia nitrogen. Excess ammonia in the environment can lead to dissolved oxygen (DO) depletion, eutrophication, and toxicity to aquatic organisms.

The prior permit required KPC to monitor ammonia in the effluent once per year. DEC reviewed the facility's ammonia effluent monitoring data from March 2020 – March 2025. During this time period, KPC reported one result of 0.075 mg/L and four results of 0.5 mg/L.

DEC used salinity, temperature, and pH data from Ward Cove that was collected by Tetra Tech in 1997 for development of DEC and EPA's total maximum daily load for residues and DO in Ward Cove. The Department entered the 15th percentile salinity (25.7 parts per thousand), and the 85th percentiles temperature (13.4 ° Celsius), and pH (7.8 S.U.) into the State of Oregon Department of Environmental Quality Saltwater Ammonia Calculator, which calculates ammonia water quality criteria that are consistent with *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances,* Appendices F and G, to arrive at a chronic ammonia criterion of 2.1 mg/L and an acute ammonia criterion of 14.3 mg/L.

DEC's Reasonable Potential Analysis (RPA) and Effluent Limits Development Guide, requires that for pollutants where TBELs have been determined, that WQBELs be calculated using the dilution for the driving parameter of the mixing zone. Therefore, ammonia WQBELs were calculated using the dilution factor for manganese (15), the driving parameter of the mixing zone, which resulted in WQBELs of 14.3 mg/L daily maximum limit (DML) and 7.1 mg/L average monthly limit (AML). The ammonia TBELs (DML 10 mg/L, AML 4.9 mg/L) are more stringent than the WQBELs, and therefore are retained as the effluent limits in the reissued permit.

A.3.1.2 pH

Alaska WQS at 18 AAC 70.020(b)(18)(A)(i) (aquaculture) and 18 AAC 70.020(b)(18)(C) (Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife) states that the pH water quality criteria may not be less than 6.5 or greater than 8.5 S.U.

DEC reviewed Outfall 001A monitoring results from March 2020 – June 2024 pH. During this time period, the minimum pH at Outfall 001A was 6.85 S.U. and the maximum pH was 7.86 S.U. The previous permit required a minimum of 6.5 S.U. and a maximum of 8.5 S.U. These water quality criteria are retained as the pH limits for Outfall 001A.

A.3.1.3 Manganese

The most stringent WQS numeric criterion for manganese, located at 18 AAC 70.020(b)(23) is 100 µg/L, protection of human health for consumption of aquatic organisms.

DEC reviewed outfall 001A manganese monitoring results from March 2020 – March 2025. During this time period, the minimum observed manganese concentration was 9.46 µg/L, and the maximum observed manganese concentration was 2,270 µg/L. Manganese exceeded the water quality criterion of 100 µg/L; therefore, DEC conducted an RPA and developed WQBELs. The WQBELs (DML 6,810 µg/L, AML 1,500 µg/L) are less stringent than the previous permit's manganese effluent limits (DML 3,900 µg/L, AML 2,270 µg/L). 18 AAC 83.480 requires that interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit. Therefore, DEC selected the previous permit's manganese effluent limits as the effluent limits in the reissued permit.

A.3.1.4 Zinc

The most stringent WQS numeric criteria for zinc, located at 18 AAC 70.020(b)(23) is aquatic life criteria, with a chronic criterion of 86.1µg/L and an acute criterion of 95.1 µg/L.

DEC reviewed Outfall 001A zinc monitoring results from March 2020 – March 2025. During this time period, all zinc monitoring results were reported as less than 0.002 µg/L, the method reporting level (MRL) , with the exception of one monitoring result of 0.0035 µg/L.

