

**Response to Comments
Received on the Proposed Reissuance of the
Cook Inlet General NPDES Permit**

Table of Contents

INTRODUCTION	2
EPA COMMENTS	7
GENERAL COMMENTS	8
NOTIFICATION AND REPORTING REQUIREMENTS	11
COASTAL EFFLUENT GUIDELINES	14
PROHIBITED AREAS OF DISCHARGE	15
BEST MANAGEMENT PRACTICES (BMP) PLAN	16
ENVIRONMENTAL IMPACTS	22
DRILLING MUDS AND CUTTINGS DISCHARGE	28
DECK DRAINAGE	33
SANITARY WASTE DISCHARGE	36
PRODUCED WATER	43
PRODUCED WATER MIXING ZONES	52
PRODUCED WATER WHOLE EFFLUENT TOXICITY (WET)	55
COMPLETION, WORKOVER, WELL TREATMENT, AND TEST FLUIDS	59
DISCHARGES REQUESTED & NOT AUTHORIZED	60
DISCHARGES REQUESTED & AUTHORIZED	61
APPENDIX A: PERMIT LIMIT CALCULATIONS	A-

1

INTRODUCTION

The public comment period for the proposed issuance of the Cook Inlet National Pollutant Discharge Elimination System (NPDES) General Permit AKG2851000 opened on September 20, 1995, and was scheduled to close November 30, 1995. Due to several requests for comment period extensions, the comment period was formally extended to January 29, 1996. Public hearings were held in Anchorage on November 28, 1995, and in Soldotna on November 29, 1995. Due to tremendous public interest, a third public hearing was held in Homer on January 25, 1996.

All comments specifically addressing the draft Cook Inlet permit which were submitted during the public comment period are summarized in this document. Each of the comments was given equal consideration during finalization of the permit, regardless of the number of times that comment was submitted or who submitted the comment. The comments were, in many cases, used to make changes to the final Cook Inlet permit. There were a limited number of comments received by the EPA that are not addressed in this document, and which were not used to make changes to the final permit, including:

- comments specifically addressing the Coastal Effluent Guidelines, which were finalized on December 16, 1997; opportunity to comment on the Coastal Guidelines was provided by EPA Headquarters upon publication of the draft Coastal Guidelines in February, 1995; and
- comments which were submitted to the EPA previously, and incorporated by reference into letters sent to the EPA during the public comment period for the draft Cook Inlet permit.

The following parties submitted written or verbal comments:

- Alaska Center for the Environment
- Alaska Clean Water Alliance
- Alaska Dept. Of Environmental Conservation (ADEC)
- Alaska Marine Conservation Council
- Alaska Miners Association, Inc.
- Alaska Oil and Gas Association (AOGA)
- Alaska Shellfish Growers Association
- Alaska Waveriders
- Alaska Wildlife Alliance
- Alaskans For Clean Water
- American Petroleum Institute

The Alliance
Baker Hughes Inteq
Coastal Coalition
CTI Alaska
Chugachmiut
Coal Point Trading Co.
Cook Inlet Keeper
Cook Inlet Marine Mammal Council
Cook Inlet Pipe Line Company
Cook Inlet Region, Inc.
Cook Inlet Regional Citizens Advisory Council (CIRCAC)
Cook Inlet Vigil
Exxon Company, U.S.A. (Exxon)
Greenpeace Alaska
H.C. Price Co.
Indigenous People's Council For Marine Mammals
Industrial Instrument Service Inc.
Kachemak Bay Conservation Society
Kachemak Shellfish Growers Incorporated
Kachemak Shellfish Mariculture Association
Kenai Peninsula Borough Economic Development District, Inc.
Kodiak Conservation Network
Lynden
Marathon Oil Company (Marathon)
M-I Drilling Fluids (M-I)
Mobile Exploration & Producing U.S. Inc.
National Parks & Conservation Association
Native Village of Nanwalek (Nanwalek)
Native Village of Port Graham (Port Graham)
Ninilchik Traditional Council (Ninilchik)
Peak Oilfield Service Co.
Phillips Petroleum Company (Phillips)
Production Tools of Alaska, Inc.
Resource Development Council for Alaska, Inc (RDC)
Salamatof Native Association, Inc.
Shell Western E&P Inc. (Shell)
Trout Unlimited
Trustees for Alaska (Trustees)
Udelhoven
Unocal Corporation (Unocal)
U.S. Department of Energy (DOE)
Weaver Bros., Inc.

Approximately 300 letters, petitions and verbal comments were received from individuals not clearly affiliated with, or speaking for, a company, non-profit organization, or governmental entity. The names of these commenters are not listed here, but are part of the public record.

ACRONYMS

AML	average monthly limit
BAT	best available technology economically achievable
BCT	best conventional pollutant control technology
BMP	best management practices
BPJ	best professional judgement
BPT	best practicable control technology currently available
BTEX	benzene, toluene, ethylene and xylene
CFR	code of federal regulations
CV	coefficient of variation
CWA	clean water act
DGC	[Alaska] Division of Environmental Coordination
DMR	discharge monitoring report
EPA	United States Environmental Protection Agency
FOIA	freedom of information act
GPD	gallons per day
LC ₅₀	the concentration of effluent that is acutely toxic to 50 percent of the test organisms exposed.
MARPOL	International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978
MDL	maximum daily limit
MGD	million gallons per day
mg/l	milligrams per liter
MMS	Minerals Management Service
MSD	marine sanitation device
M9IM	facilities continuously manned by nine or fewer person, or intermittently manned
M10	facilities continuously manned by ten or more persons
NOEC	no observable effect concentration
NMFS	National Marine Fisheries Service
NPDES	national pollutant discharge elimination system
NSPS	new source performance standards
ODCE	ocean discharge criteria evaluation
PAH	polynuclear aromatic hydrocarbons
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
SBM	synthetic-based mud
SPP	suspended particulate phase
TAH	total aromatic hydrocarbons
TAqH	total aqueous hydrocarbons
TIE	toxicity identification evaluation
TRC	total residual chlorine
TRE	toxicity reduction evaluation

TSD	EPA's technical support document
TU _c	chronic toxic unit
µg/l	micrograms per liter
WBM	water based muds

COMMENTS RECEIVED ON THE COOK INLET GENERAL NPDES PERMIT FOR OIL & GAS NO. AKG285000

EPA COMMENTS

Area of Coverage

During finalization of the permit, it became apparent to the U.S. Environmental Protection Agency (EPA) that the geographic area covered by the Cook Inlet permit was not adequately defined by the draft permit. While EPA received no comments on this issue during the public comment period, clear delineation of the area of coverage is essential in order to determine whether or not future exploratory efforts fall within the area covered by the permit.

The EPA has determined that the area of coverage for the final permit includes all state and federal waters in Cook Inlet north of the line between Cape Douglas (at 58° 51' North, 153° 15' West) on the west and Port Chatham (at 59° 13' North, 151° 47' West) on the east. This area does not include Shelikof Strait, which was a “no discharge” area in the draft permit because of its designation as a special aquatic foraging area for the Stellar Sea Lion. This coverage area was determined from the draft permit, which defined the southern boundary of Cook Inlet as the line between Cape Douglas on the west and Port Chatham on the east. Designation of Shelikof Strait and the area surrounding Sugarloaf Island, which are located south of this line, as “no discharge areas,” in the draft permit, however, may have lead some readers to incorrectly assume that the area of coverage extended into Shelikof Strait.

To clarify the area of coverage, the following changes have been made to the final permit. A map which delineates the area of coverage and many of the “no discharge” areas has been added. A description of the area of coverage has been added to the cover sheet of the permit. References to previous lease sales within the area of coverage have been removed from the cover page of the permit. Finally, references to Shelikof Strait and Sugarloaf Island have been removed from Part II. of the final permit (“Prohibited Areas of Discharge and Depth-Related Requirements”), as these areas were never included within the area of coverage.

Permit Identification Number

The 1986 Cook Inlet general permit was identified by the permit number AKG285000. The 1995 draft permit proposed to change the permit number to AKG285100. The EPA typically retains the same permit number for a facility or group of facilities. The final permit number has therefore been changed back to the original permit number: AKG285000.

GENERAL COMMENTS

Long Overdue

Comment: Trustees, Nanwalek and Port Graham noted that the 1986 general permit for Cook Inlet expired in 1991, and that reissuance of the permit is long overdue. Nanwalek and Port Graham requested that future NPDES permits go through the renewal and review process in timely 5 year periods, as required by federal regulation.

Response: The EPA regrets the delay in reissuing the Cook Inlet general permit. A timely reissuance was made difficult by the complexity of the issues involved in this permit, including the proposed changes in water quality standards, the need to develop guidance for synthetic based muds, and delays associated with the state consistency determination process. The complexity of this permit is, in part, evidenced by the tremendous volume of comments received on the draft permit. Reading and responding to each of these comments also required more time than is required for a typical NPDES permit.

Compliance History

Comment: Trustees commented that recent citizen and agency enforcement actions against Permittees in Cook Inlet uncovered over 4,000 violations of the 1986 permit. Trustees urged the EPA to take past compliance records into account when promulgating any limitations or conditions.

Response: Permit violations are considered to be primarily an enforcement, rather than a permitting issue. The compliance history of the Cook Inlet facilities was, however, considered during development of the permit. The EPA found, for example, that the number of effluent limit and reporting violations has fallen off dramatically since EPA's most recent enforcement actions. For example, the EPA reviewed TSS, BOD and produced water oil and grease data from January, 1996 through April, 1998, for Granite Point Tank Farm, Trading Bay, East Forelands, Anna, Baker, Bruce, Dillon, Dolly Varden and Tyonek. One BOD violation was found, which represents a very significant improvement over the pollutant levels that were discharged in 1992, 1993 and 1994.

Gulf of Mexico Permit & OMB Review

Comment: AOGA requested that the proposed permit be withdrawn and submitted to OMB for approval. The Fact Sheet states that because the proposed permit is similar to the Gulf of Mexico permit, no Office of Management and Budget (OMB) review is required. AOGA commented that the Cook Inlet general permit should be consistent with the Gulf of Mexico offshore permit, but is not.

Response: On November 3, 1983, the Office of Management and Budget waived review of EPA-issued permits.¹ Consistency with the Gulf of Mexico permit is discussed in greater detail throughout this document. In summary, however, permit development is influenced by local and state regulations, and other site-specific conditions that result in differences between the EPA

Region 6 Gulf of Mexico general oil and gas permit, and the Cook Inlet general permit.

Tribal Governments

Comment: Nanwalek and Port Graham requested that the EPA deal with Cook Inlet Tribes on an official government to government basis. In the future, Tribes should have equal input and full approval and veto power regarding NPDES permits in Cook Inlet and Kachemak Bay.

Response: The EPA is committed to working government-to-government with tribal governments during the development of future permits. At the January 30, 1996, government-to-government meeting with the Port Graham and Nanwalek tribal councils, Chuck Findley, EPA Deputy Regional Administrator, committed to involving tribal governments in the permit development process for future permitting efforts. In addition, the October, 1995 Memorandum of Agreement between the Chugachmiut Environmental Protection Consortium, EPA and ADEC, seeks to enhance EPA's policy of achieving effective government-to-government relationships with tribes. The Clean Water Act does not provide a legal mechanism for tribal government to "approve" or "veto" NPDES permits that are issued by the EPA.

Ninilchik Jurisdiction

Comment: The Ninilchik Traditional Council (NTC) commented that no permits should be offered in the area of Cook Inlet claimed as the NTC Tribal boundaries. While recognizing that the State of Alaska and the federal government claim jurisdiction in the area, the NTC asserts its priority claim as a sovereign government. The NTC is concerned that oil and gas exploration poses an unreasonable risk to this area which is rich in natural resources, such as clam beaches, bird breeding areas, and fish, and is a scenic area for tourism.

Response: EPA recognizes the importance of this area to the subsistence lifestyle of the commenter and other Alaska Natives, and EPA has gone to great lengths to ensure the permit is protective of human health and the environment, and otherwise meets the requirements of the Clean Water Act, and the federal trust responsibility to Alaska Natives. However, EPA does not agree that the NTC has the exclusive jurisdiction to issue permits in this area or to forbid the issuance of a federal NPDES permit. The NPDES permit issued by this final action is authorized under section 402 of the Clean Water Act, which applies to all navigable waters of the United States. Congress' grant of authority to EPA for issuance of permits is not limited by the boundaries of waters that are claimed to be within the jurisdiction of the NTC. Under the statute, EPA is the appropriate authority to issue the permit because the federal permit program has not been suspended and EPA has not approved the State or an Indian tribe to administer the program. The United States has a paramount interest in these waters, and any assertion of authority by NTC to control permitting in these waters is inconsistent with EPA's authority under the Clean Water Act. In making the decision to issue this permit, EPA has evaluated the views and concerns expressed by the NTC and other Alaska Native entities with regard to ensuring that protective measures are established which will avoid adverse impacts of the permitted activities, and has included measures to minimize the threats to human health and the environment from activities that cannot be avoided.

Monitoring Frequency & Economic Impact

Comment: Numerous commenters were opposed to the increase in monitoring and reporting requirements from the 1986 permit to the draft 1996 permit. Many were concerned that the increase in monitoring would result in a decrease in jobs in the Cook Inlet area, or in the closure of platforms. Unocal stated that the "EPA National Water Program Agenda for the Future: 1996-1997" directs the EPA to work with stake holders to achieve a 25% reduction in monitoring and reporting requirements. The proposed permit, however, increases monitoring over existing levels. Numerous commenters also objected to increased monitoring because no independent studies have uncovered any long-term adverse impact to the health of Cook Inlet after a 30 year history of oil and gas operations in Cook Inlet. On the other hand, Trustees commented that the proposed monitoring frequencies are inadequate, and that daily monitoring should be required in light of the magnitude of the exceedances of water quality standards that have occurred under the current permit.

Response: Monitoring and reporting requirements for specific waste streams are discussed in more detail throughout this document. In summary, however, the EPA goal to reduce reporting and monitoring by at least 25% is based on a demonstration of excellent historical performance by the discharger. There is virtually no historical data, however, for numerous water quality parameters for which monitoring is required in the final permit. The EPA's requirement to ensure that discharges are in compliance with water-quality-based standards (40 CFR § 122.44(d)) resulted in the addition of monitoring and reporting requirements in the final permit, compared to the 1986 permit. The final permit does, however, have significantly fewer reporting requirements than the draft.

The economic impacts of the technology-based limitations contained in the final permit, including the impact on local job availability, were given significant consideration prior to finalization of the Coastal Effluent Guidelines.² The final permit also contains Alaska State water quality limits which are designed to protect human health and the environment. Federal regulations (40 CFR § 122.44 (d)) require that water quality limits be incorporated into the final permit. The economic impact of water quality-based standards is not considered during permit development.

Discharges Covered Under Permit

Comment: AOGA commented that the EPA should allow the following discharges from new facilities: waterflood and associated filter backwash, fire system test water, non-contact cooling water, domestic waste, sanitary waste, desalination waste, uncontaminated deck drainage, and boiler blowdown.

Response: New exploration facilities complying with the notification requirements at Part I.A. are authorized to discharge each these waste streams.

NOTIFICATION AND REPORTING REQUIREMENTS

Notification of Discharges, and Termination of Discharge from Individual Wells

Comment: AOGA commented that the draft permit requires permittees to notify the EPA within a seven-day period prior to initiation of discharges from each new well. Each platform in Cook Inlet has numerous wells. Production discharges are commingled, and the number of wells contributing to this commingled waste has no significance; the volume of fluids discharged is reported on the monthly DMRs. Similarly, AOGA commented that the requirement at Part D.3. to notify the EPA following cessation of discharges from *each well* (emphasis added) is problematic. AOGA recommended that this reporting requirement be changed to “Permittee shall notify the EPA on the Discharge Monitoring Report or a separate letter following termination of discharges from the discharge site.”

Response: The requirement for notification of discharge from new wells, and termination of discharges from *each well* has been removed from Parts I.A.3. and I.D.2. of the final permit.

Commencement of Discharges from Closed-in Platforms

Comment: AOGA commented that the draft permit requires that written notification be provided within 30 days of initiation of discharge. It is unclear why this requirement is included, as the facility’s DMR serves as notice to the EPA that a discharge has occurred. This requirement should be removed from the permit. The draft permit also requires that if any discharge is different from the past due to changes in treatment or operations on the platform, the permittee must notify Region 10 as early as possible, but in no case less than 90 days before initiation of discharge. The purpose of this requirement is also unclear. A change to a facility does not relieve the permittee of the responsibility to comply with permit requirements. AOGA suggests that this requirement be removed because it is already included in Part V.J. of the permit.

Response: The EPA agrees that the facility’s DMR may serve as notice to the EPA that a discharge has occurred. The requirement for notification of commencement of discharges from closed in platforms has therefore been removed from the permit.

Submission of Plans of Operation, Environmental Reports, and Biological Surveys

Comment: AOGA commented on the burdensome nature of the requirement at Part I.D. to submit copies of plans of operation, environmental reports, and biological surveys that are required by other local, state or federal agencies.

Response: Since the EPA may readily obtain these documents from local, state or federal agencies if needed, this requirement has been removed from the permit. Also, the requirement at I.A.1.d. to provide the EPA with exploration or operation plans submitted to MMS or the State has been removed from the permit.

Twenty-four Hour Notice of Noncompliance Reporting

Comment: Unocal requested that transmittal of the twenty-four hour notification requirements to

the EPA be fulfilled by either telephone or facsimile.

Response: The draft permit required twenty-four hour telephone notification of noncompliance reporting. The permit has been modified at Part IV.G.1 to state that notification via facsimile or telephone is acceptable.

Reporting

Comment: AOGA commented that reporting toxicity, hydrocarbon and metals results by the tenth of the following month may not be feasible given that it takes 30 to 45 days to receive the final reports.

Response: Section IV.A. of the final permit has been modified to state that monthly reports shall be postmarked by the 20th day of the following month, and that quarterly sampling results shall be reported on, or before the March, June, September, and December DMRs.

Monthly Chemical Inventory & Biocides

Comment: AOGA opposes the proposed monthly chemical inventory requirement for waterflooding, non-contact cooling water, and desalination waste streams. AOGA stated that these are probably the most consistent waste streams associated with oil and gas production in Cook Inlet. Operators have already provided EPA with the types and volumes of chemicals used in these three waste streams. This information should still be fairly accurate; there is not enough variation in chemical use to necessitate a monthly chemical inventory. If EPA determines that additional information is needed on the chemicals in these waste streams, a list of chemicals used could more appropriately be provided annually. CIRCAC commented that the permit should require reporting of all chemicals added to completion, workover, well treatment, and test fluids. CIRCAC commented that biocides are not regulated under this permit except in chemical inventories on miscellaneous discharges, and that the permit should require reporting of all biocides used.

