ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FACT SHEET – PRELIMINARY DRAFT

General Permit No. AKG332000 –

Facilities Related to Oil and Gas Exploration, Production, and Development on the North Slope Borough

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

Public Comment Period Start Date: **DRAFT**
Public Comment Period Expiration Date**: DRAFT**

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Issuance of an Alaska Pollutant Discharge Elimination System (APDES) general permit to:

FACILITIES RELATED TO OIL AND GAS EXPLORATION PRODUCTION AND DEVELOPMENT ON THE NORTH SLOPE BOROUGH

The Alaska Department of Environmental Conservation (Department or DEC) is issuing APDES general permit AKG332000 – Facilities Related to Oil and Gas Exploration, Production, and Development on the North Slope Borough (Permit or North Slope GP). The Permit authorizes and sets conditions on the discharge of pollutants from these facilities to fresh waters located in the North Slope Borough and coastal marine waters of the U.S. offshore of the North Slope Borough and landward of the inner boundary baseline (Attachment A – Figure A.1). 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 these operations and outlines best management practice requirements.

This fact sheet explains the nature of potential discharges from oil and gas exploration, production and development facilities operating on the North Slope Borough and the development of the permit including:

- Information on appeal procedures
- A description of the industry
- A listing of effluent limits, monitoring requirements, and other conditions
- Technical material supporting the conditions in the permit

Public Comment

Persons wishing to comment on the draft permit may do so in writing by the expiration date of the public comment period or provide oral comments by attending one of the scheduled public hearings. Written comments should be submitted to the Department at the technical contact address, fax, or email identified above (see also the public comments section of the attached public notice). Mailed comments and requests must be postmarked on or before the expiration date of the public comment period. Commenters are requested to submit a concise statement on the permit condition(s) and the relevant facts upon which the comments are based. Commenters are encouraged to cite specific permit requirements or conditions in their submittals.

The Department will hold a public hearing whenever the Department finds, on the basis of requests, a significant degree of public interest in a draft permit. The Department may also hold a public hearing if a hearing might clarify one or more issues involved in a permit decision. A public hearing will be held at the closest practicable location to the site of the operation. If the Department holds a public hearing, the Director will appoint a designee to preside at the hearing. The public may also submit written testimony in lieu of or in addition to providing oral testimony at the hearing. A hearing will be tape recorded.

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

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

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

Appeals Process

The Department has both an informal review process and a formal administrative appeal process for final APDES permit decisions. An informal review request must be delivered within 15 days after receiving the Department's decision to the Director of Water at the following address:

Director, Division of Water
Alaska Department of Environmental Conservation
410 Willoughby Street, Suite 303
Juneau AK, 99811-1800

Interested persons can review 18 AAC 15.185 for the procedures and substantive requirements regarding a request for an informal Department review. For information regarding informal reviews of Department decisions see http://www.dec.state.ak.us/commish/InformalReviews.htm. 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
410 Willoughby Street, Suite 303
Juneau AK, 99811-1800

Interested persons can review 18 AAC 15.200 for the procedures and substantive requirements regarding a request for an adjudicatory hearing. For information regarding appeals of Department decisions, see http://www.dec.state.ak.us/commish/ReviewGuidance.htm.

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 addresses below. The permit, fact sheet, and other information are also located on the Department's Wastewater Discharge Authorization Program website: http://www.dec.state.ak.us/water/wwdp/index.htm .

Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 555 Cordova Street, Anchorage, AK 99501 (907) 269-6285	Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 610 University Avenue Fairbanks, AK 99709 (907) 451-2183

TABLE OF CONTENTS

1.0 INTRODUCTION....4

1.1 Legal Basis....4

1.2 Individual Permit....4

2.0 BACKGROUND....5

2.1 Industry Description....5

2.2 Permit History....6

3.0 PERMIT COVERAGE....7

3.1 Coverage Area....7

3.2 Authorized Discharges....8

3.3 Exemptions from Oil and Gas Storm Water Coverage....8

4.0 WASTEWATER CHARACTERIZATION....9

4.1 Graywater Characterization and Compliance History (Discharge 002)....9

4.2 Gravel Pit Dewatering Characterization and Compliance History (Discharge 003)...10

4.3 Excavation Dewatering Characterization and Compliance History (Discharge 004) .11

4.4 Hydrostatic Test Water Characterization and Compliance History (Discharge 005)..12

4.5 Storm Water Characterization from Industrial Facilities (Discharge 006)....13

4.6 Mobile Spill Response Characterization and Compliance History (Discharge 007)...14

4.7 Secondary Containment Characterization and Compliance History (Discharge 008).15

4.8 General Trends in Reporting and Compliance....16

5.0 EFFLUENT LIMIT DEVELOPMENT....16

5.1 Basis for Permit Effluent Limits....16

5.2 Technology-Based Effluent Limits....17

5.3 Water Quality-Based Effluent Limits....21

6.0 LIMITATIONS AND MONITORING REQUIREMENTS....29

6.1 Limitations and Monitoring for Graywater (Discharge 002)....29

6.2 Limitations and Monitoring for Gravel Pit and Excavation (Discharges 003 – 004)..30

6.3 Limitations and Monitoring for Hydrostatic Test Water (Discharge 005)....32

6.4 Limitations and Monitoring for Storm Water Discharge (Discharge 006)....34

6.5 Limitations and Monitoring for Mobile Spill Response (Discharge 007) 35
6.6 Limitations and Monitoring for Secondary Containment (Discharge 008) 35
6.7 Additional Monitoring 36
7.0 RECEIVING WATERS 36
7.1 Water Quality Standards 36
7.2 Mixing Zones 37
8.0 PLAN SUBMITTAL REQUIREMENTS (18 AAC 72) 42
9.0 ANTIBACKSLIDING 43
10.0 ANTIDEGRADATION 45
11.0 OTHER PERMIT CONDITIONS 51
11.1 Standard Permit Conditions 51
11.2 Best Management Practices Toolkit 51
11.3 Storm Water Pollution Prevention Plan 56
11.4 Quality Assurance Project Plan 58
11.5 Notice of Intent Procedures 59
11.6 Notice of Transfers 61
11.7 Notice of Termination 62
11.8 Permit Expiration 62
12.0 RECORDING AND REPORTING REQUIREMENTS 62
12.1 Discharge Monitoring Reports 62
12.2 Annual Reports 63
13.0 OTHER LEGAL REQUIREMENTS 63
13.1 Endangered Species Act 63
13.2 Essential Fish Habitat (EFH) 65
13.3 Refuges, Critical Habitat Areas, Sanctuaries, and State Ranges 65
14.0 REFERENCES 66

ATTACHMENTS

ATTACHMENT A – FIGURES **68**

ATTACHMENT B – EXISTING PERMIT AUTHORIZATIONS TABLE **71**

ATTACHMENT C – EFFLUENT LIMIT CALCULATIONS **76**

ATTACHMENT D – MIXING ZONE ANALYSIS CHECKLIST **79**

TABLES

Table 1: Characterization of DMR Data from Graywater Discharges (Discharge 002) **10**

Table 2: Characterization of Max Daily Observations from Gravel Pit Dewatering (Discharge 003) **11**

Table 3: TBEL Data from Previous Bulk Fuel Facilities Operating Under IPs **20**

Table 4: TBEL Data from Existing Bulk Fuel Facilities Operating Under IPs **21**

Table 5: Comparison of Paired Data for TAH/TAqH and TOC/O&G **21**

Table 6: Effluent Limits and Monitoring Requirements for Graywater (Discharge 002) ... **30**

Table 7: Effluent Limits and Monitoring Requirements for Gravel Pit and Excavation Dewatering (Discharges 003 – 004) **31**

Table 8: Effluent Limits and Monitoring Requirements for Hydrostatic Testing Water (Discharge 005) **33**

Table 9: Effluent Limitations and Monitoring Requirements for Mobile Spill Response (Discharge 007) **35**

Table 10: Effluent Limitations and Monitoring Requirements for Secondary Containment (Discharge 008) **36**

1.0 INTRODUCTION

1.1 Legal Basis

Section 301(a) of the Clean Water Act (CWA) and Title 18 of the Alaska Administrative Code (AAC), Chapter 83, Section 15 (18 AAC 83.015) provide that the discharge of pollutants to waters of the United States (U.S) located in Alaska is unlawful except in accordance with an Alaska Pollutant Discharge Elimination System (APDES) permit. Often the discharge of pollutants is regulated through an individual APDES permit. However, 18 AAC 83.205 authorizes the issuance of a general APDES permit to categories of discharges when a number of point sources are:

- located within the same geographic area and warrant similar pollution control measures;
- involve the same or substantially similar types of operations;
- discharge the same types of wastes;
- require the same effluent limits or operating conditions;
- require the same or similar monitoring requirements; and
- in the opinion of the Alaska Department of Environmental Conservation (DEC or Department), are more appropriately controlled under a general permit than under individual permits.

Per 18 AAC 83.210(a), a general permit is to be administered according to the individual permit regulations in 18 AAC 83.115 and 18 AAC 83.120. Like an individual permit, a violation of a condition contained in a general permit constitutes a violation of the CWA and subjects the Permittee of the facility with the permitted discharge to the penalties specified in AS 46.03.020(13). In accordance with 18 AAC 83.155, the Permit has a term of 5 years and those authorizations under the general permit will remain in force and effect via administrative extension should the Department be unable to reissue the permit prior to its expiration date.

1.2 Individual Permit

A Permittee authorized to discharge under a general permit may request to be excluded from coverage by applying for an individual permit. This request must be made by submitting APDES permit application Form 1 and Form 2C with supporting documentation to DEC.

The Department may require any entity authorized by a general permit to apply for and obtain an individual permit, or any interested person may petition the Department to take this action. Per 18 AAC 83.215, the Department may consider the issuance of an individual permit when:

- The discharger is not in compliance with conditions of the general permit,
- A change has occurred in technology or practices,
- Effluent limits guidelines (ELGs) are promulgated,
- A water quality management plan is approved,
- DEC determines that the discharge is significant, or
- Total Maximum Daily Load (TMDL) has been completed.

2.0 BACKGROUND

Oil-field operations on the North Slope Borough (NSB) initiated in the early 1920's when the United States Navy began to explore for oil and gas and established what would eventually become known as the National Petroleum Reserve. From the 1920's through early 1960's, pockets of exploration and development activities and support infrastructure began to appear. It wasn't until the discovery and development of North America's largest oil field (Prudhoe Bay Unit) in 1968-1970 and the completion of the Trans Alaska Pipeline in 1977 that a permanent development and production force has been in place. While more recent years have shown a steady decline in oil production on the North Slope, there is still significant activity on the North Slope, new reserve discoveries, and the development of existing gas resources as a commodity for instate and potentially for international distribution. Currently, there are approximately 24 units (at least 12 of which are producing) on the NSB.

The North Slope GP is designed to cover wastewater discharges associated with various phases of these oil-field operations. Potential discharges associated with industry operations are evaluated by the Department during each permit cycle. The Permit is modified based on changes in the industry, environment, available technology, regulations, and permitting authorities. Below is a brief description of activities associated with oil-field operations on the North Slope and the history of the North Slope GP.

2.1 Industry Description

Oil-field operations covered by the North Slope GP involve three distinct but closely related phases: exploration, development, and production. Seismic exploration on the North Slope typically includes the deployment of small to medium sized crews that place vibrating equipment and receivers in a pattern along the tundra or ice surface. Due to the nature of the terrain, these activities are generally conducted during winter months when the tundra and lakes freeze over and provide an easily traversable surface while minimizing environmental impacts. Seismic exploration crews can spend the entire winter collecting data for a single area of interest. Temporary camps and fuel tanks are fitted on sleds and transported across snow and ice from one area to the next using track equipment (Cat-trains). When a commercially feasible quantity of oil or gas is found to be present, exploratory drilling activities to prove the resource may also be conducted in the winter. Temporary ice roads and ice pads are often constructed on the tundra for transportation of equipment, housing people, delivering supplies, and transporting waste to approved disposal facilities. Large volumes of water from a variety of sources are used during these exploratory drilling operations for the construction of ice roads and pads, for consumption and domestic needs, equipment wash, and for drilling. Depending on the use, the water can be sourced by dewatering nearby gravel pit mine sites, reservoirs, wells, ice and snow melt, or trucked in from a commercial source (NSB Service Area 10).

When an economically viable discovery is made during the exploration process, the development phase often follows. This phase involves additional drilling, and the construction of more

permanent facilities such as gravel pads and roads, airstrips, waste disposal facilities, seawater treatment plants, power generation facilities, fuel storage areas, buildings for storage and maintenance of supplies and equipment, and other oil-field related facilities.

Once infrastructure has been developed on a site, production can begin. The primary differences between the two initial stages and production are (1) the large volumes of fluids and wastes that are handled, transported, and disposed; (2) the semi-permanent infrastructure required; and (3) the ability to conduct certain activities year around.

2.2 Permit History

2.2.1 History of the Existing and Previous North Slope General Permit's

The North Slope GP was first issued by the Environmental Protection Agency (EPA) in 1997 and authorized Domestic Wastewater, Graywater, Gravel Pit Dewatering and Excavation Dewatering. In 1998, the permit was amended to extend the area of coverage to marine waters offshore of the NSB for discharges from Graywater, Domestic Wastewater, and meltwater from ice roads and ice pads constructed using Gravel Pit water. The Permit was reissued in 2004 and included new discharges from Storm Water and Mobile Spill Response Units.

On October 31, 2008, EPA approved an application from the State to administer the National Pollutant Discharge Elimination System (NPDES) Program. Under the State program, EPA phased the transfer of authority to administer specific NPDES program components as follows:

- Phase I (transferred October 2008): domestic discharges, timber, and seafood processing.
- Phase II (transferred October 2009): federal facilities, storm water, pretreatment program, and miscellaneous nondomestic discharges.
- Phase III (transferred October 2010): mining.
- Phase IV (transferred October 2012): oil and gas facilities, cooling water intake structures and discharges, munitions, and remaining facilities not transferred in Phases I-III.

When EPA reissued the existing Permit in 2012, they removed Graywater and Domestic Wastewater discharges because DEC had taken over primacy for domestic wastewater authority in 2008. To cover the resulting gap in coverage, the Department issued APDES general permits AKG426000 and AKG570000 for Graywater and Domestic Wastewater, respectively. Secondary Containment water was previously considered an allowable non-storm water discharge in previous permits. The 2012 general permit added Secondary Containment (Discharge 008) as a discrete discharge. Hydrostatic Test Water (Discharge 005) was broadened to include existing pipelines that required limitations for petroleum hydrocarbons.

During the effective period of the existing North Slope GP, there have been 66 permit authorizations of which there are currently 58 active (Attachment B – Table B.1). Below is the quantity of authorizations made for each outfall category:

OUTFALL	DISCHARGES DISCRIPTION	QUANTITY
003	Gravel Pit Dewatering	32
004	Excavation Dewatering	5
005	Hydrostatic Test Water	6
006	Storm Water	35
007	Mobile Spill Response	8
008	Secondary Containment	16

2.2.2 History of the Existing Graywater General Permit (AKG426000)

Following the Phase I transfer of authority from EPA to DEC in 2008, the Department issued AKG426000 in 2013 to provide coverage for graywater discharge authorizations vacated by the existing Permit. During the effective period of the existing Graywater GP (to date), there have been 9 permit authorizations of which there are currently 8 active (Attachment B – Table B.2).

2.2.3 2017 Reissuance of the North Slope GP

As of October 31, 2012, the authority for all four phases of the NPDES program have been transferred to the State APDES Program. As a result, the Department intends to reinstate Graywater discharges while reissuing the Permit to eliminate duplicative permitting. The Permit will provide clarification for permitting Gravel Pit Dewatering (003) sources, clarify applicability of limits for turbidity when not discharging directly to an open waterbody, and remove the daily volume limit previously established to prevent sediment and erosion control problems. The Department also seeks to align the reissued North Slope GP with other recently developed permits that have similar discharges. This alignment will include, but not be limited to, plan submittal requirements for domestic and nondomestic discharges under the most recent version of 18 AAC 72 for graywater treatment systems, minimum treatment waivers, and treatment processes or systems that may be necessary to ensure compliance under the Permit. Some plan submittals may be necessary to adopt a treatment control strategy into a BMP Plan. Lastly, DEC intends to restructure authorizations and reporting requirements to improve permit management and rectify reporting problems.

3.0 PERMIT COVERAGE

3.1 Coverage Area

The Permit will authorize certain discharges to fresh waters located in the NSB and coastal marine waters of the U.S. offshore of the NSB that are landward of the inner boundary baseline per 18 AAC 83 (See Attachment A – Figure A.1). Coverage does not apply to wastewater discharged into impaired waterbodies (as listed on the CWA Section 303(d) list if the wastewater contains the pollutant that causes or contributes to the impairment).

3.2 Authorized Discharges

Permit coverage will include discharges associated with oil and gas exploration, development, and production activities and related facilities (e.g., service company facilities). However, the Permit does not apply to mobile offshore drilling units, lift boats, barges, or other floating facilities. The North Slope GP is developed to provide multiple wastewater discharges authorizations for the oil and gas industry under a single general permit rather than several. The following wastewater discharges are authorized under the Permit:

OUTFALL	DISCHARGE DISCRIPTION
002	Graywater
003	Gravel Pit Dewatering
004	Excavation Dewatering
005	Hydrostatic Test Water
006	Storm Water from Industrial Facilities
007	Mobile Spill Response
008	Secondary Containment

3.3 Exemptions from Oil and Gas Storm Water Coverage

In 1987, the Water Quality Act added section 402(*l*)(2) to the Clean Water Act (CWA) which provided an exemption for the oil and gas industry in federal NPDES storm water permits. Section 402(*l*)(2) of CWA specifies that, "*Environmental Protection Agency (EPA) and States shall not require NPDES permits for uncontaminated storm water discharges from oil and gas exploration, production, processing or treatment operations, or transmission facilities.*" In 2005, section 323 of the Energy Policy Act added a new provision to CWA defining the terms oil and gas exploration, production, processing, or treatment operations or transmission facilities to mean, *"all field activities or operations associated with exploration, production, processing, or treatment operations, or transmission facilities, including activities necessary to prepare a site for drilling and for the movement and placement of drilling equipment, whether or not such field activities or operations may be considered to be construction activity,"*
[per 33 U.S.C. § 1362(24)] (EPA, 2014).

The additions to the CWA referenced above exempt the oil and gas industry (including associated construction activities), from Federal NPDES storm water permits, in certain instances. However, facilities that have had a discharge of storm water resulting in a reportable quantity for which notification is or was required per 40 CFR 117.21, 40 CFR 302.6, or 40 CFR 110.6 or any storm water that contributes to a violation of a water quality standard [40 CFR 122.26(c)(1)(iii)]), are required to immediately obtain an APDES permit for storm water for the entire operating life of the facility. Because the exemption only applies until there has been a reportable quantity, the Department encourages all permittees to seek coverage for this discharge despite their ability to claim the exemption. Having a SWPPP developed for each facility improves site management and pollution control. This outfall is designated for those discharges

which do not meet the requirements for the exemption and for discharges from facilities electing to receive coverage.

4.0 WASTEWATER CHARACTERIZATION

The North Slope GP authorizes wastewater discharges from sources applicable to industrial oil and gas activities on the North Slope Borough. Data collected from discharge monitoring reports (DMRs) for the existing North Slope GP (AKG331000) and Graywater GP (AKG426000) has been used to support the characterization section, where applicable. Other data collected from individual APDES permit authorizations (i.e., bulk fuel permits) is also used to provide information about discharges where there is insufficient data to evaluate for that discharge.

4.1 Graywater Characterization and Compliance History (Discharge 002)

Per 18 AAC 72, graywater is defined as wastewater generated from laundry, kitchen, sink, shower, bath, or other domestic source. Graywater does not contain excrement, urine, or combined storm water. Graywater on the North Slope is typically generated from mobile camps used to house geophysical exploration crews during winter months. These facilities are mounted on sleds that are moved from site to site throughout a season. Some remote camps on the North Slope have a graywater treatment system that meets secondary treatment standards, but most are only equipped with a primary treatment system which removes settleable solids (grit) and possibly a method of disinfection such as ultraviolet (UV) or chlorination.

4.1.1 Graywater Characterization Data

Parameters of concern (POCs) for graywater include, pH, total suspended solids (TSS), 5-day biochemical oxygen demand (BOD_5), fecal coliform bacteria (FC), residues, and total residual chlorine (TRC) when chlorine is used as a disinfectant. Escherichia coli (E. coli) and enterococci bacteria are generally of concern near recreation areas where individuals may come into contact with bacteria (i.e., contact recreation criteria). Contact recreation criteria for E.coli and enterococci are likely to be promulgated in the Alaska Water Quality Standards (WQS) during the next Permit cycle. DEC evaluated available effluent data from facilities discharging to freshwater; no data is currently available for marine discharges as shown in Table 1.

Table 1: Characterization of DMR Data from Graywater Discharges (Discharge 002)

Parameter	Units	Existing Limits		Mixing Zone[1]	No Mixing Zone[2]
		MDL	AML	(Low-High; Average)	(Low-High; Average)
Flow	gpd	5000	5000	1225-2431; 1850.9	0-5000; 1171.4
TRC[3]	µg/L	19	11	0-7.0; 0.5	
BOD_5 [3]	mg/L	2305	826	2-**2400**[4]; 689	
TSS [3]	mg/L	820	296	1.6-**930** [4]; 236.7	
FC $_{\text{Mixing Zone}}$	#/100mL	400	200	150-400; 337.5	N/A
FC $_{\text{No Mixing Zone}}$	#/100mL	40	20	N/A	3-**15800 ; 1207.1**[4]

NOTES:
1. There were three facilities discharging to freshwater with an authorized mixing zone.
2. There were five facilities discharging to freshwater without an authorized mixing zone.
3. These parameters are not mixing zone dependent and apply to all discharges.
4. Bold values represent an exceedance with existing limits.

4.1.2 Graywater Compliance History

Since the development of the Graywater GP in 2012, there have been few exceedances. There were less than seven percent (%) for TSS, less than 10% for BOD_5 (less than 10%). For the three facilities which have a mixing zone, there were no additional exceedances reported for other parameters. For the five facilities without a mixing zone, data indicate an exceedance rate of 37% for FC bacteria. However, if those same facilities had applied for a mixing zone, the number of exceedances would have been reduced to two incidents. There is no data available from the one marine discharge authorization issued during the permit cycle. Permittees should evaluate their treatment systems, BMP Plan, and operations and maintenance procedures for the facility as well as consider requesting a mixing zone when reapplying for the North Slope GP.

4.2 Gravel Pit Dewatering Characterization and Compliance History (Discharge 003)

Gravel deposits are typically composed of weathered and eroded unconsolidated rocks fragments that may include silt and clay lenses deposited by rivers and glaciers. Gravel pits are developed for construction of roads, pads, and other fill activities. These mine sites can accumulate water from groundwater infiltration, rain and snowmelt water during breakup, wash down activities used to clean rock material, or other sources. Water that accumulates in the quarry is generally removed to provide access to material extraction. Once a gravel pit is no longer used for gravel mining, dewatering for gravel extraction is no longer applicable and the mine site is rehabilitated into a waterbody for habitat (i.e., a receiving water). Water from a rehabilitated mine site, as determined by Alaska Department of Fish and Game (DF&G), is no longer consider a wastewater source and does not require a discharge authorization under the North Slope GP.

