ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT FACT SHEET – Final

Permit Number: AKR061000

Ted Stevens Anchorage International Airport (ANC-GP)

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

Public Comment Period Start Date: March 1, 2019
Public Comment Period Expiration Date: April 15, 2019
Alaska Online Public Notice System

Technical Contact: William Ashton
Alaska Department of Environmental Conservation
Division of Water
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501
(907) 269-6283
Fax: (907) 269-7509
william.ashton@alaska.gov

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

TED STEVENS ANCHORAGE INTERNATIONAL AIRPORT

For wastewater discharges from

Ted Stevens Anchorage International Airport
P.O. Box 196960
Anchorage, Alaska, 99519-6960

The Alaska Department of Environmental Conservation (Department or DEC) proposes to issue an APDES general permit for Ted Stevens Anchorage International Airport. 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 Ted Stevens Anchorage International Airport and the development of the permit including:

- information on public comment, 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

Appeal Process

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

Director, Division of Water
Alaska Department of Environmental Conservation
555 Cordova Street, 3rd Floor
Anchorage AK, 99501

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

See dec.alaska.gov/commish/review-guidance/informal-reviews/ for information regarding informal reviews of Department decisions.

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

Commissioner
Alaska Department of Environmental Conservation
P.O. Box 111800
Juneau AK, 99811-1800

Location: 410 Willoughby Avenue, Juneau

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

Documents are Available

The permit, fact sheet, 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 address below. The permit, fact sheet, and other information are located on the Department's Wastewater Discharge Authorization Program website: 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

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

This fact sheet provides information on the Alaska Pollutant Discharge Elimination System (APDES) general permit for the following entity:

Name of Facility:	Ted Stevens Anchorage International Airport
APDES Permit Number:	AKR061000
Facility Location:	5000 West International Airport Road, Anchorage, AK 99502
Mailing Address:	PO Box 196960, Anchorage, AK 99519
Facility Contact:	Ms. Tracy Mitchell

Outfall Location

Discharge Location (Outfall)	Receiving Water	Latitude	Longitude
001A	Lake Spenard	61˚ 10’ 30” North	-149˚ 57’ 08” West
002B	Lake Hood	61˚ 10’ 43” North	-149˚ 58’ 30” West
003C	Lake Hood	61˚ 10’ 53” North	-149˚ 58’ 42” West
004D	Knik Arm/Cook Inlet	61˚ 11’ 58” North	-149˚ 59’ 29” West
005E	Unnamed Creek	61˚ 10’ 22” North	-150˚ 02’ 57” West

Figure 1 in Appendix A shows the location of the facility and the discharge locations.

2.0 FACILITY INFORMATION

2.1 Background

Winter operations at Ted Stevens Anchorage International Airport (ANC) requires deicing of aircraft and airfield pavement to ensure the safety of passenger and cargo flights. Aircraft deicing fluid (ADF) is a glycol-based fluid used to remove and prevent ice and snow buildup on aircraft surfaces prior to departure. Tenants of ANC typically use between 250,000 and 500,000 gallons of glycol-based deicing/anti-icing chemicals on an average annual basis depending on winter conditions.

Note: The following naming convention will typically refer to the following entities:

- *Ted Stevens Anchorage International Airport or “ANC” refers to the overall physical airport. “Airport Authority” refers to the Alaska Department of Transportation and Public Facility – Administration Organization.*
- *Co-permittee refers to the tenant or leaseholder that has one of the four Standard Industrial Codes (SIC) listed in Permit Part 1.2.1.*
- *Facility or “activity” refers to the location where the Co-permittees action takes place.*

The Airport Authority has operated a single glycol recovery vehicle (GRV) to collect spent ADF, as well as storm water and snow. The GRV collects the ADF-laden mixture from basin A in the East Airpark and, when time permits, from the ramp areas of the South Terminal. Historically, the ADF-laden mixture was disposed of at the airside snow disposal site on the west end of the airport in basin E, just south of Taxiway K and just east of the end of Runway 7L-25R. (Snow disposal sites are discussed in the next section.) A majority of spent ADF is not collected with the GRV due to the limited operational area. Uncollected spent ADF mixes with precipitation and is directed to the storm water drainage system.

Aircraft and airfield deicing and anti-icing are required for aircraft and human safety under Federal Aviation Administration (FAA) regulations and, as such, the Airport Authority does not have direct operational control over the use of such products at ANC.

Tenant Deicing. The Airport Authority currently allows the commercial airlines to deice their aircraft near the gates as a necessary activity for safe transportation. The FAA has the authority to approve the products used and the procedures associated with deicing. Aircraft deicing is performed by airlines and ground support service companies only, not by the Airport Authority. Each airline has a deicing plan that is reviewed and approved by the FAA. For safety reasons, the Airport Authority cannot control the operation of an independent company's equipment, or when and how aircraft are deiced. The airlines typically use ethylene glycol (10-20%) and propylene glycol (80-90%) and mixtures of both to deice aircraft.

Airport Authority Deicing. Historically the primary airfield deicing ingredients were urea and potassium acetate. In 1993, the Airport Authority converted runway deicer from glycol-based liquid deicers to a potassium acetate liquid deicer to reduce nutrient loading to Lakes Hood and Spenard. The Airport Authority continued to use pelletized urea until 2013; however, its efficiency decreased as the temperature decreased and became ineffective below 20°F, necessitating the use of other deicers. In the 2013 deicing season (August 2013 to August 2014) the Airport Authority switched from using urea to potassium acetate pursuant to EPA's recently promulgated Effluent Limit Guidelines (ELG) (40 CFR 449) on airfield pavement deicer. In the last year of using urea (August 1, 2012 to August 1, 2013) the Airport Authority used 1,655.61 tons of urea. From 2013 to present, the Airport Authority uses potassium acetate only for pavement deicing. In the first year of exclusively using potassium acetate (August 1, 2013 to August 1, 2014), the Airport Authority used 1,390.5 tons of potassium acetate. Switching to potassium acetate contributes to reducing nutrient discharges to receiving waters. The Airport Authority continues to evaluate new deicing chemicals as they become available and will incorporate new chemicals when they are shown to be effective and reduce environmental impacts.

The Airport Authority manages the collection and storage of removed snow through the segregation of airside snow and landside snow. Airside activity takes place within the security fence around runways, taxiways, and aprons. Landside is the area outside the security fence and still on airport property. Airside snow has the potential to be mixed with spent ADF and other contaminants generally found around the terminals and areas experiencing deicing activities. Landside snow is generally free of major contaminants and originates from street and parking lot plowing on the landside of the Airport. Snow disposal sites are selected for infiltration capacity; and, for airside snow disposal sites, the natural bio-degradation of ADF that can occur prior to meltwater entering the storm water drainage system. Airside snow disposal sites are managed to minimize the release of ADF into receiving waters. There are five co-permittee designated airside snow disposal sites – one in Basin A, two in Basin D, and two in Basin E. There are five Airport Authority designated airside snow disposal sites – three in Basin D and two in Basin E. The primary landside snow disposal site is located just south of Turnagain Bog.

A determination of (clean) landside snow or (dirty) airside snow must be made on snow that is pushed into piles and left until such time as it is hauled to snow disposal sites. Snow which contains deicing chemicals is classified as "ANC Airside Snow" by the Airport Authority. This snow must be removed to storage areas farthest from Lake Hood & Spenard water bodies and away from wetlands. Snow within the airport operations areas must be disposed of in dedicated snow storage areas within the airfield boundaries. Snow from areas such as parking lots, administrative areas, and small aircraft parking are disposed of in the approved storage location. Co-permittees ensure that no solid waste is contained in the

snow. Snow cannot be placed in taxiways, taxi lanes, roadways, water bodies, wetlands, or disrupt flow of drainage systems.

The Airport's drainage area covers approximately 4,700 acres and includes five basins. The five basins are designated as A, B, C, D, and E and direct storm water to separate discharge points in Lake Spenard, Lake Hood, Knik Arm, and an unnamed creek. The basins are shown in Permit Figure 1 along with each outfall designated as National Pollutant Discharge (NPD) 001A – 005E associated with each basin. Each basin is hydraulically isolated and not impacted by storm water from the surrounding areas. Below is a brief description of the basins, receiving waters, and deicing activities at the Airport:

- Basin A captures storm water runoff from the east airfield and eastern portion of the south airfield and drains to Lake Spenard via Outfall – 001A. Aircraft deicing and airside snow management activities occur in this basin. Area of total impervious surface area is 315 acres.
- Basin B captures storm water runoff from the South Terminal, parking area, and East Airpark and drains to Lake Hood via Outfall – 002B. Aircraft deicing and airside and landside snow management activities occur in this basin. Area of total impervious surface area is 137 acres.
- Basin C captures storm water runoff from the North Terminal and general aviation area and drains to Lake Hood via Outfall – 003C. Area of total impervious surface area is 30 acres.
- Basin D captures storm water runoff from the North Airpark and all airfield facilities east of Taxiway R and drains to Knik Arm via the Postmark Drive outfall via Outfall – 004D. Aircraft deicing and airside snow management activities occur in this basin. Area of total impervious surface area is 475 acres.
- Basin E captures storm water runoff from all airfield facilities west of Taxiway R including Runway 15-33, the West Airpark, and the western portion of the South Airpark and drains to an unnamed creek via Outfall – 005E. Aircraft deicing and airside snow management activities occur in this basin. Area of total impervious surface area is 367 acres.

3.0 COMPLIANCE HISTORY

3.1 Permitting History

The Airport Authority began operating under the Environmental Protection Agency (EPA) Multi Sector General Permit (MSGP) industrial storm water general permit in December 1992. A Storm Water Pollution Prevention Plan (SWPPP) for ANC was prepared, as required by the permit, and certified in April 1993. In January 1999, the Airport Authority began operating under the newly implemented MSGP Sector S (Air Transportation Sector). The Airport Authority operated under the 2000 MSGP using permit tracking number AKR05A516. Under the 2008 MSGP, the Airport Authority was assigned permit tracking number AKR05CC00. In October 2009, storm water APDES permitting authority including MSGP permit authority shifted from EPA to the Alaska Department of Environmental Conservation (DEC or the Department). Under the 2015 MSGP reissued by DEC, the Airport Authority was assigned permit tracking number AKR06AC69. Besides the Airport Authority, there are nineteen co-permittees (airline, air cargo and ground support companies) that have filed under the MSGP and five companies filed for no exposure certification for a total of twenty-four entities. This permitting effort will replace the MSGP for these twenty-four entities upon the filing of a complete NOI and submitting a revised SWPPP.

3.2 Compliance History

Since this specific permitting action is occurring for the first time (i.e., not a permit reissuance), the compliance history discussed herein is in relation to the discharges historically and currently authorized under the MSGP. The MSGP stipulates pollutant benchmark concentrations applicable to the Air Transportation Sector (Sector S). Benchmark monitoring data is primarily for the permittees use to determine the overall effectiveness of the permittees control measures and to assist the permittee in knowing when additional corrective action(s) may be necessary to comply with permit requirements including benchmarks. Under the MSGP, the benchmark concentrations are not effluent limitations; and a benchmark exceedance, therefore, is not a permit violation. However, if corrective action is required as a result of a benchmark exceedance, failure to conduct required corrective action is a permit violation.

Under the authority provided by the Clean Water Act (CWA) Section 308 and 18 AAC 83.425(d), DEC requested that the Airport Authority collect certain supplemental data pertaining to the storm water runoff from the airport. The CWA Section 308 monitoring was conducted from March 2014 through October 2015 and was reviewed to determine the airport's compliance with MSGP benchmark requirements and the applicable ELG. Table 1 presents benchmark and ELG exceedances.

Table 1: Benchmark Exceedances for the Winter Deicing period for March 2014 through October 2015 (Percentage)(Number of exceedances/total number of samples)

Parameter (Benchmark)	Outfall				
	001A	002B	003C	004D	005E
Biological Oxygen Demand $_{5\ day}$ (BOD_5) (30 mg/l)	30 (3/10)	30 (3/10)	40 (4/10)	80 (8/10)	40 (4/10)
Chemical Oxygen Demand (COD) (120 mg/l)	30 (3/10)	50 (5/10)	40 (4/10)	80 (8/10)	30 (3/10)
Ammonia (2.14 mg/l)	50 (5/10)	30(3/10)	50 (5/10)	40 (4/10)	60 (6/10)
Ammonia (14.7 mg/l, ELG)	20 (2/10)	0 (0/10)	0 (0/10)	0 (0/10)	20 (2/10)
pH (6.5-8.5 S.U.)	10 (1/10)	20 (2/10)	0 (0/10)	10 (1/10)	0 (0/10)
Notes: Winter Deicing Period: October 1 – May 31					

For example: the discharge from Outfall 001A exceeded the MSGP benchmarks 30% of the time for BOD_5 and COD, 50% of the time for ammonia and 10% of the time for pH (Table 1). Outfall 004D had the most number of exceedances of the MSGP benchmarks, 80% of the time for BOD_5 and COD, 40% of the time for ammonia while only 10% of the time for pH (Table 1). Discharge from Outfall 003C had no exceedances of pH during the winter deicing period.

For the discharge of BOD_5 from Outfall 001A the maximum value is two orders of magnitude higher than the minimum value (Table 2). The average is one order of magnitude higher than the benchmark. This trend holds true for the discharge from Outfalls 002B, 003C and 004D as well.

Table 2: Outfall Benchmark Parameter - Maximum, Minimum, and Average for the Winter Deicing period between 10/28/2009 to 3/24/2016 (Magnitude)

Parameter (MSGP Benchmark)		Outfall				
		001A	002B	003C	004D	005E
BOD_5 mg/l (30)	Max	1000	3300	2100	5330	1400
	Average	317	443	370	2160	231
	Min	10.2	3.7	7.8	49.4	3.3
COD mg/l (120)	Max	6100	2500	1900	27400	1700
	Average	1080	475	349	7130	412
	Min	34	13	15	140	30.9
Ammonia mg/l (2.14)	Max	194	33	44	571	210
	Average	66	14	18	134	73
	Min	1.9	0.6	3.1	2.9	0.05
pH s.u. (6.5 to 8.5)	Max	9.7	8.4	7.9	9.2	9.4
	Average	7.1	7.0	7.1	7.4	7.4
	Min	5.9	6.0	6.7	6.6	6.3

Notes:

a. Winter Deicing Period: October 15 – April 30

DEC conducted inspections of the discharge from Outfall 004D in April 2009 and May 2012, and received a citizen's complaint in April 2017 about discharges from Outfall 004D. The inspections were citizen compliant driven based on odor and foam discharging from Outfall 004D. In 2009 an inspection was conducted on April 8 and April 17. The inspection report noted: "(O)n both inspection occasions a large amount of white, frothy foam was being discharged from the airport into Knik Arm. It is reasonable to assume that glycol build-up from aircraft deicing operations caused much of the foam, especially as it was being released from melting snow banks." In 2012, the inspection report noted: "(W)hen Outfall (004)D was inspected, a white foaming effluent was seen snaking quite a distance across the mudflats towards Knik Arm. At the end of the pipe, on the sides of the flow, piled foams and residues were stacked even higher amongst the rocks. The smell was sickly pungent and slightly sweet, but also intermittently wafting, solvent-like, and very strong at times." In 2017, DEC issued a Notice of Violation that noted: "(O)n April 18, 2017, DEC received a citizen complaint regarding the discharge of foamy water into Cook Inlet (Knik Arm), Anchorage, AK. Upon investigation, DEC determined that the discharge of foam is the result of deicing products that is mixed with snow due to airport deicing activities that occur in the winter. The snowmelt/deicing mixture is discharging from the storm water system (Outfall (004)D) originating from the Ted Stevens Anchorage International Airport. As of April 28, 2017, the discharge of foam into Cook Inlet (Knik Arm) is ongoing."

During the spring of 2017, DEC received several citizen complaints about the water quality in Lake Hood, specifically about odor, increased turbidity and staining of plane floats. Please see Fact Sheet Section 5.4 for receiving water monitoring requirements.

4.0 PERMIT CONDITIONS

4.1 Coverage under the Permit (Permit Part 1.0)

4.1.1 Permit Area and Facilities Covered

The permit area covers the area within the boundaries of Ted Stevens Anchorage International Airport, an area of approximately 4,612 acres, contributing to discharges to the airport's separate storm sewer

system. The permittees consists of the Airport Authority and co-permittees (airport tenants) subject to meeting the following two permitting criteria:

1. The owner or operator is in the air transportation business with a Standard Industrial Classification code of 4512, 4513, 4522, or 4581; and,
2. The tenant is involved in maintenance, fueling, cleaning, or de-icing.

The permit includes a list of existing airport tenants that have coverage under the MSGP 2015 and are expected to file for permit coverage under the permit (Appendix D). Co-permittees have individual responsibilities and joint responsibilities at ANC. Air cargo airlines that transient at the airport do not have to obtain permit coverage. Transient military aircraft, mechanical or medical diverts do not need to obtain permit coverage. The fixed base operators that service these planes and deice them do have to get permit coverage.

4.1.2 Allowable Storm Water Discharges

Permit Part 1.2.2 lists the type of storm water discharges eligible for coverage under the permit. The Airport Authority and co-permittees shall use this section to determine which storm water discharges from their site can be covered under the Ted Stevens Anchorage International Airport General Permit (ANC-GP).

4.1.3 Allowable Non-Storm Water Discharges

Permit Part 1.2.3 lists the non-storm water discharges authorized under the permit. The section specifies which non-storm water discharges are covered under the permit as exceptions to the general exclusion of non-storm water discharge from eligibility. In addition, to be authorized under the permit, any sources of non-storm water allowed by Permit Part 1.2.3 (except flows from firefighting activities) must be identified in the SWPPP. The Airport Authority may be stricter than the permit requirements.

4.1.4 Limitations on Coverage

4.1.4.1 Discharges Mixed with Non-Storm Water

The ANC-GP does not authorize the discharge of storm water that is mixed with non-storm water other than those non-storm water discharges listed in Permit Part 1.2.3. The prohibition on mixed storm water and non-storm water discharges further ensures that non-storm water discharges (except for those classes of non-storm water discharges that are specifically authorized by the permit) are not authorized by the permit. Where a storm water discharge is mixed with non-storm water that is not authorized by the ANC-GP or another APDES permit, the Airport Authority or co-permittee must submit the appropriate application forms to obtain authorization to discharge the non-storm water portion of the discharge in accordance with the CWA and implementing APDES regulations.

