

**ADMINISTRATIVE APPROVAL NO. AIO 25.003**

Mr. Brian Huff  
Satellite Resource Manager – Greater Prudhoe Bay  
BP Exploration (Alaska) Inc.  
P. O. Box 196612  
Anchorage, AK 99519-6612

Dear Mr. Huff:

By letter dated November 6, 2003 you requested amendment of Rule 4, Area Injection Order 25 that sets forth rules for conducting water injection into the Polaris Oil Pool. Currently, Rule 4 is as follows:

Rule 4 Authorized Injection Pressure for Enhanced Recovery

- a. Normal injection pressures must be maintained below the parting pressure of the confining mudstone (approximately 0.67 psi/ft).
- b. Operating pressure within well W-212i must be maintained below parting pressure of the reservoir sandstone, until offset well W-17 is proven to provide sufficient mechanical isolation to prevent migration of water out of the approved injection stratum.

The Commission ordered this rule to ensure that Polaris injected water does not fracture or migrate out of zone, and based its decision upon information supplied by BPXA. This information suggested a fracture pressure for the confining mudstone of about 0.66-0.67 psi/ft using data from stress tests and dipole sonic log.

BPXA performed step rate water injection tests in June in Wells W-212i and S-215i, with verbal approval from the Commission. These tests showed significant improvement in injection rate with increased injection pressure. Temperature logs run in July show the water to be confined to the intended intervals. These tests were performed at injection gradient of 0.75-0.80 psi/ft, well above the expected confining zone fracture pressure gradient of 0.67 psi/ft.

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Baseline and two month temperature profiles were run in Well W-17 (255' offset to W-212i) in accordance with requirements of Rule 10 of AIO 25. The Commission required the logs because confinement across the Polaris Oil Pool in well W-17 was questionable. There was no apparent change in temperature; hence offset injection in Well W-212i has not reached the well.

In review of more recent injection data the Commission discovered that injection pressures in wells W-212 and W-207 have greatly exceeded the Rule 4 limiting pressure of 0.67 psi/ft in Wells W-212 and W-207 during August and September. This injection could have resulted in a Notice of Violation. Please take care that requirements of the Conservation Orders are met.

The Commission finds that based upon the tests performed on wells W-212i and S-215i, a less restrictive rule is appropriate. It is BPXA's responsibility to ensure the injection stays within the approved injection interval.

Rule 4 of Area Injection Order 25 is amended to read as follows:

**Rule 4 Authorized Injection Pressure for Enhanced Recovery**

- a. Injection pressure must be maintained so that injected fluids do not fracture the confining zone or migrate out of the approved injection stratum.
- b. Within three months of start of injection in a new or converted water injector, a step rate test and surveillance log must be run for detection of fluids moving out of the approved injection stratum. Results must be submitted to the commission.
- c. If fluids are found to be fracturing the confining zone or migrating out of the approved injection stratum, the Operator must immediately shut in the injector(s). Injection may not be restarted unless approved by the Commission.

**DONE** at Anchorage, Alaska and dated November 13, 2003.

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Sarah Palin  
Chair

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Daniel T. Seamount, Jr.  
Commissioner