DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF WATER

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January 21, 2011 DEC File 300.45.179

Mr. Thomas Manson
Senior Environmental Coordinator
ConocoPhillips, Alaska, Inc.
700 G Street
P.O. Box 100360
Anchorage, AK 99510-0360

Re: **DEC §401 Certification of NPDES Permit AK0043354,**
ConocoPhillips Alaska, Inc. – Kuparuk Seawater Treatment Plant

Dear Mr. Manson:

On December 29, 2010 the United States Environmental Protection Agency (USEPA) requested a final 401 certification for the issuance of National Pollutant Discharge Elimination System (NPDES) Permit AK0043354 regulating discharges from Kuparuk Seawater Treatment plant located at Oliktok Point, Beaufort Sea, Alaska.

In accordance with §401 of the Clean Water Act and §402(o)(2) exceptions, as well as Alaska Administrative Codes (AAC) 18 AAC 15 (Administrative Procedures), 18 AAC 70 (Water Quality Standards), and 18 AAC 72 (Wastewater Discharge), the Department of Environmental Conservation (DEC or the department) has prepared the enclosed final Certificate of Reasonable Assurance for NPDES Permit AK0043354.

DEC regulations provide that any person who disagrees with this decision may request an informal review by the Division Director in accordance with 18 AAC 15.185 or an adjudicatory hearing in accordance with 18 AAC 15.195 - 18 AAC15.340. An informal review request must be delivered to the Director of Water, 555 Cordova Street, Anchorage, Alaska 99501, within 15 days of receipt of the permit decision. An adjudicatory hearing request must be delivered to the Commissioner of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, PO Box 111800 Juneau, Alaska 99811-1800, within 30 days of the permit decision. If a hearing is not requested within 30 days, the right to appeal is waived.

Be advised, pursuant to 18 AAC 15.120(c), the certification of the NPDES permit constitutes the permit required under Alaska Statute 46.03.100. Also, 18 AAC 15.120(c) states, "Any rights or privileges inuring to the benefit of EPA in the NPDES permit, including any right to enter, inspect, sample, and have access to records, also inure to the benefit of the department. Any

reports or other information filed with EPA in accordance with the NPDES permit must be contemporaneously filed with the department."

If you have any questions concerning this final certification, please contact Marc H. Bentley at marc.bentley@alaska.gov or (907) 269-6287.

Sincerely,

Sharon Morgan
Program Manager

Enclosure: Final Certificate of Reasonable Assurance for NPDES Permit AK0043354

cc: Michelle Bonnet, DEC/Juneau
Sharmon Stambaugh, DEC/Anchorage
Hahn Shaw, EPA/Anchorage
Kenwyn George, DEC/Juneau
Marc Bentley, DEC/Anchorage

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CERTIFICATE OF REASONABLE ASSURANCE

A Certificate of Reasonable Assurance, as required by §401 of the Clean Water Act, has been requested by the United States Environmental Protection Agency (USEPA) for the Kuparuk Seawater Treatment Plant, Oliktok Point, Beaufort Sea, Alaska to discharge wastewaters to the Simpson Lagoon of the Beaufort Sea under National Pollutant Discharge Elimination System (NPDES) Permit No. AK0043354. These wastewater discharges are necessary for activities associated with the development and production of offshore oil and gas located at Latitude 70° 30' 45" N, Longitude ¯149° 51' 30". W. This certification is for NPDES Permit No. AK0043354, which covers the disposal of the following discharges:

Discharge 001 - Wastewater from Strainer/Backwash System
Discharge 002 - Wastewater from Marine Life Return System

Public notice of the application for this certification was made in accordance with 18 Alaska Administrative Code (AAC) 15.180.

Water Quality Certification is required for the activity because it will be authorized by a USEPA permit identified as NPDES Permit No. AK0043354, and discharges into State waters will result from the activity authorized under this permit.

The Department of Environmental Conservation (DEC or the department) has reviewed the permit and certifies there is reasonable assurance the activity, and the resultant discharge, is in compliance with the requirements of §401 of the Clean Water Act and 18 AAC 70 (Water Quality Standards), as amended through September 19, 2009 (unless otherwise noted), provided that the terms and conditions of the final certification are adhered to.

Through this certification, in accordance with 18 AAC 15.120, the final NPDES permit AK0043354 will constitute the permit required under Alaska Statute (AS) 46.03.100, provided the stipulations of the certification are made part of the final NPDES permit AK0043354.

