

NATIONAL PETROLEUM RESERVE IN ALASKA

HISTORY
OF
DRILLING OPERATIONS

SOUTH BARROW WELL NO. 15

HUSKY OIL NPR OPERATIONS, INC.
Prepared by: Drilling Department
Edited by: S. L. Hewitt and Gordon W. Legg

For the

U. S. GEOLOGICAL SURVEY
Office of the National Petroleum Reserve in Alaska
Department of the Interior
SEPTEMBER 1982

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
DRILLING SUMMARY	2
GOVERNMENT FORMS AND REPORTS	
Notice of Intent to Drill	5
Sundry Notices and Reports	
Subsequent Report of Spud	6
Subsequent Notice of Change of Plans (Depth Revision)	7
Subsequent Report of Running 7" Casing	8
Notice of Plug Back	9
Gas Well Completion Report	10
Well Completion Report	11
LOCATION DATA	
As Staked Location Plat	14
Drill Pad Drawing	15
DRILLING DATA	
Operations History	16
Drilling Time Analysis	21
Drilling Time Curve	25
Drilling Mud Record	26
Bit Record	27
CASING DATA	
Introduction	28
Casing and Cementing Report 9-5/8" Casing	30
Casing Tally Summary 7" Casing	31
Casing Tally 7" Casing	32
Casing and Cementing Report 7" Casing	34
Tubing Tally Summary 2-7/8" Tubing	35
Tubing Tally 2-7/8" Tubing	36
COMPLETION DATA	
Well Completion Schematic	38
Wellhead Schematic	39
Arctic Casing Pack	43
APPENDIX NO. I - Rig Inventory	I-1

LIST OF FIGURES

Figure No. 1, Well Location Map	1
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SOUTH BARROW WELL NO. 15

INTRODUCTION

South Barrow Well No. 15 is located in the East Barrow Gas Field, Alaska (Figure 1). The well is 2,640 feet from the east line and 990 feet from the north line of protracted Section 23, Township 22 North, Range 17 West, Umiat Meridian (Latitude: $71^{\circ}14'58.68''$ North; Longitude: $156^{\circ}20'42.13''$ West). The Alaska State Plane Coordinates are: X = 694,843.94 and Y = 6,309,541.29, Zone 6. Elevations are 7' ground level and 30' Kelly Bushing. Painting, cleaning and rigging up began on August 15, 1980 and was completed on August 23, 1980. The well was spudded August 23, 1980.

South Barrow Well No. 15 is a step-out well 1/2 mile northwest of the South Barrow Well No. 19. The hole was drilled to a total depth of 2,278 feet. The primary zone of interest was the Barrow Sandstone. Zones 2054' to 2064' and 2110' to 2151' were found to contain hydrocarbons. At the conclusion of the drilling and evaluating operations, the well was completed as a gas producer. The wellhead was secured, and the rig was released on September 18, 1980.

Husky Oil NPR Operations, Inc. supervised and directed the drilling and support operations as prime contractor for the Department of the Interior. Brinkerhoff Signal, Inc. was the drilling contractor, and Brinkerhoff Rig 31, a National T-20, was used to drill the well.

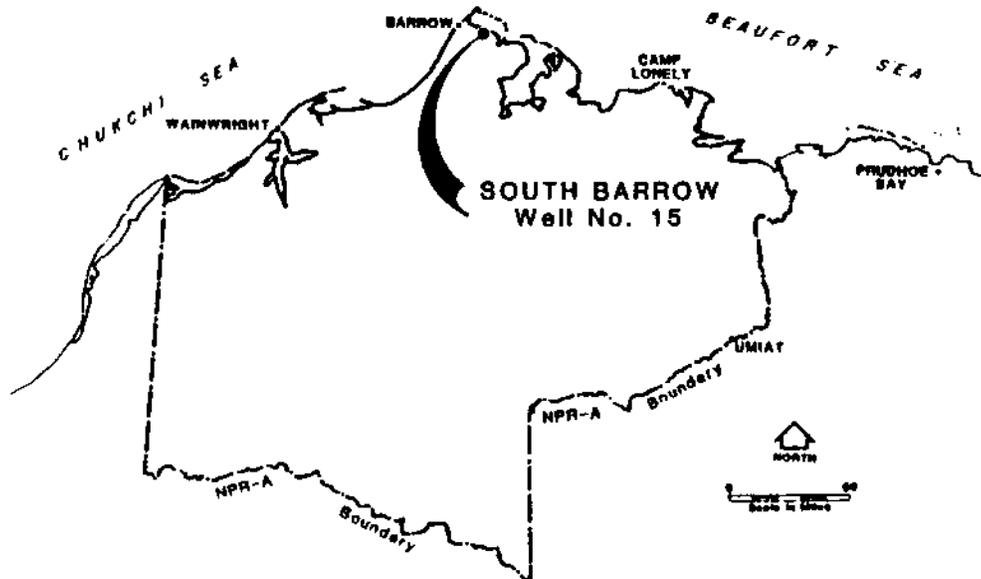


FIGURE 1 - WELL LOCATION MAP - SOUTH BARROW WELL NO. 15

DRILLING SUMMARY

Cleaning, painting and rigging up of Brinkerhoff Signal, Inc., Rig No. 31, began on August 15, 1980. Rigging up was completed on August 23, 1980 and the hole was spudded at 12:30 p.m. The rig had previously been on South Barrow No. 20, a short distance away. A 13-3/8" conductor was set at 80' and cemented to surface with 230 sacks of Permafrost cement.

A 12-1/4" hole was drilled to 1510'. Fresh water was used as a drilling fluid to 1350' where it was displaced with a gel mud system to clean the hole. Core No. 1 was cut from 800-825' with 9 feet recovered, and Core No. 2 was cut from 1329' to 1389' with 59 feet recovered. A DIL/GR/SP, BHC-Sonic/GR/TTI and HDT-Dipmeter were run from 1510' back into the 13-3/8" shoe at 80'.

An additional 5 feet of 12-1/4" hole was drilled and 9-5/8" casing was run (36 joints, 53.5#, S-95). The casing was landed at 1514' and cemented back to the surface with 1,500 sacks of 14.9 ppg Permafrost cement. The mud was displaced with 10.1 to 10.3 ppg calcium-chloride mud which was then used to the total depth of the well. The shoe and 10 feet of formation were drilled and the formation was tested to a 0.61 psi per foot equivalent gradient with no break down.

An 8-1/2" hole was drilled to 2278'. The following cores were cut: Core No. 3, 1838' to 1881', 42.8 feet recovered; Core No. 4, 2096' to 2136', 36.2 feet recovered; Core No. 5, 2165' to 2187', 19.9 feet recovered. Three open-hole drill-stem tests were run as follows on the way down:

Drill Stem Test No. 1 (2080-2136'):

Misrun; packers failed after approximately 3 minutes of initial open.

Drill Stem Test No. 2 (2095-2136'):

Misrun; packers failed after 20 minutes of initial open.

Drill Stem Test No. 3 (2105-2136') no cushion:

1st FP (63 minutes): IHP 1,175 psi; opened through 1/8" choke with immediate strong blow, GTS in 4 minutes, stabilized SFP of 830 psi, IFP 248.5-945.5 (from final Halliburton report, gauge No. 62 at 2128'); shut in for 124 minutes, ISIP 970 psi.

2nd FP (125 minutes): Opened through 24/64" choke with maximum SFP of 290 psi; changed to 20/64" choke, pressure declined from 245 psi to 200 psi at end of FP; calculated final flow rate 500 MCFPD; FFP 294-265 psi; shut in for 240 minutes; FSIP 964 psi; FHP 1,167 psi.

The 8-1/2" hole was logged from 2278' to the 9-5/8" shoe at 1514' with a DLL/GR, BHC-SONIC/GR, FDC/CNL/GR/CAL, HDT-DIPMETER, and MLL/ML.

Open hole Drill Stem Test No. 4 was then run from 2188' to 2278' with no water cushion. Results are as follows:

1st FP (60 minutes): IHP 1,253 psi; opened through 20/64" choke with moderate blow, decreased to weak blow in 30 minutes. *IFP 222-984 psi, shut in for 120 minutes, ISIP 1,020 psi.

2nd FP (116 minutes): Opened with weak blow, well dead in 60 minutes; *FFP 1,004-1,023 psi; shut in for 248 minutes; FSIP 1,026 psi; FHP 1,248 psi. Recovered 2090' of mud and mud cut water, 15,500 ppm chloride (this converts to 14.2 barrels of fluid and since the 8-1/2" open hole below the packer would have contained approximately 6.3 barrels, it is assumed that 7.9 barrels of fluid came from the formation). The makeup water for the mud system was 48,000 ppm chloride which supports the assumption that some formation water was recovered.

* NOTE: Tool plugged during initial open; all flow pressures are unreliable.

After evaluation of wireline logs and drill-stem tests, it was decided to plug back and complete the zones 2054' to 2064' and 2110' to 2151'. Seven-inch casing was run (58 joints, 38#, S-95, BTC) and landed at 2198'. FOs were at 1180' and 1300'. The casing was cemented with 90 sacks of 14.9 to 15.2 ppg Class "G" cement (2% CaCl₂, 1% CFR-2). The blowout preventer was nipped up and tested to 3,000 psi. Both FOs were cycled and tested to 2,000 psi. Fifty sacks of Class "G" cement were down squeezed through the FO at 1300'. The 7" x 9-5/8" annulus was then Arctic packed through the FO at 1180' back to the surface.

A CBL/VDL/CCL/GR log was run to aid in selecting perforation intervals for the completion and the 7" casing was perforated at 4 shots per foot from 2054' to 2064' and from 2110' to 2151'. The 2-7/8" tubing was run to 2155', the blowout preventers nipped down, and the test tree nipped up and tested to 3,000 psi. The test lines were hooked up and the mud was displaced with 9.3 ppg CaCl₂ water, and the well tested.

Production Test No. 1 is summarized as follows:

<u>Choke Size</u>	<u>Time</u>	<u>Flowing Surface Tubing Pressure</u>	<u>Flowing Bottom Hole Pressure</u>	<u>Bottom Hole Temperature</u>
8/64"	8:00 p.m. 9/17	780 psi	944 psi	52°F
12/64"	1:00 a.m. 9/18	380 psi	574 psi	48.7°F
16/64"	6:00 a.m. 9/18	690 psi	855 psi	50.7°F
20/64"	6:00 a.m. 9/18	460 psi	649.5 psi	50.8°F

The calculated rate on a 5/16" choke was 1.0 MMCFGPD. Final bottom-hole shut-in pressure was 962 psi.

At the conclusion of the production test, the well was suspended as a shut-in gas well, the test tree capped, the mud tanks cleaned, and the rig was released at midnight on September 18, 1980.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

NOTICE OF INTENT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK
 DRILL DEEPEN PLUG BACK

b. TYPE OF WELL
 OIL WELL GAS WELL OTHER SINGLE ZONE MULTIPLE ZONE

2. NAME OF OPERATOR
 National Petroleum Reserve in Alaska
 (through Husky Oil NPR Operations, Inc.)

3. ADDRESS OF OPERATOR
 2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)
 At surface
 2640' FEL, 990' FNL, NW 1/4, Sec 23, T22N, R17W, UM
 At proposed prod. zone
 Same (straight hole)

5. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*
 9.8 Miles Southeast of Barrow, Alaska

6. LEASE DESIGNATION AND SERIAL NO.
 N/A

8. IF INDIAN, ALLOTTEE OR TRIBE NAME
 N/A

7. UNIT AGREEMENT NAME
 N/A

8. FARM OR LEASE NAME
 National Petroleum Reserve in AK

9. WELL NO. (So. Barrow Well No. 15 (East Area))

10. FIELD AND POOL, OR WILDCAT
 South Barrow Gas Field

11. SEC. T., R., M., OR BLK. AND SURVEY OR AREA
 Sec 23, T22N, R17W, UM

12. COUNTY OR PARISH 13. STATE
 North Slope Borough, AK

10. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drilg. unit (lbe, if any) 10,000

15. NO. OF ACRES IN LEASE 23,680,000

17. NO. OF ACRES ASSIGNED TO THIS WELL
 N/A

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT. 5,370'

19. PROPOSED DEPTH ± 2200'

20. ROTARY OR CABLE TOOLS
 Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.)
 Ground = 7'; Pad = 12'; KB = 30'

22. APPROX. DATE WORK WILL START*
 September 1, 1980

PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
17 1/2"	13 3/8" (Cond)	72# (S-95)	110' KB	± 100 Sx Permafrost to Surface
12 1/4"	9 5/8"	53.5# (S-95)	1500'	± 1000 Sx Permafrost to Surface
8 1/2"	7"	38# (S-95)	2100'	± 10 Sx Class "G" w/Additives Around the Shoe.

