Core (2971.5', 2980.5', 3002.2', 3,010', and 3,014') analysis report of the U. S. Navy Fish Creek No. 1 well.
ARCO ALASKA, INC.

CORE ANALYSIS REPORT
FISH CREEK #1
EXPLORATION
NORTH SLOPE, ALASKA
CL FILE NO. BP-C-1516

Performed by:

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or other mineral well or formation in connection with which such report is used or relied upon.
INTRODUCTION

Core Laboratories was requested to perform permeability and porosity measurements on behalf of Arco Alaska, Inc. for samples recovered from the Fish Creek #1 well from the North Slope, Alaska. Presented herein are the results of this study.

Slabbed sections of core approximately one inch in thickness were received in Anchorage by Core Lab. personnel. A service description and methodology are presented in section 1. The core analysis results and lithological descriptions for the horizontal samples are presented in section 2.

We sincerely appreciate this opportunity to be of service and hope this data prove beneficial in the development of a reservoir.
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SECTION 1

CONVENTIONAL CORE ANALYSIS
SERVICE DESCRIPTION
Upon arrival at Core Laboratories Anchorage facility, the slabbed sections of core were saturated with water, then placed in a freezer and allowed to freeze overnight.

The one-inch routine plugs were cut parallel to bedding, through the central portion of the one inch slabs. The horizontal plugs were cut using carbon dioxide liquid as a coolant, and trimmed on a dry saw. Two samples - from 2971.5ft. and 2980.5ft. - failed and were not suitable for further analysis. The sample from 3002.3ft. was well consolidated and required no special handling. The samples from 3010.0ft. and 3014.0ft. were wrapped in lead foil with screens at each end to prevent their parting along bedding plains.

Laboratory Procedures

Plug Cleaning

The horizontal plugs were cleaned individually for a minimum of five day in a Dean-Stark. The plugs were considered clean when no cut fluorescence was observed using trichloroethane under UV light.

Plug Drying

The horizontal plugs were dried in a convection oven at 240°F for 24 hours.

All samples were cooled in a desiccator to room temperature before porosity and permeability measurements were made.

Grain Density

Grain volume determinations were measured on desleeved samples according to Boyle’s Law utilizing Helium in an Auto Porosimeter. The equipment was calibrated to yield a grain density variation of less than .005 gm/cc. Grain densities were calculated using Equation 1.

\[
D_g = \frac{M_g}{V_g}
\]  

(1)

Where:  
\(D_g\) = Grain Density  
\(V_g\) = Grain Volume  
\(M_g\) = Grain Mass
Atmospheric Porosity of Consolidated Samples

The horizontal plug samples were measured for bulk volume by mercury displacement at ambient conditions. Porosity was calculated using Equation 2.

\[
P = \left(\frac{V_b - V_g}{V_b}\right) \times 100
\]

Where:
- \( P \) = Porosity, Percent
- \( V_b \) = Bulk Volume
- \( V_g \) = Grain Volume

Atmospheric Permeability to Air

Horizontal permeabilities were measured in a Hassler type core holder at a confining pressure of 400 psig after the plugs were redried overnight at 240°F. Permeability calculations were performed as defined by Darcy's Equation for compressible fluids, Equation 3.

\[
K = \frac{Pa \times v \times 1000 \times Qa \times L \times L}{(P_1 - P_2)(P_1 + P_2)} \times \frac{V_b}{2}
\]

Where:
- \( K \) = Permeability
- \( v \) = Gas Viscosity
- \( P_1 - P_2 \) = Differential Pressure
- \( P_1 + P_2 \) = Mean Pressure
- \( 2 \)

\( Pa \) = Atmospheric Pressure
\( Qa \) = Flow Rate
\( L \) = Length
\( V_b \) = Bulk Volume
SECTION 2

CONVENTIONAL CORE ANALYSIS
TABULAR RESULTS
### DEAN STARK ANALYSIS

<table>
<thead>
<tr>
<th>SMPL #</th>
<th>DEPTH (FT)</th>
<th>PERMEABILITY (KAIr MD)</th>
<th>POROSITY (HELIUM %)</th>
<th>GRAIN DENSITY (GM/CC)</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1</td>
<td>2972</td>
<td>SAMPLE FAILED</td>
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