4.1.4.2 Storm Water Discharges Associated with Construction Activity

The permit does not apply to storm water discharges associated with construction activity, defined in 40 CFR 122.26(b)(14)(x) and (b)(15). The exception to this provision is that discharges from land disturbances less than one (1) acre in size are covered by the permit consistent with Permit Part 1.2.2 for discharges not otherwise required to obtain permit coverage but that are commingled with discharges that are authorized under the permit. The exclusion of coverage for construction storm water discharges recognizes the distinction that has been made between construction and other types of storm water discharges associated with industrial activity.

4.1.4.3 Eligibility for New Dischargers Based on Water Quality Standards

Permit Part 1.2.4.6 describes permit eligibility with regard to new discharges (as defined in Permit Appendix C). If the facility is a "new discharger", it is not eligible for coverage under the ANC-GP for any discharges that DEC determines will not meet any applicable Water Quality Standards (WQS). Where such a determination is made prior to authorization, DEC may notify the permittee that an individual permit application is necessary. However, DEC may authorize coverage under the permit after the permittee has included appropriate controls and implementation procedures designed to ensure the discharge meets WQS.

Permit Part 1.2.4.6 is a new requirement that provides greater guidance for new dischargers in complying with 40 CFR 122.4(i). Permit Part 1.2.4.6 clarifies that, in the absence of information demonstrating otherwise, DEC expects that compliance with the permit will not adversely impact applicable water quality. DEC notes that while Permit Part 1.2.4.6 is designed to specifically implement 40 CFR 122.4(i), other water quality-based requirements apply to new and existing dischargers. Permit Part 3.2 includes water quality-based effluent limitations applicable to all sources, which are designed to ensure that discharges from both new and existing permittees are controlled as necessary to meet WQS. In addition, Permit Part 1.2.4.7 includes specific eligibility requirements that are designed to comply with 40 CFR 122.4(i) for new dischargers who are discharging to impaired waterbodies.

4.1.4.4 New Dischargers to Water Quality Impaired Waters

Permit Part 1.2.4.7 requires any new discharger to demonstrate its ability to comply with 40 CFR 122.4(i) (prohibiting the issuance of permits to new dischargers that will cause or contribute to the violation of WQS) prior to coverage under the permit. To satisfy the requirements of 40 CFR 122.4(i), an operator must (a) eliminate all exposure to storm water of the pollutant(s) for which the water body is impaired, and document no exposure and retain such documentation with the SWPPP; or (b) demonstrate that the pollutant for which the water body is impaired is not present at the site, and retain documentation of this finding with the SWPPP; or (c) submit data to the appropriate DEC office documenting that the pollutant discharge will not cause or contribute to an excursion of WQS because the discharge will meet WQS at the point of discharge or because there are sufficient remaining waste load allocations and available in an approved Total Maximum Daily Load (TMDL) and the discharge is controlled at least as stringently as similar discharges subject to that TMDL. Permit Part 1.2.4.6, which applies to new dischargers and not to existing dischargers, is designed to comply with 40 CFR 122.4(i) requirements that address new discharges to water bodies not meeting in-stream WQS.

4.1.5 Conditional Exclusion for No Exposure

Permit Part 1.3 states that after submittal of a No Exposure Certification, a permittee is no longer authorized by, nor required to comply with, the ANC-GP (including the Notice of Termination requirements). To be excluded from the permit, the operator must submit a No Exposure Certification once every five years. This provision allows permittees who become eligible for a no exposure exclusion from permitting under 40 CFR 122.26(g) to file a No Exposure Certification to DEC.

For background, under the conditional no exposure exclusion, operators of industrial facilities have the opportunity to certify to a condition of "no exposure" if their industrial materials and operations are not exposed to storm water. As long as the condition of "no exposure" exists at a certified facility, the operator is excluded from APDES industrial storm water permit requirements provided that the operator notifies the permitting authority at least once every five years consistent with 40 CFR 122.26(g) requirements.

To qualify for this exclusion, (1) the operator must provide a storm resistant shelter to protect industrial materials and activities from exposure to rain, snow, snow melt, and runoff; (2) certify that there are no discharges of storm water contaminated by exposure to industrial materials and activities from the entire facility.

Industrial materials and activities not requiring storm resistant shelter is not required for (1) drums, barrels, tanks, and similar containers that are tightly sealed, provided those containers are not deteriorated and do not leak ("sealed" means banded or otherwise secured and without operational taps or valves); (2) adequately maintained vehicles used in material handling, and (3) final products, other than products that would be mobilized in storm water discharge (e.g., rock salt).

Note, this conditional exclusion is available on a facility-wide basis only, not for individual outfalls. If circumstances change and industrial materials or activities become exposed to rain, snow, snow melt, and/or runoff, the conditions for this exclusion no longer apply. In such cases, the discharge becomes subject to enforcement for un-permitted discharge. Any conditionally exempt discharger who anticipates changes in circumstances should apply for and obtain permit authorization prior to the change of circumstances.

4.2 Authorization under this Permit (Permit Part 2.0)

4.2.1 How to Obtain Authorization

Permit Part 2.1 specifies that to be covered under the ANC-GP as a co-permittee, the operator must meet the requirements in Part 2.1 and submit a complete and accurate Notice of Intent (NOI) and a revised Storm Water Pollution Prevention Plan (SWPPP) to DEC prior to obtaining coverage (see 18 AAC 83.210). Submission of a complete and accurate NOI eliminates the need to apply for an individual permit for a regulated discharge unless DEC specifically notifies the applicant that an individual permit application must be submitted. DEC does not have a computer-based eNOI process for the ANC-GP, so each NOI filed to DEC must be by paper copy. DEC also clarifies that authorization is not valid if the NOI upon which authorization is based is incomplete or inaccurate, or if the discharge is not eligible for permit coverage. DEC has included these provisions in the ANC-GP to establish the fundamental principle that discharges of storm water are not authorized until permit coverage is obtained, and that permit coverage is obtained for the ANC-GP through the submission of a complete and accurate NOI, a revised SWPPP, and written reply is sent by DEC with a permit authorization number.

4.2.2 Submission Deadlines

Timeframes for discharge authorization are contained in Permit Part 2.2, which identifies the category of discharger, NOI submission deadline, and discharge authorization date. Existing dischargers (those facilities that have been paying their annual fee based on invoices from DEC) will continue to pay the annual fee based on invoices from DEC, and will not need to pay an additional permit fee when they submit their NOI.

4.2.3 Date of Authorization to Begin Discharge

The Airport Authority and co-permittees are authorized to discharge storm water from industrial activities under the terms and conditions of the permit upon DEC's acknowledgment of receipt that a complete NOI and issuance of a permit authorization number via an authorization letter, unless DEC notifies the applicant that authorization has been delayed. The permit will remain in effect until midnight

on the day the permit expires. Permit authorizations are posted on DEC's website: dec.alaska.gov/Applications/Water/WaterPermitSearch/Search.aspx.

Actions to be taken on approving the authorization depends on the nature of the eligibility concerns (e.g., water quality or impaired receiving waters). Additional actions may include a requirement to revise the SWPPP. For sake of expediency in obtaining coverage, any requests should be complied with as soon as possible. When an applicant is notified that additional actions must be taken, a discharge is not authorized until notified via a written authorization by DEC.

4.2.4 Continuation of Expired General Permit

If the permit is not reissued prior to the expiration date, it will be administratively continued in accordance with 18 AAC 83.155 and remain in force and effect for discharges that were covered prior to expiration. The Airport Authority and co-permittees are required to abide by all limitations, monitoring, and reporting included in the permit when the permit enters administrative continuation until such time a permit is reissued authorizing the discharge or a Notice of Termination (NOT) is submitted by the co-permittee and approved by DEC. If a co-permittee is authorized to discharge under the permit prior to the expiration date, any discharges authorized under the permit will automatically remain covered by the permit until the earliest of set of conditions specified in Permit Part 2.4 are met.

A co-permittee with a discharge authorized under the 2015 MSGP that the Department determines shall transition to the ANC-GP for that discharge that filed a timely and complete NOI and was granted administrative continuation of the 2015 MSGP. The administrative continuation from the 2015 MSGP survives the effective date of the ANC-GP until the facility receives coverage under the ANC-GP permit contingent on the applicant submitting a timely and complete application for coverage under the ANC-GP.

4.2.5 Permit Compliance

Permit Part 2.5 explains that any failure to comply with the conditions of the permit constitutes a violation of the CWA. Where requirements and schedules for taking corrective actions are included, the time intervals are not grace periods, but are schedules considered reasonable for making repairs and improvements. For provisions specifying a time period to remedy noncompliance, the initial failure, such as a violation of a numeric or non-numeric permit requirement, constitutes a violation of the ANC-GP and the CWA, and subsequent failure to remedy such deficiencies within the specified time periods constitutes an independent, additional violation of the permit and CWA. However, where corrective action is prompted by an event, which does not itself constitute permit noncompliance, there is no permit violation provided the permittee takes the required corrective action within the deadlines in Permit Part 9.4. Permit Part 2.5 is intended to instruct the co-permittee of the ramifications for failure to comply with the conditions of the permit.

4.2.6 Submittal of Modification to Original NOI

The Airport Authority and co-permittees must file an NOI modification form with DEC to update or correct information on the original NOI (e.g., such as name of receiving water body, acreage of industrial area exposed to storm water, addition or deletion of industrial sectors, and facility contact information). Forms are available on DEC's website dec.alaska.gov/water/wastewater/stormwater.aspx. Currently no general permit authorization fee is required when submitting an NOI modification.

At facilities where there is a transfer of ownership and/or a new operator takes over operational control at an existing facility, the new operator shall submit an NOI no later than 30 calendar days after a

change in owner/operator. The previous owner/operator must submit a NOT no later than 30 calendar days after DEC's authorization of the new co-permittee.

4.3 Control Measures (Permit Part 4.0)

4.3.1 Control Measure Selection and Design Considerations

Permit Part 4.1 requires the operator to select, design, install, implement, and maintain control measures to meet the non-numeric technology-based effluent limits listed in Permit Part 4.2. The selection, design and implementation of these control measures must be in accordance with good engineering practices and manufacturer's specifications. If the Airport Authority or co-permittees find their control measures are not reducing pollutant discharges adequately, the control measures must be modified as expeditiously as practicable.

4.3.2 Non-Numeric Technology-Based Effluent Limits

The permit requires the Airport Authority and co-permittees to comply with non-numeric technology-based effluent limits (found in Permit Part 4.2) by implementing control measures. The achievement of these non-numeric limits will result in the reduction or elimination of pollutants from the co-permittees storm water discharge. Such limits constitute the permit's technology-based limits, expressed narratively per 40 CFR 122.44(k), and are developed using best professional judgment.

DEC notes that the permit uses the term "control measures" more often than "best management practices" and "BMPs". This change was adopted to better describe the range of pollutant reduction practices that may be employed, whether they are structural, non-structural or procedural. In addition, the definition of "control measures" in Appendix C of the permit includes both BMPs and "other methods" used to prevent or reduce the discharge of pollutants to receiving waters. The greater breadth of meaning for control measures vis-à-vis BMPs is why DEC uses this term in Permit Part 4.2, and throughout the permit.

The permit requires the Airport Authority and co-permittee to achieve all of the non-numeric effluent limits delineated in Permit Part 4.2. A summary of the permit's non-numeric TBELs is provided in Appendix B.

4.3.3 Urea Prohibition

The Airport Authority and co-permittees shall certify annually they do not use airfield, taxiway or apron deicing products that contain urea, in accordance with 40 CFR Part 449.10. This certification shall be included with the annual report (See Permit Part 10.2). Urea may be used in the case of emergency that poses a threat to safety of humans or aircraft. The dates of such emergency uses, the reason for the use, and the amounts of urea used shall be reported in the Annual Report.

4.3.4 Snow Storage Site Retrofit

The Airport Authority and/or co-permittee must retrofit the snow storage site located to the east and adjacent to the FedEx facility. For acceptable design criteria see DEC Snow Disposal Site Guidance (dec.alaska.gov/water/wastewater/stormwater/resources/) or criteria developed by the Transportation Association of Canada (www.tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/roadsalt-8.pdf) regarding siting, design, and operation and/or by using infiltration, evapotranspiration or reuse techniques. The retrofit must comply with applicable FAA flight safety and airport regulations. The plans for construction must be submitted for plan review to DEC (Address given in Appendix A Part 1.1.1) using the Storm Water Engineering Plan Review Checklist no later than one year after the effective date of the

permit. The Snow Storage Site shall be constructed and operational no later than two years after the effective date of the permit.

4.3.5 Plan Approval for Permanent Storm Water Management Controls (Permit Part 4.3)

For all permittees who construct or install any part of a nondomestic wastewater treatment works shall submit a copy of the engineering plans to DEC for review at the address in Permit Part 10.6, and pay an engineering plan review fee (see 18 AAC 72.600 and 18 AAC 72.955). Engineering plan approval must be obtained from DEC prior to construction. Nondomestic wastewater includes storm water runoff. All permanent storm water treatment devices shall receive engineering plan approval per 18 AAC 72.600. (For the purposes of Permit Part 4.5 "permanent storm water treatment device" means a treatment device with a design life longer than two years.)

4.4 Storm Water Pollution Prevention Plan (Permit Part 5.0)

4.4.1.1 Purpose.

The purpose of the SWPPP is to plan, develop, describe and document procedures the Airport Authority and co-permittees must implement to prevent or minimize the generation and the potential for release of pollutants from the facility to the lands of the State and waters of the U.S. through normal and ancillary activities

4.4.1.2 Elements of Storm Water Pollution Prevention Plan.

The SWPPP contains six elements: storm water pollution prevention team; site description; summary of potential pollutant sources; description of control measures; schedules and procedures; and signature requirements.

4.4.1.3 Development and Implementation Schedule.

The Airport Authority and co-permittees must develop and implement their individual SWPPP within 120 days of the effective date of the permit.

4.4.1.4 Objectives.

There are three objectives in developing the SWPPP: managing each waste stream in the most appropriate manner; ensure proper operation and maintenance of water management and wastewater treatment systems; and, examine each facility component for its waste minimization opportunities

4.4.1.5 Contents of SWPPP

4.4.1.5.1 Permittee**.** Identify the Airport Authority or co-permittee for the facility.

4.4.1.5.2 Pollution Prevention Team.

Developing a SWPPP requires that a qualified individual or team of individuals be identified as responsible for developing and revising the facility's SWPPP. Additionally, this team is responsible for implementing and maintaining the control measures to meet effluent limits, and taking corrective action where necessary. Team members should be chosen for their expertise in the relevant departments at the facility to ensure that all aspects of facility operations are considered in developing the plan. The SWPPP must clearly describe the responsibilities of each team member to ensure that each aspect of the plan is addressed. DEC expects the Airport Authority and most co-permittees will have more than one individual on the team, except for small facilities with relatively simple plans and/or staff limitations.

The permit requires that team members have ready access to all applicable portions of the SWPPP and the permit.

Identification of a storm water pollution prevention team ensures that appropriate persons (or positions) are identified as necessary for developing and implementing the SWPPP. Inclusion of the team in the SWPPP provides notice to facility staff and management (i.e., those responsible for signing and certifying the plan) of the responsibilities of certain key staff for following through on compliance with the permit's conditions and limits.

4.4.1.5.3 Site Description.

The SWPPP must describe activities, materials, and physical features of the facility that may contribute significant amounts of pollutants to storm water runoff or, during periods of dry weather, result in pollutant discharges through the municipal separate storm sewers or storm water drainage systems that drain the facility. The SWPPP must also contain both a general location map of the site that shows the location of the facility, or activities such as aircraft deicing, in relationship to receiving waters and other geographical features, and a more detailed site map that contains information on facility/site characteristics that affect storm water runoff quality and quantity. For areas of the facility or activities that generate storm water discharges with a reasonable potential to contain significant amounts of pollutants (such as aircraft deicing fluid), the map must indicate the probable direction of storm water flow and the pollutants likely to be in the discharge. Flows with a significant potential to cause soil erosion also must be identified. The site map must also include locations of: existing structural control measures; receiving waters; storm water conveyances, inlets and outfalls; potential pollutant sources; past significant spills or leaks; storm water monitoring points; municipal separate storm sewer systems; and locations and sources of run-on to the Airport Authority's or co-permittee's site (see permit for complete list of required items). To improve readability of the map, some detailed information may be kept as an attachment to the site map and pictures may be included as deemed appropriate. A detailed site description assists the Airport Authority and co-permittees in subsequent efforts to identify and set priorities for the selection, design, and implementation of measures taken to meet effluent limits and in identifying necessary changes in materials, materials management practices, or site features.

4.4.1.5.4 Summary of Potential Pollutant Sources.

This permit requires the Airport Authority and co-permittees to identify potential sources of pollutants in storm water resulting from exposure of industrial activities to storm water. In addition, the Airport Authority and co-permittees must document in their SWPPP any authorized non-storm water discharges that are released. The permit and the NPDES regulations at 40 CFR 122.26(b)(14) define "storm water discharges associated with industrial activities" to include, but not be limited to: storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters; sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. The term "storm water discharges associated with industrial activity" excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as

long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas.

Manufacturers of aircraft deicing fluid (ADF) are generally willing to identify the freezing point depressants comprising the bulk of their airport deicing product formulations (e.g. propylene glycol or ethylene glycol), but the identity of product additives and their concentration in product formulas is generally considered to be proprietary. Research by parties outside the airport deicing product manufacturing community indicates that some airport deicing product additives have toxic or other properties potentially harmful to aquatic ecosystems. EPA's determination of the composition of ADF's and pavement deicers is incomplete, however, for several reasons. EPA relied on available data sources to identify components. These sources are limited because many airport deicing product ingredients are proprietary, and manufacturers do not, therefore, identify them in product labels, MSDSs, or other publicly available documents. Because a significant level of effort is required for an outside party to determine a deicing product's composition, the peer-reviewed literature on this subject is limited, particularly for chemicals present in formulation in low concentration as are most airport deicing product additives. (USEPA 2012). It is for this reason the Whole Effluent Toxicity testing is required (see Fact Sheet Part 5.3).

Additionally, the term "material handling activities" is defined in the permit to include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product or waste product.

Permit Part 5.5.4 is only applicable to those parts of the site for which the Airport Authority or co-permittee is covered under the permit. For example, a site that discharges storm water to an area of the site covered by a different APDES permit, is not required to identify the specific activities occurring in that area. DEC does expect the Airport Authority and co-permittees to clearly identify those areas of the site and describe why they do not require coverage under the permit.

When identifying potential pollutant sources at the site, the Airport Authority and co-permittees must consider industrial storm water from the following sources: activities in the area; pollutants; spills and leaks; non-storm water discharges; salt storage; and sampling data.