Response: Because there is little month-to-month variability in the chemicals used in these three waste streams, the EPA has determined that annual, rather than monthly reporting is sufficient. The permit has been modified at Parts III.E.2 and III.G.3 to require annual reporting of the types and volumes of chemicals added to waterflooding, non-contact cooling water and desalination waste streams; annual reporting has also been required for completion, workover, and well treatment, and test fluids.

The permit has also been modified at Part IV.B. to require annual reporting of the type and volume of all biocides added to any waste streams authorized for discharge under this permit. The EPA needs this information in order to evaluate the Permittees compliance with Alaska water quality standards. Chemical inventory and biocide reports shall be assembled for the calendar year, and shall be submitted to the EPA within 90 days of the completion of the calendar year.

Flow Volumes

Comment: AOGA commented that the volume of miscellaneous discharges is minimal and does not present a significant risk to the environment. The flow monitoring requirement for these minor miscellaneous discharges will add additional administrative burden without providing significant information to the Agency. If flow monitoring is required, AOGA recommends that it be applied only to non-contact cooling water and waterflood effluents.

Response: The flow estimation requirement for Part III.E., Miscellaneous Discharges, has been removed from the final permit. The EPA agrees that the discharge volumes for these waste streams are minimal, and do not present a significant risk to the environment. The EPA also agrees that the estimated flow volumes of these waste streams are not significant for the Agency, as we have no current plans to develop additional monitoring requirements or effluent limitations for these waste streams. Should the development of additional monitoring or effluent requirements be considered, flow volumes will be requested of the Permittees at that time.

Produced Sands

Comment: AOGA commented that the NPDES permit should allow for technology development which may allow for the treatment of produced sands to an acceptable level. The EPA, an industry group of operators, and vendors are presently conducting studies of produced-sand washing using various equipment and procedures. If the results are positive, produced sand discharges may be allowed again. AOGA submitted comments to the EPA regarding produced sand for the Coastal Effluent Guidelines rulemaking process. These comments are incorporated herein by reference.

Response: The discharge of produced sands is not authorized in this permit. The Coastal Effluent Guidelines (discussed in the following section) established “no discharge” BAT, BCT, BPT and NSPS effluent limitations for produced sands.

ADEC Address

Comment: The Alaska Department of Environmental Conservation (ADEC) commented that the address for reporting monitoring results to ADEC was incorrect in the proposed permit, and should be changed to

Alaska Department of Environmental Conservation
Attn: Watershed Management Section
555 Cordova Street
Anchorage, AK 99501

Response: The ADEC address at Part I.D of the permit has been corrected.

COASTAL EFFLUENT GUIDELINES

Zero Discharge & Cook Inlet “Exemption”

Comment: Numerous commenters urged the EPA to adopt zero discharge limitations at all

existing or future oil and gas facilities in and around Cook Inlet, and expressed concern that discharges allowed in Cook Inlet are not allowed in other U.S. coastal waters. Nanwalek and Port Graham recommended that the permit include language that directs the oil and gas industry to achieve zero discharge in Cook Inlet by 1998. Trustees commented that the goal of the Clean Water Act was to eliminate the discharge of pollutants into navigable waters by 1985. RDC and numerous other commenters expressed concern that a zero discharge requirement would force the early closure of many operations because of high costs.

Response: The technology-based Effluent Guidelines for the Coastal Oil & Gas industry were promulgated on December 16, 1996³ and have been incorporated into the final permit. The Guidelines require zero discharge of produced water and muds & cuttings in all coastal waters except Cook Inlet. The EPA rejected zero discharge for muds & cuttings in large part because the technology of grinding and injection has not been demonstrated to be available throughout Cook Inlet. The EPA rejected zero discharge of produced water because zero discharge is not economically achievable in Cook Inlet.

In addition to incorporating these technology-based limitations into the permit, pollutant levels in the discharge are also compared to Alaska water quality standards that are designed to protect human health and the environment. The most stringent of the technology-based and water quality based limits is incorporated into the permit. The final permit meets CWA requirements because the technology-based effluent guidelines allow produced water and muds discharge, and because the permit limits comply with state water quality standards.

New Sources and New Facilities

Comment: Trustees commented that coverage of new sources under the proposed general permit is inappropriate and contrary to federal requirements, because new sources must meet New Source Performance Standards; permitting of new sources must comply with the National Environmental Policy Act; and new sources may not be permitted without adequate public participation.

Response: The final permit does not authorize discharge from new development and production facilities (i.e. new sources, *see* 40 CFR § 435.11), but does authorize discharge from new exploration facilities (i.e. new dischargers, *see* 40 CFR § 122.2). Development and production wells are considered to be new sources because of the significant site preparation work that occurs during placement of a development or production facility on or over a site.⁴ New source performance standards for the oil and gas industry, which apply to all new development and production facilities in Cook Inlet, were not promulgated for coastal waters until after the draft permit was issued; this is why new sources were not discussed in the draft permit. In the final permit, coverage for new development and production facilities has been removed from Part I of the permit, and depth-related requirements which clearly applied to new sources (referred to as “new facilities” in the 1995 draft permit) have been removed from Part II.A. of the final permit.

Age of Equipment and Facilities

Comment: Ninilchik asked how much weight was given to the age of equipment and facilities

during development of the best professional judgement/best available technology (BPJ/BAT) permit conditions. Ninilchik stated that limits on facility age, and equipment update requirements may be necessary in order that the spirit and intent of the CWA be met.

Response: No BPJ limitations are included in the final permit because the coastal BAT limitations discussed above were incorporated into the final permit. While the age of equipment and facilities were considered during BAT development, BAT limitations represent the best existing economically achievable performance within the coastal oil and gas industry. The BAT limitations for oil and grease in the produced water waste stream are significantly more stringent than those contained in the 1986 permit. More detailed information on the way in which the BAT limits were developed is available in the EPA *Coastal Development Document*.⁵

PROHIBITED AREAS OF DISCHARGE

National Parks

Comment: The U.S. Department of Interior commented that the list of resource areas of concern identified at Part II.B. of the permit include only state-designated areas, and requested that the criteria used to determine the resources areas of concern be described. They also recommended that the list of coastal resources of concern be expanded to include Lake Clark National Park and Preserve, Katmai National Park and Preserve, and Chisik Island unit of the Alaska Maritime Wildlife Refuge, and selected State Park/recreation areas.

Response: Parts II.C.2. and III.B.3.a. of the final permit have been modified to include references to National Parks generally, and Lake Clark National Park and Preserve specifically. Katmai National Park and preserve, and the Chisik Island unit of the Alaska Maritime Wildlife Refuge are located outside the area of permit coverage, and are therefore not specifically mentioned in the permit. Given the unique role that National Parks play in wildlife conservation (e.g. no hunting, mining or consumptive activities), the EPA has determined that inclusion of National Parks in Part II.C. (Geographic Restrictions) is appropriate.

Geographic discharge restrictions for coastal marshes, river deltas river mouths, Areas Meriting Special Attention (AMSA), State Game Refuges (SGR), State Game Sanctuaries (SGS) and Critical Habitat Areas (CHA) were placed in the 1986 Cook Inlet permit, and the final permit, as recognition of the unique role these areas play for subsistence hunting, fishing and food gathering; and conservation and protection of Alaskan wildlife. In future permitting actions, the EPA will consider expanding the geographic discharge restriction area (Part II.C.2.) to include certain State Park/recreations areas if specifically requested. Please note that the monitoring requirements at Part III.B.3.a. are required for sensitive areas *such as* (emphasis added) coastal marshes, et al. State Parks and recreations areas are therefore not necessarily excluded from this requirement.

BEST MANAGEMENT PRACTICES (BMP) PLAN

Authority

Comment: CIRCAC strongly supports the inclusion of Best Management Practices (BMP)

requirements in the permit. DOE commented that they do not dispute the EPA's authority to require the development of a BMP Plan in the general permit. AOGA commented that the inclusion of a BMP Plan requirement in the draft permit exceeds the Agency's authority, and noted the following specifics:

- ! AOGA commented that Section 402(a)(1) of the CWA authorizes the EPA to include permit conditions on a case-by-case basis. However, it does not authorize the EPA to require BMP plans where the plan would be in addition to effluent limitations. Furthermore, reliance on 402 (a)(1) and (2) requires that the EPA first determine that additional controls via BMP plans “meet either all applicable requirements under Sections 301, 302, 306, 307, 308 and 403 of this Act...” or that BMP plans address conditions which the Agency has determined present an industry-wide danger of contributing significant amounts of pollutants in receiving waters.
- ! AOGA commented that BMP plans are required by 40 CFR § 125.103(d) only for dischargers covered under § 125.102, and that the ancillary activities listed in 125.102 are not applicable to oil and gas production, drilling and exploration activities. Furthermore, an analysis of the six factors listed in § 125.103(b) was not included in the Fact Sheet.
- ! AOGA noted that authority for the EPA to require BMPs is found in Section 304(e) of the CWA which authorizes "supplemental" controls for "any specific pollutant which the administrators charged with a duty to regulate as a toxic or hazardous pollutant..." Congress was careful to distinguish the term "oil" as separate from materials which fit the definition as "hazardous substances," therefore oil and grease in produced water, drilling wastes, and deck drainage cannot be regulated as a toxic or hazardous substance within the meaning of the Act. Section 304(e) also states that permits containing BMPs must show that the activity in question “contributes significant amounts of such pollutants to navigable water.” The proposed permit, however, contains effluent limits based on best available technology (BAT) which reduces pollution to insignificant amounts.
- ! AOGA states that 40 CFR § 122.44 (k) allows for BMPs in 3 situations, none of which is applicable to the permit. First, BMPs are applicable for the control of toxic pollutants and hazardous substances from ancillary industrial activities; none of the waste streams, however, is ancillary to the permitted activity. Second, § 122.44 allows for BMPs when numeric effluent limitations are infeasible; since the draft permit has effluent limitations for numerous waste streams, these waste streams must be excluded from BMP requirements. Finally, BMPs are applicable when they are needed to carry out the purposes of the Act. AOGA counters that BMPs are not necessary to carry out the purpose of the Clean Water Act, because BAT controls reduce pollution to insignificant amounts.
- ! According to “Region 10 Guidance: Best Management Practices Plans in NPDES Permits,” the EPA Region 10 does not have the authority to broaden the scope of pollutants to include all pollutants, not just toxic and hazardous pollutants.

Response: AOGA had several specific comments regarding the EPA's authority to include a BMP Plan requirement in the permit. In an effort to address AOGA's concerns, it is worth briefly reviewing the EPA's authority to include such requirements in permits. Pursuant to Section 304(e) and 402(a) of the CWA, BMP plans may be included as conditions in NPDES permits. Section 304(e) of the CWA authorizes the Administrator to publish regulations supplemental to effluent limitations for a class or category of point sources for toxic or hazardous pollutants under Section 307(a) or Section 311 of the Act. No BMPs have been promulgated for the offshore or coastal oil and gas category under the authority of CWA 304(e). Therefore, the authority for BMP Plan requirements in the permit is Section 402(a) of the CWA.

Section 402(a)(1) of the Act allows the Administrator to prescribe conditions in a permit determined necessary to carry out the provisions of the Act. BMPs are one such condition. Section 402(a)(2) authorizes the EPA to include miscellaneous requirements in permits on a case-by-case basis which are deemed necessary to carry out the provisions of the Act. Based upon the aforementioned statutory authorities, the EPA promulgated regulations which provide for BMPs to be used "to control or abate the discharge of pollutants when . . . [numeric effluent limitations are infeasible . . . or . . . [t]he practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of [the Act]." 40 CFR § 122.44(k)(2) and (3).

The statutes and regulations cited above have been the basis for BMP plan requirements in many individual and general NPDES permits previously issued by Region 10. This basis is also presented in EPA BMP guidance.⁶

The EPA BMP guidance states that the increase in awareness of pollution prevention opportunities, as well as the increase in legislation and regulatory policies directing pollution prevention efforts, has redirected the traditional focus of BMP activities from ancillary activities to industrial manufacturing processes. This redirection is resulting in the integrated application of traditional BMPs and pollution prevention practices into cohesive and encompassing plans that cover all aspects of industrial facilities.

For the Cook Inlet permit, BMPs are needed to carry out the purposes and intent of the regulations promulgated by the Clean Water Act. 40 CFR § 122.44(k)(2),(3) states that BMPs are to be used to control or abate the discharge of pollutants when numeric effluent limitations are infeasible, or the practices are reasonable necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA. The EPA disagrees with AOGAs contention that BAT controls reduce the pollution being discharged to Cook Inlet to insignificant amounts. The EPA also believes that the presence of BAT controls does not in itself substitute for BMPs.

CWA Reauthorization Bill

Comment: AOGA commented that a proposed Senate Clean Water Act reauthorization bill would have authorized BMPs which include treatment requirements or operating techniques, processes, procedures and methods. The conference committee deleted this language, stating that the EPA is not authorized to become involved in actual plant process design and operating decisions. AOGA also noted that BMPs are not required in either the offshore effluent guidelines or the

proposed coastal guidelines. AOGA also referenced an EPA General Counsel opinion (1976) which discusses the limitations associated with the use of BMPs in place of effluent limitations.

Response: Absence of BMP requirements in the Clean Water Act Reauthorization Bill and the effluent guidelines is immaterial to the inclusion of BMPs in NPDES permits. The EPA is not bound by proposed legislation that may be years away from becoming law. The EPA General Counsel opinion discussed the use of BMPs in place of effluent limitations. In the Cook Inlet permit, however, BMPs are used in addition to effluent limitations. The EPA would like to clarify that BMPs are intended to augment effluent limitations, and are inherently pollution prevention practices which focus on good housekeeping measures and good management techniques. BMPs do not specify treatment requirements or operating techniques, as implied by the AOGA comments.

Approval of BMP Plan

Comment: DOE noted that the permit requires operators to maintain a copy of the BMP Plan and make it available to the EPA, but does not require that the permittee obtain approval of its plan. DOE commented that either the EPA should review and approve the BMP Plans up front, or, if the EPA doesn't approve them up front, the permit should clearly state that an EPA determination that a plan is inadequate at some point after general permit coverage is granted does not automatically constitute a noncompliance.

Response: The available statutes, regulations, and guidance documents provide discretion concerning agency approval of BMP Plans developed by permittees. In its experience, Region 10 has found that in some, but not all situations, it may be appropriate for the agency to approve the initial BMP Plan, and possibly future amendments or modifications to a facility's plan. Approval of a new or modified BMP Plan, however, is a very significant workload for a general permit which covers multiple platforms and shore-based facilities. For the final Cook Inlet permit, EPA is choosing to clearly specify the objectives and requirements of a BMP Plan, but to not require EPA approval of the Plan. The EPA believes that BMP Plans are beneficial to the permit, but does not believe that EPA input is required in order for the Permittees to develop practices which optimize platform or shore-based operations. At Part III.I.6., the requirement to report all changes in the BMP Plan to the EPA has been removed from the final permit. Enforceability is also discussed further in the following comment.

Enforceability

Comment: AOGA and SWEPI commented that the BMP plan requirements are vague and unenforceable, and it is unclear how the plan's effectiveness would be measured. Phillips objects to the inclusion of BMPs as an enforceable condition of the permit, stating that BMPs are unnecessary, time consuming and a paperwork burden. The Resource Development Council of Alaska, Inc. asked how the EPA will determine if a violation of the plan occurs.

DOE commented that enforceable BMP Plans could lead to a situation where a discharger is out of compliance with the permit by violating a minor provision of the BMP Plan without violating any of the numerical limits or causing any environmental impacts. DOE recommended that

actions that fail to comply with all the provisions of the BMP but which do not violate the intent of the permit or cause an adverse environmental impact, should not be enforceable. AOGA requested clarification of whether a facility that meets all effluent limitations would violate the BMP if pollutants were not minimized, since continued discharge does not demonstrate prevention or minimization of the generation and the potential for release of pollutants.

Response: In order to clarify the enforceability of BMP Plan requirements, the permit language has been changed to make it clear that the enforceable requirement of the permit section III.I is to develop an adequate BMP Plan to meet all of the stated objectives and requirements of Section III.I. The EPA considers all provisions of its permits to be enforceable, however, including requirements to prepare and implement a BMP Plan.

Reasonable Potential for BMPs

Comment: AOGA commented that the Region 10 BMP guidance states that normal operations and ancillary sources should be examined to determine if there is a reasonable potential for equipment failure, natural conditions, or other circumstances which could result in the discharge of pollutants. There is no mention in the draft permit or Fact Sheet of EPA conducting any examination to determine if there is a reasonable potential for any of the above.

Response: Under the implementing regulations, EPA is not required to evaluate if there's a reasonable potential for circumstances which could result in the discharge of pollutants. As discussed earlier in the section, the regulations at 40 CFR § 122.44(k)(2), (3) authorize the use of BMPs in situations where numeric limitations are infeasible, or the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA. The EPA believes that the complexity and variety of the wastes generated by the oil and gas industry lend itself particularly well to BMPs. BMPs can include almost any pollution control measure or practice that controls the generation of pollutants and their release to surface waters, including construction, monitoring and maintenance. One example of pollution control in Cook Inlet is the case-by-case approach to evaluating the toxicity of mud-additive systems which was implemented by the EPA under the 1986 permit, and which will be the responsibility of the Permittee in the final permit. Numerous other areas where BMPs may be applicable to the coastal oil and gas industry were identified in chapter XV of the Coastal Development Document.⁵ The applicability of industrial pollution control measures is generally accepted throughout the industrial community. In fact, in their July 12, 1996, letter to ADEC⁷, Marathon, Phillips, Shell and Unocal agreed to voluntarily implement a pollution prevention program which included provisions for source reduction, recycling/reuse, waste treatment and disposal.

BMP Due Date

Comment: AOGA requests 18-months to submit a BMP plan, and cites the Region 10 BMP guidance as stating that a normal compliance schedule is 6 months for plan preparation, and 12 months for plan implementation. AOGA also requested that the operators be given one year to complete the BMP Plan. The draft permit does not specify when the BMP should be complete for existing facilities.

Response: The EPA thinks that one year is adequate time to develop a BMP plan. The permit has been modified at Part III.I.1. to state that, for existing dischargers, the BMP Plan shall be developed within one year of permit issuance. For future exploratory operations, the BMP Plan shall be developed no later than 7 days prior to initiation of discharges from the facility.

Overly Specific Requirements

Comment: DOE commented that some of the BMP Plan requirements are overly specific and could have serious economic implications. For example, in paragraph III.I.3.a., the EPA requires that:

"...the number and quantity of pollutants and the toxicity of the effluent generated, discharged or potentially discharged at the facility shall be minimized by the permittee to the extent feasible by managing each influent waste stream in the most appropriate manner."

DOE recommended that "technically and economically" be added before "feasible." Without this additional language an operator could be required to add process or treatment equipment regardless of its cost or effectiveness. DOE also found the list of 12 BMP requirements to be too specific; in particular, they recommended deletion of items (4) - specific management practices and standard operating procedures and (5) risk identification and assessment. AOGA also stated that the BMP language was not individualized in the draft permit to meet individual permit needs, as is suggested by the Region 10 BMP guidance.