DEC's RPA and Effluent Limits Development Guide, requires that for pollutants where TBELs have been determined, that WQBELs be calculated using the dilution for the driving parameter of the mixing zone. Therefore, zinc WQBELs were calculated using the dilution factor for manganese, the driving parameter of the mixing zone, which resulted in WQBELs of 95 µg/L DML and 47 µg/L AML which are more stringent than the TBELs (200 µg/L DML, 110 µg/L AML). The prior permit contained zinc WQBELs of 95 µg/L DML and 33 µg/L AML. 18 AAC 83.480 requires that interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit. Therefore, DEC selected the previous permit's zinc WQBELs as the effluent limits in the reissued permit. Because Outfall 001A zinc effluent concentrations have predominately been less than zinc's MRL and because the one monitoring result above the MRL is well below zinc water quality criteria, DEC is reducing the monitoring frequency in the reissued permit from 2/Year to 1/Year.

A.3.2 Selection of Most Stringent Limitations

Table A.2 provides a summary and reference to those parameters that contain effluent limits at Outfall 001A.

Table A.2- Summary of Effluent Limitations

Parameter	Fact Sheet Reference	Type of Effluent Limit
TSS	APPENDIX A-Section A.2.2	BPJ TBEL
BOD_5		
Total Ammonia, as Nitrogen	APPENDIX A- Section A.2.2, Section A.3.1.1	BPJ TBEL
pH	APPENDIX A- Section A.2.2, Section A.3.1.2	WQBEL
Manganese	APPENDIX A- Section A.3.1.3	WQBEL
Zinc	APPENDIX A- Section A.2.2, Section A.3.1.4	WQBEL

A.3.3 Storm Water WQBELs

A.3.3.1 Color

Alaska WQS at 18 AAC 70.020(b)(13)(A)(ii) (seafood processing) and 18 AAC 70.020(b)(13)(B)(i) (contact recreation) states that color for marine water uses may not exceed 15 color units or the natural condition, whichever is greater. DEC conducted an RPA for each of the storm water locations using monitoring results from June 2020 – March 2025. Color demonstrated reasonable potential to exceed water quality criteria and required the most dilution to achieve water quality criteria over other parameters included in each of the storm water location RPAs; therefore, color WQBELs were developed for each storm water location. The color WQBELs for each storm water location are provided in Table A.3.

Table A.3- Storm Water Color WQBELs

Storm Water Location	Monthly Average Limit (Color Units)	Daily Maximum Limit (Color Units)
SWL4	878	1,761
SWL6B	234	469
SWL11	102	205
SWL12	176	352

APPENDIX B-REASONABLE POTENTIAL DETERMINATION

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

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

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

B.1 Mass Balance

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

$$C_d Q_d = C_e Q_e + C_u Q_u \qquad \text{(Equation B-1)}$$

Where,

C_d = Receiving waterbody concentration downstream of the effluent discharge

C_e = Maximum projected effluent concentration

C_u = Assumed receiving waterbody ambient concentration

Q_d = Receiving waterbody flow rate = $Q_e + Q_u$

Q_e = Effluent flow rate (set equal to the design flow of the wastewater treatment facility (WWTF))

Q_u = Receiving waterbody flow rate

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

$$C_d = \frac{C_e Q_e + C_u Q_u}{Q_e + Q_u} \qquad \text{(Equation B-2)}$$

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

$$C_d = \frac{C_e Q_e + C_u (Q_U \times MZ)}{Q_e + (Q_u \times MZ)} \qquad \text{(Equation B-3)}$$

Where, MZ = the fraction of the receiving waterbody flow available for dilution.

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

$$C_d = C_e \quad \text{(Equation B-4)}$$

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

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

$$D = \frac{Q_e + Q_u}{Q_e} \quad \text{(Equation B-5)}$$

After the D simplification, this becomes:

$$C_d = \frac{(C_e - C_u)}{D} + c_u \quad \text{(Equation B-6)}$$

B.2 Maximum Projected Effluent Concentration

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

Since there are a limited number of data points available, the 99th percentile is calculated by multiplying the maximum observed effluent concentration (MOC) by a reasonable potential multiplier (RPM). The RPM is the ratio of the 99th percentile concentration to the MOC and accounts for the statistical uncertainty in the effluent data. The RPM is calculated from the coefficient of variation (CV) of the data and the number of data points. The CV is defined as the ratio of the standard deviation of the data set to the mean. When fewer than 10 data points are available, the *TSD* and DEC's RPA Guide recommends setting the CV value to 0.6. A CV value of 0.6 is a conservative estimate that assumes a relatively high variability. In the example of manganese, the Department used ProUCL, a statistical software program, to determine a CV of 1. ProUCL also indicated that the data set follows a lognormal statistical distribution. Therefore, the RPM equation in Section 2.4.2.1 of the RPA Guide is used to determine the RPM for manganese.