4.4.1.5.5 Description of Control Measures.

The Airport Authority and co-permittees must describe in their individual SWPPP the control measures it has implemented at its site to achieve each of the effluent limits in Permit Parts 4.1, 4.2, and 4.3, and to address any storm water run-on that commingles with discharges covered under the permit. The description of the control measures implemented to meet the effluent limits must include a brief explanation of the measures implemented at the site, including how the Permit Part 4.1 selection and design considerations were followed. The description in the SWPPP must describe how the Airport Authority and co-permittee specifically plans to meet the applicable technology-based or water quality-based effluent limits.

4.4.1.5.6 Schedules and Procedures**.**

The permit identifies specific information that must be documented in the SWPPP. DEC emphasizes that ALL control measures implemented to meet the Permit Part 4 limits must be documented in the SWPPP. In addition to the description to the on-the-ground control measures implemented to meet the effluent limits, the permit requires certain schedules and procedures to be documented in the SWPPP.

The permit requires the Airport Authority and co-permittees to document in their individual SWPPP monitoring and inspection procedures that will be followed. For monitoring activities, the Airport Authority and co-permittee must document in their individual SWPPP information such as locations where samples are to be collected, person(s) or position(s) responsible for collecting those samples, the frequency of sampling and the parameters to be sampled, applicable control values at each sample location, and procedures that will be followed to gather storm event data.

Runoff coefficients can be found in Table 3-2 of the Alaska Storm Water Guide located on DEC's Storm Water Website http://dec.alaska.gov/water/wastewater/stormwater/guidance/.

For inspection activities, the Airport Authority and co-permittees must document procedures for performing the three types of inspections specified in the permit, namely, routine facility inspections (Permit Part 7.1), quarterly visual assessments (Permit Part 7.2) (co-permittees do not have to do visual assessments), and Comprehensive Site Inspections (Permit Part 7.3). For each of these types of inspections, the SWPPP must include information such as person(s) or position(s) performing inspections, the inspection schedule, and specific items to be covered by the inspection.

DEC is requiring these documentation provisions to help ensure that appropriate monitoring and inspection procedures consistent with permit requirements are implemented. DEC believes documenting these activities will help to improve facility compliance with the requirements.

4.4.1.5.7 Signature Requirements**.**

The Airport Authority and co-permittees must sign and date the SWPPP in accordance with Permit Appendix A Part 1.12, including the date of the signature.

4.4.1.6 Inspections.

The permit requires that the SWPPP document the procedures for performing facility inspections and include copies of the inspection reports.

4.4.1.7 Monitoring.

The permit requires that the SWPPP document the procedures for performing facility monitoring and include copies of the monitoring reports.

4.4.1.8 Documentation of Permit Eligibility Related to a TMDL.

The permit requires that the SWPPP include documentation supporting determination of permit eligibility with regards to waters that have an approved TMDL. See Permit Part 3.2 for additional information to determine eligibility related to a TMDL.

4.4.1.9 Maintaining an Updated SWPPP.

The permit requires that the SWPPP be updated whenever any of the conditions for corrective action in Permit Part 9.1 occur, or when a review following the conditions in Permit Part 9.2 indicates that changes to the permittee's control measures are necessary to meet the effluent limits in this permit. The permit requires that the SWPPP be signed and dated by an authorized representative each time it is modified. Changes to the SWPPP must be made in accordance with Permit Part 5.9.

It is important to note that failure to update the SWPPP in accordance with Permit Part 5.9 is a recordkeeping violation, not a violation of an effluent limit. For example, if the permittee changes its maintenance procedures, but fails to update its SWPPP to reflect these changes, a recordkeeping violation will result. The permittee must revise its SWPPP to reflect the new maintenance procedures

and include documentation of the corrective action (in accordance with Part 9) to return to full compliance.

4.4.1.10 SWPPP Availability.

The permit requires that a copy of the SWPPP be kept at the facility and be immediately available to representatives of DEC or EPA at the time of an on-site inspection or upon request. Permit Part 5.10 indicates that DEC may provide access to portions of the SWPPP to a member of the public upon request. Confidential Business Information (CBI) may be withheld from the public, but may not be withheld from DEC or EPA (Permit Appendix A, Part 1.13). The purpose of Part 5.10 is to require the Airport Authority and co-permittees to retain copies of their SWPPP on site, and to make the document available to DEC or EPA immediately upon request. If a member of the public wishes to have access to the non-CBI portions of the permittee's SWPPP, they must first contact DEC. The mechanism for providing DEC with a copy of the SWPPP is at the discretion of the permittee (e.g., web-based, hard copy), though DEC strongly encourages that SWPPPs be provided electronically.

Copies of the SWPPP, inspections, or supporting documentation must be on-site and available for DEC inspectors to review. The permit does not exclude electronic copies. In fact, electronic storage of documents can be used as long as they are accessible when a DEC inspector conducts an on-site inspection. In other words, the documents must be readily available at the facility (either paper or electronically).

4.4.1.11 Additional Documentation Requirements.

DEC requires documentation of various implementation activities, such as reports of routine facility inspections and descriptions of corrective actions, after facilities are authorized to discharge. This documentation is useful both for facility personnel and DEC inspectors to assess overall performance of the control measures selected to meet the technology-based and water quality-based effluent limits in the permit.

4.5 Adaptive Management Plan (Permit Part 6.0)

The permit includes an adaptive management plan based on the recommendations of the *Ted Stevens Anchorage International Airport 2014 Master Plan Update, Appendix C-Aircraft Deicing Fluid Management Strategie*s and the *Airport Cooperative Research Program Report 14, Deicing Planning Guidelines and Practices for Stormwater Management Systems*. The Adaptive Management Plan is developed using the approach described in ACRP Report 14 and the Deicing Practices Fact Sheets that accompany Report 14.

The purpose of the Adaptive Management Plan is to coordinate aircraft deicing fluid management and source reduction among the Airport Authority and co-permittees to use a structured, iterative process to monitor aircraft deicing operations of the individual co-permittees and provide feedback for making operational and monitoring improvements to co-permittees. The process of using monitoring information to make adjustments or corrections to management actions in order to achieve desired outcomes is a principle of the Adaptive Management Plan. The importance of this approach is underscored by the central premise of science-based adaptive management, which emphasizes that:

- uncertainty exists in all managed systems, and reduction of uncertainty can improve management of water quality;
- management decisions must be made despite uncertainty (of weather);

- monitoring programs are in place to evaluate management decisions and to continually improve the knowledge on which these decisions should be based; and
- learning about the effects of certain decisions will hasten improvement of management decisions in the future, resulting in a more rapid and cost-effective attainment of objectives – in this case improvement in water quality.

The SWPPPs' developed by the co-permittees serve to manage the individual activities. The one Airport-wide Adaptive Management Plan serves to coordinate and integrate the individual permittees activities carried out by the individual SWPPP activities into an organized whole system approach.

In the Permit Part 6.2.1.9 there is a requirement to develop a report on improving recycling of aircraft deicing fluid. In 2000, ANC hired CH2M Hill to examine deicing control strategies at the airport. The results were presented in a draft report, *Deicing Control Strategies Feasibility Assessment* (2000) by CH2MHill. The report says, "recycling (of aircraft deicer) companies in the Lower 48 have indicated that they would not hesitate to begin a recycling program at ANC given the annual volume of deicing fluid applied." One of the impediments to a recycling program was marketing the recycled product. The system developed at the Portland International Jetport (PWM) addresses this issue by remanufacturing Type I aircraft deicing fluid that is sold to airports. The Permit requirement for a report on the feasibility of recycling spent aircraft deicing fluid for reuse as aircraft deicing fluid at the airport is to comply with the mixing zone criteria that the most effective technological and economical methods are used to disperse, treat, remove, and reduce pollutants.

4.6 Inspections (Permit Part 7.0)

4.6.1 Routine Facility Inspections.

The Airport Authority and co-permittees are required to conduct routine inspections, at least quarterly, of all areas of the facility where industrial materials or activities are exposed to storm water, and of all storm water control measures used to comply with the effluent limits required by the ANC-GP. Qualified personnel must conduct the routine facility inspections with at least one member of the Pollution Prevention Team participating. One person can fulfill both roles – being a qualified person and a member of the pollution prevention team. Because some equipment, processes, and procedures may require more frequent inspections, the relevant inspection schedules must be documented in the SWPPP. For example, inspection of outdoor areas associated with regular industrial activity may require more frequent inspections to ensure that the site is swept, garbage picked up, drips and spills cleaned, etc., on a regular basis.

Permit Part 7.1 elaborates on the specific information to be documented for each routine inspection. Most importantly, this documentation must include when the inspection took place, who conducted the inspection, and any indication that controls may not be adequate or are not functioning properly. The findings of these routine inspections must be maintained on-site with the SWPPP. It is clearly stated in Part 7.1.2 that the inspection form be signed and certified in accordance with Permit Appendix A, Part 1.12. The permit allows the signatory identified in Appendix A, Part 1.12 to delegate responsibility to sign inspection reports to either a person or a position, such as pollution prevention team lead or the environmental manager. A copy of the delegation memo or letter must be included in the SWPPP.

At least once each calendar year, the routine facility inspection must be conducted during a period when a storm water discharge is occurring. As the Airport Authority is already required to perform visual monitoring and effluent limitations monitoring during storm events, DEC maintains this coordination does not imposes significant additional burden on permittees. Rather, DEC maintains the permit

requirement is a potentially important tool for the permittee to be able to better identify sources of pollutants discharged in storm water runoff from the facility and to actively observe the effectiveness of control measures.

4.6.2 Quarterly Visual Assessment of Storm Water Discharges

The permit retains the requirement from the MSGP to conduct quarterly visual examinations of storm water discharges. The Airport Authority is required to conduct these examinations. Co-permittees are not required to conduct these examinations. To ensure that all inspection and assessment requirements were described in the same part of the permit, DEC retains the requirement to conduct quarterly visual assessments from the monitoring section of the permit in Permit Part 7.2 addressing inspections.

The permit requires that grab samples of storm water discharges be taken and examined visually for the presence of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. No analytical tests are required to be performed on these samples. The grab samples must be taken within the first 30 minutes or as soon as practicable after the occurrence of an actual discharge from the site (including documentation of why sampling was not practicable within the first 30 minutes). The trigger for visual monitoring is the precipitation event causing an actual discharge to occur. The permit includes conditions specific to the monitoring of snowmelt. Specifically, in areas subject to snow, the ANC-GP requires that at least one of the quarterly samples be collected from snowmelt. For practical purposes, the permit does not require that these snowmelt samples be collected within the first 30 minutes of discharge as is the case for samples collected during rain events.

The storm/snowmelt event must create an actual discharge from the site ("measurable storm event"). This storm event will vary based on numerous factors at the facility, the most obvious being the actual size and duration of the storm event.

The Airport Authority must document the results of their visual assessments in a report that includes the sample location, date and time, personnel collecting the sample and performing visual assessments, results of the observations, and probable sources of any observed storm water contamination. The visual examination reports must be maintained with the SWPPP. The inspection forms under the 2015 MSGP required the name and signature of the inspector. However, it was not clearly specified that the inspection form had to be signed and certified according to Permit Appendix A, Part 1.12 whereas this requirement is clearly stated in ANC-GP Permit Part 7.2.1.6.8.

When conducting a storm water visual examination, the pollution prevention team, or individual team member, should attempt to relate the results of the examination to potential sources of storm water contamination on the site. For example, should an oil sheen be observed, facility personnel (preferably members of the pollution prevention team) should conduct an inspection of the area of the site draining to the examined discharge to look for obvious sources of spilled oil, leaks, etc. If a source can be located, then this information would allow the facility operator to immediately conduct a clean-up of the pollutant source, and/or to revise control measures to minimize the contaminant source.

The permit includes exceptions to these requirements in order to account for circumstances during which conducting quarterly visual assessments may not be feasible, namely during adverse (e.g., dangerous) weather conditions. Where these types of conditions prevent a facility from performing these assessments quarterly, permittees have the ability to modify their assessment schedule such that the four assessments are conducted over the course of the year during periods when discharges, be it from rain or snow, actually occur and can be safely observed.

4.6.3 Comprehensive Site Inspections

The permit requires that the Airport Authority and co-permittees conduct comprehensive site inspections at least once a year for the entire permit term. DEC added clarifying language identifying the inspection periods for the duration of the permit, based on the issuance date of the permit, including language clarifying that should the permit be administratively extended (i.e., DEC fails to reissue the general permit prior to expiration), these inspection requirements continue to apply while the permit is in administrative continuance.

Comprehensive site inspections may be conducted simultaneously with other site inspections (such as with the routine facility inspection described in Permit Part 7.1), provided the scope is sufficient to address the minimum requirements of the comprehensive site inspection. Qualified personnel must conduct inspections, and the inspection team must include at least one member of the Pollution Prevention Team. Qualified personnel are those who possess the knowledge and skills to assess conditions and activities that could impact storm water quality at the facility, and who can also evaluate the effectiveness of controls selected. The Airport Authority and co-permittees may hire outside contractors to perform these inspections; however, signature and certification of inspection reports must be by a duly authorized representative of the facility, as defined in Permit Appendix A, Part 1.12.

Note that the comprehensive site inspections are not the same as routine facility inspections. Routine facility inspections (Permit Part 7.1) are required more frequently and are meant to be less formal evaluations of the facility's exposed industrial activities so that permittees have a mechanism for ensuring that problems are not developing. Comprehensive site inspections, as the term implies, include a much more in-depth review of the site and all operations, as they relate to storm water management and the requirements of this permit.

The comprehensive site inspection must cover all areas of the facility affected by the requirements in the permit including areas where industrial materials or activities are exposed to storm water, storm water control measures used to comply with the effluent limits, deicing source reduction techniques, and areas where any leaks, spills, or other accidental discharge may have occurred in the last three years. DEC developed an Annual Reporting Form, included in Permit Appendix E, which is recommended for use when performing these inspections. The Annual Reporting Form focuses on assessments at each outfall and the areas of the facility that may contribute storm water discharges associated with industrial activity to that outfall. The permit identifies the specific activities that may occur at the facility that are to be inspected. Also, the comprehensive site inspection must include observation of storm water control measures used to meet permit requirements to assess the adequacy of these control measures, including any measures in need of maintenance, repair, or replacement or where additional controls are needed.

The results of each comprehensive site inspection must be documented in a report signed and certified by an authorized official in accordance with Permit Appendix A, Part 1.12. In addition to documenting findings of the assessment and observations described above, the report must also include basic inspection information (e.g., inspectors, date, and APDES permit number), must certify if the facility is in compliance with the permit, and must describe any corrective action initiated or completed during the reporting period or required as a result of the inspection. The comprehensive site inspection is to be submitted to DEC with the annual report.

4.7 Monitoring (Permit Part 8.0)

4.7.1 Quality Assurance Project Plan

The Airport Authority is required to develop procedures to ensure that the monitoring data submitted are accurate and to explain data anomalies if they occur. The Airport Authority is required to develop and implement the Quality Assurance Project Plan (QAPP) within 120 calendar days of the effective date of the final permit. Additionally, the Airport Authority must submit a paper and electronic (pdf) copy of the QAPP to the Department (at the address in Permit Appendix A Part 1.1.2) within 120 calendar days of the effective date of the permit stating that the QAPP has been implemented within the required time frame. 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; and quality assurance/quality control criteria. The plan shall be retained on site and also made available to the Department upon request during inspections.

4.7.2 Monitoring Procedures

The permit requires the Airport Authority to sample and analyze their storm water discharges as a way to assess the effectiveness of control measures in meeting the effluent limitations. Analytical monitoring is a means by which to measure the concentration of a pollutant in a storm water discharge. Analytical results are quantitative and therefore can be used to compare discharge results and to quantify the effectiveness of storm water control measures, including identifying pollutants that are not being successfully controlled. Permit Part 8.2 identifies procedures for collecting samples and identifies where to sample, when to sample, and what to sample. These requirements are in addition to the standard permit conditions described in Permit Appendix A, Part 3.0.

4.7.2.1 Monitored Outfalls

The monitoring requirements in the permit apply to each outfall discharging storm water associated with industrial activity. DEC clarifies in Permit Part 8.2.1 that the allowance for monitoring only one of the substantially identical outfalls is not applicable to any outfalls with numeric effluent limitations. The permittee is required to monitor each outfall with associated numeric effluent limit(s) as identified in Permit Part 3.2.

4.7.2.2 Commingled Discharges

If storm water discharges associated with industrial activity commingle with discharges not authorized by the permit (e.g., unregulated storm water or other permitted wastewater), then the Airport Authority must sample the storm water discharge before it mixes with the other discharges when practicable. The commingled discharge provision is intended to ensure that monitoring results are representative of discharges covered under this permit and not indicative of other discharges from the site. DEC acknowledges that in certain instances, such as when authorized discharges are commingled with other waste streams prior to on-site treatment, sampling only authorized waste streams may be infeasible.

4.7.2.3 Adverse Weather Conditions

When adverse weather conditions make sampling dangerous, monitoring may be postponed until the next monthly sample event. This provision applies to serious weather conditions such as: lightning, flash flooding, and high winds. This provision should not be used as an excuse for not conducting sampling under conditions associated with more typical storm events. In many cases, sampling during a subsequent non-hazardous storm event may still be possible during the reporting period. Where this is

not possible, the Airport Authority and its co-permittees are still required to report the inability to monitor indicating the basis for not sampling during the reporting period. This provision applies to all monitoring requirements of the permit. As with the 2015 MSGP, the permit allows the Airport Authority to postpone sampling under conditions immediately hazardous to the life and health of monitoring staff, and offers examples of adverse conditions. If postponement is required, the Airport Authority is afforded the flexibility to collect samples during the next monthly sample event to ensure the safety of facility personnel.

4.7.2.4 Monitoring Periods

Certain monitoring must be conducted monthly. For such monitoring, DEC is defining the months during which monitoring must occur and also describing when the first monitoring is to commence based on the date of permit coverage.

4.7.2.5 Monitoring for Allowable Non-Storm Water Discharges

This provision clarifies that the Airport Authority is only required to monitor allowable non-storm water discharges when they are commingled with storm water discharges associated with industrial activity.

4.7.3 Additional Required Monitoring

The permit includes two types of required monitoring, one or more of which may apply to the permittees discharge: effluent limitations monitoring (Permit Part 8.3.2), and other monitoring as required by DEC (Permit Part 8.3.4).

4.7.4 Follow-up Actions if Discharge Exceeds Numeric Effluent Limit

The permit includes follow-up monitoring provisions for pollutants that exceed any effluent limit contained in the permit. This requirement is to ensure that existing control measures are modified as necessary to bring a facility back into compliance with the effluent limitations contained in the permit. DEC emphasizes in the permit that failure to complete follow-up monitoring and reporting within the stipulated time frames constitutes an additional violation of the permit, in addition to the initial effluent limit violation.