The most common methods for gravel pit dewatering for gravel mining are submersible pumps, wells, and well points. The discharge of gravel pit water is typically to a nearby waterbody or tundra (i.e., point discharges). During spring break-up, flooding can necessitate the discharge of large volumes of water to access gravel when needed the most. This may require multiple pumps

with multiple discharge points. On the North Slope, gravel pit water is also used as a source for ice roads and pad development during the winter months and for dust suppression on gravel roads in the thawed season.

4.2.1 Gravel Pit Dewatering Characterization Data

Gravel extraction often requires contained water that collects in the mining pit to be discharged so that operating equipment can access the material. Typically, this water is discharged to a nearby waterbody or to tundra. POCs associated with these activities include turbidity and sediment or settleable solids (SS) from disturbing the material, as well as pH, and petroleum hydrocarbons (oil and grease) from operating equipment. When possible, industry prefers to reuse the gravel pit water on the NSB for other purposes such as ice road construction and dust suppression. When the repurposed water is applied to gravel, tundra, or ice, turbidity is not generally a POC, and dependent upon the application, settleable solids also may not be a POC. Table 2 provides a summary of data from available DMRs during the previous permit cycle that characterizes gravel pit discharges.

Table 2: Characterization of Max Daily Observations from Gravel Pit Dewatering (Discharge 003)

	Units	Existing Limits		Reported Data
		MDL	AML	(Low-High; Average)
Flow	mgd	3		0.0088-2.9200; 0.5508
SS	mL/L	0.2		0.0-**0.4**; 0.16
pH (Min)	S.U.	6.5		6.7-8.3; 7.59
pH (Max)	S.U.	8.5		7.1-8.4; 7.94
Oil and Grease	Visual Monitor	No Sheen		No Sheen Reported

4.2.2 Gravel Pit Dewatering Compliance History

During this permit cycle, there have been 32 authorizations for gravel pit dewatering. The Department collected 137 data observation points from DMR submittals and summarized the information in Table 2 above. There was one exceedance for settleable solids in a five year period indicating limits are attainable using current treatment methods. Previously monitored limits do not include turbidity, however, all other parameters are consistent with current permits which allow gravel pit dewatering discharges.

4.3 Excavation Dewatering Characterization and Compliance History (Discharge 004)

Excavation dewatering (formerly construction dewatering) is the removal of water from excavated areas where precipitation, snowmelt water, or groundwater infiltration accumulates and hinders the construction activity. Excavation dewatering is primarily related to trenching activities while installing or repairing utilities and pipelines, but may also be related to other activities such as foundation or vertical support member installations. The most common

methods for dewatering include submersible pumps, wells, well points, and vacuum trucks for small volumes. Dewatering activities near gravel bed streams will likely require higher rates of discharge as larger grain sizes associated with gravel tend to be more permeable when compared to locations with less permeable sediments (i.e., silts and clays).

4.3.1 Excavation Dewatering Characterization Data

The main POCs for excavation dewatering are sediment and turbidity. Sediment can typically be effectively controlled using filtration or sediment basins. Turbidity may be more difficult to control depending on how much the turbidity is associated with fine-grained materials. Finer silts and clays are not readily removed in filters or basins unless enhanced by the use of coagulant aids. Excavation water may also come into contact with small quantities of petroleum hydrocarbons, oils and grease from operating equipment. Infrequently, excavation dewatering may encounter existing sources of underground hydrocarbon contamination.

When excavations occur next to underground sources of contamination, the discharges can include additional POCs depending on the nature of the contaminant. Typically, the contaminants are petroleum hydrocarbons. However, solvents and metals may also be contaminants of concern. These excavations near contaminated sites require coordination with DEC Contaminated Sites Program (CSP).

4.3.2 Excavation Dewatering Compliance History

During the history of this permit cycle, there have been six authorizations for this discharge. However, there is no data currently available to quantitatively characterize this discharge. Therefore, qualitative POCs are used and are consistent with other permits authorizing excavation dewatering discharges.

4.4 Hydrostatic Test Water Characterization and Compliance History (Discharge 005)

Before a new or repaired pipeline or tank is entered into service, a pressure test using water is performed to verify that no leaks are present. Certain hydrostatic test practices include the use of antifreeze chemicals to prevent freezing in the winter months and biocides to prevent development or proliferation of bacteria. However, the use of these chemicals are considered atypical and are not considered for the Permit. Hydrostatic Test Water also includes other similar contained water discharges from fuel or oil tanks, water tanks, valve vault discharges, basement discharges, non-hydrocarbon bearing lines associated with ancillary pipelines related to oil and gas facilities, and utilidor discharges

4.4.1 Hydrostatic Test Water Characterization Data

For pipelines or other infrastructure which have not previously been exposed to hydrocarbons, the primary POC is sediment or debris left behind during construction. Alternatively, infrastructure which has previously been exposed to hydrocarbons may also contain petroleum hydrocarbons (e.g., existing pipeline or tank repairs). Sediment, turbidity, petroleum

hydrocarbons and oil and grease, total aromatic hydrocarbons (TAH), and total aqueous hydrocarbons (TAqH) are typical POCs for existing infrastructure in contact with hydrocarbons. Common treatment and discharge methods include settling ponds, sediment and erosion control (velocity reduction on splash pads, rubble mound infiltration into dry stream channels, pumping to tundra areas, and pumping to ice or snow areas).

4.4.2 Hydrostatic Test Water Compliance History

During the history of this permit cycle, there have been five authorizations for this discharge. However, there is no data currently available to quantitatively characterize this discharge. Therefore, qualitative POCs are used and are consistent with other permits authorizing hydrostatic test water discharges.

4.5 Storm Water Characterization from Industrial Facilities (Discharge 006)

Storm water runoff originates from rain, snow, and snowmelt events that, if not appropriately managed, can come into contact with contaminants (contact storm water) such as sediment, debris, and chemical pollutants, which can eventually discharge into receiving waters. The management techniques used to prevent discharges from coming into contact with sources of contamination are dependent upon the type of facility and the risks associated with the industrial activities. In general, water that has come into contact with a source of contamination that would result in violation of water criteria is not allowed to be discharged as storm water (non-allowable storm water discharges). In addition, there are specific types of discharges that are allowed to be discharged along with storm water such as firefighting water (allowable non-storm water discharges). Lastly, there are discharges that are prohibited because they are specifically covered by effluent limitation guidelines for the specific industrial activity (e.g., gravel pit dewatering). Only discharges of non-contact storm water or allowable non-storm water discharges are authorized by the Permit.

Similar to the 2012 North Slope GP, DEC has identified the following activities associated with oil and gas industrial facilities that have the potential to be a source of pollutants in storm water discharges:

1. Industrialized resource extraction areas including drill sites and gravel removal areas located on existing roads and pads;
2. Access roads, docks and airstrips used or traveled by carriers of raw materials, intermediate products, or finished products;
3. Sites used for storage of manufactured products, waste material or byproducts used or created by the facility;
4. Material handling and storage sites, refuse sites, and sites used for the application or disposal of process wastewaters;
5. Production reserve pits which have been closed under 18 AAC 60 and converted to storm water storage areas;
6. Sites used for residual treatment, storage or disposal of production or remediation wastes:

    a. Shipping and receiving areas;
    b. Manufacturing buildings, including electric power generation plants, storage areas (including tank farms) for raw materials and intermediate and finished products;
7. Areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. Significant materials include but are not limited to raw materials, fuels, solvents, detergents, plastic pellets, finished materials, fertilizers, pesticides, and waste products such as sludge.

Allowable non-storm water discharge activities generally discharged with storm water discharges include:

1. Fire-fighting flows, fire water storage vessel and fire hydrant flushing discharges, including periodic fire suppression test discharges, and fire training discharges;
2. Waters used to wash vehicles where detergents are not used;
3. Water used for dust control
4. Potable water sources including uncontaminated waterline flushing and drinking fountain water;
5. Landscape watering and irrigation drainage – Not a common practice but may be used on occasion for re-vegetation projects;
6. Routine external building, pipeline, and power line wash down that does not use detergent or other compounds;
7. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used;
8. Uncontaminated condensate from air conditioners, coolers, and other compressors and from the outside storage of refrigerated gases or liquids;
9. Uncontaminated, non-turbid discharges springs or groundwater;
10. Uncontaminated foundation or footing drains; and
11. Electrical insulator steaming;
12. Other uncontaminated discharges meeting water quality criteria that the Department approves on a case-by-case basis.

The volume of storm water discharged and pollutants of concern are dependent on many variables, including the type of industrial activity that the facility is engaged in (sector of industry), and the type and intensity of the runoff event. However, the typical POCs associated with storm water runoff and allowable non-storm water runoff from these facilities are sediment, petroleum hydrocarbons, and oil and grease but may also include metals or other chemicals stored at a facility.

4.6 Mobile Spill Response Characterization and Compliance History (Discharge 007)

Mobile Spill Response covers discharges associated with treated snowmelt, rain, or other water that has come into contact with hydrocarbons such as motor oil, diesel, gasoline, transmission,

hydraulic oil from small leaks that are collected from motorized vehicles and equipment. Other sources include, but may not be limited to, drip pan water and shop melt water. Treatment for small volumes of hydrocarbon impacted water is generally achieved by removing the sheen and placing the impacted water in a 55-gallon water-scrubbing unit which contains oleophilic absorbents to remove the dissolved hydrocarbon. Currently, these types of systems have been demonstrated to be effective and are used extensively on the North Slope. To ensure adequate removal of free-phase and dissolved hydrocarbons can be attained, information about the proposed treatment system is submitted to the Department before it is adopted as a BMP control**.**

4.6.1 Mobile Spill Response Characterization Data

Water impacted by petroleum hydrocarbons will be the only source considered under mobile spill response. Accordingly, petroleum hydrocarbons are the POCs associated with mobile spill response discharges. The discharge must receive an adequate level of treatment that can remove free-phase and dissolved hydrocarbons.

4.6.2 Mobile Spill Response Compliance History

During the history of this permit cycle, there have been nine authorizations for this discharge. However, there is no data currently available to quantitatively characterize this discharge. Therefore, the qualitative POCs is used and is consistent with other permits authorizing mobile spill response discharges.

4.7 Secondary Containment Characterization and Compliance History (Discharge 008)

Secondary containment areas (SCAs) are diked or bermed areas around hydrocarbon tanks, tank farms, fuel transfer stations, and tanker truck loading racks which provide an emergency storage area and help to prevent accidental spills from reaching the environment or Waters of the U.S. These areas are susceptible to rain or snowmelt accumulation which must be discharged to ensure the volume capacity is retained for Spill Prevention, Control, and Countermeasures Plan. SCAs are designed to contain the volume of the largest tank within the SCA plus precipitation (e.g., precipitation from a two-year, 24-hour storm event). SCA's are typically constructed of steel, synthetic liners or synthetic lines with a layer of gravel on top to protect the liner.

4.7.1 Secondary Containment Characterization

While SCA's may be used in limited instances for the storage of non-petroleum chemicals, the North Slope GP was developed to cover only discharges for SCA's around petroleum hydrocarbon storage tanks or transfer areas. Accordingly, only SCA's required by 40 CFR 112 – Oil Pollution Prevention or 18 AAC 75 – Oil and Other Hazardous Substances Pollution Control, Article 1 that discharge to waters of the U.S. are covered by the North Slope GP. Accordingly, the POC's associated with SCAs are petroleum hydrocarbons and pH.

4.7.2 Secondary Containment Compliance History

There have been 16 authorizations for Secondary Containment (Discharge 008) and no reports of contaminated discharges from permittees. However, there are other fuel facilities that are

operating under other APDES permits. Data from these facilities will be presented in Section 5.2.2.3.

4.8 General Trends in Reporting and Compliance

The North Slope GP and the Graywater GP are unique permits where the majority of discharge authorizations occur only during a certain seasons and many times they do not occur at all. Reporting is an important component of the CWA to ensure water quality is protected and provides information to DEC about overall trends in discharge activity, wastewater characterization, and water quality. A desktop audit of the North Slope GP and the Graywater GP resulted in a significant list of non-reporting violations. The Department found that reporting requirements are inconsistently met from one permittee to another throughout the permit cycle and. In most cases, permittees did not appear to provide the required annual certification reports, inspection certifications, or DMRs. Some of these omission are likely the result of not understanding that permittees must report even if they did not discharge during the reporting period. This situation may be exacerbated by not terminating a discharge intended for a single event (excavation dewatering or hydrostatic testing) when it was no longer needed.

The Department looks to improve the number of these types of violations by providing education and communication opportunities for existing and new permittees to help ensure reporting obligations are fully understood. The North Slope GP includes a Schedule of Submissions table (Permit – Table 1) as a quick reference guide for permit submittal requirements. The Department also seeks to provide a post issuance follow-up meeting and ongoing North Slope GP introduction opportunities (for new permittees) to discuss permittee questions, permit coverage options, and permit submittal requirements. Other changes will be discussed in subsequent sections based on these observed reporting trends.

5.0 EFFLUENT LIMIT DEVELOPMENT

5.1 Basis for Permit Effluent Limits

18 AAC 83.015 prohibits the discharge of pollutants to waters of the U.S. unless first obtaining a permit implemented by the APDES point source discharge program that meets the purposes of Alaska Statutes 46.03 and in accordance with CWA Section 402 and the requirements adopted by reference at 18 AAC 83.010. Per these statutory and regulatory provisions, the permit includes effluent limits for discharges to water of the U.S. that require the discharger to (1) meet standards reflecting levels of technological capability, (2) comply with water quality standards in 18 AAC 70 (WQS), and (3) comply with other state requirements that may be more stringent.

In establishing permit limits, DEC first determines which technology based effluent limits (TBELs) from national ELG's must be incorporated into the permit. Where national ELGs have not been developed, or did not consider specific pollutant parameters in discharges, the same performance-based approach applied to develop national ELGs is applied to specific industrial discharges using Best Professional Judgment (BPJ) to develop TBELs for the permit. DEC then

evaluates the effluent quality (See Section 4) expected to result from these technological controls to determine if the discharge could result in exceedances of the water quality criteria in the receiving water. If the expected water quality of the effluent could reasonably be exceeded, or contribute to an exceedance of applicable water quality criteria, a water quality based effluent limit (WQBEL) must be included in the permit. The limits in the permit reflect whichever requirements (technology-based or water quality-based) are more stringent. Using this process as described, DEC has developed permit conditions that comply with WQS and protect existing or designated uses of the receiving waterbody.

5.2 Technology-Based Effluent Limits

TBEL's include specific effluent limits promulgated for industrial categories (ELGs) or TBELs developed using case-by-case BPJ. The following sections discuss applicable TBELs evaluated during effluent limit development and ultimately compared to any WQBEL for selecting the most stringent effluent limit.

5.2.1 Developing TBELs Using Effluent Limit Guidelines

National ELGs are developed based on the demonstrated performance of a reasonable level of treatment that is within the economic means of specific categories of industrial facilities. For conventional pollutants (see 40 CFR § 401.16), CWA Section 301(b)(1)(E) requires the imposition of effluent limits based on Best Conventional Pollutant Control Technology (BCT). For nonconventional and toxic pollutants, CWA Section 301(b)(2)(A), (C), and (D) require the imposition of effluent limits based Best Available Technology Economically Achievable (BAT). CWA Section 301(b) requires compliance with BCT and BAT no later than March 31, 1989. The compliance deadline for Best Practicable Control Technology Currently Available (BPT) was July 1, 1977. DEC reviewed existing ELG's to the type of industrial facilities covered by the North Slope GP and compared them to applicable ELGs. As a result of the review, DEC determined there are applicable TBELs based on ELGs for coastal marine discharges of Graywater (Discharge 002), Gravel Pit Dewatering (Discharge 003), and Storm Water (Discharge 006).

5.2.1.1 Effluent Limit Guidelines for Graywater Discharges (Discharge 002)

Per 18 AAC 83.010(g)(3), DEC adopted by reference federally promulgated national ELGs for the Oil and Gas Extraction Point Source Category (40 CFR Part 435). The Oil and Gas Extraction Point Source Category is further divided into Subpart C (Onshore Subcategory) and Subpart D (Coastal Subcategory); both subcategories are applicable to the regions authorized by the North Slope GP. In the coastal subcategory of 40 CFR Part 435 Subpart D, EPA expressly regulates the discharge of graywater (defined as "domestic waste" in the ELG) and provides narrative effluent limits controlling the discharge of solids, garbage, and foam. The onshore subcategory (Subpart C) does not include limits for graywater discharges.

5.2.1.2 Effluent Limit Guidelines for Gravel Pit Dewatering (Discharge 003)

Effluent limits based on BPT for Gravel Pit Dewatering are published in 40 CFR §436 Subpart C – Construction Sand and Gravel Subcategory. The BPT ELG states that mine dewatering discharges shall not be less than a pH of 6 or greater than a pH of 9.

5.2.1.3 Effluent Limit Guidelines for Storm Water (Discharge 006)

Similar to Graywater Discharges (Section 5.2.1.1), DEC adopted by reference [per 18 AAC 83.010(g)(3)] federally promulgated national ELGs for the Oil and Gas Extraction Point Source Category (40 CFR Part 435). In the coastal subcategory of 40 CFR Part 435 Subpart D; BPT, BAT, BCT, and new source performance standards (NSPS) requirements (40 CFR §§ 435.12 through 435.15) contain provisions that apply to the discharge of storm water runoff from deck drainage areas requiring no discharge of free oil, as determined by the presence of a visual sheen upon the surface of the receiving water. Consistent with the previous North Slope GP issuance, DEC has evaluated pollution control options and does not believe specific numeric effluent limitations or a specific design or performance standard are necessary to meet the BAT/BCT standards.

5.2.2 Developing TBELs Using Case-by-Case Best Professional Judgment

Per Section 402 of the CWA, developing a TBEL using case-by-case BPJ requires the permitting authority to consider the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, the cost of achieving such effluent reduction, non-water quality environmental impact (including energy requirements), the cost of implementing these conditions relative to the environmental benefits achievable, and such other factors as deemed appropriate. Frequently, existing ELGs established for similar industries that are believed to have similar waste streams, treatment technology, and waste characteristics are used to justify TBELs using BPJ because an analysis has already been performed. There is always a risk that the comparison is not appropriate because the waste stream or the waste characteristics are not as similar as originally conceived.

The Department reviewed TBELs based on BPJ for discharges from graywater, gravel pit dewatering, excavation dewatering, hydrostatic test water, and secondary containment areas to ensure compliance with Section 402 of the CWA.

5.2.2.1 Best Professional Judgment for Graywater Discharges (Discharge 002)

As discussed in Section 4.1, POC's for Graywater (Discharge 002) include pH, TSS, BOD_5, TRC (when chlorine is used as a disinfectant), residues, and FC bacteria. Neither Alaska WQS (18 AAC 70) nor 40 CFR Part 435 ELGs contain effluent limits for TSS and BOD_5 in graywater. DEC has considered factors outlined in Section 5.2.2 in developing TBELs using case-by-case BPJ for TSS and BOD_5 and determined that the current model treatment technology of filtration is the most appropriate technology upon which to develop effluent limits.

Biochemical Oxygen Demand and Total Suspended Solids: As these facilities are not publicly-owned treatment works, federally promulgated secondary treatment requirements do not apply to the discharge. In addition, only permittees with graywater treatment systems that comply with 18 AAC 72 are eligible for coverage under this discharge (See section 8.0). This may mean that systems which do not meet secondary treatment would require a waiver from minimum treatment standards.

During the Graywater GP development, DEC previously developed TBELs using BPJ for TSS and BOD_5, using performance data submitted under EPAs 2004 – North Slope GP (AKG330000) that included 23 data points for TSS and 22 data points for BOD_5. From this performance data, DEC developed average monthly limits (AML) and maximum daily limits (MDL) using an approach consistent with EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD), the methodology used in establishing WQBELs, and the methodology EPA uses to develop effluent limits for ELGs. Below are the AMLs and the MDLs that were developed for TSS and BOD_5 in the Graywater GP:

	MDL	**AML**
TSS (mg/L)	820	296
BOD_5 (mg/L)	2305	826

The Department reapplied the same method described for the existing limits to evaluate TSS and BOD_5 data collected throughout the permit cycle of the Graywater GP (AKG426000) that included 32 data points for TSS and 27 data points for BOD_5. Evaluation of the Graywater GP data set yielded higher AML and MDL results for TSS and BOD_5 than those developed from the 2004 – North Slope GP (AKG330000) data set. Additional evaluation of the recent data shows effluent limits for TSS were exceeded less than seven percent of the time and less than ten percent of the time for BOD_5. The percentages indicate upsets are not a reoccurring issue and that more than 90% of the time, limits can be met. Instances of operator error or equipment malfunction likely contributed to those few exceedances, which can be resolved through improvements to operations and maintenance procedures in the BMPs. As the AML and MDL calculations are not an indication that the available treatment is unable to achieve the effluent limits established previously in the Graywater GP, DEC finds that relaxation of these limits is not warranted at this time. Attachment C of this fact sheet contains additional explanations and a summary of effluent limit calculations from the Graywater GP data set.

5.2.2.2 Best Professional Judgment for Gravel Pit Dewatering, Excavation Dewatering, and Hydrostatic Test (Discharges 003-005)

The existing Permit issued by EPA found the treatment technologies used to remove sediment from a gravel pit dewatering, excavation dewatering, and hydrostatic test activities were similar to the practice used for gold placer mining discharges. In the Gold Placer Mining category (40 CFR §440 Subpart M) the only parameter published is settleable solids with a limit of 0.2mL/L. DEC evaluated the previous case-by-case TBEL development using BPJ and carries them forward in this fact sheet to be compared to WQBELs.

5.2.2.3 Best Professional Judgment Based Limits for Secondary Containment (Discharge 008)

There are no EPA promulgated ELGs for discharges from bulk fuel storage SCAs. The existing Permit compared discharges from SCAs to ballast water discharges covered under ELGs for Petroleum Refining Point Source Category (40 CFR § 419.12) and developed TBELs using BPJ for BOD_5, TSS, chemical oxygen demand (COD), Oil and Grease, and pH.

More recently, four bulk fuel individual permits issued by the Department (AK0036994, AK0031429, AK0029459, and AK0029441) concluded SCA discharges are not comparable to ballast water. Ballast water as defined in 40 CFR § 419.11 is the flow of water from a ship, that is treated along with refinery wastewater in the main treatment system. Secondary containment areas (defined in Section 4.7) are diked areas around petroleum storage tanks, tank farms, fuel transfer stations and tanker truck loading racks that provide an emergency storage area and barrier to prevent accidental spills from reaching the environment. These areas are susceptible to rain or snowmelt accumulation that must be discharged to preserve the secondary containment capacity available for emergencies. Based on information available at the time, DEC concluded during the reissuance of the individual permits for bulk fuel facilities that discharges from SCAs may be more appropriately characterized as contaminated runoff rather than ballast water. Contaminated runoff defined in 40 CFR § 419.11 is runoff which comes into contact with any raw material, intermediate product, finished product, byproduct or waste product located on petroleum refinery property. Because the previous limits and monitoring were a technical error (unsubstantiated assumption), DEC removed limits for BOD_5, COD, and TSS. Available data was evaluated during the reissuance of the bulk fuel individual permits that supported an alternative assumption that SCAs may be more similar to contaminated runoff. Table 3 provides statistical summary of the data including minimum values (min), maximum values (max), averages, standard deviation, (StDev), coefficient of variation (CV), and the percent of the limit represented by the average value (% MDL).