$$RPM = \frac{\exp(\, z_{99}\hat{\sigma}_y - 0.5\hat{\sigma}_y^2 \,)}{\exp(p_n\hat{\sigma}_y - 0.5\hat{\sigma}_y^2 \,)} \quad \text{(Equation B-7)}$$

Where,

z_{99} = the z − statistic at the 99th percentile = 2.326

μ_n = mean calculated by ProUCL = 354

σ = the standard deviation calculated by ProUCL = 667

p_n = the z − statistic at the 95th percent confidence level of $(1 - 0.95)^{\frac{1}{n}} = 0.861$

n = number of valid data samples = 20

RPM = 1.0

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

$$\text{MEC} = (\text{RPM})(\text{MOC}) \quad \text{(Equation B-8)}$$

MOC = 2,270 micrograms per liter (µg/L)

In the case of manganese,

MEC = (2,270)(1.0) = 2,270 µg/L

Comparison with water quality criteria

To determine if reasonable potential exists for this discharge to exceed the manganese water quality criterion, the highest projected concentration is compared with the human health water quality criterion for consumption of aquatic organisms.

Manganese MEC: 2,270 µg/L

Human Health Criteria for Consumption of Aquatic Organisms: 100 µg/L

2,270 µg/L > 100 µg/L

Yes, there is reasonable potential for the discharge to exceed the manganese human health criterion for consumption of aquatic organisms

Table B.1 summarizes the data, multipliers, and criteria used to determine reasonable potential to exceed water quality criteria for Outfall 001A. Table B.2 summarizes the data, multipliers, and criteria used to determine reasonable potential to exceed water quality criteria for each of the storm water locations. Since there is reasonable potential for the effluent from Outfall 001A to exceed human health manganese water quality criteria and reasonable potential for the discharge from each of the storm water locations to exceed color, and because manganese requires the most dilution of the parameters at Outfall 001A and because color requires the most dilution of the storm water parameters, WQBELs for Outfall 001A manganese and WQBELs for color for each of the storm water locations are required. See Appendix C for an example of the calculation for manganese.

Table B.1- Outfall 001A Reasonable Potential Analysis Results

Parameter	MOC	N[a]	C_u[b]	RPM	MEC (C_e)	WQS Criteria	Reasonable Potential to Exceed Water Quality Criteria?
Manganese	2,270 µg/L	20	15 µg/L	1.0	2,270 µg/L	100 µg/L (human health for consumption aquatic organisms)	Yes
Color	45 Color Units	20	2.3 Color Units	1.2	55 Color Units	15 color units or natural background, whichever is greater	Yes
Zinc	3.5 µg/L	10	13 µg/L	2.5	8.9 µg/L	95 µg/L (acute) 86 µg/L (chronic)	No
Total Ammonia as Nitrogen	0.08 mg/L	5	0.3 mg/L	3.4	0.3 mg/L	14 mg/L (acute) 2.1 mg/L (chronic)	No

