NATIONAL PETROLEUM RESERVE IN ALASKA

HISTORY
OF
DRILLING OPERATIONS

SOUTH BARROW WELL NO. 16 (NORTH AREA)

Branch of Oil and Gas Resources
Denver, Colorado

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

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Department of Oil and Gas Resources
Denver, Colorado

SOUTH BARROW WELL NO. 16 (NORTH AREA)

INTRODUCTION

South Barrow Well No. 16 (North Area) is located north-northeast of the South Barrow Gas Field and southeast of Barrow, Alaska, on the National Petroleum Reserve in Alaska (Figure 1). The well is situated 150' from the east line and 450' from the south line in the southeast quarter of protracted Section 1, Township 22 North, Range 18 West, Umiat Meridian (Latitude: 71°16'56.681" North; Longitude: 156°32'46.814" West). Alaska State Plane Coordinates are X = 670,860.08 and Y = 6,320,927.72, Zone 6. Elevations were 8' ground level 12' pad and 30' Kelly Bushing. Drilling related operations began on December 15, 1977, with the mobilization of construction crews and equipment for the building of the drilling location. Rig-up operations started January 8, 1977. The rig, Brinkerhoff Rig 31, was moved from Anchorage to the location prior to start of rig-up. Operations at South Barrow No. 16 ended on February 22, 1978, with the final movement of rig components to South Barrow No. 17 and a general location cleanup.

The well was drilled to a total depth of 2400'. The primary objective, the lower Jurassic "Barrow Gas Sand" was missing due to an erosional unconformity which had also stripped the secondary objective, the Sag River Sandstone. Also considered to be of interest were sands of the basal Torok and the possiblility of fractured argillite basement. The well was plugged with cement and mechanical plugs and was temporarily abandoned since no reservoir rocks were encountered.

Husky Oil NPR Operations, Inc. supervised and directed the drilling and support operations as prime contractor to the Department of the Interior, U. S. Geological Survey, Office of National Petroleum Reserve in Alaska. Brinkerhoff Signal, Inc. was the drilling contractor and Brinkerhoff Rig 31, a National T-20, was used to drill the well.

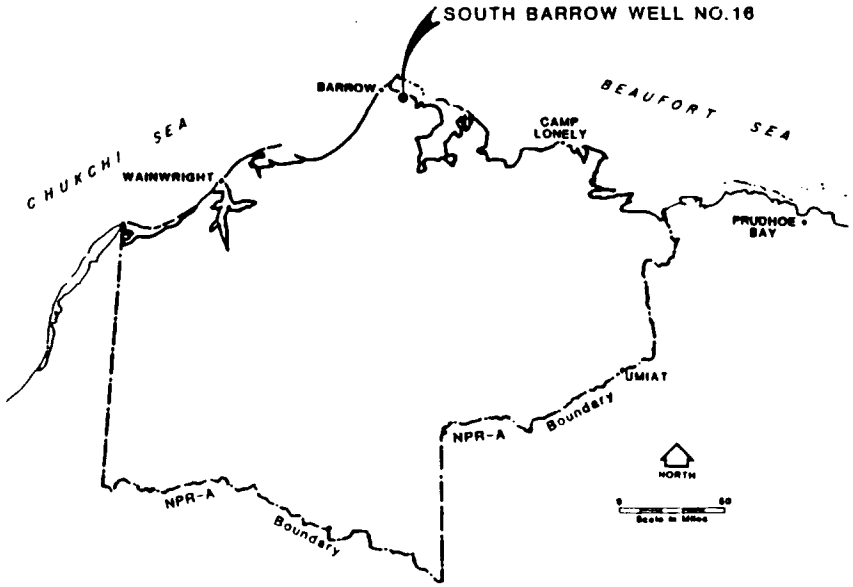


FIGURE 1 - WELL LOCATION MAP - SOUTH BARROW NO. 16

DRILLING SUMMARY

Field operations at the South Barrow Well No. 16 (North Area) location were started on December 15, 1977, with the mobilization of construction crews required to build the drilling pad. Rig-up began on January 8, 1978 and was completed in 20 days. The well was spudded at 11:00 a.m., January 28, 1978.

The rig was moved from Anchorage to Fairbanks by truck and from Fairbanks to Barrow by air. Also, a drilling camp was flown from Fairbanks to Barrow along with a sewer plant and a water plant. In addition, all rig-support equipment was flown to Barrow from Deadhorse. The movement of rig and camp from Fairbanks was begun December 17, 1977 and completed on December 26, 1977. Several loads were taken to the Naval Arctic Research Laboratory (NARL) due to problems with the airstrip at the well. Because of high tides, the Elson Lagoon airstrip was badly damaged. A second strip was built on West Twin Lake and was operational on January 15, 1978. Construction of the pad was delayed several days pending discussions with Ukpugvik Inupiat Corporation officials in regard to gravel availability. The location was completed on January 8, 1978, at which time rig-up operations began.

Rig-up operations were hampered somewhat because the rig was newly remodeled and rig crews were not familiar with it. Also, the camp was new and electrical, water, and sewer systems had to be tied in. Approximately one day was lost in thawing the 13-3/8" conductor which had frozen prior to cementing. The conductor was then cemented from 80' to the surface with 250 sacks of Permafrost cement.

A 12" annular blowout preventer and diverter lines were installed on the 13-3/8" conductor. A 12-1/4" hole was drilled from 80' to 1510'. The hole was logged from 1510' to the bottom of the 13-3/8" conductor with DIL/SP and a BHC-Sonic/GR.

After logging, 9-5/8", 53.5#, S-95 buttress casing was run to 1487'. The casing was cemented to surface with 1,020 sacks of Permafrost cement on February 4, 1978. A 12", 3,000 psi blowout-preventer stack was installed on the 9-5/8" casing. The blowout-preventer rams, choke manifold, and kill lines were tested to 3,000 psi. The Hydril was tested to 1,500 psi. The 9-5/8" casing was tested to 1,500 psi.

The Barrow gas sands were suspected of containing swelling clays, so to minimize possible formation damage, an inhibitive system of calcium chloride-lignosulfonate mud was mixed, and the system was changed over. Permeability damage tests were conducted by both Core Laboratories, Inc. and by Chemical and Geological Laboratories of Alaska, Inc. on core samples selected from the Upper and Lower Barrow gas sands in the previously drilled South Barrow No. 12. Chemlab tested selected samples at 2030', 2036', 2042', 2044', 2048' and 2054' (Upper Barrow gas sand). Core Lab tested one sample at 2226' (Lower Barrow gas sand). Both laboratories demonstrated that severe permeability damage resulted from contact with fresh-water filtrate. With calcium-chloride concentrations

greater than 25,000 ppm, permeability damage gradually decreased to minor amounts in saturated solutions (above 200,000 ppm calcium-chloride). The mud system below casing (1487') was converted to 100,000 ppm calcium and 250,000 ppm chloride. The casing was drilled out with an 8-1/2" bit and the formation was tested to a 0.63 psi/ft. equivalent gradient.

An 8-1/2" hole was drilled to a total depth of 2400'. At 1851' approximately 30 barrels of mud were lost and another 30 barrels were lost at 1923'. At 1992', while tripping for a bit six stands off bottom, the well kicked through the drill pipe. The safety valve was installed and the pipe was run back to bottom. Gas was circulated out with partial returns. After stabilizing the well, the mud weight was built to 10.5 ppg and lost-circulation material added to the system. After pulling five stands, the well swabbed on the sixth stand. Four stands were rerun and the hole conditioned. Pipe was tripped out and the well circulated each stand. Seven stands out, the bit plugged. Pipe was worked and the bit unplugged. The trip out was resumed, circulating each stand. The stabilizers were laid down. After tripping in, the hole was conditioned and drilling was resumed with minor mud losses. Core No. 1 was cut from 2397' to 2400' where the core barrel jammed. The hole was conditioned to 2400'. A slow pit gain of 75 barrels was taken while circulating. The well would not flow with the pump shut off and, when shut-in, had no pressure. The hole was stabilized and conditioned for logging. The well was logged from 2392', logger's total depth, to the shoe of the 9-5/8" casing with a Temperature Survey, DIL/SP, FDC/CNL/CAL/GR, BHC-Sonic/GR, HDT-Dipmeter, Velocity Survey and Temperature Survey (second run). Sidewall Cores were also obtained.

After evaluation of the logs, a decision was made to plug and abandon the well. Open-end drill pipe was run to 2300' and Plug No. 1 set with 175 sacks of Class "G" cement with 2% calcium chloride added to the mix water. The cement was in place at 10:00 p.m., February 15, 1978. Plug No. 2 consisted of a 9-5/8" Halliburton cement retainer run and set at 1426'. Sixty sacks of Permafrost cement were mixed, 55 sacks squeezed below and five sacks spotted on top of the retainer. The cement was in place at 12:30 p.m., February 16, 1978. The mud was then reversed out to water, then to diesel, at 1208' to the surface to allow the well to be used in the USGS's North Slope geothermal measurement program. Blowout-preventer equipment was nippled down and the abandonment marker was installed. The rig was released at 8:00 p.m., February 17, 1978. Rig down started and the equipment was moved to South Barrow Well No. 17 (East Area).