Table 3: TBEL Data from Previous Bulk Fuel Facilities Operating Under IPs

TBEL(Units)	MDL	Count	(min - max) average	StDev	CV	% MDL
BOD5 (mg/L)	48	192	(2 - 37.4) 5.0	5.4	1.1	10
COD (mg/L)	470	87	(6.3 - 53.9) 16.4	9.0	0.5	3.5
TSS (mg/L)	33	262	(0.2 - 30.0) 9.9	5.8	1.0	17

Using the data above, DEC successfully removed the limits and monitoring requirements associated with ballast water for TSS, BOD_5, and COD from the bulk fuel individual permits and developed new TBELs using case-by-case BPJ. Citing 40 CFR § 419.12(e)(1) for contaminated runoff, the reissued individual permits included TBELs using case-by-case BPJ establishing daily maximum effluent limits for oil and grease (15 mg/L) and total organic carbon or TOC (110 mg/L).

Since the issuance of these individual permits, the Department has collected new data from these facilities for oil and grease and TOC that demonstrate observed effluent concentrations are far below the corresponding limits. A data summary for TOC and oil and grease is included in Table 4 to provide an improved understanding of SCA discharge characteristics.

Table 4: TBEL Data from Existing Bulk Fuel Facilities Operating Under IPs

TBEL (Units)	MDL	Count	(min - max) average	StDev	CV	% MDL
Oil and Grease (mg/L)	15	178	(1.32 – 6) 3.5	1.5	0.33	23%
TOC (mg/L)	110	190	(0.053 – 18) 4.1	3.71	.91	4%

The individual permits for bulk fuel SCAs also require quarterly monitoring for TAH and TAqH. To date, there have been three exceedances of water quality criteria for TAH or TAqH. Table 5 shows paired data sets for TAH, TAqH, Oil and Grease, and TOC for these exceedances.

Table 5: Comparison of Paired Data for TAH/TAqH and TOC/O&G

WQBEL Parameter Exceeded	Reported Value (µg/L)	Reported Oil and Grease (mg/L)	Reported TOC (mg/L)
TAH	97	4.17	5.07
TAH	43.6	4	5.14
TAqH	11.46	1.55	3.79

In each case where TAH and TAqH exceeded criteria, the paired data for oil and grease and TOC were not elevated. Based on available analytical data from representative SCAs, neither ballast water nor contaminated runoff ELGs defined in (40 CFR 419.12) appear to adequately define or limit the parameters of concern for SCAs. DEC finds the use of these TBELs based on case-by case BPJ (BOD_5, TSS, COD, TOC, and oil and grease) were a technical error and unnecessary to carry forward. Furthermore, the WQBELs for secondary containment based on water quality criteria for Petroleum Hydrocarbons, Oil and Grease 18 AAC 70.020(5)(A)(iii) and (17)(A)(i) are adequately stringent and are protective of water quality and existing uses of the waterbody (see Section 5.3.7).

5.3 Water Quality-Based Effluent Limits

CWA Section 301(b)(1) requires the establishment of limits in permits necessary to meet WQS by July 1, 1977. All discharges to state waters must comply with WQS, including the antidegradation policy. The APDES regulations at 18 AAC 83.435(a)(1) require that permits develop WQBELs that "achieve water quality standards established under CWA Section 303, including State narrative criteria for water quality." For discharges where comparisons are available between TBELs and WQBELs, the most stringent limit is adopted.

5.3.1 Narrative Limitations for All Discharges

Narrative criteria are established to help ensure that discharges do not result in objectionable conditions or make the receiving water unsafe for unfit for existing uses. DEC applies the following narrative limitations to all discharges under the permit.

Residues: Residues are defined in 18 AAC 70.990(49) as any floating solids, debris, sludge, deposits, foam, scum, or other material or substance remaining in a waterbody as a result of direct or nearby human activity. Based on the use classification for fresh water supply used for aquaculture per 18 AAC 70.020(b)(6)(A)(i) and marine water supply used for seafood processing per 18 AAC 70.020(b)(20)(A)(ii), residues 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 surface of the water or adjoining shorelines; cause leaching of toxic or other 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.

5.3.2 Graywater (Discharge 002)

Based on the characterization of graywater in Section 4.2, the Department believes there is reasonable potential to exceed, or contribute to an exceedance of numeric water quality criteria for the following parameters: TRC (when chlorine is used as a disinfectant or introduced to the system by some other means), pH, and FC Bacteria. Therefore, DEC establishes WQBELs based on applicable water quality criteria to ensure protection of water quality and existing uses of the waterbody. The narrative criteria for residues are adopted as a general limitation for all discharges. All numeric criteria apply to the effluent at the point of discharge. However, a mixing zone may be authorized for FC bacteria and residues (Section 7.2) with supportive information supplied in the mixing zone request form. For an authorized mixing zone, FC bacteria limits will be based on an appropriate wasteload allocation by applying a dilution factor of 10. The mixing zone dilution factor does not apply to WQBELs for TRC or pH. Lastly, to prepare for implementation of new criteria for Escherichia coli (E. coli) and Enterococci bacteria, monitoring for these parameters will be required. The following sections provide details into the WQBEL development.

Total Residual Chlorine: The *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (Toxics Manual)* [adopted by reference in 18 AAC 70.020(b)] lists acute and chronic water quality criteria for TRC which is protective of aquatic life for freshwater and marine waterbodies separately. Acute criterion is based upon a 24-hour average concentration and the chronic criterion is based upon a four day average concentration. The freshwater effluent limits for TRC are 19µg/L (acute) and 11µg/L (chronic). The freshwater effluent limits for TRC are 13µg/L (acute) and 7.5µg/L (chronic). The method detection limit for this parameter is 100 µg/L using EPA approved analytical methods and will be used as the compliance level for this parameter.

Fecal Coliform Bacteria: FC bacteria are a non-pathogenic indicator species whose presence suggests the likelihood that pathogenic bacteria are present. The most stringent fresh water quality criteria per 18 AAC 70.020(b)(2)(A)(i) provides protection of waterbodies for water supply designated for drinking, culinary, and food processing. The discharges without an authorized mixing zone, water quality criteria requires that in a 30-day period, the geometric mean may not exceed 20 FC/100mL (applied as an AML), and not more than 10% of the samples may exceed 40 FC/100mL (applied as a MDL). Per Section 7.2.2, graywater discharges with an authorized mixing zone receive a dilution factor of 10 for FC bacteria. The resulting freshwater AML is 200 FC/100mL and the MDL is 400 FC/100mL.

The most stringent marine water quality criteria per 18 AAC 70.020(b)(14)(D) and 18 AAC 70.020(b)(14)(D) provides protection of waterbodies for water supply designated for harvesting and consumption of raw mollusks or other raw aquatic life as well as seafood processing. The water quality criteria requires that in a 30-day period, the geometric mean may not exceed 14 FC/100mL (applied as the AML), and not more than 10% of the samples may exceed 40 FC/100mL (applied as the MDL). For graywater discharges to marine waters with a mixing zone, the AML is 140 FC/100mL and the MDL is 400 FC/100mL.

Permittees may demonstrate compliance with the MDL (with or without a mixing zone) in one of two ways: by showing the calculated 90th percentile of a data set does not exceed the MDL, or by determining that the maximum observed concentration does not exceed the MDL more than 10% of the time.

pH: Based on the use classification for water supply used for aquaculture per 18 AAC 70.020(b)(6)(A)(iii) and (b)(18)(A)(i), pH must meet 2 criteria, first, it must be no less than 6.5 standard units (SU) and no greater than 8.5 SU, and second, it may not vary from natural conditions by more than 0.5 SU for freshwaters or 0.2 SU for marine waters. Because graywater cannot be discharged to open waters, monitoring of natural receiving water conditions is infeasible. Department only applies the first part of this criteria.

Enterococci and E. coli: Enterococci and E. coli are indicator organisms of harmful pathogens in marine and fresh water and are a better indicator of acute gastrointestinal illness than fecal coliform bacteria. In 1986, EPA published Ambient Water Quality Criteria for Bacteria-1986 that contained their recommended bacteria water quality criteria for primary contact recreational users from gastrointestinal illness. Water quality criteria for E. coli and Enterococci bacteria are anticipated to be promulgated during the next permit cycle. Consideration of WQBELs are appropriate at this as the criteria has not been adopted and there is currently no data to support an RPA. Therefore, monitoring for E.coli in freshwater discharges and enterococci in marine discharges will be required to inform future permit development decisions.

5.3.3 Gravel Pit Dewatering (Discharge 003)

Based on the characterization section for gravel pit dewatering (Section 4.2) and the identified POCs, the Department finds there is reasonable potential to exceed or contribute to an

exceedance, of numeric water quality criteria at the point of discharge for the following parameters: pH, turbidity, and sediment. To ensure protection of water quality and existing uses of the waterbody the Department applies numeric WQBELs for pH, sediment, and turbidity. In addition, the Department establishes a prohibition to discharge oil and grease determined by an observation of a sheen. The presence of a sheen may indicate the presence of dissolved hydrocarbons but there is insufficient information to determine if limits are appropriate. The following sections provide details concerning the WQBELs for gravel pit dewatering discharges.

pH: Limits for pH discussed in Section 5.3.2 apply

Turbidity: Per 18 AAC 70.020(b)(12)(B)(i) discharges to open freshwaters used for contact recreation water supply may not exceed 5 nephelometric turbidity units (NTU) above natural conditions when the natural turbidity is 50 NTU or less, and may not have more than 10% increase in turbidity when the natural turbidity is more than 50 NTU, not to exceed a maximum increase of 15 NTU. Discharges may not exceed 5 NTU above natural turbidity for all lake waters. Per 18 AAC 70.020(b)(24)(A)(i) discharges to open marine waters used for aquaculture water supply may not exceed 25 NTU. For discharges to areas that are considered waters of the U.S. but do not have a direct connection to an open waterbody (i.e., dry stream channel, tundra, or snow), it may not be possible to demonstrate compliance. Water quality criteria for turbidity are in reference to ambient receiving water conditions. There are situations where collecting ambient receiving water measurements for turbidity is not possible (e.g., discharges to frozen environment, tundra, dry stream beds etc.) In these situations, the criteria and resulting limits are not applicable because there is no legitimate basis of reference.

Settleable Solids: Per 18 AAC 70.020(b)(9)(A)(i) and (b)(21)(B)(i), discharges to freshwaters protected for drinking, culinary, and food processing and marine waters used for contact recreation water supply, may not have a measurable increase in concentrations of settleable solids above natural conditions, as measured by the volumetric Imhoff cone. As the concentration of 0.2 mL/L is the smallest incremental graduation mark that can accurately be measured using the Imhoff cone, discharges from gravel pit dewatering activities to open waters may not exceed 0.2 ml/L above natural conditions. Although the criteria for settleable solids reference receiving water similar to turbidity, the limit of 0.2mL/L can still be applied in cases where it is impossible to measure receiving water. The Department uses this limit of 0.2 ml/L to help ensure there is no excessive accumulation of sediment that would adversely affect the receiving environment or vegetation. Similarly, specific BMPs must also be implemented to prevent sediment accumulation in excess of $1/8^{th}$ inch for discharges vegetated areas.

Petroleum Hydrocarbon, Oil and Grease: Per 18 AAC 70.020(b)(5)(B)(i) and (b)(17)(A)(ii) discharges may not cause a film, sheen or other discoloration on the surface or floor of the waterbody or adjoining shorelines. Surface waters must be virtually free from floating oils. Sites should have no direct contact with oil production activities. Furthermore, appropriate BMPs

should be in place to ensure equipment is not operated in a manner that would allow contact of hydraulic fluids, lubricants, fuel, or other hydrocarbon based products with melt water.

Petroleum Hydrocarbon, TAH and TAqH: Per 18 AAC 70.020(b)(5)(B)(i) and (b)(17)(A)(ii) discharges may not cause a film, sheen or other discoloration on the surface or floor of the waterbody or adjoining shorelines. Surface waters must be virtually free from floating oils. Sites should have no direct contact with oil production activities. Furthermore, appropriate BMPs should be in place to ensure equipment is not operated in a manner that would allow contact of hydraulic fluids, lubricants, fuel, or other hydrocarbon based products with melt water.

The Department does not have sufficient information at this time to determine whether there is reasonable potential to exceed numeric water quality criteria in 18 AAC 70.020(b)(5)(A)(iii) and (b)(17)(A)(i) for TAH and TAqH. Therefore, the Permit establishes a monitoring requirement for TAH and TAqH whenever a sheen is observed.

Most Stringent Limits: As discussed in Section 5.2.1.2, there are applicable TBELs based on ELGs for pH and a previously applied TBEL for sediment based on case-by-case BPJ (Section 5.2.2.2). However, WQBELs for both of these parameters are more stringent. All other limits for gravel pit dewatering are also WQBELs.

5.3.4 Excavation Dewatering (Discharge 004)

Excavation dewatering WQBELs are the same as those of gravel pit dewatering. Based on the characterization section for excavation dewatering (Section 4.3) and the identified POCs, the Department finds there is reasonable potential to exceed, or contribute to an exceedance, of numeric water quality criteria at the point of discharge for the following parameters: pH, turbidity, and sediment. To ensure protection of water quality and existing uses of the waterbody the Department applies numeric WQBELs for pH, sediment, and turbidity. In addition, the Department establishes a prohibition to discharge oil and grease determined by an observation of a sheen. The presence of a sheen may indicate the presence of dissolved hydrocarbons but there is insufficient information to determine if limits are appropriate. The following provides additional details on the WQBELs for excavation dewatering discharges:

pH: Limits for pH discussed in Section 5.3.2 apply.

Turbidity: Turbidity limits discussed in Section 5.3.3 apply.

Settleable Solids: Settleable solids limits discussed in Section 5.3.3 apply.

Petroleum Hydrocarbon, Oil and Grease: Narrative petroleum hydrocarbon, oil and grease limits discussed in Section 5.3.3 apply.

Petroleum Hydrocarbon, TAH and TAqH: The monitoring requirements triggered by the presence of a sheen per 5.3.3 apply.

Most Stringent Limits: The most stringent limits applied to excavation dewatering are the same as gravel pit dewatering per 5.3.3.

5.3.5 Hydrostatic Test Water (Discharge 005)

Similar to gravel pit and excavation dewatering, a review of hydrostatic test characteristics (Section 4.4) indicates there is likely reasonable potential for pH, turbidity, and sediment to exceed, or contribute to an exceedance, of water quality criteria at the point of discharge and WQBELs are established accordingly. Also like gravel pit and excavation dewatering, Department finds that pipelines (and other approved infrastructure) which have not been previously exposed to hydrocarbons are unlikely to exceed, or contribute to an exceedance, of petroleum hydrocarbons, oil and grease, TAH, and TAqH. However, pipelines and other approved infrastructure which have been previously exposed to hydrocarbons have the potential to exceed, or contribute to an exceedance, of TAH and TAqH criteria. Therefore, the Department establishes a tiered approach to petroleum hydrocarbons, oil and grease, TAH, and TAqH outlined below. Chemical additions such as biocides or antifreeze agents are not considered by the Permit and are prohibited. However, heated water may be allowed to prevent freezing of test segments with adequate BMPs to control the temperature of the discharge and prevent thermokarsting.

pH: Limits for pH discussed in Section 5.3.2 apply.

Turbidity: Turbidity limits discussed in Section 5.3.3 apply.

Petroleum Hydrocarbon, Oil and Grease: Narrative petroleum hydrocarbon, oil and grease limits discussed in Section 5.3.3 apply for hydrostatic test water discharged from pipelines or other approved infrastructure (vaults, etc.) which have not previously been exposed to hydrocarbons. The discharge of a visible sheen is prohibited.

Petroleum Hydrocarbon, TAH and TAqH: Hydrostatic test water discharged from pipelines or other approved areas which have previously been exposed to hydrocarbons, have been determined to have reasonable potential to exceed water quality criteria for TAH and TAqH. Therefore, DEC applies the following WQBELs which are protective of freshwater and marine water supply used for aquaculture:

> *TAH:* Per 18 AAC 70.020(b)(5)(A)(iii) and (b)(17)(A)(i) discharges shall not have a TAH concentration in the water column exceeding 10 µg/L. The analytical measurement for TAH consists of summing the individual concentrations of the monoaromatic hydrocarbons including benzene, toluene, ethylbenzene, and total xylenes (sum of m, p, and o xylene).
>
> *TAqH:* Per 18 AAC 70.020(b)(5)(A)(iii) and (b)(17)(A)(i) discharges shall not have a TAqH concentration in the water column exceeding 15 µg/L. TAqH is the sum of monoaromatic hydrocarbons (i.e., TAH) plus the sum of the individual concentrations of polynuclear aromatic hydrocarbons.

If a sheen is observed in a discharge from a new pipeline or infrastructure not anticipated to have petroleum hydrocarbons, the permittee must monitor the discharge for TAH and TAqH. This information may be used to inform permit decisions in subsequent reissuances of the Permit.

Settleable Solids: Settleable solids limits discussed in Section 5.3.3 apply.

Most Stringent Limits: All WQBELs described above are the most stringent and applied as limits in the Permit.

5.3.6 Storm Water Discharges from Industrial Facilities (Discharge 006)

Based on the characterization section (Section 4.5) for storm water discharges from industrial facilities (including allowable non-storm water discharges) and the identified POCs, Department finds there is reasonable potential to exceed or contribute to an exceedance of water quality criteria for petroleum, oil and grease. As discussed in Section 5.2.1.3, there are applicable ELG-based TBELs for free oil (visual sheen) which apply to offshore deck drainage; however, WQBELs for petroleum hydrocarbons, oil and grease are more stringent and apply to all onshore and offshore storm water discharges. Other POCs identified in Section 4.5 (i.e. Sediment) are rigorously controlled through implementation of a BMP Plan (Section 11.2), a storm water pollution prevention plan (SWPPP) submitted upon application per 40 CFR 122.26(c) (Section 11.3), and inspection and monitoring requirements. To ensure protection of water quality and existing uses of the waterbody the Department applies narrative criteria for residues, and petroleum hydrocarbon, oil and grease (oily sheen).

Petroleum Hydrocarbon, Oil and Grease: Per 18 AAC 70.020(b)(5)(B)(i) and (b)(17)(A)(ii) discharges may not cause a film, sheen or other discoloration on the surface or floor of the waterbody or adjoining shorelines. Surface waters must be virtually free from floating oils. The discharge of a visible sheen is prohibited.

5.3.7 Mobile Spill Response (Discharge 007)

Mobile spill response discharges must be treated using a treatment process or system (scrubber unit) capable of removing free-phase and dissolved-phase hydrocarbons. Once a treatment unit has been evaluated (Section 8.2) it can be adopted into the BMP Plan for subsequent use under the Permit. Based on the POCs identified in the characterization section for mobile spill response (Section 4.6), DEC has determined that discharges from an appropriately designed and operated treatment system would not have reasonable potential to discharge petroleum hydrocarbons. The discharge of other potential pollutants are not considered in the Permit. The Department has found that there were previously applied TBELs based on BPJ treatment unit evaluation, which applied a narrative limit of no sheen (Section 5.2.2.3). The Department finds the WQS narrative criteria for this parameter is more stringent. Narrative criteria for petroleum hydrocarbon, oil and grease, and residues are adopted and discussed below.

Petroleum Hydrocarbon, Oil and Grease: Per 18 AAC 70.020(b)(5)(B)(i) and (b)(17)(A)(ii) discharges may not cause a film, sheen or other discoloration on the surface or floor of the waterbody or adjoining shorelines. Surface waters must be virtually free from floating oils. The discharge of a visible sheen is prohibited. The observation of a sheen triggers cessation of the

discharge and triggers implementation of specific BMPs to conduct operation and maintenance on the treatment system to restore treatment capacity.

Most Stringent Limits: All WQBELs described above are the most stringent and applied as limits in the Permit.

5.3.8 Secondary Containment (Discharge 008)

Department finds there is reasonable potential to exceed or contribute to an exceedance of water quality criteria for pH and petroleum hydrocarbons, oil and grease [18 AAC 70.020(5)(A)(iii) and (17)(A)(i)] if there has been an observation of a sheen. Therefore, numeric WQBELs for pH, TAH and TAqH, and narrative criteria for petroleum hydrocarbon, oil and grease discussed below.

Petroleum Hydrocarbon, Oil and Grease: Per 18 AAC 70.020(b)(5)(B)(i) and (b)(17)(A)(ii) discharges may not cause a film, sheen or other discoloration on the surface or floor of the waterbody or adjoining shorelines. Surface waters must be virtually free from floating oils. The discharge of a visible sheen is prohibited. The observation of a sheen triggers limits for TAH and TAqH

Petroleum Hydrocarbon, TAH and TAqH: DEC concludes that if there is an observation of a sheen within the SCA, there would be a reasonable potential to exceed or contribute to an exceedance of water quality criteria for TAH and TAqH., Therefore, DEC applies the following WQBELs using a tier-based approach where observation of a sheen automatically triggers WQBELs for TAH and TAqH to ensure the protection of freshwater and marine water supply used for aquaculture:

> *TAH:* Per 18 AAC 70.020(b)(5)(A)(iii) and (b)(17)(A)(i) discharges to fresh and marine waters used for aquaculture water supply shall not have a TAH concentration in the water column exceeding 10µg/L. The analytical measurement for TAH consists of summing the individual concentrations of the monoaromatic hydrocarbons including benzene, toluene, ethylbenzene, and total xylenes (sum of m, p, and o xylene).
>
> *TAqH:* Per 18 AAC 70.020(b)(5)(A)(iii) and (b)(17)(A)(i) discharges to fresh and marine waters used for aquaculture water supply shall not have a TAqH concentration in the water column exceeding 15µg/L. TAqH is the sum of monoaromatic hydrocarbons (i.e., TAH) plus the sum of the individual concentrations of polynuclear aromatic hydrocarbons.

pH: Numeric pH criteria discussed in Section 5.3.2 apply.

Most Stringent Limits: Based on the characterization section for discharges from SCAs (Section 4.7) using available analytical data discussed Section 5.2.2.3 (TBELs based on case-by-case BPJ), neither ballast water nor contaminated runoff ELGs described in (40 CFR 419.12) adequately define or limit the parameters of concern for SCAs. Previously applied TBELs based

on case-by-case BPJ are found to be technical errors that are not representative of the discharge activity or waste characterization and should not be carried forward. All WQBELs described above are the most representative of the discharge. The criteria is adequately stringent and protective and applied as limits in the Permit.

6.0 LIMITATIONS AND MONITORING REQUIREMENTS

Pollutants in discharges must be controlled by meeting numeric limits, narrative limitations, developing and implementing BMPs. When applying effluent limits to commingled discharges, the more stringent effluent limits apply to the commingled discharge. In general, all discharges, whether alone or in combination, must not make the water unfit or unsafe; cause a film, sheen, or discoloration on the water surface or adjoining shoreline; cause leaching of toxic or deleterious substance, or cause a sludge, solid, or emulsion to be deposited beneath or upon the water surface, water column, on the bottom, or adjoining shoreline.

Per 18 AAC 83.455, APDES permits require monitoring to determine compliance with effluent limits. Monitoring frequencies for compliance with limits are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor facility performance. Monitoring may also be required to gather data to evaluate future effluent limits or to monitor effluent impacts on receiving water quality. The Permittee is responsible for conducting monitoring and reporting the results to DEC as described in the Permit. The basis for effluent limit derivation is discussed in Section 5.0. The following sections (Sections 6.1-6.6) summarize the effluent limits and describe monitoring required for each discharge.

