Fact Sheet

U.S. Environmental Protection Agency
Region 10

The United States Environmental Protection Agency (EPA)
Plans to Reissue a
National Pollutant Discharge Elimination System (NPDES) General Permit for

OIL AND GAS EXPLORATION, DEVELOPMENT AND PRODUCTION FACILITIES
LOCATED IN STATE AND FEDERAL WATERS
IN COOK INLET

Permit Number: AKG-31-5000 (formerly AKG-28-5000)

February 23, 2006

Technical Contact
Name: Scott Wilson
Phone: (214) 665-7511
FAX: (214) 665-2191
Email: wilson.js@epa.gov

U.S. Environmental Protection Agency's ("EPA's") Proposed Action

EPA proposes to reissue the National Pollutant Discharge Elimination System ("NPDES") General Permit for Oil and Gas Exploration, Development and Production Facilities in State and Federal Waters in Cook Inlet. The permit authorizes certain discharges of pollutants into Cook Inlet from oil and gas exploration, development and production platforms and related facilities, subject to limits and requirements designed to minimize pollution and protect water quality. The existing permit, NPDES Permit No. AKG285000 ("Existing Permit"), expired on April 1, 2004, but continues in effect until replaced by a reissued permit. EPA proposes to replace the Existing Permit with a reissued version ("Proposed Permit") described in this Fact Sheet, renumbered as NPDES Permit No. AKG-31-5000.

This Fact Sheet includes:

- information on public comment, public hearings, and appeal procedures;
- a description of the types of facilities subject to the Proposed Permit;
- a description of the proposed discharges from these facilities;
- a discussion of the proposed effluent limitations and other conditions set forth in the Proposed Permit;
- a map and description of the proposed discharge area; and
- technical material supporting the proposed effluent limitations and other conditions set forth in the Proposed Permit.

Public Comment and Public Hearings

Persons wishing to comment on the draft Proposed Permit must do so, in writing, by the end date of the public comment period. Comments should include the name, address, and telephone number of the commenter and should reference the Proposed Permit name and number. Comments should also include a concise statement of their basis and any relevant facts the commenter believes EPA should consider in making its decision regarding the conditions and limitations in the final Proposed Permit.

All written comments and requests should be submitted to the attention of the Director, Office of Water and Watersheds at the following address:

U.S. EPA, Region 10
1200 Sixth Avenue, M/S OWW-130
Seattle, Washington 98101

Alternatively, comments may be submitted electronically to shaw.hanh@epa.gov by the end date of the public comment period.

EPA will also hold public hearings in Anchorage, Homer, and Kenai, Alaska. The dates and times of the public hearings are set forth in the Public Notice for the Proposed Permit.

After the public comment period ends, EPA will review and address all submitted comments and will take them into account in making a decision on the effluent limitations and conditions in the Proposed Permit. EPA's Director for the Office of Water and Watersheds in Region 10 will then make a final decision regarding final issuance of the Proposed Permit. The Proposed Permit will become effective 30 days after it is issued, unless it is stayed by the court in response to an appeal. Pursuant to Section 509(b)(1) of the Clean Water Act , 33 USC § 1369(b)(1), any interested person may appeal the permit in the Ninth Circuit Court of Appeals within 120 days following notice of EPA's final decision for the Proposed Permit.

Availability of Documents

The following documents are available at the EPA Alaska Operations Office between 8:30 a.m. and 4:00 p.m., Monday through Friday:

- Draft Proposed Permit;
- Fact Sheet;
- Draft Clean Water Act Section 401 Certification
- Environmental Assessment;
- Preliminary Finding of No Significant Impact;
- Biological Evaluation;
- Essential Fish Habitat Assessment and
- Ocean Discharge Criteria Evaluation ("ODCE")

The Alaska Operations Office is located at 222 West Seventh Avenue, Room 537, Anchorage, Alaska.

Copies of the above-listed draft documents are also available at:

EPA Region 10 website: **www.epa.gov/r10earth**

U.S. EPA, Region 10
Attn: Hanh Shaw
1200 Sixth Avenue, OWW-130
Seattle, Washington 98101

Anchorage Municipal Library
Z. J. Loussac Public Library
3600 Denali St
Anchorage, Alaska 99503-6055

Kenai Community Library
163 Main Street Loop
Kenai, Alaska 99601

Homer City Library
141 West Pioneer Ave.
Homer, Alaska 99603

State Certification

EPA is requesting that the Alaska Department of Environmental Conservation ("ADEC") certify the Proposed Permit pursuant to Section 401 of the Clean Water Act ("Act" or "CWA"), 33 USC § 1341. ADEC may, as a condition of certification, require that the permit include more stringent limitations or monitoring requirements needed to comply with the CWA or State law. EPA is required to include any such limitation or requirement in the final reissued permit. A draft 401 certification is included in the draft permit package.

Alaska Coastal Management Program ("ACMP") Review

EPA has determined that discharges authorized by the Proposed Permit are consistent with the Coastal Zone Management Act, 16 USC § 1451 *et seq.*, and is requesting that the Alaska Department of Natural Resources ("ADNR"), Office of Project Management and Permitting ("OPMP") review and concur with its consistency determination. EPA anticipates concurrence from ADNR OPMP regarding its determination for consistency with the statewide standards of the ACMP and the enforceable policies of the Kenai Peninsula Borough; Matanuska-Susitna Borough; Kodiak; and Municipality of Anchorage Coastal Management Districts.

Summary of Proposed Changes

The Proposed Permit proposes the following changes to the Existing Permit. These changes are described in detail in the body of this Fact Sheet.

1. EPA proposes to expand the existing coverage area to include the recent Minerals Management Service Lease Sales Nos. 191 and 199 and the State waters adjoining those lease areas.

2. EPA proposes to authorize discharges from oil and gas exploration facilities located within the expanded coverage area, including discharges associated with the use of synthetic-based drilling fluids.

3. EPA proposes to authorize discharges from new oil and gas development and production facilities located within the expanded coverage area, including sanitary waste water, domestic waste water, deck drainage, and miscellaneous discharges

such as cooling water and boiler blowdown. These new development and production facilities, however, would not be authorized to discharge produced water, drilling fluids, or drill cuttings under the Proposed Permit.

4. EPA proposes to add new whole effluent toxicity and technology-based limits for discharges that contain treatment chemicals, such as biocides and corrosion inhibitors. These discharges include, but are not limited to, flood waste water, cooling water, boiler blowdown, and desalination unit waste water.

5. EPA proposes to add a new water quality-based effluent limit for total residual chlorine.

6. EPA proposes to change the monitoring requirements found in the Existing Permit. The proposed changes would result in increased monitoring for facilities that violate the effluent limits, and reduced monitoring for facilities that demonstrate a good compliance record.

7. EPA proposes to expand the Existing Permit's baseline study to include new facilities.

8. EPA proposes to include a new study that will involve collecting ambient data to determine the effect of large volume produced water discharges on Cook Inlet.

9. EPA proposes to expand the permit's discharge prohibition near protected areas, coastal marshes, and deltas.

10. EPA proposes to change the permit number from AKG-28-5000 to AKG-31-5000.

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FACT SHEET

I. INTRODUCTION

Section 301(a) of the Clean Water Act ("Act" or "CWA"), 33 USC § 1311(a), provides that the discharge of pollutants is unlawful except in accordance with the terms of a National Pollutant Discharge Elimination System ("NPDES") permit. In general, 40 CFR § 122.28(c) requires the U.S. Environmental Protection Agency ("EPA") to issue NPDES general permits for discharges from offshore oil and gas facilities. General permits are mechanisms for authorizing discharges from a number of similar facilities through a single permit, rather than an individual permit for each facility. In cases such as oil and gas extraction, where new facilities are likely to begin operating during the life of the permit, general permits can offer the flexibility of authorizing discharges from those new facilities without the need to issue a new permit for each new facility.

The existing NPDES General Permit for Oil and Gas Exploration, Development and Production Facilities Located in State and Federal Waters in Cook Inlet, NPDES Permit No. AKG-28-5000 ("Existing Permit"), expired on April 1, 2004, but continues in effect until reissued. The Existing Permit authorizes discharges from 23 facilities operated by Unocal, Cross Timbers (also known as "XTO"), Marathon, Conoco-Phillips, ARCO, and Forest Oil. EPA proposes to reissue the permit as NPDES Permit No. AKG-31-5000 ("Proposed Permit").

II. COVERED FACILITIES AND DISCHARGES

The Existing Permit and Proposed Permit authorize and place conditions on certain discharges from particular types of oil and gas exploration, development and production facilities that are located within a specified geographical area, described in more detail below.

A. Types of Facilities and Typical Discharges

The Proposed Permit addresses discharges from three types of platform-based oil and gas operations: exploration, development and production. A single facility can conduct development and production operations at the same time. A single facility, however, rarely engages in exploratory operations in conjunction with either development or production activities. The Proposed Permit also addresses discharges from specified onshore facilities. These onshore facilities typically involve different discharges than platform-based operations.

Exploratory operations are conducted to determine the nature of potential hydrocarbon reserves. Drilling is the main activity during exploratory operations. Wastewater discharges from exploratory operations typically include drilling fluids; drill cuttings and washwater; deck drainage; sanitary wastes; domestic wastes; desalination unit wastes; blowout preventer fluid; boiler blowdown; fire control system test water; non-contact cooling water; uncontaminated ballast water; uncontaminated bilge water; excess cement slurry; mud, cuttings, and cement at the seafloor; and well completion fluids. In general, exploratory facilities do not discharge

waterflood waste water, produced water, or well treatment fluids.

Development operations consist of drilling and completion of producing wells, which can be conducted from fixed or mobile facilities. Discharges associated with development operations include all those listed above for exploratory operations. In addition, generally, facilities engaged in development operations discharge produced water and well treatment fluids.

Production operations consist of the active recovery of hydrocarbons from producing formations after development has been completed. Facilities conducting production operations are likely to discharge produced water, well treatment fluids, workover fluids, deck drainage, sanitary wastes, domestic wastes, desalination unit wastes, blowout preventer fluid, boiler blowdown, fire control system test water, non-contact cooling water, uncontaminated ballast water, and uncontaminated bilge water. Some production operations also discharge waterflood waste water, which is used to enhance production from older fields. In general, facilities engaged solely in production do not discharge drilling fluids, drill cuttings, well completion fluids, or mud, cuttings, and cement at the seafloor, except when wells are worked over.

Onshore Facilities: Some existing production platforms are equipped to separate oil and gas from produced water. These platforms then discharge produced water directly to Cook Inlet. Other production platforms, however, perform only initial oil/water separation, and route their produced water to onshore facilities for further treatment. In these cases, produced water is discharged from the onshore facility.

Section II.D. of this Fact Sheet describes the discharges that the Proposed Permit will authorize. Operators who wish to have discharges authorized by the Proposed Permit that are not currently included in the Proposed Permit should submit comments during the public comment period explaining why any additional discharges are necessary to their operations.

B. Areas of Coverage

1. Existing Permit

a. Area Included

The Existing Permit covers oil and gas facilities located in Cook Inlet north of a line extending between Cape Douglas (at 58°51' latitude, 153° 15' longitude) on the west and Port Chatham (at 59°13' latitude, 151° 47' longitude) on the east (see Figure 1), except the prohibited areas described in Section II.B.1.b., below.

b. Prohibited Areas

The Existing Permit prohibits discharges in the sensitive areas listed below. The discharge prohibitions are necessary to prevent unreasonable degradation of the areas based on Ocean Discharge Criteria (40 CFR Part 125, Subpart M).

The Existing Permit prohibited discharges in the following areas:

- In water depths less than the 10 meter mean lower low water isobath for exploration facilities;
- In water depths less than the 5 meter mean lower low water isobath for all facilities;
- Shoreward of the 5.5 meter isobath adjacent to either (1) the Clam Gulch Critical Habitat Area (Sales 32, 40, 46A, and 49) or (2) from the Crescent River northward to a point one-half mile north of Redoubt Point (Sales 35 and 49).
- Within the boundaries, or within 1,000 meters, of a coastal marsh, river delta, or river mouth, or a designated Area Meriting Special Attention ("AMSA"), State Game Refuge ("SGR"), State Game Sanctuary ("SGS"), or Critical Habitat Area ("CHA") (the seaward edge of a coastal marsh is defined as the seaward edge of emergent wetland vegetation);
- Minerals Management Service Lower Kenai Peninsula Deferral Area and Barren Island Deferral Area, including the area between the deferral areas and the shore;
- In Kamishak Bay, west of a line from Cape Douglas to Chinitna Point;
- In Chinitna Bay, inside of the line between the points of the shoreline at latitude 59°52'45" N, longitude 152°48'18" W on the north and latitude 59°46'12" N, longitude 153°00'24"W on the south (Figure 1); and
- In Tuxedni Bay, inside of the lines on either side of Chisik Island
  - from latitude 60°04'06" North, longitude 152°34'12" West on the mainland to the southern tip of Chisik Island (latitude 60°05'45" North, longitude 152°33'30" West).
  - from the point on the mainland at latitude 60°13'45" North, longitude 152°32'42" West to the point on the north side of Snug Harbor on Chisik Island (latitude 60°06'36" North, longitude 152°32'54" West).
    See Figure 1.

The Existing Permit prohibits discharges in waters with a depth less than 5 meters for all facilities, and in waters with a depth less than 10 meters for exploration facilities, because these shallow water discharges are less dispersed than deeper water discharges, and thus have a greater potential to impact the abundant aquatic life found in these shallow waters.

The Existing Permit prohibits discharges in parts of Chinitna, Tuxedni, and Kamishak Bays because they are either areas of high resource value, or are adjacent to areas of high resource value. In addition, Kamishak Bay is a known net depositional environment where drilling mud solids and other pollutants will likely accumulate if discharges are authorized.

In order to comply with the Coastal Zone Management Plan's prohibitions on the discharge of silty materials to certain areas, as well as activities that potentially alter protected biological resources, the Existing Permit prohibits discharges within 1,000 meters of a coastal marsh, river delta, or river mouth, or an AMSA, SGR, SGS or CHA.