All logs from the South Barrow No. 16 well were recorded on magnetic tape for ease in computer interpretation. The hole was straight. The maximum deviation of 1-1/2° occurred at 1510' in the 12-1/4" hole. The 8-1/2" hole was drilled at 1° deviation.

Detailed drilling information, in the form of bit records, mud summary, time analysis, and casing and cementing reports, is included in the body of this report.

Form 9-331 C
(May 1963)

SUBMIT TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1425.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

NOTICE OF INTENT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK: DRILL [X] DEEPEN [ ] PLUG BACK [ ]

b. TYPE OF WELL: OIL WELL [ ] GAS WELL [X] 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: 150' FEL; 450' FSL
At proposed prod. zone: Same (straight hole)

5. LEASE DESIGNATION AND SERIAL NO.: 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 AK

9. WELL NO.: So. Barrow Well No. 16 (North Area)

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

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec 1, T22N, R18W, UM

12. COUNTY OR PARISH: North Slope Borough

13. STATE: AK

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: 4.2 miles southeast of Barrow, Alaska

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any): 23,000'

16. 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.: 7390'

19. PROPOSED DEPTH: 2575'

20. ROTARY OR CABLE TOOLS: Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.): Ground = 8'; Pad = 12'; KB = 30'

22. APPROX. DATE WORK WILL START*: January 5, 1978

23. 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'	± 1020 Sx Permafrost to Surface
8 1/2"	7"	38# (S-95)	2575'	± 100 Sx Class "G" w/additives from TD to ± 1600'. Second stage: Down squeeze through FO @ ± 1300' w/± 60 sx Permafrost. Arctic Pack 9 5/8" X 7" annulus through FO @ 1220' w/± 60 bbls Arctic Pack.

Blowout Preventer Program-

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

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

See Drilling Program for details.

RECEIVED
OFFICE OF THE
OIL & GAS SUPERVISOR
JAN 3 1978
CONSERVATION DIVISION
U.S. GEOLOGICAL SURVEY
ANCHORAGE, ALASKA

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.

24. SIGNED Max S Brewer TITLE Chief of Operations DATE December 15, 1977

(This space for Federal or State office use)

APPROVED BY: CONFORMS WITH PERTINENT PROVISIONS 30 CFR 221 TITLE OIL & GAS SUPERVISOR ALASKA AREA DATE JAN 17 1978

CONDITIONS OF CONCURRENCE ATTACHED

AREA

*See Instructions On Reverse Side

AMENDED January 6, 1983

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: 150' FEL, 450' FSL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

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. 16 (North Area)

10. FIELD OR WILDCAT NAME
South Barrow Gas Field

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec 1, T22N, R18W, UM

12. COUNTY OR PARISH: North Slope
13. STATE: Alaska

14. API NO.

15. ELEVATIONS (SHOW DF KDB, AND WD)
KDB - 30'

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

NOTICE OF INTENT TO:		SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF	☐	☐
FRACTURE TREAT	☐	☐
SHOOT OR ACIDIZE	☐	☐
REPAIR WELL	☐	☐
PULL OR ALTER CASING	☐	☐
MULTIPLE COMPLETE	☐	☐
CHANGE ZONES	☐	☐
ABANDON*	☐	☐
(other) Subsequent report of spud date.		

(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 well was spudded at 11 AM, January 28, 1978. Operations began with drilling a 12 1/4" hole below 13 3/8" conductor pipe set at 80' KB. The 12", 3000 psi Hydril on the 13 3/8" conductor pipe was tested to 250 psi prior to spud. A diverter system is installed.

RECEIVED
DEPUTY MINERALS MANAGER
ONSHORE FIELD OPERATIONS

JAN 18 1983

MINERALS MANAGEMENT SERVICE
411 W. 4TH AVE., SUITE 2A
ANCHORAGE, ALASKA 99501

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

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

SIGNED Max S. Brewer TITLE Chief of Operations DATE 6 January 1983

(This space for Federal or State office use)

Conforms with pertinent provisions of 30 CFR 221.

William J. Hause TITLE Acting District Supr DATE 1/18/83

THIS AMENDS ORIGINAL SUNDRY NOTICE DATED JANUARY 30, 1978.

*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: 150' FEL, 450' FSL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

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. 16 (North Area)

10. FIELD OR WILDCAT NAME
South Barrow Gas Field

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec 1, T22N, R18W, UM

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

14. API NO.

15. ELEVATIONS (SHOW DF, KDB AND WD)
30' KDB

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

NOTICE OF INTENT TO:		SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF	☐	☐
FRACTURE TREAT	☐	☐
SHOOT OR ACIDIZE	☐	☐
REPAIR WELL	☐	☐
PULL OR ALTER CASING	☐	☐
MULTIPLE COMPLETE	☐	☐
CHANGE ZONES	☐	☐
ABANDON*	☐	☐
(other) Intent to run and cement 9 5/8" surface 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.)*

The operator proposes to drill a 12 1/4" hole to 1510' KB and log with DIL/SP and BHC Sonic/GR. After properly conditioning the hole, 9 5/8", 53.5 lb/ft, S-95, Buttress casing will be run and landed at TD. The casing string will be cemented to surface with approximately 1000 sacks of Halliburton's Permafrost II cement using the duplex cementing technique. WOC time will be at least 16 hours. The casing job is expected to begin on or about February 3, 1978.

RECEIVED
OFFICE OF THE
OIL & GAS SUPERVISOR
FEB 1978
CONSERVATION DIVISION
U.S. GEOLOGICAL SURVEY
ANCHORAGE, ALASKA

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 2 February 1978

(This space for Federal or State office use)

Conforms with pertinent provisions of 30 CFR 222.

TITLE OIL AND GAS SUPERVISOR DATE 6 FEB 1978

*See Instructions on Reverse Side

Amended January 6, 1983

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: 150' FEL, 450' FSL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

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. 16 (North Area)

10. FIELD OR WILDCAT NAME
South Barrow Gas Field

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec 1, T22N, R18W, UM

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

14. API NO.

15. ELEVATIONS (SHOW DF KDB, AND WD)
30' KDB

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

NOTICE OF INTENT TO:		SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF	☐	☐
FRACTURE TREAT	☐	☐
SHOOT OR ACIDIZE	☐	☐
REPAIR WELL	☐	☐
PULL OR ALTER CASING	☐	☐
MULTIPLE COMPLETE	☐	☐
CHANGE ZONES	☐	☐
ABANDON*	☐	☐

(other) Subsequent report of running and cementing 9 5/8" surface casing.

RECEIVED
DEPUTY MINERALS MANAGER
ONSHORE FIELD OPERATIONS

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

MINERALS MANAGEMENT SERVICE
411 W. 4th AVE.
ANCHORAGE, ALASKA

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.)*

A 12 1/4" hole was drilled to 1510' and logged. Conditioned hole and ran 36 joints of 9 5/8", 53.5 lb/ft, S-95, Buttress casing and landed at 1487' KB with the duplex float collar at 1444'. Centralizers were located 10' above shoe, one every other collar (No's 1, 3, 5, 7, and 9) and one on last three collars. Ran duplex stinger. Conditioned mud and pumped 20 bbls water, 1020 sacks Permafrost II (14.6 ppg), and displaced with 10.7 bbls water. Full returns throughout cement job with good cement returns at surface. Cement in place at 3:30 AM, 2/4/78. Unsting from duplex collar. Floats held. Landed casing and set slips. Nipple up wellhead and SRRA BOP stack. Tested rams and choke manifold to 3000 psi. Tested Hydril to 1500 psi. Tested 9 5/8" casing to 1500 psi. Drill out float collar and shoe to 1520'. Pressure tested formation and shoe bond to equivalent gradient of 0.63 psi/ft with no indicated leak-off. Total WOC time: ± 84 hours.

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

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

SIGNED J. Max Brewer TITLE Chief of Operations DATE 6 January 1983

(This space for Federal or State office use)

Conforms with pertinent provisions of 30 CFR 221.

William J. Hauser TITLE Actg Dist Supvr DATE 1/18/83

THIS AMENDS ORIGINAL SUNDRY NOTICE DATED February 9, 1978.

