NATIONAL PETROLEUM RESERVE IN ALASKA

HISTORY
OF
DRILLING OPERATIONS

TULAGEAK TEST WELL NO. 1

HUSKY OIL NPR OPERATIONS, INC.
Edited by: S. L. Hewitt & R. G. Brockway

For the

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

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TULAGEAK TEST WELL NO. 1

INTRODUCTION

Tulageak Test Well No. 1 is located in the National Petroleum Reserve in Alaska (Figure 1). The well is located 1,140 feet from the west line and 3,338 feet from the south line of protracted Section 7, Township 21 North, Range 14 West, Umiat Meridian (Latitude: 71°11'21.62" North; Longitude: 155°44'00.82" West). Alaska State Plane Coordinates are: X = 295,272.76; Y = 6,287,738.37, Zone 5. Elevations are: ground level 10 feet and Kelly bushing 27 feet. Rig-up began on February 20, 1981, and the rig released on March 23, 1981.

The well was drilled to a total depth of 4,015 feet. The primary objective of the well was to test the sandstones in the basal portion of the "Pebble Shale" unit. Secondary objectives were the equivalents of the Jurassic Barrow sandstones and the Sag River Sandstone. The Argillite basement was reached at 3,964 feet.

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 the National Petroleum Reserve in Alaska. Geological personnel were furnished by Tetra Tech, Inc. Brinkerhoff Signal, Inc. was the drilling contractor; Brinkerhoff Rig 31, a National T-20, was used to drill the well.

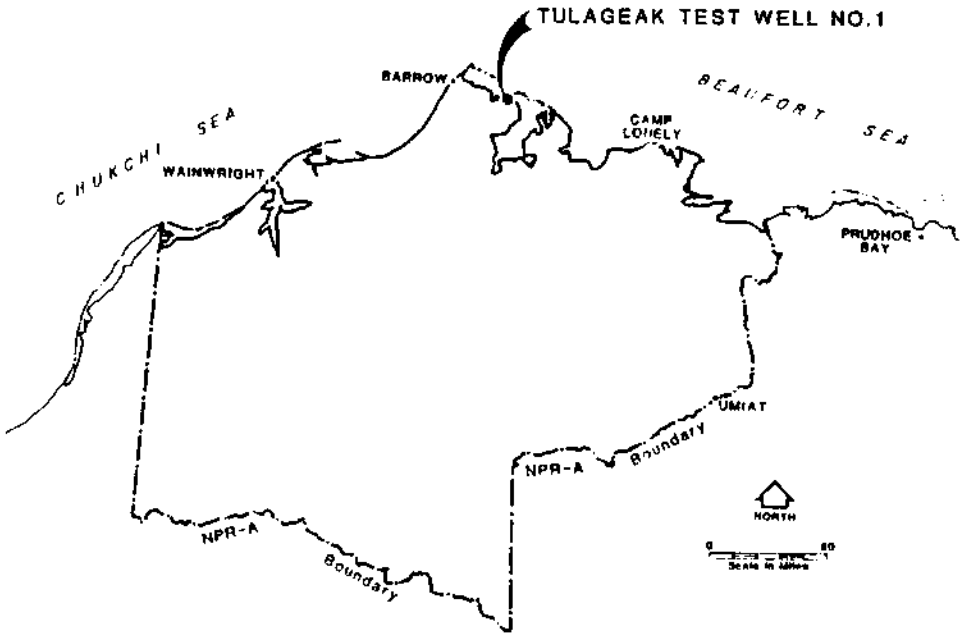

FIGURE 1 - WELL LOCATION MAP - TULAGEAK NO. 1

DRILLING SUMMARY

Field operations at the Tulageak Test Well No. 1 location began on January 26, 1981, with the mobilization of construction crews and equipment required to build the drilling pad and an ice airstrip to accommodate C-130 Hercules aircraft. Construction work was completed on February 11.

The rig move from Walakpa Test Well No. 2 was accomplished with 34 Rolligon loads. Rig move-in operations began on February 16. Rig-up operations began on February 20, and were completed on February 26. The well was spudded February 26, 1981, at 3:00 p.m.

During rig-up, 20" conductor pipe was set at 105' and cemented with 475 sacks of 14.9 ppg Permafrost cement. A 12-1/4" hole was drilled below the 20" conductor pipe to 2730' and the hole conditioned for logs. This interval was drilled with a 3% calcium chloride mud system with a weight of 9.6 to 10.1 ppg. A calcium chloride mud was used to prevent damage to possible hydrocarbon reservoirs which are known to contain swelling clays in the Barrow area (determined from water susceptibility tests on cores from the South Barrow wells 10s. The use of calcium chloride necessitated the running of a dual laterolog rather than a induction log. The following logs were run: DLL/GR/ FDC/CNL/GR/CAL, BHC-Sonic/GR/TTI, LSS/GR/TTI, and HDT-Dipme Nineteen sidewall cores were shot with seventeen recovered. Sixty-th joints of 9-5/8", S-95, 53.5 lb./ft. Buttress casing were run to 2720' cemented with 1,500 sacks of Permafrost cement; slurry weight of retu was 14.6 ppg. The 9-5/8" casing was hung with a National casing hang and slips were set with full casing weight. The Hydril was tested to 1, psi; the blowout preventer and all other equipment were tested to 3, psi. A 13-5/8", 5,000 psi, SRRA arrangement blowout-preventer st was installed. The casing was tested to 3,000 psi, and a formation lea test was run after drilling 10 feet of new hole. The formation was tes to 12.0 ppg equivalent with 9.6 ppg mud in the hole (360 psi sur pressure). There was no leakoff.