Response: The EPA believes that the phrase "to the extent feasible" addresses DOE's concerns about technical and economic feasibility, and no change has been made to this requirement in the final permit.

Numerous changes have been made to the BMP requirements to allow each platform or shore-based facility the ability to tailor the BMP Plan to their own facilities. The 12 BMP requirements listed at Part III.I.4.a. of the draft permit have been removed from the final permit. This part now requires that the BMP Plan include three separate components: planning, development and implementation, and evaluation/reevaluation, making this part consistent with the EPA BMP guidance.⁸ Similarly, the following sentence, which specified facility systems to be examined, has been removed from Part III.I.3.b.1. of the final permit:

The examination shall include all normal operations and ancillary activities including material storage areas, site runoff, in-plant transfer, process and material handling areas, loading or unloading operations, spillage or leaks, sludge and waste disposal, or drainage from raw material storage.

These changes are consistent with the region 10 BMP guidance, and the more current EPA BMP guidance. It is EPA's intent to allow Permittees to identify the practices and procedures most appropriate for each facility.

BMPs duplicate existing regulations

Comment: AOGA and the Resource Development Council for Alaska, Inc. commented that the BMP Plan requirements duplicate existing regulations, and the BMP Plan should be removed from the permit. AOGA specifically noted that the NPDES permit will regulate discharges, not spills and releases that are regulated elsewhere; whereas BMP plans are designed to prevent or minimize the *release* of pollutants. They commented that the BMP Plan requirements add no benefit and should be deleted from the final permit.

AOGA noted that many of the proposed BMP Plan requirements are regulated under other programs, and pointed out numerous BMP Plan objectives and requirements that are also required by 40 CFR 112, 18 AAC 75, and other regulations. AOGA also commented that some of the BMP requirements are duplicated within the permit, such as proper operation and maintenance, and preventative maintenance.

Response: The requirements listed at Part III.I.4.d. of the draft permit have been removed from the final permit. Section III.I.4.d. required that measures be established in the BMP to ensure the requirements of RCRA, Alaska Solid Waste Management, Stormwater, and other programs be met. EPA believes that this requirement may detract from the purpose of the BMP Plan, which is to minimize the discharge of pollutants into Cook Inlet. When a BMP issue is already addressed via a separate regulatory program, the BMP Plan is expected to reference those efforts, not duplicate them. The EPA does not intend for permittees to attempt to duplicate or repeat practices more fully described in the other documents. The duplicate requirements within the permit have been removed by removing Part III.I.3.b (BMP operation and maintenance) from the final permit.

BMP Incident

Comment: AOGA asked what defines a "BMP incident?" Since BMP incident reporting is used to keep records of incidents such as spills, leaks, runoff and other improper discharges, does this mean that an oil spill is now reportable to the EPA, and could be enforced by the EPA (or citizen lawsuits)?

Response: As discussed above, Part III.I.4.a. has been removed from the final permit.

BMPs and Produced Water

Comment: In reference to the BMP Plan objectives, AOGA commented that the pollutants in produced water occur naturally in the produced fluid and therefore cannot be "managed." The only discharge that can be managed is the muds and cuttings discharge, which will be managed through the mud plan.

Response: The EPA disagrees. Pollutants and toxicity of waste streams, including produced water, can be minimized through treatment, through preventative maintenance of existing treatment systems, through modification of equipment & procedures, as well as through other means.

ENVIRONMENTAL IMPACTS

Human Health

Comment: Nanwalek, Port Graham, Chugachmiut, and numerous other commenters expressed concern with the potential human health impact of the 5 billion gallon annual oil and gas industrial discharge of drilling muds, produced waters and sewage. Nanwalek, Port Graham and Chugachmiut also commented that federal and state water quality standards must take into account that Alaska natives consume seafood at a rate 50 times greater than the national average. They also commented that the physical oceanography of Cook Inlet is not well understood, making it difficult to know where all the pollutants are being deposited, and how those pollutants may be impacting subsistence foods.

Response: Protection of human health is of primary importance to the EPA. Two mechanisms used as part of the permit process to examine the impact of the permitted discharges on human health include determining compliance with Alaska Water Quality Standards, and with Ocean Discharge Criteria. In addition, interim results from field studies in Cook Inlet being conducted by the EPA and by the Minerals Management Service (MMS) have been examined, and final study results will be examined to determine if study results warrant changes to the permit, or warrant additional studies. Water Quality Standards, Ocean Discharge Criteria, and the EPA and MMS studies are each discussed in more detail below.

Water Quality Standards. The numeric water quality criteria for Cook Inlet have been developed to protect aquatic life and human health from the deleterious effects of pollutants. The primary way in which humans are exposed to pollutants in Cook Inlet is through eating contaminated aquatic organisms. Water quality criteria designed to protect human health from exposure due to ingestion of contaminated aquatic organisms exist for some of the pollutants in the permitted discharge, including benzene, ethylbenzene, toluene and arsenic. For all pollutants except arsenic, the standards designed to protect aquatic life are more stringent than the standards to protect humans, and have therefore been used to calculate the permit limitations. In other words, protection of aquatic organisms is the driving force in the development of effluent limitations. For arsenic, the human health standard is more stringent than the aquatic life standard, and was used to calculate the effluent limitations in the final permit. Because the discharge is subject to compliance with the Alaska Water Quality Standards, and because ADEC has certified that the permit is in compliance with the Water Quality Standards, the EPA considers the discharge to be protective of the designated uses of Cook Inlet, which include harvesting for consumption of raw mollusks or other raw aquatic life.

Ocean Discharge Criteria. The EPA's Ocean Discharge Criteria (40 CFR Part 125, Subpart M) set forth specific determinations of unreasonable degradation that must be made for the territorial seas prior to permit issuance, including the "threat to human health through direct exposure to pollutants or through consumption of exposed aquatic organisms." The EPA found that, for the exploratory operations that may occur in the territorial waters covered under this general permit, significant impacts to human health are not expected.⁹

EPA Subsistence Study. Alaska water quality criteria do not currently include adjustments for elevated consumption rate of Alaska natives. Furthermore, increased consumption rates do not necessarily mean increased risks to human health. The health risk is correlated to the extent and level of contamination in seafood which is consumed. To that end, the EPA is conducting a study of chemical contaminants in Cook Inlet to assess the levels of pollutants in selected fish, marine invertebrates, marine plants and marine mammals which are routinely harvested by subsistence harvesters.¹⁰ The objective of the study was to characterize health risks associated with exposure to contaminants detected in fish and wildlife harvested from Cook Inlet by members of four native Alaskan subsistence villages. The preliminary results of this study indicate that four contaminants were found to exceed levels of potential concern in tissue samples (based on an acceptable risk level of 10^{-5}): PCBs (Aroclor 1260) and methylmercury in sea bass; cadmium in chiton, octopus and snail; and dieldrin in chinook salmon.

PCBs and dieldrin have not been used or discharged by the oil and gas industry. In the produced water waste stream, cadmium was not detected in the eight samples collected in 1995. Because of the limited data set, however, monthly cadmium monitoring has been required for one year in the final permit. Mercury was detected at three locations at levels which meet water quality standards at the edge of the state-authorized mixing zones. Because the mercury data set is limited, however, monthly mercury monitoring has also been required in the final permit for one year.

While cadmium and mercury are found in the intermittent drilling mud waste stream, the EPA has no indication that drilling muds are a significant source of metal contamination in Cook Inlet: sediment concentrations of metals have not increased significantly since oil and gas production began in Cook Inlet (see paragraph below); and riverine inputs are hypothesized to be the dominant source of sediments metals in Cook Inlet.¹¹

MMS Sediment Study. MMS is conducting a study to determine the current sediment quality of Lower Cook Inlet and Shelikof Strait. The purpose of the MMS study is to determine if the sediment acts as a “trap” for oil industry contaminants; to determine whether the sediment contaminants present an environmental risk; to examine whether contaminants in these areas have increased relative to preindustrial levels; and whether levels can be correlated to specific discharges, discharge events, or natural sources. The final results of this study are expected to be available in 1999. Preliminary results from the MMS study indicate that the surface sediments of outermost Cook Inlet and Shelikof Strait are potential traps for oil and gas contaminants, but that the concentrations of metals and organics in these sediments have not increased significantly over the past 25 to 50 years.¹²

In the absence of final results from these studies, the permit’s effluent limits and other conditions comply with all applicable federal and state standards, and are designed to protect human health and the environment. To the extent that these studies show that state water quality standards need to be revised, the State of Alaska will need to address this issue. The EPA will confer with the State of Alaska on any water quality issues related to the permit, and will modify the permit if necessary.

Appropriateness of State-Authorized Mixing Zone

Comment: Nanwalek, Port Graham, Chugachmiut, and numerous other commenters expressed concern with the potential long-term effects of the 5 billion gallon annual oil and gas industrial discharge on the subsistence species of Cook Inlet (e.g. salmon, clams, mussels, seals, octopus, cod, halibut, bidarkis, Beluga whales), as well as other Cook Inlet mammals, birds and biota. Trustees commented that the actual risk to the biota of Cook Inlet is likely to be far greater than stated. Trustees also commented it is not possible to fully assess the risk to marine mammals, and probably less is known of how oil affects marine mammals than any other group of marine organisms. Trustees commented that Section 301(b)(1)(C) of the CWA imposes an affirmative duty on the EPA, independent of state review, to insure that an NPDES permit includes limits to protect state water quality standards

Trustees, Trout Unlimited, and numerous other comments expressed concern over the proposal to allow mixing zones, and pointed out that organisms within the mixing zone will be adversely affected since the water quality standards will not be met end-of-pipe. Toxic materials may well be dispersed and diluted, as assumed in the mixing zone models, but may also be accumulating in low-energy environments. Trustees commented that the mixing zone application prepared by the permittees incorrectly discount problems with bioaccumulation, cites unrealistic depuration rates; and that the permit makes no effort to assess the magnitude of ecological harm from the pollution allowed within these mixing zones. Trustees also commented that Alaska water quality standards for aromatic hydrocarbons (10 µg/l) and total aqueous hydrocarbons (15 µg/l) may not be adequate, and cite an NAS report which discusses behavioral effects at very low petroleum concentrations (as low as 10 µg/l); the continuance of normal behavior underlies and is absolutely critical to larval settling, feeding, reproduction, substrate recognition, and homing.

Trustees commented that produced water discharges are shown to cause contamination of sediments with metals and polynuclear aromatic hydrocarbons (PAH) up to 1000 meters from the platforms. Other significant impacts include reduction of benthic organisms (to below background levels) up to 300 meters from platforms, alteration of benthic communities (mostly toward opportunistic species), and sub-lethal (chronic) impacts to biota at distances in excess of 500 meters from the discharge point in high energy, open ocean environments.¹³

Trustees also commented that existing studies and environmental monitoring results for Cook Inlet are flawed and scientifically deficient, and recommended that comprehensive studies designed to understand the long-term and chronic impacts of present, past, and future waste disposal practices in Cook Inlet be conducted. These studies should include the physical process that influence pollutant distribution; the chemical processes that influence availability, persistence and degradation of pollutants in sediment and water; the long-term biological effects; and the consequences of those effects on subsistence, commercial, and recreational fisheries. Nanwalek and Port Graham recommended that the permit direct industry to fund a non-biased and peer reviewed long-term, multi-year ecosystem and food chain study of Cook Inlet to determine if the chemical constituents of the discharge are causing any biological harm.

Response: The Alaska State Water Quality Standards are designed to protect the short and long-

term growth and propagation of fish, shellfish, other aquatic life, and wildlife, including subsistence species. Because the discharge is subject to compliance with the Alaska Water Quality Standards, and because ADEC has certified that the mixing zones and the discharges are in compliance with the Water Quality Standards, the EPA considers the permit to be protective of these activities. Under Section 7(a)(2) of the Endangered Species Act, the EPA consulted with NMFS and F&W, and both agencies concurred with EPA that this permit would not adversely affect listed species or designated critical habitat, including endangered whales, and the Steller sea lion.^{14, 15, 16}

As discussed in the previous comment, studies designed to characterize the potential long-term impacts of waste disposal practices in Cook Inlet have been initiated by EPA and MMS. To the extent that these studies show that state water quality standards need to be revised, the State of Alaska will need to address this issue. If the commenter believes that the mixing zone does not comply with Alaska State Standards, the commenter should raise this issue with ADEC.

Existing Studies

Comment: Unocal, RDC, Shell and numerous other commenters suggested that the health of Cook Inlet and the absence of any evidence of harm to Cook Inlet from oil and gas discharges should be considered by the EPA. Studies recently performed in Cook Inlet indicate that the low concentrations of hydrocarbons found in Cook Inlet are consistent with levels found in other pristine environments with no oil and gas operations.

Response: All available data have been considered by the EPA during the development of the final permit. The EPA is required, however, to ensure that effluent water quality complies with state water quality standards and national effluent guidelines. In fact, the objective of the CWA is to restore and maintain the chemical physical and biological integrity of the Nation's waters (CWA § 101). The best way to maintain the health of the Cook Inlet environment is to minimize the discharge of pollutants within Cook Inlet.

Impact of Drilling Waste

Comment: Trustees commented that discharged drilling wastes have the potential to cause significant adverse impacts in the marine and aquatic environment. Drilling fluids and cuttings are shown to cause contamination of sediments with heavy metals and hydrocarbons up to 4000 meters from the platforms. Other documented impacts include decline in abundance of benthic species (up to 1000 meters from the platform), reduced bryozoan coverage (within 2000 meters of discharge), altered benthic communities (up to 300 meters from platforms), bioaccumulation of heavy metals known to be present in drilling fluids and drill cuttings by benthic organisms, complete elimination of seagrass (within 300 meters of discharge), inhibited growth of seagrass (up to 3700 meters from the discharge point), and decreased coral coverage.¹⁷

Response: These documented impacts occurred in the Gulf of Mexico, and may not represent the impacts that occur in Cook Inlet. The transport of drilling muds in Cook Inlet was modeled as part of the ODCE.¹⁸ Impacts from bioaccumulation, toxicity and changes in community structure could be cumulative spatially, but it is unlikely that these impacts will be persistent. In addition,

lessening impacts can be expected over time, and available data indicate that unreasonable degradation of the environment is not likely to occur in areas of adequate dispersion and dilution. It was the EPA's recognition of the need for adequate dispersion and dilution that resulted in a prohibition on discharges in water depths less than 5 meters (as measured from mean lower low water).

Fine-grained, organic-rich sediments are the most common sink in coastal areas for organic and trace metal contaminants. In Cook Inlet, the shallow water and large tidal ranges move fine-grained sediments southward to outermost Cook Inlet and Shelikof Strait. As discussed earlier in this Section (Response to "Human Health" comment on page 21), MMS has initiated a sediment study in lower Cook Inlet to determine if the sediments act as "traps" for oil industry contaminants, to determine whether the sediment contaminants present an environmental risk, and to determine whether contaminants can be correlated to specific discharges, discharge events, or natural sources (e.g. existing platforms, Exxon Valdez, oil seeps). Preliminary literature review conducted by MMS examined numerous studies performed on sediment samples in Cook Inlet. The sediments in the region have been only partially characterized with respect to contaminant levels. What is known indicates that petroleum hydrocarbons and PAHs, other anthropogenic and natural hydrocarbon sources, and metals are found in widespread abundance and at varying concentrations through the Shelikof Strait and lower Cook Inlet area. Preliminary results from the MMS study indicate that the surface sediments of outermost Cook Inlet and Shelikof Strait are potential traps for oil and gas contaminants, but that the concentrations of metals and organics in these sediments have not increased significantly over the past 25 to 50 years.¹⁹ The permit's effluent limits and other conditions comply with all federal and state standards, and are designed to protect human health and the environment to the maximum extent allowable by law. To the extent that these studies show that state water quality standards need to be revisited, the State of Alaska will need to address this issue. The EPA will confer with the State of Alaska on any water quality issues related to the permit.

Coastal Zone Management Plan

Comment: Nanwalek and Port Graham commented that the NPDES permit contradicts the subsistence provision of the Kenai Peninsula Borough's Coastal Zone Management Plan, and asked that the NPDES permit not be issued until the subsistence issue is appropriately considered in the final provisions of the permit. Chugachmiut made numerous comments about ways in which the permit does not comply with the Kenai Borough Coastal Zone Management Plan provisions for protecting subsistence and water quality.

Response: The State of Alaska Division of Governmental Coordination (DGC) issued a final consistency determination on October 15, 1996. On November 4, 1996, the Villages of Port Graham and Nanwalek, and five non-profit organizations appealed the final consistency determination for the Cook Inlet permit. On June 16, 1997, the Superior Court of Alaska found the final consistency determination for the Cook Inlet permit incomplete with respect to consideration of the coastal management program standards for the protection of subsistence and habitats. The Court remanded the final consistency determination to the state for additional subsistence and habitats findings. DGC issued a final consistency finding on January 28, 1999,

stating that DGC has determined that the final permit is consistent to the maximum extent possible with the Alaska Coastal Zone Management Program. The EPA therefore considers that the final permit is consistent with the Alaska Coastal Zone Management Program.

Ocean Discharge Criteria Evaluation (ODCE)

Comment: Trustees commented that issuance of the draft permit, as proposed, will violate the ODCE provision of section 403 of the CWA. Section 403 plainly states that no permit shall be issued except in compliance with the EPA-promulgated guidelines for determining the marine degradation, including the effect of the disposal of the pollutants on the biological community, and the persistence and permanence of the effects. Section 403(c) concludes that if insufficient information exists to make this determination, that no permit shall be issued. Trustees states that the EPA Fact Sheet language should proscribe reissuance of the permit based on Section 403 requirements based on the absence of conclusive evidence regarding the impact of produced water on Beluga whales. The fact sheet proposes a different standard which is inconsistent with the statute: if a definitive determination of no unreasonable degradation cannot be made because of insufficient information, the EPA must then determine whether a discharge will cause irreparable harm to the environment through monitoring. Yet the permit does not propose monitoring which would assess the probability of irreparable harm.

Response: The EPA has determined, in accordance with 403(c), that discharges occurring under the final permit will not cause unreasonable degradation. Under Section 7(a)(2) of the Endangered Species Act, the EPA consulted with NMFS, and NMFS concurred with EPA that this permit would not adversely affect listed species or designated critical habitat, including endangered whales, and the Steller sea lion.²⁰ The EPA believes that if the conditions of this permit are sufficient to protect endangered whales, they are also sufficient to protect Beluga whales, which are not currently listed or endangered.

Section 403(c) of the CWA requires that NPDES permits for ocean discharges be issued in compliance with the EPA's Ocean Discharge Criteria. The implementing regulations at 40 CFR Part 125, Subpart M set forth specific determinations of unreasonable degradation that must be made, based on ten criteria, for the territorial seas prior to permit issuance. The regulations also state that an NPDES permit may be issued if the director, on the basis of available information, determines prior to permit issuance that the discharge will not cause unreasonable degradation of the marine environment. The EPA ODCE, and preliminary results from the MMS sediment study and the EPA Subsistence Study provide the basis for EPA's determination that discharges occurring under the final permit will not cause unreasonable degradation (see "Human Health" response on page 21 for further discussion of these studies).