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

RECEIVED
CONSERVATION DIVISION
U.S. GEOLOGICAL SURVEY
ANCHORAGE, ALASKA

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: 150' FEL, 450' FSL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

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. 16

10. FIELD OR WILDCAT NAME
South Barrow Gas Field

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec 1, T22N, R18W, UM

12. COUNTY OR PARISH North Slope

13. STATE Alaska

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD)
30' KB

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

NOTICE OF INTENT TO:		SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF	☐	☐
FRACTURE TREAT	☐	☐
SHOOT OR ACIDIZE	☐	☐
REPAIR WELL	☐	☐
PULL OR ALTER CASING	☐	☐
MULTIPLE COMPLETE	☐	☐
CHANGE ZONES	☐	☐
ABANDON*	☐	☒
(other)		

(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 well has been plugged and abandoned. The well was drilled to a total depth of 2400' KB. The necessary logs for evaluation were run and the well plugged and abandoned as follows. Conditioned mud at 2300' through open-ended drill pipe. Spotted 175 sacks Class "G" cement with 2% $CaCl_2$ from 2300' to 1850' in open hole. Cement in place at 10:00 PM, 2/15/78. Pick up to 1450' and circulate. WOC 12 hours. Ran 9 5/8" cement retainer on drill pipe and set at 1426' KB. Establish injection rate below retainer of 4.6 BPM at 700 psi. Squeeze 55 sacks of Permafrost II cement below retainer and spot 5 sacks on top of retainer. Cement in place at 12:30 PM, 2/16/78. Pick up to 1208'. Reverse out mud with water and reverse out water with diesel. Nippled down and set abandonment marker.

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 21 February 78

(This space for Federal or State office use)

onforms with
ertinent
rovisions of
0 CFR 221.

TITLE DISTRICT SUPERVISOR DATE FEB 27 1978

*See Instructions on Reverse Side

AREA

Form 9-330
(Rev 7-63)

Amended January 6, 1983

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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

Form approved. Budget Bureau No. 42-R355.5.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

1a. TYPE OF WELL: OIL WELL [ ] GAS WELL [ ] DRY [X] Other

b. TYPE OF COMPLETION: NEW WELL [X] WORK OVER [ ] DEEP-EN [ ] PLUG BACK [ ] DIFF. RESVR. [ ] 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 and in accordance with any State requirements)*
At surface 150' FEL, 450'FSL
At top prod. interval reported below (Straight Hole)
At total depth (Straight Hole)

5. LEASE DESIGNATION AND SERIAL NO. 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. 16

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

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA Sec 1, T22N, R18W, UM

12. COUNTY OR PARISH North Slope

13. STATE Alaska

14. PERMIT NO. N/A

DATE ISSUED N/A

15. DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMPL. (Ready to prod.)	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	19. ELEV. CASINGHEAD
1/28/78	2/13/78	2/16/78 P & A	30' KB	12'

20. TOTAL DEPTH, MD & TVD	21. PLUG, BACK T.D., MD & TVD	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
2400' MD & TVD	1414' MD & TVD	None	→	Rotary	

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)* None

25. WAS DIRECTIONAL SURVEY MADE No

26. TYPE ELECTRIC AND OTHER LOGS RUN DLL-SP, BHC Sonic-GR, FDC-CNL, HRT, HRD, Velocity

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	99' MD	18"	250 Sx Permafrost II	None
9 5/8"	53.5	1487' MD	12 1/4"	1000 Sx Permafrost II	None

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)
None				

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
None		

31. PERFORATION RECORD (Interval, size and number) None

RECEIVED
DEPUTY MINERALS MANAGER
ONSHORE FIELD OPERATIONS
JAN 18 1983
MINERALS MANAGEMENT SERVICE
411 W. 4TH AVE., SUITE 2A
ANCHORAGE, ALASKA 99501

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

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
1850' to 2300'	175 Sx Cl G w/2% $CaCl_2$
	Open Hole Plug
1414' to 1539'	60 Sx PF II, 55 Sx Squeezed
Retainer @ 1426'	Below Retainer + 5 Sx
	Spotted on Top

33.* PRODUCTION

DATE FIRST PRODUCTION None

PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump)

WELL STATUS (Producing or shut-in) Plugged & Abandoned

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
			→				

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
		→				

34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.) None

TEST WITNESSED BY

35. LIST OF ATTACHMENTS Wellbore Schematic

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

SIGNED Max Brewer TITLE Chief of Operations DATE 6 January 1983

*(See Instructions and Spaces for Additional Data on Reverse Side)

THIS AMENDS ORIGINAL REPORT DATED FEBRUARY 24, 1978

INSTRUCTIONS

South Barrow No. 16

General: This form is designed for submitting a complete and correct well completion report and log on all types of lands and leases to either a Federal agency or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office. See instructions on items 22 and 24, and 33, below regarding separate reports for separate completions.
If not filed prior to the time this summary record is submitted, copies of all currently available logs (drillers, geologists, sample and core analysis, all types electric, etc.), formation and pressure tests, and directional surveys, should be attached hereto, to the extent required by applicable Federal and/or State laws and regulations. All attachments should be listed on this form, see item 35.
Item 4: If there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.
Item 18: Indicate which elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments.
Items 22 and 24: If this well is completed for separate production from more than one interval zone (multiple completion), so state in item 22, and in item 24 show the producing interval, or intervals, top(s), bottom(s) and name(s) (if any) for only the interval reported in item 33. Submit a separate report (page) on this form, adequately identified, for each additional interval to be separately produced, showing the additional data pertinent to such interval.
Item 29: *"Sacks Cement":* Attached supplemental records for this well should show the details of any multiple stage cementing and the location of the cementing tool.
Item 33: Submit a separate completion report on this form for each interval to be separately produced. (See instruction for items 22 and 24 above.)

Amended January 6, 1983

37. SUMMARY OF POROUS ZONES:
SHOW ALL IMPORTANT ZONES OF POROSITY AND CONTENTS THEREOF; CORED INTERVALS; AND ALL DRILL-STEM TESTS, INCLUDING DEPTH INTERVAL TESTED, CUSHION USED, TIME TOOL OPEN, FLOWING AND SHUT-IN PRESSURES, AND RECOVERIES

FORMATION	TOP	BOTTOM	DESCRIPTION, CONTENTS, ETC.
Lower Cretaceous SS	1961'	1967'	SS: light gray, fine to medium grained, argillaceous, glauconitic, fair porosity, dull yellow fluorescence, fair streaming cut; net sand thickness is 6 feet.
Core No. 1	2395'	2399'	Cut 4', Rec. 3' Argillite: black color (2397-2398') on fresh breaks, occasional oil stain on bedding planes, yellow white cut fluorescence.

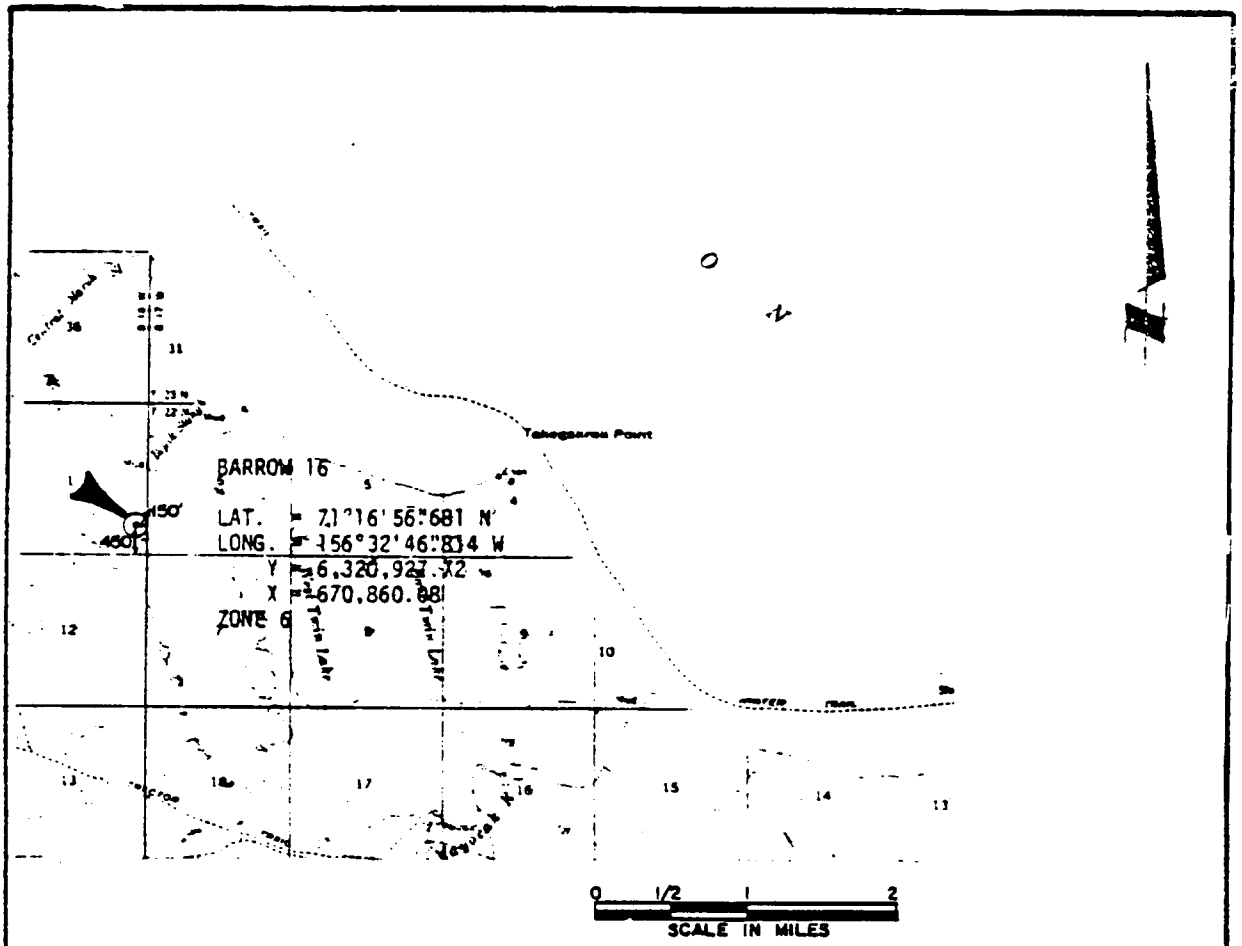
RECEIVED
EQUITY MINERALS MANAGER
CHOKE FIELD OPERATIONS
JAN 18 1983
MINERALS MANAGEMENT SERVICE
411 W. 4TH AVE., SUITE 2A
ANCHORAGE, ALASKA 99501