4.8 Corrective Actions (Permit Part 9.0)

4.8.1 Conditions Requiring Review and Revision to Eliminate Problem

The Airport Authority and co-permittees are required to review and revise the selection, design, installation, and implementation of their control measures in response to any of the following conditions:

- An unauthorized release or discharge occurs at the facility;
- A discharge violates a numeric effluent limit;
- The Airport Authority or co-permittee becomes aware, or DEC determines, that control measures are not stringent enough for the discharge to meet applicable WQS;
- An inspection or evaluation of the facility by a DEC official, or federal entity, determines that modifications are necessary to meet the non-numeric effluent limits in Permit Part 4.2; or
- A routine facility inspection, quarterly visual assessment, or comprehensive site inspection finds that control measures are not being properly operated and maintained.

The corrective action must ensure that any of the above conditions are eliminated and will not be repeated in the future.

4.8.2 Conditions Requiring Review to Determine if Modifications are Necessary

The Airport Authority and co-permittees are required to review the selection, design, installation, and implementation of their control measures to determine if modifications are necessary to meet the Part 4 control measures if any of the following conditions occur:

- Construction or a change in design, operation or maintenance at the Airport Authority or co-permittee's facility significantly changes the nature of pollutants discharged in storm water from the facility, or increases the quantity of pollutants discharged.
- Sampling results exceeds an numeric effluent limit.

4.8.3 Schedule of Compliance

The Airport Authority received DEC-issued Notice of Violations for exceeding the residue water quality criteria in 2009, 2012 and 2017 associated with the discharge from Outfall 004D. To date, the entity has not instituted any new treatment methods or BMPs to address the documented violation. The Airport Authority and co-permittees are responsible for compliance with the residue criteria and may need to provide additional controls to ensure compliance with the criteria.

4.8.4 Corrective Action Deadlines

The permit includes specific deadlines for the Airport Authority or co-permittees to take corrective actions. Permit Part 9.4 requires that within 24 hours following identification or discovery of any of the conditions listed in Permit Parts 9.1 or 9.2, the Airport Authority or co-permittee must document such discovery. Subsequently, within 14 days of the discovery, the Airport Authority or co-permittee must document corrective actions taken or to be taken to eliminate the condition and any additional review necessary to further investigate the condition. If the Airport Authority or co-permittee determines that changes are necessary following the review, any modifications to the control measures must be made before the next storm event if possible, or as soon as practicable following that storm event.

4.8.5 Corrective Action Report

For any event described in Permit Parts 9.1 or 9.2, the Airport Authority or co-permittees must document basic information describing the event and their response to that event. As described above, the permit establishes conditions for both 24-hour and 5-day response periods. The Annual Report Form includes a section for Corrective Actions (Permit Appendix E) for use by the Airport Authority or co-permittee to clarify expectations for documentation of conditions initiating a response and the details of the response taken. For conditions in Permit Part 9.2, where the Airport Authority or co-permittees determines that revision to control measures is not necessary, the Airport Authority or co-permittees must still document the review and the basis for this determination. As described elsewhere in the permit, the Airport Authority or co-permittees are required to maintain a copy of this documentation with their SWPPP as well as submit this information in an annual report.

4.8.6 Effect of Corrective Action

The permit clarifies that if the condition prompting a corrective action review is a permit violation (e.g., exceedance of an effluent limit), correcting it does not remove the original violation. Additionally, failure to take corrective action in accordance with Part 9 is a separate, additional permit violation. DEC will consider the appropriateness and promptness of corrective action in determining enforcement responses to permit violations.

4.9 Reporting and Recordkeeping (Permit Part 10.0)

4.9.1 Reporting Monitoring Data to DEC

All monitoring data collected pursuant to Permit Part 3.0 must be submitted to DEC no later than 15th day of the following month (email date or postmark date) after the permittee has received the complete laboratory results for all monitored outfalls for the reporting period. The Airport Authority is responsible for electronically submitting DMRs and other reports in accordance with 40 CFR §127. See Permit Part 10.7.

4.9.2 Annual Reports

The permit requires the Airport Authority and co-permittees to submit an annual report to DEC containing the results of the required comprehensive site inspection and a discussion of corrective actions required and/or taken at any time since the previous comprehensive site inspection or, for the first comprehensive inspection required under the permit, since permit authorization. These annual reports must be submitted (i.e., postmarked or electronically if required) to the DEC Address (Permit Part 10.6) by September 1 following the reporting year (July 1 to June 30) for each year of permit coverage. In addition to the information required in the corrective action report (Permit Part 9.5) and comprehensive site inspection report (Permit Part 7.3), the Airport Authority and co-permittees are required to include the facility name, the APDES permit tracking numbers, the facility physical address, and the contact person's name, title, and phone number. To simplify this reporting requirement, as well as to help clarify DEC's expectations for these inspections, DEC developed an annual report form, a copy of which is included as Appendix E of the permit. The Airport Authority and co-permittees are strongly encouraged to use this form.

4.9.3 Noncompliance Notification for Numeric Effluent Limits

As described in Permit Part 8.3, the Airport Authority must conduct follow-up monitoring any time a monitoring event identifies an exceedance of a numeric effluent limit. Permit Part 10.3 specifies that this data must be submitted to DEC according to Appendix – A Part 3.0 of the permit. Permit Part 10.3 also identifies the specific information to be included in this report, which is necessary for DEC to assess the potential impact of this discharge on water quality and the adequacy of the Airport Authority or co-permittees response in addressing the exceedance.

4.9.4 Recordkeeping

Permit Part 10.4 describes recordkeeping requirements associated with activities covered under the permit. These include the original SWPPP and any modifications, so as to provide a traceable historical record of the SWPPP and its evolution, additional documentation, all reports and certifications required by the permit, monitoring data, and records of all data used to complete the NOI to be covered by this permit. The Airport Authority and co-permittees must retain copies of these documents for a period of at least three years from the date that the Airport Authority or co-permittee's coverage under this permit expires or is terminated. The recordkeeping requirements in Permit Appendix A, Part 1.11 include a more general statement of the APDES standard condition for records retention. The permit requires the Airport Authority and co-permittees to maintain certain records to help them assess performance of control measures and as a way to document compliance with permit conditions. These requirements are consistent with regulations at 40 CFR 122.41(j), but have been tailored to more closely reflect requirements of the ANC-GP.

4.9.5 Request for Submittal of Records

The Permit Part 10.5 requires the permittee to submit a copy of plans or records to DEC within 30 calendar days of receipt of a written request from DEC

4.9.6 Address for Reports

Notices of Intent, SWPPP, Notices of Termination, NOI Modification, and No Exposure Certificates should be sent to the DEC Permitting Program address specified in Permit Appendix A Part 1.1.1.

Paper copies and electronic copies of any reports required in Permit Parts 6 through 10, must be sent to the DEC Compliance and Enforcement address specified in Permit Appendix A Part 1.1.2

4.9.7 Electronic Reporting (E-Reporting) Rule

The Airport Authority 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 (see Permit Part 9.7). 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 http://dec.alaska.gov/water/Compliance/EReportingRule.htm that contains general information about this new reporting format. Training materials and webinars for NetDMR can be found at https://netdmr.zendesk.com/home.

Phase II of the E-Reporting rule will integrate electronic reporting for all other reports required by the Permit (e.g., Annual Reports and Certifications) and implementation is expected to begin December 2020. Permittees should monitor DEC's E-Reporting Information website (http://dec.alaska.gov/water/Compliance/EReportingRule.htm) 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.

4.9.8 Identification Sign

The Airport Authority shall post a sign or signs on the shoreline adjacent to the discharge point that indicate the name and contact number for the facility, the permit number, the type of discharge (storm water with deicing fluid), and the approximate location and size of any mixing zone. The sign(s) should inform the public that certain activities, such as harvesting of aquatic life for raw consumption, should not take place in the mixing zone.

4.10 Terminating Coverage (Permit Part 11.0)

4.10.1 Submitting a Notice of Termination

To terminate permit coverage, a co-permittee must submit a complete and accurate NOT to the address listed in Part 10.6. A co-permittees authorization to discharge under the permit terminates at midnight of the day the co-permittee is notified by DEC that a complete NOT has been processed. (If a co-permittee submits a NOT without meeting one or more of the conditions identified in Part 10.2, then a co-permitttee's NOT is not valid.) The co-permittee is responsible for meeting the terms of the permit until their authorization is terminated.

4.10.2 When to Submit a Notice of Termination

Once a storm water discharge associated with industrial activity is eliminated from a facility, the co-permittee must submit a NOT, as described in Permit Part 10.1, within 30 days after one or more of the following conditions have been met: (1) a new owner or operator has assumed responsibility for the facility and has obtained coverage under a new authorization; (2) operations have ceased at the facility and there are no longer discharges of storm water associated with industrial activity, and necessary sediment and erosion controls have already been implemented at the facility as required by Permit Part 4.2.5; or (3) permit coverage has been obtained under an individual or alternative general permit for all discharges requiring APDES permit coverage, either because DEC required the co-permittee to obtain such coverage or the co-permittee petitioned DEC requesting coverage under an alternative permit.

5.0 EFFLUENT LIMITS and MONITORING REQUIREMENTS

5.1 Basis for Effluent Limits

Per 18 AAC 83.015, the Department prohibits the discharge of pollutants to waters of the U.S. unless the applicant has first obtained an APDES permit that meets the purposes of AS 46.03 and is in accordance with CWA Section 402. Per these statutory and regulatory provisions, the Permit includes effluent limits that require the discharger to meet standards reflecting levels of technological capability, comply with WQS, and comply with other state requirements that may be more stringent. 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).

5.2 Effluent Limits and Monitoring Requirements

In accordance with AS 46.03.110(d), the Department may specify the terms and conditions for discharging wastewater in a permit. Monitoring in a permit is required to determine compliance with effluent limits or to gather effluent and receiving water data to determine if additional effluent limits are required and/or to monitor effluent impact on the receiving water body quality. The Airport Authority is responsible to conduct the monitoring and report results on DMRs or on the application for reissuance, as appropriate, to the Department.

The CWA requires that the limits for a particular pollutant be the more stringent of either TBEL or WQBELs. TBELs in APDES permits require a minimum level of treatment or control of pollutants for point source discharges based on available technologies, while allowing the discharger to use any available control technique to meet the limits. For industrial facilities, TBELs are derived by: (1) using national effluent limitations guidelines and standards established by EPA, and/or (2) using best professional judgement (BPJ) on a case-by-case basis in the absence of national guidelines and standards.

EPA promulgated the Airport Deicing Effluent Guidelines in 2012 (40 CFR Part 449). The requirements generally apply to wastewater associated with deicing of airfield pavement at commercial airports. The Airport Authority elected to follow the source reduction option in the ELG. This should lead to a reduction of ammonia in the wastewater discharge from the runways. The non-numeric technology-based effluent limits for the Air Transportation Sector in the Multi-Sector General Permit are incorporated in the permit (See Permit Part 4.2).

WQBELs are designed to ensure that the WQS of a water body are met. WQBELs may be more stringent than technology-based effluent limits. In the permit the WQBELs are pH, dissolved oxygen,

and residues. Additional detail providing the basis for the proposed effluent limits in the permit is provided in Appendix B.

The permit authorizes the discharge of industrial storm water and the pollutants of concern were identified by reviewing the monitoring required by the Multi-Sector General Permit and DEC's required Section 308 monitoring from March 2014 through October 2015. The Department's analysis of pollutants of concern identified Dissolved Oxygen, pH, Biological Oxygen Demand 5 day, Chemical Oxygen Demand. DEC's compliance inspections also identified residue criteria violations necessitating residues be contemplated as a pollutant of concern.

5.2.1 Requirements for All Facilities

APDES regulations at 18 AAC 83.435 state that permits must contain conditions to achieve WQS. The permit implements WQBEL for the discharge outfalls 001A – 005E and implements non-numeric technology based limits for facilities and activities on the airport property. The requirements in Permit Part 3.1.1 are intended to ensure that those seeking coverage under the general permit select, install, implement, and maintain control measures at their facility or activity that will be adequate and sufficient to meet WQS.

Based on EPA's *1996 Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits (EPA 833-D-96-001),* DEC determined that control measures when properly selected, installed, implemented, and maintained provide effluent quality that can meet WQS. However, because proper selection, installation, implementation, and maintenance are so critical to the success of control measures, the effectiveness of simply "installing control measures" at industrial sites may not provide adequate water quality protection.

Permit Part 3.1.2 specifies that DEC may determine that the Airport Authority's or co-permittees discharge will cause, have reasonable potential to cause, or contribute to an excursion above WQS, including failure to protect and maintain existing designated uses of receiving water. This sub-part is adapted from the APDES Construction General Permit. Where such a determination is made, DEC may require the Airport Authority or co-permittee to take one of three actions (Permit Part 3.1.2):

- Take corrective actions and modify storm water controls to adequately address the identified water quality concerns;
- Submit to DEC valid and verifiable data and information that are representative of ambient conditions and indicate that the receiving water is attaining WQS; or
- Minimize discharges of storm water from the facility or industrial activity, implement corrective actions.

(Table 3: Outfall 001A, 002B, 003C, 005E: Effluent Limits and Monitoring Requirements Is located on the following page.)

Table 3: Outfall 001A, 002B, 003C, 005E: Effluent Limits and Monitoring Requirements

	Effluent Limits					Monitoring Requirements		
Parameter [a]	**Daily Minimum**	**Monthly Average**	**Weekly Average**	**Daily Maximum**	**Units [a]**	**Sample Location**	**Sample Frequency**	**Sample Type**
Total Discharge Flow	—	Report	—	Report	gpd	Effluent	1/month	Estimated
Biochemical Oxygen Demand (BOD_5)	—	—	—	Report	mg/L	Effluent	1/Month	Grab
Chemical Oxygen Demand (COD)	—	—	—	Report	mg/L	Effluent	1/Month	Grab
Sheen	—	—	—	No Presence	—	Effluent	1/Month	Visual
Total Aqueous Hydrocarbons (TAqH) [b]	—	—	—	Report	µg/L	Effluent	1/Month	Grab
Total Aromatic Hydrocarbons (TAH) [b]	—	—	—	Report	µg/L	Effluent	1/Month	Grab
pH	6.5	—	—	8.5	SU	Effluent	1/Month	Grab
Temperature	—	—	—	Report	° C	Effluent	1/Month	Grab
Dissolved Oxygen	5.0	—	—	17	mg/L	Effluent	1/month	Grab
Residues [c]	Residues may not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use, or cause acute or chronic problem levels as determined by bioassay or other appropriate methods. Residues may not, alone or in combination with other substances, cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.					Effluent	1/Month	Visual
Ethylene Glycol	—	—	—	Report	mg/L	Effluent	1/Month (Nov-May)	Grab
Propylene Glycol	—	—	—	Report	mg/L	Effluent	1/ Month (Nov-May)	Grab

Notes:

a. See Appendix C - Definitions

b. TAH and TAqH shall only be monitored if a visual sheen is detected. Samples to determine concentrations of TAH and TAqH must be collected in marine and fresh waters below the surface and away from any observable sheen; concentrations of TAqH must be determined and summed using a combination of: (A) EPA Method 602 (plus xylenes) or EPA Method 624 to quantify monoaromatic hydrocarbons and to measure TAH; and (B) EPA Method 610 or EPA Method 625 to quantify polynuclear aromatic hydrocarbons listed in EPA Method 610; use of an alternative method requires department approval; the EPA methods referred to in this note may be found in Appendix A of 40 C.F.R. §136, Appendix A, as revised as of July 1, 2003 and adopted by reference..

c. See 18 AAC 70.20(b)(8)(C) (2003)

Table 4: Outfall 004D: Effluent Limits and Monitoring Requirements

	Effluent Limits					Monitoring Requirements		
Parameter [a]	**Daily Minimum**	**Monthly Average**	**Weekly Average**	**Daily Maximum**	**Units [a]**	**Sample Location**	**Sample Frequency**	**Sample Type**
Total Discharge Flow	—	Report	—	Report	gpd	Effluent	1/month	Continuous
Biochemical Oxygen Demand (BOD_5)	—	—	—	Report	mg/L	Effluent	1/Month	Grab
Chemical Oxygen Demand (COD)	—	—	—	Report	mg/L	Effluent	1/Month	Grab
Sheen	—	—	—	No presence	—	Effluent	1/Month	Visual
Total Aqueous Hydrocarbons (TAqH) [b]	—	—	—	Report	µg/L	Effluent	1/Month	Grab
Total Aromatic Hydrocarbons (TAH) [b]	—	—	—	Report	µg/L	Effluent	1/Month	Grab
pH	6.5	—	—	8.5	SU	Effluent	1/Month	Grab
Temperature	—	—	—	Report	° C	Effluent	1/Month	Grab
Dissolved Oxygen	6.0	—	—	17	mg/L	Effluent	1/Month	Grab
Residues [c]	Residues may not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use, or cause acute or chronic problem levels as determined by bioassay or other appropriate methods. Residues may not, alone or in combination with other substances, cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.					Effluent	1/Week (March 1 to May 31 and 1/Month (June 1 to February 28)	Visual
Ethylene Glycol	—	—	—	Report	mg/L	Effluent	1/Month (Nov-May)	Grab
Propylene Glycol	—	—	—	Report	mg/L	Effluent	1/Month (Nov-May)	Grab

Notes:

a. See Appendix C - Definitions

b. TAH and TAqH shall only be monitored if a visual sheen is detected. Samples to determine concentrations of TAH and TAqH must be collected in marine and fresh waters below the surface and away from any observable sheen; concentrations of TAqH must be determined and summed using a combination of: (A) EPA Method 602 (plus xylenes) or EPA Method 624 to quantify monoaromatic hydrocarbons and to measure TAH; and (B) EPA Method 610 or EPA Method 625 to quantify polynuclear aromatic hydrocarbons listed in EPA Method 610; use of an alternative method requires department approval; the EPA methods referred to in this note may be found in Appendix A of 40 C.F.R. §136, Appendix A, as revised as of July 1, 2003 and adopted by reference.

c. See Permit Part 9.3 Schedule of Compliance: see 18 AAC 70.20(b)(20)(C) (2003)

5.3 Whole Effluent Toxicity Monitoring (Permit Part 3.5)

18 AAC 83.435 requires that a permit contain limitations on whole effluent toxicity (WET) when a discharge has reasonable potential to cause or contribute to an exceedance of a WQS. For this first permit cycle the WET Testing is for monitoring only.