Environmental Monitoring

Comment: Indigenous People's Council For Marine Mammals, and Trustees commented that the EPA's proposal to limit environmental monitoring to new facilities within 1500 meters of sensitive areas is inadequate given the potential for ongoing impacts at much greater distances from all of the discharging facilities. Since discharges can contaminate sediments with heavy metals and hydrocarbons up to 4000 meters away, it makes little sense to arbitrarily limit environmental

monitoring to distances from the discharges that have no correlation to actual observed effects elsewhere.

Response: The final permit has been changed to require environmental monitoring within 4000 meters of drilling operations that are subject to “Environmental Monitoring Requirements” at Part III.B.3. of the permit (i.e. new discharger of drilling muds and cuttings). This change is consistent with the requirements contained in the Arctic General Permit.

DRILLING MUDS AND CUTTINGS DISCHARGE

End-of-Well Reports

Comment: AOGA commented that end-of-well reports should be due 45 days after the toxicity laboratory results are received by the operator. In the past, toxicity reports have not been received until 45 days after the well was completed. This has created possible compliance problems with meeting the current 45-day reporting requirements. End-of-well samples should satisfy monthly sampling requirements.

Response: The final permit has been modified at Part III.B.2.b. to require that the data typically included in the end-of-well report be submitted 90 days after well completion. Part III.B.2.f. of the draft and final permit states that the end-of-well sample can also serve as the monthly monitoring sample.

Definition of Drilling Fluids

Comment: DOE, M-I, and INTEQ commend EPA for acknowledging that synthetic-based fluids are different from oil-based fluids, and not including synthetics in the prohibition of oil-based fluids. DOE, AOGA, Exxon, and other commenters expressed concern, however, that EPA’s definition of oil-based drilling muds, muds containing “fossil-derived petroleum hydrocarbons as the continuous phase” would exclude many synthetic-based fluids, since many synthetic-based fluids are derived directly or indirectly from petroleum hydrocarbons. AOGA specifically cited a low-toxicity synthetic-based mud (LCS) that is derived from natural gas, and offered a new definition of “oil-based drilling fluid” that clearly excludes all synthetic muds. Alternatively, AOGA requested that the term “non-aqueous fluids” be defined as any fluid that is not made from water, and that has a polynuclear aromatic hydrocarbon content of less than or equal to 0.1 percent as measured by EPA Method 1654A. M-I recommended that the National Ocean Industries Association (NOIA) work group consensus comments be adopted for definitions for water-based mud, oil-based mud, synthetic based mud and synthetic fluid in the permit.

Response: The EPA agrees that the definition of oil-based drilling muds in the draft permit was problematic because it did not clearly exclude all synthetic muds. Drilling fluid definitions in the final permit have been changed to incorporate the Coastal Effluent Guidelines definitions for both the offshore and coastal subcategories (61 FR 66120). The definition of "drilling mud" proposed in the draft permit has been removed from the final permit. The new definitions clearly

differentiate among the types of drilling fluids.

“Drilling Fluid” refers to the circulating fluid (mud) used in the rotary drilling of wells to clean and condition the hole and to counterbalance formation pressure. The four classes of drilling fluids are:

- (a) A water-based drilling fluid has water as its continuous phase and the suspending medium for solids, whether or not oil is present.
- (b) An oil-based drilling fluid has diesel oil, mineral oil, or some other oil, but neither a synthetic material nor enhanced mineral oil, as its continuous phase with water as the dispersed phase.
- (c) An enhanced mineral oil-based drilling fluid has an enhanced mineral oil as its continuous phase with water as the dispersed phase.
- (d) A synthetic-based drilling fluid has a synthetic-based drilling fluid has a synthetic material as its continuous phase with water as the dispersed phase.

“Enhanced Mineral Oil Drilling Fluid” means a petroleum distillate which has been highly purified and is distinguished from diesel oil and conventional mineral oil in having a lower polycyclic aromatic hydrocarbon (PAH) content. Typically, conventional mineral oils have a PAH content on the order of 0.35 weight percent expressed as phenanthrene, whereas enhanced mineral oils typically have a PAH content of 0.001 or lower weight percent PAH expressed as phenanthrene.

“Synthetic-based drilling fluid” means material produced by the reaction of specific purified chemical feedstock, as opposed to the traditional base fluids such as diesel and mineral oil which are derived from crude oil solely through physical separation processes. Physical separation processes include fractionation and distillation and/or minor chemical reactions such as cracking and hydro processing. Since they are synthesized by the reaction of purified compounds, synthetic materials suitable for use in drilling fluids are typically free of polycyclic aromatic hydrocarbons (PAHs) but test sometimes report levels of PAH up to 0.001 weight percent PAH expressed as phenanthrene. Poly (alpha olefins) and vegetable esters are two examples of synthetic materials used by the oil and gas extraction industry in formulating drilling fluids. Poly (alpha olefins) are synthesized from the polymerization (dimerization trimerization, tetramerization and higher oligomerization) of purified straight-chain hydrocarbons such as C₆-C₁₄ alpha olefins. Vegetable esters are synthesized from the acid-catalyzed esterification of vegetable fatty acids with various alcohols. The mention of these two synthetic fluid base materials is to provide examples, and is not meant to exclude other synthetic materials that are either in current use or may be used in the future. A synthetic-based drilling fluid may include a combination of synthetic materials.

Synthetic-Based Muds

Comment: (a) AOGA and M-I encouraged EPA to allow the discharge of synthetic-based muds (SBMs). M-I commented that the use of SBMs offers greater waste reducing capabilities than water based muds. SBMs also allow drilling in areas which now require oil-based mud. SBMs

also offer significant non-water quality advantages in the areas of air pollution, worker safety, reduction of potential spills and reduction in landfill usage.

Trustees commented that the mutagenic and carcinogenic potential of synthetic oils is greater than for natural crude oils. Trustees cited a National Academy of Science report which states that “the future use and discharge of these synthetic products should be monitored with care.” Trustees comments that the testing procedures proposed for the NPDES permit are totally unable to determine whether the discharges are having mutagenic or carcinogenic effects.

(b) M-I encouraged Region 10 to support the modification of the three tier method, as described in the NOIA consensus comments, in order to confirm the adherence to the discharge prohibitions of diesel-oil and mineral oil-based muds, as well as promote base fluids that contain no detectable levels of priority pollutants.

Response: (a) Although the draft permit proposed to allow the discharge of SBMs, the final permit does not allow the discharge of SBMs. The Coastal Guidelines, which were published after the draft permit was public noticed, contain new information indicating that the static sheen and toxicity tests may not be appropriate tests to determine compliance with the no free oil and toxicity limitations. The sheen and toxicity tests were developed for use on water based muds (WBM), which readily disperse in water, allowing components of the drilling fluid or contaminants to rise to the surface to give a sheen or partition to the suspended particulate phase and show toxicity. Conversely, the cuttings from synthetic based muds (SBM) sink to the sea floor with little or no dispersion in the water. When conducting toxicity tests on SBM, the aqueous phase typically remains clear, indicating little or no dispersion of drilling fluid. For this reason, EPA believes it may be inappropriate to measure only *aquatic* toxicity, as proposed in the draft permit, to determine the toxicity of SBMs.

SBM samples have been shown to pass the static sheen test following the addition of various levels of oil, crude oil, diesel oil and mineral oil. Results of this evaluation also showed that the sheen test appears to be more subjective and difficult to judge for the synthetics than for the water-based drilling fluids, due to the lack of dispersion of the synthetics in the aqueous phase, and due to the formation of sheens (or discoloration) which are not iridescent.

Because the two tests originally proposed to monitor the no free oil and toxicity limitations have been shown to be inappropriate for SBMs, and because appropriate tests have not yet been proposed by EPA, the discharge of SBMs is not allowed under the final permit. Development of technology-based effluent guidelines for SBMs is currently underway by EPA Headquarters, and is scheduled for proposal in December, 1998. If the final SBM Guidelines are promulgated prior to the expiration date of the Cook Inlet permit, the regulations at 40 CFR § 122.62 allow for modification of the permit.

Toxicity Test

Comment: AOGA recommended use of a partial toxicity test, which is conducted by exposing mysids to a 30,000-ppm solution instead of to the five dilutions needed to obtain an estimate of

the LC50. The partial test could save operators about \$1,500 per well.

Response: The permit has been modified at Part III.B.e.3. to state that the Permittee shall report pass/fail or 96-hour LC50 value on the DMR using either the full toxicity test or the partial toxicity test as specified at Appendix 2 to Subpart A of 40 CFR Part 435 *Drilling Fluids Toxicity Test*. If the partial toxicity test shows a failure, however, all testing of future samples from that well shall be conducted using the full toxicity test method to determine the 96-hour LC50.

Suspended Particulate Phase

Comment: ADEC commented that the permit should carry a definition for the term “suspended particulate phase,” which is abbreviated as SPP.

Response: The definition of SPP (suspended particulate phase) has been added to Part VII of the final permit.

Environmental Monitoring Exemptions

Comment: CIRCAC commented that EPA should evaluate the fate of drilling cuttings in Cook Inlet prior to granting exemptions to the environmental monitoring requirement for exploratory facilities. To date, EPA has only evaluated the fate of drilling *muds* in the Inlet. The natural dispersion and fate of drilling cuttings in the lower Inlet has not been established. DOE encouraged EPA to consider allowing a coordinated comprehensive study by an industry group as an alternative to having many individual operators conduct separate and uncoordinated monitoring studies. DOE also recommended that EPA review and comment on the study plans before the operators begin monitoring.

Response: The EPA agrees that the fate of drilling cuttings has not been evaluated, and that further information on cuttings fate is required prior to granting an environmental monitoring exemption. Part III.B.3.g. of the permit has been modified to state that Region 10 *may* grant an exemption (as opposed to *will* grant an exemption) to clarify that the exemption is not automatic. Any efforts by industry to coordinate environmental monitoring activities are fully supported by EPA, but are not a permit requirement. EPA review of environmental monitoring plans is included in Part III.B.3.b. of the draft and final permit.

Monitoring of Oil Content in Muds and Cuttings

Comment: AOGA supports the removal of the 10 percent by weight limitation of the oil content of cuttings, as this requirement is inconsistent with the offshore guidelines. Unocal and AOGA commented that since the oil content is already limited by the no free oil requirement, the requirement for monitoring oil content in drilling fluids should be removed from the permit. The basis for this requirement is unclear, and not consistent with past rulemakings.

Response: This requirement has been removed from the permit. Measurement of the oil content of cuttings was required in the 1986 Cook Inlet permit in order to determine compliance with the 5% and 10% (wt) limit on drill cuttings. BAT for muds and cuttings in offshore and coastal waters, however, is no discharge of free oil, as measured by the static sheen test. The prohibition

on the discharge of free oil appears to be the more stringent limitation, as data indicates that visible sheen can be caused by as little as one percent oil (50 FR 34592).

Mud Plan

Comment: DOE, AOGA and numerous other commenters stated that a mud plan requirement is not necessary to comply with the 30,000 ppm SPP limit, and that the mud plan should serve as a guide for compliance with the permit. AOGA also commented that inclusion of the mud plan exceeds the Agency's authority. M-I commented that the mud plan does not represent BMP, does not achieve the goals of the Pollution Prevention Act, does not achieve the goals of the Paperwork Reduction Act, nor meet EPA's policy guidelines for implementation of regulatory control. Additional detailed comments, which are not summarized here, were submitted by AOGA and M-I regarding the inappropriateness of the proposed mud plan. RDC stated that clarification of the mud plan was needed in order to understand what would constitute a violation. CIRCAC strongly supported the inclusion of the mud plan requirement.

Response: The EPA has removed the mud plan requirement from the permit. The intention of the mud plan was to provide a format for planning and using a mud/additive system in compliance with the permit. In the 1986 permit, the responsibility for conducting case-by-case evaluations of individual muds systems rested on the EPA. The final permit, however, not only shifts that responsibility to the operators, but contains a 30,000 ppm SPP BAT limit promulgated for the coastal oil and gas industry. The EPA is confident that the 30,000 ppm SPP limit, which was not contained in the 1986 Cook Inlet permit, in combination with BMP requirements, will result in continued efforts by Permittees to minimize the toxicity of drilling fluids.

Chemical Inventory

Comment: AOGA commented that the contents of drilling fluids are regulated through the requirements for toxicity, no diesel, no free oil and mercury and cadmium limits in the stock barite. These data are routinely collected by operators, but have not been used in past rulemakings. It is unclear how EPA will use this information. Since these data are collected by operators as standard operating procedures, it may be more appropriate for this information to be made available upon the agency's request if a future use is identified.

Response: Part III.B.2.a of the final permit still requires that the Permittee maintain a precise chemical inventory of all constituents added downhole, but no longer requires that this information be submitted to the EPA. A requirement to maintain these records for a period of five years, and to make these records available to the EPA upon request, has also been added to the permit. The information may be used by the EPA in the future to aid in development of discharge limitations, or to aid in future environmental impact analyses. Because the information is not used regularly, however, the EPA agrees that submission of the data, except upon request, is not necessary.

Metal Analysis:

Comment: AOGA questioned whether metal analysis is required for all mud systems, or only for if a mineral oil pill is used and on end-of-well samples. If the proposed requirement applies to all

drilling fluids, AOGA encourages EPA to eliminate this permit condition. An explanation of the rationale to support this data collection is also requested.

Response: The permit has been modified to require only total recoverable metals analysis; and has been clarified to require metals analysis for all mud systems. As discussed in the ODCE²¹, total recoverable data is needed for drilling muds in order to evaluate compliance with water quality standards.

Dual-Laterals

Comment: AOGA requested clarification on whether a dual-lateral well is considered one or two wells for the purposes of permitting and administration. Dual-laterals involve drilling a primary well bore and then kicking off and drilling a second leg. Generally, one mud system is used on both legs of the well, and the second well is limited in length when compared to the total depth of the first leg.

Response: Part III.B.1, footnote 2 has been modified to state that dual-laterals are considered to be one well.

DECK DRAINAGE

Commingling Deck Drainage with Produced Water

Comment: AOGA requested that deck drainage flow be monitored and reported on the monthly DMR for only those discharges that are not commingled with produced water. Unocal asked for clarification of the monitoring requirements when deck drainage is combined with produced water. At Part III.C.3., the draft permit states that any deck drainage which is commingled with other wastes prior to discharge shall be subject to the most stringent of the limitations. Unocal states that it is not clear which limitations are most stringent, but suggested that such commingled effluent be subject to the produced water limitations (and that a static sheen test not be required).

Response: The language at Part III.C. has been modified to state that if deck drainage is commingled with produced water, then this discharge shall be considered produced water for monitoring purposes; redundant language referencing the application of produced water effluent limitations was also removed from footnote 3 in Part III.C., and from Part III.F.2. The requirement to report the estimated volume of deck drainage does, however, remain. This modification clarifies that a static sheen test is not required if deck drainage is commingled with produced water. Oil and grease is the primary pollutant controlled by the prohibition on the discharge of free oil. The EPA considers the oil and grease limitation for produced water to be a more stringent control on deck drainage than the static sheen test.

The EPA also clarified the language addressing the commingling of produced water with workover, completion, well treatment and test fluids. The language at Part III.G. has been made consistent with deck drainage commingling by stating that if workover, completion, well treatment or test fluids are mixed with produced water, then this discharge shall be considered produced water for monitoring purposes. This language change does not change the permit

requirements at Part III.G.

Visual Sheen

Comment: AOGA requested that for those facilities using a top-deck-drain effluent tank, that a visual sheen observation be used in place of the “grab/static sheen test” when ice conditions exist in Cook Inlet.

Response: The regulations at 40 CFR § 435.43 place a “no discharge of free oil” limitation on the deck drainage waste stream. The definition of “no discharge of free oil” at 40 CFR § 435.41(u) states that the presence of free oil may be determined through either measurement of the visual sheen on the receiving water *or* the static sheen test. AOGA did not provide adequate information to the EPA to indicate whether or not their proposal is equivalent to the regulatory requirements, therefore no changes to the methodology have been made in the final permit. The permit has been clarified, however, by adding “static sheen” to the required sample methods at Part III.C.1., clearly giving the Permittee the choice to use the static sheen at periods of low visibility (e.g. night, fog).

Unstaffed Facilities

Comment: AOGA requested that testing and reporting requirements not be applied to suspended or unstaffed facilities. Currently the operation of two Cook Inlet platforms has been temporarily suspended. Planning is underway to operate one of these as an unstaffed facility, which would be secured and inspected periodically by the operator. The potential of contamination of stormwater is minimal to none. Chemical usage and presence would be minimal, since no daily activities would take place. Any necessary fuel or chemical products would be stored in secured areas to prevent freezing and eliminate release from the platform. Typical rain and snowmelt from the roof and decking would not come into contact with contaminants, and discharge of this water should be allowed with no requirements. Visual sheen inspections and records of discharge would not be possible because no personnel will be on the platform.

Response: The EPA agrees that the potential for stormwater contamination at unstaffed facilities is minimal, and that monitoring should not be required. This modification has been made to the permit at Part III.C.4. Written notification that a facility is no longer staffed must be provided to EPA prior to terminating the monitoring requirements at Part III.C.

WET requirement

Comment: Niniichik recommended that the WET requirement apply to new exploratory facilities, as well as production facilities. AOGA, Shell and numerous other commenters oppose the proposed requirement for production platforms to conduct WET analysis on deck drainage not commingled with produced water. The EPA considered and rejected additional controls on deck drainage during development of the coastal guidelines. Additional regulation of this waste stream would result in significant costs, and the technological difficulties are considerable. Since effluent volume is minimal, additional regulation is not reasonable when considering the cost and the associated benefits. AOGA also commented that this proposed requirement is not consistent with recently issued NPDES permits for oil and gas operators in other regions of the United States.

The requirement to collect these samples during the wettest times of the year, and during peak deck-drainage flow will be difficult to determine since precipitation can vary significantly from year to year. It is also unclear why the proposed permit requires the samples to be captured during greatest rainfall and greatest snowfall. On all the platforms, the upper decks, which are exposed to rainfall or snowfall, are generally kept free from oil and other contaminants. The basis of the proposed sampling time - the buildup of contaminants on upper decks until a significant rainfall - is flawed.

Response: The EPA has reduced the toxicity monitoring requirement to one sample that will be collected during the first year of the permit (or the first year of discharge for new exploratory platforms, or existing platforms that initiate deck drainage discharge separate from the produced water wastestream after the first year). Because the pollution prevention opportunities discussed below are also applicable to exploratory facilities, the toxicity requirement has been expanded to include exploratory platforms.