6.1 Limitations and Monitoring for Graywater (Discharge 002)

Graywater discharges under the North Slope GP are expected to be associated with seasonal winter facilities that discharge over an area of operation that may include freshwater or marine receiving waters with or without an authorized mixing zone. Accordingly, both receiving waters were considered in the limit development. The Permit contains two sets of freshwater limits for FC bacteria and two sets of marine water limits for FC bacteria with and without a mixing zone. Graywater treatment systems under the North Slope GP may not be equipped to disinfect effluent prior to discharge. However, TRC limits are included for facilities that have introduced chlorine into the system (e.g., disinfection or potable water source). Limits and monitoring requirements for Graywater are provided in Table 6.

Table 6: Effluent Limits and Monitoring Requirements for Graywater (Discharge 002)

Parameter (Unit)	Effluent Limits		Monitoring Requirements		
	MDL	AML	Frequency	Location	Sample Type
Flow Volume (gpd)	5000	Report	daily	Effluent	Estimate or Measure [a]
pH [b] (SU)	6.5 - 8.5		1/week	Effluent	Grab
BOD_5 (mg/L)	2,305	826	1/month	Effluent	Composite [c] or Grab
TSS (mg/L)	820	296	1/month	Effluent	Composite [c] or Grab
TRC – Freshwater [d] (µg/L)	19	11	1/week	Effluent	Grab
TRC – Marine [d] (µg/L)	13	7.5	1/week	Effluent	Grab
FC Bacteria – Fresh [g] (#/100ml)	40 [e]	20 [f]	1/month	Effluent	Grab
FC Bacteria – Fresh [h] (#/100ml)	400 [e]	200 [f]	1/month	Effluent	Grab
FC Bacteria – Marine [g] (#/100ml)	40 [e]	14 [f]	1/month	Effluent	Grab
FC Bacteria – Marine [h] (#/100ml)	400 [e]	140 [f]	1/month	Effluent	Grab
E. coli – Freshwater (#/100ml)	Report		1/month	Effluent	Grab
Enterococci – Marine (#/100ml)	Report		1/month	Effluent	Grab

Notes:

a) Flow volume shall be measured or estimated using total water consumption at the facility.
b) The effluent limit for pH shall be between 6.5 and 8.5. Report maximum and minimum for each month.
c) See Appendix C of the General Permit for composite sample definition.
d) Sampling for chlorine is not required if chlorine is not used as a disinfectant or introduced elsewhere in the system. The method detection limit for TRC is 100 µg/L (using approved EPA analytical methods) and will be used as the compliance level for TRC.
e) No more than 10% of the samples may exceed MDL for FC bacteria. If less than 10 samples are collected, compliance can be determined by calculating 90th percentile of the sample set. If the calculated percentile is less than or equal to the MDL, the discharge is compliant.
f) Average results for FC must be reported as the geometric mean. When calculating the geometric mean, replace all results of zero, 0, with a one, 1. The geometric mean of "n" quantities is the "nth" root of the quantities. For example the geometric mean of 10, 20, and 30 is $(10 \times 20 \times 30)^{1/3} = 18.2$.
g) Limits apply to discharges without an approved mixing zone
h) Limits apply to discharges with an approved mixing zone (See Section 7.2 for details)

Authorization to discharge graywater requires complying with the most recent version of 18 AAC 72. Graywater discharges to open waters are prohibited and discharges to frozen conditions may occur for period of not more than 30 days at a given location. BMPs controls must be developed to ensure solids accumulation does not exceed a depth of 1/8th inch at the disposal area. Other BMP controls which ensure kitchen oils from food preparation shall not be discharged, and phosphate free non-toxic detergents and soaps are used, as well as other specific controls shall also be included (Section 11.2.4.1) .

6.2 Limitations and Monitoring for Gravel Pit and Excavation (Discharges 003 – 004)

Gravel pit and excavation dewatering discharges can be to freshwater or marine waters. Accordingly, limits are provide for both freshwater and marine discharges. Limits and monitoring requirements for Gravel Pit and Excavation Dewatering are provided in Table 7.

Table 7: Effluent Limits and Monitoring Requirements for Gravel Pit and Excavation Dewatering (Discharges 003 – 004)

Parameter (Unit)	Effluent Limits	Monitoring Requirements		
		Frequency	Location	Sample Type
Flow Volume [a] (gpd)	Report	Daily	Effluent	Estimate or Measured
pH [b] (S.U.)	6.5 - 8.5	Daily	Effluent	Grab
Turbidity (NTU)	Report	Daily	Receiving Water [c]	Grab
Turbidity (NTU)	5 above ambient [d] 25 above ambient [e]	Daily	Effluent	Grab
Settleable Solids [f] (mL/L)	0.2	Daily	Effluent	Grab
Oil and Grease (oily sheen) [g]	No Discharge	Daily	Effluent	Visual
TAH [h] (µL/L)	Report	Event	Effluent	Grab
TAqH [h] (µL/L)	Report	Event	Effluent	Grab

Notes:

a) Record daily flow measurements, or estimates in a daily log. Report daily maximum for each month.
b) The effluent limit for pH shall be between 6.5 and 8.5. Report maximum and minimum for each month.
c) Receiving water monitoring provides measurement of ambient conditions prior to discharge. If receiving water turbidity monitoring is not possible, the limit is not applicable (N/A). In these situation, the permittee records N/A on the DMR and provides a comment as to why it is not applicable (e.g., tundra or snow).
d) Freshwater discharges may not exceed 5 NTU above ambient conditions when the ambient turbidity is 50 NTU or less; and shall not have more than a 10% increase in turbidity when the ambient condition is greater than 50 NTU (not to exceed a maximum increase of 15 NTU); and shall not exceed 5 NTU above ambient conditions for all lake waters. Report the receiving water value prior to discharge and maximum value for effluent.
e) Discharges to marine waters shall not exceed 25 NTU above ambient conditions. Report the receiving water value prior to discharge and maximum value for effluent.
f) As measured using volumetric Imhoff cone.
g) A visual observation for sheen must be conducted and recorded in a daily log when discharging.
h) Upon observation of an oily sheen, effluent must be monitored for TAH and TAqH once per event.

Discharges from gravel pits and excavations are anticipated to be intermittent and highly variable with the potential for high volumes and velocities at the point of discharge. Dewatering discharges to open waters must be controlled using specific BMPs to meet applicable limits and prevent sedimentation and erosion (Section 11.2.4). Certain enhanced BMP treatment methods (i.e., coagulants/flocculants or advanced filtration systems) may require plan submittals. Where receiving water turbidity sampling is not possible, the turbidity limit is not applicable (e.g., gravel pit water used for ice roads and dust suppression, or excavation water discharged to a seasonal dry stream bed where discharge does not reach other connected waterbodies).

For discharges where an oily sheen has been observed, permittees must monitor for TAH and TAqH. Permittees conducting activities within 1,500-feet of a contaminated site must consult with DEC, Contaminated Sites Program (CSP). Information regarding known contaminated sites can be found at: http://dec.alaska.gov/spar/csp/.

6.3 Limitations and Monitoring for Hydrostatic Test Water (Discharge 005)

DEC uses a tier-based approach to either limit, or monitor, petroleum hydrocarbons, TAH, and TAqH. Limits for TAH and TAqH are applied for existing infrastructure that has been exposed to hydrocarbons. Whereas, infrastructure that has not been exposed to hydrocarbons must monitor for TAH and TAqH whenever a sheen is observed. While hydrostatic test water may be discharged to marine or freshwater, there are differences in the limits. Limits and monitoring requirements for Hydrostatic Test Water are provided in Table 8 below.

Table 8: Effluent Limits and Monitoring Requirements for Hydrostatic Testing Water (Discharge 005)

Parameter (Unit)	Effluent Limits	Monitoring Requirements		
		Frequency	Location	Sample Type
Flow Volume [a] (gpd)	Report	Daily	Effluent	Estimate or Measured
pH [b] (S.U.)	6.5 - 8.5	Daily	Effluent	Grab
Turbidity (NTU)	Report	Daily	Receiving Water [e]	Grab
Turbidity (NTU)	5 above ambient [c] 25 above ambient [d]	Daily	Effluent	Grab
Settleable Solids (mL/L)	0.2 [f]	Daily	Effluent	Grab
Oil and Grease (oily sheen) [g]	No Discharge	Daily	Effluent	Visual
TAH [h] (µL/L) Non-Exposed	Report	Event	Effluent	Composite [k] or Grab
TAqH [h] (µL/L) Non-Exposed	Report	Event	Effluent	Composite [k] or Grab
TAH [i] (µL/L) Exposed	10	Daily	Effluent	Composite [j, k] or Grab
TAqH [i] (µL/L) Exposed	15	Daily	Effluent	Composite [j, k] or Grab

Notes:

a) Record daily flow measurements, or estimates in a daily log. Report daily maximum for each month.

b) The effluent limit for pH shall be between 6.5 and 8.5. Report maximum and minimum for each month.

c) Freshwater discharges may not exceed 5 NTU above ambient conditions when the ambient turbidity is 50 NTU or less; and shall not have more than a 10% increase in turbidity when the ambient condition is greater than 50 NTU (not to exceed a maximum increase of 15 NTU); and shall not exceed 5 NTU above ambient conditions for all lake waters. Report the receiving water value prior to discharge and maximum value for effluent.

d) Discharges to marine waters shall not exceed 25 NTU above ambient conditions. Report the receiving water value prior to discharge and maximum value for effluent.

e) Receiving water monitoring provides measurement of ambient conditions prior to discharge. If receiving water turbidity monitoring is not possible, the limit is not applicable (N/A). In these situation, the permittee records N/A on the DMR and provides a comment as to why it is not applicable (e.g., tundra or snow).

f) As measured using a volumetric Imhoff cone. Report maximum for each month.

g) A visual observation for sheen must be conducted daily when discharging.

h) Upon observation of an oily sheen, pipelines which have not previously been exposed to hydrocarbons must monitor effluent for TAH and TAqH once per event.

i) Effluent limits for TAH and TAqH apply to discharges from pipelines or other approved areas which have previously been exposed to hydrocarbons. Report maximum result.

j) For discharge volumes less than or equal to 500,000 gpd, a grab sample may be used to analyze effluent once daily while discharging. For discharges greater than 500,000 gpd representative composite sample (See Appendix C - Definitions) composed is required daily while discharging. Procedures for composite sampling large intermittent volumes of wastewater shall also be outlined in the QAPP (Section 11.4). Report maximum result.

Daily monitoring for oily sheen is required for all hydrostatic test discharges. Similar to Discharges 003 and 004, where receiving water turbidity sampling is not possible, the turbidity limit is not applicable. Discharges must not result in sedimentation or erosion around the discharge area or down current of the discharges. Specific BMP Plan requirements for sediment and erosion control are required. Chemical additions such as biocides or antifreeze agents are prohibited. However, if heated water is used to prevent freezing, BMP Plan should also include methods which control the temperature of the discharge and prevent thermokarsting of tundra or permafrost.

6.4 Limitations and Monitoring for Storm Water Discharge (Discharge 006)

6.4.1 Applicability of Storm Water Coverage

The operation of an oil and gas exploration, production or development facility or activity may include supporting ancillary facilities and activities. Examples of common support activities and facilities can be found in the characterization section for storm water discharges (Section 4.5). These include but are not limited to, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas, equipment wash down areas, temporary camp areas, pump or compressor stations, and airstrips. Discharges of storm water, or allowable non-storm water, from these types of facilities may be eligible for coverage under the Permit if the following conditions are met:

- The support activity or ancillary facility is directly related to the operation of an oil and gas exploration, production or development facility or activity on the North Slope Borough;
- Storm water will not be discharged to a waterbody classified on State of Alaska Impaired Waterbody 303(d) List or Tier III Waters;
- The support activity or ancillary facility is not a commercial operation serving multiple, unrelated projects or entities (e.g., commercial gravel pit operation or public airport or an airstrip with more than 1000 departures per year);
- Based on the standard industrial code (SIC) for the industrial support facility additional storm water monitoring ELGs would not be triggered if the facility was covered under the Alaska Multi Sector General Permit (MSGP or AKR060000).

The intent of limiting coverage in this manner is to keep the North Slope GP manageable by avoiding triggers for additional monitoring requirements that would be necessary to align the North Slope GP with the MSGP. DEC does not anticipate that these excluded situations will be frequently encountered and if these excluded conditions are encountered, then coverage could still be obtained under the MSGP or an individual permit.

6.4.2 Storm Water Requirements

Compliance with storm water requirements under the North Slope GP relies on developing and implementing a SWPPP and conducting visual monitoring and observations during inspections. To prevent storm water runoff from coming into contact with sources of pollution, each facility

must develop and institute a SWPPP (Section 11.3) that is composed of a series of materials management practices and existing structural and non-structural control measures contained in a BMP Plan (Section 11.2). An annual certification that the SWPPP has been reviewed and updated is required to be submitted to the Department by January 31st each year (Section 12.2).

DEC has determined that it is unnecessary to establish specific numeric effluent limits or specific design or performance standards for storm water and allowable non-storm water discharges characterized in Section 4.5. However, the Permit prohibits the discharge of petroleum hydrocarbon, oil and grease as determined by the presence of an oily sheen (reportable quantity). To ensure there are no reportable quantities of oil or hazardous substances, biannual inspections must be performed (11.3.3.2) by a qualified person as defined in Appendix C of the Permit. The qualified person must be knowledgeable and possess the skills to assess conditions at the facility that could impact storm water quality and the effectiveness of pollution control measures used to maintain water quality objectives. Annual certification that the biannual inspection have been completed must be submitted annually (Section 12.2).

6.5 Limitations and Monitoring for Mobile Spill Response (Discharge 007)

Discharges of mobile spill response wastewater requires treatment prior to discharge. Permittees must submit scrubber or treatment unit information to the Department that demonstrates adequate removal free-phase and dissolved-phase hydrocarbons. Once a treatment unit has been evaluated (Section 8.2), the system may be adopted in the BMP Plan along with other BMPs that ensure the system is properly operated and maintained to sustain treatment performance. Discharges from these units must be monitored for sheen daily and for the estimated total monthly volume of discharge. Limits and monitoring are included in Table 9 below.

Table 9: Effluent Limitations and Monitoring Requirements for Mobile Spill Response (Discharge 007)

Parameter (Unit)	Effluent Limits	Monitoring Requirements		
		Monitoring Frequency	Monitoring Location	Sample Type
Volume [a] (gpd)	Report	Daily	Effluent	Estimate
Oil and Grease (oily sheen) [b]	No Discharge	Daily	Effluent	Visual

Notes:
a) The Permittee must record discharges greater than 25 gallons in daily operating logs. Report total estimated volume discharged per month.
b) A visual observation for sheen must be conducted daily when discharging.

6.6 Limitations and Monitoring for Secondary Containment (Discharge 008)

Similar to hydrostatic test water, DEC uses a tier-based approach to petroleum hydrocarbons, oil and grease, TAH, and TAqH for this discharge. Upon observation of an oily sheen, limits for TAH and TAqH are triggered. Limits and monitoring requirements for discharges from Secondary Containment are provided in Table 10 below.

Table 10: Effluent Limitations and Monitoring Requirements for Secondary Containment (Discharge 008)

Parameter (Unit)	Effluent Limits	Monitoring Requirements		
		Monitoring Frequency	Monitoring Location	Sample Type
Flow Volume [a] (gpd)	Report	Continuous	Effluent	Estimate Measure
pH [b] (S.U.)	6.5 to 8.5	Monthly	Effluent	Grab
Oil and Grease (oily sheen) [c]	No Discharge	Daily	Effluent	Visual
TAH [d] (µg/L)	10	Event	Effluent	Composite [e, f] or Grab
TAqH [d] (µg/L)	15	Event	Effluent	Grab

Notes:
a) Record daily flow measurements, or estimates in a daily log. Report daily maximum for each month.
b) The effluent limit for pH shall be between 6.5 and 8.5. Report maximum and minimum for each month.
c) Discharges of petroleum hydrocarbons, oil and grease are prohibited. A visual observation for sheen must be conducted daily when discharging.
d) Upon observation of a sheen, the permittee must monitor for compliance with TAH and TAqH limits.

An oily sheen on the surface of water in the SCA must be removed prior to discharge and monitoring for TAH and TAqH must be conducted for each occurrence. The permittee may submit information about a treatment process or systems that removes dissolved hydrocarbons for adoption into the BMP Toolkit. If no sheen is observed, the discharge of secondary containment water can be discharged with storm water.

6.7 Additional Monitoring

Samples must be collected per a Quality Assurance Project Plan (QAPP) and analyzed using approved test methods found in 40 CFR § 136 and adopted by reference at 18 AAC 83.010(f). A Permittee has the option of taking more frequent samples than required under the Permit for evaluating monthly averages or pre-discharge to determine effluent quality and help avoid a permit violation. However, samples collected prior to discharge may not be used for compliance sampling unless it can be adequately demonstrated to the Department that samples are as representative of the discharge as a sample that would otherwise be collected while discharging.

7.0 RECEIVING WATERS

The North Slope GP will authorize discharges to fresh waters of the U.S. located in the North Slope Borough and coastal marine waters of the U.S., offshore of the North Slope Borough and landward of the inner boundary baseline as defined in 18 AAC 83.990(77).

7.1 Water Quality Standards

Section 301(b)(1)(C) of the CWA requires the development of limits in APDES permits necessary to meet Alaska WQS by July 1, 1977. Per AAC 83.435, DEC establishes the

conditions in APDES permits to ensure compliance with the WQS. The WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an antidegradation policy. The use classification system designates the beneficial 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 beneficial use classification of each waterbody. The antidegradation policy ensures that the beneficial uses and existing water quality are maintained.

Freshwater receiving waters are classified as Classes (1)(A), (B), and (C) for use in drinking, culinary and food processing, agriculture, aquaculture, and industrial water supply; contact and secondary recreation; and growth and propagation of fish, shellfish, other aquatic life, and wildlife. Marine waters are classified in the WQS at 18 AAC 70.020(a)(2) as Classes (2)(A), (B), (C), and (D) for use in aquaculture, seafood processing, and industrial water supply; contact and secondary recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life. Per 18 AAC 70.050, freshwaters and marine waters in the State of Alaska are designated for all use classes unless the waterbody has been reclassified under 18 AAC 70.230 as listed under 18 AAC 70.230(e). Some waterbodies in Alaska can also have site–specific water quality criterion per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b).

The Department acknowledges there may be reclassified waters within the coverage area as listed under 18 AAC 70.230(e), or waters which have site specific water quality criteria defined in 18 AAC 70.236(b). However, the limits and conditions for discharges contained in the North Slope GP are based on protecting all use classes by applying the most stringent criteria of all the use classes to waterbodies uniformly. Should an applicant seek coverage for discharges to reclassified waterbodies, the applicant may use the conservatively protective limits for all waterbodies contained in the Permit, or submit an application for an individual permit based on reclassified uses defined in 18 AAC 70.230(e).

7.2 Mixing Zones

7.2.1 Mixing Zone Analysis

A study conducted by Michael Pollen (*Arctic Tundra as a Wastewater Discharge Receiving Environment,* Cold Regions Environmental Engineering Conference, 1983) (Pollen Study) analyzed the environmental effects of wastewater discharge to tundra. Four case studies were conducted that spanned one year's seasonal activities, one of which focused on graywater discharges to tundra. The studies were a combination of field and laboratory analyses that followed effluent from the point of discharge during the winter throughout the flow regime during and after breakup. Samples were taken at the point of origin and discharge to the environment and at points in the tundra until the pollutant concentrations were similar to ambient conditions outside the influence of the discharge. During the summer and spring thaws, dye studies were used to determine the direction of flow. Analyses were completed for alkalinity,

conductivity, dissolved oxygen, pH, temperature, BOD_5, FC bacteria, suspended solids, and a nutrient series that included ammonia, nitrate, ortho-phosphate, and sulfate. Photographic records were kept to document the conditions at each site during the study. Late winter examinations were made to examine effluent conditions during the winter season.

The graywater study conducted three surveys to examined discharges from a 200-bed housing complex for workers from various construction camps near Barrow. The first survey provided a spring thaw analysis, the second provided information about summer ambient conditions, and the third survey provided information about winter discharge conditions. There were three graywater discharges from the facility, each going to different receiving areas: Source 1 was discharged to a nearby gravel pit operation, while the other two sources (sources 2 and 3) were discharged to nearby areas on the tundra. The primary focus of the study was on the two graywater discharges to tundra.

Effluent data collected from the two tundra discharges showed Source 2 BOD_5 concentrations averaged 210 mg/L and FC bacteria concentrations averaged 6,000 colonies/100 mL. Source 3 discharged effluent with BOD_5 concentrations averaging of 180 mg/L and FC bacteria concentrations averaging 20,000 colonies/mL. During the winter months, ice mounds from the two discharge locations eventually combined to form one large mound. Data collected during the spring thaw months indicated ambient meltwater rapidly combined with meltwater from the ice mound and spread evenly across the tundra. Samples collected 200 meters from each outfall showed BOD_5 concentrations had decreased to 9 mg/L (a reduction greater than 90%) and FC bacteria concentrations decreased to 33 colonies/100 mL. Summer survey data found ambient BOD_5 concentrations at the 200m boundary were 10 mg/L and FC bacteria concentrations were 11 colonies/100 mL. The study noted that the pollutant reductions observed in the spring thaw were primarily the result of the effluent melting and comingling with ice melt from various ambient sources. Data further indicated effluent concentrations are similar to ambient conditions approximately 200 meters (m) from the discharge location following spring thaw season.

Some of the conclusions from the study include: (1) discharge directly to tundra in the winter season results in rapid freeze containment of the effluent; (2) during the spring thaw, the rapid breakup results in significant comingling with other waters (snowmelt, etc.) such that even untreated graywater meets ambient levels within several hundred meters from the point of discharge; and (3) thawing of the tundra in the vicinity of the outfalls was consistent with those in the area outside the influence of the discharge.

7.2.2 Mixing Zone Authorization

Per 18 AAC 70.240 – 70.270, as amended through June 26, 2003, DEC may authorize a mixing zone under a general permit upon receipt of a complete application. A Notice of Intent (NOI) serves as the application under a general permit. The NOI provides information required by 18 AAC 70.260 as amended through June 2003, including the information and available

evidence necessary to demonstrate consistency with 18 AAC 70.240 – 18 AAC 70.270. The information in the NOI is used to inform the Department if the request for a mixing zone is consistent with the mixing zone evaluation conducted during permit development. If consistent, then a mixing zone authorization is approved.

Based on the results of the Pollen Study, existing permit data, and inclusion of specific operational conditions for Graywater (Discharge 002), DEC has determined that a mixing zone will not cause environmental effects or damage to the ecosystem, per 18 AAC 70.250(a)(4), as amended through June 2003. Therefore, the Department establishes a circular mixing zone with a 200-meter radius (centered on the outfall) for the temporary exceedance of WQBELs for FC bacteria and residues within the boundary of the mixing zone. The Permit applies a dilution factor of 10 for fecal coliform bacteria to water quality criteria [18 AAC 70.020 (b)(2)(A) and 18 AAC 70.020 (b)(14)(D), as amended April 8, 2012]. FC bacteria and residues do not have associated acute criteria and a smaller initial mixing zone for the application of acute criteria per 18 AAC 70.255(d) is not required. The Permit does not authorize discharges of Graywater (002) directly to open marine waters or freshwater lakes or rivers. Further, the Permit imposes operation limitations to ensure water quality criteria are met at the boundary of the mixing zone. These limitations include a discharge loading limit at any one location to no more than 30 consecutive days and a discharge volume limit of 5,000 gallons per day.