Blowout Preventer Program:

From ± 110' KB to ± 1500':
 12", 3000 psi, SA Diverter Assembly

From ± 1500' to ID:
 12", 3000 psi, SRRA BOP Assembly
 w/3000 psi Choke Manifold and Kill Line

Second Stage: ± 60 Sx From 2000' to ± 1600'.
 Down squeeze through FO @ ± 1300' with ± 50 sx Permafrost. Arctic Pack 9 5/8" X 7" annulus through FO at 1220' with ± 60 barrels Arctic Pack.

See Drilling Program for details.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

SIGNED: Max Brewer TITLE: Chief of Operations DATE: 11 Aug 80

(This space for Federal or State office use)

NO. _____ DATE _____
 BY: Robert Redford TITLE: _____ DATE: 7-25-80

"See Attached Conditions"

*See Instructions On Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well gas well other

2. NAME OF OPERATOR National Petroleum Reserve in Alaska (through Husky Oil NPR Operations, Inc.)

3. ADDRESS OF OPERATOR
2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 2640' FEL; 990' FNL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH: Same (straight hole)

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

NOTICE OF INTENT TO:		SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF	<input type="checkbox"/>	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>	<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>	<input type="checkbox"/>
PULL OR ALTER CASING	<input type="checkbox"/>	<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>	<input type="checkbox"/>
CHANGE ZONES	<input type="checkbox"/>	<input type="checkbox"/>
ABANDON*	<input type="checkbox"/>	<input type="checkbox"/>
(other) Subsequent Report of Spud		

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

South Barrow Well No. 15 was spudded at 12:30 p.m. on August 23, 1980.

5. LEASE	N/A
6. IF INDIAN, ALLOTTEE OR TRIBE NAME	N/A
7. UNIT AGREEMENT NAME	N/A
8. FARM OR LEASE NAME	National Petroleum Reserve in Alaska
9. WELL NO.	South Barrow Well No. 15 (East Area)
10. FIELD OR WILDCAT NAME	South Barrow Gas Field (East Area)
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA	Sec. 23, T22N, R17W, U.M.
12. COUNTY OR PARISH	13 STATE
North Slope Borough	Alaska
14. API NO.	50-023-20016
15. ELEVATIONS (SHOW DF KDB, AND WD)	G.L.: 7'; Pad: 12'; K.B.: 30'

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

Original signed _____ TITLE Chief of Operations DATE _____
signed _____
conforms with _____ (This space for Federal or State office use)
pertinent _____ TITLE _____ DATE _____
provisions of _____
30 CFR 221.

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well gas well other

2. NAME OF OPERATOR National Petroleum Reserve in Alaska (through Husky Oil NPR Operations, Inc.)

3. ADDRESS OF OPERATOR
2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 2640' FEL; 990' FNL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH: Same (Straight Hole)

15. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

NOTICE OF INTENT TO:

TEST WATER SHUT-OFF
FRACTURE TREAT
SHOOT OR ACIDIZE
REPAIR WELL
PULL OR ALTER CASING
MULTIPLE COMPLETE
CHANGE ZONES
ABANDON*

SUBSEQUENT REPORT OF:

(other) Notice of Intent to Change Plans (Depth Revision No. 1)

5. LEASE

N/A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

N/A

7. UNIT AGREEMENT NAME

N/A

8. FARM OR LEASE NAME National Petroleum Reserve in Alaska

9. WELL NO.

South Barrow Well No. 15 (East Area)

10. FIELD OR WILDCAT NAME

South Barrow Gas Field (East Area)

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA

Sec 23, T22N, R17W, UM

12. COUNTY OR PARISH

North Slope Borough, Alaska

14. API NO.

15. ELEVATIONS (SHOW DEKDB. AND WD)

GL: 7' Pad: 12'; KB: 30'

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)

Due to possible faulting, expected Geologic sequences have come in at approximately 180 feet lower than anticipated. The expected TD is now 2300'. The Operator plans to continue drilling. Verbal approval to continue to the new proposed depth was given by Mr. Harold Hedlund.

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ FL

18. I hereby certify that the foregoing is true and correct

SIGNED Max Brewer TITLE Chief of Operations DATE 22 September 80

Conforms with pertinent provisions of 30 CFR 221.

(This space for Federal or State office use)
William J. House ACTING DISTRICT SUPERVISOR DATE 9/25/80

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well gas well other

2. NAME OF OPERATOR National Petroleum Reserve in Alaska (through Husky Oil NPR Operations, Inc.)

3. ADDRESS OF OPERATOR
2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 2640' FEL; 990' FNL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH: Same (straight hole)

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

NOTICE OF INTENT TO:		SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF	<input type="checkbox"/>	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>	<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>	<input type="checkbox"/>
PULL OR ALTER CASING	<input type="checkbox"/>	<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>	<input type="checkbox"/>
CHANGE ZONES	<input type="checkbox"/>	<input type="checkbox"/>
ABANDON*	<input type="checkbox"/>	<input type="checkbox"/>
(other)		Subsequent Report of Running 7" Casing

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Drilled 8-1/2" hole to 2278'. Logged with DLL/MSFL/GR, FDC/CNL/GR/CAL, BHC/GR, Dipmeter, MLL. Ran 58 joints of 38#, S-95, BTC casing. Landed shoe at 2198', FOs at 1180.07' and 1300'. Cemented with 90 sacks of Class "G" with 2% CaCl₂ and 1% CFR-2 at 14.9-15.2 ppg slurry weight. CIP at 3:15 PM, 9/14/80. Nippled up and tested BOPs to 3000 psi. Tested FO to 2000 psi OK. Arctic Packed 7" x 9-5/8" annulus. Circulated and downsqueezeed through lower FO 50 sacks Class "G" with 2% CaCl₂ and 1% CFR-2.

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

Original signed s/Max C. Brewer TITLE Chief of Operations DATE 26 September 80

Conforms with pertinent provisions of 30 CFR 221. Original signed by s/Harold J. Hoelund (This space for Federal or State office use) TITLE Acting District Supervisor DATE 10-2-80

Amended

5. LEASE
N/A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
N/A

7. UNIT AGREEMENT NAME
N/A

8. FARM OR LEASE NAME
National Petroleum Reserve in Alaska

9. WELL NO.
South Barrow Well No. 15 (East Area)

10. FIELD OR WILDCAT NAME
South Barrow Gas Field (East Area)

11. SEC. T., R., M., OR BLK. AND SURVEY OR AREA
Sec. 23, T22N, R17W, UM

12. COUNTY OR PARISH 13 STATE
North Slope Borough Alaska

14. API NO.

15. ELEVATIONS (SHOW DF KDS, AND WD)
GL: 7'; Pad: 12'; KB: 30'

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-311-C for such proposals.)

1. oil well gas well other

2. NAME OF OPERATOR National Petroleum Reserve in Alaska (through Husky Oil NPR Operations, Inc.)

3. ADDRESS OF OPERATOR
2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)

AT SURFACE: 2640' FSL; 990' FNL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH: Same (straight hole)

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

NOTICE OF INTENT TO:

SUBSEQUENT REPORT OF:

TEST WATER SHUT-OFF	<input type="checkbox"/>	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>	<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>	<input type="checkbox"/>
PULL OR ALTER CASING	<input type="checkbox"/>	<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>	<input type="checkbox"/>
CHANGE ZONES	<input type="checkbox"/>	<input type="checkbox"/>
ABANDON*	<input type="checkbox"/>	<input type="checkbox"/>
(other) Confirming Notice to Plug Back	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Amended

5. LEASE	N/A
6. IF INDIAN, ALLOTTEE OR TRIBE NAME	N/A
7. UNIT AGREEMENT NAME	N/A
8. FARM OR LEASE NAME	National Petroleum Reserve in Alaska
9. WELL NO.	South Barrow Well No. 15 (East Area)
10. FIELD OR WILDCAT NAME	South Barrow Gas Field (East Area)
11. SEC. T. R. M. OR BLK. AND SURVEY OR AREA	Sec. 23, T22N, R17W, UM
12. COUNTY OR PARISH	13 STATE
North Slope Borough	Alaska
14. API NO.	
15. ELEVATIONS (SHOW DF, KPS, AND WD)	Bl: 7'; Pad: 12'; KB: 30'

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

This is a confirming notice to plug back South Barrow Well No. 15. The well was drilled to a total depth of 2278' and logged. The Lower Barrow Zone was open hole drill stem tested and production tested after running 7" casing. The Lower Barrow Sand was found to have an $S_w = 100\%$ and produced a column of mud and mud cut water of 2090' when tested.

- Mixed and pumped 10 barrels H_2O w/2% $CaCl_2$ + 2% Cla-Sta ahead of 35 sacks Class "G" cement at 15.6 ppg w/2% $CaCl_2$ and 1% CFR-2.
- Displaced with 15.5 barrels mud; POH. Cement in place 9/12/80 at 10:30 PM.
- Picked up bit, RIH, tagged cement at 2175'. Drilled cement to 2205'.

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

Original SIGNED s/Max C. Brewer TITLE Chief of Operations DATE 26 September 80

Conforms with pertinent provisions of 30 CFR 221. Original signed by s/Rarold J. Hedlund (This space for Federal or State office use) TITLE Actg. District Supervisor DATE 10-2-80

Amended 1/7/83

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well gas well other

2. NAME OF OPERATOR National Petroleum Reserve in Alaska (through Husky Oil NPR Operations, Inc.)

3. ADDRESS OF OPERATOR
2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 2640' FSL; 990' FNL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH: Same (straight hole)

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

NOTICE OF INTENT TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	<input type="checkbox"/>		<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>		<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>		<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>		<input type="checkbox"/>
PULL OR ALTER CASING	<input type="checkbox"/>		<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>		<input type="checkbox"/>
CHANGE ZONES	<input type="checkbox"/>		<input type="checkbox"/>
ABANDON*	<input type="checkbox"/>		<input type="checkbox"/>
(other)	<input checked="" type="checkbox"/>	Gas Well Completion Report	<input type="checkbox"/>

5. LEASE
N/A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
N/A

7. UNIT AGREEMENT NAME
N/A

8. FARM OR LEASE NAME National Petroleum Reserve in Alaska

9. WELL NO.
So. Barrow Well No. 15 (East Area)

10. FIELD OR WILDCAT NAME
So. Barrow Gas Field (East Area)

11. SEC. T., R., M., OR BLK. AND SURVEY OR AREA
Sec 23, T22N, R17W, UM

12. COUNTY OR PARISH | 13. STATE
North Slope Borough, Alaska

14. API NO.

15. ELEVATIONS (SHOW DF., KDS, AND WD)
GL: 7'; Pad: 12; KB: 30.

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)

The following procedure describes the completion of South Barrow Well No. 15 as a gas well. Zones 2054'-2064' and 2110'-2151' were tested and found to produce hydrocarbons.

1. After pulling drill pipe, RIH with 70 joints of 2 7/8" tubing and landed at 2155' (with 25' of mule shoe included). Ten centralizers were run on the tubing.
2. All connections were broken, cleaned, redoped, and retorqued when running. Make-up torque was 2300 ft-lbs.
3. Rigged down BOPE and nipped up Xmas tree. Tested Xmas tree to 3000 psi.
4. Ran BPV; secured wellhead.

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED Max Brewer TITLE Chief of Operations DATE 26 September 80

Conforms with pertinent provisions of 30 CFR 221.