State of Alaska Certification Stipulations:

1. Mixing Zone for Discharge 001 (Strainer/Backwash System)

The department is issuing a mixing zone for wastes discharged from the Kuparuk Seawater Treatment Plant Outfall 001. The mixing zone is defined as the area of a 100 meter radius circle, centered at the discharge point, from the sea floor to the surface. All Alaska Water Quality Standards (WQS) must be met outside the authorized mixing zone boundary. Within the mixing zone the water quality criteria may be exceeded for the following parameters:

a. Temperature
b. Total Residual Chlorine
c. pH
d. Sediment
e. Turbidity
f. Residues
g. Color

h. Whole Effluent Toxicity (WET)

Rationale:

In accordance with 18 AAC 70.240, as amended through June 23, 2003, the department will, in its discretion, authorize a mixing zone in a discharge permit if the department finds that available evidence reasonably demonstrates that

a. *The applicable requirements of the chapter will be met;*

b. *The mixing zone will be as small as practicable; and*

c. *An effluent or substance will be treated to remove, reduce, and disperse pollutants using methods found by the department to be the most effective and technologically and economically feasible, consistent with the highest statutory and regulatory requirements.*

d. *Ongoing compliance with 18 AAC 70.240 – 18 AAC 70.270 is a condition of any permit authorizing a mixing zone.*

The department finds the size of the mixing zone authorized for discharge in this certification is appropriate and provides reasonable assurance that existing uses of Simpson Lagoon and the Beaufort Sea outside of the mixing zone are maintained and fully protected. In determining the 100 meter radius mixing zone size, conformance with parts a-d above is demonstrated as follows.

- *Modeling using PLUMES software has shown that a 100 meter radius mixing zone would suffice as being as small as practicable. The determination of the mixing zone for temperature for various seasonal conditions gave a conservative dilution ratio of 14.9:1 for open water periods and 11:1 for under ice periods. This dilution ratio allows acceptable dispersion during critical periods. A conservative ratio of 13.3:1 derived from consideration of the 100 µg/L regulatory compliance limit for chlorine (per Table 1 of the permit, Footnote 1), and the necessary dilution to meet the WQS chronic criterion of 7.5 µg/L for chlorine will be used for WET. DEC understands that the 13.3:1 dilution factor was derived by dividing the regulatory compliance limit of 100 µg/L by the chronic criterion for chlorine of 7.5 µg/L.*

- *The technology employed by the facility to reduce regulated pollutants conforms to industry standards and represents available technology that is economically achievable.*

The mixing zone will ensure the most stringent WQS are met at all points outside of the mixing zone for the following parameters.

- *Temperature – May not cause the weekly average temperature to increase more than 1° C. The maximum rate of change may not exceed 0.5° C per hour. Normal daily temperature cycles may not be altered in amplitude or frequency. May not exceed 15° C.*

- *Total Residual Chlorine – The concentration of substances in water may not exceed the criteria shown in Table IV and in Table V, column B of the Alaska Water Quality Criteria Manual (2003), or any chronic and acute criteria established in this chapter, for a toxic pollutant of concern, to protect sensitive and biologically important life stages of resident*

species of this state. There may be no concentrations of toxic substances in water or in shoreline or bottom sediments, that, singly or in combination, cause, or reasonably can be expected to cause adverse effects on aquatic life or produce undesirable or nuisance aquatic life, except as authorized by this chapter. Substances may not be present in concentrations that individually or in combination impart undesirable odor or taste to fish or other aquatic organisms, as determined by either bioassay or organoleptic tests. The Chlorine Aquatic Life Saltwater Chronic numeric criteria is 7.5 µg/L as listed in Table IV of the Alaska Water Quality Criteria Manual (2003).

- *pH – May not be less than 6.5 or greater than 8.5, and may not vary more than 0.2 pH units outside of the naturally occurring range.*

- *Sediment – No measurable increase in concentration of settleable solids above natural conditions, as measured by the volumetric Imhoff cone method.*

- *Turbidity – May not exceed 25 nephelometric turbidity units (NTU). May not reduce the depth of the compensation point for photosynthetic activity by more than 10%. May not reduce the maximum secchi disk depth by more than 10%.*

- *Residues – May not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use; cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.*

- *Color – Color or apparent color may not reduce the depth of the compensation point for photosynthetic activity by more than 10% from the seasonally established norm for aquatic life. For all waters without a seasonally established norm for aquatic life, color or apparent color may not exceed 50 color units or the natural condition, whichever is greater.*

- *WET – May not impart chronic toxicity to aquatic organisms, expressed as 1.0 chronic toxic unit, at the point of discharge, or if the department authorizes a mixing zone, at or beyond the mixing zone boundary, based on the minimum effluent dilution achieved in the mixing zone.*