Attachment D of the Fact Sheet, Mixing Zone Analysis Checklist, outlines criteria that must be satisfied when the Department analyzes whether a mixing zone can be authorized. These criteria include size, technology, existing uses of the water body, human consumption, spawning areas, human health, aquatic life, and endangered species. Consideration of these criteria are outlined below.

7.2.3 Mixing Zone Criteria Analysis

7.2.3.1 Size

Per 18 AAC 70.240(a)(2), the Department has determined the mixing zone size for the discharge of graywater (as described above) is appropriately sized and as small as practicable based on extensive data collected from the Pollen Study and from data collected by permittees during the five year issuance period of the 2012 Graywater GP discharge. In evaluating 18 AAC 70.255; criteria protective of streams, rivers, or other flowing fresh waterbodies [18 AAC 70.255(e)(3) and 18 AAC 70.255(f)] cannot generally be applied to frozen tundra and ice and therefore do not apply. Based on the nature of the pollutant anticipated to exceed water quality criteria (fecal coliform bacteria and residues), no toxic effects, lethality to passing organisms, or risks of bioaccumulation or bioconcentration are expected to occur. Due to the remote nature of the facilities, near instantaneous freeze characteristics of the discharge and rapid melting and dilution of the ice mound during spring thaw, human health and aquatic life are protected (See Section 7.2.3.4 and 7.2.3.6).

7.2.3.2 Treatment Technology

Per 18 AAC 70.240(a)(3), the Department must determine if "an effluent or substance will be treated to remove, reduce, and disperse pollutants, using methods found by the Department to be the most effective and technologically and economically feasible, consistent with the highest statutory and regulatory treatment requirements," before authorizing a mixing zone.

Applicable "highest statutory and regulatory requirements" are defined in 18 AAC 70.990(30). Accordingly, there are three parts to the definition, which are:

- Any federal TBEL identified in 40 CFR 125.3 and 40 CFR 122.29, as amended through August 15, 1997, adopted by reference at 18 AAC 83.010;
- Minimum treatment standards in 18 AAC 72.040; and
- Any treatment requirement imposed under another state law that is more stringent than the requirement of this chapter.

The first part of the definition includes all applicable federal technology-based ELGs. The Department determined ELGs for graywater (domestic waste in ELGs) are potentially applicable as found in CFR Part 435 Subpart D (Coastal Subcategory), adopted by reference at 18 AAC 83.010(g)(3). However, the ELGs in Subpart D were not as stringent as the corresponding WQBEL. Accordingly, DEC adopted WQBELs that were more stringent for graywater discharges. TBELs using case-by-case BPJ were developed for BOD_5 and TSS in graywater discharges. Per Section 5.2.2.1, existing data was evaluated to derive appropriate limits base on the treatment performance observed from existing graywater discharges. When compared to existing limits in the Graywater GP, the existing limits were retained because they are slightly more stringent yet still attainable with the treatment technology currently used by permittees.

The second part of the definition from the WQS appears to be in error, as 18 AAC 72.040 considers discharge of sewage to sewers and not minimum treatment. The correct reference should be 18 AAC 72.050, minimum treatment for domestic wastewater. In relation to the North Slope GP issuance, provisions of this regulation mandate that graywater discharged to surface water must be treated to secondary standards, unless a waiver request is submitted by the applicant and subsequently granted by the Department under current requirements of 18 AAC 72. The waiver request must satisfactorily demonstrate the discharge will be protective of human health and environment. Under the Permit, facilities which do not meet secondary treatment standards must apply for this waiver and at a minimum, meet primary treatment (defined at 18 AAC 72.990 (50)], and comply with specific Best Management Practices (BMP) relating to the discharge. Authorization to discharge graywater will only be issued after the applicant has obtained necessary approvals and waivers per requirements in the most recent version of 18 AAC 72.

The third part of the definition includes any treatment required by state law that is more stringent than 18 AAC 70. Other regulations beyond 18 AAC 70 that may apply to this permitting action include 18 AAC 15 and 18 AAC 72. The paragraph above speaks directly to the more stringent treatment requirements contained in 18 AAC 72 for domestic wastewater discharges. In addition, neither the regulations in 18 AAC 15 nor another state legal requirement that the Department is aware of impose more stringent treatment requirements than 18 AAC 70 besides those in 18 AAC 72.

In accordance with 18 AAC 70.240(a)(3), the Department finds that available evidence reasonably demonstrates that the effluent will be treated to remove, reduce, and disperse pollutants, using methods found by the Department to be the most effective and technologically and economically feasible, consistent with the highest statutory and regulatory treatment requirements.

7.2.3.3 Existing Use

Per 18 AAC 70.245, the mixing zone has been appropriately sized to fully maintain and protect the existing uses of receiving waters covered by the permit. Operations can only occur during the winter months and effluent will freeze at, or very near, the discharge location. Therefore, melting discharges will be accompanied by the thawing of surrounding snow and ice resulting in large amounts of available dilution and assimilative capacity in receiving waters. When compared to the graywater outfalls in previous AKG330000 and Graywater GP issuances, the North Slope GP does not include any changes that would contribute to the discharge of lower quality wastewater than previously authorized. In addition, no impairments to specific water bodies as result of discharges from previous permit authorizations have been identified by the Department. DEC has determined that the existing uses and biological integrity of the waterbody will be maintained and fully protected under the terms of the permit, as required in 18 AAC 70.245(a)(1) and (a)(2).

7.2.3.4 Human Health

Per 18 AAC 70.250(a)(1), 18 AAC 70.250(b)(2) and (b)(3), and 18 AAC 70.255(c), the FC bacteria or residues are not considered pollutants that would bioaccumulate, bioconcentrate, or persist above natural levels in sediments, water, or biota, nor is the pollutant expected to occur at levels that would otherwise will create a public health hazard through encroachment on a water supply or contact recreation uses so long as appropriate BMPs are implemented as required by the Permit. The authorized mixing zone is consistent with 18 AAC 70.250(a)(1). Consistent with Per 18 AAC 70.250(b)(2) and (b)(3), BMPs, numeric, and narrative limits imposed by the Permit ensure subject pollutants will not produce objectionable color, taste, or odor in aquatic resources harvested for human consumption, nor will the discharge preclude or limit established processing activities or commercial, sport, personal use, or subsistence fish and shellfish harvesting. Based on a review of the Pollen Study and the information provided herein, the Department concludes that the discharge complies with this criterion.

7.2.3.5 Spawning Areas

Per 18 AAC 70.255(h), a mixing zone is not authorized in an area of anadromous fish spawning or resident fish spawning reds for Arctic grayling, northern pike, rainbow trout, brook trout, cutthroat trout, whitefish, sheefish, Arctic char (Dolly Varden), burbot, and landlocked Coho, king, and sockeye salmon. The permit does not authorize the discharge of effluent to open marine waters or to open waters of a freshwater lake or river, therefore no discharge to spawning areas will be authorized.

7.2.3.6 Aquatic Life and Wild Life

Per 18 AAC 70.250(a)(2)(A-C), 18 AAC 70.250(b)(1), 18 AAC 70.255(g)(1) and (2), and 18 AAC 70.255(b)(1) and (2), the pollutant for which the mixing zone will be authorized (fecal coliform) is not expected to result in concentrations outside of the mixing zone that are undesirable, present a nuisance to aquatic life, permanent or irreparable displacement of indigenous organisms, a reduction in fish or shellfish population levels, or pose a risk to aquatic life and wildlife. The mixing zones are determined using critical effluent and receiving water conditions and are as small as practicable. Department concludes authorized mixing zones are protective of aquatic life and wildlife.

7.2.3.7 Endangered Species

Per 18 AAC 70.250(a)(2)(D), The Department may not authorize a mixing zone that will cause an adverse effect on threatened or endangered species. Due to the nature of discharge, limitations, and controls imposed by the Permit, authorized mixing zones are unlikely to cause adverse effects to threatened or endangered species (Section 13.1). The NOI requires the permittee to inform the Department if any threatened or endangered species may be within the area of discharge or of any determinations or restrictions imposed by U.S. National Marine Fisheries Service (NFMS) and the U.S. Fish and Wildlife Service (FWS) at the project area. In the event threatened or endangered species are in the vicinity, the Department retains the ability to consult with the NFMS and the FWS and include additional site-specific requirements in the authorization (i.e. time-area restrictions) or to deny the mixing zone.

8.0 PLAN SUBMITTAL REQUIREMENTS (18 AAC 72)

Authorizations under the Permit for domestic and nondomestic discharges to waters of the U.S. may require plan submittals per the most recent amendment of 18 AAC 72. Submittals are often necessary to ensure that treatment systems are adequate for attaining limits as authorized by the Permit and complying with WQS.

8.1.1 Plan Submittals for Graywater Discharges (Discharge 002)

First time applicants or existing Permittees who are conducting major renovations to a graywater treatment system may be required to submit plans to the Department to evaluate applicability for coverage under the Permit, attainment of limits, or compliance with WQS.

If graywater is commingled with nondomestic wastewater (e.g., drinking water filter backwash) there may be parameters of concern that were not addressed in the Permit. This commingling could result in an inability to obtain coverage under the Permit because it is not practicable to develop a general permit based on unknown factors. For this reason, DEC encourages applicants to coordinate graywater treatment system submittals that include drinking water backwash with drinking water plan reviews concurrently. In these situations, the wastewater plan review may help determine whether coverage under the Permit is applicable given the nondomestic waste stream.

Finally, the Permit may contain effluent limits for BOD_5 and TSS which do not meet secondary treatment standards outlined in the most recent amendment of 18 AAC 72. In this case, applicants requesting Graywater (Discharge 002) may be required to submit information supporting a request to waive minimum treatment standards.

8.1.2 Plan Submittals for Non-Domestic Wastewater Discharges (003-005, 007, and 008)

Non-domestic discharges may require plan submittals and review (conducted under 18 AAC 72) to help ensure Permit compliance for settleable solids, turbidity, and petroleum hydrocarbons. These submittals may include information to support unique treatment method or to support a common treatment method that can be applied broadly as a BMP Tool. Information should support attainment of discharge limits, or water quality criteria, identified in Section 6.0, and must not introduce new pollutants that were not previously considered during limit development and vetted through the public process. For example, it would be appropriate to review a treatment system that removes dissolved hydrocarbons from gravel pit dewatering, excavation dewatering, hydrostatic test, mobile spill response units, and SCA discharges because hydrocarbons were considered in limit development. However, conducting a plan review for a treatment system to remove glycol from hydrostatic test discharges would not be appropriate because this parameter was excluded in characterization and prohibited in the discharge of hydrostatic test water. Based on the applicable discharges and parameters of concern, the supporting plan reviews are anticipated to include, but not be limited to, the following:

- Chemical treatments (i.e., coagulants and flocculants) and processes or systems that remove settleable solids and turbidity using an enhanced treatment mechanism, and
- Treatment processes and systems that remove free-phase and/or dissolved-phase petroleum hydrocarbons.

9.0 ANTIBACKSLIDING

Per 18 AAC 83.480, a reissued permit 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 ELGs in effect at the time the permit is renewed or reissued."

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

CWA §303(d)(4)(A) states that, for waterbodies where the water quality does not meet applicable WQS, effluent limitations may be revised under two conditions; the revised effluent limitation must ensure the attainment of the WQS (based on the waterbody TMDL or the waste load allocation) or the designated use which is not being attained is removed in accordance with the WQS regulations.

CWA §303(d)(4)(B) states that, for waterbodies where the water quality meets or exceeds the level necessary to support the waterbody's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy. 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 ELGs.18 AAC 83.480(c) prohibits relaxed limits that would result in violations of WQS or ELGs.

State regulation 18 AAC 83.480(b) only applies to effluent limitations established on the basis of CWA Section 402(a)(1)(B), and modification of such limitations based on effluent guidelines that were issued under CWA Section 304(b). Accordingly, 18 AAC 83.480(b) applies to the relaxation previously established case-by-case TBELs developed using BPJ. To determine if backsliding is allowable under 18 AAC 83.480(b), the regulation provides five regulatory criteria (18 AAC 83.480[b][1-5]) that must be evaluated and satisfied.

This permitting action modifies case-by-case TBELs established previously for BOD_5, TSS, and O&G. The evaluation and justification for the modification of these limits is discussed below:

> **18 AAC 83.480. Reissued permits**
>
> (b) In the case of effluent limitations established on the basis of 33 U.S.C. 1342(a)(1)(B), a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under 33 U.S.C. 1314(b) after the original issuance of the permit to contain effluent limitations that are less stringent than the comparable effluent limitations in the previous permit, except that a permit under this subsection may be renewed, reissued, or modified to contain a less stringent effluent limitation applicable to a pollutant, if:
>
> > (2) information other than revised regulations, guidance, or test methods that would have justified the application of a less stringent effluent limitation is now available but was not available at the time of permit issuance, or the Department determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under 33 U.S.C. 1342(a)(1)(b);

Based on information discussed in Sections 5.2.2.3 and 5.3.7, the Department has determined that there was a technical error in previously adopted TBELs based on case-by-case BPJ for BOD_5, COD, Oil and Grease, and TSS that justifies removing these TBELSs in the reissued permit per 18 AAC 83.480(b)(2). TBELs in the existing Permit were based on case-by-case BPJ citing 40 CFR 419. Specifically, the limits were developed based on the assumption SCA discharges have similar characteristics as ballast water [defined in 40 CFR 419.11(c)]. Current available data from SCA facilities permitted by the Department (e.g., permit applications and DMR data), does not support the presumptions that SCA discharge characteristics are comparable to ballast water from oil refineries as described in 40 CFR 419. Furthermore, the current data does not support that 40 CFR 419 is appropriate for citing TBELs using case-by-case BPJ for SCA discharges in general.

DEC previously demonstrated ballast water was inappropriate for developing case-by-case TBELs while reissuing several individual permits. As a result of the analysis, TBELs using case-by-case BPJ for BOD_5, COD, TSS, and oil and grease, were discontinued in these reissued individual permits consistent with 18 AAC 83.480(a). The Department finds that the most appropriate limits for controlling the applicable POCs in the discharge is by imposing WQBELs based on water quality criteria for TAH and TAqH. Because these stringent WQBELs are protective of water quality and the uses of the waterbody, the removal of the inappropriate parameters will not negatively affect the receiving water and is consistent with the State's antidegradation policy.

In addition, the Department has determined that there was a technical error in previously adopted volume limit of 3mgd for Gravel Pit Dewatering (Discharge 003). While there was no indication for basis of this volume limit, the intent appeared to be for preventing sedimentation and downstream erosion (Section 2.2.3). There does not appear to be a clear nexus between the 3mgd limit and prevention of sediment and erosion as this is often dependent upon seasonal variations in the receiving water (e.g., high stream flows or flooding during break up). Instead, DEC requires daily observations, implementation of BMPs to control sedimentation and erosion, and in the event sediment and erosion is not controlled, the permittee must then obtain authorization for multiple discharge outfalls. These permit limitations is less arbitrary than the 3mgd limit, provide and flexibility for gravel pit dewatering during flooding events when gravel is a necessity, and results in the same level of protection of the waterbody.

10.0ANTIDEGRADATION

Section 303(d)(4) of the CWA states that, for waterbodies where the water quality meets or exceeds the level necessary to support the designated uses of the waterbody, WQBELs may be revised as long as the revision is consistent with the State antidegradation policy.

The antidegradation policy in the WQS (found at 18 AAC 70.015) states that the existing water uses and the level of water quality necessary to protect existing uses must be maintained and

protected. This section of the fact sheet analyzes and provides rationale for the Department's decision to issue the permit with respect to the antidegradation policy.

The Department's approach in implementing the antidegradation policy, found in 18 AAC 70.015, is based on the requirements in 18 AAC 70 and the *Policy and Procedure Guidance for Interim Antidegradation Implementation Methods, July 14, 2010 (Interim Methods).* Using these requirements and policies, the Department determines whether a waterbody, or portion of a waterbody, is classified as Tier 1, Tier 2, or Tier 3 where a higher numbered tier indicates a greater level of water quality protection. At this time there are no Tier 3 waterbodies designated in Alaska. Therefore, wastewater discharged under this permit is subject to a Tier 2 antidegradation analysis, as detailed in the *Interim Methods*. The State antidegradation policy in 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 (Tier 2), that quality must be maintained and protected unless the Department finds that the five specific requirements of the antidegradation policy at 18 AAC 70.015(a)(2)(A)-(E) are satisfied. These five findings are:

1. **18 AAC 70.015(a)(2)(A). Allowing lower water quality is necessary to accommodate important economic or social development in the area where the water is located.**

Based on the evaluation required per 18 AAC 70.015(a)(2)(D), the Department has determined that the most reasonable and effective pollution prevention, control, and treatment methods are being used and the lowering of water quality is necessary.

The 2013 Alaska Economic Performance Report written by the Department of Commerce, Community and Economic Development indicates that the Alaskan oil and gas industry continues to be the largest source of state revenue while creating some of the highest paying jobs in the State (DCCED, 2013). Over 92 percent of the state's unrestricted revenue originates from taxes and royalties affiliated with the petroleum industry. Alaska's mineral industry has increased in production and between 2001 and 2013 and the mining industry has doubled its employment (DCCED 2013).

In addition, DNR tracks oil and gas activity in the state when it develops findings for lease sales (DNR, 2011). The July 15, 2008 Best Interest Finding for the North Slope Areawide Oil and Gas lease sale, the November 9, 2009 Final Finding for the Beaufort Sea Areawide Oil and Gas Lease Sale, and The Alaska Economic Performance Report included the following socio-economic information on the oil and gas industry:

- Alaska's economy depends heavily on revenues related to oil and gas production and government spending resulting from those revenues. Oil and gas lease sales generate income to state government through royalties (including bonuses, rents, and interest), production taxes, petroleum corporate income taxes, and petroleum property taxes. Total oil revenue totaled $7.4 billion in fiscal year (FY) 2013.

- Unrestricted oil revenue comprised approximately 92% of the state's general fund unrestricted revenue in FY2013.
- The Alaska state-wide economy depends heavily on revenues related to petroleum development, which totaled $5.2 billion in fiscal year 2007. The petroleum industry is Alaska's largest industry, annually spending $2.1 billion, including $422 million on payroll and $1.7 billion on goods and services.
- Overall, $5 billion was spent on Alaska vendors resulting in 51,000 jobs and $3.45 billion in wages. Alaska's oil & gas industry is responsible for approximately one third of all Alaska wages and salary jobs and more than $6.43 billion in wages.
- A primary goal of the North Slope Borough (NSB) has been to create employment opportunities for Alaska Native residents. The NSB has been successful in hiring large numbers of Alaska Natives for NSB construction projects and operations. The NSB employs many permanent residents directly and finances construction projects under its Capital Improvement Program. The NSB pay scales have been equal to, or better than, those in the oil and gas industry, while working conditions and the flexibility offered by the NSB are considered by Alaska Native employees to be superior to those in the oil and gas industry. In addition, NSB employment policies permit employees to take time off, particularly for subsistence hunting.
- Oil and gas is an important component of revenues to support government services to Alaskans. At the end of the state's 2012 fiscal year, oil and gas revenues represented 83% of the total revenue to the state.
- According to the State Pipelines Coordinator's Office 2013 Annual Report, the state collected $5.59 million from the state right-of-way leases for pipelines (SPCO, 2014). APSC is the largest pipeline in the state that maintains and operates the TAPS pipeline and has approximately 800 employees (APSC, 2011).

Facilities and activities which support oil and gas exploration, production, and development on the North Slope Borough support important economic and social aspects in the area where the water body is located and across the State of Alaska. The Department finds that the requirements of this part of the antidegradation analysis have been met.

2. 18 AAC 70.015 (a)(2)(B) Except as allowed under this subsection, reducing water quality will not violate the applicable criteria of 18 AAC 70.020 or 18 AAC 70.235 or the whole effluent toxicity limit in 18 AAC 70.030.

The permit limits and conditions ensure water quality criteria are not violated in the receiving waterbodies. The permit includes limits for each wastewater stream that are based on meeting water quality criteria at the point of discharge, except for graywater discharges to frozen tundra and ice. For discharges of graywater to frozen tundra or ice, the Department may authorize a standard-sized 200-foot radius mixing zone for FC bacteria and residues. Where DEC has authorized a mixing zone, all applicable water quality criteria must be met at the boundary of the authorized mixing zone. Meeting water quality criteria at the point of discharge, or at the

boundary of an authorized mixing zone, ensures the existing uses of the water body as a whole are protected. Site-specific criteria as allowed by 18 AAC 70.235 has not been established for the North Slope GP and is therefore not applicable. Similarly, no Whole Effluent Toxicity (WET) limits or monitoring requirements are contained in the Permit; therefore, 18 AAC 70.030 is not applicable.

The Department finds that the requirements of this part of the antidegradation analysis have been met.

3. 18 AAC 70.015 (a)(2)(C) the resulting water quality will be adequate to fully protect existing uses of the water

Water quality criteria established in the WQS were developed so that attainment of the criteria ensures the protection of the existing uses of the waterbody. Waters covered under the Permit are protected for all fresh water use categories per 18 AAC 70.20(a)(1)(A-C) and all marine use categories per 18 AAC 70.020(a)(2)(A-D). Effluent limits and monitoring in the Permit have been developed to ensure that freshwater and marine water quality criteria are not exceeded at the point of discharge, or if applicable, at or beyond the boundary of an authorized mixing zone. Accordingly, all water quality criteria will be met in the waterbody at the boundary of the mixing zone, and the existing uses of the waterbody are protected.

The Department finds that requirements of this part of the antidegradation analysis have been met.

4. 18 AAC 70.015(a)(2)(D) the methods of pollution prevention, control, and treatment found by the Department to be most effective and reasonable will be applied to all wastes and other substances to be discharged.

Evaluation of the waste streams show a potential for any of the discharges authorized under the Permit to include sediment, turbidity, petroleum hydrocarbons, oil and grease, TAH, or TAqH. While each of the pollution prevention, control, and treatment methods discussed can be applied holistically, the discharges covered by the Permit will be grouped into four categories according to the likelihood of the pollutant making it into the waste stream for the purpose of this finding:

1. Discharges likely to become contaminated with sediment or turbidity
    - Gravel Pits
    - Excavations
2. Discharges likely to become contaminated with petroleum hydrocarbons, oil and grease
    - Hydrostatic Test Water
    - Mobile Spill Response Units
    - Secondary Containment Areas
3. Graywater Discharges
4. Storm Water Discharges

Discharges Likely to Become Contaminated with Sediment and Turbidity: These discharges represent point source discharges that are controlled through the combination of typical treatment technologies (e.g. sediment basins, velocity dissipation devices, etc.) as a part of the standard BMP Plan and enhanced treatment (e.g. flocculants, coagulants, and advanced filtration systems) that have been approved for adoption into the BMP Plan. Review of enhanced treatment, where applicable, helps to ensure the proposed treatment is the most effective and reasonable method. Other discharge specific BMPs for sediment and erosion control enhance these controls.

Discharges Likely to Become Contaminated with Petroleum Hydrocarbons, Oil and Grease, TAH and TAqH: The permit prohibits the discharge of petroleum hydrocarbons, oil and grease as determined by the visual sheen test in all discharges. The permit requires removal of any oily sheen prior to discharge. For discharges where a sheen has been observed or there is a higher likelihood for discharge of petroleum hydrocarbons or oil and grease (e.g., hydrostatic testing of pipelines which have been exposed to hydrocarbons), the Permit either requires monitoring or applies numeric limits for TAH and TAqH to ensure discharges do not violate water quality criteria. Similar to discharges likely to have sediment and turbidity, discharges that are likely to have TAH and TAqH can apply treatment processes or systems that have been reviewed by the Department and adopted in the BMP Plan. Discharges from mobile spill response units must have such a system in the BMP plan in order to receive coverage. If these discharges are likely to have petroleum hydrocarbons and also exhibit high turbidity or sediment, applicable BMP Plans for sediment and erosion control can also be implemented. As stated previously, the Department considers prohibiting the discharge of petroleum hydrocarbons through effective use of approved treatment technologies adopted in the BMP Plan to be the most effective and reasonable treatment and pollution control techniques for these discharges.