2. Proposed Permit

a. Area Included

The Proposed Permit expands the Existing Permit's coverage area. The Proposed Permit coverage area differs from the Existing Permit coverage area in the portions of Cook Inlet located north and south of a line extending across Cook Inlet at the southern edge of Kalgin Island. See Figure 1. EPA proposes to expand the permit coverage area to include areas under the Minerals Management Service ("MMS") Lease Sales Nos. 191 and 199, some of which lie outside the southern boundary of the Existing Permit's coverage area as well as the Territorial Seas adjoining the MMS Lease Sales. See Figure 2. The Proposed Permit coverage area, however, does not include the areas identified under the MMS Lease Sales as the Lower Kenai Peninsula Deferral Area and the Barren Islands Deferral Area. In general, the expanded coverage area includes the entire Cook Inlet north of Shuyak Island, with the exception of several bays and sensitive areas described in Section II.B.2.b, below.

b. Prohibited Areas

EPA proposes to continue the discharge prohibitions contained in the Existing Permit, as described in Section II.B.1.b, above. In addition, the Proposed Permit would prohibit discharges in the following areas:

- In Shelikof Strait south of a line between Cape Douglas (at 58° 51' North, 153° 15' West) on the west and the northernmost tip of Shuyak Island on the east (at 58° 37' North, 152° 22' West);

- Within 20 nautical miles of Sugarloaf Island as measured from a centerpoint at 58° 53' North and 152° 02' West;

- Within the boundaries, or within 4,000 meters (expanded from 1,000 meters in the Existing Permit), of a coastal marsh, river delta, or river mouth, or an AMSA, SGR, SGS or CHA; and

- Within tracts identified in the Alaska Department of Natural Resources (ADNR) Oil and Gas Division's Mitigation Measure Number 33;

The Shelikof Strait area described above was outside of the Existing Permit coverage area. The National Oceanic and Atmospheric Administration-Fisheries ("NOAA Fisheries") has designated Shelikof Strait as a special aquatic foraging area for the Stellar Sea Lion. See 58 Fed. Reg. 45278 (September 27, 1993); see also 50 CFR § 226.12(c)(1). Therefore, the Proposed Permit prohibits discharges in the Shelikof Strait area.

ADNR's mitigation measure number 33 was included in the State's oil and gas leases to protect the beluga whale populations in Cook Inlet as they are Endangered Species Act ("ESA") candidate species and recently determined to be depleted under the Marine Mammal Protection Act ("MMPA"). The stipulation excludes sale of offshore facilities from an area that includes the Knik and Turnagain Arms, Chickaloon Bay and extends northwest to the mouths of the Susitna and Beluga Rviers. The stipulation also excludes operations within all of the Type 1 habitat (High Value/High Sensitivity) and most of the Type 2 habitat (High Value). Key areas in Type 3 habitat are addressed in this Proposed Permit.

In order to comply with the Coastal Zone Management Plan, the Existing Permit prohibits discharges within 1,000 meters of a coastal marsh, river delta, or river mouth, or an AMSA, SGR, SGS or CHA. In the Proposed Permit, EPA proposes to expand this prohibition to a distance of 4,000 meters to afford better protection of these sensitive areas. EPA knows of no plans for oil and gas facilities to operate in those areas, so the change should not have an impact on any of these facilities. With modern drilling technologies, there should be no need to operate within the expanded buffer zone. The following SGRs, SGSs, CHAs, and AMSAs are located in the Proposed Permit coverage area:

Palmer Bay Flats SGR	Trading Bay SGR
Goose Bay SGR	Kalgin Island CHA
Potter Point SGR	Clam Gulch CHA
Susitna Flats SGR	Kachemak Bay CHA
McNeil River SGS	Anchorage Coastal Wildlife Refuge
Redoubt Bay CHA	Port Graham/Nanwalek AMSA

Alaska Statute (AS) § 16.20 contain the legal descriptions of these state specialty areas. The present boundaries of these state special areas are described in a document entitled the "State of Alaska Refuges, Critical Habitat Areas, and Sanctuaries," prepared by the Alaska Department of Fish and Game, Habitat Division, dated March 1991. Further information may also be obtained from the Alaska Department of Natural Resources, Office of Habitat Management and Permitting, 550 West 7th Avenue, Suite 1420, Anchorage, Alaska 99501; phone (907) 269-8690.

3. Regulatory Status of Waters Within Area of Coverage

The area of coverage includes waters in three different regulatory categories. The portion of Cook Inlet north of the southern edge of Kalgin Island ("Northern Cook Inlet"), is defined as inland or **Coastal Waters**; the area south of that line ("Southern Cook Inlet") is defined as offshore waters. See 43 USC §§ 1331 (defining "outer continental shelf") and 1333 (providing for federal mineral leases on the outer continental shelf); see also 40 CFR § 435.10. The offshore waters of Southern Cook Inlet are further divided into two categories. The first three miles measured from the coastline or the boundary between coastal and offshore waters is defined as the **Territorial Seas**. Seaward of the territorial seas is defined as the contiguous zone or ocean, referred to in this Fact Sheet as **Federal Waters**. See Figure 1.

State water quality standards apply to Coastal Waters and Territorial Seas. Ocean Discharge Criteria apply in Territorial Seas and Federal Waters pursuant to Clean Water Act § 403(c), 33 USC § 1343(c), and 40 C.F.R. Part 125, Subpart M. Technology-based limits for Coastal Waters are specified in 40 CFR Part 435, Subpart D (Coastal Subcategory), and for Territorial Seas and Federal Waters are specified in 40 CFR Part 435, Subpart A (Offshore Subcategory). The following table summarizes this information.

	State Water Quality Standards	Ocean Discharge Criteria	Applicable Effluent Guidelines
Coastal Waters	Yes	No	Coastal Subcategory
Territorial Seas	Yes	Yes	Offshore Subcategory
Federal Waters	No	Yes	Offshore Subcategory

C. Facilities Authorized to Discharge

1. Existing Facilities

The only existing facilities that are covered by the Existing Permit, and that applied for coverage under the Proposed Permit, are the following production facilities, all of which are located in Coastal Waters (*i.e.,* Northern Cook Inlet):

* Granite Point Production Facility
* Trading Bay Treatment Facility
* East Foreland Treatment Facility
* Platform Anna
  Platform Baker
* Platform Bruce
  Platform Dillon
  King Salmon Platform
  Dolly Varden Platform
  Spark Platform
* Tyonek Platform A
  Cross Timbers Platform A
  Cross Timbers Platform C
  Spurr Platform
  Granite Point Platform
  Grayling Platform
  Monopod Platform
  Steelhead Platform
  North Forelands Platform

The facilities marked with an asterisk ("*") are currently authorized to discharge produced water under the Existing Permit. At this time, Platform Baker, Platform Dillon, Spurr Platform, and Spark Platform have been shut in and, with the exception of deck drainage, are not currently discharging. The Existing Permit authorized the existing production facilities to discharge the waste streams listed in Section II.D., below, subject to appropriate effluent limits and other requirements. As proposed, the permit would authorize the discharge of these same waste streams; however, EPA proposes to change the effluent limits and other requirements as described in Sections IV.B. and IV.C., below.

2. New Exploratory Facilities

The Proposed Permit authorizes the discharge of the waste streams listed in Section II.D., below, subject to the conditions and requirements set forth in the Proposed Permit. Since exploratory wells do not generally produce water, the Proposed Permit does not authorize the discharge of produced water from exploratory facilities. In addition, the Existing Permit limited exploratory

operations to a maximum of five wells per site. The Proposed Permit contains this same limitation.

3. New Development and Production Facilities ("New Sources")

"New Sources" are defined as any facility that discharges pollutants where construction commenced after the effective date of applicable New Source Performance Standards ("NSPS"). See 40 CFR § 122.2. Construction of a New Source commences if the owner or operator of the facility (1) has begun, or caused to begin significant site preparation work as a part of a continuous on-site construction program or (2) has entered into a binding contractual obligation for the purchase of facilities or equipment that are intended to be used in its operations within a reasonable amount of time. See 40 CFR § 122.29(b). Significant site preparation work means the process of surveying, clearing or preparing an area of the water body floor for the purpose of constructing or placing a development or production facility on or over the site. See 40 CFR § 435.11(w)(1)(ii).

For Offshore Subcategory facilities (facilities in Territorial Seas or Federal Waters), NSPS were promulgated on March 4, 1993. See 58 Fed. Reg. 12454 (Mar. 4, 1993). For Coastal Subcategory facilities (those located in Coastal Waters), NSPS were promulgated on December 16, 1996. See 61 Fed. Reg. 66125 (Dec. 16, 1996). Therefore, any new development or production facilities in Cook Inlet are New Sources.

For new development and production facilities, with some exceptions, the Proposed Permit would authorize the discharge of the waste streams described in Section II.D. of this Fact Sheet, subject to effluent limits and other requirements described in detail below. Drilling fluids, drill cuttings, and produced water discharges from new development and production facilities are not proposed to be authorized. Operators of New Sources who wish to obtain authorization to discharge drilling fluids, drill cuttings, or produced water, must seek coverage under an individual NPDES permit.

New Sources do not include new exploratory facilities because exploration is conducted at a particular site for a short duration and generally consists of drilling only one to three wells. See 59 Fed. Reg. 12454 (Mar. 4, 1993). In general, exploratory facilities differ from New Sources in that they do not have high volume discharges, and they do not discharge produced water. Moreover, the volume of drilling fluids and drill cuttings discharged from an exploratory facility is significantly less than from a development facility, where up to fifty wells can be drilled.

D. Authorized Discharges

The Proposed Permit authorizes the discharges from the following waste streams (discharge numbers are in parentheses):

- Drilling Fluids and Drill Cuttings (001)
- Deck Drainage (002)
- Sanitary Wastes (003)
- Domestic Wastes (004)
- Desalination Unit Wastes (005)
- Blowout Preventer Fluid (006)
- Boiler Blowdown (007)
- Fire Control System Test Water (008)
- Non-Contact Cooling Water (009)
- Uncontaminated Ballast Water (010)
- Bilge Water (011)
- Excess Cement Slurry (012)
- Mud, Cuttings, Cement at Seafloor (013)
- Waterflooding Discharges (014)
- Produced Water and Produced Sand (015)
- Completion Fluids (016)
- Workover Fluids (017)
- Well Treatment Fluids (018)
- Test Fluids (019)
- Storm Water Runoff from Onshore Facilities (020)

III. AUTHORIZATION TO DISCHARGE

A. Application

40 CFR § 122.28(b)(2)(i) requires dischargers seeking coverage under a general permit to submit a notice of intent ("NOI") to be covered by the general permit. Submitting a NOI fulfills the NPDES permit application requirements.

B. Notice of Intent Contents

40 CFR § 122.28(b)(2)(ii) requires that the NOI contain information necessary for adequate program implementation. The following information must be provided in the NOI:

1. Applicant Information. The Existing Permit requires the applicant to provide the owner's or operator's name, mailing address, contact name, and telephone number as well as the facility's name, mailing address,

contact name, and telephone number. The Proposed Permit contains the same requirement.

2. Location of discharge. The Existing Permit requires the applicant to provide the name of the lessor (*i.e.*, MMS or Alaska Department of Natural Resources ("ADNR")); the lease and block numbers of operations and discharges; the latitude and longitude of the facility; the latitude and longitude of each well; the range of water depths below mean lower low water ("MLLW") in the lease block; and the water depths for each discharge. The Proposed Permit contains this same requirement. In addition, the Proposed Permit requires the applicant to provide the type of drilling rig used for exploratory operations (*i.e.*, jackup, drillship, semisubmersible, etc.). The GIS coordinate of the facility would also be required to be reported under the Proposed Permit.

3. Commencement date of discharge. The Existing Permit requires the applicant to provide the initial date and expected duration of operations. The Proposed Permit contains the same requirement.

4. Environmental reports. The Existing Permit requires the applicant to provide copies of any exploration plans, biological surveys, and environmental reports required by MMS for the identification or protection of biological populations or habitats. If these documents do not exist, the Existing Permit requires the applicant to provide notice that such documents do not exist. The Proposed Permit contains the same requirement.

5. Wells. The Existing Permit requires the applicant to submit the following for each well: the initial date of drilling, the well name, the well number (*i.e.*, #1, #2, etc.), the well hole diameter, the category of mud(s) used (*e.g.*, water-based, oil-based, synthetic-based, etc.), the type or group of mud used (*e.g.*, lignosulfonate muds, lime muds, etc.), the solids removal process, and the certification of a complete Mud Plan. The Proposed Permit contains the same requirement.

6. Discharges. The Existing Permit requires each applicant to identify the types of discharges from the facility. The Proposed Permit contains the same requirement. In addition, the Proposed Permit requires the applicant to indicate the type of sanitary discharge that will occur, if any (*i.e.,* M10 or M9IM).

7. Line Drawing. EPA proposes to include in the Proposed Permit a new requirement that the applicant submit a line drawing showing the flow of

waste streams from the facility. EPA has added this requirements to be consistent with the NPDES permit application requirements found in the CWA regulations at 40 CFR § 122.21.

C. Deadlines for Submitting Notice of Intent

The Existing Permit requires each applicant to submit an NOI at least 30 days prior to the commencement of discharges from a facility. The Proposed Permit contains this same requirement.

D. Date of Authorized Discharge

40 CFR § 122.28(b)(2)(iii) requires a general permit to specify the date(s) when it authorizes a discharger to begin discharging. The Existing Permit authorized a facility to begin discharging when the applicant received written authorization from EPA. The written authorization also assigned the facility an NPDES permit number.

Under the Proposed Permit, the same discharge authorization date would apply to new dischargers. However, for existing dischargers (those covered by the Existing Permit), the Proposed Permit would authorize discharge beginning on the effective date of the Proposed Permit, provided the discharger applied for continued coverage under the Existing Permit prior to its expiration date.

E. Transfers

Under 40 CFR § 122.41(l)(3), permit coverage for a given facility may be transferred from an existing owner to a new owner. The Proposed Permit would authorize such transfers only for an existing facility (*i.e.,* one covered under the Existing Permit) located at the site designated in the original NOI. Discharge authorizations for a particular facility may not be transferred to a new facility at the same site, nor do they apply to the same facility at a new location. In addition, permit coverage for new facilities (*i.e.,* facilities that were not covered under the Existing Permit) may not be transferred.

F. Termination Notification

EPA may terminate coverage under an NPDES permit for the reasons, and using the procedures, provided in 40 CFR § 122.64.