(This space for Federal or State office use)

TITLE _____ DATE _____

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE*
(See other instructions on reverse side)

AMENDED

Form approved.
Budget Bureau No. 42-R365.6.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

1. TYPE OF WELL: OIL WELL GAS WELL DRY Other _____
 a. TYPE OF COMPLETION: NEW WELL WORK OVER DEEP-EN FILL BACK DIFF. CASE Other _____

2. NAME OF OPERATOR
USGS through Husky Oil NPR Operations, Inc.

3. ADDRESS OF OPERATOR
2525 C Street, Suite 400, Anchorage, AK 99503

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements):
 At surface 2640' FEL; 990' FEL
 At top prod. interval reported below
 At total depth Same (straight hole)

5. LEASE DESIGNATION AND SERIAL NO.
N/A

6. IF INDIAN ALLOTTEE OR TRIBE NAME
N/A

7. LEASE AGREEMENT NAME
N/A

8. FARM OR LEASE NAME
National Petroleum Reserve in

9. WELL NO.
Alaska

10. FIELD AND POOL, OR WILDCAT
South Barrow Well No. 15

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA
South Barrow Gas Field

12. COUNTY OR PARISH
North Slope Borough, Alaska

13. STATE
Alaska

14. PERMIT NO. N/A DATE ISSUED N/A

15. DATE BEGUN 8/23/80 16. DATE T.D. REACHED 9/1/80 17. DATE COMPL. (Ready to prod.) 9/10/80 18. ELEVATIONS (DP, RER, RT, OR ETC.)* GL-7'; Pad-12'; KB-30' 19. ELEV. CASINGHEAD 12'

20. TOTAL DEPTH, MD & TVD 2278' TVD & MD 21. PLUG, BACK T.D., MD & TVD 2170' 22. IF MULTIPLE COMPL., HOW MANY* N/A 23. INTERVALS DRILLED BY Rotary

24. PRODUCING INTERVAL(S) OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)* 2054-2064' and 2110-2151' MD & TVD, Upper Barrow sands 25. WAS DIRECTIONAL SURVEY MADE

26. TYPE ELECTRIC AND OTHER LOGS RUN DLL/MSFL/GR, FDC/CNL/GR/CAL, BHC/GR, DIP, MLL 27. WAS WELL CORED Yes

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
13-3/8"	72#, S-95	80' KB	17-1/2"	230 Sx C1 G to Surface	None
9-5/8"	53.5#, S-95	1514' KB	12-1/4"	1500 Sx Permafrost Rtrns	None
7"	38#, S-95	2198' KB	8-1/2"	90 Sx C1 G w/2% CCl ₂ 50 Sx Downsqueeze 2 nd Stage	None

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)	SIZE	DEPTH SET (MD)	PACKER SET (MD)
					2-7/8"	2155' KB	N/A

31. PERFORATION RECORD (Interval, size and number)

2054-2064'; 2110-2151'
w/4 Hyperjet II Casing Gun

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED

33. PRODUCTION

DATE FIRST PRODUCTION 9/17/80 PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump) Gas WELL STATUS (Producing or Shut-in) Shut-in

DATE OF TEST	HOURS TESTED	CHOKEN SIZE	PROD'N. FOR TEST PERIOD	OIL—BBL.	GAS—MCF	WATER—BBL.	GAS-OIL RATIO
9/17-18/80	36	1/8-5/16"		0	250 MCFD	0	N/A
				0	+ 1.0 MMCFD	0	0

34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.) Flared TEST WITNESSED BY H. M. Peterson

35. LIST OF ATTACHMENTS Well Completion Schematic

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED Max C. Brewer TITLE Chief of Operations, ONPRA DATE 30 October 80

*(See Instructions and Spaces for Additional Data on Reverse Side) Amended 1/7/83

Well Completion Report
 National Petroleum Reserve in Alaska
 South Barrow Well No. 15

SUMMARY OF CORES

<u>Core No.</u>	<u>Formation</u>	<u>Interval/ Recovery</u>	<u>Description</u>
1	Torok Shale	800-825' (Rec 9')	Shale with rare Siltstone: soft, apparent bedding 18-30° no indication of hydrocarbons.
2	Torok Shale	1329-1389' (Rec 59')	Interlaminated Shale, Siltstone and Sandstone; no visible porosity, very minor oil shows in thin sandstones.
3	"Pebble Shale"	1838-1881' (Rec. 42.8')	Siltstone grading to Shale at base of core; occasional thin sandstones with poor porosity and some oil shows.
4	Upper Barrow sand	2096-2136' (Rec. 36.2')	Sandstone: very fine to fine grained, with siltstone and shale partings, poor to fair porosity, poor to fair oil shows. See DST descriptions.
5	Lower Barrow sand	2165-2187' (Rec. 19.9')	Sandstone: very fine to fine grained, partly shaly, poor to fair porosity, partly oil stained. See DST description.

SUMMARY OF DRILL STEM TESTS

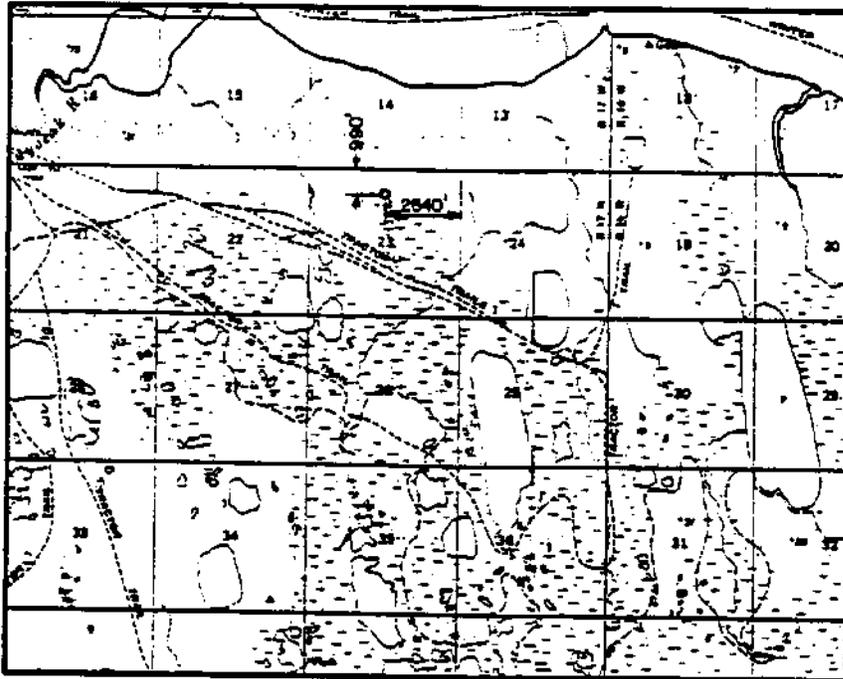
<u>Test No.</u>	<u>Formation</u>	<u>Interval</u>	<u>Description</u>
1	Upper Barrow sand	2080-2136'	Misrun. Open hole DST. No cushion, packers failed after approximately three minutes of initial open, no pressures recorded, no fluid recovered.
2	Upper Barrow sand	2095-2136'	Misrun. Open hole DST. No cushion, no packer seat, packers completely failed after approximately 22 minutes of initial open. No pressures recorded, no fluid recovered.

Well Completion Report
 National Petroleum Reserve in Alaska
 South Barrow Well No. 15

SUMMARY OF DRILL STEM TESTS (Continued)

Test No.	Formation	Interval	Description
3	Upper Barrow sand	2105-2136'	Open Hole DST. No cushion. 1st FP (63 Min): IHP 1175 psi, opened with immediate strong blow through 1/8" choke, increased to very strong blow in two minutes, GTS in four minutes; SFP 830 psi in 22 minutes, 1st FP pressure 248.5-445.5 psi, ISIP 970 psi, shut in for 124 minutes. 2d FP (125 Min): Opened through 24/64" choke with SFP of 200 psi, increasing to 290 psi in 20 minutes, declining to 200 psi through 20/64" choke; calculated final flow rate 500 MCFGPD; 2d FP pressure 294-265 psi, FSIP 964 psi, FHP 1167 psi. No water or oil recovered.
4	Lower Barrow sand	2188-2278'	Open Hole DST: No cushion. 1st FP (60 Min): IHP 1253 psi, opened with moderate blow through 20/64" choke and 90 psi SFP, decreased to weak blow in 30 minutes, no fluid to surface. 1st FP pressure *222-984 psi, ISIP 1020 psi, shut in for 120 minutes. 2nd FP (116 Min): Opened with weak blow, well dead in one hour. 2d FP pressure 1004-1023 psi, FSIP 1026 psi, FHP 1248 psi. Recovered 2090 feet of mud and formation water.

* Note: Tool plugged during initial open; all flow pressures are unreliable.



BARROW GAS WELL No. 15

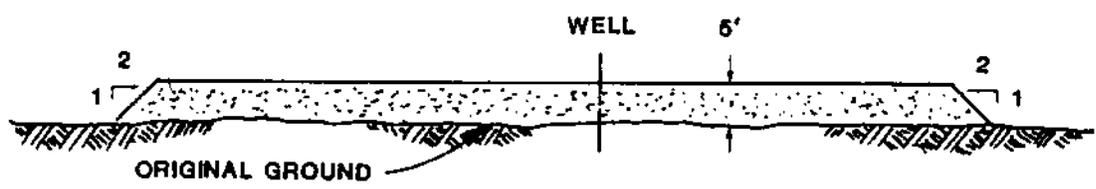
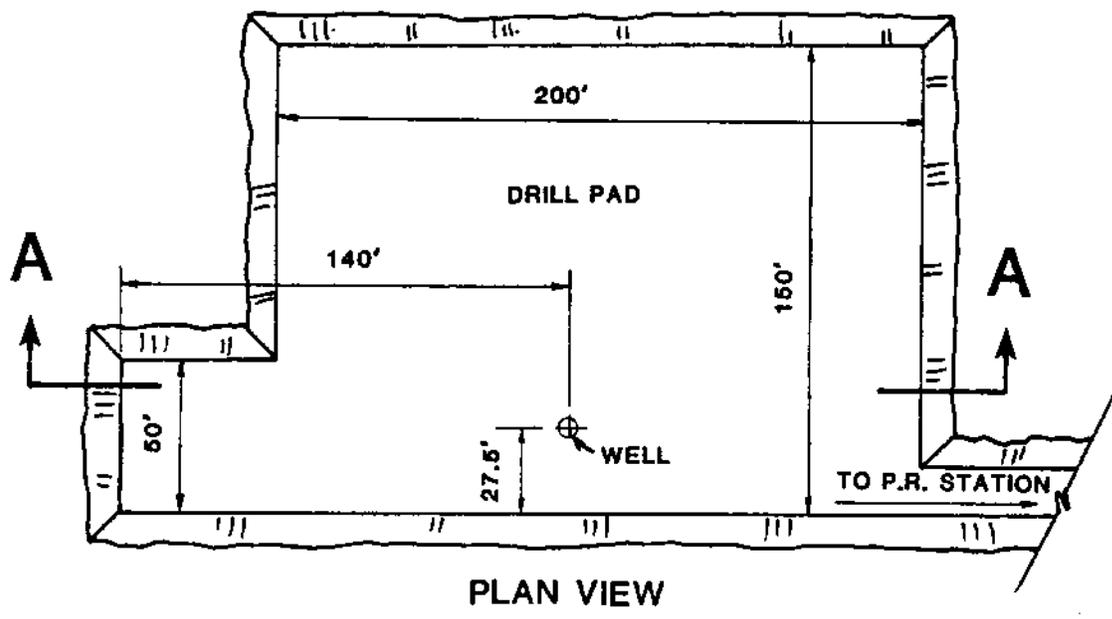
LAT. = 71° 14' 58.68"
 LONG. = 156° 20' 42.13"
 Y = 6,309,541.29
 X = 694,843.94
 ZONE 6

CERTIFICATE OF SURVEYOR

I hereby certify that I am properly registered and licensed to practice land surveying in the State of Alaska and that this plat represents a location survey made by me or under my supervision, and that all dimensions and other details are correct.