Footnotes:

a. N = Number of valid samples
b. C_u = Ambient concentration

Table B.2- Storm Water Reasonable Potential Analysis Results

Parameter	MOC	N [a]	C_u [b]	RPM	MEC (C_e)	WQS Criteria	Reasonable Potential to Exceed Water Quality Criteria?
Color SWL4	300 Color Units	7	2.3 Color Units	2.9	878 Color Units	15 color units or natural background, whichever is greater	Yes
Color SWLB6	80 Color Units	7	2.3 Color Units	2.9	234 Color Units	15 color units or natural background, whichever is greater	Yes
Copper SWLB6	4.87 µg/L	11	0.56 µg/L	1.5	7.3 µg/L	5.8 µg/L (acute) 3.7 µg/L (chronic)	Yes
Color SWL11	35 Color Units	7	2.3 Color Units	2.9	102 Color Units	15 color units or natural background, whichever is greater	Yes
Copper SWL11	8.69 µg/L	11	0.56 µg/L	1.4	13 µg/L	5.8 µg/L (acute) 3.7 µg/L (chronic)	Yes
Color SWL12	60 Color Units	7	2.3 Color Units	2.9	176 Color Units	15 color units or natural background, whichever is greater	Yes
Manganese SWL12	78 µg/L	10	15 µg/L	2.5	198 µg/L	100 µg/L (human health aquatic organisms)	Yes

Footnotes:

a. N = Number of valid samples
b. C_u = Ambient concentration

APPENDIX C- EFFLUENT LIMIT CALCULATION

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

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

In the case of the Ketchikan Pulp Company Ward Cove Landfill (KPC Landfill), manganese demonstrated reasonable potential to exceed at the end of pipe and required the most dilution to meet water quality numeric criteria at the boundary of the authorized mixing zone; therefore, the Department developed WQBELs for manganese. An example of the manganese limit calculation is depicted below.

C.1 Effluent Limit Calculation

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

C.2 Mixing Zone-based WLA

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

C.3 "End-of-Pipe" WLAs

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

C.4 Permit Limit Derivation

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

The DML is based on the CV of the data and the probability basis, while the AML is dependent on these two variables and the monitoring frequency. As recommended in the TSD, the Department used a probability basis of 95% for the AML calculation and 99% for the DML calculation.

The following is a summary of the steps to derive WQBELs from WQS numeric criteria for pollutants that have reasonable potential to exceed WQ numeric criteria. These steps are found in the RPA Guide and the guidance's accompanying Microsoft Excel RPA Tool. The guidance and tool were used to calculate the DML and AML for manganese in the KPC Landfill permit.

Step 1- Determine the WLA

The human health criteria are converted to waste load allocations using the following equation:

$$WLA_{hh} = (WQC_{hh})(D_{hh}) + C_s(1 - D_{hh})$$

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

Where: $D_{hh} = Dilution = \frac{(Q_d + Q_s)}{Q_d}$

$D_{hh}(Dilution\ [Human\ Health])$

$Q_s = Critical\ Upstream\ Flow$

$Q_d = Critical\ Discharge\ Flow$

$C_s = Critical\ Upstream\ Concentration$

$WLA_{hh} = Wasteload\ Allocation\ (\ human\ health)$

$WQC_{hh} = C_r = Water\ Quality\ Criterion(human\ health)$

For manganese,

$D_{hh} = 26.5$

$C_s = 15\ micrograms\ per\ liter$ (µg/L)

$WLA_{hh} = 2{,}270\ \mu g/L$

$WQC_{hh} = 100\ \mu g/L$

Step 2 - Calculate the Permit Limits

The DML and AML are calculated using the following equations that are found in section 5.4.4 of the TSD:

$$AML_{hh} = WLA_{hh}$$

$$MDL_{hh} = AML_{hh}\left(\frac{\exp(z_{99}{}^{\sigma} - 0.5\sigma^2)}{\exp(z_{95}{}^{\sigma} - 0.5\sigma_n^2)}\right)$$

Where z_{95} = the z-statistic at the 95th percentile = 1.645

$$\sigma^2 = ln[CV^2 + 1]$$

$$\sigma_n^2 = ln\left[\left(\frac{CV^2}{n}\right) + 1\right]$$

CV = coefficient of variation = 1.8110

n = number of samples per month = 4

For manganese:

DML = 6,900 µg/L

AML = 2,270 µg/L

The above effluent limits are less stringent than the previous permit's manganese effluent limits (DML 3,900 µg/L, AML 1,500 µg/L). 18 AAC 83.480 requires that interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit. Therefore, DEC selected the previous permit's manganese effluent limits as the effluent limits in the reissued permit.