Oil and grease are the primary pollutants identified in the deck drainage waste stream. In addition to oil, various other chemicals used in drilling and production operations may be present including drilling fluids, ethylene glycol lubricants, fuels, biocides, surfactants, detergents, corrosion inhibitors, cleaners, solvents, paint cleaners, bleach, dispersants, coagulants, and any other chemical used in the daily operations of the platform. Because the pollutant concentrations can vary widely from place-to-place and over time, it is not practical to establish water quality based limits for this waste stream. The intent of the proposed WET requirement is to estimate the toxicity of the deck drainage.

Rather than conducting WET monitoring for the life of the permit, it is anticipated that pollution prevention and product substitution in the deck drainage waste stream be specifically addressed in the BMP. The EPA hopes that the BMP requirement will encourage facilities to maximize the removal of oil and grease, and minimize the addition of pollutants (e.g. cleaners, bleach and other chemicals used as part of daily operations) to the deck drainage waste stream. The EPA will examine the toxicity results, and the plan to reduce toxicity documented in each facility's BMP. If toxicity levels above the state water quality standard are found in this waste stream, and the permittees have not taken adequate action to reduce this toxicity, the EPA will consider reopening the permit to require further monitoring. The requirement to sample during the first significant rainfall and once during snowmelt has been changed to a requirement to sample during a significant rainfall or snowmelt. The deck drainage flow which occurs during a significant rainfall or snowmelt will minimize the residence time in the treatment system, which is expected to maximize the concentration of oil and grease.

Separation of Contaminated and Uncontaminated Deck Drainage

Comment: AOGA commented that EPA did not include best management practices (BMPs) for this waste stream as part of the coastal guidelines. Given that the proposed permit requires that deck drainage drain systems separate contaminated deck drainage from uncontaminated deck drainage, and that the contaminated deck must also be processed through an oil-water separator tested for sheens before discharge, additional BMPs are not needed for this waste stream. DOE

commented that the required separation of contaminated and uncontaminated deck drainage be removed from the permit, and that such practices be left to the operators' discretion as long as discharges comply with the no free oil limit.

Response. The requirement to separate contaminated and uncontaminated deck drainage is present in the 1986 Cook Inlet General Permit, and is present in permits issued by Region 10 for operations in Arctic waters. Operators have not expressed an inability to comply with the requirements. Furthermore, it is a basic principle of pollution prevention to separate contaminated streams from clean streams to minimize the volume of material needing treatment. The requirement has been maintained in the final permit.

Deck Drainage From Onshore Facilities

Comment: AOGA interpretation of the permit is that contaminated deck drainage from onshore facilities may be commingled with produced water and discharged.

Response: The EPA agrees with this interpretation

SANITARY WASTE DISCHARGE

Clarification of Sanitary Monitoring Requirements

Comment: ADEC requested clarification of the monitoring requirements for MSDs.

Response: The effluent limitation table at Section III.D.1. has been rearranged in order to clearly differentiate between the biological treatment units and the MSDs, and between those facilities staffed by nine or fewer persons, and by ten or more persons. After the table was rearranged, footnotes 1, 4 and 9 were no longer needed and were deleted from the final permit.

The following definitions were obtained from the *Final Effluent Limitations Guidelines and Standards for the Coastal Subcategory*²² and have been added to Part VII (Definitions), and used in the effluent limitations table at Part III.D.

"M9IM" means those facilities continuously manned by nine (9) or fewer persons or only intermittently manned by any number of persons.

"M10" means those facilities continuously manned by ten (10) or more persons.

Total Suspended Solids

Comment: ADEC commented that for the sanitary discharge, the parameter suspended solids is typically designated "total suspended solids" and is usually abbreviated as TSS. The proposed permit, however, used the abbreviation "SS," which is generally reserved for the parameter settleable solids.

Response: The designation for "total suspended solids" has been changed to "TSS" in the final

permit

BOD and TSS limits for MSDs and M9IM Biological Treatment Units

Comment: (a) AOGA specifically requested that the proposed BOD limitation, and the TSS monitoring requirements for MSDs be removed from the permit. ADEC, SWEPI, and Phillips stated that the operation of MSDs is currently regulated under Section 312 of the Clean Water Act by the U.S. Coast Guard, and no additional requirements should be placed on these treatment units in the permit.

(b) For both MSDS and biological treatment units, AOGA commented that compliance with the existing permit limitations is a significant concern to Cook Inlet operators. Given that the weekly sampling frequency will require compliance with the more stringent 30 mg/l limit, compliance with the proposed limit will be even more difficult. Unocal commented that the proposed sanitary discharge limitations will force Unocal to add additional treatment facilities and eliminate sanitary discharges on many of the platforms.

AOGA commented that the BOD and TSS limitations in the 1986 permit are not supportable for biological treatment units with fewer than ten people. AOGA referenced the 1976 EPA document “Development Document for Interim Final Effluent Limitations guidelines and Proposed New Source Performance Standard for the Oil and Gas Extraction Point Source Category,” which stated that:

The most common biological system applied to offshore operations is aerobic digestion or extended aeration processes. These biological waste treatment systems have proven to be technically and economically feasible means of waste treatment at offshore facilities which have more than ten occupants and are continuously manned.

Response: (a) The Cook Inlet facilities are not vessels, and are therefore not subject to regulation under Section 312 of the CWA.

(b) The TSS and BOD limitations in the 1986 permit and the draft 1995 permit are technology-based treatment requirements from the Alaska Wastewater Disposal regulations (18AAC72). Section 402(o) of the Clean Water Act establishes anti-backsliding rules for situations where a permittee seeks relaxation of an effluent limitation which is based upon a State treatment standard. Section 402(o), as it applies to state treatment standards, prohibits backsliding except in certain limited circumstances. Section 402 (o)(2)(E) states that a permit may be reissued to contain less stringent effluent limitations if

the permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit and has properly operated and maintained the facilities but has nevertheless been unable to achieve the previous effluent limitations, in which case the limitations in the reviewed, reissued, or modified permit may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit renewal, reissuance, or modification).

After reviewing available data for both MSDs and M9IM biological treatment units, the EPA has determined that even with proper operation and maintenance, the permittee has been unable to achieve the TSS and BOD limits contained in the previous permit. MSDs typically are designed to meet U.S. Coast Guard requirements of 150 mg/l TSS. The data available for biological treatment units indicates that fluctuations in staff that often occur at platforms staffed with less than 10 people often result in TSS and BOD violations. The EPA has modified the TSS and BOD limitations to reflect the level of pollutant control actually achieved, as discussed below.

M9IM Biological treatment units: EPA has reviewed 130 TSS and BOD data points for the Anna, Baker, Bruce, and Dillon platforms. Each of these platforms regularly discharged sanitary waste from 1992-1994, each uses a biological treatment system, and each typically has less than 10 people on board. Also, each of these platforms has primarily potable water flowing through their units, which is important because use of seawater would elevate the TSS levels. Data collected after February, 1995 is not representative of operations and was not included in this analysis. After this date, sanitary waste was routinely hauled to shore from some of the platforms in order to achieve compliance with the TSS and BOD limits in the permit.

“Outliers” which were identified in the DMRs as being caused by unusual conditions were eliminated from the data set. Existing data were used to calculate the mean, standard deviation, coefficient of variation, and sigma values for BOD and TSS. The mean value was assumed to represent a long term average value, and was used to determine whether less stringent AMLs and MDLs are appropriate, and if so, to calculate what those limits would be. The following limits were calculated:

	TSS	BOD
maximum daily limit	108 mg/l	90 mg/l
average monthly limit	56 mg/l	48 mg/l

These new TSS and BOD limitations have been incorporated in the final permit for biological treatment units on platforms with 9 persons or less, and for those platforms that are intermittently staffed (M9IM). The TSS and BOD limitations for platforms staffed by 10 or more persons (M10) remains unchanged.

MSDs: As discussed above, Section 402(o) prohibits backsliding except in certain limited circumstances. Under no circumstance, however, may the TSS and BOD limits be removed from the permit. The draft permit proposal to substitute TSS monitoring for TSS limitations was therefore in error, and TSS limitations have been included in the final permit for MSDs.

The EPA has reviewed 84 TSS and BOD data points from Shell A, Shell C, Steelhead and Granite Point platforms, each of which uses an MSD for treatment of sanitary waste. EPA looked at the data from all four facilities, and also looked separately at data from the M9IM facilities (Shell A and Shell C) and the M10 facilities (Steelhead and Granite Point). These four facilities were chosen because there are no other facilities that use MSDs without additional biological

treatment, and that routinely discharge (rather than reinject) their sanitary waste. Although Steelhead usually reinjects, their data from 5 months of discharge in 1996 was added to the data set.

“Outliers,” which were identified in the DMRs as being caused by unusual conditions, were eliminated from the data set. Existing data were used to calculate the mean, standard deviation, coefficient of variation, and sigma values for BOD and TSS. The mean value was assumed to represent a long term average value, and was used to determine whether less stringent MDLs and AMLs are appropriate, and if so, to calculate what those limits would be.

For BOD, calculations indicate that the limitations contained in the draft permit can be met by existing MSDs. The final permit therefore contains BOD limitations of 30 mg/l AML and 60 mg/l MDL, as proposed in the draft permit. For TSS, however, the following limitations were calculated:

	TSS
maximum daily limit	67 mg/l
average monthly limit	51 mg/l

The EPA considered calculating separate limitations for M10 and M9IM facilities. The mean TSS values for the two M10 facilities (Steelhead and Granite Point) was found to be 31 mg/l. The means TSS for the two M9IM facilities (Shell A and C) was 28 mg/l. The performance of these two categories is so similar, that the EPA determined that there is no need to calculate separate limitations.

TSS Intake Credits for Biological Treatment Units

Comment: (a) AOGA commented that the proposed TSS influent credit will not significantly affect the final TSS concentration for biological treatment systems at Anna, Baker, Bruce & Dillon, since the influent makeup water has little or no TSS.

(b) Niniichik asked how the measurements for intake pollutants will be performed, and whether an easy-to-read report on those measurements will be available to the public.

Response: (a) For biological treatment units, this permit limitation has been modified to make the influent credit optional. In this way, facilities that don't need an intake credit are not burdened with the additional monitoring of the influent stream. EPA is aware, however, that some facilities (e.g. Tyonek A) use seawater in their biological units and want to use the proposed influent credit.

The permit has been clarified by replacing the proposed variable limit (e.g. $60 \text{ mg/l} + \text{TSS}_{\text{intake}}$) with a *net* limit (e.g. 60 mg/l). This change also eases the tracking and recording of compliance data. Footnote text has been added which states

The TSS limitation is a net value. The net TSS value is determined by subtracting the

TSS value of the intake water from the TSS value of the effluent. Report the TSS value of the intake water in the comment section of the DMR. For those facilities that use filtered water, the TSS of the effluent may be reported as the net value.

Samples collected to determine the TSS value of the intake water must be taken on the same day, during the same time period that the effluent sample is taken. Intake water samples must be taken at the point where the water enters the facility prior to mixing with other flows.

An intake credit has not been included for MSDs because the intake seawater is routinely filtered prior to entering the MSDs.

(b) The EPA wishes to clarify that intake credits were proposed only for TSS, not for any other pollutants. The intake values for TSS will be measured using the same analytical method used for the effluent TSS values. Results of all analytical tests are available to the public. Written requests should be directed to the FOIA Coordinator, USEPA Region 10, OW-133, 1200 - Sixth Avenue, Seattle, Washington 98101.

TRC and Fecal Coliform Monitoring

Comment: AOGA recommended that the requirement for fecal coliform and total residual chlorine (TRC) monitoring of MSDs be removed from the final permit. MSDs are regulated by the U.S. Coast Guard, which appropriately determined that annual testing for fecal coliform and TSS is sufficient to determine if the devices are working properly. Any facility which operates and maintains a MSD in compliance with Section 312 of the Act should be considered in compliance with all sanitary permit limits.

CIRCAC commented that mechanical limitations of biological treatment units make it difficult for dischargers to control chlorine concentrations in their sanitary waste. CIRCAC and ADEC recommended the permit eliminate use of chlorine in these systems. CIRCAC recommended implementing a fecal coliform mixing zone or end-of-pipe standard instead.

Response: As discussed on earlier (response to "BOD and TSS limits for MSDs and M9IM Biological Treatment Units" on page 36), the Cook Inlet facilities are not vessels, and are therefore not subject to regulation under Section 312 of the CWA. The technology-based Effluent Guidelines for the Coastal Oil & Gas industry²³ require a residual chlorine level of at least 1 mg/l, maintained as close to this concentration as possible, for all M10 facilities. This TRC limitation has therefore been incorporated into the final permit for M10 MSDs and biological treatment units, with a monthly sampling frequency.

While chlorine serves to disinfect the sanitary waste prior to discharge, chlorine is also a pollutant that, in elevated concentrations, can have toxic impacts to aquatic life. The ADEC has granted mixing zones for residual chlorine (see Appendix B). The mixing zones extend from the marine bottom to the surface. Outside the boundary of these mixing zones, residual chlorine must not exceed 2µg/l, the applicable state water quality standard. The EPA utilized the ADEC authorized

mixing zones to calculate end-of-pipe TRC limitations for all facilities discharging sanitary waste under the final permit. To calculate the permit limits, the following data sets were used:

Biological treatment units: TRC data for Anna, Baker, Bruce and Dillon from 9/93 to 1/96.

MSDs: TRC data from Monopod, Steelhead and Grayling from 1/93 to 6/94. More recent MSD data were not available, as monitoring and reporting of TRC data was not required under the 1986 permit, and generally was not monitored or reported after 1994.

Using the methodology recommended by the TSD, the following permit limits were calculated for the biological treatment units and MSDs: daily maximum of 19 mg/l, and monthly average of 9 mg/l. The permit limits for the biological treatment units and the MSDs are identical because of the similarity between the coefficient of variations (CVs) and the mixing zone dilutions for both types of treatment. For example, the following CVs were calculated: 1.79 for the biological treatment units, and 1.67 for the MSDs. The dilutions authorized by the ADEC mixing zones were also similar: 1:9574 for the biological treatment units, and 1:9657 for MSDs.

The EPA has incorporated these TRC limitations into the final permit at Part III.D.1. The EPA realizes that incorporating both a minimum and a maximum TRC limit into the final permit may require dischargers to monitor their sanitary treatment operations more closely than they have previously. If operators decide to install dechlorination equipment, samples may be collected upstream and downstream of the dechlorinator to determine compliance with the technology-based limitations and the water quality based limitation, respectively.

The ADEC has also required that all facilities discharging sanitary waste collect monthly fecal coliform data for one year beginning with the first month of permit coverage. Section III.D.3. has been modified to require that a facility specific mixing zone application be submitted to ADEC based on the first 12 months monitoring data within 18 months after the effective date of the permit.

Monitoring Frequency for Sanitary Treatment Units

Comment: ADEC recommended that the monitoring frequency for the sanitary discharge be monthly instead of weekly as in the draft permit. Because of the low volume of this discharge and the nature of the receiving water, a monthly monitoring schedule seems appropriate for insuring adequate operation and maintenance of the facility's sewage treatment plants. AOGA strongly objected to increasing the monitoring frequency from monthly to weekly. CIRCAC commented that frequency of BOD and TSS testing should be based on sanitary waste stream volumes, and that sampling frequency at low volume facilities should be reduced to monthly as found in the 1986 permit. Phillips objected to the proposed weekly monitoring frequency. The EPA has over 10 years of data for sanitary waste discharges available to address any compliance concerns. Sanitary monitoring costs would increase approximately \$214 per month per platform, not including handling and transportation, due to the increased frequency, with no added benefit.

Response: The final permit contains monthly monitoring requirements for BOD, TSS, chlorine and fecal coliform. The EPA agrees with ADEC's comment that, even at the most populated platforms, the sanitary discharge volume is small enough that a monthly monitoring schedule is appropriate for ensuring adequate operation and maintenance of the facility's sewage treatment plants. Sanitary flow rates range from approximately 200 to 2500 gallons per day.

Weekly Average for BOD and TSS

Comment: ADEC commented that the proposed weekly average limitation of 45 mg/l for BOD and TSS is inappropriate, and inconsistent with the Arctic General NPDES. Footnote #8 states that each weekly sampling value will be subject to both the daily maximum (60 mg/l) and the weekly average (45 mg/l) criteria. Since the frequency of monitoring is weekly, ADEC does not believe that the result of a single sampling event should have an average criterion applied to it, but should be considered an instantaneous value, with the daily maximum criterion applied as the appropriate numerical limitation. This is the method generally used by ADEC when issuing wastewater disposal permits under State authority.

Response: As discussed in the previous comment, the final permit contains monthly monitoring requirements for BOD and TSS. The EPA agrees that applying a weekly average limitation (45 mg/l) to these samples is inappropriate. The weekly average limitation has been removed from the final permit limit. The monthly BOD and TSS samples are subject to daily maximum (60 mg/l) and monthly average (30 mg/l) limitations.

Floating Solids

Comment: Unocal commented that due to the extreme tidal ranges and fast current speeds of Cook Inlet, and the fact that discharges occur beneath the surface of the receiving water, the visual observation for floating solids is impractical. The gray color and speed of the moving water make observations unlikely to ever detect floating solids regardless of their origin.

Response: The "no floating solid" requirement is unchanged in the final permit. It is the responsibility of the discharger to ensure that floating solids are not present in the effluent, even if visual observation of the effluent is impractical. The EPA encourages the permittees to optimize the efficiency of their sanitary treatment units as one method of ensuring that floating solids are not present in the discharge.

Inter-laboratory Variability in TSS and BOD analyses

Comment: AOGA is concerned about the high degree of variability inherent in the TSS and BOD analyses. AOGA requests clarification on how EPA will consider analysis variability during compliance actions.

Response: All effluent samples are subject to compliance with the limitations contained in the permit, regardless of the inherent variability of the analytical method.

Comparison with the City of Anchorage

Comment: SWEPI and numerous public citizens commented that all discharge sources should be

held to the same standards, and compared the relatively small volume of Cook Inlet sanitary discharges with the city of Anchorage, which has less stringent limits than those proposed in the draft permit.

Response: Permit limitations can be based on technology-based standards that vary among industrial categories, and water quality standards that change over time. Facilities with older permits may also contain limitations different than those limitations placed in current permits. The draft Cook Inlet permit has been developed based on all current applicable technology-based and water quality-based standards. The suggestion that sanitary limitations in the Cook Inlet permit be made less stringent simply because another discharger is allowed to discharge higher levels of waste overlooks the statutory and regulatory requirements which drive permit development, and is contrary to the EPA’s goal to minimize the discharge of pollutants.

PRODUCED WATER

Rerouting Platform Discharge to a Shore-Based Facility

Comment: AOGA and Unocal commented that the Anna and Bruce platforms have historically sent small volumes of produced water to the onshore treatment facilities of Granite Point; similarly, the Baker and Dillon platforms have historically sent small volumes of water to the East Foreland Production Facility. The volume of water sent to the onshore facilities varies depending on the status of the produced-water treatment systems on the platforms, but the volume is usually very small. Larger volumes of fluid may be discharged for several days for various reasons. AOGA pointed out that the nature of the produced water within a field does not vary significantly, and the nature of the discharge from the onshore facilities does not vary greatly. The permit should allow discharge of produced water from the on-shore facilities as needed to prevent upsets and bypasses at the platforms.