AS STAKED
BARROW GAS WELL No. 15
LOCATED IN
NE 1/4 PROTRACTED SEC. 23 T22N, R17W, UMIAT MERIDIAN, AK.
SURVEYED FOR
HUSKY OIL
N. P. R. OPERATIONS, INC.
 TECTONICS INC.
P.O. BOX 4-2285, ANCHORAGE, AK 99508



NOT TO SCALE

SOUTH BARROW No.15 DRILL PAD

OPERATIONS HISTORY

DATE AND FOOTAGE DRILLED AS OF 6:00 A.M.	ACTIVITY
8/22/80	Repaired rig and camp. Performed general rig-up. Cleaned 9-5/8" casing. Drilled out mouse hole. Picked up kelly.
8/23/80 152'	Total Depth: 232'; Mud Weight: 8.4; Viscosity: 30. Completed rig-up. Tested casing and Hydril to 150 pounds. Spudded well August 23, 1980, at 12:30 p.m. Drilled to 200'; pulled out of hole. Replaced jet. Ran in hole and drilled ahead.
8/24/80 586'	TD: 818'; MW: 8.9; Vis: 31. Drilled ahead to 800'; circulated; surveyed. Pulled out of hole. Picked up core barrel. Began coring.
8/25/80 536'	TD: 1354'; MW: 9.3; Vis: 30. Finished cutting Core No. 1, 800' to 825'. Pulled out of hole; recovered nine feet of core. Tripped in hole with bit; reamed from 800' to 825'. Drilled to 1340'. Circulated for core. Pulled out of hole and picked up core barrel. Began coring.
8/26/80 156'	TD: 1510'; MW: 9.5; Vis: 43. Cut Core No. 2, 1329' to 1389'. Pulled out of hole with core; recovered 59 feet. Tripped in hole. Drilled ahead to 1510'. Circulated; made short trip. Circulated for logs.
8/27/80 0'	TD: 1510'; MW: 9.5; Vis: 38. Circulated and conditioned hole for logs. Pulled out of hole; rigged up logging unit. Ran DIL/GR/SP, BHCS/GR/TTI, and HDT-Dipmeter. Tripped in hole to circulate. Dropped collars and slips into hole; lost seven drill collars and slips. Waited on fishing tools. Made up spear; tried to grab slips with spear. Tagged slips at 420'; could not pull loose. Slips went down hole to 430'. Waited on fishing tools.
8/28/80 0'	TD: 1510'; MW: 9.6; Vis: 43. Waited on fishing tools. Picked up flat-bottomed mill and ran in hole. Milled on slips at 438'. Pulled out of hole and laid down mill. Picked up jars and screwed into sub. Ran in hole to 1280'. Screwed into collars; pulled out of hole with fish. Checked drill collars. Ran in hole with flat-bottomed mill; milled on junk.

8/29/80
0' TD: 1510'; MW: 9.6; Vis: 45. Milled on drill collar slips; pulled out of hole. Ran in hole with bit and junk basket. Drilled on junk. Pulled out of hole; no recovery. Reran mill; milled on junk. Pulled out of hole. Ran magnet; recovered miscellaneous parts of slips. Ran in hole with bit and junk sub.

8/30/80
5' TD: 1515'. Finished milling on junk. Pulled out of hole; picked up bit. Ran in hole and circulated and conditioned for casing. Pulled out of hole. Ran 36 joints of 9-5/8", 53.5#, S-95 casing; landed at 1514'. Circulated and cemented with 20 barrels water and 1,500 sacks Permafrost cement at 14.9 ppg, 6 BPM, 450 to 650 pounds. Full returns to surface at 14.7 ppg. Cement in place August 29, 1980, at 8:45 p.m. Waited on cement.

8/31/80
0' TD: 1515'; MW: 9.6; Vis: 41. Finished waiting on cement. Cleaned pits and mixed CaCl₂ mud.

9/1/80
12' TD: 1527'; MW: 10; Vis: 58. Cut off 13-3/8" head; installed 9-5/8" head. Nippled up blowout preventers and flow line. Tested blowout preventer and manifold to 3,000 pounds. Tripped in hole with bit. Cleaned flow line. Tested casing to 1,500 pounds. Drilled out float and shoe; tested formation to 0.61 psi/ft. Drilled ahead.

9/2/80
11' TD: 1538'; MW: 10.0; Vis: 38. Drilled ahead; drilled on junk. Pulled out of hole at 1538'; ran magnet. Pulled out of hole; good recovery. Ran in hole with bit; junk on bottom. Pulled out of hole. Reran magnet with small amount of recovery. Ran in hole with bit; drilled on junk.

9/3/80
32' TD: 1570'; MW: 10; Vis: 38. Drilled on junk. Steel-line measured out; made strap correction. Ran in hole with magnet. Made six magnet runs between bit runs. Ran in hole with bit. Drilled ahead.

9/4/80
268' TD: 1838'; MW: 10; Vis: 45. Drilled ahead to 1713'; pulled out of hole for bit. Drilled from 1713' to 1812'; circulated samples. Drilled to 1838'; dropped survey. Pulled out of hole, steel-line measuring. Picked up core barrel; began trip in.

9/5/80
117' TD: 1955'; MW: 10.1; Vis: 45. Finished washing to bottom with core barrel. Cut Core No. 3, 1838' to 1881'. Pulled out of hole; recovered 42.8 feet of core. Ran in hole with bit; reamed core hole. Drilled ahead.

9/6/80
134' TD: 2089'; MW: 10.2; Vis: 47. Drilled to 2064'. No. 1 engine went down; waited on parts. Drilled from 2064' to 2089'. Pulled out of hole for bit. Tripped in hole with bit.

9/7/80
47' TD: 2136'; MW: 10.2; Vis: 41. Drilled to 2096'. Pulled out of hole; picked up core barrel. Ran in hole. Cut Core No. 4, 2096' to 2136'. Recovered 36.2 feet of core. Picked up drill-stem test tools; ran in hole. Prepared to run drill-stem test.

9/8/80
0' TD: 2136'; MW: 10.2; Vis: 41. Ran Drill-Stem Test No. 1. Attempted to set packers at 2080'; packers failed to hold. Pulled out of hole; reset charts. Ran Drill-Stem Test No. 2. Attempted to set packers at 2095'; packers failed to hold. Pulled out of hole. Picked up bit and conditioned hole for Drill-Stem Test No. 3. Pulled out of hole; picked up test tools.

9/9/80
0' TD: 2136'; MW: 10.3; Vis: 41. Ran Drill-Stem Test No. 3, 2105' to 2136'. Opened tool at 12:14 p.m. for one hour initial open. Gas to surface in four minutes; built to 830 pounds in 30 minutes through 1/8" choke. IFP: 251. Closed in tool at 1:14 p.m. for two-hour initial shut-in. Opened for final at 3:15 p.m. Strong blow (275 pounds) through 24/64" choke. Pressure dropped to 220 pounds after 30 minutes. Changed choke to 20/64" at 250 pounds. Final shut-in of four hours, 5:15 to 9:15 p.m. Unseated packer; dropped bar; reversed out; no fluid. Circulated well. Pulled out of hole; laid down tools. Made up bottom-hole assembly.

9/10/80
51' TD: 2187'; MW: 10.2; Vis: 41. Ran in hole; washed to bottom. Drilled to 2151'. Pulled out of hole; bit locked up with junk. Ran in hole; drilled to 2165'. Pulled out of hole; picked up core barrel. Cut Core No. 5, 2165' to 2187'; recovered 19.9 feet. Ran in hole with bit.

9/11/80
91' TD: 2278'; MW: 10.2; Vis: 45. Finished running in hole; washed to bottom. Drilled to 2278'. Circulated and conditioned for logs. Rigged up logging unit; ran log to 2132'; hit bridge. Pulled out of hole; picked up bit and tripped in to circulate and condition. Pulled out of hole. Ran DLL/GR/CAL.

9/12/80
0' TD: 2278'; MW: 10.3; Vis: 41. Ran BHCS/GR, CNL/FDC/GR/CAL, HRD-Dipmeter, and MLL/ML. Ran in hole; circulated and conditioned for Drill-Stem Test No. 4. Pulled out of hole; picked up test tools. Ran

in hole and tested the interval 2188' to 2278'. Initial open: 3:30 a.m. with medium blow in bucket. No gas to surface. Initial shut-in at 4:30 a.m. Opened for final blow.

- 9/13/80 TD: 2278'; PBTD: 2205'; MW: 10.3; Vis: 40. Finished running Drill Stem Test No. 4. Well dead on final opening. Shut in. Pulled packer loose at 12:30 a.m.; pulled out of hole. Ran in hole; circulated and conditioned for cementing. Mixed and pumped 10 barrels water with 2% Cla-Sta and CaCl_2 ahead of 35 sacks Class "G" cement at 15.6 ppg with 2% CaCl_2 plus 1% CFR-2. Cement in place at 10:30 p.m. Picked up bit; ran in hole. Tagged cement at 2175'. Drilled cement to 2205'. Circulated; pulled out of hole. Rigged-up to run 7" casing.
- 9/14/80 PBTD: 2205'; MW: 10.1; Vis: 38. Ran 58 joints of 7", 38#, BTC, Range 3 casing. Landed shoe at 2198'; FOs at 1180' and 1300'. Circulated and conditioned for cementing. Mixed and pumped 10 barrels water with 2% CaCl_2 and 2% Cla-Sta ahead of 90 sacks Class "G" with 2% CaCl_2 plus 1% CFR-2. Cement in place at 3:15 p.m.
- 9/15/80 PBTD: 2158'; MW: 10.1; Vis: 35. Tested blowout preventer to 3,000 pounds. Ran in hole with bit and scraper to 1500'; circulated. Pulled out of hole; picked up FO shifting tool. Cycled both FOs. Circulated lower FO; established 4 BPM injection rate. Squeezed 50 sacks Class "G" containing 2% CaCl_2 and 1% CFR-2. Closed FO.
- 9/16/80 PBTD: 2158'; MW: 10.1; Vis: 34. Mixed Arctic pack. Opened FO at 1180'. Cleaned annulus with water. Placed Arctic pack. Closed FO and tested to 2,000 pounds. Ran in hole with bit; cleaned out to 2170'. Circulated. Pulled out of hole, laying down drill pipe. Picked up 2-7/8" tubing.
- 9/17/80 PBTD: 2170'. Ran CBL/VDL, 2153' to 1200'. Perforated with 4 shots per foot, 2054' to 2064' and 2110' to 2151', with four-inch casing gun. Ran 2,155 feet of 2-7/8" tubing with 1/4" steel line. Hung tubing; nipped down blowout preventer. Nipped up tree; tested to 3,000 pounds.
- 9/18/80 PBTD: 2170'. Hooked up test lines; displaced well to 9.3 ppg CaCl_2 water and displaced water with gas. Tested well on 1/8" choke with 580 pounds; pressure built to 780 pounds at surface and 944 pounds at

bottom. Bottom-hole temperature: 52°F. Went to 3/16" choke; pressure declined to 350 pounds. Bottom-hole pressure: 554 pounds; bottom-hole temperature: 48.7°F. Pressure built to 380 pounds at surface and 574 pounds at bottom of hole. Went to 1/4" choke; built pressure to 690 pounds at surface. Bottom-hole pressure: 855 pounds.

9/19/80

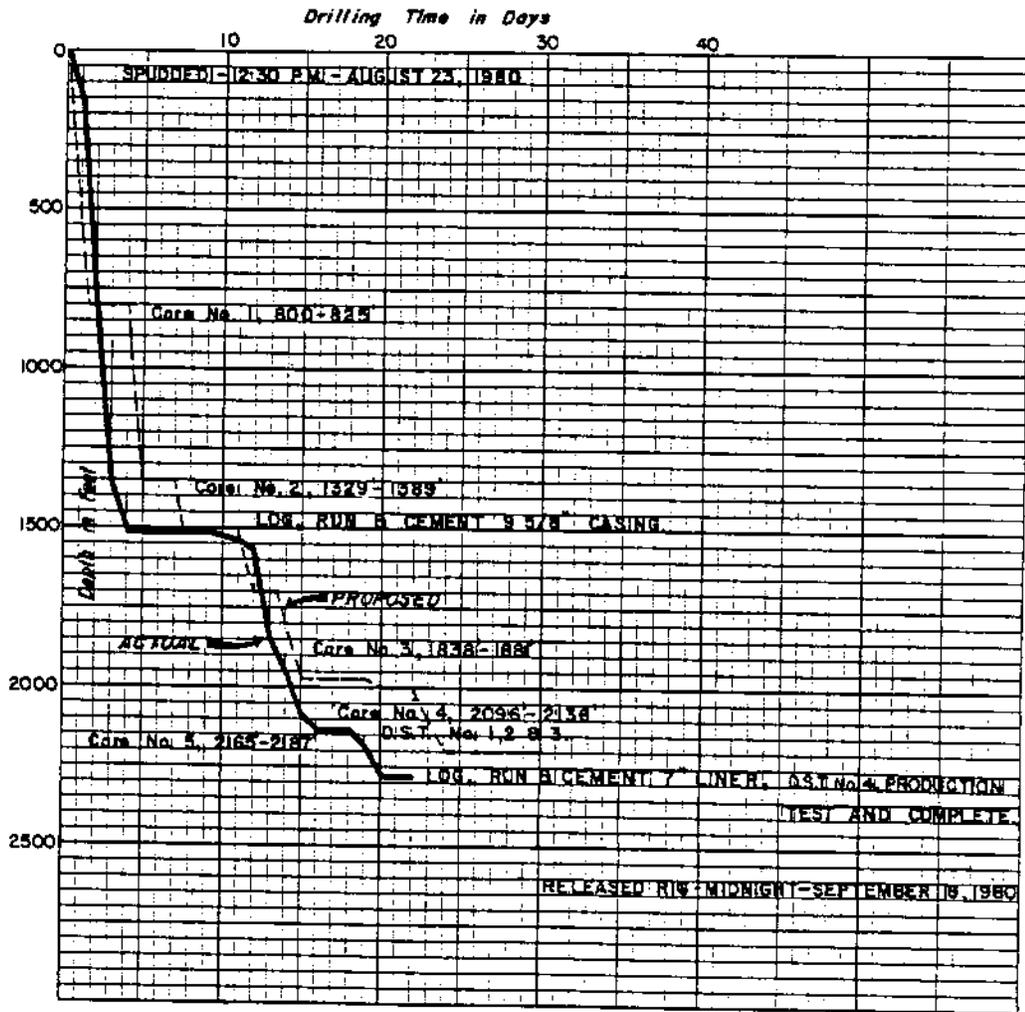
Tested well on 5/16" choke. Shut well in at 11:00 a.m. for build up. Built to 962 pounds at 7:00 p.m. with bottom-hole temperature of 51°. Rigged down Schlumberger. Cleaned mud tanks; capped off tree. Well suspended as shut-in gas well. Released rig September 18, 1980, at 12:00 midnight.