WET testing is an important component of the U.S. Environmental Protection Agency's integrated approach for detecting and addressing toxicity in surface waters. WET testing is used to assess and regulate the combined effects of all constituents of a complex effluent rather than the conventional methods of controlling the toxicity of single chemicals or constituents. WET Monitoring is required each year of the permit because of the variable weather conditions from year-to-year will lead to a variable amount of deicing fluid applied each year. A synthesis of five WET testing results, along with chemical and physical analyses (added to Part 3.5.1.2 and Part 3.5.2.2) and other information derived from the Adaptive Management Plan, can provide a more comprehensive and realistic picture of potential effects of discharges into aquatic systems. The ACRP 134 says collection of a single sample is unlikely to be representative of the storm water discharge event. To address this concern DEC modified the sampling to a four hour –composite (collected once an hour over a four hour period to collect the volume of effluent needed for the WET testing and chemical and physical testing).

WET tests are laboratory tests that measure total toxic effect of an effluent on living organisms. WET tests use small vertebrate and invertebrate species and/or plants to measure the aggregate toxicity of an effluent. Chronic toxicity tests measure reductions in survival, growth, and reproduction over a 7-day exposure. Toxicity testing on each organism must include a series of five test dilutions and a control. The dilution series for Outfall 004D for the sample events before construction shall consist of effluent concentrations of 78.4%, 39.2%, 19.6%, 9.8%, 4.9%, and a control. The dilution series for Outfall 002B shall consist of effluent concentrations of 100%, 50%, 25%, 12.5%, 6.25%, and a control. DEC may require subsequent tests to use a modified dilution series that increases the likelihood of observing effect or inhibition endpoints and provide more accurate estimates of chronic toxicity. Similarly, the Airport Authority may request written approval from DEC to modify the dilution series based on previous test results.

The Airport Cooperative Research Program published a 2015 report, *Applying Whole Effluent Toxicity Testing to Aircraft Deicing Runoff, Report 134* that details the pros and cons of using WET Testing on aircraft deicing runoff. Generally airport storm water discharges are not predictable, for the most part, with respect to frequency of occurrence or volume of flow. In Anchorage each year there is a spring break-up runoff event typically in April into May, with the peak snowmelt discharge typically in the second or third week of April. This time period is when the snow with deicing fluid that has been collected during the winter begins to melt and the mixture of water and deicing fluid runs-off and is discharged through the outfalls. To capture the variable nature of the discharge, DEC requires a four-hour composite sample approach to approximate a sample collection approach which must be described in the QAPP. This will provide a cost-effective and time-efficient sample representative of a variable discharge.

The logistics of shipping WET samples to the lower 48 (mainland U.S.) can be challenging as poor weather delays or missed connections during shipping can result in violation of the standard 36-hour hold time. If extenuating circumstances occur, WET samples hold times can exceed 36 hours but must not exceed 72 hours. The Airport Authority must document the conditions that resulted in the need for

the holding time to exceed 36 hours and any potential effect the extended hold time could have on the test results.

5.4 Receiving Water Monitoring (Permit Part 3.6)

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 receiving water data to determine if additional effluent limits are required and/or to monitor effluent impact on the receiving water body quality. Permit Part 3.6 addresses monitoring in Lake Hood and identifies three monitoring stations to be sampled twice during the summer. This is a modification of the current lake monitoring carried out by the Airport Authority. Permit Part 3.6 focuses sampling on Lake Hood and adds the following parameters: BOD, COD, and turbidity.

The Airport Authority previously collected water quality sample from Lake Hood as part of a Waterbody Recovery Plan. This water quality monitoring (Table 4) is to inform future Department permit decisions.

Table 5. Receiving Water Body Monitoring Requirements for Lake Hood

Parameter [a]	Units	Sampling Frequency	Sample Type
BOD_5	mg/L	Two/Year (May-September)[b]	Grab
COD	mg/L	Two/Year (May-September)[b]	Grab
Dissolved Oxygen	mg/L	Two/Year (May-September)[b]	In-Situ
Temperature	°C	Two/Year (May-September)[b]	In-Situ
pH	SU	Two/Year (May-September)[b]	In-Situ
Visual Sheen	—	Two/Year (May-September)[b]	Visual
Turbidity	NTU	Two/Year (May-September)[b]	Grab

Footnotes:

a. The Airport Authority must use a sufficiently sensitive Environmental Protection Agency (EPA) approved teat method that quantifies the level of pollutants to a level lower than applicable limits or water quality standards or use the most sensitive Title 40 Code of Federal Regulations (CFR) Part 136 (Guidelines Establishing Test Procedures for the Analysis of Pollutants), adopted by reference at 18 AAC 83.010(f) test method available.

b. Two per year (May to September) means a sample must be taken twice per year during the months May to September, a minimum of 60 days apart.

6.0 RECEIVING WATER BODY

6.1 Existing Conditions

Annual precipitation in Anchorage averages 15 inches per year with the majority of this precipitation coming during the months of July, August, September and October. Average daily precipitation during the wet months does not usually exceed 0.2 inches over a 24 hour period, and extreme 1-hour events rarely exceed 0.3 inches of precipitation. Precipitation falls primarily as snow between the months of November and March with occasional snowfalls during October and April. Average annual snowfall is 70 inches.

The Airport is bounded on the north by the Knik Arm and on the west by Cook Inlet, which are both receiving waterbodies of storm water runoff from the Airport. Receiving waterbodies found on or adjacent to the Airport property include: an unnamed creek, Knik Arm, Lake Spenard, and Lake Hood.

Waterbodies found on Airport property that do not receive storm water runoff, and are therefore not the focus of this section, include: Turnagain Bog, Little Campbell Lake, South Airpark Pond (known also as Sullivan Pond), Delong Lake, Meadow Lake, and Connors Bog.

Fact Sheet Section 6 focuses on the receiving waterbodies that are directly affected by ADF-laden runoff from aircraft deicing activities and snow management activities, including Knik Arm, an unnamed creek, Lakes Hood, and Spenard.

6.2 Water Quality Standards and Status of Receiving Water

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

Water bodies in Alaska are protected 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 discharges: Lake Spenard, Lake Hood, Knik Arm, and an unnamed creek, have not been reclassified, nor have site-specific water quality criteria been established. Therefore the subject water bodies must be protected for all use classes listed in 18 AAC 70.020(a)(1) for Lake Spenard, Lake Hood, and an unnamed creek, and 18 AAC 70.020(a)(2) for Knik Arm. Any part of a water body 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 water body list. Lakes Hood and Spenard were placed on the Alaska list of impaired waterbodies in 1992 for non-attainment of fecal coliform (FC) bacteria and in 2002 / 2003 for low dissolved oxygen (DO). Water quality concerns in these two lakes over the years have been attributed to high FC, hydrocarbon contamination, and low DO. FC bacteria in the lakes was generally attributed to the concentration of waterfowl found on or around the lakes. As per Alaska Department of Environmental Conservation's (DEC's) 2014/2016 *Final Integrated Report, Waterbody Categories 2 through 5 (Integrated Report)*, the lakes meet the FC bacteria standard. The *Integrated Report* also notes that the data indicated that there were no persistent violations of hydrocarbon contamination. Pollution sources associated with the Airport include runoff from aircraft and pavement deicing operations that mix with snowmelt and drain into the lakes. The drop in DO was attributed to high biochemical oxygen demand (BOD) resulting from decomposition of glycol-based aircraft deicing fluid. Priority actions identified for these waterbody's include the Airport Authority shunting away much of the storm water from the tarmac and installation of retention ponds to treat storm water coming from the parking lots; future construction to improve drainage in the area; tracking of ongoing storm water rerouting projects and water quality sampling being done by the Airport Authority; and conducting monitoring of nutrients and storm water BMP effectiveness.

The Airport Authority submitted and DEC approved a waterbody recovery plan for Lakes Hood and Spenard in 2004. The recovery plan had three components: (1) a reduction in the amount and placement of urea, (2) an increase in glycol recovery, and (3) diversion of storm water contaminated by glycol and nutrients storm water from the waterbody. Review of water quality data from 2000 to 2009 shows that the waters were meeting the FC bacteria standard and Lakes Hood and Spenard are in Category 2 for

meeting the FC bacteria standard. DO concentrations have improved over the same time period (2000 to 2009) and have tracked the predictive modeling in the waterbody recovery plan. Waterbodies are placed in Category 2 if sufficient credible data and information are available to support a determination that some, but not all, designated uses are attained, and if the attainment status for the remaining uses is unknown because there is insufficient or no data or information. Implementation of the waterbody recovery control plan predicted that Lakes Hood and Spenard should recover in 8 to 10 years from its 2002 implementation timeframe. Data collected by the Airport Authority in 2010 and 2011 have shown the lakes met the water quality standard for DO, but had not yet provided sufficient data to move the water to Category 2.

The Water Body Recovery Plan was developed to reverse the negative impacts on the DO in the lakes. One aspect of the near-term control was seasonal diversion of runoff containing ADF and pavement deicer from the lakes. Since implementation of the plan in 2005, the water quality of Lakes Hood and Spenard has steadily improved. As of 2012, the lakes meet or exceed DEC's standard for DO levels. In 2013, the Airport Authority stopped using urea for pavement deicing and switched to potassium acetate.

In the 2012 Integrated Report Lake Hood/Spenard is described as originally Section 303(d) listed in 1992 for non-attainment of the FC bacteria standard and in 2002/2003 for low DO. The waterbody was also placed on the 1992 Section 303(d) list for FC bacteria, lead, nitrates, and phosphates. A Total Maximum Daily Load (TMDL) was developed for FC bacteria in 1997, and the waterbody remained on the Section 303(d) list (Category 5) for dissolved gas (i.e., low DO). A later DEC water quality assessment also assessed the four other pollutants of concern: petroleum, nitrates, lead, and ammonia. However, the data indicated that there are no persistent violations of these parameters. Priority actions identified for this water included ANC shunting away much of the storm water from the tarmac and installation of retention ponds to treat storm water coming from the parking lots; future construction to improve drainage in the area; tracking of ongoing storm water rerouting projects and water quality sampling being done by the Airport Authority; and conducting monitoring of nutrients and storm water BMP effectiveness. The Airport Authority submitted and DEC approved a waterbody recovery plan for Lake Hood/Spenard.

During March 2014 to October 2015, the Airport Authority took monthly water samples from the five outfalls at the Airport. Outfalls 001A, 002B and 003C discharge into Lakes Hood and Spenard. During the spring and early summer of 2014 the discharge from Outfall 001A was less than the DO WQS four times. During the spring and summer of 2014 and 2015, the discharge at Outfall 002B was less than the DO WQS for a total of 14 of 19 sampling events. The outfall results are measured in the piped outfall not the lake itself.

6.3 Mixing Zone Analysis

In accordance with state regulations at 18 AAC 70.240, as amended through June 26, 2003, 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, while an acute mixing zone is sized to prevent lethality to passing organisms. The Airport Authority submitted a mixing zone application and technical analysis with the initial application on December 15, 2016 and submitted supplemental information on July 25, 2017 and September 15, 2017. The submittals provided information to demonstrate consistency with state mixing zone regulations. The Department reviewed the submittals to verify conformance with regulations and consistency with DEC mixing zone procedures. The limits established in Table 3 will be met at the mixing zone boundary.

The Airport Authority modelled the existing outfall that discharges to a channel that at low tide meanders across the tide flats into Knik Arm.

Other data required for the mixing zone modeling included: the input of receiving water characteristics at the outfall such as the water temperature (4 deg. C). 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.

Appendix E, Mixing Zone Analysis Checklist, outlines criteria that must be considered and met for the Department to authorize a mixing zone. These criteria include the size of the mixing zone, treatment technology, designated and existing uses of the waterbody, human consumption, spawning areas, human health, aquatic life, and endangered species. Summaries of the Department evaluation of these criteria follow. All criteria must be met in order to authorize a mixing zone. The following summarizes the Department's analysis.

Size In accordance with 18 AAC 70.255, the mixing zone must be as small as practicable. The Airport Authority used the CORMIX modeling software package to model the chronic and acute mixing zones at various critical tidal velocities. For the existing outfall configuration, the authorized chronic mixing zone is 109 meters long and 55 meters wide and is bank attached with a dilution of 5.1. The chronic mixing zone is authorized for dissolved oxygen, pH and color. For the acute mixing zone, the authorized mixing zone is 7.4 meters long and 5.8 meters wide with a dilution of 1.6. The acute mixing zone is authorized for dissolved oxygen, pH and color. The area extends from the marine bottom to the surface of the water and is oriented with the tidal flow.

Technology In accordance with 18 AAC 70.240(a)(3), the Department finds that available evidence reasonably demonstrates that the effluent from Outfall – 004D will be treated to remove, reduce, and disperse pollutants using methods found by the Department to be effective and technologically and economically feasible, consistent with the highest statutory and regulatory treatment requirements. Advanced source reduction techniques are required by the permit (Permit Part 4.2.2.8) in addition to separation of contaminated snow from clean snow to limit deicing snowmelt runoff. The permit also includes an adaptive management plan (Permit Part 6) to coordinate action among the Airport Authority and co-permittees. The plan uses a structured, iterative process to monitor deicing operations of the individual facility and provide feedback for making operational and monitoring improvements to ANC to ensure compliance with the monitoring values.

Existing Use In accordance with 18 AAC 70.245, the mixing zone has been appropriately sized to fully protect the existing uses of Knik Arm. All water quality criteria must be met at the boundary of the authorized chronic and acute mixing zones. Given that all water quality criteria must be met at the boundary of the authorized mixing zones, existing uses of Knik Arm will be maintained and protected. Furthermore, the discharge volumes and receiving water characteristics at the discharge location have been examined to ensure human health and the biological integrity of Knik Arm will be maintained and fully protected under the terms of the Permit as required in 18 AAC 70.245(a)(1) and (a)(2).

Human Consumption In accordance with 18 AAC 70.250 and 18 AAC 70.255, the pollutants discharged cannot produce objectionable color, taste, or odor in aquatic resources harvested for human consumption; nor can the discharge preclude or limit established processing activities or commercial, sport, or personal use, or subsistence fish and shellfish harvesting. There is no indication that the pollutants discharged have produced objectionable color, taste, or color in aquatic resources harvested for human consumption. Further, there is no indication that aquatic resources are harvested for human consumption in the area of the discharge. The nearest personal use fishery is in Ship Creek 3.5 miles

away. Therefore the discharge will not preclude or limit established processing activities or commercial, sport, personal use, or subsistence fish and shell fish harvesting.

Spawning Areas In accordance with 18 AAC 70.255(h), a mixing zone is not authorized in a known spawning area for anadromous fish or resident fish spawning redds; this is a marine discharge.

Human Health In accordance with 18 AAC 70.250 and 18 AAC 70.255, the mixing zone authorized in the permit shall be protective of human health and will not result in pollutants discharged at levels that will bioaccumulate, bioconcentrate, or persist above natural levels in sediments, water, or biota, or at levels that otherwise will create a public health hazard through encroachment on a water supply or contact recreation uses. Sampling information submitted with the permit applications (and previous monitoring required by the MSGP and a CWA Section 308 request) does not indicate that the discharge contains any pollutants known to bioaccumulate, bioconentrate, or persist above background levels or could be expected to cause carcinogenic, mutagenic, or tetratogenic effects, or otherwise present risk to human health. The quality of the effluent is required to meet water quality criteria either at the end of pipe or at boundary of the mixing zone for select parameters. There are no known water supply or contact recreation uses occurring in the vicinity of the discharge. The Department has determined that the permit satisfies 18 AAC 70.250(a)(1)(A-C), 18 AAC 70.255 (b and c), and that the level of treatment is protective of human health.

Aquatic Life and Wildlife In accordance with 18 AAC 70.250 and 18 AAC 70.255, the mixing zone authorized by the permit shall be protective of aquatic life and wildlife. Pollutants for which the mixing zone will be authorized will not accumulate in concentrations outside the mixing zone that are undesirable, present a nuisance to aquatic life, cause permanent or irreparable displacement of indigenous organisms, or result in a reduction in fish or shell fish population levels. The mixing zone has been sized to prevent lethality to drifting organism. Specifically a drifting organism would be in the acute mixing zone for the shore hugging case for less than one minute, which is less than the 15 minutes typically required for acute effects to occur. Based on the effluent and mixing zone characteristics, the discharge is not expected to cause lethality to passing organisms or create a toxic effect in the water column, sediment, or biota outside the boundary of the mixing zone. The lack of lethality is also due to the seasonal and low discharge volume, outfall structure and location, and large tidal fluctuations at the point of discharge. Accordingly, the Department finds that the discharge will meet all water quality criteria at the boundary of the mixing zone and that 18 AAC 70.250 and 18 AAC 70.255 are met.

Endangered Species In accordance with 18 AAC 70.250(a)(2)(D), the authorized mixing zone will not cause an adverse effect on threatened or endangered species. The National Marine Fisheries Service (NMFS) and the United States Fish and Wildlife Service (USFWS) were contacted in 2017 and 2018. A summary of critical habitat and endangered species is provided in Fact Sheet Section 10.2 and 10.3. The Department provided a copy of the permit and fact sheet to NMFS and USFWS when they were noticed for applicant and agency review and public noticed.

7.0 ANTIBACKSLIDING

18 AAC 83.480 requires that "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." The effluent limitations in the permit reissuance are consistent with 18 AAC 83.430.

Effluent limitations may be relaxed under two categories as allowed under 18 AAC 83.480 (CWA §402(o)) and CWA §303(d)(4). 18 AAC 83.480(b) allows relaxed limitations in renewed, reissued, or modified permits when there have been material and substantial alterations or additions to the permitted facility that justify the relaxation. CWA §303(d)(4)(A) states that, for water bodies where the water quality does not meet applicable water quality standards, effluent limitations may be revised under two conditions; the revised effluent limitation must ensure the attainment of the water quality standard (based on the water body's TMDL or the wasteload allocation (WLA)) or the designated use which is not being attained is removed in accordance with the water quality standard regulations. CWA §303(d)(4)(B) states that, for water bodies where the water quality meets or exceeds the level necessary to support the water body's designated uses, water quality-based effluent limitations may be revised as long as the revision is consistent with the State's antidegradation policy. Even if the requirements of CWA §303(d)(4) or 18 AAC 83.480(b) are satisfied 18 AAC 83.480(c) prohibits relaxed limits that would result in violations of WQS or effluent limitation guidelines.

8.0 ANTIDEGRADATION

Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the 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 Clean Water Act*. Both the Antidegradation policy and the implementation methods are consistent with 40 CFR 131.12 and approved by EPA. This section analyzes and provides rationale for the Department's decisions in the permit issuance with respect to the Antidegradation policy and implementation methods.