Graywater: As stated in Sections 5.2.2.1 and 5.3.2, graywater is not expected to meet secondary treatment requirements, but must at least meet primary treatment. The applicant must reasonably demonstrate that the treatment level attained will be protective of human health and the environment. The limits contained in the Permit are WQBELs and TBELs using case-by-case BPJ based on existing performance data from existing graywater treatment facilities. The level of treatment attained using available technology and other pollution controls have reasonably demonstrated they are protective of the existing uses of the waterbody. As discussed in Sections 4.1 and 5.3.2, mobile facilities use various treatment systems but typically include grit removal technologies, housekeeping measures to prevent pollutants from entering the waste stream, and BMP tools to control pollutants in the discharge. Hence, limits developed using BPJ need not meet minimum secondary treatment standards defined by 18 AAC 72. The Permit requires applicants to adhere to existing requirements in 18 AAC 72 that may require permittees to submit plans and a request to waive secondary treatment standards prior to receiving authorization to discharge graywater. Finally, the permit requires permittees to develop specific BMPs that prevent and control pollutants in the most effective and reasonable manner.

Storm Water: Storm water is similar to the other discharges except the entire BMP Plan is applicable for use based on site specific requirements determined during the development of a SWPPP. The SWPPP emphasizes source control and housekeeping to prevent discharges from coming into contact with pollution sources. Based on the unique nature of the facility (e.g., the types and amounts of potential contaminant sources) and operations, the permittee develops site-specific SWPPPs using appropriate BMPs to prevent, or control, pollutants in the discharge. The permittee is required to conduct biannual inspections of the facility during breakup to evaluate the effectiveness of the selected controls. If appropriate, the SWPPP is revised to reflect any changes or modifications to pollutant controls. The permittee reports annually that the inspection and revision process has been conducted according to Permit requirements.

Each waste stream is either treated using the most effective and reasonable methods or controlled by implementing practicable and effective pollution prevention and control strategies. The Department finds that requirements of this part of the antidegradation analysis have been met.

5. **18 AAC 70.015(a)(2)(E). 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" as defined in 18 AAC 70.990(30) includes the following three parts:

a) *Any federal TBEL identified in 40 CFR § 125.3 and 40 CFR § 122.29, as amended through August 15, 1997, adopted by reference at 18 AAC 83.010;*
b) *Minimum treatment standards in 18 AAC 72.040; and*
c) *Any treatment requirement imposed under another state law that is more stringent than a requirement of this chapter.*

The first part of the definition refers to ELG's and TBELs using case-by-case BPJ. Per Section 5.2.1, DEC considered ELGs in 40 CFR 435 and 40 CFR 436 during limit development for graywater and storm water. The resulting determination was that WQBELs were more stringent and were, accordingly, adopted in the Permit. DEC also evaluated TBELs using case-by-case BPJ for secondary containment citing 40 CFR 419, and concluded that the ELGs referenced did not adequately represent the observed discharge characteristics based on available data (Section 5.2.2.3). WQBELs were determined to be the most appropriate (Section 5.3.7) for secondary containment. Last, the Department considered 40 CFR 440 Subpart M for settleable solids TBELs using case-by-case BPJ (Section 5.2.2.2) for Gravel Pits, Hydrostatic Test, Excavation Dewatering (Discharges 003-005) and again found WQBELs to be more stringent. Ultimately, TBELs using case-by-case BPJ were only developed for BOD_5 and TSS for graywater discharges. Per Section 5.2.2.1, existing data was evaluated to derive appropriate limits base on the treatment performance observed from existing graywater discharges. When compared to existing limits in the existing Graywater GP, the existing limits were retained

because they are slightly more stringent yet still attainable with the treatment technology currently used by permittees.

As stated previously (Section 7.2.3.2) the second part of the definition appears to be in error, as 18 AAC 72.040 considers discharge of sewage to sewers and not minimum treatment. The correct reference appears to be 18 AAC 72.050, minimum treatment, which deals with domestic wastewater. The Permit includes BOD_5 and TSS TBELs for graywater that do not meet minimum treatment requirements defined in the most recent version of 18 AAC 72 as secondary treatment. Where minimum treatment standards cannot be met, a waiver may be granted by the Department prior to receiving discharge authorization. The waiver is appropriate based on the current data and information reviewed from existing permittees and supported by the mixing zone analysis which evaluated 200-foot radius mixing area (Section 7.2). The mixing zone analysis and existing data also supports the Department finding that human health and the environment are protected.

The third part of the regulation includes any treatment required by State law that is more stringent than 18 AAC 70. Other regulations beyond 18 AAC 70 that directly apply to the permitting action include 18 AAC 72 and 18 AAC 15. The paragraph above speaks directly to the more stringent treatment requirements contained in 18 AAC 72 for graywater discharges. Besides those in 18 AAC 72, neither the regulations in 18 AAC 15 or another State law that the Department is aware of impose more stringent treatment requirements than 18 AAC 70.

The Department finds that requirements of this part of the antidegradation analysis have been met.

11.0 OTHER PERMIT CONDITIONS

11.1 Standard Permit 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, signatory authority, and other general requirements.

11.2 Best Management Practices Toolkit

A BMP Plan is a collection of controls and housekeeping measures which are intended to minimize or prevent the generation and the potential release of pollutants from a facility to the waters of the U.S. through normal operations and ancillary activities. Pursuant to CWA Section 402(a)(1), development and implementation of BMPs may be included as a condition in APDES permits. CWA Section 402(a)(1) authorizes DEC to include miscellaneous requirements that are deemed necessary to carry out the provision of the CWA in permits on a case-by-case basis. The Permit requires a BMP Plan which is developed to control or abate the discharge of pollutants in accordance with 18 AAC 83.475. A BMP Plan must include certain generic controls as well as specific tools for controlling pollutants from each of the following unique waste streams:

Graywater (Discharge 002), Gravel Pit Dewatering (Discharge 003), Excavation Dewatering (Discharge 004), Hydrostatic Test Water (Discharge 005), Storm Water (Discharge 006), Mobile Spill Response (Discharge 007), and Secondary Containment (Discharge 008).

11.2.1 Implementation and Maintenance of the BMP Plan

A permittee must develop a BMP Plan which achieves the objectives outlined in Section 11.2. For first time authorizations under the North Slope GP, applicants shall provide a copy of the BMP Plan with the NOI for DEC files. Subsequent NOIs for authorization revisions or renewals require a certification statement that the BMP Plan has been updated and is ready to implement to be submitted with the NOI request (Section 11.5). The BMP Plan for industrial activities shall be located at the permitted facility and made available for Department review upon request. A qualified person must amend the BMP Plan whenever there is a change in the facility or in the operation of the facility that materially increases the generation of pollutants, their release, or potential release to receiving waters. Changes to the BMP Plan shall be consistent with the objectives and specific requirement as described in Permit Section 2.15.8. Facility and Environmental managers must review all change to the BMP Plan. Permittees must conduct an annual review and a certification statement must be submitted to the Department as outlined in Section 12.2.

11.2.2 Standard BMP Plan Components

The BMP Plan must be consistent with the general guidance contained in *Guidance Manual for Developing Best Management Practices* (EPA 833-B-93-004, October 1993) or any subsequent revision. The BMP Plan must include, at a minimum, the following items:

- Statement of BMP policy. The BMP Plan must include a statement of management commitment to provide the necessary financial, staff, equipment, and training resources to develop and implement the BMP Plan on a continuing basis.
- Current copies of the North Slope GP, the signed and certified NOI submitted to DEC, authorization letters issued by the Department, and previous 3 years of annual BMP Plan certification letters.
- Description, location, and sequence of activities, BMP control measures, any stabilization measures, final constructed site plans, drawings, and maps.
- A log of BMP Plan modifications which documents maintenance and repairs of control measures, including date(s) of regular maintenance, date(s) of discovery of areas in need of repair/maintenance, and date(s) that the control measure(s) returned to full function (Section 3.2.7);

- Description of any corrective action taken at the facility, including the event that caused the need for corrective action (include notice of non-compliance if reporting was required) and dates when problems were discovered and modifications occurred (Section 3.2.7);
- Structure, functions, and procedures of the BMP Committee. The BMP Plan must establish a BMP Committee chosen by the permittee responsible for developing, implementing, and maintaining the BMP Plan.
- A description of potential pollutant sources and their associated discharge numbers.
- An identification and assessment of risks associated with accidental pollutant releases.
- Standard Operating Procedures that include but are not limited to:
    - Good Housekeeping.
    - Security.
    - Materials compatibility.
    - Record keeping and reporting.
    - Operation and maintenance plans for wastewater treatment systems and BMP controls. Elements should include preventative maintenance and repair procedures that are developed in accordance with good engineering practices.
    - Use of local containment devices such as liners, dikes, and drip pans where chemicals are being unpackaged and where wastes are being stored and transferred.
    - Apply chemical cleaning compounds and disinfectants in accordance with manufacturer instructions and suggested application rates.
    - Employee training and records of employee training date(s), etc.
    - Inspections and regular evaluation of BMP controls including evaluation of planned facility modifications to ensure that BMP Plan is considered and adjusted accordingly.

11.2.3 General BMP Requirements

In addition to the standard BMP Plan components listed in Section 11.2.2, DEC will require the following general tools be included in the BMP Plan for all applicable discharges.

- **Contaminated Sites.** DEC strongly suggests that Permittees review the Contaminated Sites Database to determine if contamination may be encountered when conducting activities in a new area. Division of Spill Prevention and Response, Contaminated Sites Program website at: http://dec.alaska.gov/spar/csp/. If within 1,500 feet of a contaminated site, the permittee must contact CSP. The permittee must develop BMPs controls to help ensure compliance with Permit limits for situations where contaminated water is encountered.

- **Petroleum Hydrocarbons, Oils and Grease.** Petroleum hydrocarbons, oils and grease may be present in graywater, gravel pits, excavations, hydrostatic test water, or secondary containment areas from kitchen oils, machinery, or other spills. The Permittee shall have BMP controls that will be implemented if a sheen is observed in order to prevent these pollutants from entering waters of the U.S.
- **Sediment and Erosion Controls.** All discharges shall use BMPs for erosion and sediment control. BMP controls should incorporate the use of sedimentation ponds or basins, diffusers or other energy dissipation devices at the point of discharge to prevent sedimentation and erosion. The BMP controls should also include methods which prevent sediment accumulation (i.e., greater than 1/8 inch) that could adversely impact sensitive vegetation areas. DEC strongly suggests that erosion and sediment controls be utilized for all discharges. Refer to the following manuals for guidance: *Alaska Storm Water Guide.* http://dec.alaska.gov/water/wnpspc/stormwater/Guidance.htm .

11.2.4 Discharge Specific BMP Controls

DEC has determined that individual waste streams may have unique challenges which must be addressed with discharge specific BMP controls. BMP Plans must establish specific BMPs or other measures to achieve the objectives under Sections 11.2.4.1-11.2.4.7 for each discharge requested.

11.2.4.1 Specific Graywater BMP Controls (Discharge 002)

Permittees shall develop tools or methods which ensure: discharges do not contain floating solids, foam or garbage; the use of phosphate free and non-toxic soaps and detergents; minimal use of chlorine and other disinfections products; chemical cleaning compounds and disinfectants used will minimize the addition of nitrogen and phosphorous-based chemicals; chemical cleaning compounds and disinfectants are applied in accordance with manufacturer's instructions; surface discharge point is relocated as necessary and at a minimum frequency of once per 30-days; access to the surface discharge area is prevented through signage, remote location and/or fencing; kitchen oils are not introduced to the graywater system and provide alternate waste receptacles or holding tanks for these materials; use of nontoxic degreasers; all toxic or hazardous material, unused soaps, detergents, or pharmaceuticals have alternate waste receptacles or holding tanks and are prohibited from entering into the graywater system.

11.2.4.2 Specific Gravel Pit Dewatering BMP Controls (Discharge 003)

Gravel Pit Dewatering (Discharge 003) requires specific BMP controls which address downstream sedimentation or erosion in the receiving water in addition to ensure compliance with Permit limits. This may include a variety of velocity dissipation devices, settling basins, or splitting a large volume across multiple discharge locations (may require multiple outfalls), etc. Because gravel pit water may be discharged directly to a waterbody or repurposed for ice roads and ice pad construction or dust suppression, BMPs controls should be specific to each activity authorized under the Permit. For guidance on BMP controls for gravel pits, refer to *Alaska*

DEC's User Manual, Best Management Practices for Gravel/Rock Aggregate Extraction Projects and *North Slope Gravel Pit Performance Guidelines.*

11.2.4.3 Specific Excavation Dewatering BMP Controls (Discharge 004)

Excavation Dewatering discharges require the same specific BMPs as Gravel Pit Dewatering. BMPs must prevent adverse sediment and erosion and ensure compliance with Permit limits. In addition, dewatering activities which occur within 1,500 feet of a contaminated site or within 1,500 feet of a contaminated groundwater plume must include BMPs controls to help ensure compliance with Permit limits for situations where contaminated water is encountered.

11.2.4.4 Specific Hydrostatic Test Water BMP Controls (Discharge 005)

Operators are required develop BMP Plans which prevent sedimentation and erosion control at point of discharge or downstream of the discharge. The BMP Plan must also include tools which address hydrocarbon removal in the event a sheen is observed in the hydrostatic test water. This requirement is particularly important for discharge authorizations that include limits for TAH and TAqH due to a higher potential for hydrocarbon presence in the discharge. Last, specific controls must be implemented for facilities which use heated water to prevent freezing in the pipelines during a test. These controls must include measures which ensure water quality criteria for temperature is met at the point of discharge and which discharge protocols which prevent thermokarsting of tundra and permafrost.

11.2.4.5 Specific Storm Water BMP Controls (Discharge 006)

The permittee is required to identify and control pollutant sources associated with industrial storm water and allowable non-storm water discharges from each identified facility. A qualified person must select, design, install, and implement BMPs that will prevent pollution from being discharged with storm water. Permittees shall eliminate to extent practicable storm water runoff; properly manage solid and hazardous waste; and properly manage of materials in accordance with spill prevention, control, and countermeasure plans. For Storm Water (Discharge 006), the SWPPP satisfies the specific tool requirements of the BMP Plan (Section 11.3).

11.2.4.6 Specific Mobile Spill Response BMP Controls (Discharge 007)

BMP Plan must include operation and maintenance procedures for treatment systems that remove free-phase and dissolved-phase hydrocarbons to ensure the treatment capacity of the system is maintained. The BMP Plan must also address procedures which must be implemented to bring the discharge into compliance with the Permit upon observation of a sheen.

11.2.4.7 Specific Secondary Containment BMP Controls (Discharge 008)

Permittees are required to develop specific BMPs for discharges from SCAs. These procedures shall include controls used to remove sheen, and dissolved as well as free-phase hydrocarbons in the event that a sheen is observed on the surface water or when monitoring results exceed water quality criteria for TAH and TAqH in the SCA.

11.3 Storm Water Pollution Prevention Plan

Coverage for Storm Water (Discharge 006) requires that the applicant develop and implement a SWPPP, which assesses site specific conditions, sources of sediment and other pollutants, and establishes BMP controls to prevent, or minimize to the extent practicable, pollutants from being discharged in storm water. The SWPPP must identify BMPs or controls that will best suit the facility and activities and meet pollution control objectives. The SWPPP must also satisfy the Specific BMPs for Storm Water outlined in Section 11.2.4.5.

11.3.1 SWPPP Development and Implementation

The SWPPP must be developed by a qualified person and applicants seeking first time coverage, or reapplication for an existing storm water authorizations, must provide a copy of the SWPPP with the NOI (See Section 11.5). Subsequent NOIs for revisions of an existing authorization must include a written certification statement that the SWPPP has been reviewed and updated, if necessary, and is ready to implement (Section 11.5). While SWPPPs are developed to address site-specific control measures for an individual facility, the permittee may develop a SWPPP for multiple facilities in a proximal area, so long as the implementation of the SWPPP is not impracticable due to distance separating the facilities and the SWPPP has adequate details for each individual facility (e.g., site maps showing snow storage areas, secondary containment areas, other potential contaminant sources, local drainage patterns, etc.). Any revisions to a multi-facility SWPPP must be distributed to each facility prior to implementation.

The SWPPP must be updated as necessary to reflect any revisions to the facility that affect the storm water controls implemented at the site (Section 11.3.3.3) including revisions that address applicable federal, state, tribal, or local requirements. The adaptation of the SWPPP for facility changes resulting from other program requirements is intended to account for overlapping or similar requirements, while complying with the Permit. The permittee must review the SWPPP annually, make revisions if necessary, and submit annual certifications to the Department. The current SWPPP must be maintained at the facility site as described in Section 11.3.3.1.

11.3.2 SWPPP Contents

A SWPPP shall be consistent with EPAs document, *Developing Your Stormwater Pollution Prevention Plan – A Guide for Industrial Operators (February 2009, EPA 833-B-09-002)* or any subsequent revision of the guidance document. For additional guidance, permittees may also consult the *Alaska Storm Water Guide (December 2011*) or the 2015 Alaska Multisector General Permit (MSGP). While these guidance documents are helpful, forms from other permits must not be used to satisfy reporting requirements of the North Slope GP.

The North Slope GP requires that the narrative of the SWPPP also include descriptions of the following items:

- Measures to cleanup reportable quantity releases (Contaminated storm water is storm water associated with a discharge of a reportable quantity for which notification is or was

required per 40 CFR 117.21, 40 CFR 302.6, or 40 CFR 110.6 or any storm water that contributes to a violation of a water quality standard [40 CFR 122.26(c)(1)(iii)]);

- Vehicle and equipment storage, cleaning, and maintenance areas;
- Snow handling procedures and erosion controls; and
- Any provisions necessary to meet the BMP Plan requirements of the Permit.

11.3.3 SWPPP Implementation and Administrative Requirements

11.3.3.1 SWPPP Documentation and Availability

Copies of the North Slope GP, the signed and certified NOI submitted to DEC, authorization letters, and a log of SWPPP modifications must be included with the SWPPP. This permit condition stresses the importance understanding interrelated permit requirements and responsibilities. In addition, the following documents must be kept with the SWPPP:

- Description, location, and sequence of activities, control measures, and stabilization measures;
- Documentation of maintenance and repairs of control measures, including date(s) of regular maintenance, date(s) of discovery of areas in need of repair/maintenance, and date(s) that the control measure(s) returned to full function;
- Manufacture Information (i.e. Material Safety Data Sheet, manufacturer and/or supplier test results, or installation instructions);
- Description of any corrective action taken at the facility, including the event that caused the need for corrective action and dates when problems were discovered and modifications occurred;
- Records of employee training, including the date(s) training was received; and
- Copies of biannual inspection reports, non-compliance notices, annual SWPPP certifications, monitoring reports, and annual reports.

A Permittee must make a copy of the SWPPP and documentation available to DEC upon request for review or copying during any CEP on-site inspection per 18 AAC 83.405(j)(2). Electronic storage of documents can be used so long as they are accessible when a DEC inspector conducts an onsite inspection. A copy of the SWPPP must be kept at the facility at all times. The SWPPP must identify any alternative off-site location for available access if there is a seasonal shut down for a facility. The SWPPP must be returned to the facility once the shutdown is over.

11.3.3.2 Inspection Requirements

Requirements for reporting results of storm water monitoring inspections are specified at 40 CFR §122.44(i)(4). Specifically the Permit requires:

- Bi-annual inspection of the facility site. One inspection should be conducted prior to breakup to assess whether there are any areas which may contribute to storm water discharges associated with the industrial facility or activity and could be addressed with BMPs to minimize contact with contamination sources. The second inspection should be conducted after the breakup period is over to assess whether there are any areas which

contributed to storm water discharge associated with the industrial facility or activity that were unanticipated and unaddressed by the SWPPP. Based on findings during the inspections, the SWPPP should be modified to include the necessary practices to minimize future contact or contamination.

- Inspection reports and compliance certification must be maintained for a period of three years.
- Certifications that the bi-annual inspections have been conducted must be reported to the Department with other annual reporting requirements (Section 12.2). Certifications must be signed in accordance with established signatory authority (40 CFR §122.22). For inactive sites where annual inspections are impracticable, or otherwise unwarranted, a certification is required once every three years stating the facility is in compliance with the Permit or alternative requirements.

11.3.3.3 SWPPP Modifications

The permittee must update the SWPPP, site maps, within seven calendar days in response to any following triggering conditions:

- Changes to control measures, good housekeeping measures, or other activities that render the exiting SWPPP obsolete,
- Changes made in response to corrective actions, or maintenance procedures, or
- An inspection or investigation reveal changes are necessary to comply with the Permit.

The permittee must revise its SWPPP to reflect the new maintenance procedures and include documentation of the corrective action to return to full compliance. The permittee must maintain a log showing the dates of all SWPPP modifications, including name of the person authorizing each change and a brief summary.

11.4 Quality Assurance Project Plan

The Permittee is required to develop a QAPP for all authorized discharges where monitoring is required (See Permit Section 3.1). The plan shall be retained onsite and made available to the Department upon request. The QAPP shall consist of standard operating procedures the permittee must follow for collecting (See composite sampling requirements in Section 6.3), handling, storing, and shipping samples; laboratory analysis; and data reporting, which ensure that monitoring data submitted are accurate and to explain data anomalies if they occur. A certification that a QAPP has been developed and is ready to be implemented must be submitted to the Department with the NOI for first time applicants and existing permittees that are required to reapply under the Permit (Section 11.5). In addition, a summary of any changes to the QAPP and a certification statement of the existing QAPP must be submitted to the Department with other annual reports (Section12.2).

11.5 Notice of Intent Procedures

An applicant seeking coverage under the permit must submit a NOI to DEC per 18 AAC 83.210(b). Per Section 4.8, DEC believes the intermittent or infrequent discharges associated with certain discharges has led to reporting problems. Therefore, authorizations which were previously issued, but not frequently used, will now be issued as separate authorizations on an as-needed basis and terminated as soon as practicable afterwards (i.e., Excavation Dewatering and Hydrostatic Test Water). The Permit includes separate NOI applications for long-term activities (Discharges 002, 003 and 006-008) and single event activities (Discharges 004-005). The following information will be required for each NOI:

1. **Applicant information**. The NOI requires the applicant to provide the owner's or Permittee's name, mailing address, contact name, and telephone number.
2. **Discharges**. The permit requires the applicant to clearly identify the types of discharges being requested.
3. **Location of discharge**. The NOI requires the applicant to provide accurate descriptions for location of operations and discharges. The following summarizes the approach per discharge:
    a. **Graywater (Discharge 002)**: Area of discharge as described in the vicinity map.
    b. **Gravel Pit Dewatering (Discharge 003):**
        i. To open waterbodies – coordinate of the gravel pit (approximate centroid) and each discharge point to the receiving water.
        ii. Ice roads/pads and dust control – provide coordinate of mine site and show area of coverage with road systems in vicinity maps. Two opposite corner coordinate points for the vicinity map designate the area of coverage.
    c. **Excavation Dewatering and Hydrostatic Test (Discharges 004 and 005):** These are one-time authorizations for a construction or maintenance projects that must be terminated upon project completion. Provide coordinate of proposed discharge locations, vicinity maps, and site plans that clearly depict the project components.
    d. **Storm Water (Discharge 006):** Storm water requires vicinity maps and detailed site plans be provided in the SWPPP submitted with the NOI. Detailed site plans must include potential sources of contamination and interrelated discharges such as secondary containment. Secondary containment areas must be labeled according to the discharge description provided in the NOI for those discharges.
    e. **Mobile Spill Response (Discharge 007):** Mobile spill response may be discharged over an area of operation. Provide vicinity map with road systems similar to Section 11.5, item (3)(b)(ii).
    f. **Secondary Containment (Discharge 008):** If the request to discharge secondary containment is for a mobile facility, the applicant must submit a vicinity map of the area of operation similar to gravel pit water for ice roads/pad construction and

gravel road dust control. If applicant is submitting a SWPPP that overlaps secondary containment coverage, the applicant submit vicinity maps and site plans in the SWPPP include that include secondary containment areas and cross-reference the outfall descriptions on the NOI. If secondary containment is not overlapping storm water, the applicant must submit a detailed site plan with the NOI that shows the containment area(s) with a cross-referenced identifier and drainage paths.

