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EXXON PRODUCTION RESEARCH COMPANY

GEOCHEMICAL ANALYSES AND INTERPRETATION OF TWO GASES FROM THE 16/7-4 WELL, OFFSHORE NORWAY

Report by:
A. T. James

Analyses by:
P. A. Gregory
J. L. Briggs

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Research Application Report

EXXON PRODUCTION RESEARCH COMPANY
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RESERVOIR EVALUATION DIVISION

M.A. ROGERS
MANAGER

June 9, 1983

Mr. J. D. Hedberg
Esso Exploration and Production Norway, Inc.
Postboks No. 560
4001 Stavanger, Norway

Attention: Mr. John Thomas/Mr. R. Todd/Mr. S. Horvik

Transmitted are three copies of our EPR.117ES.83 report entitled "Geochemical Analyses and Interpretation of Two Gases from the 16/7-4 Well, Offshore Norway", by A. T. James. This work was done in response to your March 25, 1983, telex, and charges for this work have been billed to EPR job number 17628.

Gases from DST #1 and DST #2 are nearly identical and have the same source. We believe they have been generated from the Jurassic at a LOM of 11 to 12 and are not indigenous to the reservoir.

If you have any questions concerning either the analyses or their interpretation, please contact us.

M. A. ROGERS

By J. P. Shannon, Jr.
J. P. Shannon, Jr.

ATJ:sp
Attachment
c: Mr. R. M. Meek
Mr. C. R. Davis

EXXON PRODUCTION RESEARCH COMPANY

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A. T. James

Reservoir Evaluation Division

June 1983

EPR.117ES.83

Charges for this work were specifically authorized by Esso Exploration and Production Norway, Inc., and are not covered by production research agreements with Exxon Production Research Company.

GEOCHEMICAL ANALYSES AND INTERPRETATION OF TWO GASES FROM THE 16/7-4 WELL, OFFSHORE NORWAY

A. T. James

Two gas samples from DST #1 and DST #2 in the 16/7-4 well have been analyzed in an effort to determine their sources and maturities. The results of the analyses together with the interpreted LOMs and sample information are given in Table 1.

Gases from DST #1 and #2 are nearly identical and have the same source. Gas from DST #1 is slightly wetter than gas from DST #2 and might be expected to be associated with significant condensate or high-gravity crude oil production. The gases have been generated from the Jurassic at a LOM of 11 to 12 and are not indigenous to their Triassic reservoirs.

The two gases from 16/7-4 appear to be very similar to those encountered at 15/9-11, 15/9-9, and 15/8-1 reported previously (refer to EPR.247ES.82) as well as to other gases in the Sleipner area, all of which are believed to have been generated in the Jurassic.

No hydrogen sulfide was detected in the samples provided from 16/7-4. (Detection limits were 1.0 ppm.)

For a discussion of the hydrocarbon source potential of the section penetrated, the reader is referred to EPR.99ES.83 by R. E. Metter. The interpretations presented in this report are based on analyses shown in Table 1, as well as on additional proprietary procedures, as has been discussed in previous conversations between Statoil, Esso Norway and EPR.

TABLE 1 Chemical and carbon isotopic compositions of gases from the 16/7-4 well

Well	16/7-4	16/7-4
Test	DST #1 Separator 345 psi at 100°F	DST #2 Separator 410 psi at 100°F
Sample Depth	2,590.5-2,597 m.	2,320-2,340 m.
Reservoir	Triassic	Triassic
Sample Number	76563	76564
Molecular Composition, mole %		
H_2S	0.00	0.00
CO_2	0.32	0.36
N_2	1.99	3.02
C_1	70.39	72.35
C_2	12.85	12.54
C_3	9.28	8.19
iC_4	1.44	1.10
nC_4	2.15	1.57
iC_5	0.56	0.38
nC_5	0.51	0.33
C_{6+}	0.51	0.16
Carbon Isotopic Composition, °/oo δC^{13} vs. PDB		
Methane	-42.44	-42.61
CO_2	-9.77	-9.42
Interpreted Source LOM	11-12	11-12