APPENDIX D. MIXING ZONE ANALYSIS CHECKLIST

The purpose of the Mixing Zone Checklist is to guide the permit writer through the mixing zone regulatory requirements to determine if all the mixing zone criteria at 18 AAC 70.240 are satisfied, as well as provide justification to authorize a mixing zone in an Alaska Pollutant Discharge Elimination System permit. See Fact Sheet Section 4.5 for the KPC Ward Cove Landfill Leachate mixing zone analysis.

Criteria	Description	Resources	Regulation
Size	Is the mixing zone as small as practicable?	Technical Support Document for Water Quality-Based Toxics Control DEC's Reasonable Potential Analysis Guidance Environmental Protection Agency's Permit Writers' Manual CORMIX	**18 AAC 70.240(k)**
Technology	Were the most effective technological and economical methods used to disperse, treat, remove, and reduce pollutants?		**18 AAC 70.240(c)(1)**
Low Flow Design	**For streams, rivers, or other flowing fresh waters.** - Determine low flow calculations or documentation for the applicable parameters.		**18 AAC 70.240(l))**
Existing Use	Does the mixing zone… (1) maintain and protect designated and existing uses of the waterbody as a whole? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(c)(2)**
	(2) impair overall biological integrity of the waterbody? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(c)(3)**
	(3) create a public health hazard that would preclude or limit existing uses of the waterbody for water supply or contact recreation? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(c)(4)(B)**

Criteria	Description	Resources	Regulation
	(4) preclude or limit established processing activities or established commercial, sport, personal use, or subsistence fish and shellfish harvesting? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(c)(4)(C)**
Human consumption	Does the mixing zone… (1) produce objectionable color, taste, or odor in aquatic resources harvested for human consumption? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(d)(6)**
Spawning Areas	Does the mixing zone… (1)discharge in a spawning area for anadromous fish or Arctic grayling, northern pike, rainbow trout, lake trout, brook trout, cutthroat trout, whitefish, sheefish, Arctic char (Dolly Varden), burbot, and landlocked coho, chinook, and sockeye salmon? **If yes, mixing zone prohibited.**		**18 AAC 70.240(f)**
Human Health	Does the mixing zone… (1) contain bioaccumulating, bioconcentrating, or persistent chemical above natural or significantly adverse levels? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(d)(1)**
	2) contain chemicals expected to present an unacceptable risk to human health from carcinogenic, mutagenic, teratogenic, or other effects as determined using risk assessment methods approved by the Department? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(d)(2)**
	(5) occur in a location where the department determines that a public health hazard reasonably could be expected? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(k)(4)**

Criteria	Description	Resources	Regulation
Aquatic Life	Does the mixing zone… (1) result in a reduction in fish or shellfish population levels? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(c)(4)(d)**
	(2) form a barrier to migratory species or fish passage? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(c)(4)(G)**
	(3) result in undesirable or nuisance aquatic life? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(d)(5)**
	(4) result in permanent or irreparable displacement of indigenous organisms? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(c)(4)(E)**
	(5) result in a reduction in fish or shellfish population levels? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(c)(4)(D)**
	(6) prevent lethality to passing organisms; or exceed acute aquatic life criteria at and beyond the boundaries of a smaller initial mixing zone surrounding the outfall, the size of which shall be determined using methods approved by the Department? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(d)(7)** **18 AAC 70.240(d)(8)**
	(7) cause a toxic effect in the water column, sediments, or biota outside the boundaries of the mixing zone? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(c)(4)(A)**

Criteria	Description	Resources	Regulation
Endangered Species	Are there threatened or endangered species (T/E spp) at the location of the mixing zone? If yes, are there likely to be adverse effects to T/E spp based on comments received from the United States Fish and Wildlife Service or National Oceanic and Atmospheric Association? If yes, will conservation measures be included in the permit to avoid adverse effects? **If yes, mixing zone may be approved as proposed or authorized with conditions.**		**18 AAC 70.240(c)(4)(F)**