38. GEOLOGIC MARKERS

NAME	TOP MEAS. DEPTH	TOP TRUE VERT. DEPTH
Base of Cretaceous	2332'	2332'
Top of Argillite	2332'	2332'

THIS AMENDS ORIGINAL REPORT DATED FEBRUARY 24, 1978.

U.S. GOVERNMENT PRINTING OFFICE: 1983—O-403636



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.

August 17, 1977

STATE OF ALASKA
No. 953-3
LICENSED PROFESSIONAL LAND SURVEYOR

AS STAKED

BARROW 16

LOCATED IN

SE 1/4 PROTRACTED SEC 1 T22 N, R18W UMIAT MERIDIAN, AK

Surveyed for

HUSKY OIL

N.P.R. OPERATIONS INC.

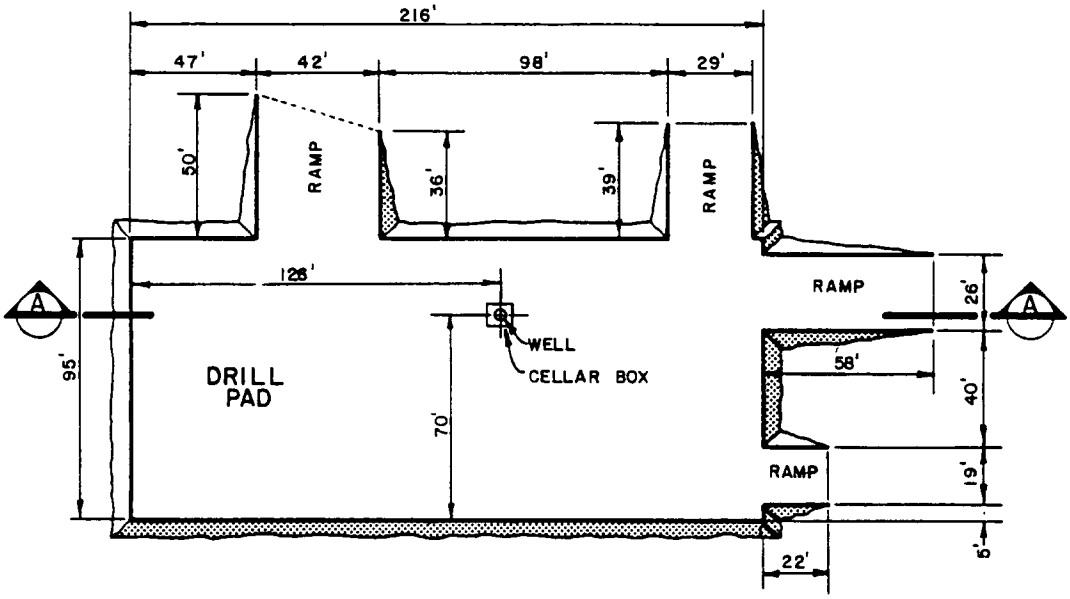
Surveyed by

Bell, Herring and Associates

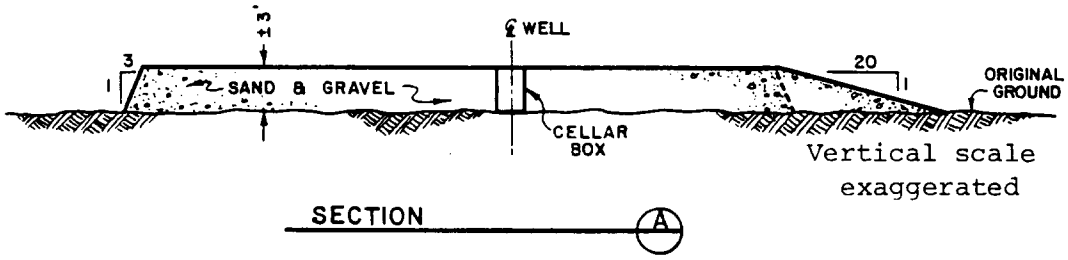
ENGINEERS AND LAND SURVEYORS

801 West Fireweed, Suite 102

ANCHORAGE, ALASKA 99503



PLAN VIEW



SECTION A

SOUTH BARROW No. 16 DRILL PAD

OPERATIONS HISTORY

DATE AND FOOTAGE DRILLED AS OF 6:00 A.M.	ACTIVITY
1/8/78	Rigging up camp. Accepted pad 1/7/78 at 4:00 p.m. Set remaining camp units.
1/9/78	Rigging up. Set mats and lower sub. Built steps for camp. Worked on camp.
1/10/78	Rigging up. Set lower subbase. Electricity in camp.
1/11/78	Rigging up. Set in top subbase. Put in false walls. Set in draw-works motors and rotary table. Built steps to camp and worked on camp units.
1/12/78	Rigging up. Set in dog house. Welded hinges on wind walls. Put derrick together. Picked up and laid mats. Set in water treatment and sewer disposal unit houses. Hooked up sewer lines.
1/13/78	Rigging up. Put derrick on floor. Raised A frame. Set pump houses, generator house, water tank, and boiler house. Built berm for fuel tank. Hooked up sewer and water lines to camp. Worked on camp.
1/14/78	Rigging up. Set mud tank. Set rig fuel tank and hooked up fuel lines. Started rig generator. Started Tioga heater. Worked on camp, sewer disposal unit, and water treatment plant.
1/15/78	Rigging up. Set 20,000 gallon fuel tank. Put up wind wall on rig. Strung up blocks. Set Halliburton house. Hooked up steam, mud, and water lines. Worked on camp. Sewer and water treatment plant running.
1/16/78	Rigging up. Installed monkey board. Worked on Halliburton house. Set cement tanks. Hooking up steam, air, water, and diesel lines. Fired boilers.
1/17/78	Rigging up. Raised derrick. Thawed ice and snow out of mud tanks. Started pump motors. Worked on mud and accumulator lines. Hooked up Halliburton unit.
	Took control of Delta Commander 1/16/78 at 6:00 p.m.

1/18/78	Rigging up. Completed hooking up Halliburton unit. Hooked up lights to rig. Put in mud lines and stand pipe. Built drip trays for diesel tanks. Repaired drain lines in showers.
1/19/78	Rigging up. Cleaned around location and camp. Wired and started Halliburton unit. Rigged up heaters on rig. Put cement on back side of cellar. Pulled 33,000 pounds on 13-3/8" conductor. Would not move. One-inch pipe beside 13-3/8" stopped at 8 feet. Installed steam lines in mud pit.
1/20/78	Rigging up. Rigged and ran 2" line 77 feet inside conductor. Steamed on 13-3/8". Pulled 13-3/8" loose. Rat hole would not go. Recut hole in upper floor. Trying to get in kelly.
1/21/78	Rigging up. Set rat hole. Steamed conductor; pulled free at 10,000 pounds. Rebuilt legs on Halliburton tanks. Made top connection to cement 13-3/8" conductor. Cut 210 sacks of cement. Rigged up two cellar pumps. Preparing to cement conductor.
1/22/78	Rigging up. Rigging up to cement. Broke circulation around 13-3/8" conductor. Halliburton cemented with 250 sacks of Permafrost. Circulated 25 sacks. Cement in place 1/21/78 at 3:00 p.m. Waited on cement. Cleaned up snow around location.
1/23/78	Waited on cement - 36-1/2 hours. Released pressure; no flow back. Rigging up to cut casing and nipple up. Rigging up logging unit.
1/24/78	Rigging up. Cut off 13-3/8" conductor and welded on 13-3/8" OCT starter head. Mixed mud. Nippled up blowout preventer.
1/25/78	Rigging up. Nippled up mud spool, diverter lines, and Hydril. Worked on rat hole and kelly boot.
1/26/78	Rigging up. Nippled up blowout-preventer equipment. Hooked up kill line, diverter line, and choke manifold. Changed Hydril rubber. Spare element wrong size; waited on new element. Nippled up.
1/27/78	Rigging up. Tested choke manifold. Completed diverter line. Put blower on No. 2 draw-works motor. Put bladder in accumulator.
1/28/78	Rigging up. Installed well identification sign. Repaired Swaco valve in choke manifold. Tested choke

manifold and kill lines to 300 psi. OK. Tested Hydril to 250 psi. OK. Tested weld on Braden head to 250 psi. OK. Worked on pump controls.