4. **Vicinity map**. The NOI requires the application to submit a vicinity map of proposed location of operations and discharges.
5. **Detailed Site Plans**: Detailed site plans that show the discharge point, relative infrastructure (e.g., SCAs, pipelines, excavation areas, etc.) must be submitted as described in item 3.
6. **Commencement Date of discharge**. The applicant must provide the initial date and expected duration of operations. However, the date that discharges may commence is based upon receiving written authorization from the Department.
7. **BMP Plan and SWPPP**. First time applicants and existing permittees required to reapply under the Permit must submit a BMP Plan, or SWPPP, with the NOI for DEC files. NOIs submitted to revise an authorization after first authorization or to obtain administrative extension prior termination of the Permit need only submit a certification that a current BMP Plan, or SWPPP, is ready to implement.
8. **QAPP Certification**. First time applicants and existing permittees required to reapply under the Permit must submit a certification statement that a QAPP has been developed and is ready to be implemented with NOI submittal. Certification statements are not required to be submitted with NOIs for authorization revision or administrative extension prior to permit termination.
9. **Miscellaneous Reports**. The applicant may submit copies of plans, surveys, and other reports required by other state and federal agencies to support the NOI.
10. **Plan Approval**. The Permit requires the applicant to demonstrate to the Department that graywater treatment systems are compliant with the most current version of 18 AAC 72 prior to discharging to water of the U.S. Applicants may be required to submit plans, waivers to minimum treatment, or previous Department graywater approvals with the NOI.

11.5.1 Deadlines for Submitting NOI

NOI submittals fall under four categories: new applicants, existing permittees required to reapply under the Permit, NOIs to revise an existing NOI (after first issuance or reapplication), and NOIs to obtain administrative extension prior to Permit expiration. All existing permittees under AKG331000 and AKG426000 are required to reapply under the reissued Permit to become

authorized. Applicants who must reapply shall submit an NOI within 30 days after the effective date of the permit and include documents as if submitting for the first time. Applicants for an extension under the permit and new or revised applications that are not required to submit plans or request to waive minimum treatment requirements for graywater must submit within 30 days prior to discharge.

Applicants that have previously received approvals or waivers required by 18 AAC 72, must submit an NOI to DEC at least 30 days prior to discharge and include copies of those previous approvals. Applicants that have not received approvals or waivers required by 18 AAC 72, must submit an NOI at least 45 days prior to discharge and include the necessary submittals per most current version of 18 AAC 72. Note that incomplete or unacceptable submittals may require additional time to issue an authorization.

11.5.2 Existing Permittee Reapplication Rationale

Because DEC is reissuing the Permit to include graywater discharges currently authorized under AKG462000, all existing authorizations under AKG462000 must reapply under the Permit as AKG462000 will be terminated. In addition, there are many existing AKG331000 authorizations that are no longer appropriate (i.e., gravel pits have been rehabilitated) and many of the authorizations may be combined into a single authorization under AKG332000. Therefore, existing permittees with several closely related facilities (e.g., by project, unit, etc.) may combine those authorizations under a single authorization number and include multiple discharges. A list of potential combinations are included in Attachment B – Table B.3. However, each existing permittee is responsible for reviewing their existing authorizations and submitting NOIs that are appropriate based on ensuring there is a nexus, other than ownership, of the facilities and discharges they seek to combine into a single authorization.

11.5.3 Date of Authorized Discharge

Per 18 AAC 83.210(f) a general permit must specify the date(s) when it authorized a Permittee to begin discharging. Commencement of discharges from an activity may occur any time after issuance date of a written authorization from DEC. The written authorization will identify a general authorization number for the facility, list the authorized discharges, and specify any additional conditions necessary to comply with the Permit.

11.6 Notice of Transfers

Per 18 AAC 83.150, allows Permit coverage for a facility to be transferred from an existing owner to a new owner for an existing facility or location designated in the original NOI. Discharge authorizations for a particular facility may not be transferred to another facility at the same site, nor will the transfer apply to the same facility at a new location. The transfer requires signatures from both the existing permittee and the new permittee. A notice of transfer form can be obtained at the WDAP Website.

11.7 Notice of Termination

DEC may terminate coverage under an APDES permit for the reasons described in 18 AAC 83.140 using the procedures provided in 18 AAC 83.130. If a Permittee desires to terminate coverage for an individual outfall or the entire permit authorization, the permittee must submit a Notice of Termination (NOT) form to DEC within 30 days following cessation of discharge. The notice must include any final reports, if not already submitted, required by the Permit. Termination is complete upon written confirmation from the Department.

11.8 Permit Expiration

The Permit will expire five years from the effective date.

12.0 RECORDING AND REPORTING REQUIREMENTS

Per 18 AAC 83.455(b), reporting provisions allow flexibility in determining the frequency of reporting. Reporting requirements may differ based on the discharge. Currently, DEC is transitioning to an e-reporting system in accordance with 40 CFR § 127. In the interim, permittees must sign and certify DMRs and all other reports in accordance with the requirements of Appendix A, Part 1.12, Signatory Requirements and Penalties. All signed and certified legible original documents and reports must be submitted to the Department at the Compliance and Enforcement Program address in Appendix A, Part 1.1.2.

Upon implementation of the e-reporting system, the Permittee is responsible for electronically submitting DMRs and other reports in accordance with 40 CFR § 127. Reports submitted in compliance with the E-Reporting Rule are not required to submit hard copies unless requested by the Department. The start dates for e-reporting are provided in 40 CFR § 127.16. DEC has established a website at http://dec.alaska.gov/water/Compliance/EReportingRule.htm which contains general information about this new reporting format. As DEC implements the E-Reporting Rule, more information will be posted on this webpage. Training modules and webinar's for NetDMR can be found at https://netdmr.zendesk.com/home. The permittee will be further notified by DEC in the future about how to implement the conditions in 40 CFR §127.

12.1 Discharge Monitoring Reports

During the next permit cycle, DEC anticipates there will be a period of adjustment for permittees while the E-Reporting Rule is implemented. To address this adjustment period and inconsistent reporting issues identified in Section 4.8, DEC will use a tiered approach to DMR Reporting. Monitoring results for discharge authorizations (002 – 005 and 007 – 008) shall be summarized and recorded each month on a DMR or approved equivalent form and submitted (time-stamped) by the 28th of the following month. For periods of no discharge, DMRs must be submitted on the appropriate form and marked "No Discharge." Permittees with single event discharges (e.g. excavation dewatering and hydrostatic test water discharges) are encouraged to submit a Notice of Termination (per Section 11.7) for the discharge authorization upon completion of the activity. During the permit cycle, DEC will assess the capability of NetDMR to process batch

submittals of DMRs as well as reporting consistency across permit authorizations. Based on successful implementation of electronic DMR reporting and improved reporting consistency (no DMR schedule violations), DEC may modify the DMR submittal frequency from monthly back to an annual submittal schedule, if appropriate. Such modification would be conducted as a minor modification to the Permit per 18 AAC 83.145(a)(6).

12.2 Annual Reports

Annual report submittals must submitted by January 31st each year and include an annual certification of the BMP Plan and the QAPP. Permittees with an authorization for Storm Water (Discharge 006) must also include an annual SWPPP certification and biannual storm water inspection reports.

13.0 OTHER LEGAL REQUIREMENTS

13.1 Endangered Species Act

Endangered species are defined as a species that is in danger of extinction throughout all or a significant portion of its range. Threatened species are defined as a species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. The Endangered Species Act (ESA) requires federal agencies to consult with the agencies responsible for administering the ESA. Consultation helps to ensure actions authorized by the agency do not jeopardize the continued existence and recovery of species listed as threatened or endangered. It also helps to ensure actions do not result in the destruction or adverse modification of critical habitat.

DEC, as a state agency, voluntarily contacted FWS and NMFS on August 16, 2016 to obtain listings of endangered species and critical habitat. Within the permit coverage area (Section 3.1), the following species are listed as threatened or endangered and may potentially be affected by discharges authorized under the Permit.

- Polar Bear *(Ursus maritimus)*: Threatened; Wherever found
- Bowhead whale (*Balaena mysticetus*): Endangered
- Fin whale (*Balaenoptera physalus*): Endangered
- Humpback whale (*Megaptera novaeangliae*): Endangered
- Spectacled Eider *(Somateria fishceri)*: Threatened; Wherever found
- Steller's Eider *(Polysticta stelleri)*: Threatened; Wherever Found

The following critical habitats are also listed which may potentially be affected by discharges authorized under the Permit include the following:

- Polar Bear critical habitat (See Attachment A – Figure A.2).
- Spectacled Eider marine critical habitat in Ledyard Bay (See Attachment A – Figure A.3).

Steller's eider: The Alaskan breeding populations of Steller's eider were listed as threatened under the ESA on June 11, 1997 in the Federal Register (62 FR 31748). Designated critical habitat for the Steller's eider includes five units located along the Bering Sea and north side of the Alaskan Peninsula but none in the permit Area of Coverage.

Spectacled eider: The Alaskan breeding populations of Spectacled eider were listed as threatened under the ESA on June may 10, 1993 (58 FR 27474)). On February 6, 2001, the USFWS designated critical habitat for spectacled eider (66 FR 9146) in Ledyard Bay in the Chukchi Sea but none in the Beaufort Sea.

Polar bear: On May 15, 2008, the USFWS published a Final Rule in the Federal Register listing the polar bear as a threatened species under the federal Endangered Species Act (73 FR 28212-28303). The USFWS based its listing on the loss of sea ice, which it says threatens and will likely continue to threaten polar bear habitat. On December 7, 2010, the USFWS designated critical habitat for the polar bear 50 CFR Part 17. In 2013, the decision was challenged, and in 2016, the decision was upheld.

Bowhead whale: Bowhead whales are listed as endangered under the Endangered Species Act and are considered depleted under the Marine Mammal Protection Act. NMFS, in 2002, issued a determination within the Federal Register deciding against designating critical habitat for bowheads. NMFS determined that (1) the population decline was due to overexploitation by commercial whaling, and habitat issues were not a factor in the decline; (2) the population is abundant and increasing; (3) there is no indication that habitat degradation is having any negative impact on the increasing population; and (4) existing laws and practices adequately protect the species and its habitat (67 FR 55767, August 30, 2002.).

Fin whale: The fin whale population was decimated by commercial whaling in the 1800s and early 1900s. It was listed as endangered under the Endangered Species Conservation Act, the predecessor to the Endangered Species Act (ESA), in 1970. When the ESA was passed in 1973, the fin whale was listed as endangered throughout its range. It is also designated as depleted under the Marine Mammal Protection Act.

Humpback whale: Commercial whaling in the 1800s and early 1900s significantly reduced the global humpback whale population. In 1946, commercial whaling of humpbacks was regulation by the International Convention for the Regulation of Whaling. Then, the International Whaling Commission ended commercial whaling of humpbacks in 1966. In 1970, the humpback whale was listed as endangered under the Endangered Species Conservation Act, the predecessor the Endangered Species Act (ESA). When the ESA was passed in 1973, the humpback whale was listed as endangered throughout its range. In the same year it was designated as depleted under the Marine Mammal Protection Act. The Chukchi Sea is the northernmost area for humpbacks during their summer feeding, although, in 2007, humpbacks were seen in the Beaufort Sea east of Barrow, which would suggest a northward expansion of their feeding grounds.

Bearded seal: With the loss of sea ice due to climate change, concern has arisen over the survival of ice seals. The National Marine Fisheries Service (NMFS) was petitioned to list ribbon seals under the Endangered Species Act (ESA). In 2008, upon finding that the petition for ribbon seals had merit, NMFS decided to initiate status reviews for the ribbon seal and the other three species of ice seal, the spotted seal, the ringed seal, and the bearded seal. In December 2010 NMFS proposed to list the bearded seal as a threatened species under the ESA, but that decision has not been finalized

Ringed seal: With the loss of sea ice due to climate change, concern has arisen over the survival of ice seals. The National Marine Fisheries Service (NMFS) was petitioned to list ribbon seals under the Endangered Species Act (ESA). In 2008, upon finding that the petition for ribbon seals had merit, NMFS decided to initiate status reviews for the ribbon seal and the other three species of ice seal, the spotted seal, the ringed seal, and the bearded seal. In December 2010 NMFS proposed to list the ringed seal as a threatened species under the ESA, but that decision has not been finalized.

13.2 Essential Fish Habitat (EFH)

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 Management and Conservation Act (January 21, 1999) set forth a number of new mandates for the NMFS, regional fishery management councils, and other federal agencies to identify and protect important anadromous fish habitat. DEC, as a state agency, voluntarily contacts these federal agencies to obtain EFH designations.

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

13.3 Refuges, Critical Habitat Areas, Sanctuaries, and State Ranges

These areas legislatively designated areas (LDAs) which contain anadromous waters, fish crossings, indigenous fish, mammals, and birds in the State of Alaska that might be adversely affected by certain activities. Currently, there are no state designated refuges, critical habitat areas, sanctuaries, or state ranges located within the permit coverage area (Section 3.1). Listings within the state can be found at ADF&Gs website:
http://www.adfg.alaska.gov/index.cfm?adfg=conservationareas.locator

14.0 REFERENCES

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Pollen, M. R. 1983. Arctic Tundra as a Wastewater Discharge Receiving Environment. Proceedings of the First Conference on Cold Regions Environmental Engineering. May 18 – 20, 1983. Fairbanks, Alaska. University of Alaska Fairbanks and University of Alberta Edmonton, Alberta, Canada.

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ATTACHMENT A – FIGURES

Figure A. 1: Permit Coverage Area

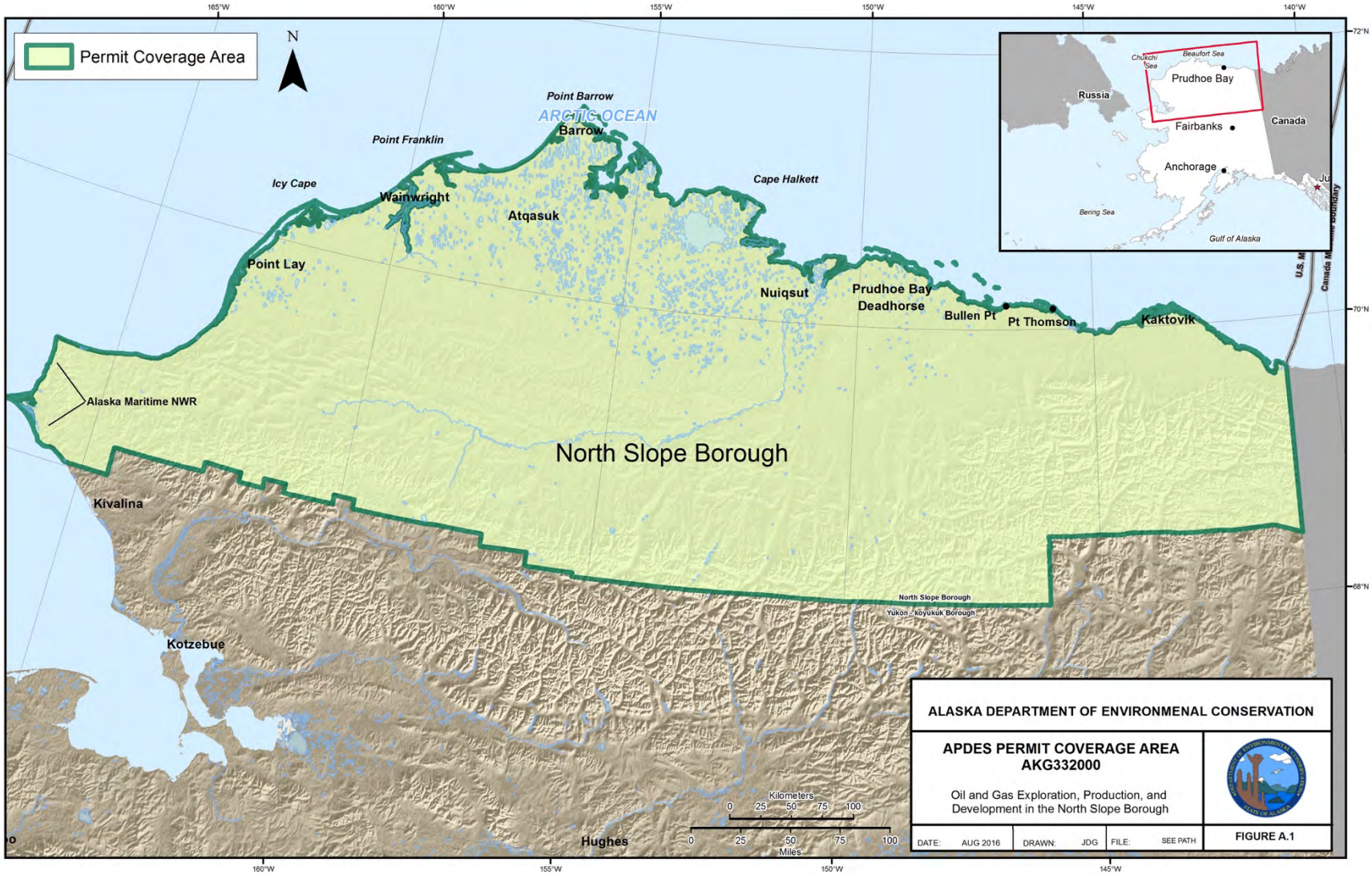


Figure A. 2: Polar Bear Critical Habitat

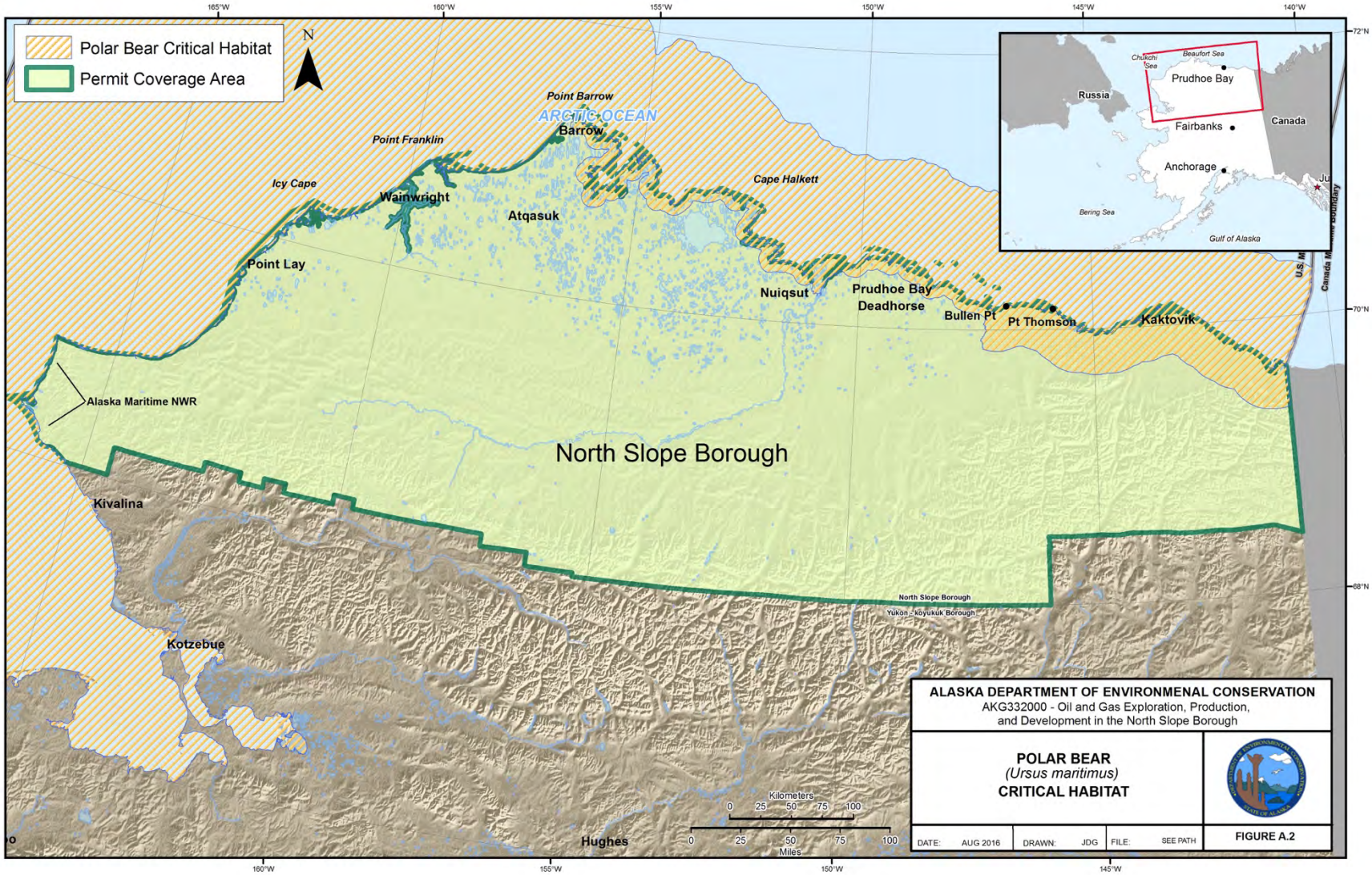
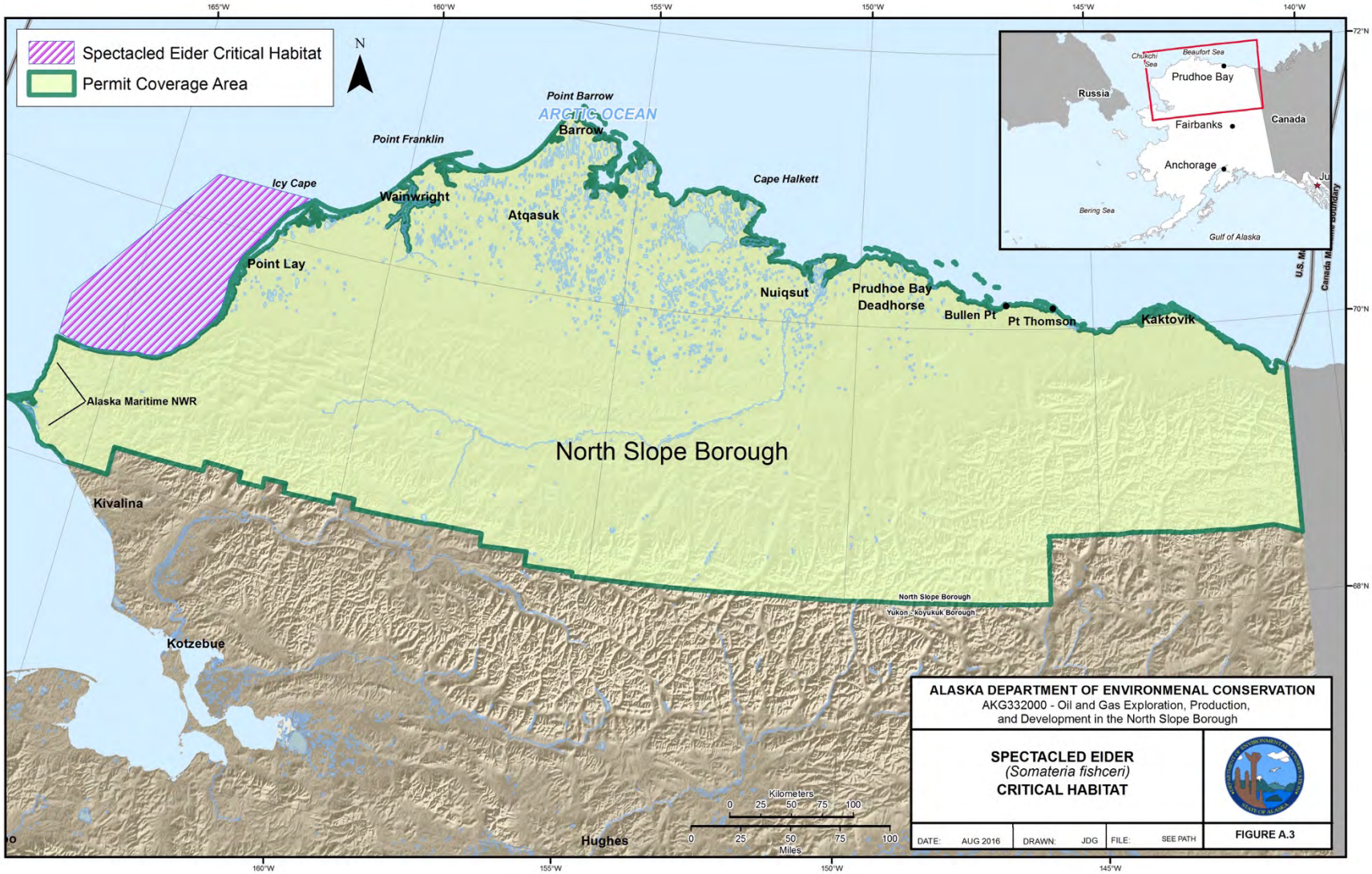


