



THE STATE  
of **ALASKA**  
GOVERNOR SEAN PARNELL

## Alaska Oil and Gas Conservation Commission

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### ADMINISTRATIVE APPROVAL AREA INJECTION ORDER NO. 20.003

Katrina Garner  
Head of Base Management  
Alaska Reservoir Development  
BP Exploration (Alaska), Inc.  
P.O. Box 196612  
Anchorage, AK 99519-6612

Re: Docket Number: AIO-14-030  
Authorized Fluids for EOR and Pressure Maintenance for the Midnight Sun Oil Pool

Dear Ms. Garner:

By letter dated August 27, 2014, and received by the Alaska Oil and Gas Conservation Commission (AOGCC) on September 2, 2014, BP Exploration (Alaska) Inc. (BPXA) requested administrative approval to modify Area Injection Order (AIO) 20.002 to authorize the use of miscible and other hydrocarbon gases to enhance recovery from the Midnight Sun Oil Pool (MSOP), BPXA's request is **APPROVED**.

BPXA proposes to inject miscible injectant, as well as other hydrocarbon gases, into the MSOP to enhance oil recovery from the pool. The MSOP is one of several Kuparuk Formation oil pools in the Prudhoe Bay Unit (PBU). On April 30, 2012, BPXA applied to the AOGCC to have one consistent list of approved fluids for all Prudhoe Bay Unit (PBU) oil pools. On September 4, 2012, the AOGCC issued AIO 20.002 which partially approved this request. Gas injection was not authorized for the MSOP at that time.

The Aurora, Borealis, and Pt. McIntyre Oil Pools (collectively Other Kuparuk Oil Pools) within the PBU have all been approved for hydrocarbon gas injection for enhanced recovery purposes. The Other Kuparuk Oil Pools provide good analogues, based on similar rock and fluid properties, for what performance could be expected from gas injection in the MSOP. Miscible injectant water alternating gas (MIWAG) has shown no rock or fluid compatibility issues over decades of operation in the Other Kuparuk Oil Pools and other Kuparuk Formation pools on the North Slope. It is anticipated that ultimate recovery from the MSOP will increase by 3-6% by utilizing a MIWAG recovery mechanism.

Rule 9 of AIO 20 allows for administrative amendment of the order as long as the change does not promote waste or jeopardize correlative rights, is based on sound engineering and geoscience principles and will not result in an increased risk of fluid movement into a USDW. MIWAG injection in the Kuparuk Formation has been shown to improve oil recovery and thus will not

promote waste. The PBU is unitized with equalized ownership throughout the pool, thus no correlative rights would be jeopardized by BPXA's proposed activities. MIWAG injection is a well understood process on the North Slope and is based on sound engineering and geoscience principles. Properly constructed MIWAG injection wells and a proper review of other wellbores in the vicinity of the injection well will ensure that gas will stay in the injection zone .

**NOW THEREFORE IT IS ORDERED:**

Rule 1. of AIO 20, as amended by AIO 20.002 is repealed and replaced by the following:

**Rule 1. Authorized Injection Strata and Fluids for Enhanced Recovery**

Within the affected area and in the strata defined as those strata which correlate with the strata found in well PBU E-100 between the measured depths of 11662 feet and 11805 feet the following fluids may be injected for purposes of pressure maintenance and enhanced oil recovery:

- a) Produced water and gas from Prudhoe Bay Unit processing facilities;
- b) Enriched hydrocarbon gas;
- c) Non-hazardous water and water based fluids – (specifically seawater, source water, freshwater, domestic wastewater, equipment washwater, sump fluids, hydrotest fluids, firewater, and water with trace chemicals, and other water based fluids with a pH greater than 2 and less than 12.5 and flashpoint greater than 140 degrees F);
- d) Fluids introduced to production facilities for the purpose of oil production, plant operations, plant/piping integrity or well maintenance that become entrained in the produced water stream after oil, gas, and water separation in the facility. Specifically:
  - i. Freeze protection fluids;
  - ii. Fluids in mixtures of oil sent for hydrocarbon recycle;
  - iii. Corrosion/scale inhibitor fluids;
  - iv. Anti-foams/emulsion breakers;
  - v. Glycols
- e) Non-hazardous glycols and glycol mixtures;
- f) Fluids that are used for their intended purpose within the oil production process. Specifically:
  - i. Scavengers;
  - ii. Biocides
- g) Fluids to monitor or enhance reservoir performance. Specifically:
  - i. Tracer survey fluids;
  - ii. Well stimulation fluids;
  - iii. Reservoir profile modification fluids



**DONE** at Anchorage, Alaska and dated October 23, 2014.

Handwritten signature of Cathy P. Foerster in blue ink.

Cathy P. Foerster  
Chair, Commissioner

Handwritten signature of Daniel T. Seamont, Jr. in blue ink.

Daniel T. Seamont, Jr.  
Commissioner

Handwritten signature of David J. Mayberry in blue ink.

David J. Mayberry  
Commissioner

**RECONSIDERATION AND APPEAL NOTICE**

As provided in AS 31.05.080(a), within **20** days after written notice of the entry of this order or decision, or such further time as the AOGCC grants for good cause shown, a person affected by it may file with the AOGCC an application for reconsideration of the matter determined by it. If the notice was mailed, then the period of time shall be **23** days. An application for reconsideration must set out the respect in which the order or decision is believed to be erroneous.

The AOGCC shall grant or refuse the application for reconsideration in whole or in part within 10 days after it is filed. Failure to act on it within 10-days is a denial of reconsideration. If the AOGCC denies reconsideration, upon denial, this order or decision and the denial of reconsideration are **FINAL** and may be appealed to superior court. The appeal **MUST** be filed within **33** days after the date on which the AOGCC mails, **OR 30** days if the AOGCC otherwise distributes, the order or decision denying reconsideration, **UNLESS** the denial is by inaction, in which case the appeal **MUST** be filed within **40** days after the date on which the application for reconsideration was filed.

If the AOGCC grants an application for reconsideration, this order or decision does not become final. Rather, the order or decision on reconsideration will be the **FINAL** order or decision of the AOGCC, and it may be appealed to superior court. That appeal **MUST** be filed within **33** days after the date on which the AOGCC mails, **OR 30** days if the AOGCC otherwise distributes, the order or decision on reconsideration.

In computing a period of time above, the date of the event or default after which the designated period begins to run is not included in the period; the last day of the period is included, unless it falls on a weekend or state holiday, in which event the period runs until 5:00 p.m. on the next day that does not fall on a weekend or state holiday.