Spudded well 1/28/78 at 11:00 a.m.

1/29/78 80'	Total Depth: 160'; Mud Weight: 9; Viscosity: 39. Worked on and cut off rat hole. Worked on Crown-o-matic. Drilled.
1/30/78 568'	TD: 728'; MW: 9.4; Vis: 36. Changed out shaker screens to 20 x 20. Drilled ahead.
1/31/78 423'	TD: 1151'; MW: 9.9; Vis: 40. Drilled from 728' to 1151'. Tripped for bit. Tight hole. Tripped in with Bit No. 2.
2/1/78 258'	TD: 1409'; MW: 10; Vis: 38. Drilled from 1151' to 1409'. Changed out fuel pump in draw-works engine. Waited on governor for draw-works engine. Circulated.
2/2/78 101'	TD: 1510'; MW: 10.1; Vis: 38. Circulated and waited on part for draw-works engine. Made short trip to wipe hole. Worked on No. 1 engine. Cleaned out to bottom 5 feet of fill. Cooled transfer case and changed oil in same. Drilled 1409' to 1510' in 6 hours. Tripped out to log.
2/3/78 0'	TD: 1510'; MW: 10.1; Vis: 38. Made short trip to shoe. Circulated and conditioned for logs. Ran DIL/SP/BHC-Sonic/GR. Tripped in to condition for casing. Circulated. Tripped out.
2/4/78 0'	TD: 1510'. Cleaned mud pits. Finished trip out. Rigged up and ran 9-5/8", 53.5#, S-95, BTC casing. Set shoe at 1487'; set duplex float collar at 1444'. Tripped in with stinger and conditioned mud. Cemented with 1,020 sacks of Permafrost cement at 14.6 ppg. Mixing rate: 5-1/2 BPM. Preceded cement with 20 barrels of water and followed with 2 barrels of water. Received full returns while pumping. Final cement returns: 14.6 ppg. Cement in place at 3:30 a.m., 2/4/78. Tripped out with Halliburton stinger. Flushed blowout-preventer stack. Waited on cement.
2/5/78 0'	TD: 1510'. Cleaned mud pits. Cut off diverter lines. Cut off 13-3/8" head. Cut off 9-5/8" casing. Ground down outside diameter on 9-5/8" casing for slip-on casing head. Built berm around rig fuel tank and installed new liner. Put 10 sacks of cement around 9-5/8" casing. Waited on cement.

2/6/78 0'	TD: 1510'. Welded on 10", 3,000 psi x 9-5/8" slip-on head. Set in drilling spool. Modified drilling nipple. Hooked up Tioga heater and laid duct to rig. Moved 20,000-gallon fuel tank and hooked up to camp generator. Nippled up.
2/7/78 0'	TD: 1510'; MW: 10.3 Fabricated and hooked up choke and kill lines. Hooked up hydraulic lines. Installed turn buckles on stack. Tested blowout-preventer equipment and rams to 3,000 psi, Hydril to 1,500 psi, and choke manifold to 3,000 psi. Installed bit guide; changed valve on stand pipe. Tripped in hole.
2/8/78 282'	TD: 1792'; MW: 10.2; Vis: 38. Picked up bottom-hole assembly. Took steel-line measure in hole; float at 1444'. Drilled cement to shoe at 1487'. Tested casing to 1,500 psi. Tested OK. Drilled out shoe and 10' of new hole. Tested formation to 0.63 psi/ft. equivalent gradient. Tested OK. Drilled ahead to depth of 1792'.
2/9/78 200'	TD: 1992'; MW: 10.3; Vis: 42. Lost circulation while drilling at 1851' (30 barrels) and 1923' (30 barrels). Conditioned mud and drilled to 1992'. Tripped for bit. Well kicked through drill pipe. Installed inside blowout preventer and tripped back to bottom. Started pumping down drill pipe; no returns. Closed Hydril and circulated through choke. Pumped 30 strokes with 1,000 psi on drill pipe and 0 psi on the casing pressure. Opened Hydril for 1/4 hour. Closed Hydril and pumped 41 strokes with 700 psi on drill pipe. Opened Hydril and pumped 29 strokes with 100 psi on drill pipe. Regained circulation and condition stabilized. Circulating and conditioning mud.
2/10/78 0'	TD: 1992'; MW: 10.4; Vis: 45. Circulating and conditioning mud. Added lost-circulation material and built weight to 10.5 ppg. Pulled out of hole. Swabbed with five stands out. Ran in hole four stands. Circulated and worked pipe. Tripped out, circulating each stand. Bit plugged seven stands out. Worked pipe and unplugged bit. Tripped out, circulating each stand. Laid down stabilizers. Tripped in and circulated. Washed 1950' to 1970'. Circulating out trip gas.
2/11/78 168'	TD: 2260'; MW: 10.8; Vis: 54. Circulated and washed 20' to bottom. Drilled ahead.
2/12/78 88'	TD: 2348'; MW: 10.8; Vis: 48. Drilled to 2309' and tripped for bit. Ran Bit No. 5. Bit plugged; could not unplug. Tripped out and unplugged bit. Installed larger nozzles. Tripped in.

2/13/78 49'	TD: 2397'; MW: 10.8; Vis: 44. Tripped in; bridge at 2280'. Circulated out trip gas. Washed 25' to bottom. Lost mud; added lost-circulation material. Drilled to 2397'. Tripped for core barrel. Coring.
2/14/78 3'	TD: 2400'; MW: 11; Vis: 52. Jammed core barrel with 3' core. Circulated and conditioned mud. Added lost-circulation material and weight material. Gained 75 barrels fluid in pit. Tripped out to log. Ran log in hole to 2392', Ran temperature survey, DLL/SP, CNL, and Density. Core No. 1: 2397' to 2400'. Logging.
2/15/78 0'	TD: 2400'; MW: 11; Vis: 49. Ran BHC-Sonic/GR and HRD from 2392' to 1487'. Ran velocity and temperature survey from 2392' to 60'. Attempted 86 sidewall cores; recovered 77 (1 empty and 8 misfires). Logging completed at 3:00 a.m., 2/15/78.
2/16/78	TD: 2400'; PBTD: 1420'; MW: 11; Vis: 47. Laid down drill collars. Tripped in open ended to 2300'. Circulated and conditioned hole. Pumped 175 sacks Class "G". Cemented with 2% $CaCl_2$ in mix water. Cement in place at 10:00 p.m., 2/15/78. Picked up to 1450' and circulated. Plug remained in place. Tripped out and picked up 9-5/8" cement retainer and ran to 1420'. Waiting on cement.
2/17/78	TD: 2400'; PBTD: 1426'. Set cement retainer at 1426'. Established injection rate and pressure of 4.6 BPM at 700 psi. Pumped 60 sacks of Permafrost cement--55 sacks below and spotted 5 sacks above retainer. Final pressure: 500 psi. Cement in place at 12:30 p.m., 2/16/78. Tripped out to 1208'. Reversed out, displacing mud to water to diesel. Laid down drill pipe, kelly, and rat hole. Thawed mud lines. Nippled down.
2/18/78	TD: 2400'; PBTD: 1412'. Cleaned mud tanks. Set out ramp and cat walk. Hung off blowout preventer. Broke out diverter line. Released rig at 8:00 p.m., 2/17/78. Rigging down and moving rig.