Response: The EPA agrees that, in situations where the platforms are not able to treat produced water and a bypass may occur, it is preferable to route the discharge to a shore-based facility than to bypass the treatment system on the platform. The daily maximum discharge limitations for produced water are different for each of these 6 dischargers, as illustrated below.

	Arsenic	Zinc	TAH	TAqH	WET
East Foreland	2900 µg/l	no limit ¹	61,800 µg/l	92,700 µg/l	115 TUc
Baker	no limit ¹	16,700 µg/l	no limit ¹	no limit ¹	100 TUc
Dillon	no limit ¹	7,980 µg/l	59,300 µg/l	88,900 µg/l	174 TUc

	Arsenic	Zinc	TAH	TAqH	WET
Granite Point Prod. Facility	no limit ¹	no limit ¹	63,700 µg/l	no limit ¹	133 TUc
Anna	no limit ¹	no limit ¹	86,000 µg/l	129,000 µg/l	486 TUc
Bruce	no limit ¹	no limit ¹	298,000 µg/l	no limit ¹	912 TUc

¹ “no limit” means that there is no limitation for this pollutant in the final permit

For each of the two on-shore facilities, permit limitations exist which are similar to permit limitations for the platforms. For example, the East Foreland facility contains limitations for TAH, TAqH and WET that are similar to the Dillon platform limitations, and limits two pollutants (TAH and TAqH) that are not limited at the Baker platform. Similarly, the Granite Point Production Facility contains limitations for TAH and WET that are similar to, or more stringent than limitations at Anna and Bruce. There are two pollutants that are limited at one or more of the platforms, but are not limited at the shore-based facility (i.e. East Foreland does not limit zinc, and Granite Point PF does not limit TAqH). The EPA believes, however, that existing effluent limitations at the shore-based facilities are adequate to monitor the water quality of produced water that may occasionally come from the platforms. The permit has been modified at Part III.F.2. to reflect this change, and contains the following reporting requirement: the Permittee shall report rerouting by telephone or facsimile within 24 hours of rerouting, and shall provide a written submission within five days of rerouting that describes why rerouting was necessary, and the anticipated time that rerouting is expected to continue. The Permittee is required to cease rerouting as soon as possible.

Increase in Produced Water Pollutant Loading

Comment: Trustees commented that the permit may actually increase pollutant loading to Cook Inlet through produced water discharges due to the expected increase in the ratio of produced water to recoverable petroleum product over the life of a producing well. It was recommended that any analysis of the reduction of toxics in produced water must consider the increase in volume of produced water discharges.

Response: The final permit is designed to comply with technology-based requirements and state water quality standards which are based on regulating the concentration of pollutants in the discharge, not the total pollutant loading of the discharge. The permit therefore allows for an increase in volume of produced water over the life of a producing well. If an increase in volume occurs that results in a failure to meet state water quality standards, modification of the permit is authorized at 40 CFR § 122.62(a)(2).

Produced Water Flow Rate

Comment: AOGA requested that the requirement for daily flow rate estimates be removed from the permit, since day-to-day discharge volumes do not vary significantly in any given month.

Clarification of “daily average” was also requested, since the average daily flow is usually listed as the monthly average.

Response: The produced water flow monitoring requirement has been changed in the final permit to require weekly flow monitoring, and monthly average flow reporting. The EPA agrees that daily flow monitoring is not required, since the day-to-day discharge volumes do not vary significantly in any given month.

Produced Water Oil & Grease Limits

Comment: Trustees stated that EPA has ignored evidence in the record that shows that the proposed oil and grease limits for produced water are far from what the vast majority of Cook Inlet discharges can achieve. For example, recent data from the Trading Bay facility, from which more than 90 percent of the produced water discharged into Cook Inlet flows, illustrated that oil and grease concentrations reached a maximum of only 14 mg/l, with a mean of 12.3 mg/l. The proposed permit limits, however, are 29 mg/l and 42 mg/l as monthly average and daily maximum concentrations.

Response: In 1997, EPA promulgated technology-based effluent limitations for the coastal oil and gas industry²⁴ that place BAT oil and grease limits of 29 mg/l and 42 mg/l (monthly average/daily max) on the produced water waste stream. These limitations apply to all dischargers (except Phillips A which is already operating under more stringent limitations), and are significantly more stringent than the 48 mg/l and 72 mg/l limits contained in the 1986 Cook Inlet permit. EPA’s authority to develop BPJ effluent limits is limited to situations where EPA-promulgated effluent limitations are inapplicable (*see* 40 CFR §125.3(c)(2)), so BPJ limitations can not be developed for Trading Bay.

Oil and Grease Sample Type

Comment: AOGA recommended that facilities be given the option to collect either 1 oil & grease sample, or to average the results of 4 grab samples. AOGA and DOE believe the definition of "composite sampling" in the draft permit is inconsistent with 40 CFR 136. (AOGA page 4-11)

Response: The EPA agrees that composite sampling is inappropriate for oil and grease samples.²⁵ Monitoring requirements for produced water (Part III.F.1) and completion, workover, well treatment and test fluids (Part III.G.1.) have been modified to state that oil and grease can be measured by collecting one grab sample, or by averaging four separate samples that have been collected within a 24 hour period. The definition of “composite sample” has been removed from the final permit.

Monitoring Frequency

Comment: (a) AOGA states that Cook Inlet platforms have been improperly classified as “major” facilities, and requests that the NPDES Non-Municipal Permit Rating System be utilized to downgrade the facilities from “major” to “minor” dischargers. As “minor” dischargers, the facilities would qualify for reduced frequency of monitoring for most categories of pollutants.

(b) AOGA, ADEC, Shell and numerous other commenters stated that the draft permit proposes significant increases in the volume of monitoring, sampling, and analysis for produced water, and that a significant increase in the cost and administrative burden of implementing the permit will result. AOGA recommended that monitoring frequencies based on flow volume, similar to those in the Gulf of Mexico permit be used (0 to <499 bpd require annual monitoring; 499 to 4599 bpd require quarterly monitoring; >4599 bpd require monthly monitoring). AOGA also argued that sampling frequency should be reduced because the mixing zones are based on the maximum concentrations for each facility, and the chances of violating the water quality standards at the edge of the mixing zone are minimal.

CIRCAC commented that the WET testing requirements are excessive, and recommended monthly testing for at least a year, with a possible reduction in testing frequency after a facility goes 12 months without an exceedance.

ADEC commented that the monitoring schedule for oil & grease, pH, copper, arsenic, zinc, TAH, and TAqH is excessive and not justified since the quality of produced water with respect to hydrocarbon content is fairly consistent, based on a comparison of 1989 and 1995 data. The treatment processes are simple physical processes and not subject to wide treatment fluctuations, as would be the case for a biological process. ADEC recommends that the monitoring frequency be reduced from monthly to quarterly for WET, and from weekly to monthly for all other parameters. Alternatively, the monitoring frequency could be based on flow volume. Facilities with discharges over 1 mgd would sample on a monthly bases, and facilities with discharge volumes of less than 1 mgd could sample on a quarterly basis.

Response: (a) The three shore-based facilities covered under the Cook Inlet permit are currently classified as “major” facilities, while the platforms are currently classified as “minor” facilities. Classification as a minor facility, however, does not necessarily mean that monitoring requirements will be less rigorous than major facilities.

(b) There is no fixed guidance on establishment of monitoring frequencies. Monitoring frequency determinations are case-specific, and need to consider a variety of factors including type of treatment process; environmental significance; cost of monitoring relative to the discharger’s capabilities and benefit obtained; compliance history; number of monthly samples used in developing the permit limit; and effluent variability.

The EPA agrees that utilizing flow volume to determine monitoring frequency is appropriate for the Cook Inlet permit. Flow volumes among Cook Inlet operators vary from 2,000 gallons per day at the Tyonek platform to 5,000,000 gallons per day at Trading Bay. An increased monitoring frequency at Trading Bay acknowledges the increased environmental significance associated with any single permit violation. The EPA does not agree, however, that the monitoring frequencies contained in the Gulf of Mexico permit are necessarily appropriate for Cook Inlet. The Gulf of Mexico permit requires monthly monitoring for 10% of platforms, which was statistically determined to be those platforms with volumes greater than 4600 bbl/day. The EPA agrees that the request for flow-based frequencies is reasonable, and has used site-

specific flow data to determine the monitoring frequencies.

All of the Cook Inlet facilities currently discharge well under 1 mgd except for Trading Bay, which discharges over 5 mgd. The EPA has placed the following monitoring requirements in the final permit:

Daily Discharge Rate	TAH, TAqH, and Metals monitoring frequency	WET monitoring frequency
>1 mgd	weekly	quarterly
<1mgd	monthly	annual

Trading Bay routinely discharges over 5 mgd, and is currently the only discharger subject to the more rigorous monitoring requirements. Rigorous monitoring requirements have been maintained at Trading Bay because of the relatively large volume of pollutants discharged from this location daily. Monitoring requirements for all other facilities, which range from 2,000 gpd at Tyonek to over 150,000 gpd at Dillon, have been decreased to monthly because of the substantially decreased threat of harm to the environment posed by any single permit violation, when compared to a facility discharging greater than 1 mgd. For WET, annual monitoring is required at platforms which discharge less than 1 mgd, and quarterly monitoring is required for facilities that discharge greater than 1 mgd. The EPA has determined that decreasing the proposed monitoring frequency from weekly to monthly for TAH, TAqH and metals at all platforms discharging less than 1 mgd of produced water per month, and to annual for WET, is appropriate considering the relatively low discharge volumes at those locations, and the routine and consistent nature of the physical separation methods used at those locations.

pH Limitation & Monitoring Frequency

Comment: AOGA requested that the pH limitation be eliminated for the produced water stream unless acid treatment, workover, completion, or treatment fluid is commingled with the produced water. Compliance with the pH limitation in the 1986 permit was obtained successfully, which would justify elimination of the limit [see 40 CFR 122.44(e)]. If pH is included, AOGA recommends that only the average monthly pH be reported.

Response: The EPA has reduced the pH monitoring frequency to monthly for all facilities that discharge less than 1 mgd, but has retained weekly monitoring for locations discharging greater than 1 mgd (Trading Bay). Tiered monitoring frequencies were also used for TAH, TAqH and metals monitoring (see previous comment). pH data were reviewed for Granite Point Tank Farm, Trading Bay, East Forelands, Anna, Baker, Bruce, Dillon, Dolly Varden and Tyonek from January, 1996 through April, 1998. No pH violations were found for that time period. The absence of violations during this time period supports a reduction in monitoring frequency, but does not support elimination of the permit limitation. The EPA is maintaining a weekly monitoring frequency at Trading Bay because of the increased potential for environmental impact associated any single permit violation at a facility that discharges a large volume of wastewater. The “reported values” portion of the table at Part III.F.1. has been clarified by adding “daily max and min.” It is important to report the maximum and minimum values in order to determine compliance with the permit limitation. Although AOGA recommended that the monthly average be reported, the monthly average reporting requirement has been removed from the final permit; because the pH scale is logarithmic, an arithmetic average is not a representative way to summarize data.

Reduction in Monitoring after a year of Compliance

Comment: AOGA requested that the permit include a statement that allows for a reduction to annual monitoring after a year of compliance, which would be consistent with the Gulf of Mexico permit.

Response: Performance-based monitoring reductions have not been incorporated into the final permit. EPA Guidance²⁶ suggests that a reduction in monitoring frequency may be appropriate in situations where the pollutant concentrations have been reduced to a level that is significantly lower than the monthly average permit limit. The guidance states that monitoring reduction may be appropriate for treatment processes that are not subject to wide treatment fluctuations (e.g. physical treatment of produced water), and are inappropriate for batch or highly variable waste streams (e.g. drilling muds and deck drainage). Given that many of the monitoring requirements placed on the produced water waste stream are new (TAH, TAqH), the EPA does not have adequate data to evaluate the appropriateness of performance-based monitoring reductions. Also, as discussed elsewhere in this permit, the monitoring frequencies proposed in the draft permit have been reduced for the majority of the facilities.

Annual Report of Hydrocarbon Constituents

Comment: AOGA requested that the annual report summarizing the concentrations of individual

TAH and TAqH components be removed from the final permit, as it adds unnecessary burden to industry.

Response: Part III.F.1., footnote 1, has been modified to state that fifteen months after issuance of the permit, a report summarizing the individual TAH and TAqH components from data collected during the first year of permit coverage shall be provided to the EPA. Given the importance of the individual TAH and TAqH components in assessing the toxicity of the produced water waste stream, and given the relatively small data set currently available to the EPA, this report requirement remains in the final permit. The EPA has determined, however, that submittal of data from the first year of permit coverage is adequate. Since the individual TAH and TAqH pollutant levels are typically provided by the analytical laboratory, laboratory reports may be copied and submitted to the EPA to fulfill this requirement.

Water Quality Based Standard Calculations: Dynamic and Steady-State Modeling

Comment: AOGA proposed that the “potential to exceed water quality-based limits” be calculated using dynamic modeling, rather than steady-state modeling.

Response: For this general permit, EPA did not consider dynamic modeling primarily because such modeling requires more data than are currently available for the produced water waste stream and for the receiving water. The regulations at 40 CFR § 122.44(d) require the EPA to determine whether a discharge causes, has the reasonable potential to cause, or contribute to an excursion above state water quality standards. The recommended method for determining the potential to exceed water quality-based limits involves use of a steady-state waste load allocation model as a baseline for limit determination. EPA guidance suggests that if time and resources are available, or if the discharger itself takes the initiative, dynamic modeling could be conducted to further refine the waste load allocation from which final permit limits would be derived.²⁷

Minimum Detection Levels (MDLs)

Comment: AOGA recommended that method detection limits for metals be reevaluated, since the levels listed in the draft permit are too low. DOE commented extensively on the inappropriately low detection levels for numerous metals, and recommended that the detection levels for all metals be based on analytical capabilities rather than on the water quality criteria. DOE recommended the approach used by EPA Region 6; monitoring results which are less than established minimum quantification levels are reported as zero when calculating averages or reporting individual measurements.

Response: The MDLs at Part III.F.7.c. in the final permit have increased, and should be readily attainable using either 40 CFR 136 methods, or the 200.8 ICP-MS method. The permit language has been modified to explicitly state that method 200.8 may be used. The MDLs were recalculated to be 5 times lower than the aquatic life chronic criteria. This ensures that the resulting data can be used to determine whether the metals are present in the effluent at levels above the applicable water quality standards. The MDL for arsenic was also impacted by the withdrawal of the federal human health criterion for arsenic in Alaska.²⁸ The MDL proposed in the draft permit reflected the 1.4 µg/l human health criterion. The MDL in the final permit has

been calculated based on the 36 µg/l marine chronic criterion.

Coefficient of Variation

Comment: DOE and AOGA commented that facility-specific coefficient of variations (CV) be used to assess the need for limitations. AOGA further commented that there is enough existing data to calculate a CV for one facility (Baker Platform) and almost enough information (n=9) from several additional facilities. AOGA recommended that bootstrapping techniques be used to determine a sufficient sample size for facilities with fewer than ten samples. Alternatively, given that similar treatment technologies exist, data from some Cook Inlet facilities can be applied to other facilities. AOGA specifically requested that data from Anna and Dillon be combined for the purposes of calculating a CV.

Response: The EPA's review of the uncertainty associated with effluent variability has resulted in EPA guidance which recommends a value of 0.6 as a default CV, unless a minimum of ten samples are available to quantify the CV.²⁹ Because EPA's recommendation to use ten samples is based on effluent variability, bootstrapping techniques which are used to determine distribution and sample size are not appropriate in this situation. The EPA also does not feel that compiling produced water data from a group of platforms is appropriate, given that the pollutant concentrations vary significantly among some of the platforms. The EPA has, however, calculated an individual CV for the Baker Platform since 14 samples had been taken at that location (see Appendix A for a summary of the CVs used for each discharger). Because the Permittees have submitted no additional data in the three years that have passed since the draft permit was public noticed, a CV of 0.6 was used at all other locations.

Reasonable Potential Multiplier and "z" statistic

Comment: AOGA questioned the rationale used in selecting a 95th or 99th percentile probability basis for the reasonable potential calculations and for the "z" statistic used to calculate permit limitations.

Response: The EPA Region 10 office typically uses the 99th percentile probability basis for determining the reasonable potential to exceed water quality standards, because it represents the upper boundary of the effluent distribution, and is therefore more conservative than the 95th percentile. For the "z" statistic, the 99th percentile was used for calculation of the maximum daily limit (MDL), and the 95th percentile was used for calculation of the average monthly limit (AML), as recommended by EPA Guidance.³⁰

TAH and TAqH, and Metals Monitoring

Comment: Unocal commented that monitoring requirements for TAH, TAqH, and metals should be removed if there is no reasonable potential. AOGA commented that silver is not an expected constituent in produced water, and only occurs in two of the eight Cook Inlet facilities monitored; monitoring should not be required. Similarly, cadmium and nickel monitoring should not be required. The variability is quite low for cadmium, copper, lead and nickel and monitoring should either not be required or be very limited.

Response: The EPA has removed monitoring requirements for TAH, TAqH and metals for those facilities where the reasonable potential to exceed water quality standards does not exist (except for Cadmium and Mercury, as discussed on page 21). For new dischargers who, in the future, may receive authorization for interim produced water mixing zones, however, there is no available data to determine whether there is a reasonable potential to exceed water quality standards. These facilities are therefore required to collect metals data for one year, as specified in Part III.F.1. of the final permit.

Total vs. Dissolved Metals Monitoring Data

Comment: AOGA recognized that the draft permit requires monitoring for total recoverable metals, and recommended that the EPA memorandum "Office of Water Policy and Technical Guidance on Interpretation of Aquatic Life Metals Criteria" be used to determine whether total or dissolved data are most useful. DOE encouraged EPA to specify that metals monitoring be in the dissolved form, and cited an EPA guidance paper which states that dissolved metals more closely approximate the bioavailable fraction of metal.

Response: Total recoverable metals data are required in the permit because 40 CFR §122.45(c) requires that metals limits be based on total recoverable metals.

Reasonable Potential Calculations for Hydrocarbons, WET and Metals

Comment: AOGA and DOE requested that all available data for hydrocarbons, WET and metals be used in establishing sample size and permit limits, and that actual, rather than rounded data be used to develop permit limits. AOGA commented that the method for calculating the reasonable potential to exceed was not clear, and submitted their reasonable potential calculations showing that only one facility (Tyonek A) requires a permit limit for TAH and TAqH.

AOGA commented that it does not appear that existing data were used in determining the reasonable potential to exceed the zinc limit, and that only Platform Bruce should have a limit for zinc. DOE commented that the maximum projected receiving water concentrations for zinc at Dillon are lower than the water quality criteria, therefore no limits should be included for zinc at that location. Unocal commented that the aquatic life acute factor is not applicable.