If a permittee wishes to terminate coverage, the Existing Permit required the permittee to provide notice of termination to EPA within 30 days following cessation of discharges. The Proposed Permit would require the permittee to provide notice to EPA <u>prior to</u> cessation of discharges. However, if a facilities is engaged in drilling operations at a well, the permittee must provide a notice of termination <u>within 7 days</u> of ceasing such drilling operations. The notice must include

certification that the facility is not subject to an enforcement action or citizen suit.

G. Requiring an Individual Permit

40 CFR § 122.28(b)(3) provides situations where EPA may require, or the discharger may request, an individual NPDES permit. These situations have been incorporated into the Proposed Permit at Part I.H.

IV. BASIS FOR PERMIT CONDITIONS

A. Legal Basis

Section 301(a) of the CWA, 33 USC § 1311(a), prohibits the discharge of pollutants to waters of the United States unless authorized pursuant to a NPDES permit. CWA Section 402, 33 USC § 1342, authorizes EPA to issue NPDES permits authorizing discharges subject to limitations and requirements imposed pursuant to CWA Sections 301, 304, 306, 401, and 403, 33 USC §§ 1311, 1314, 1316, 1341, and 1343. Pursuant to these statutory provisions, NPDES permits must include effluent limitations that require the discharger to (1) meet standards reflecting levels of technological capability, (2) comply with EPA-approved State water quality standards, (3) comply with other State requirements adopted pursuant to CWA Section 510, 33 USC §1370, and (4) cause no unreasonable degradation to the territorial seas, contiguous zone, or oceans. Moreover, many NPDES permits impose reporting/information gathering requirements pursuant to CWA Section 308, 33 USC § 1318.

1. Technology-Based Limits

For conventional pollutants (*i.e.,* pH, biochemical oxygen demand ("BOD"), oil and grease, total suspended solids ("TSS"), and fecal coliform), CWA Section 301(b)(1)(E), 33 USC § 1311(b)(1)(E), requires the imposition of effluent limitations based on best conventional pollutant control technology ("BCT"). For nonconventional and toxic pollutants, CWA Section 301(b)(2)(A), (C), and (D), 33 USC § 1311(b)(2)(A), (C), and (D), require the imposition of effluent limitations based on best available technology economically achievable ("BAT"). CWA Section 301(b), 33 USC § 1311(b), requires compliance with BCT and BAT no later than March 31, 1989.

For New Sources, as that term is defined in 40 CFR § 122.2, CWA Section 306, 33 USC § 1316, requires the imposition of effluent limitations for conventional and toxic pollutants based on NSPS. CWA Section 306, 33 USC § 1316, requires compliance with NSPS no later than the effective date of such standards.

EPA is authorized to establish BAT and BCT based on the best professional judgement of the permit writer; however, that authorization is only available for the period prior to issuance of Effluent Limitations Guidelines (see CWA § 402(a)(1)(B)).

EPA promulgated final ELGs specifying BCT, BAT, best practicable control technology currently available ("BPT"), and NSPS for the Offshore Subcategory of the Oil and Gas Point Source Category. These ELGs were published in the Federal Register at 58 Fed. Reg. 12,454, on March 4, 1993, and were codified at 40 C.F.R. Part 435, Subpart A. EPA modified the ELGs on January 22, 2001 to add technology-based standards for discharges associated with the use of synthetic-based drilling fluids. See 66 Fed. Reg. 6,850 (Jan. 22, 2001). EPA also promulgated ELGs specifying BCT, BAT, BPT, and NSPS for the Coastal Subcategory of the Oil and Gas Point Source Category. These ELGs were published in the Federal Register at 61 Fed. Reg. 66,125 on December 16, 1996, and were codified at 40 C.F.R. Part 435, Subpart D.

In general, since EPA has established ELGs for oil and gas point sources, the Proposed Permit may not impose more stringent technology-based limits. For any specific waste stream or pollutant not addressed by the ELGs, EPA must develop technology-based permit limitations through the use of Best Professional Judgment ("BPJ") on a case-by-case basis. Here, there are several waste streams that are not addressed by the ELGs (*e.g.,* chemically treated sea water). The Proposed Permit contains technology-based limits for these waste streams based on BPJ.

2. Water Quality-Based Limits

a. Limits Based on State Water Quality Standards

CWA Section 301(b)(1)(C), 33 USC § 1311(b)(1)(C), requires that NPDES permits contain the necessary limitations and monitoring requirements to ensure compliance with State water quality standards. State water quality standards apply only in Coastal Waters and Territorial Seas; they do not apply in Federal Waters.

b. Limits Based on Ocean Discharge Criteria

The CWA prohibits the issuance of an NPDES permit for discharges to the Territorial Seas or Federal Waters, unless the permit is in compliance with the Ocean Discharge Criteria established pursuant to CWA Section 403(c), 33 USC § 1343(c), and its implementing regulation, 40 CFR Part 125, Subpart M. This regulation does not allow EPA to issue an NPDES permit for discharges that cause unreasonable degradation of the marine environment. To determine whether a discharge will cause unreasonable degradation to the marine environment, EPA must consider the factors set forth in 40 CFR § 125.122.

3. Summary of Legal Basis for Limits

The Existing Permit contained a number of limitations and monitoring requirements to ensure compliance with Ocean Discharge Criteria and State water quality standards. EPA has reexamined those water-quality based conditions and, in many cases, retained them in the Proposed Permit.

Table 1, below, summarizes the regulatory basis for the limitations and conditions in the Proposed Permit.

TABLE 1: Regulatory Basis For Permit Limitations

Discharge & Permit Condition	Statutory Basis
Drilling Muds and Cuttings (001)	
flow rate limitations	CWA §403
depth related limits	CWA §403
volume	CWA §308
mud plan	CWA §§308, 304, 402
toxicity	BAT
no free oil	BCT, BAT
no oil-based fluids	BPT, BCT, BAT
no diesel	BAT
mercury & cadmium in barite	BAT
monitor metals	CWA §308
inventory of added substances	CWA §308
environmental monitoring requirement	CWA §403
Deck Drainage (002)	
no free oil	BPT, BCT, BAT
monitor whole effluent toxicity (direct discharge only)	CWA §308
Sanitary Wastes (003)	
chlorine (facilities >10 people)	BCT, State Water Quality Standards
biological oxygen demand (BOD)	State Water Quality Standards, except in Federal Waters
suspended solids (SS)	State Water Quality Standards, except in Federal Waters
no floating solids	BPJ/BAT

monitor flow rate	CWA §308
Marine Sanitation Devices (fecals, solids, chlorine)	CWA §312
Domestic Wastes (004)	
no foam	BAT
no floating solids	BCT
monitor flow rate	CWA §308
Miscellaneous Discharges (005-014)	
monitor flow rate (all)	CWA §308
no free oil (006, 010, 011, 012, 013, 014)	BPT
inventory chemicals added (005, 009, 014)	CWA §308
Produced Water (015)	
flow rate	CWA §308
produced sands	BCT, BAT
oil & grease	BAT
pH	BCT
Metals/Hydrocarbons	State Water Quality Standards
Whole Effluent Toxicity	State Water Quality Standards/CWA §403

B. Technology-Based Permit Requirements

The Proposed Permit contains technology based limitations and conditions as required under the ELGs. The ELGs establish BCT, BAT, BPT, and NSPS for the Offshore and Coastal Subcategories of the Oil and Gas Extraction Point Source Category. See 40 CFR Part 435, Subpart A and D. This section describes the associated limitations and monitoring requirements for the individual waste streams that the Proposed Permit authorizes.

Tribes and private citizens have raised concerns regarding the fact that the ELGs for the Coastal Subcategory contain an exemption for Cook Inlet that allows the discharge of drilling fluids and produced water. EPA is governed by the regulations at 40 CFR Part 435, Subpart D. These regulations establish BAT and NSPS ELGs for oil and gas facilities in Coastal Waters. Unlike other areas of the United States, the ELGs allow for the discharge of produced water, drilling fluids, drill cuttings, de-watering effluent, and well treatment, completion and workover fluids

from existing oil and gas facilities in Cook Inlet. See 40 CFR §§ 435.43, 435.44, and 435.45. As such EPA cannot impose more stringent limits, such as a discharge prohibition, unless such limits are needed to ensure that State water quality standards are met. See 40 CFR § 122.44. After conducting a reasonable potential analysis, EPA has determined that zero discharge is not necessary to meet State water quality standards. Moreover, ADEC has preliminarily certified that the limits established in the Proposed Permit ensure that State water quality standards are not exceeded. Thus, EPA lacks a legal basis to prohibit discharges from existing oil and gas facilities. However, the Proposed Permit does not authorize the discharge of produced water, drilling fluids and drill cuttings from New Sources.

1. Drilling Fluids

The technology-based limitations for drilling fluid discharges in the Existing Permit were based on the ELGs establishing NSPS and BAT for Cook Inlet. The Proposed Permit retains the Existing Permit's limitations with a few minor changes. The Proposed Permit does not authorize discharges of drilling fluids from New Sources.

Based on the ELGs, the Proposed Permit, like the Expired Permit, includes the following limits and prohibitions: (1) no discharge of free oil; (2) no discharge of diesel oil; and, (3) a toxicity limit of 3% by volume. The Proposed Permit limits the discharge of organic contaminants through these free oil and diesel oil discharge prohibitions, and also by restricting the use of mineral oil in drilling fluids. Permittees must measure free oil in drilling fluid discharges using the static sheen test method. Permittees must measure toxicity using a 96-hour LC_{50} on the suspended particulate phase using the *Leptachoirus plumniosus* species.

Stock barite, which is added to drilling fluids, contains cadmium and mercury. Barite is the main source of heavy metals in drilling fluid discharges. Pursuant to the ELGs, the Proposed Permit, like the Expired Permit, establishes effluent limitations for cadmium and mercury of 3 mg/kg and 1 mg/kg, respectively. The Proposed Permit would require permittees to report cadmium and mercury concentrations measured in the stock barite before it is added to the drilling fluids, using EPA Test Methods 245.5 or 7471. The technology-based limits for cadmium and mercury are surrogate parameters for other metals contained in the barite.

The Proposed Permit retains the Existing Permit's prohibitions on discharges of oil-based drilling fluids, inverse emulsion drilling fluids, oil-contaminated drilling fluids, and drilling fluids to which mineral oil has been added. The purpose of these prohibitions is to ensure compliance with the toxicity limit, and the prohibition against the discharge of free oil. The Proposed Permit allows an exception to those prohibitions for drilling fluids to which mineral oil or non-aqueous based fluids have been added as a carrier agent, lubricity additive, or pill. A pill is defined as a discrete amount of mineral oil and non-aqueous fluid which is circulated through the well to free stuck pipe.

The Existing Permit prohibits all discharges of non-aqueous based drilling fluids, also known as

synthetic-based drilling fluids. The Proposed Permit carries forward this prohibition. In Territorial Seas and Federal Waters, however, permittees are authorized to discharge non-aqueous based drilling fluids that adhere to drill cuttings, pursuant to the Offshore Category ELGs, as amended in 2001. The limitations that apply to these proposed new drill cuttings discharges are set forth in Section IV.B.2., below.

No drilling is presently under way at the existing platforms covered by the Existing Permit. Therefore, these platforms do not discharge drilling fluids or drill cuttings. Due to the age of development in Cook Inlet, only a small number of new wells are likely to be drilled at existing platforms in the future. For that reason, EPA does not expect significant discharges of drilling fluids and drill cuttings from existing platforms.

While drilling is under way, the volume of drill cuttings and drilling fluids discharged depends on the rate at which wells are drilled and the resulting volume of cuttings that are brought to the surface. When drilling is completed, facilities typically discharge the remaining drilling fluids in bulk. On the permit applications received for this permit renewal, the maximum discharge volume reported for drilling fluids and drill cuttings combined was 18,942 gallons per day. That volume is consistent with the typical bulk discharge of drilling fluids traditionally made at the end of drilling.

2. Drill Cuttings

The main source of pollutants in drill cuttings discharges come from drilling fluids that are used in drilling a well, which then adhere to the drill cuttings. Therefore, based on the ELGs for BAT, BCT, BPT, and NSPS, the Proposed Permit, like the Existing Permit, subjects drill cuttings discharges to the same limits that apply to drilling fluid discharges.

As noted above, in Territorial Seas and Federal Waters, the Proposed Permit would authorize the discharge of drill cuttings generated using synthetic-based drilling fluids. The use of synthetic-based fluids is a type of pollution prevention technology because the drilling fluids are not disposed of through bulk discharge at the end of drilling. Instead, the drilling fluids are brought back to shore and refurbished so that they can be reused. In addition, drilling with synthetic based fluids allows operators to drill a slimmer well and results in less erosion of the well during drilling than when water-based fluids are used. Thus, the volume of drill cuttings that are discharged is reduced. The Proposed Permit requires permittees to remove synthetic-based drilling fluids from the drill cuttings prior to discharge, which is not required when water-based fluids are used.

The ELGs also include limits for sediment toxicity and biodegradation. Although the ELGs do not address specific types of synthetic-based fluids, the ELGs contain toxicity and biodegradation limits that require operators to use less toxic fluids that biodegrade quickly.

The Proposed Permit contains limits for synthetic-based fluids at three points. First, for stock synthetic fluids prior to combination with other components of the drilling fluid system, the Proposed Permit imposes limits on polynuclear aromatic hydrocarbons ("PAHs"), sediment toxicity (10-day), and biodegradation rate. Second, combined fluid components are limited for formation oil contamination, measured using gas chromatography/mass spectrometry ("GC/MS"). Third, drilling fluids that adhere to drill cuttings are limited for sediment toxicity (4-day), and formation oil contamination as measured by either a reverse phase extraction test or GC/MS.

3. Produced Water

The ELGs require oil and grease limits of 29 mg/l, monthly average, and 42 mg/l, daily maximum, for produced water. These limitations were contained in the Existing Permit and are retained in the Proposed Permit. In formulating those ELGs, EPA examined all of the pollutants that could be expected to be discharged in produced water, and concluded that they could be appropriately controlled by the oil and grease limits. Therefore, the Proposed Permit may not impose more stringent BPJ-based effluent limits, such as an outright prohibition on the discharge of produced water, in order to control those same pollutants.