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

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

There are no freshwater or marine waters covered under the general permit listed as impaired (Category 4 or 5) on DEC's most recent *Alaska's 2014/2016 Final Integrated Water Quality Monitoring and Assessment Report*; therefore, no parameters have been identified where only the Tier 1 protection level applies. Accordingly, this antidegradation analysis conservatively assumes that the Tier 2 protection level applies to all parameters, consistent with 18 AAC 70.016(c)(1).

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

The Department may allow a reduction of water quality only after the specific analysis and requirements under 18 AAC 70.016(b)(5)(A-C), 18 AAC 70.016(c)(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).

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

The permit places limits and conditions on the discharge of pollutants. The limits and conditions are established after comparing TBELs and WQBELs and applying the more restrictive of these limits. The WQ criteria, upon which the permit effluent limits are based, serve the specific purpose of protecting the existing and designated uses of the receiving water. WQBELs are set equal to the most stringent water quality criteria available for any of the protected water use classes. The permit also requires ambient water quality monitoring to evaluate possible impacts to the receiving waters and existing uses.

Pollutants of concern from ANC include pavement deicing chemicals, aircraft deicing fluids, petroleum leaks and spills, and sediment from sanding.

The general permit includes numeric or narrative effluent limits and best management practices addressing each of these pollutants of concern. The permit requires facilities to implement BMP Plans to minimize the production of waste and the discharge of pollutants to waters of the U.S., to ensure that air transportation facilities provide for the protection or attainment of existing and designated uses

The permit requires that the discharge shall not cause or contribute to a violation of the WQS at 18 AAC 70. As previously stated, there are no fresh water or marine waters covered under the general permit that are listed as impaired; therefore, no parameters were identified as already exceeding the applicable criteria in 18 AAC 70.020(b) or 18 AAC 70.030. No waters covered under the general permit are listed under 18 AAC 70.236(b) as subject to site specific criteria and therefore does not apply.

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

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

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;

As previously stated, the permit requires that the discharge shall not cause or contribute to a violation of the WQS at 18 AAC 70. WQBELs are set equal to the most stringent water quality criteria available

under 18 AAC 70.020(b) for any of the protected water use classes. Because of the nature of the permitted discharges, other pollutants are not expected to be present in the discharges at levels that would cause, have the reasonable potential to cause, or contribute to an exceedance of any Alaska WQS, including the whole effluent toxicity limit at 18 AAC 70.030. The Department will not authorize a discharge under the general permit to waters that have established or adopted site-specific criteria in the vicinity of the discharge. Currently, no fresh water or marine waters covered under the general permit are listed under 18 AAC 70.236(b) as subject to site specific criteria and therefore does not apply.

The permit does not authorize short term variance or zones of deposit under 18 AAC 70.200 or 18 AAC 70.210; therefore does not apply. The permit includes a mixing zone with a compliance schedule to attain compliance with applicable WQS residue criteria.

The Department has determined 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), and that the finding is met.

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

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

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

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

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

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

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

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

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

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

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

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

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

The first part of the definition includes all federal technology-based ELGs, including "For airports with at least 1,000 annual non-propeller aircraft departures they must comply with 40 CFR 449.10", which are incorporated in the permit.

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 (Section 1.3.2). The permit requires support vessel sanitary wastewater to be routed to the local municipal domestic wastewater treatment facility. 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. Other regulations beyond 18 AAC 70 that apply to this permitting action include 18 AAC 15 and 18 AAC 72. Neither the regulations in 18 AAC 15 and 18 AAC 72, nor another state law that the Department is aware of impose more stringent requirements than those found in 18 AAC 70.

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

The Department reviewed available information on known point source discharges to receiving waters covered under the permit, and found an outstanding noncompliance issue for residues. There are no state regulated nonpoint sources that discharge to, or otherwise impact, the receiving waters covered under the permit.

After review of the methods of treatment and control and the applicable statutory and regulatory requirements, including 18 AAC 70, 18 AAC 72, and 18 AAC 83, the Department finds that the discharge authorized under this general permit meets the highest applicable statutory and regulatory requirements (with the compliance schedule to come into compliance with the residue standard); therefore, 18 AAC 70.016(c)(7)(C) 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;*

To identify the most effective and reasonable pollution prevention, control and treatment method for storm water impacted by deicing operations at ANC, an analysis of the best available technologies (BAT) was prepared and submitted to DEC. An alternatives analysis is required to identify those

technologies that are ideally suited for application at ANC based on effectiveness and cost. The BAT analysis previously provided to DEC identified multiple storm water management alternatives, identified those alternatives applicable to ANC and evaluated each alternative based on criteria established by EPA, including the aviation-specific factors that EPA identified in its ELG rulemaking: operational constraints, land availability, safety considerations, potential impacts to flight schedules and cost. The alternatives considered consisted of combinations of pollution prevention, collection, treatment and recycling technologies. The options considered were based on those identified by EPA in the development of the ELG for aircraft deicing as well as technologies employed at different airports.

Based on an evaluation of each alternative with respect to EPA evaluation criteria, pollution prevention (P2) was identified as the best available technology for implementation at ANC to reduce pollutants associated with aircraft deicing operations discharged in storm water, which is implemented by Permit Part 4.2.2.8. This alternative was found to have the least impact on airport operations (safety, flight schedule, operational constraints and space requirements). Equally important, this technology produces substantial reductions in BOD discharge at a cost that is 1.8 to 2.3 times less per pound of BOD compared to the other alternatives.

For storm water impacted by other airport operations, storm water discharges from ANC have historically been regulated under the *Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity*. As a result, all storm water generated at ANC is managed, controlled and treated through the application of best management practices (BMPs) constituting BAT at the time as described in the airport and the tenant-specific SWPPPs. The BMPs consist of structural, vegetative or operational practices used to treat, prevent or reduce impacts of airport operations to storm water discharges. Specifically, the following BMPs have been deployed at the airport:

- Installation of grassy swales along all taxi lane and runway perimeters to dissipate flow velocities, capture suspended solids and provide infiltration area for storm water;
- Installation of constructed wetlands where appropriate to facilitate capture of suspended solids, promote infiltration and biodegradation of contaminants;
- Use of centralized snow dumps for snow containing aircraft deicing fluids to retain melt water on site to facilitate infiltration of melt water and minimize storm water discharge;
- Installation of oil/water separators in areas associated with aircraft fueling operations to capture residual fuel; and
- Deployment of absorbent booms deployed in storm water ditches and other conveyance structures to retain floating material on site.

With the permit required implementation of BMP controls, the compliance schedule as required, and the requirement to meet ELGS and WQS, the methods of pollution prevention, control, and treatment applied to all waste and other substances to be discharged are found by the department to be the most effective and practicable; therefore 18 AAC 70.016(c)(7)(D)(ii) finding is met.

> ***18 AAC 70.016(c)(7****)(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); and*

The Ted Stevens Anchorage International Airport was constructed beginning in 1951 and was officially opened in 1953. Due to its unique location being less than 9.5 hours from 90% of the industrial world, the Airport has grown and is currently ranked 30th nationally in terms of passenger enplanements (2012)

and 5th internationally in terms of the weight of cargo managed. The Airport consists of 4,612 acres, of which 768 acres are dedicated to aircraft operations and includes three runways, each of which is greater than 10,600 feet in length which allows for landing any size aircraft. Due to its location, it is an ideal refueling and maintenance facility for international cargo operations. The airport serves as the major connection point between Alaska and the lower 48 states. Given that 82% of the communities within Alaska are inaccessible by road, ANC serves as a critical link providing cargo, mail and passenger service within Alaska.

The Airport is also a major economic generator for the Municipality of Anchorage and is responsible for contributing approximately 15,577 airport and community jobs which equates to one in ten jobs in Anchorage, with a total earning of approximately a billion dollars. The Airport helps support local government through the payment of property taxes and public infrastructure construction projects create additional local jobs.

The Airport is managed as a financially self-sustaining administrative unit. The Airport does not receive support from federal, state, or local tax revenues. Outside of FAA administered programs that provide capital project support and occasional Transportation Security Administration (TSA) funded projects, operating costs and expenses must be covered by rental rates and charges for its tenants and users. Thus expenses outside of FAA or TSA, are passed on to the air carriers and tenants through landing fees, fuel flowage fees, terminal rents, concessions, vehicle and aircraft parking and other miscellaneous charges.

The Department concludes that the operation of the Airport and the authorization of the discharge accommodates the important economic and social development of the Municipality of Anchorage and the State of Alaska and that the 18 AAC 70.016 (c) (7)(E) finding is met.

18 AAC 70.016(c)(7)(F) 18 AAC 70.015 and this section have been applied consistent with 33 U.S.C. 1326 (Clean Water Act, sec. 316) with regard to potential thermal discharge impairments.

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

9.0 OTHER PERMIT CONDITIONS

9.1 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.

10.0 OTHER LEGAL REQUIREMENTS

10.1 Ocean Discharge Criteria Evaluation

CWA Section 403(a), Ocean Discharge Criteria, prohibits the issuance of a permit under CWA Section 402 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 on the territorial seas must comply with the requirements of Section 403, which include development of an Ocean Discharge

Criteria Evaluation (ODCE). The Permit authorizes a discharge landward of the baseline so no ODCE needs to be completed.

In addition, the Permit requires compliance with Alaska WQS. Consistent with 40 CFR 125.122(b), adopted by reference at 18 AAC 83.010(C)(8), discharges in compliance with Alaska WQS shall be presumed not to cause unreasonable degradation of the marine environment. EPA made the connection between the similar protections provided by ODCE requirements and WQS when promulgating ocean discharge criteria rules in 1980, as stated, "the similarity between the objectives and requirements of [state WQS] and those of CWA Section 403 warrants a presumption that discharges in compliance with those [standards] also satisfy CWA Section 403." (Ocean Discharge Criteria, 45 Federal Register 65943.). As such, given the Permit requires compliance with Alaska WQS, unreasonable degradation to the marine environment is not expected and further analysis under 40 CFR 125.122 is not warranted for this permitting action.

10.2 Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies to consult with the National Oceanic and Atmospheric Administration (NOAA) NMFS and the USFWS if their actions could beneficially or adversely affect any threatened or endangered species. The NMFS and USFWS were contacted in 2017 and 2018. Cook Inlet beluga whales (Delphinapterus leucas) are sometimes observed in waters of upper Knik Arm. The critical habitat for the Cook Inlet beluga whales covers 7,000 square kilometers (3,013 square miles) of marine environment including waters near the facility.

The Department provided a copy of the permit and fact sheet to NMFS and USFWS when they were noticed for applicant and agency review as well as public noticed. The following comment was received from NMFS regarding endangered species.

NMFS designated critical habitat for the Cook Inlet beluga whale on April 11, 2011 (76 FR 20180). NMFS identified five physical and biological features essential for conservation of Cook Inlet beluga whales (also known as primary constituent elements, or PCEs) in the final rule to desiginate critical habitat: (1) intertidal and subtidal waters of Cook Inlet with depths less than 30 ft (MLLW) and within 5 miles of high and medium flow anadromous fish streams; (2) primary prey species consisting of four species of Pacific Salmon (Chinook, sockeye, chum, and coho), Pacific eulachon, Pacific cod, walleye Pollock, saffron cod, and yellowfin sole; (3) waters free of toxins and other agents of a type and amount harmful to Cook Inlet beluga whales; (4) unrestricted passage within or between the critical habitat areas; and (5) waters with in-water noise below levels resulting in the abandonment of critical habitat areas by Cook Inlet beluga whales.

Multiple data sources indicate that beluga seasonally shift their distribution within Cook Inlet in association with seasonal changes in the physical environment (e.g., ice and currents) and the timing of anadromous fish runs (NMFS 2016). Generally, belugas spend the ice-free months in the upper Inlet, then expand their distribution south and into more offshore waters in winter (Hobbs et al. 2005, Goetz et al. 2012), although belugas remain in upper Cook Inlet, including Knik Arm, throughout the year.

Additional research found the waters near Point Woronzof (near Outfall 4D) were used by belugas primarily as a transit corridor, to travel up and down and in and out of Knik Arm (CH2MHill, 2011). Cook Inlet belugas were estimated to spend <2 percent of their lives within 1 kilometer of Point Woronzof. This estimate is considered approximate and may be an overestimate given the following: not all belugas appear to use Knik Arm every day, some belugas likely pass Point Woronzof at distances greater than 1 kilometer, many belugas may remain farther north of Point Woronzof within Knik Arm

during the fall and do not pass this point four times per day (CH2MHill, 2011). Based on these results and the fact most of the discharge of aircraft deicing fluid is during the winter and spring DEC believes the time spent in the outfall 004D discharge will be a small percentage of the belugas lives.

10.3 Essential Fish Habitat

Essential fish habitat (EFH) includes the waters and substrate (sediments, etc.) necessary for fish from commercially-fished species to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires federal agencies to consult with NOAA when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH.

As a state agency, DEC is not required to consult with NOAA on EFH; however, DEC voluntarily contacted NOAA to notify them of the proposed permit issuance and to obtain listings of EFH in the area. NOAA has directed the Department to consult their EFH Mapper at http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html to obtain locations of EFH in the area of Point Woronzof adjacent to ANC's discharges. The Department contacted NOAA staff and received two trip reports on "Nearshore Fish Assemblages in Upper Cook Inlet, Alaska" (8/18/2009 and 7/14/2010) to gain an approximate determination that the area ANC discharges to could be habitat for four species of Pacific salmon, Pacific cod, Threespine stickleback, Longfin smelt, Pacific herring, Saffron cod, Ninespine stickleback, and Juvenile flatfish.

10.4 Permit Expiration

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

11.0 References

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4. CH2MHill, 2000, *Deicing Control Strategies Feasibility Assessment*.
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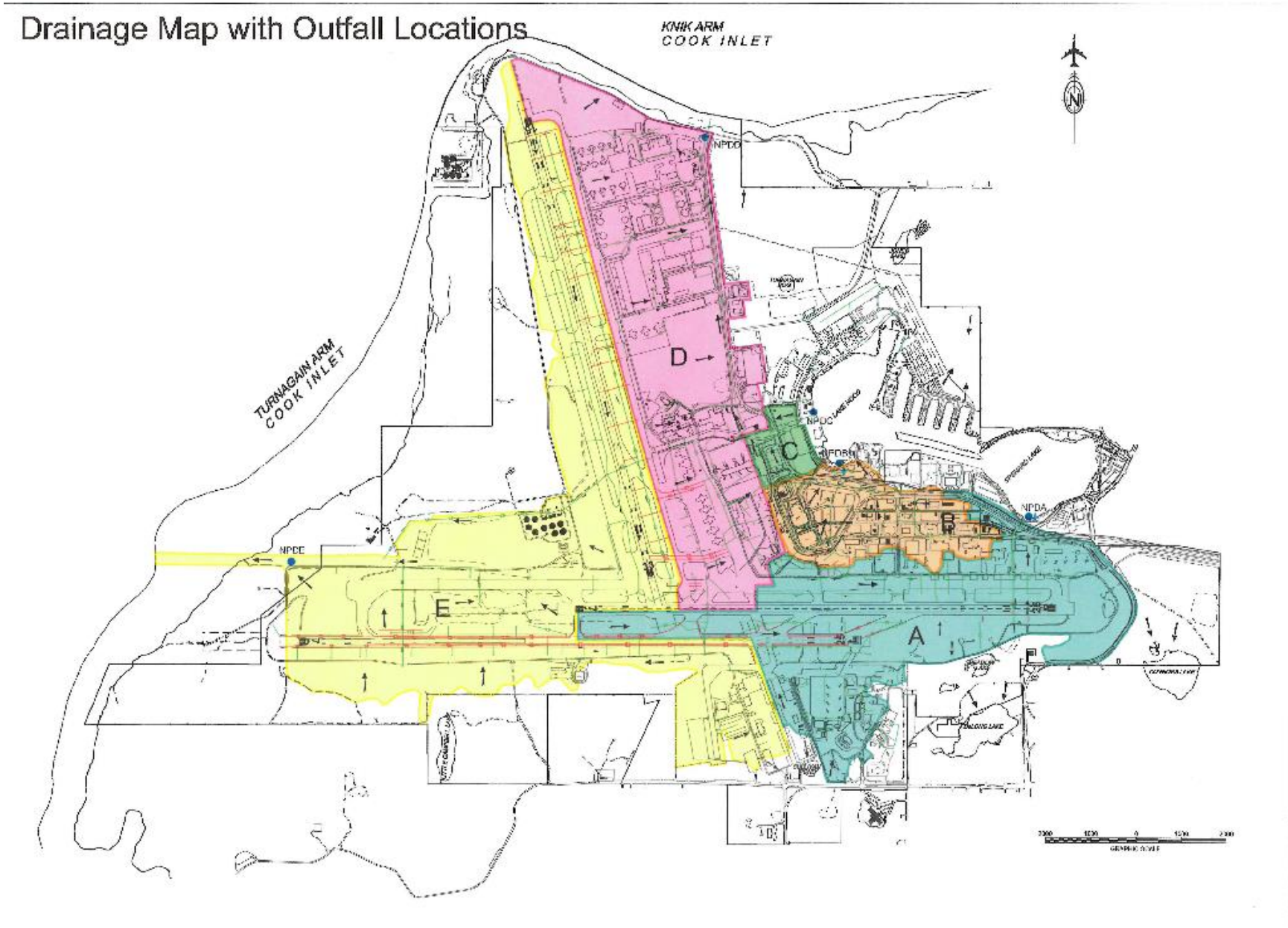
APPENDIX A. FACILITY INFORMATION

Figure 1: Ted Stevens Anchorage International Airport (ANC) Map



APPENDIX B. BASIS FOR EFFLUENT LIMITATIONS

The Alaska Department of Environmental Conservation (Department or DEC) prohibits the discharge of pollutants to waters of the United States (U.S.) per Alaska Administrative Code (AAC) 18 AAC 83.015 unless first obtaining a permit issued by the Alaska Pollutant Discharge Elimination System (APDES) Program that meets the purposes of Alaska Statutes (AS) 46.03 and is in accordance with Clean Water Act (CWA) Section 402. Per these statutory and regulatory requirements, general permit AKR061000 – ANC-GP (Permit) includes effluent limitations that require the Airport Authority and co-permittees to (1) meet standards reflecting levels of technological capability, (2) comply with 18 AAC 70 – Alaska Water Quality Standards (WQS), (3) and comply with other state requirements that may be more stringent.