Response: The EPA has recalculated the permit limitations for all facilities. Appendix A illustrates the data used to perform the calculations, and explains the way in which the calculations were performed. The limitations contained in the final permit are different than those proposed in the draft permit because of changes made to either the dilution factor, the CV, the sampling frequency, the reasonable potential multiplier, or facility specific data. For example, hydrocarbon mixing zones contained in the Alaska 401 certification (Appendix B) are different than those used in the proposed permit for the Trading Bay, Baker and Tyonek platforms. Also, as discussed earlier in this section, the CV for Baker Platform was recalculated using facility-specific data. Reducing the monitoring frequency from weekly to monthly increased the monthly average limitation at numerous locations. Also, the EPA corrected some incorrect reasonable potential multipliers and dilution factors that were used at a few locations. All available data were used for all locations.

Translators

Comment: AOGA was not able to determine whether the translation factor was applied to obtain total recoverable standards from Alaska's adoption of dissolved water-quality standards for some of the metals.

Response: Because the water quality standards for metals in Alaska are expressed as "total recoverable," translators are not needed to calculate permit limitations. 40 CFR §122.45(c) requires that metals limits be based on total recoverable metals. When state water quality standards are expressed as "dissolved" metals, translators are needed to account for the amount of total recoverable metal in the effluent that may become dissolved as the effluent mixes with the receiving water.

Produced Water Pipeline Freezing

Comment: Additional language in the proposed permit should clearly allow the addition of excess waterflood water to the produced water discharge in order to minimize the possibility of line-freezing.

Response: The final permit has been modified at Part III.E.3. to state that if excess waterflood water is added to the produced water discharge in order to minimize the possibility of line freezing, then this discharge shall be considered produced water for monitoring purposes. The estimated waterflood flow rate shall be reported in the comment section of the DMR.

Administrative Order & Compliance Schedule

Comment: ADEC recommended that the EPA issue an administrative order that will allow the Cook Inlet operators to discharge produced water and concurrently upgrade their treatment processes to meet the new BAT based effluent limits for the parameter oil & grease. The administrative order should be for a period of no longer than one year after the effective date of the permit, and contain penalties for noncompliance. AOGA requested that EPA establish a schedule for compliance with the new NPDES permit, and that operators be allowed to develop the schedule. If a facility must add new equipment or modify existing equipment or procedures to comply, a schedule should be developed to allow the operator enough time to make the needed modifications. It may take up to one year to have new equipment in operation.

Response: Compliance schedules for water-quality based regulations are not currently authorized by the Alaska water quality standards, and are therefore not included in the final permit. Enforcement actions by the EPA are discretionary, and are taken on a case-by-case basis.

PRODUCED WATER MIXING ZONES

Comment: Ninilchik requested that the term "mixing zone" be defined.

Response: The TSD Guidance³¹ defines a mixing zone as the area around an effluent outfall where certain numerical water quality standards are permitted to be exceeded. In the Cook Inlet permit, computer models were used to determine the size of all mixing zones. The edge of the circular

mixing zones is the point at which the discharged pollutants are in compliance with state water quality standards.

Interim Mixing Zones

Comment: AOGA commented that the following 11 facilities should be authorized to discharge produced water: Anna, Baker, Bruce, Dillon, East Foreland PF, Granite Point, Granite Point PF, Spark, Spur, Trading Bay PF and Tyonek. Dillon and Granite Point Platform are currently authorized to discharge produced water, but were not listed in the Fact Sheet as authorized to discharge produced water. Marathon commented that while Spark and Spur are currently shut-in, these platforms should receive permit limits similar to other platforms covered under the final permit.

Response: Mixing zones have been authorized in the State 401 certification (see Appendix B) for specified pollutants in the produced water waste stream at the following eight platforms: Granite Point PF, Trading Bay PF, East Foreland PF, Tyonek A, Bruce, Baker, Dillon and Anna. Two separate mixing zones, for “gas” and “oil,” have been authorized for Tyonek. Produced water mixing zones for Granite Point, Spark and Spur were not requested by the Permittees in the November 1995 Mixing Zone application to ADEC because none of these platforms currently is discharging.

ADEC and EPA recognize that future changes in operation may include the initiation of produced water discharge from platforms which are currently shut-in, or from platforms which are currently sending their produced water to another location for treatment and discharge. In their 401 certification ADEC has authorized an “interim” mixing zone for existing facilities that have not received an ADEC authorized mixing zone. The interim mixing zone granted by the state was sized based on the largest dilution required to meet water quality standards at existing platforms. In calculating effluent limitations for the interim mixing zones, the EPA used the maximum pollutant concentrations found at any of the production platforms to determine whether monitoring was needed, and what effluent limits would be required.

The notification requirements for obtaining coverage under an interim mixing zone are explained in Part I.B of the final permit; the effluent limits and reporting requirements are specified at Part III.F. For monthly flow rates below 1 mgd, monthly TAH, TAqH, and metals monitoring is required; and annual WET monitoring is required. For monthly flow rates above 1 mgd, weekly TAH, TAqH, and metals monitoring is required; and quarterly WET monitoring is required. Monthly metals monitoring for arsenic, cadmium, copper, lead and nickel is also required for all interim dischargers, so that the EPA may assess the reasonable potential to exceed water quality standards for each of these pollutants. Because monitoring frequency impacts monthly average permit limitations (e.g. a decrease in monitoring frequency will increase the monthly average permit limits), separate limitations have been developed for interim facilities based on their flow rates. The permit has been modified at Part III.F.3 to state that the operator must submit a facility specific mixing zone application to ADEC based on the first 12 months of monitoring data within 18 months after commencement of a discharge utilizing the interim mixing zone. At that time, ADEC may authorize site specific mixing zones based on the monitoring data. It is anticipated

that material and substantial changes that qualify a discharger for an interim mixing zone will also be grounds for permit modification (see 40 CFR § 122.62(a)(1)). After ADEC has authorized a site specific mixing zone, the EPA may modify the general permit to include the site specific mixing zone. Modification of the permit by the EPA is subject to the public notification provisions at 40 CFR § 124.10.

Tyonek Gas and Crude Production

Comment: AOGA and Phillips Petroleum support EPA's application of offshore BAT for oil & grease (42 mg/l daily maximum and 29 mg/l monthly average) to coastal platforms, but object to maintaining a more stringent limitation for the Tyonek A Platform (20 mg/l daily maximum and 15 mg/l monthly average). Tyonek currently produces only gas, but deeper oil accumulations have been found and plans for production are underway. The proposed limits, however, could not be met if oil production were brought on line. AOGA and Phillips state that anti-backsliding prohibitions are not applicable to this situation, due to the material and substantial change in circumstances associated with the feasibility of oil production, and the existence of new information regarding less stringent effluent limitations.

Response: The EPA anti-backsliding regulations [*see* 40 CFR § 122.44 (l)] require that when a permit is renewed or reissued, effluent limitations must be at least as stringent as effluent limitations in the previous permit. None of the exceptions to this anti-backsliding requirement is applicable to Tyonek, and therefore Tyonek is subject to more stringent oil and grease limits (20 mg/l MDL, 15 mg/l AML) as long as produced water from gas production remains the primary portion of the produced water wastestream. If Tyonek converts to crude production and initiates discharge of crude related produced water from the platform, anti-backsliding regulations (*see* 40 CFR § 122.44) allow for less stringent limitations and the mixing zone for "crude" production will apply. Two separate limitations for Tyonek "gas" and "crude" produced water discharge have been authorized in the State 401 certification (Appendix B), and may be found at Part III.F.1. of the final permit.

Reopener Clause

Comment: AOGA requested that the permit include a reopener clause to allow for revised mixing zones and dilution factors based on the collection of additional data. Unocal requested that the final permit contain a reopener clause to address changes in the nature of the produced water.

Response: The reopener clause at Part VI.L. allows for modifying the permit based on future monitoring results.

Field Verification Study

Comment: CIRCAC suggested that field validation of the modeling should be written into the permit as a special study for, at a minimum, the Trading Bay facility and one offshore oil facility.

Response: The mixing zones contained in the final permit were sized using dilutions which were estimated using mathematic models. The modeling runs, which were performed by the Permittee's contractor, used a wide range of tidal current speeds and seasonal conditions to determine

conditions which would require the largest mixing zone. Because the mixing zones represent “worst case” conditions, the EPA feels that a mixing zone verification study would not provide any information that would have a significant impact on permit conditions.

PRODUCED WATER WHOLE EFFLUENT TOXICITY (WET)

NOEC Endpoint

Comment: CIRCAC strongly supported the inclusion of WET testing requirements in the permit, but recommended that the all WET endpoints be based on the more sensitive NOEC (growth or reproduction) rather than the NOEC (survival).

Response: The permit language at Part III.F.7.b.4 has been clarified to state that the reported NOEC shall be the highest NOEC (i.e. most stringent) for the applicable survival, growth or fecundity endpoints.

Duplication of Chemical Specific Limits

Comment: AOGA commented that the establishment of both chemical-specific and WET limits are duplicative, unnecessary and costly, and that EPA should establish either a WET limit to control toxic pollutants or chemical-specific limitations to control specific toxic pollutants. In addition, AOGA suggests that federal effluent guidelines cite several reasons for monitoring oil and grease as an indicator versus individual constituents.

Response: The inclusion of both chemical-specific and WET limits is not duplicative or unnecessary. The EPA has found that whole effluent toxicity is a useful parameter for assessing and protecting against impacts upon water quality and designated uses caused by the aggregate toxic effect of the discharge of pollutants. WET testing is not, however, a substitute for parameter specific testing of individual chemical constituents (e.g. benzene) which are of particular concern because of carcinogenic or toxic effects to human health and the environment. Moreover, 40 CFR 122.44 (d) and the State 401 (a)(1) certification require the inclusion of both chemical-specific and WET limits to ensure that water quality standards are met at the edge of the State designated mixing zone.

WET Underestimates Ecological Harm

Comment: Trustees commented that WET LC50 tests tend to greatly underestimate ecological harm. Trustees cites a National Academy of Sciences’ report which recommends that LC50 tests be used only to compare the toxicity of different substances or to compare the sensitivity of different organisms or life stages, and not to predict ecological harm or set “safe levels,” as the draft NPDES permit attempts. Trustees adds that using growth rather than death as the measure in toxicity tests does little to improve the situation, as the two approaches give comparable results. This is due, in part, to the insensitivity of using growth rate as a measure because fish require long exposure times before significant differences can be detected.

Response: As discussed in the previous comment, 40 CFR 122.44 (d) and the State 401 (a)(1) certification require the inclusion of chronic WET limits in the permit to ensure that water quality standards are met at the edge of the State designated mixing zone. As discussed in earlier in this document (see “Appropriateness of State-Authorized Mixing Zone” on page 23), the Alaska State Water Quality Standards are designed to protect the short and long-term growth and propagation of fish, shellfish, other aquatic life, and wildlife, including subsistence species. Because the discharge is subject to compliance with the Alaska Water Quality Standards, and because ADEC has certified that the mixing zones and the discharges are in compliance with the Water Quality Standards, the EPA considers the permit to be protective of these activities. Under Section 7(a)(2) of the Endangered Species Act, the EPA consulted with NMFS, and NMFS concurred with EPA that this permit would not adversely affect listed species or designated critical habitat, including endangered whales, and the Steller sea lion.

Studies designed to characterize the potential long-term impacts of waste disposal practices in Cook Inlet have been initiated by EPA and MMS. To the extent that these studies show that state water quality standards need to be revised, the State of Alaska will need to address this issue. If the commenter believes that the mixing zone does not comply with Alaska State Standards, the commenter should raise this issue with ADEC.

WET Compliance Schedule

Comment: AOGA requested inclusion of a compliance schedule that allows six months to pass prior to commencement of WET monitoring. It takes several months for an established laboratory to develop stable populations of test organisms because of capital improvements needed to handle, quarantine, and culture the organisms. AOGA also requested that WET testing not be required for at least one year, to allow local laboratories to develop stocks for testing.

Response: The test organisms required by the permit are currently available from suppliers, and are being utilized by numerous laboratories on the west coast. The EPA does not see any reason for delaying the commencement of WET monitoring. Moreover, on May 26, 1992, EPA’s Environmental Appeals Board issued an “Order Denying Modification Request” in Star-Kist Caribe, Inc.,³² finding that NPDES permits can not include schedules of compliance for effluent limitations unless the state standards explicitly authorize schedules of compliance. The Alaska water quality standards do not authorize schedules of compliance.

WET Analytical Methodology

Comment: AOGA objects to the use of the EPA’s *West Coast Methodology*³³, as laboratories may not be able to reliably implement a new method requiring “non-standard species”, and as a new method it is relatively untested. Continued use of *Short-term Methods For Estimating The Chronic Toxicity of Effluents & Receiving Water to Marine & Estuarine Organisms*³⁴ was requested until the new methodology is incorporated in 40 CFR 136. AOGA was also concerned that exclusion of *Short-Term Methods* from Footnote 9 in *Final Whole Effluent Toxicity: Guidelines Establishing Test Procedures for the Analysis of Pollutants*³⁵ raises questions about what methods can be required in the permit.

Response: Numerous laboratories are currently using many of the organisms specified in the *West Coast WET* methodology. The EPA therefore disagrees with AOGAs assessment of the method as “untested,” and the species as “non-standard.” Exclusion of *Short-Term Methods* from footnote 9 of 60 FR 199 serves the purpose of allowing NPDES permits to require West Coast methodologies, but does not preclude the inclusion of *Short-Term Methods* in permits.

Bivalve Requirement

Comment: AOGA suggested that the bivalve test be eliminated from the testing requirements. Because of difficulties in culturing and/or spawning the organisms, few toxicology laboratories can consistently perform the bivalve test. The requirement for nonstandard species will introduce greater variability into these results. Even if two bivalve species are utilized, there are six months during the year when it is difficult to obtain larvae from either species due to annual changes in the bivalves’ natural reproductive cycle. If bivalve testing is required in the final permit, AOGA requested that the testing be focused during reliable spawning periods (e.g. December through February for mussels, and June through August for oysters.)

Response: Bivalves are currently being utilized by numerous west-coast laboratories, and are not considered by EPA to be nonstandard species. The potential variability introduced by purchasing organisms, rather than culturing them in-house, is monitored through the concurrent reference toxicant requirement. The EPA agrees that the permit requirements should consider the seasonal variability of bivalves. The permit has been modified at Part III.F.7.b.1. to focus bivalve testing during spawning periods (December through February for mussels, and June through August for oysters).

WET Species Selection

Comment: AOGA and DOE suggest that rather than requiring the use of one vertebrate and two invertebrate species, the most sensitive of the three species be identified annually, and that species used for the remainder of the year, consistent with TSD and other EPA guidance. AOGA also commented that the selection of three species from two phyla is excessive. The TSD recommends the use of three species from three phyla (e.g. fish, invertebrate, and plant). Since there are presently no appropriate plant tests for Cook Inlet, one fish and one invertebrate should be selected. The use of two invertebrate species is excessive since both are sensitive to metals. *Mysidopsis bahia* is an appropriate species because of the extensive database available on its behavior, and the species’ ability to accept a broader salinity range.

Response: The permit has been modified to state that the most sensitive of the three species be identified annually and used for the remainder of the year. The use of three species from two phyla, however, will be required. Proper effluent toxicity analysis requires an assessment of a range of sensitivities of different test species to that effluent. Since whole effluents are complex mixtures of toxicants, generalizations about sensitive and nonsensitive species are difficult to make. The fact that two invertebrate species are both sensitive to metals does not mean they will respond to the effluent toxicants in identical manners; and the fact that *Mysidopsis bahia* can accept a broader salinity range does not make it more appropriate as an indicator of toxicity.

Permit Reopener

Comment: AOGA expressed concern that if bivalves exhibit more sensitivity to produced waters, that mixing zones would need to be recalculated. The special conditions section of the permit should allow for reopening of the mixing zone.

Response: New information that, had it been available at the time of permit issuance, would have justified the application of different permit conditions is justification for permit modification under 40 CFR § 122.62 (a)(2).

Quality Assurance Requirements

Comment: AOGA suggested that the permit reference the analytical methods for quality assurance requirements, rather than restating a portion of the QA requirements in the permit.

Response: The quality assurance requirements included at Part III.F.7.b.6 are not routinely specified by the analytical methodologies, and are included in the final permit.

In-house Cultures

Comment: AOGA commented that concurrent testing with reference toxicants should not be required if a laboratory has in-house cultures of test organisms and has monthly reference toxicant protocols.

Response: The permit has been modified at Part III.F.7.b.6.a to state that concurrent testing with reference toxicants is no longer required if organisms are cultured in-house; monthly reference toxicant testing is sufficient.

Future Methodology Changes

Comment: AOGA suggests that the language of the permit be flexible enough to allow for the use of subsequent methodologies as the science of WET testing advances.

Response: Specific methodologies are cited in the permit in order to assure analytical consistency over the life of the permit, and to eliminate ambiguity over permit requirements. The EPA cannot build contingencies into the permit for unexpected changes, when such changes would constitute a major modification of the permit and must be subject to public comment.

Toxicity Identification Evaluation (TIE) and Toxicity Reduction Evaluation (TRE)

Comment: Unocal asked EPA to clarify the intent of the TIE and TRE, their relationship to each other, and whether it is consistent with the TSD to perform a TRE prior to a TIE.

Response: The purpose of a toxicity reduction evaluation (TRE) is to investigate the causes and identify corrective actions for effluent toxicity problems. TREs are designed to identify the causative agents of effluent toxicity, isolate the sources of the toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity. The ultimate objective of a TRE is for the discharger to achieve the limits or permit requirements for effluent toxicity contained in the permit, and thereby attain the water quality standards for receiving

waters. A toxicity identification evaluation (TIE) is performed as part of a TRE. The objective of the TIE is to identify the specific chemicals causing effluent toxicity.

TIE and TRE Triggers

Comment: AOGA, DOE and Phillips state that commencing a toxicity reduction evaluation (TRE) within 15 days of the identification of a single WET exceedance is unwarranted, and inconsistent with the TSD. AOGA, Unocal and DOE suggested that a TRE not be required until after a subsequent test exceeds permit limits, and the permittee is unable to eliminate the source of the toxicity. AOGA also proposed that a toxicity identification evaluation (TIE) should only be required if a permittee, after having eliminated other potential contributing factors in the first two tiers of the TRE, has not been able to identify the source of the toxicity, and initial steps taken by the permittee to control the effluent toxicity are unsuccessful.