Historically, the produced water oil and grease limits in the Existing Permit have been exceeded most often. EPA has found that non-compliance with the oil and grease limit is often the result of a minor problem with the treatment system that can be easily alleviated when it is found. Although there is no strict correlation between the oil and grease concentration and the presence of sheen, the presence of a sheen often indicates some problem with the treatment system, and therefore potential noncompliance with the oil and grease limit. To promote better compliance with the oil and grease limits, the Proposed Permit includes a new produced water sheen monitoring requirement. Under this requirement, when conditions allow, operators would observe the receiving water down current of the produced water discharge once per day. If sheen is observed, operators would collect and analyze a produced water sample to determine compliance with the oil and grease limit. Observations must be made during slack tide so that turbulence that is generally present during periods of high ambient velocity does not interfere with the ability to observe sheen.

4. Produced Sand

The Existing Permit prohibited the discharge of produced sand based on the ELGs. The Proposed Permit retains this prohibition.

5. Well Treatment, Completion and Workover Fluids

For well treatment, completion, and workover fluid discharges, the ELGs for NSPS and BAT require oil and grease limits of 29 mg/l, monthly average, and 42 mg/l, daily maximum. In addition, the BCT ELGs require a limit of no free oil. These limits were contained in the

Existing Permit and are retained in the Proposed Permit.

6. Deck Drainage

For deck drainage discharges, the Offshore and Coastal Subcategory ELGs for NSPS, BAT, and BCT require a limitation of no discharge of free oil as determined by the presence of film, sheen, or a discoloration of the surface of the receiving water. This limit was contained in the Existing Permit and has been retained in the Proposed Permit.

7. Sanitary Waste Water

For sanitary waste discharges, the Offshore and Coastal Subcategory ELGs for NSPS and BCT require total residual chlorine to be maintained as close to 1 mg/l as possible for facilities that are continuously manned by ten or more persons. The ELGs also require no discharge of floating solids for offshore facilities that are continuously manned by nine or fewer persons or intermittently manned by any number of persons. These limits were contained in the Existing Permit and are retained in the Proposed Permit.

8. Domestic Waste Water

For domestic waste water discharges, the ELGs prohibit the discharge of floating solids, garbage or foam and require compliance with 33 CFR Part 151. This limit was contained in the Existing Permit and has been retained in the Proposed Permit.

9. Miscellaneous Discharges

The Existing Permit authorized the following miscellaneous discharges:

- desalination waste water (005)
- blowout preventer fluid (006)
- boiler blowdown (007)
- fire control system test water (008)
- non-contact cooling water (009)
- uncontaminated ballast water (010)
- bilge water (011)
- excess cement slurry (012)
- muds, cuttings, and cement at the sea floor (013)
- water flood waste water (014)

The Existing Permit limited those discharges to no free oil as monitored by the visual sheen test method. The Existing Permit requires discharges of uncontaminated ballast water and bilge water to be treated in an oil-water separator. The Existing Permit also required operators to sample bilge water discharges for free oil using the static sheen test method when discharges

occurred during broken, unstable, or stable ice conditions. In addition, the Expired Permit required operators to maintain a precise inventory of the type and quantity of chemicals added to water flooding, non-contact cooling water, and desalinization waste water discharges. The ELGs do not address these miscellaneous discharges. The Proposed Permit retains these limitations and monitoring requirements except, as described in Section IV.B.10., below, when treatment chemicals such as corrosion inhibitors or biocides are added.

10. Chemically-Treated Sea Water and Fresh Water Discharges

Operators use a broad range of chemicals to treat seawater and freshwater used in offshore operations. The available literature shows that more than twenty biocides are commonly used. These include derivations of aldehydes, formaldehyde, amine salt, and other compounds. The toxicity of these compounds to marine organisms as measured with a 96-hour LC_{50} test is reported to range from 0.4 mg/l to greater than 1000 mg/l. Scale inhibitors are also used to treat seawater and freshwater. The scale inhibitors commonly used are amine phosphate ester and phosphonate compounds. Scale inhibitors are generally less toxic to marine life than biocides with 96-hour LC_{50} concentrations shown to be from 1,676 mg/l to greater than 10,000 mg/l. 96-hour LC_{50} values for corrosion inhibitors were reported to range from 1.98 mg/l to 1050 mg/l. See *Chemical Treatments and Usage in Offshore Oil and Gas Systems* (May 1992).

The Proposed Permit uses generic BPJ-based limits, based on available technology, to regulate chemically treated sea water and fresh water discharges, rather than attempting to limit the discharge of specific biocides, scale inhibitors and corrosion inhibitors. Due to the large number of chemical additives used, it would be very difficult to develop technology-based limits for each individual additive. In addition, if the Proposed Permit were to limit specific chemicals, it could potentially halt the development and use of new and potentially more beneficial treatment chemicals.

Many of the chemicals normally added to seawater or freshwater, especially biocides, have manufacturer's recommended maximum concentrations or EPA product registration labeling. In addition, information obtained from offshore operators demonstrates that it is unnecessary to use any of the chemical additives or biocides in concentrations greater than 500 mg/l. Therefore, the Proposed Permit limits discharges of seawater or freshwater to the most stringent of the following:

1) the maximum concentrations and any other conditions specified in the EPA product registration labeling if the chemical additive is an EPA registered product;

2) the maximum manufacturer's recommended concentration; or

3) 500 mg/l.

Compliance with this limit is calculated based on the amount of treatment chemicals added to the volume of water discharged.

As with the other miscellaneous discharges described above, the Proposed Permit contains BCT limits prohibiting the discharge of free oil for chemically-treated seawater and freshwater discharges. Free oil is a direct measurement of oil contamination and, based on BPJ, the Proposed Permit uses it as a surrogate parameter for conventional pollutants in these discharges.

11. Storm Water Runoff from Onshore Facilities

In an effort to regulate discharges from on-shore production facilities similar to the manner in which such discharges are regulated for shore-based industrial facilities, EPA proposes to include new requirements in the Proposed Permit. These requirements have been imposed pursuant to CWA § 402(l)(2) and 40 CFR § 122.26(c). Specifically, operators of on-shore facilities are required to develop and implement storm water pollution prevention plans ("SWPPPs"). The SWPPPs must include best management practices ("BMPs") to monitor and maintain operations to prevent contamination of storm water. If facilities are covered under a separate NPDES permit and have completed these requirements in compliance with that permit, these requirements would not apply.

12. All Discharges

The Proposed Permit prohibits the discharge of rubbish, trash and other refuse based on the International Convention for the Prevention of Pollution from Ships ("MARPOL"). The Proposed Permit also prohibits the discharge of sandblasting waste pursuant to 33 C.F.R. Part 151. Operators typically use management practices such as enclosing areas being sand blasted in tarps to capture as much of the waste as practicable. The Proposed Permit clarifies that the use of reasonable measures such as enclosing the area in tarps would meet the intent of the discharge prohibition.

Based on CWA Section 403(c), 33 USC § 1343(c), the Proposed Permit also requires minimization of the discharge of surfactants, dispersants and detergents.

C. Water Quality-Based Permit Conditions

The Proposed Permit establishes water quality-based limitations and monitoring requirements necessary to ensure that the authorized discharges comply with the CWA's Ocean Discharge Criteria and State water quality standards, for the waters in which they apply (see Section II.B.3 of this Fact Sheet). The rationale used to develop those permit requirements is described below.

1. General Information

a. Ocean Discharge Criteria

Section 403 of the Act, 33 USC § 1343, requires NPDES permits for discharges into offshore waters, including Territorial Seas and Federal Waters (Southern Cook Inlet in the case of this permit), to comply with the Ocean Discharge Criteria for determining the potential degradation of the marine environment. See 40 CFR Part 125, Subpart M. The Ocean Discharge Criteria are intended to "prevent unreasonable degradation of the marine environment and to authorize imposition of effluent limitations, including a prohibition of discharge, if necessary, to ensure this goal." See 49 Fed. Reg. 65942 (Oct. 3, 1980).

Under the Ocean Discharge Criteria, EPA may issue an NPDES permit if it determines that a discharge will not cause unreasonable degradation to the marine environment. If insufficient information exists to make such a determination prior to permit issuance, EPA may only issue the permit if the discharge will not cause irreparable harm to the marine environment while additional monitoring is undertaken, and if there are no reasonable alternatives to on-site disposal.

The MMS completed a Preliminary Ocean Discharge Criteria Evaluation ("ODCE") for Lease Sale No. 60, and a Revised Preliminary ODCE for Lease Sale No. 88 and state lease sales located in Cook Inlet, for discharges from facilities in those lease sale areas. For the Existing Permit, EPA updated the existing ODCE information in the ODCE for Cook Inlet (Oil & Gas Lease Sale 149) and Shelikof Strait (Tetra Tech, 1995). EPA further updated that evaluation for the Proposed Permit, and expanded its scope to include the areas covered under MMS Lease Sale Nos. 191 and 199 as well as adjoining Territorial Seas.

Based on the Ocean Discharge Criteria, the Existing Permit established discharge rate and depth limits for drilling fluids discharges, as well as discharge prohibitions in several environmentally sensitive areas of Cook Inlet. The Proposed Permit retains these requirements, and also includes new requirements based on Ocean Discharge Criteria, including toxicity limits for produced water, and toxicity limits for sea water and fresh water discharges to which treatment chemicals have been added. EPA has developed a revised ODCE for the Proposed Permit. Based on the revised ODCE, EPA has determined that discharges authorized by the Proposed Permit will not cause unreasonable degradation as long as the Proposed Permit's limitations, depth-related conditions, and environmental monitoring requirements are met.

b. State Water Quality Standards

Section 301(b)(1)(C) of the Act, 33 USC § 1311(b)(1)(C), and 40 CFR § 122.44(d)(1) require NPDES permits to contain the limitations and conditions that are necessary to attain State water quality standards. The Existing Permit contained limits based on State water quality standards for metals, hydrocarbons, and toxicity in produced water discharges. The Proposed Permit contains

revised water quality-based effluent limits which were derived from the updated mixing zone computations, provided by ADEC in the draft 401 certification and described in Table 4, below.

In addition, treatment chemicals such as biocides, corrosion inhibitors, and oxygen scavengers are used in a number of discharges such as cooling water and water flood waste water. Many of those chemical additives are highly toxic and have been limited for toxicity by EPA in other permitting actions. Tribal members have also raised this issue during the Traditional Ecological Knowledge interview process discussed in Section IV.E, below. To ensure that these discharges comply with both State water quality standards and Ocean Discharge Criteria, the Proposed Permit includes whole effluent toxicity limitations. EPA believes that the proposed limits will help to resolve the issues raised by the tribes.

2. Mixing Zones

a. General Information

Mixing zones are established by States and EPA to specify a limited portion of a water body in which otherwise applicable water quality criteria may be exceeded. In the Coastal Waters and Territorial Seas, states have the authority to define mixing zones and determine their sizes. In Territorial Seas, the Ocean Discharge Criteria concurrently apply and can restrict mixing zone sizes. In Federal Waters, State standards do not apply; thus, mixing zones are governed solely by the Ocean Discharge Criteria.

Mixing zones are used to calculate the appropriate water quality-based effluent limitations. The Existing Permit's water quality-based effluent limits for certain constituents in produced water and sanitary waste water were based on the effluent concentration calculated to exist at the edge of the mixing zone. The mixing zone sizes for the Proposed Permit have been re-calculated by ADEC. As proposed, the permit would establish water quality-based effluent limits for chemically-treated seawater based upon a calculated mixing zone.

b. Mixing Zones and State Water Quality Standards

The State water quality standards do not allow mixing zones unless authorized by ADEC. When authorized, the standards require mixing zones to be as small as practicable. See 18 Alaska Administrative Code ("AAC") 70.240. In determining whether to use a mixing zone, 18 AAC 70.245 requires full protection of the existing uses of the water body. Within a mixing zone, State water quality standards allow water quality criteria for chronic aquatic life and human health protection to be exceeded as long as water quality criteria are met outside the mixing zone. State water quality standards, however, require that acute aquatic life criteria are met at a boundary of a smaller zone of initial dilution, established within the mixing zone. See 18 AAC 70.255.

ADEC must take into account the potential exposure pathways in determining whether to authorize mixing zones. Mixing zones cannot be authorized if pollutants can bioaccumulate or

persist in concentrations above natural levels in the environment or if they can be expected to cause a carcinogenic or other human health risk. Here, ADEC has determined that the discharges authorized by the Proposed Permit are not likely to persist in the environment and, therefore, has authorized mixing zones as discussed in ADEC's draft 401 certification. See Table 3a and 3b, below, for the size of the mixing zones. The State-established mixing zones apply to Coastal Waters, where the existing facilities are located.

c. Mixing Zones and Ocean Discharge Criteria

As discussed above, Ocean Discharge Criteria must be implemented in NPDES permits for discharges to the Territorial Seas and Federal Waters. The Ocean Discharge Criteria define mixing zones to be that portion of the water body that extends laterally a distance of 100 meters from the discharge point. See 40 CFR § 125.121(c). The Ocean Discharge Criteria provide EPA with the option of establishing smaller mixing zones that are based on a zone of initial dilution calculated using a plume model.

EPA has decided to use the Ocean Discharge Criteria 100-meter mixing zone to establish toxicity limits for discharges of chemically-treated sea water as well as limits for discharges of sanitary waste water for new facilities which could be located in the Territorial Seas and Federal Waters. For this permit it is important to note that the length of the mixing zone is defined as the distance from the discharge pipe to the edge of the mixing zone.

d. Mixing Zone Calculations for Produced Water

For most discharges, ADEC determines the size of a mixing zone on a case-by-case basis as a part of the CWA Section 401 certification process. Typically, dischargers submit applications that request a specific mixing zone size. The flow volume is a critical input in the mixing zone calculation.

There have been significant changes in both the volume and number of produced water discharges in Cook Inlet since the Existing Permit was issued. Platforms Baker and Dillon no longer discharge produced water. Due to maturing production in the producing fields, however, the volume discharged from the Trading Bay Facility has significantly increased since the Existing Permit was issued. A comparison of the present discharge rates and those at the time the Existing Permit was issued is shown below in Table 2.