DRILLING TIME ANALYSIS
SOUTH BARROW WELL NO. 15 (EAST AREA)
BRINKERHOFF SIGNAL, INC., RIG 31
Spud 8/23/80; Rig released 9/18/80
Total Depth: 2,278 Feet

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments			
8-15	24																											
8-16	24																								Painting Rig			
8-17	24																								Rigging Up			
8-18	24																								Rigging Up			
8-19	24																								Rigging Up			
8-20	24																								Rigging Up			
8-21	24																								Rigging Up			
8-22	24																								Rigging Up			
8-23	15			3 1/2	2		1/2					1/2					1								1 1/2	Surveying	Spudded Well at 12:30 p.m.	
8-24	10 1/2		1/2	2 1/2	1/2		3/4										7 1/2								1 1/2	Coring	Core No. 1: 800-825', Rec. 9'	
8-25	2	1 1/2	4 1/2				1/2										12 1/2								3	Coring	Core No. 2: 1329-1389', Rec. 59'	
8-26	4 1/2		3	1/2			1	6																	9	Circulating	Running Schlumberger Wireline Logs	
8-27				5 1/2																					18 1/2	Waiting on Fishing Tools		
8-28				11 1/2																						12 1/2	Picking Up Mill	
8-29				8 1/2			1	1 1/2		5 1/2	1 1/2					1/2									5 1/2	Tripping	Set 9 5/8" at 1514'	

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments	
8-30										20	4															
8-31			2								14	5													Waiting on Cement	
9-1		6	9				2 1/2															3			Welding on Head	
9-2		5 1/2	17 1/2				1/2															6 1/2			Drilling	
9-3		17	5				1/2															1 1/2			Drilling	
9-4	1	2	5 1/2	1/2											11							3			Washing to Bottom	Core No. 3: 1838' - 1881'
9-5	14					10																			Drilling	
9-6	3 1/2		9 1/2				1															3			Tripping For Bit	Core No. 4: 2096' - 2136'
9-7			10 1/2				3															8 1/2			Making Up Test Tool	Ran DST No. 1
9-8		1/2	5				4															5			Preparing to DST	Ran DST No. 2 & No. 3
9-9	3	1 1/2	10 1/2				2															4			Tripping	Core No. 5: 2165' - 2187'
9-10	6	1	5	1/2			5 1/2	3 1/2														3			Tripping	
9-11		1	5				3	11 1/2														3 1/2			Preparing to Log	Running Schlumberger Wireline Logs
9-12			5				4 1/2	1/2														5			Drill Stem Testing	Ran DST No. 4
9-13	1/2		3 1/2				2 1/2	6			8 1/2											3			Changing Rams	Set 7" at 2198'

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments		
9-14				4½				1½				12	1												Testing Wellhead	Plugged Back to 2158'	
9-15				3½								2													18½	Pulling Out Of Hole	Placed Arctic Pack
9-16				7½				½			7														7	Waiting on Cement	Perforated 2054-2064' and 2110-2151' Ran CBL/YDL Log
9-17												8													16	Nippling Up Tree	Ran 2 7/8" Tubing, Production tested.
9-18																									17	Testing	Rig Released at 12:00 Midnight
	200	8	3½	11	21	28½	6½	-0-	42	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	164½		
TOTAL	90½	147½	-0-	35	12	48½	-0-	½	20½	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-			



SOUTH BARROW **WELL No. 15**
 2640' FEL and 990' FNL, Sec. 23, T22N, R17W, U.M.
HUSKY OIL N.P.R. Operations Inc.
 NATIONAL PETROLEUM RESERVE in ALASKA

DRILLING TIME CURVE

DRILLING MUD RECORD
ARCTIC DRILLING SERVICES

COMPANY Husky Oil NPR Operations, Inc. STATE Alaska CASING PROGRAM: 13-3/8 inch at 80 ft.
 WELL South Barrow Well No. 15 COUNTY North Slope Borough 9 5/8 inch at 1514 ft.
 CONTRACTOR Brinkerhoff-Signal, Inc. LOCATION NPRA SEC 23 TWP 22N RNC 17W 7 inch at 2198 ft.
 SLOPPY POINT DATE BAROID ENGINEER TOTAL DEPTH 2278 ft.

DATE	DEPTH feet	WEIGHT lb/gal	VISCOSITY		GELS 10 sec/ 10 mic	pH	FILTRATION ml API	HTHP of Thick	Coke of Thick	FILTRATE ANALYSIS			SAND %	RETURN		CEC Mud, cc/ml	REMARKS AND TREATMENT
			Sec API of g	PV of						Cl ppm	Ca ppm	Oil %		Water %			
1980																	
8/23	192	8.4	30	2	0/0	7.0				1100	360	Tr	1	0	99		Spudded with water.
8/24	817	8.9	31	2	0/1	7.5				1000	280	Tr	3	0	97		
8/25	1350	9.3	30	2	0/1	8.5				550	80	Tr	3	0	97		
8/26	1510	9.5	43	12	2/7	8.0	9.5			500	30	1/4	4	0	96		Preparing to log.
8/27	1510	9.5	38	10	2/4	8.0	9.8			500	30	1/4	4	0	96		Fishing for drill collars.
8/28	1510	9.6	43	10	2/6	8.0	9.5			500	30	1/4	5	0	95		
8/29	1510	9.6	45	12	2/7	8.0	9.5			500	20	1/4	5	0	95		
8/30	1510	9.6	45	12	2/7	8.0	9.5			500	20	1/4	5	0	95		Mixing CaCl ₂ mud.
8/31	1510	9.6	41	6	2/5	8.5	12			75000	35000	0	3	0	97		
9/1	1510	9.9	58	8	6/20	8.5	8.5			60000	35000	1/2	6	0	94		
9/2	1538	10.0	38	6	10/3	10.0	30			53000	29000	Tr	5	0	95		Milling on junk.
9/3	1564	10.0	38	7	2/5	9.5	12			51000	27000	0	6	0	94		
9/4	1838	10.1	45	12	3/9	9.5	9			50000	28000	Tr	7	0	93		
9/5	1990	10.1	45	15	10/3	18	10			58000	30000	Tr	7	0	93		
9/6	2092	10.2	47	16	3/16	9.0	5			52000	27000	Tr	7	0	93		
9/7	2136	10.2	41	14	2/10	9.0	9			46000	25000	Tr	7	0	93		
9/8	2136	10.2	41	14	2/9	8.0	7.5			45000	23000	Tr	8	0	92		
9/9	2136	10.3	41	14	2/9	8.0	7.5			45000	23000	Tr	8	0	92		
9/10	2187	10.2	41	15	10/3	9	10			45000	23000	1/2	8	0	92		
9/11	2277	10.2	45	14	4/12	8.5	7.0			48000	25000	1/4	8	0	92		Running 7" casing.
9/12	2278	10.3	41	14	3/10	8.5	7.5			48000	25000	Tr	8	0	92		Arctic packing.
9/13	2278	10.3	40	14	2/8	11.0	15			45000	28000	Tr	7	0	93		
9/14	2278	10.1	38	12	2/5	11.0	20			42000	25000	Tr	7	0	93		
9/15	2278	10.1	35	11	2/5	11.0	20			40000	24000	Tr	7	0	93		
9/16	1180	9.2	300	-	80/0	-	-			-	-	-	10	84	6		
9/17	2160	9.3	27	-	-	-	-			80000	38000	-	-	-	-		Arctic packing.
9/18	2160	9.3	27	-	-	-	-			80000	38000	-	-	-	-		Bringing in well.

BIT RECORD

COMPANY Husky Oil NPR Operations
CONTRACTOR Brinkerhoff-Signal, Inc.
WELL NO South Bartow No. 15
TOWNSHIP 22N
COUNTY North Slope
STATE Alaska
LEASE National Petroleum Reserve
SEC 23
RANGE 17W
BLOCK
FIELD Barrow Gas Field

TOOL DRILL PIPE
DRILL 1000
DRILLER EVENING
DRILLER MORNING
DRILLER

BIT NO	BIT SIZE	BIT MFG	BIT TYPE	SERIAL NO OF BIT	DEPTH			HOURS RUN	ACC HOURS	11/HR	WEIGHT LOAD LBS	ROTARY R P M	PUMP NO 1	PUMP NO 2	PUMPS NO LINE	SPM	MUD WT	DULL CODE			REMARKS	
					IN	OUT	11704											I	B	G		REMARKS
1	12 1/2	Sec	S3J	769230	11	11	800	15	48	15	80	30	700	2	5 1/2	1208	3	30	1	2	I	
CH1	8 1/2	Chr	D1a	OW3449			825	8.5	23.5	2.94	18	30	1000	"	5 1/2	1209	3	30				
2	12 1/2	HTC	C3A	9AA732	11	11	1340	540	10.5	34	51.4	20	1000	"	5 1/2	1209	3	30	1	1	I	
CH1	8 1/2	Chr	MC	OW3449			1389	49	12.5	46.5	3.9	15	1000	"	5 1/2	1209	3	30				
RR2	12 1/2	HTC	C3A	9AA732	11	11	1510	121	6.5	53	18.6	15	1200	"	5 1/2	1209	5	43	1	1	I	
3	8 1/2	HTC	X3A	AV659	11	11	1538	28	3.5	56.5	8	20	1400	"	5 1/2	106	10	38	6	1	I	
4	8 1/2	HTC	X3A	WN839	11	11	1538	0	1/2	56.5	0											
5	8 1/2	HTC	XDV	NH534	11	11	1547	9	3.5	60	2.5	20	1500	"	5 1/2	120	10	43	4	4	I	
RR4	8 1/2	X3A	X3A	WN839	11	11	1547	0	0	60	0	20	1500	"	5 1/2	120	10	43	4	4	I	
6	8 1/2	HTC	X3A	WN841	11	11	1713	163	10.5	70.5	15.5	20	1200	"	5 1/2	120	10	45	4	2	I	
7	8 1/2	SmI	DSJ	MJ438	11	11	1838	125	6.5	77	19.2	20	1300	"	5 1/2	120	10	45	4	4	I	
CH1	8 1/2	Chr	D1a	OW3449	-	-	1881	43	11	88	3.9	18	800	"	5 1/2	120	10	45	6	0	D	
8	8 1/2	HTC	X3A	ZR340	11	11	2089	208	17.5	105.5	11.8	25	1400	"	5 1/2	108	10	45	6	4	I	
9	8 1/2	HTC	X3A	BS297	11	11	2096	7	5	106	14	25	1400	"	5 1/2	108	10	41	1	1	I	
CH1	8 1/2	Chr	D1a	OW3449	-	-	2136	40	7	113	5.7	18	800	"	5 1/2	108	10	41	6	2	I	
RR9	8 1/2	HTC	X3A	BS297	11	11	2136															
RR9	8 1/2	HTC	X3A	BS297	11	11	2151	15	2	115	7.5	20	1400	"	5 1/2	108	10	42	8	8	I	
10	8 1/2	Sec	S4T	898586	12	12	2165	14	1	116	14	25	1400	"	5 1/2	108	10	41	1	1	I	
CH1	8 1/2	Chr	D1a	OW3449	-	-	2187	22	3	119	7.3	18	1200	"	5 1/2	108	10	41	6	0	D	
RR10	8 1/2	Sec	S4T	898586	12	12	2278	91	6.25	125.5	14.5	20	1300	"	5 1/2	108	10	41	6	2	I	
11	5 1/2	SmI	DC	AA69111	Conv		Drilled float and 10 feet of cement															

SMITH REPRESENTATIVE _____ **PHONE** _____
Compliments of  **SMITH TOOL**
 P.O. BOX 4548 - COMPTON CALIF 90224
 DIVISION OF SMITH INTERNATIONAL INC.

