STATE OF ALASKA
OIL AND GAS CONSERVATION COMMISSION
333 West 7th Avenue
Anchorage, Alaska 99501

Re: THE APPLICATION OF UNION OIL COMPANY OF CALIFORNIA ("Unocal") for an order authorizing the underground storage of hydrocarbons by injection into the Tyonek reservoir in existing well Swanson River Unit #43-28.	))))))	**Storage Injection Order No. 2** Swanson River Field Swanson River Unit Well #43-28 June 15, 2001

IT APPEARING THAT:

1. By application dated May 2, 2001, Union Oil Company of California ("Unocal") requested an order from the Alaska Oil and Gas Conservation Commission ("Commission") authorizing the underground storage of hydrocarbons by injection into the Tyonek Formation of the Swanson River Unit (SRU) #43-28 well, which is located in Section 28, Township 8 North, Range 9 West, Seward Meridian. Unocal proposes to inject gas for storage during the summer months and produce the gas for sales during winter months.

2. Notice of opportunity for public hearing was published in the Anchorage Daily News Anchorage Daily News on May 5, 2001 in accordance with 20 AAC 25.540.

3. Cook Inlet Region, Inc. ("CIRI"), a royalty owner in the Swanson River Field, indicated support for the gas storage project in correspondence dated May 9, 2001, but raised questions relating to the royalty and accounting obligations of the Operator. The Commission informed CIRI that those questions were outside the Commission's regulatory jurisdiction, and in any event Unocal informed the Commission that CIRI's concerns have been satisfied.

4. The Commission received no other comments concerning the application or requests for a public hearing.

FINDINGS:

1. Unocal is the operator of the Swanson River Field. There are no other operators within a one-quarter mile radius of the existing SRU #43-28 well, the well bore to be utilized for the proposed for storage injection program.

2. Unocal has given notice of its application by certified mail to the surface owners within a one-quarter mile radius of the SRU #43-28 well.

3. Unocal proposes to conduct dry gas storage injection within the existing SRU #43-28 well, between the measured depths of 6375 and 6443 feet in the 64-5 sand of the Tyonek Formation.

4. There are currently no other wells within one-quarter mile radius of the existing SRU #43-28 vertical well.

5. 40 CFR 147.102(b) provides that aquifers below 1700 feet from the surface and within a ¼ mile of the Swanson River Field are exempted in accordance with 40 CFR 144.7(b) and 40 CFR 146.4.

6. Impermeable siltstone 107 feet thick, claystone and coal overly and provide upper confinement from adjacent Tyonek Formation sandstone for the 64-5 sand in the SRU #43-28 well. In addition, over 680 feet of shale confine the proposed storage injection interval from the base of the non-exempted aquifers in the SRU #43-28 well. Lower confinement is provided by over 290 feet of impermeable siltstone, claystone and coal.

7. Offset well control indicates the 64-5 sand is of limited lateral extent, such that injected gas will be confined to the pool into which it is injected. Four wells penetrate the sand in the proposed gas storage area: SRU #43-28, SRU #41-28, SRU #34-28 and SRU #41-33. Of these, only the SRU #43-28 penetrates the 64-5 sand in the gas column, and this well established the gas-water contact at approximately 6390 feet measured depth.

8. Calculated porosity for the 64-5 sand in the SRU #43-28 well ranges from 10% to 36%. Average water saturation is estimated as between 51% and 55%.

9. The SRU #43-28 well was recompleted in December of 1998 to test the 64-5 sand. The well was perforated from 6380 to 6388 feet measured depth and produced dry gas at an initial rate of 3.0 mmcfd. Cumulative production from the 64-5 sand in SRU #43-28 was 1.31 bcf through March of 2001.

10. Material balance analysis of historical production and injection indicate an original gas in place of 1.55 bcf in the 64-5 sand, corresponding to 85% recovery as of 2/28/01. This material balance analysis supports the conclusion that the interval proposed for gas storage is isolated from other strata.

11. The SRU #43-28 well is completed with 7 inch casing run and cemented to 10875 feet measured depth, with a stage collar located at 7114 feet measured depth.

12. A cement bond log was run on July 21, 1961, and it indicates the tops for the first and second stage cement at 9100 and 3675 feet measured depth, respectively. This log indicates good cement bond across the proposed gas storage interval and isolation between the injection strata and the remainder of the well bore.

13. SRU #43-28 meets the casing, cementing, and tubing criteria of 20 AAC 25.412.

14. The mechanical integrity of SRU #43-28 was demonstrated on May 15, 2001 in accordance with 20 AAC 25.412.

15. The fluid proposed for injection is predominantly methane produced from a liquid extraction plant for produced gas from the Hemlock Formation in the Swanson River Field. Specific gravity of the injected gas is expected to range from about 0.61 to 0.59 (air = 1.0).

16. Estimated maximum daily injection volume is 10 mmcfd, and expected wellhead injection pressure is 2400-2600 psi. Proposed maximum injection pressures will be maintained less than the original wellhead pressure of 2850 psi.

17. If the maximum injection pressure is limited to the original wellhead pressure of 2850 psi, fractures will not be propagated in the confining strata, as the sandface injection pressure will be less than the original reservoir pressure of 3300 psi for the 64-5 sand in the SRU #43-28 well.

CONCLUSIONS:

1. The proposed injection of natural gas into the SRU #43-28 well for the purpose of storage will not cause movement of hydrocarbons into sources of freshwater.

2. The proposed storage of natural gas in SRU #43-28 will not cause fluids to move behind casing beyond the approved storage zone.

3. The proposed storage of natural gas in well SRU #43-28 will not propagate fractures through the confining zones.

4. The proposed injection of natural gas into the SRU #43-28 well for the purpose of storage will not cause waste, jeopardize correlative rights, endanger freshwater, or impair ultimate recovery.

NOW, THEREFORE, IT IS ORDERED that the following rules, in addition to statewide requirements under 20 AAC 25 apply to the underground storage of hydrocarbons by injection in the SRU #433-28 well.

RULE 1: STORAGE INJECTION

The Commission approves the injection for storage of natural gas into the 64-5 sand of the Tyonek Formation, between the measured depths of 6375 and 6443 feet in SRU #43-28. The Operator shall report disposition of production and injection as required by of 20 AAC 25.228, 20 AAC 25.230, and 20 AAC 25.234.

RULE 2: CONTINUED MECHANICAL INTEGRITY

This approval is conditioned on the operator's demonstrating the continued mechanical integrity of SRU #43-28 in accordance with 20 AAC 25.252 (d), (e) and (f).

RULE 3: MAXIMUM INJECTION PRESSURE

The maximum wellhead injection pressure shall be limited to 2850 psi.

RULE 4: ANNUAL MATERIAL BALANCE

The operator shall annually provide to the Commission material balance calculations of the gas production and injection volumes to provide assurance of continued reservoir confinement of the gas storage volumes. This information shall be submitted no later than 60 days after each anniversary date of this order for the 12-month period ending on that anniversary date

RULE 5: EXPIRATION OF APPROVAL

As provided in 20 AAC 25.252(j), if storage operations are not begun within 24 months after the date of this order, the injection approval will expire unless an application for extension is approved by the Commission.

DONE at Anchorage, Alaska and dated June 15, 2001.

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Cammy Oechsli Taylor, Chair

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Daniel T. Seamount, Jr., Commissioner

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Julie M. Heusser, Commissioner

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 nonaction 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).