The CWA requires that the limits for a particular parameter be the more stringent of either technology-based effluent limits (TBEL) or water quality-based effluent limits (WQBEL). TBELs are set via rule makings by the Environmental Protection Agency (EPA) in the form of Effluent Limitation Guidelines (ELGs) that correspond to the level of treatment that is achievable using available technology. In situations where ELGs have not been developed or have not considered specific discharges or pollutants, a regulatory agency can develop TBELs using best professional judgment on a case-by-case basis. A WQBEL is designed to ensure that WQS are maintained and the waterbody as a whole is protected. WQBELs may be more stringent than TBELs. In cases where both TBELs and WQBELs have been generated, the more stringent of the two limits will be selected as the final permit limit.

B.1.1 Effluent Limitation Guidelines

EPA has ELGs for process wastewater discharges from this industry in 40 CFR Part 449. The Airport is an existing airport deicing point source facility, therefore the ELG in 40 CFR §449, representing the level of effluent quality attainable through application of the best available technology economically achievable are the applicable ELGs.

Parameter	**Maximum Daily Limit** mg/L
Ammonia as Nitrogen	14.7

B.2 Technology – Based Effluent Limitations

B.2.1 TBELs

Over the last 15 years, numerous conceptual studies as well as pilot studies have been conducted at ANC to determine the potential effectiveness and limitations of various collection technologies. Studies of the effectiveness of the use of glycol recovery vehicles (GRVs), plug and pump operations as well as the use of trench drains to collect storm water impacted by deicing operations resulted in a wide range of collection efficiencies. Due to the severity of weather at ANC, the need to replace substantial amounts of existing infrastructure and the increase of ramp traffic which increases safety risks, these alternatives were not considered viable for ANC.

Alternatives for the management of storm water impacted by deicing operations were evaluated to identify the best available technology (BAT) applicable to the ANC. Each alternative considered was evaluated based on 1) operational constraints, 2) land availability, 3) safety considerations, 4) potential impacts to flight schedules and 5) cost per pound of biochemical oxygen demand (BOD, a surrogate for deicing fluid) either captured or reduced using source control technologies.

The effectiveness of each technology in terms of pounds of BOD collected or avoided was estimated utilizing a site-specific deicing simulation model. Budgetary cost for each technology were developed based on experience at other airports and a cost per pound of BOD collected or avoided from application was calculated. In addition, each alternative was evaluated based on the four criteria identified by EPA in the development of the ELG for Airport Deicing (Federal Register 77 (95) at 29178).

As part of the permit application the applicant conducted an analysis to identify Best Available Technology (BAT) for the airport. The advantages and disadvantages of evaluated technologies were considered and are presented below. Based on this analysis, the use of advanced source reduction technologies has the least impact on safety, operations, land availability and flight schedule. These technologies can be deployed within several years of selection and will reduce the discharge of BOD to the receiving water by nearly 1.2 million pounds at the lowest cost per pound. Based on this, the use of advanced source reduction technologies is considered BAT for this facility for the term of the permit.

Alternative	Capital Cost (Millions $)	O&M Cost (Millions $)	Lbs. BOD Captured or Prevented (Millions)	Annualized Cost per lb. BOD Removed
Centralized Deicing Pad/ Recycling	68.1	0.95	1.893	$3.15
Centralized Deicing Pad/ ABFR Treatment	78.3	0.95	1.893	$3.54
Source Reduction	27.9	0.05	1.197	$1.76
P2 with Ramp Collection/ AFBR Treatment	72.4	1.0	1.57	$4.03
Note: AFBR – Anaerobic Fluidized Bed Reactor				

Based on the above analysis, the use of source reduction techniques to minimize the amount of aircraft deicing fluids applied at the airport is the alternative with the least cost per pound of BOD removed from the system. While the use of storm water collection technologies in addition to P2 followed by treatment of the collected storm water does increase the amount of BOD removed from the system, the cost of the system more than doubles.

B.2.2 Control Measure Selection and Design Considerations

Permit Part 4 requires the operator to select, design, install and implement control measures to meet the TBELs listed in Part 4.2. The selection, design and implementation of these control measures must be in accordance with good engineering practices and manufacturer's specifications. Regulated storm water discharges from the facility include storm water run-on that commingles with storm water discharges associated with industrial activity at the facility. If operators find their control measures are not reducing pollutant discharges adequately, the control measures must be modified as expeditiously as practicable.

B.2.3 Non-Numeric Technology-Based Effluent Limits

The permit requires Airport Authority and co-permittees to comply with non-numeric TBELs (found in Part 4.2 of the permit) by implementing control measures. The achievement of these non-numeric limits will result in the reduction or elimination of pollutants from the operator's storm water discharge. Such limits constitute this permit's TBELs, expressed narratively per 40 CFR 122.44(k), and are developed using best professional judgment.

The following is a summary of the permit's non-numeric TBELs.

Minimize Exposure .

To the extent technologically available and economically practicable and achievable, locate industrial materials and activities inside or protect them with storm-resistant coverings: this is one of the most important control options. Minimizing exposure prevents pollutants from coming into contact with precipitation and can reduce the need for control measures to treat or otherwise reduce pollutants in storm water runoff. Examples include covering materials or activities with temporary structures (e.g., tarps) when wet weather is expected or moving materials or activities to existing or new permanent structures (e.g., buildings, silos, sheds). Even the simple practice of keeping a dumpster lid closed can be very effective. While the permit requires consideration of exposure minimization, DEC does not recommend significantly increasing impervious surfaces to achieve it.

In minimizing exposure, the Airport Authority and co-permittee should pay particular attention to manufacturing, processing, and material storage areas (including loading and unloading, storage, disposal, and cleaning, maintenance, and fueling operations).

Good Housekeeping .

Keep all exposed areas that are potential pollutant sources clean. Good housekeeping is an inexpensive way to maintain a clean and orderly facility and keep contaminants out of storm water discharges. Often the most effective first step towards preventing pollution in storm water from industrial sites simply involves using common sense to improve the facility's basic housekeeping methods. Poor housekeeping can result in more storm water running off a site than necessary and an increased potential for storm water related contamination. A clean and orderly work area reduces the possibility of accidental spills caused by mishandling of chemicals, aircraft deicing fluid, and equipment. Well-maintained material and chemical storage areas will reduce the possibility of storm water mixing with pollutants.

There are some simple procedures a facility can use to meet the good housekeeping effluent limit, including improved operation and maintenance of industrial machinery and processes, improved materials storage practices, better materials inventory controls, more frequent and regular clean-up schedules, maintaining well organized work areas, and education programs for employees about all of these practices. The Facility-wide Deicing Committee is for the Airport Authority and co-permittees to meet, discuss and improve the source reduction techniques in the use of deicing equipment and practices.

Examples of control measures that the Airport Authority or co-permittee may implement to meet the good housekeeping effluent limit include: containerizing materials appropriately, storing chemicals neatly and orderly; maintaining packaging in good condition; promptly cleaning up spilled liquids and spilled aircraft deicing fluids; sweeping, vacuuming or other cleanup of dry chemicals and wastes to prevent them from reaching receiving waters, and using designated storage areas for containers or drums to keep them from protruding where they can be ruptured or spilled. Proper storage techniques can include:

- Providing adequate aisle space to facilitate material transfer and easy access for inspections;
- Storing containers, drums, and bags away from direct traffic routes to prevent accidental spills;
- Stacking containers according to manufacturers' instructions to avoid damaging the containers from improper weight distribution;

- Storing containers on pallets or similar devices to prevent corrosion of the containers, which can result when containers come in contact with moisture on the ground; and
- Assigning the responsibility of hazardous material inventory to a limited number of people who are trained to handle hazardous materials.

In 2013, ANC committed to source reduction by substituting potassium acetate for urea.

Maintenance.

Regularly inspect, test, maintain and repair or replace all industrial equipment and systems to prevent releases of pollutants to storm water. Maintain all control measures in effective operating condition. Nonstructural control measures must also be diligently maintained (e.g., spill response supplies available, personnel trained).

The Airport Authority and most co-permittees already have preventive maintenance programs (PMPs) that provide some environmental protection. Preventive maintenance involves regular inspection and testing of equipment and operational systems to uncover conditions such as cracks or slow leaks that could cause breakdowns or failures that result in discharges of pollutants to storm sewers and surface water. To prevent breakdowns and failures, the Airport Authority and co-permittees should adjust, repair or replace equipment.

As part of a typical PMP, the Airport Authority and co-permittees must include regular inspection and maintenance of storm water management devices and other equipment and systems. The Airport Authority and co-permittees should identify the devices, equipment and systems that will be inspected; provide a schedule for inspections and tests; and address appropriate adjustment, cleaning, repair or replacement of devices, equipment and systems. For storm water management devices such as catch basins and oil-water separators, PMPs should include the periodic removal of debris to ensure that the devices are operating efficiently. For other equipment and systems, there should be procedures to reveal and correct conditions that could cause breakdowns or failures that may result in the release of pollutants. This permit authorizes storm water discharges from only those portions of the air transportation facility that are involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling and lubrication), equipment cleaning operations or deicing operations.

The PMP should include a suitable records system for scheduling tests and inspections, recording test results and facilitating corrective action. The program should be developed by qualified plant personnel who evaluate the existing plant and recommend changes as necessary to protect water quality.

Spill Prevention and Response Procedures.

Minimize the potential for leaks, spills and other releases, which are major sources of storm water pollution, to be exposed to storm water. The purpose of this control measure is not only to prevent spills and leaks but, in the event one does occur, to limit environmental damage via development of spill prevention and response procedures. Operators should identify potential spill areas (including aircraft deicing fluid) and keep an inventory of materials handled, used and disposed of. Based on an assessment of possible spill scenarios, permittees must specify appropriate material handling procedures, storage requirements, containment or diversion equipment, and spill cleanup procedures that will minimize the potential for spills and, in the event of a spill, ensure proper and timely response.

Areas and activities that typically pose a high risk for spills include loading and unloading areas, storage areas, process activities, and waste disposal activities. These activities and areas, and their

accompanying drainage points, must be addressed in the procedures. For a spill prevention and response program to be effective, employees should clearly understand the proper procedures and requirements and have the equipment necessary to respond to spills.

The following are suggestions to incorporate into spill prevention and response procedures:

- Install leak detection devices, overflow controls and diversion berms;
- Perform visual inspections and identify signs of wear;
- Perform preventive maintenance on storage tanks, valves, pumps, pipes and other equipment;
- Use filling procedures for tanks and other equipment that minimize spills;
- Use material transfer procedures that reduce the chance of leaks or spills;
- Substitute less toxic materials;
- Ensure that clean-up materials are available where and when needed;
- Ensure appropriate security; and
- Notify emergency response agencies where necessary (as specified in Part 4.2.4.4).

In the event of a spill, it is important that the facility have clear, concise, step-by-step instructions for responding to spills. The approach will depend on the specific conditions at the facility such as size, number of employees and the spill potential of the site. Note the permit does not authorize the discharge of spills or leaks.

Erosion and Sediment Controls.

Stabilize and contain runoff from exposed areas to minimize onsite erosion and sediment creation, and the accompanying discharge of pollutants (other pollutants can bind to soil and other particles and be discharged along with the sediment).

There may be exposed areas of industrial sites that, due to construction activities, steep slopes, sandy soils or other factors, are prone to soil erosion. Construction activities typically remove grass and other protective ground covers resulting in the exposure of underlying soil to wind and rain. Similarly, steep slopes or sandy soils may not be able to hold plant life so that soils are exposed. Because the soil surface is unprotected, dirt and sand particles are easily picked up by wind or washed away by rain. This erosion process can be controlled or prevented through the use of certain control measures. Construction activity that disturbs more than one acre of ground shall be covered by the most recent APDES Construction General permit.

To meet this control measure, operators must select, design, install and implement controls to address the on-site exposed areas prone to soil erosion. Erosion control practices such as seeding, mulching and sodding prevent soil from becoming dislodged and should be considered first. Sediment control practices such as silt fences, sediment ponds, and stabilized entrances trap sediment after it has eroded. Sediment control practices, such as flow velocity dissipaters and sediment catchers, should be used to back-up erosion control practices.

Management of Runoff.

The Airport Authority and co-permittees must divert, infiltrate, reuse, contain or otherwise reduce storm water runoff to minimize pollutants in the discharge and must employ practices that direct the flow of storm water away from areas of exposed materials or pollutant sources. Such practices can also be used to divert runoff that contains pollutants to natural areas or other types of treatment locations.

To meet this control measure, the Airport Authority and co-permittees may consider vegetative swales, collection and reuse of storm water, inlet controls, snow management, infiltration devices, and wet detention/retention basins. If infiltration is a selected control, permittees should pay special attention to the fact that storm water infiltration control measures that meet the definition of a Class V Injection Well could be subject to Underground Injection Control (UIC) Regulations.

Salt Storage Piles or Piles Containing Salt.

Enclose or cover piles of salt or piles containing salt used for deicing or other industrial purposes. Implement appropriate measures to minimize the exposure of the piles during the adding to or removing from processes.

Options for meeting the salt pile effluent limit include covering the piles or eliminating the discharge from such areas of the facility. Preventing exposure of piles to storm water or run-on also eliminates the economic loss from materials being dissolved and washed away. A permanent under-roof storage facility is the best way to protect chemicals from precipitation and runoff, but where this is not possible, salt piles can be located on impermeable bituminous pads and covered with a waterproof cover.

Employee Training.

The Airport Authority and co-permittees must train all employees who work in areas where industrial materials or activities are exposed to storm water, or who are responsible for implementing activities necessary to meet the conditions of the permit.

Employee training programs should thoroughly educate members of the Storm Water Pollution Prevention Team (see Permit Part 5.2) on their roles in implementing the control measures employed to meet the limits in the permit. Training should address the processes and materials at the facility or area of industrial activity, good housekeeping practices for preventing discharges, and procedures for responding properly and rapidly to spills or other incidents. The training program should also address other requirements in the permit such as inspections and record-keeping.

Training sessions should be conducted at least annually to assure adequate understanding of the objectives of the control measures and the individual responsibilities of each employee. More frequent training may be necessary at facilities with high employee turnover or where storm water programs are involved, multi-faceted, or at the beginning of the deicing season. Often, training could be a part of routine employee meetings for safety or fire protection. Where appropriate, contractor personnel also must be trained in relevant aspects of storm water pollution prevention.

Training sessions should review all aspects of the control measures and associated procedures. The Airport Authority and co-permittees shall conduct spill or incidence drills on a regular basis which can serve to evaluate the employee's knowledge of the control measures and spill procedures and are a fundamental part of employee training. Such meetings should highlight previous spill events or failures, malfunctioning equipment and new or modified control measures.

Non-Storm Water Discharges.

The Airport Authority and co-permittees must eliminate non-storm water discharges that are not authorized by an APDES permit. This limit is intended to reinforce the fact that, with the exception of the allowable non-storm water discharges listed in Permit Part 1.2.3, non-storm water discharges are ineligible for coverage. Operators needing help in finding and eliminating unauthorized discharges may find the following guidance helpful: *Illicit Discharge Detection and Elimination: A Guidance Manual*

for Program Development and Technical Assessments, Chapters 7, 8, 9 at: //www.epa.gov/npdes/pubs/idde_manualwithappendices.pdf

Waste, Garbage, and Floatable Debris.

The Airport Authority and co-permittees must ensure that waste, garbage and floatable debris are not discharged to receiving waters. Trash and floating debris in waterways have become significant pollutants, especially near areas where a large volume of trash can be generated in a concentrated area or from snow piles. Trash can cause physical impairments in water bodies to aquatic species and birds and is also visual pollution and detracts from the aesthetic qualities of receiving waters.

This activity can be met through the implementation of a variety of control measures. For instance, to prevent garbage from being carried in runoff to receiving waters, there are essentially two methods of control: source control and structural control. Source control includes personnel education, improved infrastructure and cleanup campaigns. Education, such as informing employees about options for recycling and waste disposal and about the consequences of littering, is one of the best ways. Another topic that should be emphasized is proper trash storage and disposal. Improved infrastructure can include optimizing the location, number, and size of trash receptacles, recycling bins, and cigarette butt receptacles based on expected need. Clean-up campaigns are an effective way to reduce trash. Facilities should determine whether the number and placement of receptacles are adequate and if regular maintenance activities (e.g., sweeping, receptacle servicing) are preventing litter from entering receiving waters. Structural controls include physical filtering structures and continuous deflection separation. Filtering structures concentrate diffuse, floating debris and prevent it from traveling downstream. Some examples are trash racks, mesh nets, bar screens and trash booms. Continuous deflection separation targets trash from storm flows during and after heavy precipitation.

B.3 Water Quality – Based Effluent Limitations

B.3.1 Statutory and Regulatory Basis

Per 18 AAC 70.010, a person may not conduct an operation that causes, or contributes to, a violation of the WQS. Per 18 AAC 83.435(a), an APDES permit must include conditions (e.g., WQBELs) in addition to, or more stringent than, promulgated ELGs (e.g., TBELs). When evaluating if WQBELs are needed in addition to the TBELs, the Department conducts a reasonable potential analysis (RPA) based on pertinent water quality parameters. Pertinent water quality parameters are those that the Department consider as having a possibility to exceed water quality criteria at the point of discharge or at the boundary of a mixing zone, if authorized. If a mixing zone is authorized, the Department must consider the dilution available in the authorized mixing zone in the analysis. Per 18 AAC 435(c), DEC must also use procedures that account for effluent variability (e.g., maximum expected effluent concentrations and coefficient of variation) and existing controls on point source (e.g., treatment systems) and nonpoint sources of pollution (e.g., ambient receiving water concentrations).

The RPA procedures use statistical methods to estimate maximum effluent concentrations (MEC) and projects the receiving water concentration using mass balance. Because DEC has authorized acute and chronic mixing zones, the mass balance procedure evaluates if the effluent exceeds, or contributes to an exceedance, of water quality criteria at the boundary of either the acute or the chronic mixing zone. No parameter was determined to have reasonable potential.

Reasonable Potential Analysis

When evaluating the effluent to determine if WQBELs based on chemical-specific numeric criteria are needed, the Department projects the receiving water body concentration for each pollutant of concern downstream of where the effluent enters the receiving water body. The chemical-specific concentration of the effluent and receiving water body and, if appropriate, the dilution available from the receiving water body, are factors used to project the receiving water body concentration. If the projected concentration of the receiving water body exceeds the numeric criterion for a limited parameter, then there is a reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standard, and a WQBEL must be developed.

According to 18 AAC 70.990(38), a mixing zone is an area in a water body surrounding, or downstream of, a discharge where the effluent plume is diluted by the receiving water within which specified water quality criteria may be exceeded. Water quality criteria and limits may be exceeded within a mixing zone. A mixing zone can be authorized only when adequate receiving water body flow exists, and the concentration of the pollutant of concern in the receiving water body is below the numeric criterion necessary to protect the designated uses of the water body.