2. WET Testing Requirements

The permittee must conduct quarterly (i.e. four times per year, every three months) short-term chronic toxicity tests on effluent samples from Outfall 001 during quarters when biocides and/or chlorination/dechlorination chemicals are used. In addition to the dilution series specified in Section I.G.3., of the permit AK 0043354, effluent concentrations of 60% and 100% will also be tested. If the addition of brine solution or dry salts is necessary to adjust the salinity of the effluent, it may not be possible to achieve 100% effluent as one of the test concentrations. If this occurs, the maximum effluent concentration achievable after salinity adjustment will be used as a substitute for 100% effluent, and this will be documented in the next WET report. The additional 60% and 100% concentrations are required for information purposes only and may not be included in the next permit cycle.

Rationale:

- *In accordance with 18 AAC 15.090. Permit terms and conditions. As the department considers necessary to ensure that applicable criteria will be met, the department will attach terms and conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, and reporting requirements.*

- *In accordance with AS 46.03.110(d), the department may specify in a permit the terms and conditions under which waste material or water may be disposed of.*

- *In accordance with 18 AAC 70.030. Whole effluent toxicity limit.*

  (a) An effluent discharged to a water may not impart chronic toxicity to aquatic organisms, expressed as 1.0 chronic toxic unit, at the point of discharge, or if the department authorizes a mixing zone in a permit, approval, or certification, at or beyond the mixing zone boundary, based on the minimum effluent dilution achieved in the mixing zone. If the department determines that an effluent has reasonable potential to cause or contribute to exceedance of the whole effluent toxicity limit, the department will require whole effluent toxicity testing as a condition of a permit, approval, or certification. The department will reduce the frequency of, or eliminate, whole effluent toxicity if

  (1) the results of a sufficient database of testing conclusively demonstrate that an effluent does not have a reasonable potential to exceed the whole effluent toxicity limit;
  (2) significant changes in effluent quality are not expected over the life of the permit; and
  (3) the department determines that aquatic life will be adequately protected.

  (b) In this section, "chronic toxic unit" means an expression of the chronic toxicity of an effluent, determined as (100/NOEC) where NOEC, is the highest tested percentage concentration of an effluent, established by direct testing of toxicity to aquatic organisms, that causes no observable adverse effects, including effects on growth, development, behavior, reproduction, or survival. Other equivalent chronic toxicity endpoints approved by the department, such as the 25 percent Inhibition Concentration (IC_{25}) may be used in place of NOEC, and may incorporate shorter test durations.

  The IC_{25} is defined as a point estimate of the toxicant concentration, expressed in percent effluent, that causes a 25% reduction in a non-quantal biological measurement (including observable adverse effects on growth, development, behavior, reproduction, or survival) over a test duration that generally is one-tenth or more of the lifespan of the test organism.

3. Mixing Zone for Discharge 002 (Marine Life Return System)

The department is issuing a mixing zone for wastes discharged from the Kuparuk Seawater Treatment Plant Outfall 002. The mixing zone is defined as the area of a 100 meter radius circle, centered at the discharge point, from the sea floor to the surface. All WQS must be met outside

the authorized mixing zone boundary. Within this mixing zone, the water quality criteria may be exceeded for temperature. Within the mixing zone the water quality criteria may be exceeded for the following parameters:

a. Temperature

Rationale:

In accordance with 18 AAC 70.240, as amended through June 23, 2003, the department will, in its discretion, authorize a mixing zone in a discharge permit if the department finds that available evidence reasonably demonstrates that

a. The applicable requirements of the chapter will be met;

b. The mixing zone will be as small as practicable; and

c. An effluent or substance will be treated to remove, reduce, and disperse pollutants using methods found by the department to be the most effective and technologically and economically feasible, consistent with the highest statutory and regulatory requirements.

d. Ongoing compliance with 18 AAC 70.240 – 18 AAC 70.270 is a condition of any permit authorizing a mixing zone.

The department finds the size of the mixing zone authorized for discharge in this certification is appropriate and provides reasonable assurance that existing uses of Simpson Lagoon and the Beaufort Sea outside of the mixing zone are maintained and fully protected. In determining the 100 meter radius mixing zone size, conformance with parts a-d above is demonstrated as follows.