DRILLING TIME ANALYSIS

SOUTH BARROW WELL NO. 16 (NORTH AREA)

BRINKERHOFF SIGNAL, INC., RIG 31

Spudded 1/28/78, Rig released 2/17/78

Total Depth: 2,400 Feet

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. SOUTH BARROW WELL NO. 16 (North Area) Page 1 of 3

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
1978 1-8	24																							Rigging Up	
1-9	24																							Rigging Up	
1-10	24																							Rigging Up	
1-11	24																							Rigging Up	
1-12	24																							Rigging Up	
1-13	24																							Rigging Up	
1-14	24																							Rigging Up	
1-15	24																							Rigging Up	
1-16	24																							Rigging Up	
1-17	24																							Rigging Up	
1-18	24																							Rigging Up	
1-19	24																							Rigging Up	
1-20	24																							Rigging Up	
1-21	12									3	9													Rigging Up	Cemented Conductor
1-22											24													Waiting On Cement	

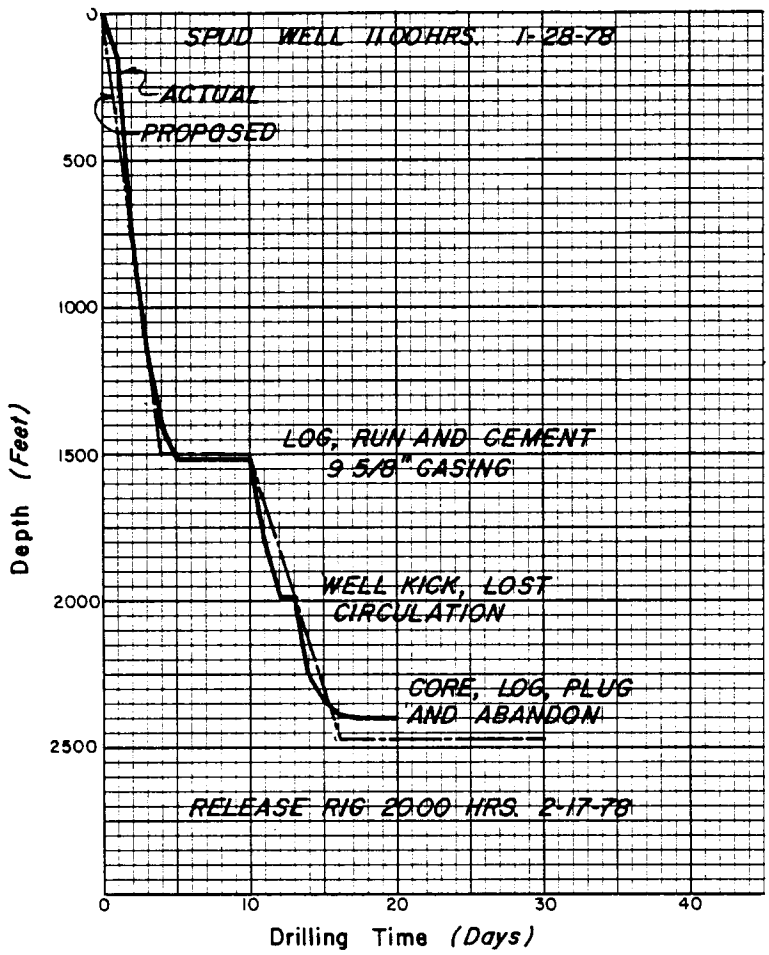
DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. SOUTH BARROW WELL NO. 16 (North Area) Page 2 of 3

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
1-23											3½	2½											18	Waiting On Cement	
1-24												24												Nippling Up BOPE	
1-25												24												Nippling Up BOPE	
1-26												12	12											Nippling Up BOPE	
1-27													24											Testing BOPE	
1-28		6	1				5						1										11	Picking Up BHA & Collars	Well Spudded at 11:00 a. m.
1-29		16¾			1¼		5½																	Drilling	
1-30		21			1	½		1½																Drilling	
1-31		12	6½			½	5																	Tripping	
2-1		3½		8			12	½																Waiting on Parts	
2-2		4½		10¼	½			3¼	5½															Tripping	Ran Schlumberger Wireline Log
2-3				10½				4½		9														Tripping	
2-4				3				2¼		1¼		16											1½	Tripping	
2-5												12											12	Grinding Down Casing	
2-6												19½	4½											Nipple Up	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. SOUTH BARROW WELL NO. 16 (North Area) Page 3 of 3

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
2-7		8½		8			1½						5										1	Changing Mud Pressure Gauge	
2-8		16		2	½		¼	5																Circulating	
2-9				8¾				15¼																Circulating	
2-10		17		3¾				1¾															1½	Circulating	
2-11		15		5½				2															1½	Drilling	
2-12		8¼		10¾				3¼															1¼	Tripping	
2-13				5½				7¼	5½								2						3¾	Circulating	Core No. 1: 3'
2-14									24															Logging	Ran Schlumberger Wireline Log
2-15				6				12	3										3					Laying Down Drill Collars	
2-16				7½				6½			4									2			4	Waiting On Cement	
2-17	17½											6½												Rigging Down	Rig Released at 8:00 p.m.
2-18	24																							Rigging Down	Preparing For Move to No. 17 Location
	365½		7½		3¾		29½		38		40½		46½		-0-		2		3		-0-		55½		
TOTAL HOURS		129		99½		1		65		13¼		116½		-0-		-0-		-0-		2		-0-			

DRILLING TIME CURVE



SOUTH BARROW No. 16
NORTH AREA

150' FEL and 450' FSL
Sec. 1, T.22 N., R.18 W., U.M.

HUSKY OIL *N.P.R. Operations*
NATIONAL PETROLEUM RESERVE - ALASKA

DRILLING MUD RECORD

ARCTIC DRILLING SERVICES

COMPANY Husky Oil NPR Operations, Inc. STATE Alaska

WELL South Barrow Well No. 16 COUNTY North Slope

CONTRACTOR Brinkerhoff Signal, Inc. LOCATION NPRA SEC 1 TWP 22N RNG 18W

STOCKPOINT _____ DATE 2/17/78 BAROID ENGINEER Rintoul/Forman

CASING PROGRAM: 13 3/8 inch at 80 ft.
9 5/8 inch at 1487 ft.
_____ inch at _____ ft.

TOTAL DEPTH 2400 ft.

DATE	DEPTH	WEIGHT	VISCOSITY		Yp	GELS	pH	FILTRATION			FILTRATE ANALYSIS				SAND	RETORT			CEC	REMARKS AND TREATMENT
1978	feet	lb/gal	Sec API @ ___°F	PV @ ___°F		10 sec / 10 min	Strip ☐ Meter ☐	ml API	HTHP @ ___°F	Cake 32nds	Pm	Pf/Mf	Cl ppm	Ca ppm	%	Solids %	Oil %	Water %	Mud, me/ml	
1/24		8.5	55	16	10	6/10	8.0	18		2			2500	0	0	2		98		Mixed spud mud
1/25		8.5	40	12	12	10/16	9.5	16		3			2200	0	0	2		98		
1/26		8.5	42	12	12	10/16	9.5	16		3			2200	0	0	2		98		
1/27		8.5	42	12	12	10/16	9.5	16		3			2200	0	0	2		98		
1/28		8.6	38	12	8	3/8	9.5	15		3			2200	40	0	3		97		Spudded well
1/29	190	9.0	39	14	12	2/6	9.0	12.8		3			2300	25	3/4	5		95		Drilling clay
1/30	691	9.4	36	10	5	1/3	9.5	13		2			2100	75	1/2	8		92		Drilling
1/31	1151	9.6	37	10	6	2/6	9.5	12		3			1600	26	Tr	9		91		Weight and solids climbing
2/1	1409	10.0	38	12	8	2/4	9.5	14		3			3500	26	Tr	12		88		Drilling clay - poor samples
2/2	1510	10.1	38	12	8	2/4	9.5	13		3			3500	30	Tr	13		87		POH to log
2/3	1510	10.1	38	12	8	2/4	9.5	13		3			3500	30	Tr	13		87		Logged - excellent caliper
2/4	1487	10.1	38	12	8	2/4	9.5	13		3			3500	30	Tr	13		87		Ran 9 5/8" to 1487
2/5	1487																			Dump and clean pits
2/6	1487	10.3																		Mix $Ca\ Cl_2$ mud
2/7	1487	10.3																		Nippling up
2/8	1750	10.2	35	9	4	2/4	10.0	9		2			250000	100000	1/4	4		96		Drilling ahead
2/9	1992	10.3	60	23	26	6/20	8.0	12		3			240000	120000	0	20		80		Lost returns at 1850'
2/10	1992	10.4	45	20	8	3/9	8.5	11		3			330000	115000	1/4	20		80		Swabbed hole at 1992'
2/11	2255	10.8	56	20	15	2/9	9.0	7.5		3			230000	80000	Tr	8		92		Drilling ahead
2/12	2378	10.8	60	20	12	2/9	9.0	7.0		3			170000	80000	1/4	10		90		Drilling ahead
2/13	2395	10.8	44	16	5	1/7	8.5	7.0		3			120000	75000	1/4	10		90		Lost 100 bbls mud to formation
2/14	2399	11.0	52	16	16	1/7	8.5	8.0		3			89000	45000	Tr	10		90		Gained fluid from hole
2/15	2400	11.0	49	15	14	1/6	8.5	20		3			90000	50000	Tr	8		92		
2/16	2400	11.0	47	15	14	1/5	8.5	8		3			90000	50000	Tr	8		92		Plugged and abandoned

