

STATE OF ALASKA
ALASKA OIL AND GAS CONSERVATION COMMISSION
3001 Porcupine Drive
Anchorage, Alaska 99501-3192

Re: THE APPLICATION OF UNION) Conservation Order No. 123A
OIL COMPANY OF CALIFORNIA) Swanson River Field
for an order expanding the Swanson River) Hemlock Oil Pool
Field, Hemlock Oil Pool, to include the)
G zone of the Tyonek formation and)
the lower portion of the Hemlock formation.)
) August 23, 1973 (original order)
) First Amendment: December 5, 1995

IT APPEARING THAT:

1. The Commission issued Conservation Order No.123 for the Swanson River Field, Hemlock Oil Pool, on August 23, 1973. Conservation Order No. 123 replaced Conservation Order #8 and Conservation Order No. 9.
2. Union Oil Company of California Inc. ("UNOCAL") became sole operator of the Swanson River Field on December 15, 1992.
3. By letters dated October 2, 1995, and October 19, 1995 UNOCAL requested expansion of the Swanson River Field, Hemlock Oil Pool to include the G zone of the Tyonek Formation and the lower portion of the Hemlock Formation. The correspondence demonstrated all affected parties had been notified prior to the subject request.

FINDINGS:

1. The Tyonek G zone is a predominately sandstone interval within the Tyonek Formation that immediately overlies the Hemlock Formation and corresponds to the 10,085 foot to 10,230 foot measured depth interval in the Soldotna Creek Unit 41-4 well. Two discrete sandstones are present in the interval; the upper sandstone is designated the G1 sand and the lower the G2 sand.
2. Average net pay is estimated to be approximately 20 feet and 40 feet in the G1 and G2, respectively. The sands are restricted to the southern portion of the field.
3. Initial production from the Tyonek G zone was established in August 1974 in the Swanson River Unit well SRU 32-33. The production rate from this interval

declined from 467 bopd to rates the operator believed were uneconomic in approximately two year.

4. Development operations within the Tyonek G zone were undertaken by UNOCAL in March 1995. Since that time four Swanson River Field wells have been completed in the interval.
5. The oil water contacts for the Tyonek G zone sandstones have not yet been precisely delineated; however, available evidence indicates they are likely to fall within a range comparable to that exhibited by the Upper Hemlock Formation sands.
6. The lithologic properties of the Tyonek G zone sandstones, including porosity and permeability, are very similar to those in the Hemlock Formation.
7. The fluid properties and reservoir pressure in the Tyonek G zone are nearly identical to those originally found in the underlying Upper Hemlock Formation. The Tyonek G-2 oil API gravity was 37.7 degrees, GOR of 370 scf per stb, and initial pressure 5540 psi. Initial properties of oil in the Hemlock Pool were 37 degrees API gravity, GOR 375 scf per stb, and 5580 psi initial pressure.
8. Preliminary estimates of original oil in place in the Tyonek G zone indicate approximately 15 million stock tank barrels.
9. The Lower Hemlock Formation is defined as the interval between the measured depths of 10,585 feet and 10,815 feet in the Soldotna Creek Unit well 41-4. This interval was originally excluded from the Swanson River Field, Hemlock Oil Pool.
10. Since December 1994, the Soldotna Creek Unit 41A-8 well has sustained production generally in excess of 100 bopd from the Lower Hemlock Formation.
11. The fluid properties and reservoir pressure in the Lower Hemlock Formation are dissimilar to those in the Upper Hemlock Formation. The Lower Hemlock production has an API gravity of 26 degrees and a GOR of 1100-1500 scf per stb with an original pressure of 5331 pounds per square inch.
12. Lithologic differences between the Upper and Lower Hemlock Formation are minor.
13. The potentially productive area for the Lower Hemlock interval is currently thought to be restricted to the crest of the Swanson River anticline in the Soldotna Creek Unit.
14. Preliminary estimates of original oil in place in the Lower Hemlock Formation indicate approximately 20 million stock tank barrels.

15. The volume of original oil in place estimated in the Tyonek G zone and the Lower Hemlock, requires reliance on existing wellbores and unit infrastructure to maximize reserves from these intervals.

CONCLUSION:

1. Pool rules must be sufficiently flexible to allow efficient exploitation of this faulted and lenticular reservoir under a gas and water injection pressure maintenance program.
2. Expansion of the Hemlock Oil Pool to include the Tyonek G-zone and the Lower Hemlock intervals will prevent waste, protect correlative rights and improve ultimate recovery from the Swanson River Field.
3. UNOCAL has satisfied the conditions necessary for administrative approval of its October, 1995 request to expand the Hemlock Oil Pool in the Swanson River Field.
4. Administrative approval is allowed by Rule 7 of Conservation Order No. 123.