Table 2: Comparison of Produced Water Discharge Rates

Facility	Previous Discharge Rate (GPD)	Current Discharge Rate (GPD)	Maximum Projected Discharge Rate (GPD)
Onshore Facilities			
Granite Point	96,986	7,000	193,200
Trading Bay	2,742,660	5,598,600	8,400,000
E. Foreland	200,459	167,040	840,000
Platforms			
Tyonek A	1,811	31,066	31,066
Bruce	6,467	11,500	25,200
Baker	42,042	0	45,000
Dillon	126,103	0	193,500
Anna	44,874	51,000	84,000

On January 4, 2005, ADEC provided EPA with preliminary mixing zone and dilution calculations based upon mixing zone applications that were submitted by Industry. EPA developed a preliminary draft permit based on those preliminary mixing zones. That draft permit was submitted to ADEC on August 19, 2005 so that the department could develop a draft CWA section 401 certification, which could be publicly noticed concurrently with the draft permit. During Tribal review of the preliminary draft permit and during ADEC's development of the draft 401 certification, Industry submitted a revised mixing zone application to ADEC, dated October 20, 2005. The revised mixing zone applications contained newly projected maximum discharge rates and the maximum predicted pollutant concentrations and included a request for mixing zones based on that information. ADEC adopted new produced water mixing zones which are based on Industry's revised application. That new information was submitted to EPA in ADEC's draft 401 certification, dated October 28, 2005. ADEC submitted an additional revision of that certification to EPA on February 17, 2006. That revision contained a change to the Trading Bay mixing zones and changes to the sanitary waste water mixing zones described later in this Fact Sheet. EPA has updated the Proposed Permit based on the mixing zones set forth in ADEC's draft 401 certification. A comparison of ADEC's February 17, 2006 mixing zones and those used to establish the Existing Permit's limits is shown below in Tables 3a and 3b.

Table 3a: Proposed and Previous TAH/TAqH and Acute Metals Mixing Zone Lengths (meters) for Produced Water Discharges

Facility	TAH/TAqH Mixing Zone		Acute Metals Mixing Zone	
	2/17/06 Draft 401 Certification	Previous Permit	2/17/06 Draft 401 Certification	Previous Permit
Onshore Facilities				
Granite Point	2,685	955	19	20
Trading Bay	2,418	1,420	<1	42
East Foreland	1,794	412	142	20
Platforms				
Tyonek A	36	20	36	20
Anna	2,734	363	239	20
Bruce	1,840	867	201	20
Baker	3,016	555	202	22
Dillon	2,121	405	11	20
Granite Point	1,863	None	12	None

Table 3b: Proposed and Previous Chronic Metals and Whole Effluent Toxicity Mixing Zone Lengths (meters) For Produced Water Discharges

Facility	Chronic Metals Mixing Zone		Whole Effluent Toxicity Mixing Zone	
	2/17/06 Draft 401 Certification	Previous Permit	2/17/06 Draft 401 Certification	Previous Permit
Onshore Facilities				
Granite Point	21	66	780	20
Trading Bay	9	431	31	59
East Foreland	121	106	1,742	20
Platforms				
Tyonek A	60	663	73	46
Anna	262	37	274	40
Bruce	218	31	715	58
Baker	216	37	248	20
Dillon	13	43	210	20
Granite Point	14	None	533	None

The mixing zones shown above have been adopted by ADEC pursuant to the State's mixing zone regulations. These mixing zones are used in implementing State water quality standards, unless it is demonstrated that more stringent limits are warranted to ensure that State water quality standards will not be exceeded. The water quality-based effluent limitations in the Proposed Permit were calculated using the February 17, 2006 mixing zones shown above.

The mixing zones for the Trading Bay Facility were calculated based on the addition of a diffuser. EPA and ADEC have concluded that it is practicable to significantly reduce the size of the mixing zone at the Trading Bay Facility through the installation of a diffuser. The TAH mixing zone requested for Trading Bay would have been 5,791 meters long for a single port discharge pipe. The discharge from the Trading Bay Facility is significantly greater in volume than the other discharges authorized under the Proposed Permit. The discharge is also located in fairly shallow water and is much closer to sensitive areas than any other produced water discharge in Cook Inlet. Those sensitive areas include the Trading Bay State Game Refuge and the mouth of the McArthur River. The current outfall for this facility is a split single port outfall, which does not provide rapid mixing of the effluent. It is common practice for large industrial facilities to construct multi-port diffuser outfalls to increase initial dilution and thereby reduce the impacts of the

discharge. EPA believes that an upgrade to the Trading Bay outfall is practicable, and would be consistent with the Alaska mixing zone requirement to reduce the size of mixing zones to the extent practicable. With the addition of an 80-meter long diffuser, the size of the Trading Bay mixing zone will be 2,418 meters. The mixing zone was calculated for the worst case conditions of low current speeds surrounding time of slack tides. For all current speeds above 0.3 meters per second, the mixing zone was calculated to be less than 100 meters long with the diffuser.

EPA examined the Trading Bay Facility discharge for a number of discharge velocities, diffuser lengths, and ambient current speeds to determine a diffuser design that is technically feasible and would result in the smallest possible mixing zone. As a result of coordinated efforts between ADEC, Unocal, and EPA, a diffuser, which will significantly reduce the mixing zone length, has been designed for the Trading Bay Facility discharge. This smaller mixing zone will help to minimize any potential effects from the discharge by reducing the size of the area of Cook Inlet in which water quality criteria will be exceeded. The Proposed Permit includes a compliance schedule that affords the permittee two years to design, construct, and install the diffuser.

The mixing zone calculations underlying the water quality based effluent limits are consistent with conditions representative of a reasonable worst case scenario. ADEC used the CORMIX dispersion model to calculate the effluent plume's dilution, and determine where the discharges will meet State water quality standards given various assumptions including, but not limited to, outfall design, effluent flow volume and current speed. The new mixing zones in the proposed general permit are, in most cases, larger than those previously authorized by ADEC. The main reasons for these larger mixing zones are that a more conservative model was used in the mixing zone applications for the proposed permit (CORMIX versus Plumes) and that mixing zones were established for reasonable worst-case conditions. The modeling covered a variety of conditions. The current speed used in the modeling was the variable that had the most significant effect on mixing. For a single port discharge, the worst case scenario was generally at high current speeds. The worst case scenario for a discharge through a multiple port diffuser was at low current speeds. That difference between single port discharges and multiple port diffusers is caused by changes in the receiving water dynamics created by the discharge. A diffuser discharge is typically at a high velocity through a number of ports. The diffuser line and the multiple discharges made from the diffuser cause localized instability of the currents. At high current speeds, that instability results in a very high degree of mixing relative to a discharge made through a single port. The mixing is reduced when current speeds are lower; however, better mixing at low current speeds can be achieved by increasing the diffuser length. For the Trading Bay Facility discharge, the operator has proposed a diffuser of approximately 100 meters in length. That diffuser will accommodate a high degree of mixing at both low and high current speeds.

The number of dilutions calculated, or number of times the effluent is diluted for the different produced water discharges are shown below in Table 4. EPA used the dilutions, as calculated by CORMIX, to derive the numeric water quality based effluent limits shown in Appendix A of this Fact Sheet.

Table 4: ADEC Calculated Produced Water Dilution Factor and Mixing Zones (referred to in this table as "MZ")

Facility	TAH/TAqH		Acute Metals		Chronic Metals	
	MZ (m)	Dilution Factor	MZ (m)	Dilution Factor	MZ (m)	Dilution Factor
Granite Point	2,685	7,756	19	32.2	21	35.9
Trading Bay	2,418	1,970	<1	20.3	9	183.3
East Foreland	1,794	2,556	142	64.6	121	55.1
Tyonek A	36	175.6	36	178.7	60	276.7
Anna	2,734	12,509	239	599.1	262	665.6
Bruce	1,840	9,170	201	496	218	550.7
Baker	3,016	15,668	202	151	216	168
Dillon	2,121	3,386	11	24	13	26
Granite Point Platform	1,863	7,756	12	32.2	14	35.9

Table 4 (continued): ADEC Calculated Produced Water Dilution Factor and Mixing Zones (referred to in this table as "MZ")

Facility	Whole Effluent Toxicity		Ammonia		Human Health	
	MZ (m)	Dilution Factor	MZ (m)	Dilution Factor	MZ (m)	Dilution Factor
Granite Point	780	1,638	53	90	35	60.4
Trading Bay	31	346	1	72	16	249.5
East Foreland	1,742	1,476	21	11	172	77.9
Tyonek A	73	327	4	11.8	N/A	N/A
Anna	274	701	102	234	32	72.9
Bruce	715	2,625	61	108	44	70.6
Baker	248	210	197	144	93	70
Dillon	210	358	0	1	10	22
Granite Point Platform	533	1,638	35	90	23	60.4

3. Water Quality Analysis and Limits

a. Dispersion Modeling

EPA used the CORMIX model to conduct dispersion modeling to analyze and develop the Proposed Permit's water quality-based effluent limits. EPA has found that CORMIX is an appropriate model for discharges authorized under NPDES permits for oil and gas related discharges. CORMIX is able to account for boundary interactions such as the effluent plume becoming trapped in a water column or striking a physical boundary such as the bottom or surface. In addition, CORMIX can be used in a wide variety of discharge conditions and is capable of simulating the dispersion of discharges in the far field.

b. Produced Water

i. Model Input Parameters

The model input parameters used by EPA and ADEC were chosen based on a comparison of permit applications and discharge monitoring reports, and an examination of modeling conducted for the Existing Permit. The values used to develop the Proposed Permit's conditions are summarized below in Table 5.

Table 5: CORMIX Input Conditions

Ambient Conditions:

Ambient Density: 1018 kg/m^3

Current Speed: 0.04 - 2.3 meters/sec

Discharge Specific Conditions

Discharge	Port Diameter (m)	Port Depth (m)	Discharge Density (kg/m^3)	Receiving Water Depth (m)
Trading Bay	0.4064	10.67	1014	10.87
Granite Point	0.0762	17.37	1014	17.41
East Forelands	0.1778	8.23	1011	8.319
Tyonek A	0.1018	22.86	1001	22.91
Platform Bruce	0.0762	16.37	1007	16.41
Platform Baker	0.0508	31.09	1010	31.12
Platform Dillon	0.0762	24.69	1009	24.73
Platform Anna	0.254	21.7	1006	21.83
Grnaite Point Platform	0.0762	18	1007	21

ii. Water Quality Criteria Comparison

EPA compared effluent data to the State water quality criteria for produced water discharges. The comparisons can be seen in Appendix A, below. The Appendix does not show parameters that EPA does not expect to be present in produced water discharges, or for which no water quality criteria exist.

The effluent concentration of the produced water discharges is generally greater than water quality criteria for ammonia, arsenic, copper, manganese, mercury, zinc, total aromatic hydrocarbons, and total aqueous hydrocarbons. However, according to EPA modeling, only ammonia, copper, total aromatic hydrocarbons, and total aqueous hydrocarbons have the potential to exceed water quality criteria outside the mixing zones.

iii. Proposed Water Quality-Based Limitations

The Proposed Permit contains water quality-based limits for total aromatic hydrocarbons, total aqueous hydrocarbons, ammonia, copper, manganese, mercury, nickel, and zinc.

The Existing Permit also contains limits for arsenic, cadmium, lead, and silver. Since new information in the form of recent discharge monitoring reports indicates that there is no reasonable potential for exceedance of the water quality criteria for arsenic, cadmium, lead or silver, antibacksliding does not apply, and EPA has not retained the water quality-based limits for arsenic, cadmium, lead and silver in the Proposed Permit.

Whole effluent toxicity limits were included in the Existing Permit, and retained in the Proposed Permit. The proposed water quality-based limits for produced water are set forth in Appendix B of this Fact Sheet.

iv. Monitoring Requirements

The Proposed Permit retains monitoring at a minimum frequency of once per month for total aromatic hydrocarbons, total aqueous hydrocarbons, ammonia, copper, manganese, mercury, nickel, and zinc. If, after the first full year of monitoring, the discharge has been in compliance with an effluent limit, the Proposed Permit reduces the required monitoring frequency for that constituent to once per quarter.

The Proposed Permit requires monitoring for whole effluent toxicity at a minimum frequency of once per quarter. If a discharge complies with the limit for one year, the Proposed Permit reduces the required minimum monitoring frequency for whole effluent toxicity to once per year. By reducing monitoring requirements upon a showing of consistent compliance, EPA believes that there remains sufficient monitoring to ensure water quality is protected and reduces the burden on operators where appropriate. There are some significant changes in the limits compared to the Expired Permit; therefore, effluent data collected under that permit is not proposed to be applied to the monitoring frequency reduction allowances under the reissued permit.

c. Chemically-Treated Sea Water Discharges

The Proposed Permit includes new water quality-based limits for miscellaneous discharges to which treatment chemicals, such as biocides, are added. Whole effluent toxicity limits in the Proposed Permit are based on the effluent concentration at the edge of the mixing zone, discussed in Section IV.C.2., above. The Proposed Permit contains whole effluent toxicity and free oil limits because they are necessary to meet State water quality standards and Ocean Discharge Criteria.

Operators will be able to use treatment chemicals that are most efficient for their operation as long as they will enable the facility to consistently meet effluent limits. While this approach will

ensure the protection of water quality, it will also provide maximum flexibility for operators to switch to newer products that may become available. Therefore, to ensure flexibility, the Proposed Permit does not prescribe specific chemical additives that may be used.

i. Toxicity Limitations (Territorial Seas and Federal Waters)

As calculated, the toxicity limits will prevent the discharge of pollutants in concentrations that will result in chronic toxicity at the edge of a 100 meter mixing zone in the Territorial Seas and Federal Waters.

EPA calculated critical dilutions at which the toxicity limits must be met using the CORMIX model. The input parameters for ambient water conditions that were used for produced water mixing zones were used to calculated the critical dilutions shown below. See Section IV.C.3.b.i., above. Based on suggestions from Robert Doneker, a co-developer of the CORMIX model, EPA simulated these discharges using a mirror image approach. In the mirror image approach, the discharges were modeled as being more dense than sea water and located on the sea floor. The plumes were shown to initially rise from the discharge pipe and then sink back to the seafloor in much the same way that a buoyant plume would initially sink and then float back to the water's surface. The discharge velocities were set at approximately 11 meters per second in an attempt to represent the impacts resulting from discharges being made above the surface. A second set of limits was calculated and is shown below for subsurface discharges. Inclusion of limits for discharges made both below and above the surface will accommodate any new platforms that may be placed in Cook Inlet in the future. The modeling results are shown below in Tables 6 and 7.