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BIT RECORD

Husky Oil NPR Operations, Inc.
South Barrow Well No. 16

BIT NO.	BIT SIZE	BIT MFGR.	BIT TYPE	SER. NO. OF BIT	JET SIZE 1	JET SIZE 2	JET SIZE 3	DEPTH OUT	FTGE.	HRS. RUN	ACC. HRS.	FT. PER. HR.	WEIGHT 1000 LBS	ROTARY R.P.M.	VERT DEV.	PUMP PRESS	PUMPS LINER	PUMPS SPM.	MUD WT.	MUD VIS	DULL CODE T	DULL CODE B	DULL CODE G
1	12 1/4	HTC	OSC3J	VH770	12	12	12	1151	1071	43.5	24.5	24.5	25	60	3/4°	900	110	110	9.0	50	2	2	I
2	12 1/4	HTC	OSC3J	TD004	12	12	12	1513	362	18	61.5	20.1	25	60	1.5°	800	112	112	10.1	38	3	2	I
3	8 1/2	HTC	X3J	XZ030	9	9	9	1992	479	24.25	85.75	19.8	25	80	1°	1200	90	90	10.4	50	3	2	I
4	8 1/2	HTC	X16	RH379	16	16	16	2309	317	29.5	115 .25	10.5	20	80	1°	600	90	90	10.5	50	3	3	I
5	8 1/2	OSC	3AJ	H2815	16	16	16	2395	86	9.5	125 .75	9	20	80	1°	600	90	90	10.8	51	7	2	I
6	8 1/2	Christenson Diamond		7S63715				2399	3	2	126 .75	1.5	18	72	1°	1200	60	60	10.8	45	G	O	O D

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 H_2S environment. Below is listed casing sizes and design criteria required by Husky:

		YIELD STRENGTH (PSI)		MINIMUM PRESSURE REQUIREMENT (PSI)		
SIZE(1)	WEIGHT	MIN.	MAX.	COLLAPSE	BURST	CONNECTION
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.

The casing programmed for South Barrow Well No. 16 was as follows: 13-3/8" conductor at ±110'; 9-5/8" casing at ±1500'; 7" casing at ±2500'; 2-7/8" production tubing to be used if the well was completed. Actual casing used was 13-3/8" conductor at 80', and 9-5/8" casing at 1487'. The well did not penetrate the expected gas reservoir and thus the 7" casing and 2-7/8" tubing were not required.

When abandoning the well, the 9-5/8" annulus was left full of diesel from 1208' to the surface. This was to allow future temperature measurements by U. S. Geological Survey personnel.

CASING OR LINER CEMENT JOB

Lease South Barrow Gas Field Well So. Barrow Well No. 16 Date January 21, 1978

Size Casing 13 3/8" Setting Depth 80' Top (liner hanger) _____

Hole Size 20" " Mud Gradient Dry Viscosity _____

Casing Equipment

_____ shoe, _____ float located _____ feet

above shoe, _____ (DV, FO) collars located at _____ feet

and _____ feet

_____ centralizers located _____

_____

_____ scratchers located _____

_____

Liner hanger and pack off (describe) _____

_____

Miscellaneous (baskets, etc.) _____

_____

Cement (around shoe)

	No. Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(1)	250	Howco	Permafrost		13.7 - 14.0	195 cu ft
(2)						28°F

Cement through (DV, FO) Collar at feet

	No. Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(3)						
(4)						

Cementing Procedure (around shoe) (cross out where necessary)

Circulated 35 bbls @ .5 BPM, pumped in _____ (cu. ft.), (barrels) _____

_____ prewash, used bottom plug (yes, no), mixed cement (1) above 15

minutes, cement (2) above _____ minutes, top plug (yes, no) displaced with

12 ~~(cu. ft.)~~, (barrels) in _____ minutes at rate of 2.5 BPM, CFM,

(Bumped plug) (Did not bump plug). Final Pressure 0 psi. Reciprocated

pipe _____ feet while (mixing) and (displacing) cement. Displacing time _____

minutes. Had full circulation (full, ~~partial~~,

none, etc.). Completed job at 3:00 ~~a.m.~~, p.m.

Cementing Procedure (through (DV, FO) at _____ feet) (cross out where necessary)

Opened (DV, FO) at _____ a.m., p.m., circulated _____ bbls @ _____ BPM, pumped in

_____ (cu. ft.), (barrels) _____ prewash, mixed cement (3) above

_____ minutes, cement (4) above _____ minutes, dropped closing plug, displaced with _____ (cu. ft.), (barrels) in _____ minutes at rate of _____

_____ BPM, CFM. (Bumped plug) (Did not bump plug). Final Pressure _____

Displacing time _____ minutes. Had _____ circulation

(full, partial, none, etc.)

Remarks (Third Stage Job, etc.)

_____

_____

_____

_____

_____

McGee/Smith
Foreman

CASING TALLY
SUMMARY SHEET

DATE: February 3, 1978

FIELD National Petroleum Reserve in Alaska LEASE & WELL NO. South Barrow Well No. 16 TALLY FOR 9 5/8" CASING

SUMMARY OF PAGE MEASUREMENTS			
	NO OF JOINTS	FEET	00'S
PAGE 1	36	1483	60
PAGE 2			
PAGE 3			
PAGE 4			
PAGE 5			
PAGE 6			
PAGE 7			
PAGE 8			
PAGE 9			
TOTAL	36	1483	60

SUMMARY OF DEPTH CALCULATIONS				
		NO. OF JOINTS	FOOTAGE FEET	FOOTAGE .00'S
1	TOTAL CASING ON RACKS	42	1706	80
2	LESS CASING OUT (JTS NOS	6	223	20
3	TOTAL (1 - 2)	36	1483	60
4	SHOE LENGTH		1	66
5	FLOAT LENGTH		2	00
6	MISCELLANEOUS EQUIPMENT LENGTH		1487	26
7	TOTAL CASING AND EQUIPMENT FROM CEMENT HEAD (3 + 4 + 5 + 6)			
8	LESS WELL DEPTH (KB REFERENCE)			
9	"UP" ON LANDING JOINT			

Weight indicator before cementing: 70,000 ; after slack-off: _____ ; inches slacked off _____ .

SUMMARY OF STRING AS RUN								
WEIGHT	GRADE	THREAD	MANUFACTURER	CONDITION NEW USED	LOCATION IN STRING	NO OF JOINTS	FOOTAGE	INTERVAL
55-3	S-95	Buttress		New	JT NO. 1 THRU NO. 36	36	1483.60	1487 - KB
					JT NO. THRU NO.			-
					JT NO. THRU NO.			-
					JT NO. THRU NO.			-
					JT NO. THRU NO.			-
					JT NO. Shoe THRU NO. 1.66			-
					JT NO. Float THRU NO. 2.00			-

PAGE 1 OF 1

CASING TALLY

DATE: February 3, 1978

FIELD NPRA LEASE & WELL NO. So. Barrow Well No. 16 TALLY FOR 9 5/8" CASING

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR.
1	41	74			
2	41	74			
3	39	43			
4	40	89			
5	38	14			
6	44	02			
7	42	65			
8	42	32			
9	38	90			
0	40	90			
TOTAL A	410	73			

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT .00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT .00'S	WT GR.
1	41	43			
2	42	56			
3	40	16			
4	41	94			
5	39	43			
6	40	35			
7					
8					
9					
0					
TOTAL D	245	87			

1	41	73			
2	41	27			
3	41	12			
4	39	55			
5	43	80			
6	40	38			
7	40	80			
8	40	88			
9	43	-			
0	42	70			
TOTAL B	415	23			

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

1	41	80			
2	41	52			
3	39	62			
4	42	50			
5	40	47			
6	40	76			
7	40	90			
8	40	38			
9	43	60			
0	40	22			
TOTAL C	411	77			

TOTAL A	410	73		
TOTAL B	415	23		
TOTAL C	411	77		
TOTAL D	245	87	1483	60
TOTAL E			3	66
TOTAL PAGE	1483	60	1487	26

CASING OR LINER CEMENT JOB

Lease South Barrow Gas Field Well So. Barrow Well No. 16 Date February 4, 1978

Size Casing 9 5/8" Setting Depth 1487' Top (liner hanger) _____

Hole Size 12 1/4" " Mud Gradient .525 Viscosity 38

Casing Equipment

Howco shoe, 1487 float located 41.74 feet

above shoe, 1444 (DV, FO) collars located at _____ feet

and _____ feet

_____ centralizers located 10' above shoe 5, on every other collar above float, and on last 3 collars in hole.

_____ scratchers located _____

Liner hanger and pack off (describe) _____

Miscellaneous (baskets, etc.) _____

Cement (around shoe)

	No. Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(1)	1020	Permafrost		None	14.6	939 cu f
(2)						

Cement through (DV, FO) Collar at _____ feet

	No. Sacks	Brand	Type	Additives	Slurry Weight	Slurry Volume
(3)						
(4)						

Cementing Procedure (around shoe) (cross out where necessary)

Circulated 167 bbls @ 5 1/2 BPM, pumped in 20 ~~(cu. ft.)~~ (barrels) water _____ prewash, used bottom plug ~~(yes,~~ no), mixed cement (1) above 30 minutes, cement (2) above _____ minutes, top plug ~~(yes,~~ no) displaced with 10.7 ~~(cu. ft.)~~ (barrels) in 2 minutes at rate of 5 BPM, CFM, (Bumped plug) (Did not bump plug). Final Pressure 500. Reciprocated pipe _____ feet while (mixing) and (displacing) cement. Displacing time 2 minutes. Had full circulation (full, partial, none, etc.). Completed job at 3:30 a.m., ~~p.m.~~