NOW, THEREFORE, IT IS ORDERED THAT the pool rules for the Swanson River Field Hemlock Oil Pool are amended to include the G zone of the Tyonek Formation and the lower portion of the Hemlock Formation and the findings, conclusions and administrative record for Conservation Order No. 123 are adopted by reference and incorporated in this decision.

The following rules apply to the Swanson River Field, Hemlock Oil Pool:

Rule 1: Previous Orders Revoked

Conservation Orders Nos. 8 and 9 are hereby revoked.

Rule 2: Rules Area

These rules apply to the combined area of the Swanson River and Soldotna Creek Units described as follows:

T 7N., R 9W., S.M.

Section 3:W $\frac{1}{2}$

Section 4:All

Section 5:E $\frac{1}{2}$, SW $\frac{1}{4}$

Section 8:E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$

Section 9:All

Section 10:W $\frac{1}{2}$ W $\frac{1}{2}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$

Section 16:W $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$

T 8 N., R 9 W., S.M.

Section 9:SE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$

Section 10:W $\frac{1}{2}$ W $\frac{1}{2}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$

Section 15:All

Section 16:E $\frac{1}{2}$

Section 21:NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$

Section 22:All

Section 27:NE $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, W $\frac{1}{2}$

Section 17: NE $\frac{1}{4}$ NE $\frac{1}{4}$

Section 28: E $\frac{1}{2}$ E $\frac{1}{2}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$

Section 32: E $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$

Section 33: E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$

Section 34: W $\frac{1}{2}$ NE $\frac{1}{4}$, W $\frac{1}{2}$

Rule 3: Pool Definition

The Hemlock Oil Pool includes all intervals which correlate with the interval 10,085 feet to 10,815 feet in the Standard Oil Company of California, Soldotna Creek Unit 41-4 well.

Rule 4: Pressure Maintenance Projects

The injection of gas and water for the purpose of pressure maintenance, secondary or tertiary recovery, and conducting pilot and injectivity tests is permitted in the Hemlock Oil Pool of the Swanson River field.

Rule 5: Spacing

Not more than two completed wells are allowed in any governmental quarter section. No well shall be completed less than 500 feet from the Swanson River Field-Working Interest Agreement Area exterior boundary line.

Rule 6: Hemlock Oil Pool Reservoir Report.

A surveillance report will be required within one year of regular production following the issuance of Hemlock Oil Pool rules amended to include the Tyonek G zone and Lower Hemlock Formation, and biannually thereafter by December 5. The report shall include but is not limited to the following:

- a. Progress of any enhanced recovery project and reservoir management summary including engineering and geotechnical parameters.
- b. Voidage balance by month of produced fluids and injected fluids.
- c. Analysis of reservoir pressure surveys within the pool.
- d. Results and analysis of production logging surveys, tracer surveys and observation well surveys.
- e. Results of any special monitoring.
- f. Future development plans.

Rule 7: Administrative Approval

Upon request of the Operator and a showing that all affected parties have been notified of such request, the Committee may authorize any operation reasonably designed to further the progress of the project and maximize the recovery of oil from the Hemlock Oil Pool in the Swanson River Field.

DONE at Anchorage, Alaska and dated August 23, 1973, amended December 5, 1995.

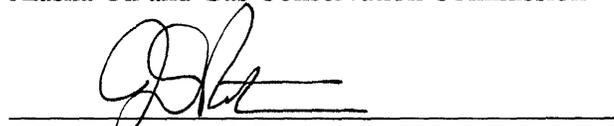




David W. Johnston, Chairman
Alaska Oil and Gas Conservation Commission



Tuckerman Babcock, Commissioner
Alaska Oil and Gas Conservation Commission



J. David Norton, P.E., Commissioner
Alaska Oil and Gas Conservation Commission

AS 31.05.080 provides that within 20 days after receipt of written notice of the entry of an order, a person affected by it may file with the Commission an application for rehearing. A request for rehearing must be received by 4:30 PM on the 23rd day following the date of the order, or next working day if a holiday or weekend, to be timely filed. The Commission shall grant or refuse the application in whole or in part within 10 days. The Commission can refuse an application by not acting on it within the 10-day period. An affected person has 30 days from the date the Commission refuses the application or mails (or otherwise distributes) an order upon rehearing, both being the final order of the Commission, to appeal the decision to Superior Court. Where a request for rehearing is denied by inaction of the Commission, the 30-day period for appeal to Superior Court runs from the date on which the request is deemed denied (i.e., 10th day after the application for rehearing was filed).