Figure A. 3: Spectacled Eider Marine Critical Habitat



ATTACHMENT B – EXISTING PERMIT AUTHORIZATIONS TABLE

Table B. 1Existing Authorizations Under AKG331000

Permit #	Permittee	Facility Name	Status	Authorized Discharges
AKG331005	ConocoPhillips Alaska, Inc.	Mine Site F		003Water
AKG331009	BP Exploration (Alaska), Inc.	Duck Island Mine Site		003Water, Ice, Dust
AKG331014	ConocoPhillips Alaska, Inc.	Kuparuk Mine Site C		003Water, Ice, Dust
AKG331028	BP Exploration (Alaska), Inc.	Mine Site E		003Water, Ice, Dust
AKG331032	BP Exploration (Alaska), Inc.	PUT 23 Gravel Mine		003Water
AKG331058	ConocoPhillips Alaska, Inc.	Kuparuk Mine Site E		003Water
AKG331061	BP Exploration (Alaska), Inc.	Greater Prudhoe Bay		006
AKG331063	Hilcorp Alaksa, Inc.	Endicott		006
AKG331064	Hilcorp Alaska, Inc.	Milne Point Unit		003Water, 006
AKG331065	Alaska Clean Seas	Coleen Lake		006
AKG331067	ConocoPhillips Alaska, Inc.	Kuparuk River Unit		007, 008
AKG331071	ConocoPhillips Alaska, Inc.	ASRC Mine Site		003Water
AKG331082	ConocoPhillips Alaska, Inc.	Colville River Unit		004, 005, 006, 007, 008
AKG331083	Caelus Energy Alaska	Oooguruk Development Mine Site E		003Water, 004, 005, 006, 007
AKG331086	Hilcorp Alaska, Inc.	NorthStar		006
AKG331088	Eni Petroleum	Nikaitchuq (WAS: Rock Flour/Maggiore MS E)		003Water
AKG331093	BP Exploration (Alaska), Inc.	Greater Prudhoe Bay Power	Terminated	004, 006
AKG331099	Geokinetics USA, Inc	Geophysical Camp		003Water, 007
AKG331100	Savant Alaska LLC	Kupcake Prospect - Duck Island		003Water
AKG331101	Savant Alaska LLC	Kupcake Prospect - Sag C		003Water
AKG331108	ExxonMobil Production Alaska Production	Shaviovik Pit		003Water
AKG331109	ExxonMobil Production Alaska Production	C-1 Pit		003Water
AKG331110	ExxonMobil Production Alaska Production	Duck Island Mine Site		003Water
AKG331111	ExxonMobil Production Alaska Production	Vern Lake/MS C		003Water
AKG331112	ExxonMobil Production Alaska Production	Badami Resevoir		003Water
AKG331113	Savant Alaska LLC	Shell Shaviovik Pit		003Water
AKG331114	Savant Alaska LLC	Badami Gravel Pit		003Water
AKG331117	Savant Alaska LLC	Badami		005, 006, 008
AKG331118	ExxonMobil Production Alaska Production	Pt. Thompson Program - Deadhorse Pad		006
AKG331119	Linc Energy LLC	Northeast NPRA Exploration Program	Terminated	003Water, 007
AKG331120	Brooks Range Petroleum Company	Mustang Development		003Water, 006, 008
AKG331121	ExxonMobil Production Alaska Production	Pt. Thomson Project		003Water, 004, 008

Permit #	Permittee	Facility Name	Status	Authorized Discharges
AKG331122	Colville Inc.	Colville Fuel Tank Farm		008
AKG331124	Caelus Energy Alaska	Oooguruk Development Nuna Drill Site #1		005, 006
AKG331125	Colville Inc.	Colville Aviation FBO		005, 006, 008
AKG331126	Repsol E&P USA	Mine Site E	Terminated	003Water
AKG331127	Artic Star, Inc.	Artic Star Facility - Prodhoe Bay		006, 008
AKG331128	Peak Oilfield Services Inc.	Light Duty Shop		006
AKG331129	Repsol E&P USA	Mine Site F	Terminated	003Water
AKG331130	ExxonMobil Alaska LNG	Duck Island Mine Site	Terminated	003Water
AKG331131	ExxonMobil Alaska LNG	Sag Mine Site C	Terminated	003Water
AKG331132	SAExploration Inc.	Sleigh #1 and #2		007, 008
AKG331133	Little Red Services Inc.	Little Red Services Facility, NSO		006, 008
AKG331134	Repsol E&P USA	Mine site F Camp		006, 008
AKG331135	NANA Oilfield Services	Deadhorse Terminal Facility		006, 008
AKG331136	Peak Oilfield Services Inc.	Wellex Facility		006
AKG331137	Peak Oilfield Services Inc.	Deadhorse Base Camp Facility		006, 008
AKG331138	Nabors Alaska Drilling, Inc.	1ES Facility		006
AKG331139	Nabors Alaska Drilling, Inc.	Frontier Pad Facility		006
AKG331140	Nabors Alaska Drilling, Inc.	NOC Facility		006
AKG331141	Nabors Alaska Drilling, Inc.	Pool Yard Facility		006
AKG331142	M-I Swaco	North Slope Mixing Facility		006
AKG331143	Schlumberger Oil Field Services	North Slope Well Services (East) Facility		006
AKG331144	Schlumberger Oil Field Services	North Slope Completions Shop Facility		006
AKG331145	Schlumberger Oil Field Services	North Slope Wireline (West) Facility		006
AKG331146	Schlumberger Oil Field Services	North Slope Gun Shop Facility		006
AKG331147	Caelus Energy Alaska	Smith Bay/Tulimaniq Exploration Program		006, 007
AKG331148	Accumulate Energy Alaska, Inc.	Icewine #1 Facility		003Water, 004, 007, 008
AKG331149	Great Bear Petroleum Operation LLC	Alcor #1 Facility		006
AKG331150	Great Bear Petroleum Operation LLC	Merak #1 Facility		006
AKG331151	Baker Hughes Oilfield Ops	North Slope Joint Facility		006
AKG331152	ExxonMobil Alaska LNG	Sag Mine Site C		003Water
AKG331153	ExxonMobil Alaska LNG	Duck Island Mine Site		003Water
AKG331154	ASRC Exploration, LLC	Placer #3 Exploration Project	Terminated	003Water, 006, 008
AKG331155	ASRC Energy Services	Wolverine Pad		006
AKG331156	BP Exploration (Alaska), Inc.	Greater PBU, Seawater Injection Lines		005

Table B. 2 Authorizations under AKG426000

Permit #	Permittee	Facility Name	Mixing Zone	Receiving Water	Status	Authorized Discharges
AKG426001	Bill Sands Camp	Bill Sands Camp	No	Fresh, Tundra		002
AKG426002	Marsh Creek Camp	Marsh Creek Camp 1 WWTF	No	Fresh, Tundra		002
AKG426003	Geokinetics USA Inc.	Geokinetics Camp 1	Yes	Fresh, Tundra		002
AKG426004	Geokinetics USA Inc.	Geokinetics Camp 2	Yes	Fresh, Tundra		002
AKG426005	Global Geophysical Services, Inc.	GGS-480 WWTF	No	Fresh, Tundra		002
AKG426006	Global Geophysical Services, Inc.	GGS-481 Mobile Camp	No	Fresh, Tundra		002
AKG426007	SAExploration	Cruz Construction Camp #1	Yes	Fresh, Tundra	Terminated	002
AKG426008	SAExploration	Sleigh Camp #1	No	Fresh, Tundra		002
AKG426009	SAExploration	Sleigh Camp #2	No	Marine		002

Table B. 3 Proposed Combined Permit Authorizations for Existing Permittees

Old Permit #	Permittee	Facility Name	Discharge Authorizations
AKG331009	BP Exploration (Alaska) Inc.	Duck Island Mine Site	003Water, Ice, Dust
AKG331028	BP Exploration (Alaska) Inc.	Mine Site E (KPU)	003Water, Ice, Dust
AKG331156, AKG331032, AKG331061	BP Exploration (Alaska) Inc.	Greater Prudhoe Bay Unit (Includes seawater line, put 23 gravel, and unit storm water)	003Water, Ice, Dust, 006
AKG331083, AKG331124	Caelus Energy Alaska	Oooguruk Development (Includes: Mine Site E, and offshore Nuna Drill Site #1)	003Water, Ice, Dust, 006, 007
AKG331147	Caelus Energy Alaska	Smith Bay/Tulimaniq Exploration Program	006, 007
AKG331122, AKG331125	Colville Inc.	Colville (includes: Aviation FBO and Fuel Tank Farm)	006, 008
AKG331005, AKG331014, AKG331058, AKG331067	ConocoPhillips Alaska Inc.	Kuparuk River Unit (Includes: Facilities and Mine Sites C, E, F)	003Water, Ice, Dust, 006, 007, 008
AKG331071, AKG331082	ConocoPhillips Alaska Inc.	Colville River Unit (Includes: Facilities CD1-CD5, and ASRC Mine Site)	003Water, Ice, Dust, 006, 007, 008
AKG331153	ExxonMobil Alaska LNG	Duck Island Mine Site	003Water, Ice
AKG331110, AKG331108, AKG331118, AKG331121	ExxonMobil Alaska Production	Pt. Thomson Unit (Includes: Deadhorse Drilling Prgm Pad, Shaviovik Pit, and Duck Island Mine Site)	003Water, Ice, Dust, 006, 007, 008
AKG331099, AKG426003	Geokinetics USA Inc.	GEOKINETICS CAMP 1	002, 007
AKG331099, AKG426004	Geokinetics USA Inc.	GEOKINETICS CAMP 2	002, 007
AKG426006	Global Geophysical Services, Inc.	GGS-481 MOBILE CAMP	002
AKG426005	Global Geophysical Services, Inc.	GGS-480 WWTF	002
AKG331149,	Great Bear Petroleum	Alcor #1 Facility,	006
AKG331150	Great Bear Petroleum	Merak #1 Facility	006
AKG331063	Hilcorp Alaska, Inc	Endicott	006
AKG331086	Hilcorp Alaska, Inc	NorthStar	006
AKG331064	Hilcorp Alaska, Inc	Milne Point Unit	003Water, Ice, Dust, 006

Old Permit #	Permittee	Facility Name	Discharge Authorizations
AKG331138, AKG331139, AKG331140, AKG331141	Nabors Alaska Drilling Inc.	Deadhorse Yard Facilities (Includes: 1ES, NOC, Pool Yard , and Frontier Pad)	006
AKG331128, AKG331136, AKG331137	Peak Oilfield Services Co.	Deadhorse Yard Facilities (Includes: Light Duty Shop, Wellex Facility, Base Camp Facility)	006, 008
AKG331132, AKG426008	SAExploration	SAE SLEIGH CAMP 1 WWTF	002, 007, 008
AKG331132, AKG426009	SAExploration	SAE SLEIGH CAMP 2 WWTF	002, 007, 008
AKG331113, AKG331117	Savant Alaska LLC	Badami Unit (Includes: Shell Shaviovik Pit)	003Water, Ice, Dust, 006, 008
AKG331143, AKG331144, AKG331145, AKG331146	Schlumberger Oilfield Services	Deadhorse Yard Facilities (Includes: Well Services (East) Facility, Wireline (West) Facility, Gun Shop, and Completions Shop)	006
AKG331148	Accumulate Energy Alaska, Inc.	Icewine #1 Facility	003Water, 007, 008
AKG331065	Alaska Clean Seas	Coleen Lake	006
AKG331127	Artic Star, Inc.	Artic Star Facility - Prodhoe Bay	006, 008
AKG331155	ASRC Energy Services	Wolverine Pad	006
AKG331151	Baker Hughes Oilfield Ops	North Slope Joint Facility	006
AKG331120	Brooks Range Petroleum Company	Mustang Development	003Water, 006, 008
AKG331088	Eni Petroleum	Nikaitchuq (WAS: Rock Flour/Maggiore Mine Site E)	003Water, 006
AKG331133	Little Red Services Inc	Little Red Services Facility, NSO	006, 008
AKG331142	M-I Swaco	North Slope Mixing Facility	006
AKG331135	NANA Oilfield Services	Deadhorse Terminal Facility	006, 008
AKG426001	Bill Sands Camp	Bill Sands Camp	002
AKG426002	Marsh Creek Camp	Marsh Creek Camp 1 WWTF	002

Note: Discharge outfalls for singular events have been removed from previous authorizations in this table (004 - Excavation Dewatering and 005 - Hydrostatic Test water). These authorizations will be obtained on a separate NOI and then terminated upon cessation of discharge activity.

ATTACHMENT C – EFFLUENT LIMIT CALCULATIONS

The Department determined that case-by-case effluent limits are appropriate for Biochemical Oxygen Demand, 5-Day at 20°C (BOD_5) and Total Suspended Solids (TSS). The procedures applied to calculate permit limits for BOD_5 and TSS are contained in the *EPA's Technical Support Document for Water Quality-based Toxics Control (TSD).*

C.1 Permit Limit Derivation

Using discharge monitoring reports (DMRs) representing graywater discharges (Discharge 002) under the Graywater GP (AKG426000), data was summarized (Table C-1, below) and a long-term average (LTA) was calculated. There were 27 data points for BOD_5 and 32 for TSS from the nine mobile camps authorized under the Graywater GP. The mobile camps utilize similar treatment technology (effluent filtration and/or screening) for graywater discharges from similar sources (i.e. wash rooms, kitchens, laundry facilities, etc.) from 2014 to 2016. When examining the graywater DMRs for BOD_5 and TSS, data points that appeared to be either higher or lower than most reported (potential outliers) were examined. The EPA guidance document (Data Quality Assessment: Statistical Methods for Practitioners EPA QA/G-9S – Section 4.4.1, p. 116) recommends the use of "extreme caution" when "discarding an outlier from a data set…," "particularly for environmental data sets, which often contain legitimate extreme values." The guidance document indicates that statistical "tests should only be used to identify data points that require further investigation. The tests alone cannot determine whether a statistical outlier should be discarded or corrected within a data set. This decision should be based on judgmental or scientific grounds." Criteria used for potentially excluding data was based on commonly applied factors such as transcription or sampling error, or sample contamination, or treatment upset. After a thorough evaluation of the DMRs (especially for the potential outliers, and a records search describing any treatment upsets, it was determined that data submitted from AKG426003 and AKG426004 were duplicates as both camps were operating as a single entity with a combined single discharge. One of the datasets was therefore not included. All other reported BOD_5 and TSS values were valid and usable for case-by-case TBEL effluent limit derivation.

The Department applies the statistical approach described in Chapter 5 of the *TSD* to calculate maximum daily and average monthly permit limits. This approach takes into account effluent variability [using the Coefficient Variation (CV)], sampling frequency, and the difference in time frames between the average monthly and maximum daily limits.

The maximum daily limit is based on the CV of the data and the probability basis. The average monthly limit is dependent on these two variables and the monitoring frequency. As documented in the *APDES Program Description*, the Department used a probability basis of 95 percent for average monthly limit calculation and 99 percent for the maximum daily limit calculation.

Table C-1. Summary of Discharge Monitoring Data, BOD_5 and TSS: Graywater Discharges

Permit No.	BOD_5 (mg/L)	TSS (mg/L)
AKG426004	1,500.	490.
AKG426004	360.	277.
AKG426004	300.	26.
AKG426004	60.	37.
AKG426004	190.	47.
AKG426004	840.	930.
AKG426004	2,200.	348.
AKG426004	1,440.	480.
AKG426007	40.	23.
AKG426001	523.00	18.7
AKG426001	117.00	37.4
AKG426001	3.05	8.4
AKG426001	2.00	1.61
AKG426002	576.	175.
AKG426002	1,600.	325.
AKG426002	781.	198.

Permit No.	BOD_5 (mg/L)	TSS (mg/L)
AKG426002	34.7	32.5
AKG426002	178.	308.
AKG426002	1,870.	420.
AKG426002	1,380.	400.
AKG426005	1,100.	370.
AKG426005	2,400.	440.
AKG426005		330.
AKG426005		376.
AKG426005		216.
AKG426005	28.	19.
AKG426006		330.
AKG426006		376.
AKG426006	216.	216.
AKG426006	28.	19.
AKG426008	410.	160.
AKG426008	450.	140.

	BOD_5	TSS
Sampling Count	27	32
Long Term Average (LTA)	689.9	236.7
Minimum	2.0	1.6
Maximum	2,400.0	930.0
Standard Deviation	731.0	206.7
Coefficient of Variation (CV)	1.06	0.87

The following is a summary of the steps to derive Best Professional Judgment-based effluent limits from performance data for BOD_5 and TSS. BOD_5 is used as an example**.**

Step 1 - Determine the Long-Term Average (LTA)

The LTA concentrations, standard deviation, and CV were calculated from the available data. In the case of BOD_5, there were 22 data points available (accounting for the removal of apparent duplicate values).

Mean or LTA = 689.9

Standard Deviation = 731.0

Coefficient of Variation (CV) = $\frac{standard\ deviation}{mean}$ =1.06

Step 2 - Calculate the Permit Limits

The maximum daily limit (MDL) for BOD_5 is calculated as follows:

$$MDL = LTA \times e^{(z\sigma - 0.5\sigma^2)}$$

where,

CV= $\frac{standard\ deviation}{LTA} = \frac{731.0}{689.9}$ =1.06

$$\sigma^2 = ln(CV^2 + 1) = ln(1.06^2 + 1) = 0.753$$

$\sigma = \sqrt{\sigma^2} = \sqrt{(0.753)} = 0.868$

z = 2.326 for 99th percentile probability basis

$$\boldsymbol{MDL = LTA \times e^{(z\sigma - 0.5\sigma^2)} = 689.9 \times e^{(2.326 \times 0.868 - 0.5 \times 0.753)} = 3,562}$$ **mg/L BOD5**

The average monthy limit (AML) for BOD5 is calculated as follows:

$$MDL = LTA \times e^{(z\sigma - 0.5\sigma^2)}$$

where,

CV= $\frac{standard\ deviation}{LTA} = \frac{731.0}{689.9}$ =1.06

n = number of sampling events required per month for BOD5 = 4

$$\sigma^2 = ln\left(\frac{CV^2}{n} + 1\right) = ln\left(\frac{1.06^2}{4} + 1\right) = 0.247$$

$\sigma = \sqrt{\sigma^2} = \sqrt{(0.247)} = 0.497$

z = 1.645 for 95th percentile probability basis

$$\boldsymbol{MDL = LTA \times e^{(z\sigma - 0.5\sigma^2)} = 689.9 \times e^{(1.645 \times 0.497 - 0.5 \times 0.247)} = 1,382}$$ **mg/L BOD5**

Applying the above methods to data for TSS results in an MDL = 1027 and an AML = 431.

ATTACHMENT 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.

Criteria	Description	Answer & Resources	Regulation
Size	Is the mixing zone as small as practicable? - Permit writer conducts analysis and documents analysis in Fact Sheet at: ►Section 7.2 - Mixing Zone.	Yes, mixing zone as small as practicable. Technical Support Document for Water Quality Based Toxics Control Fact Sheet, Section 7.2.1 Fact Sheet, Section 7.2.2 Fact Sheet, Section 7.2.3.1 DEC's RPA Guidance EPA Permit Writers' 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)

Criteria	Description	Answer & Resources	Regulation
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 4.2 Mixing Zone Analysis.	Answer: Yes Fact Sheet, Section 7.2.3.2	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	N/A	18 AAC 70.255(f)
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 7.2.3.3	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 7.2.3.1 Fact Sheet Section 7.2.3.3	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 7.2.3.3	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 7.2.6	18 AAC 70.250(a)(4)

Criteria	Description	Answer & Resources	Regulation
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 7.2.3.4	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 7.2.3.4	18 AAC 70.250(b)(3)
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 7.2.3.5	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 7.2.3.1 Fact Sheet Section 7.2.3.4	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 7.2.3.1 Fact Sheet Section 7.2.3.4	

Criteria	Description	Answer & Resources	Regulation
	(3) Create a public health hazard through encroachment on water supply or through contact recreation? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 7.2.3.4	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 7.2.3.1 Fact Sheet Section 7.2.3.4 Fact Sheet Section 7.2.3.6	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 7.2.3.4	18 AAC 70.255(e)(3)(B)
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 7.2.3.5	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 7.2.3.5	
	(3) fail to provide a zone of passage? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 7.2.3.5	
	(4) result in undesirable or nuisance aquatic life? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 7.2.3.6	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 7.2.3.6	18 AAC 70.255(g)(1)

Criteria	Description	Answer & Resources	Regulation
	(6) result in a reduction in fish or shellfish population levels? **If yes, mixing zone prohibited.**	Answer: No Fact Sheet Section 7.2.3.6	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 7.2.3.1 Fact Sheet Section 7.2.3.6	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 7.2.3.1	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.**	Answer: Yes Fact Sheet Section 7.2.3.7 Fact Sheet Section 13.1	Program Description, 6.4.1 #5 18 AAC 70.250(a)(2)(D)