- *Modeling using PLUMES software has shown that a 100 meter radius mixing zone would suffice as being as small as practicable. The determination of the mixing zone for temperature for various seasonal conditions gave a conservative dilution ratio of 14:1 for open water periods and 14:1 for under ice periods. This dilution ratio allows acceptable dispersion during critical periods.*

- *The technology employed by the facility to reduce regulated pollutants conforms to industry standards and represents available technology that is economically achievable.*

The mixing zone will ensure the most stringent WQS are met at all points outside of the mixing zone for the following parameters.

- *Temperature – May not cause the weekly average temperature to increase more than 1° C. The maximum rate of change may not exceed 0.5° C per hour. Normal daily temperature cycles may not be altered in amplitude or frequency. May not exceed 15° C.*

4. Antidegradation

The department's approach to implementing the antidegradation policy found in 18 AAC 70.015 is based on the requirements in 18 AAC 70 and the department's July 14, 2010, Policy and Procedure guidance for Interim Antidegradation Implementation Methods. *Using these requirements and policies, the department determines whether a water body or portion of a water body is classified as Tier 1, Tier 2, or Tier 3. This determination is made on a pollutant-by-pollutant basis. DEC has determined that the receiving waters Simpson Lagoon and the Beaufort Sea are Tier 2 waters using this guidance, information provided by the applicant, and DEC knowledge of the water bodies.*

For a Tier 2 water in the context of reissuing a permit such as this, antidegradation analysis under 18 AAC 70.015(a)(2) is applied to a reduction of water quality authorized by a mixing zone per 18 AAC 70.240. The mixing zone authorization in this certification does not increase the size of the mixing zone from that in the permit in effect, nor does it allow for more degradation than the permit in effect, which was reissued in 2000. In the case of this permit the parameters of concern are temperature, total residual chlorine, pH, sediment, turbidity, residues, color, and Whole Effluent Toxicity for Outfall 001; and temperature for Outfall 002.

The Antidegradation Policy of the Alaska WQS (18 AAC 70.015) states that existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected. The department may allow reduction of water quality only after finding that five specific criteria are met. These criteria and the department's findings are as follows:

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

  This activity occurs in the North Slope Borough and more specifically Barrow, Alaska and other smaller villages. Oil and oil related industry is the primary source of employment in the North Slope area (Alaska Department of Commerce, Community and Economic Development community database at: http://www.commerce.state.ak.us/dca/commdb/CF_CIS.htm), and seawater treatment is part of the necessary infrastructure that supports the oil industry. The seawater treatment plant is a key component of a waterflood project designed to maintain field pressure and enhance the recovery of hydrocarbons from the oil-bearing zone of the Kuparuk reservoir. Treated seawater is injected into the oil production zone of the hydrocarbon reservoir to maintain reservoir pressure and "sweep" oil to the producing wells, thereby extending the yield and useful life of the field.

  The oil industry is the main source of revenue for and in the North Slope Borough.

  DEC concludes that this criterion is met.

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

The final permit limits will not violate Alaska water quality criteria. The mixing zone is authorized in accordance with 18 AAC 70.240. The authorized mixing zone has been sized to ensure that all applicable water quality criteria are met at all points outside of the mixing zone. DEC concludes that this criterion is met outside the authorized mixing zones.

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

  Based on a review of the expected volume of discharge, the types and amounts of regulated pollutants including their fate and transport, and available dilution, DEC concludes that this criterion is met outside the authorized mixing zones.

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

  The methods of prevention, control, and treatment DEC finds to be most effective are the practices, requirements, and limits set out in the NPDES permit. The permit requires the permittee to follow prescribed Best Management Practices (BMPs) via developing a BMP Plan and implementation schedule to achieve the following objectives:

  (a) The number and quantity of pollutants and the toxicity of 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.

  (b) Under the BMP Plan, and any Standard Operating Procedures (SOPs) included in the Plan, the permittee shall ensure proper operation and maintenance of the treatment facility.

  DEC concludes that this criterion is met.

- *18 AAC 70.015(a)(2)(E) all wastes and other substances discharged will be treated and controlled to achieve (i) for new and existing point sources, the highest statutory and regulatory requirements; and (ii) for nonpoint sources, all cost-effective and reasonable best management practices.*

  Technology-based effluent limitation guidelines (ELGs) have been developed by EPA for particular categories of industrial dischargers. In the absence of ELGs for a particular category of industrial discharger, Best Professional Judgment can be used to establish permit limitations. EPA has not established effluent guidelines for seawater treatment facilities or marine life return systems. Therefore, in the absence of ELGs, DEC concludes that this criterion has been met through the use of best available technology

available for this type of facility, prescribed practices, limits, and BMPs in the NPDES permit.

January 21, 2011
Date

Sharon Morgan, Manager
Wastewater Discharge Authorization Program