Response: The permit has been modified at Part III.F.7.b.7. to state that if chronic toxicity is detected above the permit limits, collection and analysis of one additional sample is required. If toxicity is detected above the permit limits in this test, then bi-weekly accelerated testing over an eight-week period is required. If chronic toxicity is detected in any of the four additional tests, then the permittee shall initiate a TRE within fifteen days. If chronic toxicity is detected in any two of the four bi-weekly tests, then the permittee shall initiate a TIE to identify the causes of toxicity. These requirements are consistent with EPA Regional Guidance.³⁶

Salinity

Comment: DOE also expressed concern that the test organisms will be adversely affected if exposed to salinities outside their normal tolerance range. Produced water salinity may be as high as 300 ppt, whereas mysid shrimp have a salinity tolerance range of 5-35 ppt. The EPA Manual provides no guidance on how to handle elevated salinity. Was the toxic effect of salinity shock considered by the labs or EPA?

Response: If the Permittee suspects that test organisms are adversely affected by exposure to salinity, toxicity identification evaluation (TIE) procedures can be performed by the Permittee to determine the toxicity source. Such evaluations, however, are not typically performed by EPA as part of permit development.

COMPLETION, WORKOVER, WELL TREATMENT, AND TEST FLUIDS

Sampling Frequency

Comment: CIRCAC suggested that the sampling frequency of oil and grease and pH on completion, workover, well treatment, and test fluids should be once per discharge as found in the 1986 permit.

Response: The permit has been modified at Part III.G. to require that oil and grease and pH be monitored once per discharge for the completion, workover, well treatment and test fluids wastestreams. The 1986 permit required monitoring "once per discharge," while the draft 1995 permit proposed to require weekly monitoring. These small volume discharges are intermittent in

nature, although multiple discharges may occur during a short time period. Requiring monitoring for each discharge is therefore appropriate.

DISCHARGES REQUESTED & NOT AUTHORIZED

Landfill Leachate

Comment: AOGA requested that the EPA allow for the commingling of produced water and non-hazardous landfill leachate generated from landfills associated with the onshore oil and gas handling facilities. Approximately 20 barrels of leachate are generated annually at the Kustatan facility, and at the Trading Bay landfill. Presently, this waste is placed in drums and transported to off-site injection wells or disposal sites. The cost of transporting the leachate from Kustatan, on the west side of Cook Inlet, to the east side of Cook Inlet is costly and weather-dependent. Contamination in the leachate is similar to that in produced water.

Response: Discharge of landfill leachate is not authorized by the permit. Leachate characterization data, such as that required in a permit application, have not been provided to the EPA. Landfill leachate is often highly concentrated, and may contain contaminants that are not found in the produced water wastestream.

Wastes Associated with Paint

Comment: AOGA requested that the discharge of paint chips, paint overspray and wastes from paint removal be authorized in the permit based on the fact that U.S. Coast Guard regulations implementing MARPOL do not prohibit their discharge. AOGA states that under 33 CFR 151, maintenance wastes discharges, which are prohibited under MARPOL, include only materials which are collected. In many areas of the U.S., “diapers” are placed under areas to be sandblasted, and the captured sandblasting material is disposed of in accordance with MARPOL Annex V. The placement and use of diapers represent a significant safety risk in Cook Inlet, due to extreme tidal action and currents, cold water temperature, and the presence of broken ice in water.

Response: Discharge of wastes associated with paint is not authorized by the permit. Annex V of MARPOL (54 FR 18384) was published by the Coast Guard in order to reduce the amount of ship-generated garbage intentionally discharged into the marine environment. The discharge of garbage from fixed or floating platforms is prohibited at 33 CFR §151.73. The following definitions are contained at 33 CFR 151.05:

“Garbage means all kinds of victual, domestic, and *operational waste* (emphasis added), excluding fresh fish and parts thereof, generated during the normal operation of the ship and liable to be disposed of continuously or periodically, except dishwater, gray water, and those substances that are defined or listed in other Annexes to MARPOL 73/78.

“Operational waste” means all cargo associated waste, *maintenance waste* (emphasis added), cargo residues, and ashes and clinkers from shipboard incinerators and coal burning boilers.

“Maintenance waste” means materials collected while maintaining and operating the ship, including, but not limited to, soot, machinery deposits, *scraped paint* (emphasis added), deck, sweepings, wiping wastes, and rags.

Because MARPOL Annex V clearly prohibits the discharge of maintenance waste, including scraped paint, the discharge of such wastes can not be authorized under the Cook Inlet general permit. MARPOL regulations do not indicate that classification of a material as maintenance waste takes into consideration the hazards associated with collection of that waste. Similarly, MARPOL regulations do not indicate that material which has *not been collected* (emphasis added) are precluded from classification as maintenance waste. The preamble for 33 CFR 151.73 at 54 FR 18391 states that the Coast Guard has not exempted holders of NPDES permits from the restrictions of this section.

Soil Washwater

Comment: AOGA requested that washwater associated with cleaning crude-oil-contaminated soil be authorized by the permit. AOGA states that soil washwater is contaminated solely by production-associated wastes, and that commingling soil washwater with produced water will reduce site remediation costs and speed remediation. AOGA commented that the administrative burden associated with developing and finalizing an individual permit is significant for industry, ADEC and EPA. It would therefore be beneficial to everyone to include these waste streams in the general permit, rather than waiting for an individual permit.

Response: Faye Sullivan, Unocal, stated that coverage for the discharge of soil washwater is no longer required.³⁷

DISCHARGES REQUESTED & AUTHORIZED

Intermittent Discharges

Comment:

AOGA, Phillips, Unocal and ADEC requested that the permit authorize the discharge of numerous intermittent waste streams, including the following:

Uncontaminated freshwater: freshwater from the potable water tanks that is discharged during tank inspection or repair.

Contaminated freshwater: freshwater that is discharged when low levels of pollutants such as sea water, fecal coliform, or other pollutants are accidentally introduced into the potable water tank during barge transport or storage; and freshwater that has been treated with chlorine to make it potable.

Uncontaminated seawater: seawater which is discharged prior to tank cleaning, or discharged in order to minimize silt accumulation; and excess seawater associated with MSD operation

Vehicle wash water: wash water from vehicles used at the shore-based facilities that may contain low levels of oil & grease.

Spill response equipment wash water: wash water used to clean spill response equipment, which is expected to contain low levels of oil and grease, and cleaners.

Response: The EPA is not regulating these waste streams under this permit. Each of these waste streams is intermittent in nature, and contains only minor concentrations of pollutants that are not expected to adversely impact water quality. If, however, future monitoring or other information shows that these discharges contain quantities or types of pollutants which were not disclosed to EPA by the permit applicants, or which exceed water quality standards, then the permit may be reopened to address these waste streams. Also, if the permittees discharge types or quantities of pollutants not previously disclosed to the EPA during the permitting process, those operators may be liable for discharging pollutants without a permit.

Filter Backwash Water

Comment: AOGA requested that the EPA allow the discharge of filter backwash water associated with the use of marine sanitation devices. Filtered seawater is required for MSD operations (2-5 gallons per minute), and is usually obtained from the waterflood system; removal of solids increases the efficiency of the MSDs. Unocal commented that installation of a filter specifically for the MSD system is desired, and that coverage for discharge of the backwash is needed. AOGA requested that discharge be allowed at the surface, rather than through the J-tubes placed inside a platform leg. As a facility ages and J-tubes are either used to capacity or abandoned due to failure, the ability to discharge through a J-tube decreases. Installing new J-tubes is often prohibitively expensive and may not be possible for all facilities.

Response: At Part VII of the permit the definition of “water flood” has been expanded to include filter backwash water associated with operation of MSDs. A definition for “filter backwash” has also been added to Part VII. Since the permit does not specify the location of discharge, surface discharge locations are an acceptable alternative to J-tubes.

Pipeline Hydrotest Water

Comment: AOGA and Unocal requested permission to discharge fresh or filtered Cook Inlet water used to perform hydrotests. Hydrotesting would be performed in conjunction with a suspected leak, or after the repair of a known leak. AOGA has proposed commingling and discharging hydrotest water with produced water effluent from either Trading Bay or Granite Point onshore facilities. Any contamination of this fluid would be consistent with that found in produced water.

Response: Hydrotest water is fresh or filtered Cook Inlet water which is used to test the integrity of the pipelines running between the platforms and shore. The only other material running through these pipelines is produced water. Given that the sole source of pollutants contained in hydrotest water is pollutants in the produced water pipelines, the EPA has determined that monitoring requirements for produced water are appropriate for hydrotest water, and that combining the hydrotest water with produced water for treatment and discharge is appropriate. Given that hydrotests are performed

infrequently (less than once per year), the volume of hydrotest water generated is expected to be minimal. In Part VII of the permit, the definition of produced water has been modified to include hydrotest water, and a definition of hydrotest water has been added.

Groundwater

Comment: AOGA, Unocal and ADEC requested that the discharge of treated groundwater be authorized in the permit. AOGA stated that groundwater is contaminated solely by production-associated wastes, and that commingling these wastes with produced water will reduce site remediation costs and speed remediation. AOGA commented that the administrative burden associated with developing and finalizing an individual permit is significant for industry, ADEC and EPA. It would therefore be beneficial to everyone to include these waste streams in the general permit, rather than waiting for an individual permit.

CIRCAC supported a provision in the permit that will allow treated groundwater at Trading Bay to be discharged provided that: 1) the remediation wastes do not significantly alter the chemical content of the produced water waste stream; 2) the remediation wastes are inventoried separately; and 3) the added wastes do not cause the produced water discharge to exceed produced water limitations found in the draft permit.

Response: The EPA has authorized the discharge of treated groundwater at Trading Bay as part of the produced water waste stream, with the understanding that the contaminated groundwater will be commingled with the produced water prior to treatment, and will be treated and discharged with the produced water. The EPA agrees that providing coverage in the Cook Inlet permit for the discharge of treated groundwater will speed up the remediation process at Trading Bay, since developing an individual discharge permit for Trading Bay could delay groundwater discharge for years. At a discharge rate of 500 barrels per day, the groundwater flow rate is 0.4% of the Trading Bay produced water flow rate. It is therefore anticipated that the addition of groundwater to the produced water waste stream will not cause an exceedance of water quality standards at the edge of the designated mixing zone.

A July, 1996, ADEC compliance order requires Marathon and Unocal to remediate contaminated groundwater at the Trading Bay Production Facility. AOGA stated that the maximum discharge rate is expected to be approximately 500 barrels per day for up to 4 years. Groundwater contamination data for metals (11 samples), PAHs (9 samples), and BTEX (30 samples) were provided to the EPA during the public comment period. In reviewing this data, the EPA has found that the contamination found in the Trading Bay groundwater is similar in nature to the produced water processed at Trading Bay, but that the contaminant levels are lower in the groundwater.

Spill Clean-Up Water

Comment: Unocal requested that EPA include a provision to allow for the treatment and discharge of Cook Inlet water recovered from oil spills to Cook Inlet. AOGA understood that the following statement, from pages 1-2 of the draft permit, allows oil and gas operators to apply for permission to discharge fluids such as treated water recovered during spill response activities which recover oil and water mixtures: “the permit does not authorize the discharge of any waste streams including

spills and other unintentional non-routine discharge of pollutants, that are not part of the normal operation of the facility, or any pollutants that are not ordinarily present in such waste streams, *unless specifically authorized by EPA prior to discharge*” (emphasis added). AOGA requested clarification to ensure that compliance is clearly understood, and recommended the following language: “this permit allows for the authorization to commingle produced water with recovered water and oil mixtures which result from unintentional spills from Cook Inlet oil and gas operations.” CIRCAC commented that the public should be notified if EPA authorizes any additional discharges from the facilities covered under the general NPDES permit.

Response: The permit has been modified at Part III.F.5 to state that water that is collected as a result of spill clean-up can be treated and discharged with the produced water waste stream. Part III.F.5. also contains the following reporting provision:

The Permittee shall report the treatment and discharge of spill clean-up water to the EPA within 24 hours of initiating such treatment, shall provide a written submission within five days of initiating treatment that describes the spill, the anticipated volume of spill clean-up water, and the anticipated time that treatment and discharge of spill clean-up water is expected to continue.

The EPA recognizes that, in the event of a major spill in Cook Inlet, adequate storage of the collected spill water will probably not be available, and that treating the collected spill water with the produced water waste stream will be the most environmentally beneficial disposal option. The draft permit contained much less specific language (excerpted in the comment above) which implied that EPA could approve the discharge of a variety of pollutants and wastestreams not authorized by the permit. The EPA assumes that CIRCAC’s request for public notification was a result of the vague language contained in the draft permit, and that the changes made in the final permit have satisfied CIRCAC’s concerns. There are no public notification requirements associated with the treatment and discharge of spill clean-up water.

ENDNOTES

1. U.S. EPA, Office of Water, Office of Water Enforcement and Permits, Permits Division, General Permit Program Guidance (Washington D.C., February 1988), p. 21.
2. U.S. EPA, “40 CFR Part 435, Oil and Gas Extraction Point Source Category; Final Effluent Limitations Guidelines and Standards for the Coastal Subcategory; Final Rule.” Federal Register, Volume 61 No. 242, 16 December 16, 1996, p. 66107.
3. U.S. EPA, Oil and Gas Extraction Point Source Category; Final Effluent Limitations Guidelines and Standards for the Coastal Subcategory; Final Rule (61 FR, December 16, 1996) , p. 66086.
4. U.S. EPA, Office of Water, Development Document For Final Effluent Limitations Guidelines and Standards For The Coastal Subcategory Of The Oil and Gas Extraction Point Source Category (EPA 821-R-96-023, October, 1996) page III-4.
5. U.S. EPA, Office of Water, Development Document For Final Effluent Limitations Guidelines and Standards For The Coastal Subcategory Of The Oil and Gas Extraction Point Source Category
6. U.S. EPA, Guidance Manual for Developing Best Management Practices (BMP) (EPA-833-B-93-004, October, 1993).
7. Letter from David Perkins, Marathon Oil Company et al, to Robert Dolan, ADEC, re: Pollution Prevention Program, July 12, 1996.
8. Guidance Manual for Developing Best Management Practices (BMP)
9. Tetra Tech, Ocean Discharge Criteria Evaluation For Cook Inlet (Oil and Gas lease Sale 149) and Shelikof Strait (Redmond, Washington, September 9, 1994, revised by U.S. EPA Region 10, January 1995).
10. U.S. EPA, Office of Water, Office of Science and Technology, Study Plan For Conducting Field Sampling and Chemical Analysis for the Cook Inlet Contaminant Study (Washington D.C., October, 1997).
11. U.S. MMS, Sediment Quality in Depositional Areas of Shelikof Strait and Outermost Cook Inlet, Interim Report (Cambridge, MA, August 1998, prepared for U.S. Department of the Interior, Minerals Management Service, Anchorage, Alaska), page 3-10.
12. U.S. MMS, Sediment Quality in Depositional Areas of Shelikof Strait and Outermost Cook Inlet, Interim Report (Cambridge, MA, August 1998, prepared for U.S. Department of the Interior, Minerals Management Service, Anchorage, Alaska), page ES-4.

13. U.S. EPA, " 40 CFR Part 435, Oil and Gas Extraction Point Source Category; Offshore Subcategory Effluent Guidelines and New Source Performance Standards; Final Rule." Federal Register, Volume 58, No. 41, 4 March 1993, page 12493.
14. Avanti Corporation, Biological Evaluation For The Proposed NPDES General Permit For Oil and Gas Exploration, Development, and Production Activities in Cook Inlet/Gulf of Alaska (Vienna, VA, prepared for U.S.EPA Region 10, Seattle, WA, 3 August 1992).
15. Letter from Steven Pennoyer, National Marine Fisheries Service, to Charles Rice, EPA, re: ESA Consultation, 12 December, 1995.
16. Letter from Gregory R. Balogh, Fish and Wildlife Service, to Laurie Mann, EPA, re: ESA Consultation, 4 September, 1998.
17. U.S. EPA, "40 CFR Part 435, Oil and Gas Extraction Point Source Category; Offshore Subcategory Effluent Guidelines and New Source Performance Standards; Final Rule." Federal Register, Volume 58, No. 41, 4 March 1993, pages 12454 and 12493.
18. Tetra Tech, Ocean Discharge Criteria Evaluation For Cook Inlet (Oil and Gas lease Sale 149) and Shelikof Strait (Redmond, Washington, September 9, 1994, revised by U.S. EPA Region 10, January 1995).
19. Arthur D. Little, page ES-4.
20. U.S. EPA, Region 10. "Final Permit Decision on Cook Inlet General Permit AKG285000 403(c) Determination", February 22, 1999.
21. Ocean Discharge Criteria Evaluation, Section 10.10.
22. U.S. EPA, 1996. "Oil and Gas Extraction Point Source Category; Final Effluent Limitations Guidelines and Standards for the Coastal Subcategory; Final Rule." 61 Federal Register 66086, December 16, 1996.
23. U.S. EPA, "40 CFR Part 435, Oil and Gas Extraction Point Source Category; Final Effluent Limitations Guidelines and Standards for the Coastal Subcategory; Final Rule." Federal Register, Volume 61, No. 242, December 16, 1996, p. 66107.
24. U.S. EPA, Oil and Gas Extraction Point Source Category; Final Effluent Limitations Guidelines and Standards for the Coastal Subcategory; Final Rule (61 FR, December 16, 1996).
25. U.S. EPA, Office of Water, Enforcement and Permits, NPDES Compliance Sampling Inspection Manual, MCD-51, June, 1986, p. 5-2.
26. U.S. EPA, Office of Water, Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies (Memorandum from Robert Perciasepe, AA, Office of

Water and Steven A. Herman, AA, Office of Enforcement and Compliance Assurance, to Regional Administrators et al.), April 1996.

27. U.S. EPA, Office of Water, Technical Support Document For Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991, Section 5.3.2.
28. U.S. EPA, "40 CFR Part 131, Withdrawal From Federal Regulations of the Applicability to Alaska's Waters of Arsenic Human health Criteria." Federal Register, Volume 63, No. 40, March 2, 1998, page 10140.
29. U.S. EPA, Technical Support Document, Section 5.5.2.
30. U.S. EPA, Technical Support Document, Section 5.5.4.
31. U.S. EPA, Office of Water, Technical Support Document For Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991, page xx.
32. U.S. EPA, Recent Decision of the Environmental Appeals Board, (Memorandum from Susan G. Lepow, AGC, Water Division, to LaJuana S. Wilcher, AA, Office of Water), May 28, 1992.
33. U.S. EPA, Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, EPA/600/R95/136. August 1995.
34. U.S. EPA, Environmental Monitoring Systems Laboratory - Cincinnati, Short-Term Methods For Estimating the Chronic Toxicity of Effluents and Receiving Waters To Marine And Estuarine Organisms, EPA/600/4-91/003, July 1994.
35. U.S. EPA, "Whole Effluent Toxicity: Guidelines Establishing Test Procedures for the Analysis of Pollutants." Federal Register, Volume 60, No. 40, 16 October 1995, Page 53529.
36. U.S. EPA, Regions 9 & 10, Regions 9 & 10 Guidance For Implementing Whole Effluent Toxicity Testing Programs, 31 May 1996, page 4-3.
37. Telephone Communication Record: Laurie Mann, EPA and Faye Sullivan, Unocal, re: soil washwater. September 15, 1998.