INTRODUCTION

After the 1976 drilling season, casing requirements were reviewed and design of casing strings standardized. Every effort was made to minimize weight and grade changes for simplicity, cost effectiveness, and to reduce chances of error during handling and running operations. Casing sizes were selected to accommodate designs for wells from 2,000' to 20,000'. Steel grade selection was the controlling factor on design with low hardness (Rockwell C24-28) steel being selected for Arctic application and possible H₂S environment. Casing sizes and design criteria required by Husky are listed below:

<u>SIZE</u> ⁽¹⁾	<u>WEIGHT</u>	<u>YIELD STRENGTH</u> (PSI)		<u>MINIMUM PRESSURE</u> <u>REQUIREMENT</u> (PSI)		
		<u>MIN.</u>	<u>MAX.</u>	<u>COLLAPSE</u>	<u>BURST</u>	<u>CONNECTION</u>
20"	133#/ft.	55,000	80,000	1,500	3,050	STC
13-3/8" ⁽²⁾	72#/ft.	95,000	110,000	3,450	5,350	BTC
9-5/8" ⁽³⁾	53.5#/ft.	95,000	110,000	8,850	7,900	BTC
9-3/4" ⁽³⁾	59.2#/ft.	95,000	110,000	9,750	8,540	BTC
7"	38#/ft.	95,000	110,000	12,600	9,200	BTC

- (1) OD tolerance to be within API requirements unless adjustment absolutely necessary to meet ID requirements.
- (2) Special drift to 12.25".
- (3) Special drift to 8.50".

The following are additional requirements primarily to assure that the steel exhibits the metallurgical properties for Arctic applications and resistance to hydrogen embrittlement.

1. All pipe that is 13-3/8" OD and smaller to be quenched and tempered.
2. Run Charpy "V" notch tests on two random samples per 50 tons per heat. Minimum acceptance of 15 ft.-lb. @ -50°F. Furnish test reports with order.
3. Perform all testing normally required for API approved pipe.
4. Furnish test reports for ladle analysis, quantitative analysis, and all check tests as per API requirements.

In addition, the following handling requirements were made:

1. Collars must be of same steel grade as pipe body.
2. Apply an API modified thread compound on mill-installed collar before bucking on.

3. Inspect at mill using Tuboscope's Amalog IV or equivalent on 9-3/4" and smaller, and at least magnetic particle on 13-3/8" and 20". All pipe to have special and area inspection together with full length API drifting. (Note special drifting requirements.)
4. Apply Arctic grade grease on all connections before installing thread protectors.
5. Install closed-end type thread protectors. Plastic plugs can be used to secure wrench openings in protectors.
6. Buck up thread protectors with impact wrench. Both mill and third party inspection personnel should observe the installation of thread protectors.
7. Palletize or containerize the tubulars, if possible, prior to shipment from mill. Do not haul pipe like cordwood in gondola railroad cars.
8. All pipe to be Range 3.
9. No "V" notching or metal stenciling on pipe body or collars.

Casing programmed for South Barrow Well No. 15 was as follows: 13-3/8" conductor at ±110'; 9-5/8" casing at ±1500'; 7" casing at ±2100'; 2-7/8" production tubing if needed to complete the well. Casing actually run was 13-3/8" at 80'; 9-5/8" at 1514'; and 7" at 2198'. The 2-7/8" production tubing was hung at 2155' just below the production perforations in the 7" casing. The 7" x 9-5/8" annulus was Arctic Packed through the 7" FO at 1180' back to surface.

CASING AND CEMENTING REPORT

WELL NAME South Barrow Well No. 15

LOCATION East Barrow Gas Field

RAN CASING AS FOLLOWS:

36 Jts 9 5/8" 53.5# S-95 _____
 _____ Jts _____ _____ _____
 _____ Jts _____ _____ _____

Shoe @ 1514' Float @ _____ DV @ _____

Centralizers _____

FIRST STAGE

Sx of Cement 1500 Type Permafrost Additives _____ % Excess _____

Preflush _____ Initial Pressure _____

Displacement _____ bbls. Final Pressure _____

Plug Down 8:45 ^{AM} _{PM}

SECOND STAGE - Stage Collar @ _____

Sx of Cement _____ Type _____ Additives _____ % Excess _____

Preflush _____ Initial Pressure _____

Displacement _____ bbls. Final Pressure _____

Plug Down _____ ^{AM} _{PM}

Well Depth _____ Overall Casing Tally _____

KB to Top of Cut Off Casing _____ Length of Landing Jt Removed _____

Weight Indicator Before Cementing _____ lbs.

Weight Indicator After Slacking Off _____ lbs.

Inches Slacked Off _____

Remarks:

**CASING TALLY
SUMMARY SHEET**

FIELD National Petroleum Reserve in AK LEASE & WELL NO. South Barrow Well No. 15 DATE: September 16, 1980
 TALLY FOR 7 " CASING

SUMMARY OF PAGE MEASUREMENTS		
PAGE	NO OF JOINTS	FEET
PAGE 1	58	2201
PAGE 2		28
PAGE 3		
PAGE 4		
PAGE 5		
PAGE 6		
PAGE 7		
PAGE 8		
PAGE 9		
TOTAL		

SUMMARY OF DEPTH CALCULATIONS			
	NO OF JOINTS	FOOTAGE FEET	FOOTAGE '00'S
1 TOTAL CASING ON RACKS	58	2190	08
2 LESS CASING OUT LITS NOS.			
3 TOTAL (1 - 2)			
4 SHOE LENGTH	1	1	65
5 FLOAT LENGTH	1	1	50
6 MISCELLANEOUS EQUIPMENT LENGTH FOB	2	8	05
7 TOTAL CASING AND EQUIPMENT FROM CEMENT HEAD (3 + 4 + 5 + 6)		2201	28
8 LESS WELL DEPTH (KB REFERENCE)		2205	00
9 "UP" ON LANDING JOINT		3	

Weight indicator before casing: 100,000 ; after slack-off: 0 ; inches stacked off: 1

SUMMARY OF STRING AS RUN						
WEIGHT	GRADE	THREAD	MANUFACTURER	CONDITION NEW-USED	LOCATION IN STRING	INTERVAL
38#	S-95	Buttress		Used	JT NO. THRU NO.	
					JT NO. THRU NO.	
					JT NO. THRU NO.	
					JT NO. THRU NO.	
					JT NO. THRU NO.	
					JT NO. THRU NO.	
					JT NO. THRU NO.	

CASING TALLY

DATE: September 16, 1980

FIELD NPRA LEASE & WELL NO. South Barrow No. 15 TALLY FOR 7" CASING

JOINT NO.	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR.
	FEET	00'S	FEET	00'S	
1	36	63			
2	38	25			
3	36	52			
4	41	44			
5	40	88			
6	34	75			
7	40	66			
8	34	88			
9	35	20			
0	36	45			
TOTAL A	375	66			

JOINT NO.	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR.
	FEET	00'S	FEET	00'S	
1	34	12			
2	40	80			
3	38	08			
4	35	67			
5	38	31			
6	40	95			
7	41	28			
8	41	68			
9	39	86			
0	38	03			
TOTAL D	388	78			

1	34	70			
2	36	27			
3	37	65			
4	35	03			
5	35	87			
6	36	71			
7	34	58			
8	40	86			
9	37	16			
0	37	95			
TOTAL B	366	78			

1	35	83			
2	39	74			
3	35	25			
4	36	18			
5	37	87			
6	38	73			
7	40	45			
8	35	44			
9	40	91			
0	35	75			
TOTAL E	376	15			

1	36	71			
2	35	50			
3	40	34			
4	36	12			
5	35	18			
6	40	64			
7	40	08			
8	39	64			
9	39	00			
0	39	09			
TOTAL C	382	30			

TOTAL A	375	66			
TOTAL B	366	78			
TOTAL C	382	30			
TOTAL D	388	78			
TOTAL E	376	15			
TOTAL PAGE	1889	67			

CASING TALLY

DATE: September 16, 1980

FIELD NPRA LEASE & WELL NO. South Barrow No. 15 TALLY FOR 7" CASING

JOINT NO.	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR.
	FEET	.00'S	FEET	.00'S	
1	37	05			
2	37	85			
3	35	15			
4	34	54			
5	35	78			
6	37	98			
7	40	68			
8	41	38			
9					
0					
TOTAL A	300	41			

JOINT NO.	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR.
	FEET	.00'S	FEET	.00'S	
1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL D					

1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL B					

1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL E					

1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL C					

TOTAL A	300	41			
TOTAL B					
TOTAL C					
TOTAL D					
TOTAL E					
TOTAL PAGE	300	41			

CASING AND CEMENTING REPORT

WELL NAME South Barrow Well No. 15

LOCATION East Barrow Gas Field

RAN CASING AS FOLLOWS:

58 Jts 7" 38# S-95 Buttress Range 3
 _____ Jts _____
 _____ Jts _____
 Shoe @ 2198' Float @ 2158' DV @ 1300' - 1180'
 Centralizer @ 2186', 2083', 2001', 1926', 1855', 1784', 1340', 1264', 1140',
and 79'.

FIRST STAGE

Sx of Cement 90 Type C1 "G" Additives 2% CaCl₂ 1% CFR-2 % Excess 10%
 Preflush 10 Barrels Initial Pressure 500 Pounds
 Displacement 10 bbls. Final Pressure 600 Pounds
 Plug Down 3:15 AM
PM

SECOND STAGE - Stage Collar @ _____

Sx of Cement _____ Type _____ Additives _____ % Excess _____
 Preflush _____ Initial Pressure _____
 Displacement _____ bbls. Final Pressure _____
 Plug Down _____ AM
PM

Well Depth 2205' Overall Casing Tally 2198'
 KB to Top of Cut Off Casing 17' Length of Landing Jt Removed 20'
 Weight Indicator Before Cementing 100,000 lbs.
 Weight Indicator After Slacking Off Same lbs.
 Inches Slacked Off 1

Remarks: Good returns throughout job.
 Placed Arctic Pack. Squeezed 50 sacks of Class "G" containing 2% CaCl₂ and 1% CFR-2; FO at 1180'; injection rate 4 BPM.