Table 6: Chemically Treated Sea Water Dispersion Modeling Results (Surface Discharges)

Discharge Rate (gpd)	Critical Dilution	Toxic Units
15,000	0.24%	417
20,000	0.27%	370
25,000	0.29%	345
50,000	0.36%	278
100,000	0.46%	217
350,000	0.62%	161

Table 7: Chemically Treated Sea Water Dispersion Modeling Results (Submerged Pipe)

Discharge Rate (gpd)	Critical Dilution	Toxic Units
15,000	0.33%	303
20,000	0.36%	278
25,000	0.37%	270
50,000	0.49%	204
100,000	0.62%	161
350,000	0.99%	101

Since discharges less than 1,000 gallons per day will be very diluted and are not likely to exhibit toxic effects at the edge of the mixing zone, toxicity limits are not proposed for these discharges.

The Proposed Permit includes a table so that operators can obtain their toxicity effluent limits based on their discharge rate.

ii. Toxicity Limitations (Coastal Waters)

As calculated, the toxicity limits will prevent the discharge of pollutants in concentrations that will result in chronic toxicity at the edge of ADEC prescribed mixing zones for Coastal Waters. Toxicity limits will ensure compliance with the State water quality standard (18 AAC 70.030), which states that "[a]n effluent discharges to a water may not impart chronic toxicity to aquatic organisms."

For existing facilities, Industry submitted mixing zone applications to ADEC and ADEC approved mixing zones for the Coastal Waters. Those mixing zones and the associated dilution factors are summarized below in Table 8. The dilution factors are equivalent to the toxicity limits that are included in the permit for the existing facilities located in Coastal Waters.

No mixing zones have been adopted by ADEC for new facilities that may be placed in Coastal Waters during the life of the permit. If new facilities are added, ADEC will need to establish mixing zones for the associated chemically treated discharges if requested by a facility. The state will publicly notice those mixing zones and the dilution factors calculated for the discharges. To accommodate those potential new discharges, the Proposed Permit includes an allowance that would authorize the discharges and limit toxicity based on ADEC established mixing zones.

Table 8: ADEC Adopted Mixing Zones for Chemically Treated Miscellaneous Discharges

Facility	Discharge Rate	Mixing Zone Length	Dilution Factor
Platform Anna	40,000 gpd	7 meters	42
Platform Dolly Varden	200,000 gpd	6 meters	18.2
Granite Point Platform	348,284 gpd	3 meters	14
Platform Grayling	1,220,000 gpd	10 meters	16.3
Platform King Salmon	1,890,000 gpd	3 meters	7.3
Platform Monopod	940,000 gpd	8 meters	17.1
Platform Steelhead	131,250 gpd	485 meters	604

The mixing zone for the Steelhead platform is larger than the others because of differences in the discharge pipe configuration. It is a submerged pipe whereas the other discharges are made above the water surface.

iii. Free Oil Limitations

The Proposed Permit limits the discharge of free oil to help prevent the discharge of toxic pollutants contained in oil. The Ocean Discharge Criteria include ten factors that must be considered in determining whether a discharge will cause unreasonable degradation of the marine environment. See 40 CFR § 125.122. One of the ten factors is the potential impact on human health through direct and indirect pathways. 40 CFR § 110.3 defines quantities of oil that may be harmful to public health or welfare as a discharge that causes a sheen or discoloration on the receiving water. Therefore, the Proposed Permit limits chemically-treated sea water discharges to no free oil as measured using the visual sheen test method.

iv. Monitoring Frequencies

The Proposed Permit requires monitoring for toxicity once per quarter during discharge activities. If the effluent exceeds the toxicity limits, monitoring frequency will increase under the Proposed Permit. Specifically, when a facility has not complied with the toxicity limits, monitoring frequency will increase to once per month until the effluent has complied with the toxicity limits for three consecutive months. If the effluent complies with the toxicity limits for twelve consecutive months, the Proposed Permit allows a reduction in toxicity monitoring. Specifically, monitoring is reduced to once every six months.

In addition, free oil must be monitored once a day while the facility is discharging. Free oil must be monitored using the visual sheen test method.

d. Sanitary Waste Water Discharges

The Existing Permit included water quality-based limitations for BOD, TSS, and total residual chlorine. These limits applied to facilities located in Coastal Waters and the Territorial Seas. Based on available data there appears no need to propose new limits for BOD or TSS.

As required by CWA Section 312, 33 USC § 1322, the Existing Permit limits the total residual chlorine concentration to a minimum of 1 mg/l throughout the area of coverage. The Existing Permit also has a daily maximum limitation for total residual chlorine of 19 mg/l, which applies to facilities located in Coastal Waters and the Territorial Seas.

ADEC calculated new mixing zones for sanitary waste water discharges and submitted that information to EPA on December 22, 2005 in a revised draft 401 certification. In a revised preliminary certification received February 17, 2006, those mixing zones were revised to include discharges from Platform A and Platform C. Based on those mixing zones, ADEC determined the water quality criteria for total residual chlorine would be met if the effluent concentration does not exceed the concentrations shown below in Table 9. Based on the draft state certification and the ADEC approved mixing zones, the maximum total residual chlorine limit is proposed to be decreased from 19 mg/l to a maximum of 13.35 mg/l, as shown below.

Table 9: ADEC Adopted Mixing Zones for Sanitary Waste Water Discharges

Platform	Treatment	Pollutant	Length (m)	Limit
Bruce	M9IM Biological	TRC	60	2.25 mg/l
Dillon	M9IM Biological	TRC	30	0.66 mg/l
Baker	M9IM Biological	TRC	60	2.25 mg/l
Granite Point	M9IM MSD	TRC	180	7.68 mg/l
Steelhead	M10 MSD	TRC	260	13.35 mg/l
Dolly Varden	M9IM MSD	TRC	100	13.35 mg/l
Tyonek A	M10M Biological	TRC	148	13.35 mg/l
Platform A	M9IM MSD	TRC	100	13.35 mg/l
Platform C	M9IM MSD	TRC	100	13.35 mg/l

Note: Mixing zone size for TRC is based on meeting most stringent applicable Alaska Water Quality Standard, the chronic chlorine standard for marine aquatic life.
TRC = Total Residual Chlorine

The proposed chlorine limit will only apply to facilities located in Coastal Waters. Since State water quality standards do not apply in Federal Waters, no maximum total residual chlorine limit is proposed for facilities located in Federal Waters.

Since both State Water Quality Standards and Ocean Discharge Criteria apply in the Territorial Seas, maximum total residual chlorine limits for that area are proposed to be based on the 100 meter mixing zone prescribed by Ocean Discharge Criteria. Based on the typical discharge rate of 700 gpd, the effluent concentration at the edge of the mixing zone was calculated to 0.1%. An effluent limit of 7 mg/l was calculated based on the State Water Quality Standard of 7 ug/l and an effluent dilution of 0.1%. This new, more stringent limit, is included in the Proposed Permit for facilities located in the Territorial Seas. Permittees will be required to monitor chlorine after the contact chamber to determine compliance with CWA Section 312, 33 USC § 1322. EPA expects that most permittees will install de-chlorination equipment in order to meet the new effluent limit of 7 mg/l.

D. Environmental Study Requirements

1. Baseline Monitoring Requirements

The Existing Permit required operators of any new facilities installed during its five year term that were located within 4,000 meters of coastal marshes to conduct baseline monitoring. During the term of the Existing Permit, no new facilities were installed within 4,000 meters of coastal marsh; thus, baseline monitoring was not conducted.

The Ocean Discharge Criteria require a full understanding of the potential impacts of permitted discharges. To fulfill the requirements of CWA Section 403(c), 33 USC § 1343(c), and its implementing regulations (*i.e.,* the Ocean Discharge Criteria), the Proposed Permit extends the monitoring requirement from the Existing Permit to include new facilities installed after the effective date of the Proposed Permit. This expanded monitoring requirement is proposed to apply to all facilities regardless of the distance to the nearest coastal marsh. EPA believes that this monitoring requirement will assist in understanding potential future impacts of discharges authorized under the Proposed Permit and will assist in efforts to understand the potential impacts of future discharges. This monitoring requirement also addresses concerns, raised by both Tribal members and citizen groups, that, without baseline monitoring, it is difficult to determine the potential impacts of current and future discharges.

2. New Study Requirements

Little ambient data associated with oil and gas discharges in Cook Inlet presently exists. The only existing sediment data was collected in the far southern portions of Cook Inlet, well over 100 miles from the existing large volume produced water discharges. See *Sediment Quality in Depositional Areas of Shelikof Straight and Outermost Cook Inlet* (2001). While the data could indicate whether general contamination exists, due to the collection location, there is no way to draw a connection to the existing produced water discharges. Available ambient water column data relevant to the existing discharges is also extremely limited. Because of the data limitations, EPA has historically relied on tools such as dispersion modeling to analyze the potential effects of discharges to make permitting decisions. To increase available ambient data and ensure that future permit decisions are based on more representative information, the Proposed Permit requires new fate and effects monitoring for large volume produced water discharges.

Under this new requirement, operators of produced water discharges greater than 100,000 gallons per day will be required to conduct a sediment and water column sampling study. The goal of the study is to determine if there is a reasonable potential for large volume produced water discharges to impact sensitive areas of Cook Inlet. To achieve that goal, the Proposed Permit requires operators to plan and conduct studies that, at a minimum, would include the collection of both sediment and water column samples at 50 meter intervals over a distance of 2,000 meters between the discharge point and the closest sensitive habitat. Sediment sampling will be accomplished by a minimum of one box core or similar sample collected at each station. At a minimum, water column monitoring will include collection of a sample from both the mid and lower water column at each station. All samples must be analyzed for metals and hydrocarbons that are limited in produced water discharges.

Operators with large volume produced water discharges will be required to submit a study plan to EPA for approval prior to the commencement of monitoring. Since the studies will be in areas within Coastal Waters, EPA plans to coordinate review of the study plans with ADEC. In addition, EPA intends to obtain input from ADEC as a part of the approval process.

Pursuant to the Ocean Discharge Criteria, EPA is required to fully understand the potential impacts to the marine environment of future large volume discharges that may be placed in Cook Inlet. The information obtained from the studies will help EPA comply with the requirements of Ocean Discharge Criteria. In addition, the information will be used by both EPA and ADEC to determine whether any future changes are needed to the permit conditions to meet the requirements of the State water quality standards.

E. Traditional Ecological Knowledge

During the development of the Environmental Assessment and draft Proposed Permit, EPA facilitated the collection of Traditional Ecological Knowledge from Cook Inlet area tribes, pursuant to Executive Order 13175, Consultation and Coordination with Indian Tribal

Governments. EPA included this Traditional Ecological Knowledge in the Environmental Assessment, and EPA has considered it in the development of the Proposed Permit. The following paragraphs summarize the interview responses.

Numerous Tribal members from multiple villages expressed consistent observations and concerns. In general, these concerns fit into two main categories: (1) the potential for environmental impacts from catastrophic events such as oil spills (especially considering the age of the platforms and associated pipelines) and (2) the effects from routine platform operations that include the discharge of contaminants.

Tribal members frequently noted an overall decline in the population of important food species and in the quality of the species being caught or harvested. These changes include salmon with thinner and less firm meat and smaller halibut with chalky and fibrous meat. In addition, Tribal members noted a disappearance in bull kelp and a decrease in the abundance of clams, cockles, bidarkis, cod, flounder, crab, shrimp, mussels, algae, seals and sea lions. Clams and mussels were observed to have thinner and sometimes transparent shells. Furthermore, Tribal members observed a higher incidence of red tide that has resulted in a decrease in the community's ability to collect traditional food, including shellfish and octopus. Tribal members also observed a decrease in the number of sea ducks, such as mergansers and scoters. A number of Tribal members noted finding lesions, growths and deformities on fish. Some Tribal members noted that non-commercial fish, such as hooligans and stickelbacks, have declined in numbers; thus, indicating that commercial and recreational fishing are not the sole causes for the observed decline in population.

The tidal variations in Cook Inlet create a very high energy environment with strong currents. Tribal members noted that mixing pools near Kalgin Island and the mouth of Kachemak Bay result from the tidal currents and cause settling of detritus in those areas. Despite the strong currents, Tribal members observed that Cook Inlet is a fairly closed marine system. While Cook Inlet water is carried north and south by strong tides, there is no a mechanism to move contaminants out of Cook Inlet. Because of those characteristics, a number of Tribal members observed a potential for pollutants to accumulate in Cook Inlet over time. Based on that information, the Tribes suggested that EPA make an effort to learn more about the fate of pollutants discharged from oil and gas operations in Cook Inlet. It is important to note that during the interviews, opposition to oil and gas development was not evident, but rather there was an overall a desire to ensure that oil and gas activities did not affect the health of Cook Inlet natives, traditional foods or the environment. In fact, in numerous interviews, the Tribal members acknowledged that observations made through Traditional Ecological Knowledge could not be directly attributed to oil and gas activities. However, there was a strong sense that the stress from multiple pollution sources, including oil and gas operations affected the health of Cook Inlet natives, traditional foods, and the environment.

The impact on Tribes include traveling farther to collect food and the inability to obtain a sufficient quantity of traditional food. Since a significant portion of a Tribal member's diet

consists of seafood from Cook Inlet, there is increasing concern regarding the impact on health from contaminants that may accumulate in seafood and the affect of eating lower quality fish. This fear has led some parents to stop feeding their children traditional foods.

The Tribal members made numerous comments expressing their lack of confidence in the monitoring that operators have conducted on oil platforms. They questioned how well the Existing Permit's requirements were actually being enforced. In addition, many Tribal members requested that the public be continuously informed regarding platform reporting and compliance.

EPA agrees that additional information should be gathered regarding the fate of oil and gas discharges and, where appropriate, new limitations and monitoring requirements should be added to the permit to ensure the discharges are properly controlled. To meet these objectives, the Proposed Permit imposes the following requirements:

A. The Proposed Permit revises the setback distances for discharges from exploratory facilities. The Existing Permit prohibited the discharge of drilling fluids and drill cuttings within 1,000 meters of sensitive areas, such as coastal marshes. As described in this Fact Sheet, the Proposed Permit expands the discharge prohibition to 4,000 meters.

B The Proposed Permit does not authorize discharges of produced water, drilling fluids, and drill cuttings from New Sources.