Cementing Procedure (through (DV, FO) at _____ feet) (cross out where necessary)

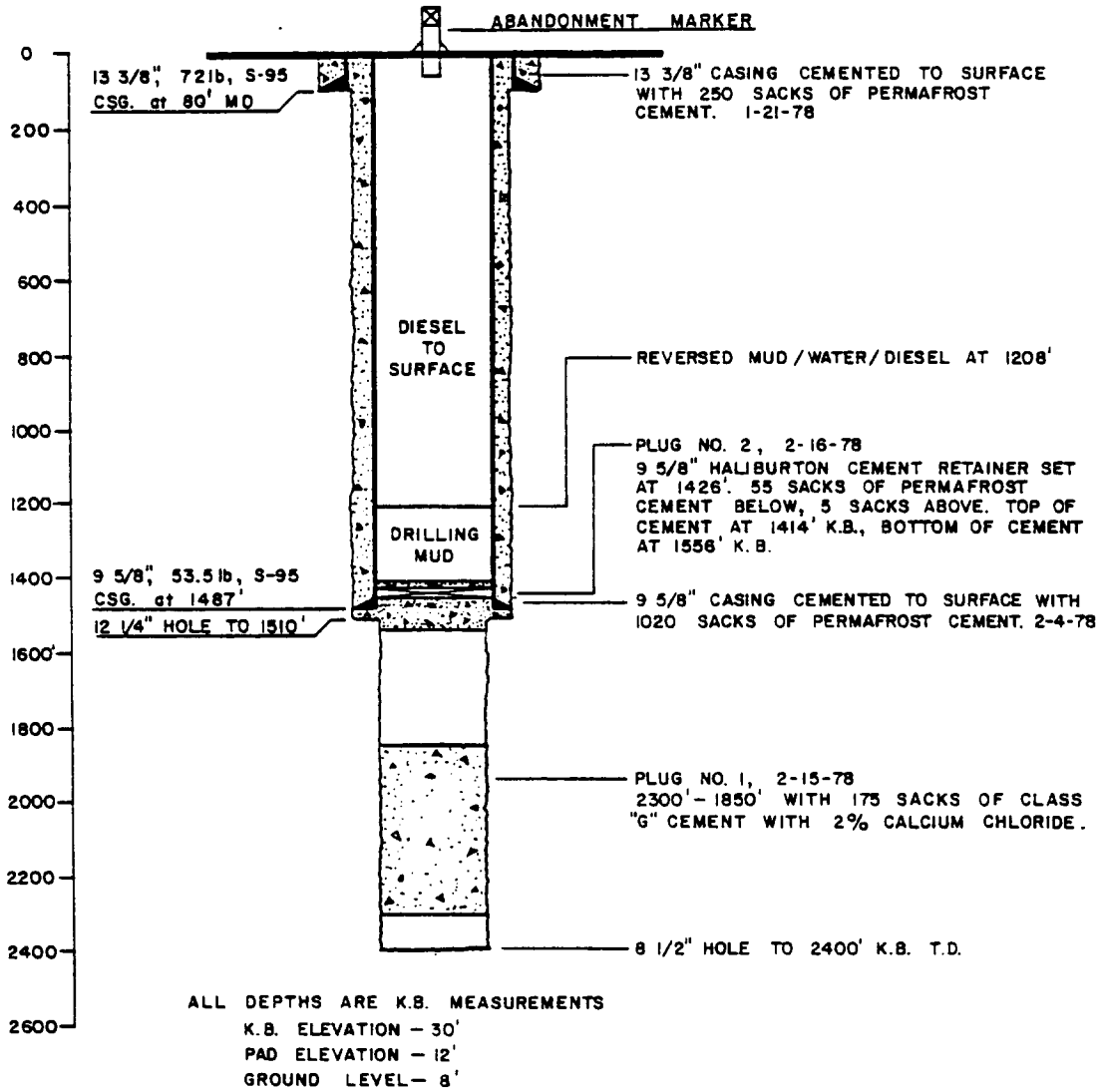
Opened (DV, FO) at _____ a.m., p.m., circulated _____ bbls @ _____ BPM, pumped in _____ (cu. ft.), (barrels) _____ prewash, mixed cement (3) above _____ minutes, cement (4) above _____ minutes, dropped closing plug, displaced with _____ (cu. ft.), (barrels) in _____ minutes at rate of _____ BPM, CFM. (Bumped plug) (Did not bump plug). Final Pressure _____ Displacing time _____ minutes. Had _____ circulation (full, partial, none, etc.)

Remarks (Third Stage Job, etc.)

Float held.

McGee/Smith
Foreman

WELLBORE SCHEMATIC

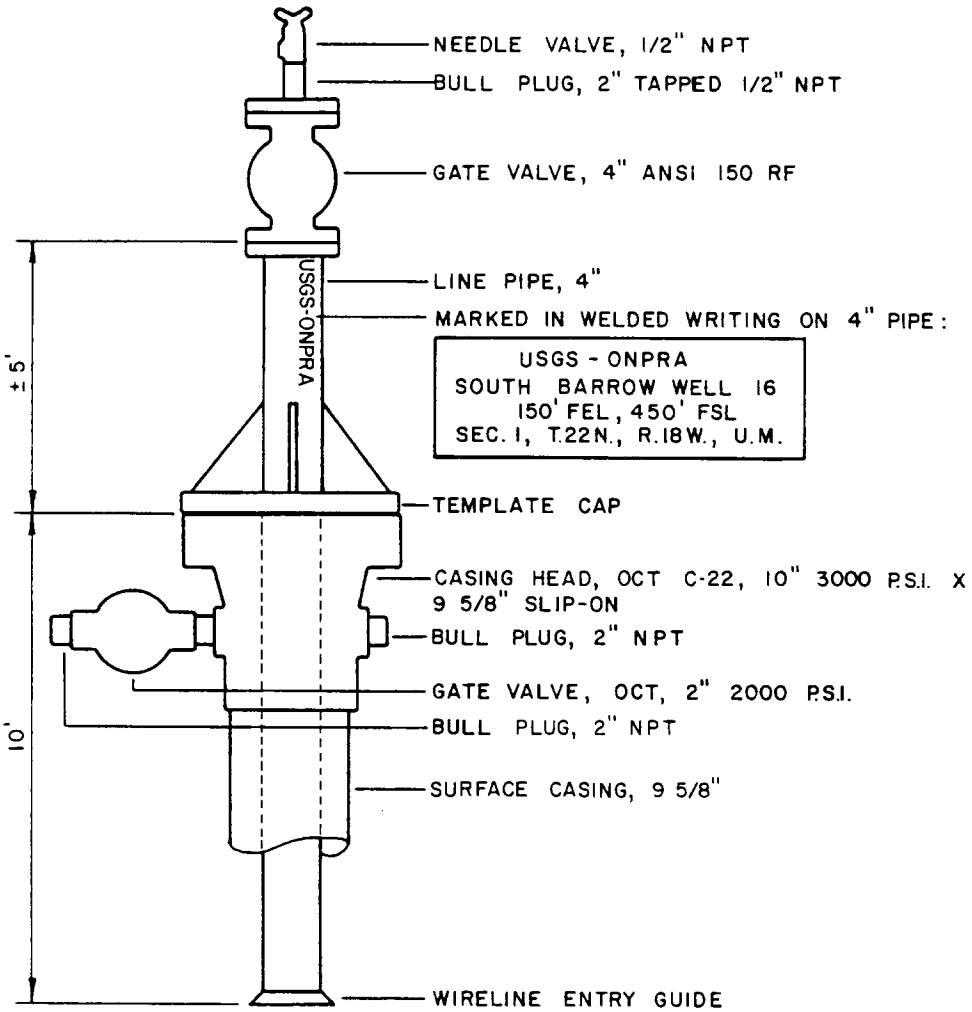


SOUTH BARROW No. 16
NORTH AREA

150' FEL and 450' FSL
Sec. 1, T.22 N., R.18 W., U.M.

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

ABANDONMENT MARKER



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

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 one set GMC diesel twin 671 engines, 300 HP, through Allison torque converter, all mounted on single skid. One Westinghouse 3YC air compressor driven by main PTO.

Mast

Lee C. Moore, 95' high with 9-foot wide front by spread cantilever. Gross nominal capacity 290,000 lbs. with racking board capacity of 130 stands 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, 1750 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, 1725 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 lbs.

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-Chalmers 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 CPM 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 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, 1725 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 ten-inch, 900 dual Shaffer gate LWS with three-inch flanged side outlet one side.

One - ten-inch 900 GK Hydril.
One - ten-inch 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 T1W 6-5/8" regular LH box to pin.
Two - T1W 10,000 psi lower kelly cocks, 4-1/2" XH joints.
Two - T1W 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 feet long.
Four - Pipe rack sections, 43" high x 4' wide x 28 feet long.