**TUBING TALLY
SUMMARY SHEET**

DATE: September 18, 1980

LEASE & WELL NO. South Barrow Well No. 15 TALLY FOR 2 7/8" TUBING

FIELD East Barrow Gas Field

SUMMARY OF PAGE MEASUREMENTS			
	NO OF JOINTS	FEET	00'S
PAGE 1	71	2130	67
PAGE 2			
PAGE 3			
PAGE 4			
PAGE 5			
PAGE 6			
PAGE 7			
PAGE 8			
PAGE 9			
TOTAL	71	2130	67

SUMMARY OF DEPTH CALCULATIONS			
	NO OF JOINTS	FOOTAGE FEET	FOOTAGE 00'S
1 TOTAL CASING ON RACKS	71	2130	67
2 LESS CASING OUT LITS NOS			
3 TOTAL (1 - 2)	71	2130	67
4 SHOIF LENGTH		25	
5 FLOAT LENGTH			
6 MISCELLANEOUS EQUIPMENT LENGTH			
7 TOTAL CASING AND EQUIPMENT FROM CEMENT HEAD (3 + 4 + 5 + 6)	71	2155	67
8 LESS WELL DEPTH (IKB REFERENCE)			
9 "UP" ON LANDING JOINT			

Weight indicator before cementing: _____ after slack-off: _____ inches stuck off: _____

SUMMARY OF STRING AS RUN								
WEIGHT	GRADE	THREAD	MANUFACTURER	CONDITION NEW USED	LOCATION IN STRING	NO OF JOINTS	FOOTAGE	INTERVAL
					JT NO THRU NO			
					JT NO THRU NO			
					JT NO THRU NO			
					JT NO THRU NO			
					JT NO THRU NO			
					JT NO THRU NO			
					JT NO THRU NO			

TUBING TALLY

DATE: September 18, 1980

FIELD NPRA LEASE & WELL NO. South Barrow No. 15 TALLY FOR 2 7/8 " TUBING

JOINT NO	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR
	FEET	00'S	FEET	00'S	
1	31	41			
2	31	51			
3	29	65			
4	31	56			
5	28	62			
6	30	79			
7	31	48			
8	29	49			
9	29	46			
0	29	47			
TOTAL A	303	44			

JOINT NO	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR
	FEET	00'S	FEET	00'S	
1	28	31			
2	30	75			
3	31	02			
4	27	69			
5	30	90			
6	30	50			
7	29	15			
8	31	49			
9	31	29			
0	30	92			
TOTAL D	302	02			

1	29	47			
2	29	45			
3	31	48			
4	30	82			
5	29	37			
6	29	13			
7	30	43			
8	29	63			
9	29	13			
0	28	64			
TOTAL B	297	55			

1	29	23			
2	29	03			
3	29	24			
4	29	64			
5	29	44			
6	31	53			
7	31	15			
8	29	97			
9	31	16			
0	29	56			
TOTAL E	299	95			

1	29	94			
2	28	85			
3	28	21			
4	29	30			
5	28	65			
6	28	43			
7	29	54			
8	29	37			
9	30	90			
0	30	54			
TOTAL C	293	73			

TOTAL A	303	44			
TOTAL B	297	55			
TOTAL C	293	73			
TOTAL D	302	02			
TOTAL E	299	95			
TOTAL PAGE	1496	69			

TUBING TALLY

DATE: September 16, 1980

FIELD NPRA LEASE & WELL NO. South Barrow No. 15 TALLY FOR 2 7/8 " TUBING

JOINT NO.	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR.
	FEET	00'S	FEET	00'S	
1	30	85			
2	30	14			
3	29	47			
4	28	56			
5	29	46			
6	29	90			
7	29	73			
8	30	70			
9	31	00			
0	31	20			
TOTAL A	301	01			

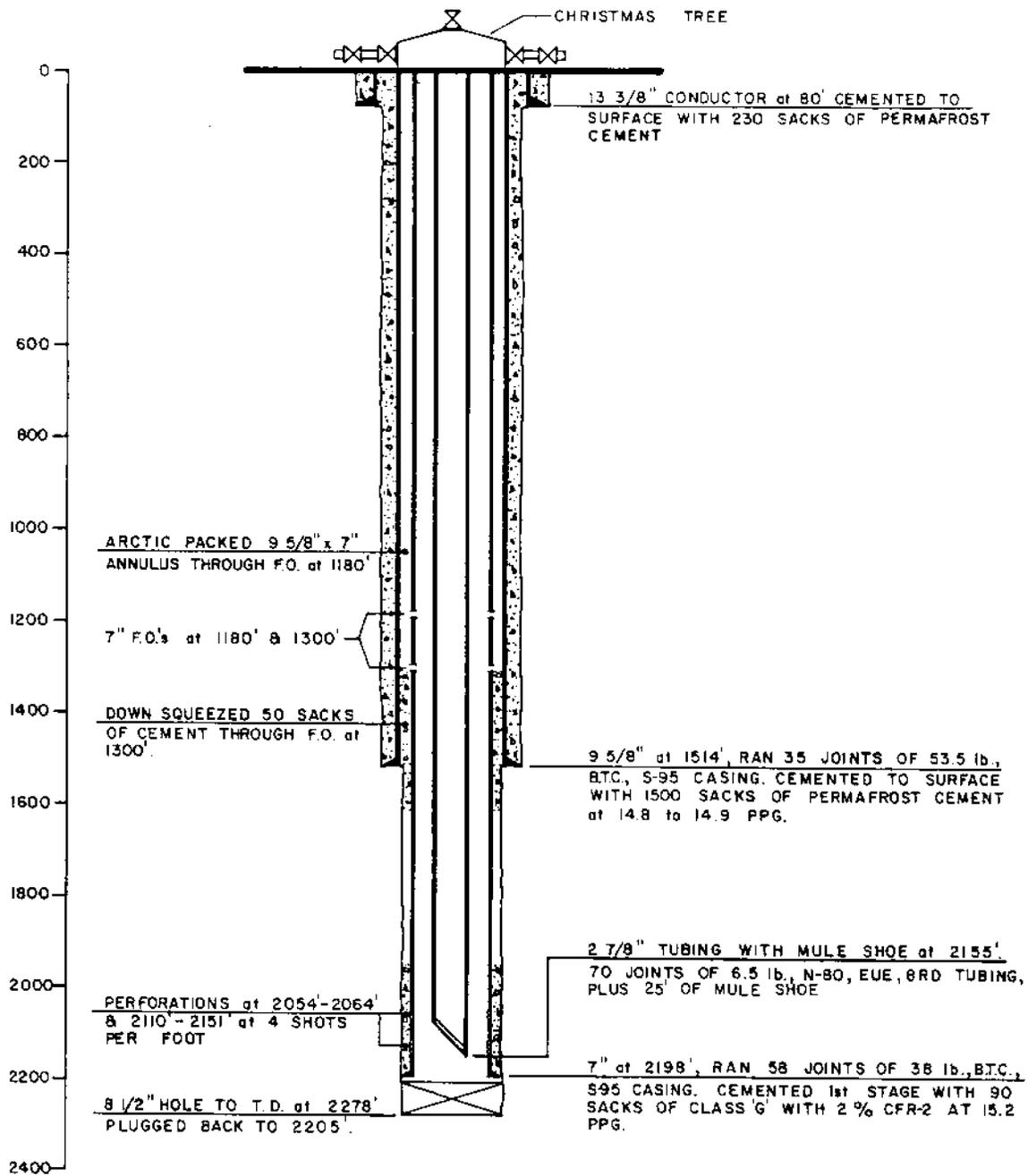
JOINT NO.	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR.
	FEET	00'S	FEET	00'S	
1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL D					

1	30	98			
2	28	82			
3	31	54			
4	29	92			
5	29	02			
6	31	33			
7	30	12			
8	28	74			
9	31	18			
0	30	60			
TOTAL B	302	25			

1					
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL E					

1	30	72			
2					
3					
4					
5					
6					
7					
8					
9					
0					
TOTAL C	30	72			

TOTAL A	301	01			
TOTAL B	302	25			
TOTAL C	30	72			
TOTAL D					
TOTAL E					
TOTAL PAGE	633	98			



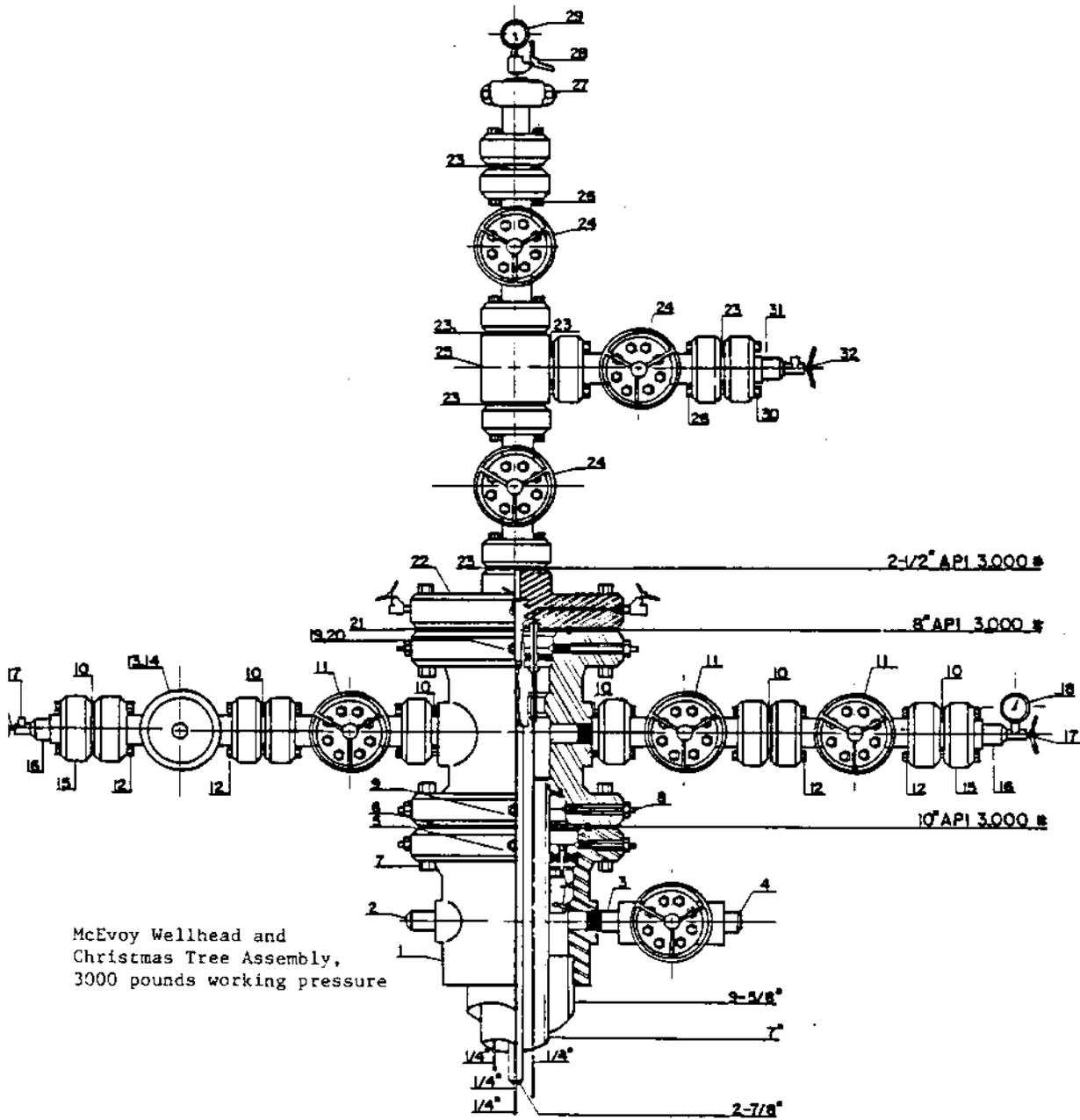
SOUTH BARROW No. 15

2640' FEL and 990' FNL
 Sec. 23, T.22N., R.17W., U.M.

HUSKY OIL N.P.R. Operations
 NATIONAL PETROLEUM RESERVE in ALASKA

**WELL COMPLETION
 SCHEMATIC**

WELLHEAD SCHEMATIC



McEvoy Wellhead and
Christmas Tree Assembly,
3000 pounds working pressure

IDENTIFICATION OF WELLHEAD SCHEMATIC PARTS

1. HEAD, CASING, LOWERMOST, TYPE 'S-3', 9-5/8" FEMALE SLIP-ON BTM. x 10" API 3000# FLANGE TOP, W/TWO 2" API L.P.S.O., 10" BOWL, API -75° SPECS
2. PLUG, BULL, SOLID, 2" API L.P. MALE THREAD, API -75° SPECS
3. NIPPLE, PIPE, 2" API L.P. MALE THREAD BOTH ENDS XXH, 6" LONG, API -75° SPECS
4. VALVE, GATE MCEVOY MODEL 'C', FIG. 120, 2" API L.P. FEMALE THREAD ENDS, FULL PORT, RM-13
5. HANGER, CASING, TYPE 'SB-3', NON-AUTOMATIC, 10" BOWL x 7" O.D. CASING, API -75° SPECS
6. GASKET, FLANGE, API #RX-53, 316 S.S.
7. SET, STUDS & NUTS, F/10" API 3000#, API -75° SPECS
8. HEAD, TUBING, TYPE 'SL-1', 10" API 3000# FLANGE BTM. x 8" API 3000# FLANGE TOP, W/TWO 2" API 3000# S.S.O., W/VRT, API -75° SERVICE
9. PACKOFF, CASING, TYPE '-1', 10" FLANGE x 7" O.D. CASING, API -75° SPECS
10. GASKET, FLANGE, API #RX-24, 316 S.S.
11. VALVE, GATE, MCEVOY MODEL 'C', FIG. 125, 2" API 3000# FLANGED ENDS, FULL PORT, RM-13
12. SET, STUDS & NUTS, F/2" API 3000# FLANGE, API -75° SPECS
13. VALVE, GATE, MCEVOY MODEL 'C', FIG. 125, 2" API 3000# FLANGED ENDS, FULL PORT, REVERSE ACTING LESS BONNET & STEM ASSY., RM-13
14. ACUTATOR, VALVE, BAKER, HYDRAULIC, F/2" FIG. 125, RM-13, VALVE COMPLETE W/BONNET ASSEMBLY & MANUAL OVERRIDE
15. FLANGE, COMPANION, THREADED, 2" API 3000# x 2" API L.P. FEMALE THREAD, API -75° SPECS
16. PLUG, BULL, TAPPED, 2" API L.P. MALE THREAD x 1/2" NPT FEMALE, API -75° SPECS
17. VALVE, NEEDLE, ANGLE PATTERN, 1/2" NPT MALE INLET x FEMALE OUTLET, API -75° SPECS