C. The Proposed Permit establishes new limits on both the amount of treatment chemicals added, and toxicity, for discharges such as water flood waste water and cooling water.

D. The Proposed Permit establishes more stringent limits for total residual chlorine.

E. The Proposed Permit requires two new studies to gain a better understanding of the potential impacts of the discharges. Specifically, the Proposed Permit requires operators of all new facilities installed during the Proposed Permit five-year term to conduct baseline monitoring. The Proposed Permit also includes ambient monitoring requirements for large volume produced water discharges. Operators are required to collect sediment and water column samples to determine the ambient pollutant concentration in the vicinity of the discharges.

In addition, EPA acknowledges that a comprehensive compliance program is a critical component of an effective permit. EPA will continue to fairly employ the four principles of compliance assurance (*i.e.,* compliance assurance, compliance incentives, compliance monitoring, and enforcement) for the Proposed Permit. EPA will look for meaningful ways to involve and respond to inquiries from the Tribes.

V. Other Legal Requirements

A. State Certification

Section 401 of the Act, 33 USC § 1341, requires EPA to seek a certification from the State that the conditions of the Proposed Permit are stringent enough to comply with State water quality standards. In a letter dated August 19, 2005, EPA sent ADEC the preliminary draft permit and draft fact sheet, and requested a draft 401 certification. ADEC sent EPA its draft certification on October 28, 2005 along with new mixing zones based on maximum projected discharge rates and calculated maximum pollutant concentrations. ADEC updated the certification on February 17, 2006 to include new mixing zones for sanitary waste water discharges.

B. Standard Permit Provisions

Sections IV, V, and VI of the Proposed Permit contain standard regulatory language that must be included in all NPDES permits. Because that language is a recitation of existing regulations, it is not open for comment and cannot be challenged in the context of this permitting action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

C. Endangered Species Act

Section 7 of the Endangered Species Act requires Federal agencies to consult with NOAA Fisheries and the U.S. Fish and Wildlife Service ("USFWS") if their actions have the potential to either beneficially or adversely affect any threatened or endangered species. EPA has determined that the Proposed Permit is not likely to adversely affect any threatened or endangered species. EPA is consulting with NOAA Fisheries and USFWS to meet its obligations under the Endangered Species Act. On January 23, 2006 EPA sent a Biological Evaluation ("BE") to NOAA Fisheries and USFWS and requested concurrence with its determinations of effect. This Fact Sheet and the draft Proposed Permit will also be submitted to NOAA Fisheries and USFWS for review during the public comment period.

D. Essential Fish Habitat ("EFH")

The Magnuson-Stevens Fishery Conservation and Management Act requires EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect an EFH. EPA is consulting with NOAA Fisheries to ensure that the discharges authorized by the Proposed Permit are not likely to adversely affect an EFH or associated species. On January 23, 2006, EPA sent the EFH Assessment to NOAA Fisheries and requested concurrence with its conclusions. EPA will also submit this Fact Sheet and the draft Proposed Permit to NOAA Fisheries for review during the public comment period.

E. Permit Expiration

Section 402(b)(1)(B) of the Act, 33 USC § 1342(b)(1)(B) requires that NPDES permits cannot be issued for a period of time that exceeds five years. Therefore, the Proposed Permit will expire five years from the effective date of the permit.

F. Coastal Zone Management Act ("CZMA")

Pursuant to 40 CFR § 122.49(d), requirements of the State coastal zone management program must be satisfied before the permit is issued. EPA has determined that the activities authorized by the Proposed Permit are consistent with the Coastal Zone Management Plan. EPA will seek concurrence with this determination from ADNR prior to issuing the final Proposed Permit.

G. Oil Spill Requirements

Section 311 of the Act, 33 USC § 1321, prohibits the discharge of oil and hazardous materials in harmful quantities. Routine discharges specifically controlled by the Proposed Permit are excluded from the provisions of CWA Section 311, 33 USC § 1321. However, the Proposed Permit does not preclude the institution of legal action, or relieve permittees from any responsibilities, liabilities, or penalties for other unauthorized discharges of oil and hazardous materials, which are covered by Section 311.

H. Maritime Protection, Research, and Sanctuaries Act ("MPRSA")

No marine sanctuaries, as designated by the MPRSA, exist in the vicinity of the Proposed Permit coverage area.

However, since State waters are involved in the Proposed Permit coverage area, the provisions of section 401 of the Act, 33 USC § 1341, apply. In accordance with 40 CFR § 124.10(c)(1), public notice of the Proposed Permit has been provided to the State agencies that have jurisdiction over fish, shellfish, and wildlife resources.

I. Annex V of MARPOL (73/78 and 33 CFR 155.73)

Under Annex V of MARPOL, the U.S. Coast Guard (USCG) has issued interim final regulations under 33 CFR § 151.73 to control the disposal of garbage and domestic wastes from fixed or floating platforms. These regulations include those platforms involved in the exploration and exploitation of oil and gas resources, such as oil drilling rigs and production platforms. These regulations also apply to all oil platforms when these platforms are located in navigable waters of the U.S. or within the 200 mile Exclusive Economic Zone. The Proposed Permit prohibits the discharge of garbage (as defined at 33 CFR Part 151) within 12 miles of the nearest land. The term garbage, as it is applied here, includes operational and maintenance wastes. Beyond 12 miles, the discharge of food wastes that are ground so as to pass through a 25 millimeter mesh

screen, incinerator ash, and non-plastic clinkers will be permitted.

J. Executive Order 12291

The Office of Management and Budget ("OMB") exempts this action from the review requirements of Executive Order 12291 pursuant to Section 8(b) of that Order. Guidance on Executive Order 12866 contains the same exemptions on OMB review as existed under Executive Order 12291. EPA, however, has prepared a regulatory impact analysis in connection with its promulgation of guidelines on which a number of the Proposed Permit's provisions are based and has submitted it to OMB for review (See 58 FR 12494).

K. Paperwork Reduction Act

EPA has reviewed the requirements imposed on regulated facilities in the proposed general permit under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* OMB has already approved most of the Proposed Permit's information collection requirements in submissions made for the NPDES permit program under the provisions of the CWA. This information has been assigned OMB control number: No. 2040-0086 for NPDES permit applications and No. 2040-0004 for the discharge monitoring report form.

L. Regulatory Flexibility Act

After review of the facts presented in the notice of intent printed above, EPA certifies, pursuant to the provisions of 5 USC § 605(b), that this Proposed Permit will not have a significant impact on a substantial number of small entities. This certification is based on the fact that the regulated parties have greater than 500 employees and are not classified as small businesses under the Small Business Administration regulations established at 49 FR 5023 *et seq.* (February 9, 1984). These facilities are classified as Major Group 13-Oil and Gas Extraction SIC 1311 Crude Petroleum and Natural Gas.

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Appendix A : Water Quality Criteria Comparison

Trading Bay Production Facility (183.3 dilutions - Metals, 1,970 dilutions - TAH/TAqH, 72 dilutions - ammonia)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Chronic Criteria (ug/l)
Ammonia	12,000	167	356	35
Arsenic	71.6	0.39	0.83	36
Cadmium	ND	ND	ND	8.8
Chromium	6.1	0.03	0.07	50
Copper	103	0.56	1.2	3.1
Lead	50	0.27	0.58	8.1
Mercury	ND	ND	ND	0.94
Nickel	115	0.63	1.34	8.2
Selenium	276	1.5	3.2	71
Zinc	6.9	0.038	0.08	81
TAH	16,400	8.3	17.7	10
TAqH	17,126	68.6	146	15

Trading Bay Production Facility (346 dilutions)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge(ug/l)	Reasonable Potential Conc. (ug/l)	Human Hlth Criteria (ug/l)
Antimony	ND	ND	ND	4,300
Manganese	1,890	5.46	11.6	100
Mercury	ND	ND	ND	0.051
Nickel	115	0.33	0.7	4,600
Selenium	276	0.8	1.7	11,000
Zinc	6.9	0.02	0.042	69,000
Phenol	280	0.81	1.72	4,600,000
Toluene	740	2.14	4.6	200,000
Acenaphthene	ND	ND	ND	2,700
Anthracene	ND	ND	ND	110,000
1,2-dichlorobenzene	ND	ND	ND	17,000
Pyrene	ND	ND	ND	11,000

Granite Point Production Facility (35.9 dilutions - metals, 7,756 dilutions - TAH/TAqH, 90 dilutions - ammonia)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Chronic Criteria (ug/l)
Ammonia	15,000	167	355	35
Arsenic	58.6	1.63	3.5	36
Cadmium	ND	ND	ND	8.8
Chromium	12.1	0.34	0.72	50
Copper	50	1.39	2.97	3.1
Lead	3.1	0.086	0.184	8.1
Mercury	1.4	0.039	0.083	0.94
Nickel	13.3	0.37	0.79	8.2
Selenium	95.3	1.58	5.65	71
Zinc	233	6.5	13.8	81
TAH	8,750	1.13	2.4	10
TAqH	8,814	1.14	2.4	15

Granite Point Production Facility (1,638 dilutions)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Human Hlth Criteria (ug/l)
Antimony	1.64	0.001	0.0021	4,300
Manganese	195	0.12	0.25	100
Mercury	1.4	0.0009	0.002	0.051
Nickel	13.3	0.008	0.017	4,600
Selenium	95.3	0.058	0.124	11,000
Zinc	233	0.14	0.302	69,000
Phenol	910	0.56	1.18	4,600,000
Toluene	2,800	1.71	3.64	200,000
Acenaphthene	ND	ND	ND	2,700
Anthracene	ND	ND	ND	110,000
1,2-dichlorobenzene	ND	ND	ND	17,000
Pyrene	ND	ND	ND	11,000

East Foreland Production Facility (55.1 dilutions - metals, 2,556 dilutions - TAH/TAqH, 0 dilutions - ammonia)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Chronic Criteria (ug/l)
Ammonia	NA	NA	NA	35
Arsenic	176	3.2	6.8	36
Cadmium	2	0.036	0.077	8.8
Chromium	40	0.73	1.55	50
Copper	31	0.56	1.19	3.1
Lead	176	3.2	6.8	8.1
Mercury	3.37	0.06	0.13	0.94
Nickel	80	1.45	3.1	8.2
Selenium	297	5.4	11.5	71
Zinc	80	1.45	3.1	81
TAH	NA	NA	NA	10
TAqH	NA	NA	NA	15

East Foreland Production Facility 1,824 dilutions)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Human Hlth Criteria (ug/l)
Antimony	40	0.02	0.047	4,300
Manganese	590	0.32	0.7	100
Mercury	3.37	0.0018	0.004	0.051
Nickel	80	0.044	0.09	4,600
Selenium	297	0.16	0.35	11,000
Zinc	80	0.04	0.09	69,000
Phenol	NA	NA	NA	4,600,000
Toluene	4.7	0.0026	0.0055	200,000
Acenaphthene	NA	NA	NA	2,700
Anthracene	7,900	4.33	9.23	110,000
1,2-dichlorobenzene	NA	NA	NA	17,000
Pyrene	NA	NA	NA	11,000

Platform Anna (665 dilutions - metals, 12,509 dilutions - TAH/TAqH, 234 dilutions - ammonia)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Chronic Criteria (ug/l)
Ammonia	39,000	58.6	125	35
Arsenic	28.6	0.043	0.09	36
Cadmium	ND	ND	ND	8.8
Chromium	14.3	0.02	0.046	50
Copper	33	0.05	0.106	3.1
Lead	1.54	0.002	0.005	8.1
Mercury	ND	ND	ND	0.94
Nickel	3.21	0.005	0.0103	8.2
Selenium	96.4	0.145	0.31	71
Zinc	2,816	4.2	9.0	81
TAH[3]	24,076	1.9	4.1	10
TAqH[4]	24,407	1.95	4.16	15

Platform Anna (693 dilutions)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Human Hlth Criteria (ug/l)
Antimony	ND	ND	ND	4,300
Manganese	112	0.162	3.4	100
Mercury	ND	ND	ND	0.051
Nickel	3.21	0.0046	0.01	4,600
Selenium	96.4	0.14	0.296	11,000
Zinc	2,816	4.06	8.66	69,000
Phenol	1,400	2.02	4.3	4,600,000
Toluene	3,300	4.76	10.1	200,000
Acenaphthene	ND	ND	ND	2,700
Anthracene	ND	ND	ND	110,000
1,2-dichlorobenzene	ND	ND	ND	17,000
Pyrene	ND	ND	ND	11,000

Platform Bruce (550.7 dilutions - metals, 9,170 dilutions - TAH/TAqH, 108 dilutions - ammonia)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Chronic Criteria (ug/l)
Ammonia	18,000	18,000	38,340	35
Arsenic	45.9	0.08	0.18	36
Cadmium	ND	ND	ND	8.8
Chromium	11.1	0.02	0.044	50
Copper	9.29	0.017	0.036	3.1
Lead	1.55	0.003	0.006	8.1
Mercury	ND	ND	ND	0.94
Nickel	3.03	0.006	0.012	8.2
Selenium	75.5	0.14	0.3	71
Zinc	9,060	16.7	355	81
TAH[3]	65,500	7.14	15.2	10
TAqH[4]	NA	NA	NA	15

Platform Bruce (2,623 dilutions)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Human Hlth Criteria (ug/l)
Antimony	1.22	0.0005	0.001	4,300
Mercury	ND	ND	ND	0.051
Nickel	3.03	0.0012	0.0025	4,600
Selenium	75.5	0.03	0.061	11,000
Zinc	9,060	3.45	7.36	69,000
Phenol	950	0.36	0.77	4,600,000
Toluene	2,700	1.03	2.2	200,000
Acenaphthene	ND	ND	ND	2,700
Anthracene	ND	ND	ND	110,000
1,2-dichlorobenzene	ND	ND	ND	17,000
Pyrene	ND	ND	ND	11,000

Tyonek A Platform (276.7 dilutions - metals, 175.6 dilutions TAH/TAqH, 0 dilutions - ammonia)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Chronic Criteria (ug/l)
Ammonia	6,100	6,100	12,993	35
Arsenic	111	0.4	0.85	36
Cadmium	NA	NA	NA	8.8
Chromium	3.53	0.013	0.027	50
Copper	4,800	17.3	36.9	3.1
Lead	13	0.047	0.1	8.1
Mercury	NA	NA	NA	0.94
Nickel	80	0.3	0.6	8.2
Selenium	20	0.07	0.15	71
Zinc	5	0.02	0.038	81
TAH[3]	NA	NA	NA	10
TAqH[4]	NA	NA	NA	15