B.3.2 Procedure for Deriving Water Quality-Based Effluent Limits

The *Alaska Pollutant Discharge Elimination System (APDES) Permits Reasonable Potential Analysis and Effluent Limits Development Guide* (Tetra Tech, 2013) and the *Technical Support Document for Water Quality-Based Toxics Control (TSD)* (EPA, 1991) and the WQS recommend the flow conditions for use in calculating WQBELs using steady-state modeling. The APDES Guide and TSD and the Alaska WQS state the WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years (7Q10) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years (1Q10) for acute criteria. In marine settings, tidal velocities must be representative of critical conditions as well.

The first step in developing a WQBEL is to develop a Waste Load Allocation (WLA) for the pollutant. A WLA is the concentration or loading of a pollutant that the permittee may discharge without causing or contributing to an exceedance of WQS or a TMDL in the receiving water body. If a mixing zone is authorized in the permit, the WQBELs apply at all points outside the mixing zone.

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

The WQS at 18 AAC 70.020(a) designates classes of water for beneficial uses of water supply, water recreation, and of growth and propagation of fish, shellfish, other aquatic life, and wildlife.

B.3.3 Specific Water Quality-Based Effluent Limits

B.3.3.1 pH

The criteria for water supply, aquaculture, water contact recreation, and growth and propagation of fish, shellfish, other aquatic life, and wildlife are the most stringent standards for pH. These standards state that fresh waters, "May not be less than 6.5 or greater than 8.5. May not vary more than 0.5 pH unit from natural conditions." For marine waters, "may not be less than 6.5 or greater than 8.5, and may not vary more than 0.2 pH unit outside the naturally occurring range."

B.3.3.2 Dissolved Oxygen

The criteria for aquaculture water supply are the most stringent standards for dissolved oxygen (DO). The standards at 18 AAC 70.020(b)(3)(A)(iii) require that "DO must be greater than 7 mg/L in receiving waters; the concentration of total dissolved gas may not exceed 110% of saturation at any point of sample collection". The standards at 18 AAC 70.020(b)(3)(C) require that "DO must be greater than 7 mg/L in waters used by anadromous or resident fish. In no case may DO be less than 5 mg/L to a depth of 20 cm in the interstitial waters of gravel used by anadromous or resident fish for spawning. For waters not used by anadromous or resident fish, DO must be greater than or equal to 5 mg/L. In no case may DO be greater than 17 mg/L. The concentration of total dissolved gas may not exceed 110% of saturation at any point of sample collection."

For marine waters the standard is similar to fresh waters. See 18 AAC 70.020(b)(15)(A)(i) for marine aquaculture water supply, "surface dissolved oxygen (D.O.) concentration in coastal water may not be less than 6.0 mg/l for a depth of one meter except when natural conditions cause this value to be depressed. D.O. may not be reduced below 4 mg/l at any point beneath the surface. D.O. concentrations in estuaries and tidal tributaries may not be less than 5.0 mg/l except where natural conditions cause this value to be depressed. In no case may D.O. levels exceed 17 mg/l. The concentration of total dissolved gas may not exceed 110% of saturation at any point of sample collection."

B.3.3.3 Total Ammonia (as Nitrogen)

The toxicity of ammonia is dependent on pH and temperature; therefore the criteria are also pH and temperature-dependent. The end-of-pipe marine acute and chronic criteria for total ammonia are 29.2 and 10.3 mg/L, respectively for Outfall 004D. Data collected by the permittee in 2014 and 2015 were evaluated to determine whether there was reasonable potential to cause or contribute to an exceedance of the criteria. A reasonable potential was not found, so a WQBEL was not included in the permit. The end-of-pipe acute and chronic criteria for total ammonia are 13.2 and 2.7 mg/L, respectively for Outfalls 001A, 002B, 003C, and 005E. They were arrived at by calculating the 85th percentile for water temperature and pH then looked up the acute and chronic values in the water quality criteria.

B.3.4 Narrative WQBELs

The WQS for floating, suspended or submerged matter, including oil and grease, are narrative. The most stringent standard, found at 18 AAC 70.020(b)(8)(A)(i) from the 2003 copy of the WQS, require that fresh waters, "may not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use; cause a film, sheen, or discoloration on the receiving of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the receiving of the water, within the water column, on the bottom, or upon adjoining shorelines."

For marine waters the standard is similar to fresh waters. See 18 AAC 70.020(b)(20)(C) from the 2003 copy of the WQS for marine waters, "may not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use or cause acute or chronic problem levels as determined by bioassay or other appropriate methods. May not, alone or in combination with other substances, cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the receiving of the water, within the water column, on the bottom, or upon adjoining shorelines."

The 2003 WQS for floating, suspended or submerged matter is used because the more recent versions of the standard have not been approved by the U.S. Environmental Protection Agency for use in APDES permits.

B.3.5 Selection of Most Stringent Limitations

B.3.5.1 pH

The current pH limit between 6.5 SU and 8.5 SU are identical to the more stringent WQBELs and shall apply at the end-of-pipe.

Table B-1: Selection of pH Permit Limits

	Minimum Daily (SU)	Maximum Daily (SU)
Technology Based Limits	6.0	9.0
Water Quality-Based Limits	6.5	8.5
Selected Limits	6.5	8.5

APPENDIX C. REASONABLE POTENTIAL DETERMINATION

This Appendix summarizes the reasonable potential analysis (RPA) process used by the Department to determine and develop effluent limits for the general permit AK061000 - Ted Stevens Anchorage International Airport (Permit).

Per Alaska Administrative Code (AAC) 18 AAC 83 - Alaska Pollutant Discharge Elimination System (APDES) Program requires limits in APDES permits to achieve water quality standards established under 33 U.S.C. 1313, including state narrative criteria for water quality. Alaska water quality standards are found in 18 AAC 70 – Water Quality Standards (WQS) and the *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances, May 15, 2003 (Toxics Manual).*

Per 18 AAC 83.435(b), "Effluent limits in a permit must control all pollutants or pollutant parameters, either conventional, non-conventional, or toxic pollutants, that the department determines are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard (i.e., criteria), including state narrative criteria for water quality."

DEC analyzes pollutant concentrations in the discharge to determine if it will cause, or contribute to, an exceedance of water quality criteria per the reasonable potential analysis (RPA) procedures described in the *RPA and Water Quality-based Effluent Limits (WQBEL) Development Guide, June 30, 2014 (RPA&WQBEL Guide).* The *RPA&WQBEL Guide* is based largely on procedures in the Environmental Protection Agency (EPA) *Technical Support Document for Water Quality-Based Toxics Control, 1991 (TSD)* that were modified by the Department.

The Department determines reasonable potential of a discharge of effluent containing a maximum expected concentration (MEC) of a parameter by comparing the projected receiving water concentration at the boundary of the authorized acute or chronic mixing zones to the applicable water quality criteria for that parameter. Reasonable potential exists if the projected receiving waterbody concentration (RWC) at the boundary of the respective mixing zone exceeds the applicable criteria for that parameter and a WQBEL must be included in the Permit per 18 AAC 83.435. The RPA of the aircraft deicing discharge considered the following parameters:

Ammonia as Nitrogen (N).

C.1 Mass Balance

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

$$(V_{MEC} + V_{AWC})\, RWC = V_{MEC} MEC + V_{AWC} AWC \qquad \text{(Equation C-1)}$$

where,

RWC = Receiving water body concentration downstream of the effluent discharge.

MEC = Maximum projected effluent concentration.

AWC = Ambient waterbody concentration, taken as the 85th percentile of data or 15 percent of the chronic criteria if no ambient data is available. The AWC for ammonia was calculated based on 15 percent of the chronic criteria.

V_{MEC} = Volume of the maximum expected effluent discharged into the control volume.

V_{AWC} = Volume of the ambient receiving water in the control volume.

The necessary dilution factor for a discharge to meet water quality criteria at the boundary of a mixing zone is defined as:

Dilution Factor (DF), $DF = \frac{(V_{MEC}+V_{AWC})}{V_{MEC}}$ (Equation C-2)

Upon separating variables in Equation C-1, substituting Equation C-2, and rearranging yields:

$$DF = \frac{(MEC-AWC)}{(RWC-AWC)} \quad \text{(Equation C-3)}$$

Rearranging Equation C-3 to solve for RWC yields:

$$RWC = \frac{(MEC-AWC)}{DF} + AWC \quad \text{(Equation C-4)}$$

For known MEC and AWC, Equation C-3 can be used to determine the required DF for a constituent by substituting water quality criteria for RWC. For cases where a DF and mixing zone have been authorized, Equation C-4 is used to calculate the RWC at the boundary of the mixing zone in the RPA

C.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." 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 water body concentration.

Since there are a limited number of data points available, the 99th percentile is calculated by multiplying the maximum reported effluent concentration by a "reasonable potential multiplier" (RPM). The RPM is the ratio of the 99th percentile concentration to the maximum reported effluent concentration 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* recommends making the assumption that the CV is equal to 0.6. A CV value of 0.6 is a conservative estimate that assumes a relatively high variability.

Using the equations in Section 3.3.2 of the *TSD*, the RPM for ammonia is calculated as follows.

The percentile represented by the highest reported concentration is calculated.

$$p_n = (1 - confidence\ level)^{1/n} \quad \text{(Equation C-5)}$$

Where,

p_n = the percentile represented by the highest reported concentration
n = the number of samples
confidence level = 99% = 0.99

The data set contains 21 ammonia effluent samples, therefore:

$$p_{21} = (1 - 0.99)^{1/21}$$

$p_{21} = 0.8032$

This means that we can say, with 99% confidence that the maximum reported effluent chlorine concentration is greater than the 94th percentile.

The RPM is the ratio of the 99th percentile concentration (at the 99% confidence level) to the maximum reported effluent concentration. This is calculated as follows:

$$RPM = \frac{C_{99}}{C_p} \quad \text{(Equation C-6)}$$

Where,

$$C = e^{(z\sigma - 0.5\sigma^2)} \quad \text{(Equation C-7)}$$

Where,

$$\sigma^2 = \ln(CV^2 + 1) \quad \text{(Equation C-8)}$$

$\sigma = \sqrt{\sigma^2}$

$CV = coefficient\ of\ variation = \frac{standard\ deviation}{mean}$

$z =$ the inverse of the normal cumulative distribution function at a given percentile

In the case of ammonia:

CV = coefficient of variation = 1.40

$\sigma^2 = \ln(CV^2 + 1) = 1.085$

$\sigma = \sqrt{\sigma^2} = 1.04$

$z_{99} = 2.326$ for the 99th percentile

$z = 2.032$ for the 98 percentile (from z-table)

$z_{99} = e^{(2.326 \times 1.04 - 0.5 \times 1.085)} = 16.8357$

$z_{98} = e^{(2.032 \times 1.04 - 0.5 \times 1.085)} = 4.810$

$RPM = \frac{C_{99}}{C_p} = \frac{16.8357}{4.810}$

RPM = 3.5 (rounded)

The maximum projected effluent concentration is determined by multiplying the maximum reported effluent concentration by the RPM:

$$C_e = (RPM) \times (MRC) \quad \text{(Equation C-9)}$$

Where,

MRC = Maximum Reported Concentration

In the case of ammonia,

$$C_e = (3.5)(8.24\ \text{mg/L}) = 28.84\frac{\text{mg}}{\text{L}}(\text{maximum projected effluent concentration}) *$$

- The above MEC calculation is simplified for illustrative purposes. The MEC is calculated in the RPA tool with an RPM prior to rounding. The actual MEC as calculated in the Department's RPA tool is 29.21 mg/L

Comparison with ambient criteria for ammonia

In order to determine if reasonable potential exists for this discharge to violate the ambient criteria, the highest projected concentrations at the boundary of the mixing zone are compared with the ambient criteria.

Acute	18.50 mg/L > 29.2 mg/L (acute criteria)	**No**, there is a reasonable potential to violate
Chronic	2.75 mg/L > 10.3 mg/L (chronic criteria)	**No**, there is a reasonable potential to violate

Since there is not a reasonable potential for the effluent to cause an exceedance of chronic WQS for protection of aquatic life, a WQBEL for ammonia is not required.

C.3 Upstream (Ambient) Concentration of Pollutant

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 (such as ammonia), the 95th percentile of the ambient data is generally used as an estimate of the worst-case. No ammonia concentrations were available from the ambient receiving water monitoring conducted by the facility, or from any USGS upstream gages. Thus, it was assumed that ambient concentrations of ammonia were zero. These values were used in the reasonable potential analyses.

Table C-1 summarizes the data, multipliers, and criteria used to determine reasonable potential to exceed criteria. Table C-2 shows the comparison of the maximum projected effluent concentrations for the acute and chronic mixing zones to their respective criteria. The most stringent criterion is the lower of the acute and the chronic criteria.

Table C-1: Reasonable Potential Calculations

Parameter (µg/L)	**Max. Reported Effluent Conc.**	**Number of Samples**	**CV**	**RPM**	**Max Projected Effluent Conc. (C_e)**	**Upstream Conc. (C_u)**	**Projected Downstream Conc. [a] (C_d)**
Total Ammonia as Nitrogen (N)	8.24	21	1.4028	3.5	29.21	0	502

Note:
a. Projected downstream concentrations were calculated using the mixing zone dilution factor of 50:1.

Table C-2: Reasonable Potential Determination

Parameter (µg/L)	**Max Projected Effluent Conc. (C_e),** µg/L	**Effluent Flow** (Q_e), mgd	**Upstream Conc.** (C_u), µg/L	**Dilution Ratio** (D)	**Max Conc. at Boundary of Mixing Zone** (C_d)	**Criterion** (µg/L) (Aquatic Life Salt Water total recoverable)	**Does C_d exceed criteria?**
Total Ammonia as N (chronic)	29,210	7.7	0	12.321	2,750	10,300	No
Total Ammonia as N (acute)	29,210	7.7	0	1.5923	18,500	29,200	No

APPENDIX D. MIXING ZONE ANALYSIS CHECKLIST

Mixing Zone Authorization Checklist
based on Alaska Water Quality Standards (2003)

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 through 18 AAC 70.270 are satisfied, as well as provide justification to authorize a mixing zone in an APDES permit. In order to authorize a mixing zone, all criteria must be met. The permit writer must document all conclusions in the permit Fact Sheet; however, if the permit writer determines that one criterion cannot be met, then a mixing zone is prohibited, and the permit writer need not include in the Fact Sheet the conclusions for when other criteria were met. See Section 6.3 of the Fact Sheet for the mixing zone analysis.

Criteria	Description	Answer & Resources	Regulation
Size	Is the mixing zone as small as practicable? – Applicant collects and submits water quality ambient data for the discharge and receiving water body (e.g., flow and flushing rates) – Permit writer performs modeling exercise and documents analysis in Fact Sheet at: ➢ Section 6.3– describe what was done to reduce size.	• Answer: Yes, mixing zone as small as practicable • Technical Support Document for Water Quality Based Toxics Control • Fact Sheet, Appendix C • Fact Sheet Section 6.3 • DEC's RPA Guidance • EPA Permit Writer's Manual	18 AAC 70.240 (a)(2) 18 AAC 70.245(b)(1) – (b)(7) 18 AAC 70.255(e)(3) 18 AAC 70.255(d)
Technology	Were the most effective technological and economical methods used to disperse, treat, remove, and reduce pollutants? If yes, describe methods used in Fact Sheet at Section 6.3. and Appendix B.2.3. Attach additional documents if necessary.	Answer: Yes	18 AAC 70.240(a)(3)
Low Flow Design	**For river, streams, and other flowing fresh waters.** Determine low flow calculations or documentation for the applicable parameters. Justify in Fact Sheet.	Answer: Not Applicable, Discharge occurs to marine, not fresh waters	18 AAC 70.255(f)

Criteria	Description	Answer & Resources	Regulation
Existing Use	Does the mixing zone…		
	(1) Partially or completely eliminate an existing use of the water body outside the mixing zone? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.245(a)(1)
	(2) Impair overall biological integrity of the water body? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.245(a)(2)
	(3) Provide for adequate flushing of the water body to ensure full protection of uses of the water body outside the proposed mixing zone? **If no, then mixing zone prohibited.**	Answer: Yes Fact Sheet Section 6.3	18 AAC 70.250(a)(3)
	(4) Cause an environmental effect or damage to the ecosystem that the department considers to be so adverse that a mixing zone is not appropriate? **If yes, then mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.250(a)(4)
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 reduced in size or prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.250(b)(2)
	(2) Preclude or limit established processing activities of commercial, sport, personal use, or subsistence shellfish harvesting? **If yes, mixing zone may be reduced in size or prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.250(b)(3)

Criteria	Description	Answer & Resources	Regulation
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, king, and sockeye salmon? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.255 (h)
Human Health	Does the mixing zone…		
	(1) Contain bioaccumulating, bioconcentrating, or persistent chemical above natural or significantly adverse levels? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.250 (a)(1)
	(2) Contain chemicals expected to cause carcinogenic, mutagenic, tetragenic, or otherwise harmful effects to human health? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	
	(3) Create a public hazard through encroachment on water supply or through contact recreation? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.250(a)(1)(C)
	(4) Meet human health and aquatic life quality criteria at the boundary of the mixing zone? **If no, mixing zone prohibited.**	Answer: Yes Fact Sheet Section 6.3	18 AAC 70.255 (b), (c)
	(5) Occur in a location where the department determines that a public health hazard reasonably could be expected? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.255(e)(3)(B)

Criteria	Description	Answer & Resources	Regulation
Aquatic Life	Does the mixing zone…		
	(1) Create a significant adverse effect to anadromous, resident, or shellfish spawning or rearing? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.250(a)(2)(A-C)
	(2) Form a barrier to migratory species? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	
	(3) Fail to provide a zone of passage? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	
	(4) Result in undesirable or nuisance aquatic life? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.250(b)(1)
	(5) Result in permanent or irreparable displacement of indigenous organisms? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.255(g)(1)
	(6) Result in reduction in fish or shellfish population levels? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.255(g)(2)
	(7) Prevent lethality to passing organisms by reducing the size of the acute zone? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.255(b)(1)
	(8) Cause a toxic effect in the water column, sediments, or biota outside the boundaries of the mixing zone? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 6.3	18 AAC 70.255(b)(2)
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 USFWS or NOAA? If yes, will conservation measures be included in the permit to avoid adverse effects? **If yes, explain conservation measures in Fact Sheet. If no, mixing zone prohibited.**	Applicant or permit writer requests list of T/E species from USFWS prior to drafting permit conditions.	Program Description, 6.4.1 #5 18 AAC 70.250(a)(2)(D)