18. GAUGE, PRESSURE, 0-3000#, 1/2" NPT MALE THREAD INLET, API -75° SPECS
19. HANGER, TUBING, TYPE 'SLA-3', 8" BOWL x ONE STRING 2-7/8" EUE TUBING x FOUR SLEP COUPLINGS F/1/4" DHBV CONTROL LINES, API -75° SPECS., COMPLETE W/WRENCH FOR PST COUPLINGS
20. NIPPLE, PACKOFF, TYPE 'PST', 2-7/8" EUE MALE x 2-1/2" NOM., API -75° SPECS., W/WRENCHING SLOTS
21. GASKET, FLANGE, API #RX-49, 316 S.S.
22. ADAPTER, TUBING HEAD, DOUBLE STUDDED, TYPE 'PST', 8" API 3000# BTM. x 2-1/2" API 3000# TOP, W/2-1/2" PST POCKET & FOUR 3/4" NOM. PST POCKETS F/DHBV LINES, W/FOUR 1/2" NPT FEMALE TAPS ON FLANGE O.D. 90° APART FOR CONTROL LINES, COMPLETE W/FOUR 1/2" NPT NEEDLE VALVES, API -75° SPECS
23. GASKET, FLANGE, API #RX-27, 316 S.S.
24. VALVE, GATE, MCEVOY MODEL 'C', FIG. 125, 2-1/2" API 3000# FLANGED ENDS, FULL PORT, RM-13
25. TEE, STUDDED, 3000# W.O.G., 2-1/2" x 2-1/2" x 2-1/2" API 3000# W/VRT IN OUTLET, API -75° SPECS
26. SET, STUDS & NUTS, F/2-1/2" API 3000# FLANGE, API -75° SPECS
27. TOP ASSEMBLY, TREE, 2-1/2" API 3000# FLANGE BTM. x CAP TAPPED 1/2" NPT, W/2-7/8" EUE LIFT THREADS, API -75° SPECS
28. VALVE, NEEDLE, GLOBE PATTERN, 1/2" NPT MALE THREAD INLET x FEMALE OUTLET, API -75° SPECS
29. GAUGE, PRESSURE, 0-3000#, 1/2" NPT MALE INLET, API -75° SPECS
30. FLANGE, COMPANION, THREADED, 2-1/2" API 3000# x 2" API L.P. FEMALE THREAD, API -75° SPECS
31. PLUG, BULL, TAPPED, 2" API L.P. MALE THREAD x 1/2" NPT FEMLE, API -75° SPECS
32. VALVE, NEEDLE, ANGLE PATTERN, 1/2" NPT MALE INLET x FEMALE OUTLET, API -75° SPECS
33. BACK PRESSURE VALVE, CIW, TYPE 'H', 2-1/2" NOM.
34. TESTER, B.O.P., 10" TYPE 'S' OR 'SL' BOWL, 4-1/2" IF TOOL JOINT TOP
35. TESTER, B.O.P., 8" TYPE 'S' OR 'SL' BOWL, 4-1/2" IF TOOL JOINT TOP

36. PROTECTOR, BOWL, F/10" TYPE 'S' BOWL
37. TOOL RUNNING & PULLING, F/10" BOWL PROTECTOR 4-1/2" IF
TOOL JOINT TOP
38. PROTECTOR, BOWL, F/8" TYPE 'SL' BOWL
39. TOOL, RUNNING & PULLING F/8", BOWL PROTECTOR, 4-1/2"
IF TOOL JOINT TOP
40. PLUG, VALVE, REMOVAL, TYPE 'A', 1-1/2" L.P. THREAD, F/2"
OUTLETS

ARCTIC CASING PACK

In production wells, wells suspended through summer months, and wells completed for re-entry with temperature recording tools, Baroid Arctic Casing Pack is used between casing strings throughout the permafrost zone. It is a stable, highly viscous fluid which will not freeze and collapse casing set in permafrost zones. Its unique gelling characteristics exhibit excellent thermal properties (heat transfer coefficient of approximately 0.1 BTU per hour per square foot per degree F at 32°F). Composition of Baroid Arctic Casing Pack used is as follows for each 100 barrels mixed:

Diesel	82.0 barrels
Water	5.0 barrels
Salt	60.0 pounds per barrel of water
EZ Mul	12.5 pounds per barrel of water
Gel Tone	50.0 pounds per barrel of water
Barite	103.0 pounds per barrel of water

The 7" x 9-5/8" annulus was Arctic Packed through the FO in the 7" casing back to surface. This was done to protect the 2-7/8" x 7" annulus from casing collapse while the well is being produced through it.

RIG INVENTORY

Draw Works

National T-20, single-drum grooved for 1" wireline with 15" double hydromatic brake, automatic breakout and make-up catheads, driven by GMC diesel twin 671 engines, 300 HP, through an Allison torque converter, all mounted on single skid. One Westinghouse 3YC air compressor which is driven by the main PTO.

Mast

Lee C. Moore, 95' high with 9-foot wide front by spread cantilever. Gross nominal capacity 290,000 pounds with racking board capacity of 130 stands of 4-1/2" drill pipe (doubles). Mast crown block capable of stringing eight 1" wire lines.

Subbase

Three box sections, two at ground level 8 feet high, 9 feet wide, 37 feet long; center section 8 feet 5 inches high, 9 feet wide and 37 feet long. Clear working space from bottom of rotary beam to bottom of subbase is 14 feet 7 inches. Rotary table to bottom of subbase is 17 feet (add four inches for rig matts).

Rig Matts

Ten 4" x 16' long x 8' wide; fifteen 4" x 24' long x 8' wide.

Traveling Blocks

IDECO, 160-ton, four 1" sheave combination block and hook.

Swivel

EMSCO L-140, 6-5/8" left-hand API regular pin, 140-ton capacity.

Bails

Byron Jackson, 2-1/4" x 108", links 250-ton capacity.

Rotary Table

Oilwell 17-1/2" split square drive master bushing, 275-ton static load capacity.

Mud Tank

Three section, insulated tank. Capacity shale tank: 75 barrels; capacity middle tank: 100 barrels; capacity suction tank: 112 barrels. Shale tank equipped with shale jet and 16-barrel trip tank. Total capacity: 303 barrels.

Shaker

Single Brandt tandem separator driven by 3-HP, three-phase, 440-volt, 1,750-RPM explosion-proof electric motor.

Degasser

Drilco, see-flo, driven by 7-1/2-HP, three-phase, 440-volt, explosion-proof motor with 1/2-HP, three-phase, 440-volt explosion-proof blower.

Desander

Pioneer Model S2-12; capacity: 500 GPM.

Desilter

Pioneer Model T8-6; capacity: 500 GPM.

Mud Mixer

One Dreco, driven by 5-HP, three-phase, 440-volt, 1,725-RPM explosion-proof motor.

Hopper

One low-pressure mud mixing hopper.

Generators

One Caterpillar Model 3406, 210 KW; one Caterpillar, skid-mounted in Hercable house, 8' 5" high x 8' 2" wide x 29' 5" long; one Caterpillar Model D-333, 100 KW standby.

Boilers

Two Continental, 40 HP, 120 PSI diesel-fired skid-mounted in Hercable house, 8' 4" high x 8' wide x 35' long.

Steam Heaters

Seven Model 90H Trane steam heaters; three Model 96H Trane steam heaters.

Tongs

Byron Jackson, Type "C", short lever, with heads.

Indicator

(Weight) Cameron, Type "C", up to 400,000 pounds.

Indicator

(Rotary Torque) Martin Decker hydraulic piston wheel type with remote gauge at Driller's position.

Indicator

(Tong Torque) Martin Decker, hydraulic piston type with remote gauge.

Mud Box

OKE mud box with 3-1/2" and 4-1/2" rubbers.

Slips

One set for 3-1/2" drill pipe; one set for 4-1/2" drill pipe.

Elevators

One set for 3-1/2" drill pipe, 18 degrees taper. One set for 4-1/2" drill pipe, 18 degrees taper.

Kelly

One square 4-1/4" drive, 4" FH pin, 6-5/8" API regular left-hand box. One square, 3-1/2" drive, 3-1/2" IF pin, 6-5/8" API regular left-hand box.

Kelly Bushing

VARCO, square drive, 3-1/2" rollers.

Pumps

(Drilling and Cementing) Two Halliburton, HT-400D, single-acting piston pumps with Gist Oil Tool API fluid ends, each driven by GMC diesel 8V-71N, 300 HP engines through an Allis-Chalmer torque converter, Model 8FW1801-1 and a twin-disc power shift transmission, Model No. T-A-51-2003. Continuous duty with 5-1/2" API pistons at maximum of 75 SPM will produce 185 GPM for each pump with maximum pressure up to 3,000 psi. Both pumps can be run simultaneously if desired. The discharge mud line furnished by the contractor from pumps to swivel connection is designed for 3,000 psi working pressure. Each pump unit mounted on 8' 4" high x 10' wide x 40' long covered skid.

Air Compressors

One LeRoi 34C mounted on drawworks compound. One Ingersoll Rand Model 71-T2-T3011 TM, driven by 10 HP, 440 volt, 1,725 RPM explosion-proof electric motor.

Water Tanks

One 7' high x 9' wide x 20' long, insulated water tank, mounted in the subbase; capacity: 225 barrels. One 17' 4" long x 6' 4" wide; capacity: 120 barrels.

Fuel Tanks

One 20' long x 8' 6" wide; capacity: 6,000 gallons.

Blowout Preventer Equipment

One 10", 900 dual Shaffer gate LWS with three-inch flanged side outlet one side.

One 10", 900 GK Hydril.

One 10", 900 drill spool with two-inch flanged outlets both sides.

One set 4-1/2" pipe rams.

One set 3-1/2" pipe rams.

One set blind rams.

One upper kelly cock TIW 6-5/8" regular LH box to pin.

Two TIW 10,000 psi lower kelly cocks, 4-1/2" XH joints.

Two TIW 10,000 psi lower kelly cocks, 3-1/2" IF joints.

One inside preventor, 10,000 lb. Hydril, 4-1/2" XH.

One inside preventor, 10,000 lb. Hydril, 3-1/2" IF.

Choke Manifold

Three-inch, 3,000 lb., with one two-inch OCT adjustable choke; one two-inch OCT positive choke and space for automatic choke.

Closing Unit

One 80-gallon Hydril closing unit with four nitrogen bottle backup. Four-station Koomey control manifold with four-station air-operated remote stations.

Drill Pipe

5,000 feet, 4-1/2", 16.6 lb., Grade E, 4-1/2" XH joints;

5,000 feet, 3-1/2", 15.5 lb., Grade E, 3-1/2" IF joints.

Drill Collars

Nineteen 6-1/4" x 2-1/4" x 30' four-inch H90 tool joints.

One 6-1/4" x 2-1/4" x 30' four-inch H90 x 4-1/2" regular bottom collar.

Nineteen 4-3/4" x 1-3/4" x 30' x 3-1/2" IF x 3-1/2" regular bottom collar.

One 4-3/4" x 1-3/4" x 30' x 3-1/2" IF x 3-1/2" regular bottom collar.

Subs

Two 4-1/2" XH kelly savor subs.

Two 3-1/2" IF kelly savor subs.

Two 4-1/2" XH box to 4" H90 pin (DC crossover).

Two 4" H90 box to 4-1/2" regular box (bit sub).

Two 3-1/2" IF box to 2-7/8" API regular box (bit sub).

Forklift

One 966 Caterpillar, equipped with 60-inch forks.

Pipe Racks

One V door ramp with stairs.

One tail walk section, 6' 1" wide x 43" high x 42' long.

Four pipe rack sections, 43" high x 4' wide x 28' long.