Tyonek A Platform (329 dilutions)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Human Hlth Criteria (ug/l)
Antimony	NA	NA	NA	4,300
Manganese	1,000	3.04	6.47	100
Mercury	NA	NA	NA	0.051
Nickel	80	0.24	0.52	4,600
Selenium	20	0.06	0.13	11,000
Zinc	5	0.015	0.032	69,000
Phenol	250	0.76	1.62	4,600,000
Toluene	3,100	9.4	20.1	200,000
Acenaphthene	ND	ND	ND	2,700
Anthracene	ND	ND	ND	110,000
1,2-dichlorobenzene	ND	ND	ND	17,000
Pyrene	ND	ND	ND	11,000

Acute Aquatic Life Criteria

Trading Bay Production Facility (20.3 dilutions - metals, 10.6 dilutions - ammonia)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Acute Criteria (ug/l)
Ammonia	12,000	1,132.1	2,411	233
Arsenic	71.6	3.5	7.5	69
Cadmium	ND	ND	ND	40
Chromium	6.1	0.3	0.64	1100
Copper	103	5.07	10.8	4.8
Lead	50	2.46	5.2	210
Mercury	ND	ND	ND	1.8
Nickel	115	5.66	12	74
Selenium	276	13.6	29	290
Silver	1.44	0.07	0.15	1.9
Zinc	6.9	0.34	0.72	90

Granite Point Production Facility (32.2 dilutions - metals, 13.2 dilutions - ammonia)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Acute Criteria (ug/l)
Ammonia	15,000	1,136	2,420	233
Arsenic	58.6	1.82	3.9	69
Cadmium	ND	ND	ND	40
Chromium	12.1	0.38	0.8	1,100
Copper	50	1.55	3.7	4.8
Lead	3.1	0.1	0.2	210
Mercury	1.4	0.04	0.09	1.8
Nickel	13.3	0.4	0.88	74
Selenium	95.3	2.96	6.3	290
Silver	1.92	0.06	0.13	1.9
Zinc	233	7.2	15.4	90

East Foreland Production Facility (64.6 dilutions - metals, 0 dilutions - ammonia)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Acute Criteria (ug/l)
Ammonia	NA	NA	NA	233
Arsenic	176	2.75	5.9	69
Cadmium	2	0.03	0.067	40
Chromium	40	0.625	1.33	1,100
Copper	31	0.48	1.03	4.8
Lead	176	2.75	5.86	210
Mercury	3.37	0.05	0.11	1.8
Nickel	80	1.25	2.66	74
Selenium	297	4.6	10	290
Silver	54	0.84	1.8	1.9
Zinc	80	1.25	2.66	90

Platform Anna (599 dilutions - metals, 34.3 dilutions - ammonia)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Acute Criteria (ug/l)
Ammonia	39,000	1,137	2,422	233
Arsenic	28.6	0.05	0.1	69
Cadmium	ND	ND	ND	40
Chromium	14.3	0.024	0.051	1,100
Copper	33	0.055	0.12	4.8
Lead	1.54	0.0026	0.006	210
Mercury	ND	ND	ND	1.8
Nickel	3.21	0.005	0.011	74
Selenium	96.4	0.16	0.34	290
Silver	ND	ND	ND	1.9
Zinc	2,816	4.72	10.1	90

Platform Bruce (496 dilutions - metals, 15.8 dilutions - ammonia)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Acute Criteria (ug/l)
Ammonia	18,000	1,139	2,427	233
Arsenic	45.9	0.093	0.2	69
Cadmium	ND	ND	ND	40
Chromium	11.1	0.02	0.05	1,100
Copper	9.29	0.02	0.04	4.8
Lead	1.55	0.003	0.007	210
Mercury	ND	ND	ND	1.8
Nickel	3.03	0.006	0.013	74
Selenium	75.5	0.15	0.33	290
Silver	NA	NA	NA	1.9
Zinc	9,060	18	39	90

Tyonek A Platform (179 dilutions - metals, 0 dilutions - ammonia)

Pollutant	Effluent Conc. (ug/l)	Conc. At Mixing Zone Edge (ug/l)	Reasonable Potential Conc. (ug/l)	Acute Criteria (ug/l)
Ammonia	6,100	6,100	12,993	233
Arsenic	111	0.62	1.3	69
Cadmium	NA	NA	NA	40
Chromium	3.53	0.02	0.04	1,100
Copper	4,800	27	57	4.8
Lead	13	0.07	0.15	210
Mercury	NA	NA	NA	1.8
Nickel	80	0.45	0.95	74
Selenium	20	0.11	0.24	290
Silver	NA	NA	NA	1.9
Zinc	5	0.02	0.06	90

Appendix B: Water Quality Based Limits

The daily maximum limits shown below were calculated by multiplying the criteria by the dilutions calculated at the edge of the mixing zone (see Table 4 above). The monthly average limits are 66% of the daily maximum limits.

Table 10-1: Granite Point Production Facility

Parameter	Effluent Limitations		Monitoring Requirements	
	Monthly Avg.	Daily Max.	Frequency	Sample Type
TAH [note 1]	51.7 mg/l	77.56 mg/l	1/Month [note 2]	Grab
TAqH [note 1]	77.56 mg/l	116.34 mg/l	1/Month [note 2]	Grab
Ammonia	132 mg/l	198 mg/l	1/Month [note 2]	Grab
Total Copper	74 ug/l	111 ug/l	1/Month [note 2]	Grab
Total Mercury	2 ug/l	3 ug/l	1/Month [note 2]	Grab
Total Manganese	4 mg/l	6 mg/l	1/Month [note 2]	Grab
Total Nickel	196 ug/l	294 ug/l	1/Month [note 2]	Grab
Total Zinc	1.94 mg/l	2.91 mg/l	1/Month [note 2]	Grab
Whole Effluent Toxicity	1,092 T.U.	1,638 T.U.	1/Quarter [note 2]	Grab

Table 10-2: The East Foreland Facility

Parameter	Effluent Limitations		Monitoring Requirements	
	Monthly Avg.	Daily Max.	Frequency	Sample Type
TAH [note 1]	17.0 mg/l	25.56 mg/l	1/Month [note 2]	Grab
TAqH [note 1]	16.1 mg/l	24.2 mg/l	1/Month [note 2]	Grab
Ammonia	16.1 mg/l	24.2 mg/l	1/Month [note 2]	Grab
Total Copper	114 ug/l	170 ug/l	1/Month [note 2]	Grab
Total Mercury	2.65 ug/l	4.0 ug/l	1/Month [note 2]	Grab
Total Manganese	5.2 mg/l	7.8 mg/l	1/Month [note 2]	Grab
Total Nickel	301 ug/l	542 ug/l	1/Month [note 2]	Grab
Total Zinc	2.97 mg/l	4.46 mg/l	1/Month [note 2]	Grab
Whole Effluent Toxicity	984 T.U.	1,476 T.U.	1/Quarter [note 2]	Grab

Table 10-3: Platform Anna

Parameter	Effluent Limitations		Monitoring Requirements	
	Monthly Avg.	Daily Max.	Frequency	Sample Type
TAH [note 1]	83.4 mg/l	125.09 mg/l	1/Month [note 2]	Grab
TAqH [note 1]	125.08 mg/l	187.6 mg/l	1/Month [note 2]	Grab
Ammonia	343 mg/l	514 mg/l	1/Month [note 2]	Grab
Total Copper	1.376 mg/l	2.06 mg/l	1/Month [note 2]	Grab
Total Mercury	2.48 ug/l	3.72 ug/l	1/Month [note 2]	Grab
Total Manganese	4.86 mg/l	7.25 mg/l	1/Month [note 2]	Grab
Total Nickel	3.64 mg/l	5.46 mg/l	1/Month [note 2]	Grab
Total Zinc	35.9 mg/l	53.9 mg/l	1/Month [note 2]	Grab
Whole Effluent Toxicity	467 T.U.	701 T.U.	1/Quarter [note 2]	Grab

Table 10-4: Platform Bruce

Parameter	Effluent Limitations		Monitoring Requirements	
	Monthly Avg.	Daily Max.	Frequency	Sample Type
TAH [note 1]	61 mg/l	91.7 mg/l	1/Month [note 2]	Grab
TAqH [note 1]	91.7 mg/l	137 mg/l	1/Month [note 2]	Grab
Ammonia	158 mg/l	237.6 mg/l	1/Month [note 2]	Grab
Total Copper	1.14 mg/l	1.7 mg/l	1/Month [note 2]	Grab
Total Mercury	2.4 ug/l	3.6 ug/l	1/Month [note 2]	Grab
Total Manganese	4.7 mg/l	7.06 mg/l	1/Month [note 2]	Grab
Total Nickel	3.01 mg/l	4.52 mg/l	1/Month [note 2]	Grab
Total Zinc	29.7 mg/l	446 mg/l	1/Month [note 2]	Grab
Whole Effluent Toxicity	1,750 T.U.	2,625 T.U.	1/Quarter [note 2]	Grab

Table 10-5: Platform Baker

Parameter	Effluent Limitations		Monitoring Requirements	
	Monthly Avg.	Daily Max.	Frequency	Sample Type
TAH [note 1]	100 mg/l	150.7 mg/l	1/Month [note 2]	Grab
TAqH [note 1]	150.7 mg/l	226 mg/l	1/Month [note 2]	Grab
Ammonia	211 mg/l	317 mg/l	1/Month [note 2]	Grab
Total Copper	347 mg/l	521 mg/l	1/Month [note 2]	Grab
Total Mercury	2.38 ug/l	3.57 ug/l	1/Month [note 2]	Grab
Total Manganese	4.67 mg/l	7.0 mg/l	1/Month [note 2]	Grab
Total Nickel	907 ug/l	1.36 mg/l	1/Month [note 2]	Grab
Total Zinc	9.07 mg/l	13.6 mg/l	1/Month [note 2]	Grab
Whole Effluent Toxicity	140 T.U.	210 T.U.	1/Quarter [note 2]	Grab

Table 10-6: Platform Dillon

Parameter	Effluent Limitations		Monitoring Requirements	
	Monthly Avg.	Daily Max.	Frequency	Sample Type
TAH [note 1]	22.57 mg/l	33.86 mg/l	1/Month [note 2]	Grab
TAqH [note 1]	33.9 mg/l	50.8 mg/l	1/Month [note 2]	Grab
Ammonia	1.46 mg/l	2.2 mg/l	1/Month [note 2]	Grab
Total Copper	53.7 mg/l	80.6 mg/l	1/Month [note 2]	Grab
Total Mercury	0.34 ug/l	0.51 ug/l	1/Month [note 2]	Grab
Total Manganese	0.67 mg/l	1.0 mg/l	1/Month [note 2]	Grab
Total Nickel	140 ug/l	2.1 mg/l	1/Month [note 2]	Grab
Total Zinc	1.4 mg/l	2.1 mg/l	1/Month [note 2]	Grab
Whole Effluent Toxicity	239 T.U.	358 T.U.	1/Quarter [note 2]	Grab

Table 10-7: Trading Bay Production Facility

Parameter	Effluent Limitations		Monitoring Requirements	
	Monthly Avg.	Daily Max.	Frequency	Sample Type
TAH [note 1]	13.13 mg/l	19.7 mg/l	1/Month [note 2]	Grab
TAqH [note 1]	19.7 mg/l	29.55 mg/l	1/Month [note 2]	Grab
Ammonia	106 mg/l	158 mg/l	1/Month [note 2]	Grab
Total Copper	379 ug/l	568 ug/l	1/Month [note 2]	Grab
Total Mercury	8.5 ug/l	12.7 ug/l	1/Month [note 2]	Grab
Total Manganese	16.6 mg/l	25 mg/l	1/Month [note 2]	Grab
Total Nickel	1.0 mg/l	1.49 mg/l	1/Month [note 2]	Grab
Total Zinc	9.9 mg/l	19.85 mg/l	1/Month [note 2]	Grab
Whole Effluent Toxicity	231 T.U.	346 T.U.	1/Quarter [note 2]	Grab

Table 10-8: Tyonek A

Parameter	Effluent Limitations		Monitoring Requirements	
	Monthly Avg.	Daily Max.	Frequency	Sample Type
TAH [note 1]	1.17 mg/l	1.75 mg/l	1/Month [note 2]	Grab
TAqH [note 1]	1.75 mg/l	2.63 mg/l	1/Month [note 2]	Grab
Ammonia	16.1 mg/l	24.2 mg/l	1/Month [note 2]	Grab
Total Copper	572 ug/l	858 ug/l	1/Month [note 2]	Grab
Total Mercury	0.034 ug/l	0.051 ug/l	1/Month [note 2]	Grab
Total Manganese	66 ug/l	100 ug/l	1/Month [note 2]	Grab
Total Nickel	1.5 mg/l	2.24 mg/l	1/Month [note 2]	Grab
Total Zinc	14.6 mg/l	22.4 mg/l	1/Month [note 2]	Grab
Whole Effluent Toxicity	218 T.U.	327 T.U.	1/Quarter [note 2]	Grab

Table 10-9: Granite Point Platform

Parameter	Effluent Limitations		Monitoring Requirements	
	Monthly Avg.	Daily Max.	Frequency	Sample Type
TAH [note 1]	51.7 mg/l	77.56 mg/l	1/Month [note 2]	Grab
TAqH [note 1]	77.56 mg/l	116 mg/l	1/Month [note 2]	Grab
Ammonia	132 mg/l	198 mg/l	1/Month [note 2]	Grab
Total Copper	74 ug/l	111 ug/l	1/Month [note 2]	Grab
Total Mercury	2.05 ug/l	3.08 ug/l	1/Month [note 2]	Grab
Total Manganese	4.03 mg/l	6.04 mg/l	1/Month [note 2]	Grab
Total Nickel	193 mg/l	290 mg/l	1/Month [note 2]	Grab
Total Zinc	1.94 mg/l	2.9 mg/l	1/Month [note 2]	Grab
Whole Effluent Toxicity	1,092 T.U.	1,638 T.U.	1/Quarter [note 2]	Grab