An 8-1/2" hole was drilled to 2940' with a mud weight of 9.9 ppg, Core No. 1 was cut from 2940' to 2982' (38' recovered). Dril operations resumed. Tight hole was encountered while tripping for a bit at 3322'. The lower interval of the hole, 2970' to 3322', was tight required three hours to ream. While tripping for a new bit at 3644', t hole was encountered at 3376'. The stand was pulled too high in derrick, and the blocks became wedged against the crown. The blo were worked loose, and 590 feet of drilling line was cut as a sa precaution. Drilling of the 8-1/2" hole was resumed. Core No. 2 was from 3783' to 3816' (33' recovered). Drilling resumed to 3880' wh circulation was lost. A lost-circulation material pill was spotted circulation regained. Drilling resumed to 4005', and Core No. 3 was cu 4015' (10' recovered).

The core hole was reamed and preparations made for logging. following logs were run: Temperature Survey, DLL/SP/

FDC/CNL/GR/CAL, BHC-Sonic/GR, HDT-Dipmeter. Twenty sidewall cores were attempted, and 18 were recovered. The top sidewall core was shot at 2730'; the bottom was shot at 3940'. A second temperature survey was run, and the hole was conditioned for testing.

Drill-Stem Test No. 1 was conducted in the open hole over the interval 3770' to 3825'. A 530' water cushion was used. Surface chokes were 1/4" and 1/8", and the bottom-hole choke was 3/4". All pressures listed below were recorded at 3811' and are the field data. The test is summarized as follows:

Initial Flow Period (30 minutes): Opened with weak blow, increasing to very strong blow in 15 minutes and continuing until shut-in; Initial Hydrostatic Pressure 1,993 psi; Bottom Hole Flowing Pressure from 279 psi when opened to 545 psi at shut-in.

Initial Shut-In (30 minutes): Initial Shut-In Pressure 1,841 psi.

Final Flow Period (120 minutes): Opened with strong blow, decreasing to moderate in one minute, and to weak at shut-in; Bottom Hole Flowing Pressure 545 psi at opening increasing to 684 psi at shut-in.

Final Shut-In (240 minutes): Final Shut-In Pressure 1,841 psi; Final Hydrostatic Pressure 1,993 psi.

Recovery: 4.59 barrels of slightly water-cut mud.

After running Drill-Stem Test No. 1, a decision was made to plug and abandon the well. Cement plugs were set from 3950' to 3700' with 96 sacks of cement and from 2800' to 2600' with 72 sacks of cement. Both plugs were of Class "G" cement containing 1% CFR-2. The pipe was pulled to 2000' and the mud was displaced with water; the water was then displaced with diesel oil. This was to allow future re-entry into the upper well bore by U. S. Geological Survey personnel to make temperature measurements. The abandonment marker and head were set and installed; the rig was released March 23, 1981, at 12:00 noon.

Mud and rental equipment were shipped by Hercules C-130 aircraft to Camp Lonely. The rig was flown by Hercules C-130 aircraft to Fairbanks, Alaska, and trucked to Anchorage. This operation was completed on April 5, 1981. During and following the rig move, the rig camp was shipped to the South Barrow Pressure Reducing Station by truck where it was stacked out for future use in connection with the Barrow Gas Field.

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 IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1425.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

5. LEASE DESIGNATION AND SERIAL NO.
N/A

DEEPEN, OR PLUG BACK

NOTICE OF INTENT TO DRIL

PLUG BACK [ ]

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

7. UNIT AGREEMENT NAME
N/A

SINGLE ZONE [ ] MULTIPLE ZONE [ ]

8. FARM OR LEASE NAME
National Petroleum Reserve in Alaska

9. WELL NO.
Tulageak Test Well No. 1

99503

ith any State requirements.*)

10. FIELD AND POOL, OR WILDCAT
Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec 7, T21N, R14W, UM

ST OFFICE*

12. COUNTY OR PARISH
North Slope

13. STATE
AK

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

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

19. PROPOSED DEPTH
4050'

20. ROTARY OR CABLE TOOLS
Rotary

22. APPROX. DATE WORK WILL START*
March 5, 1981

ING AND CEMENTING PROGRAM

FOOT	SETTING DEPTH	QUANTITY OF CEMENT
55)	100'	325 Sx Permafrost to Surface
-95)	2600'	1725 Sx Permafrost to Surface
0)	4050'	Caliper Volume + 15% Excess Class "G"

RECEIVED
DEPUTY CONSERVATION MGR.
DISTRICT FIELD OPERATIONS

Diverter Assembly
RA BOP Assembly with 3000 psi
and Kill Line

FEB 23 1981

CONSERVATION DIVISION
U.S. GEOLOGICAL SURVEY
ANCHORAGE, ALASKA

pen or plug back, give data on present productive zone and proposed new productive
t data on subsurface locations and measured and true vertical depths. Give blowout

TLE Chief of Operations, ONPRA DATE 19 February 81

DATE

TLE DISTRICT SUPERVISOR DATE 2/24/81

uctions On Reverse Side

1a. TYPE OF WORK
DRILL [X] DEEPEN

b. TYPE OF WELL
OIL WELL [X] GAS WELL [ ] OTHER

2. NAME OF OPERATOR
National Petroleum Reser
(through Husky Oil NPR Operations, Inc.

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

4. LOCATION OF WELL (Report location clearly and in accordance
At surface
1140' FWL; 3338' FSL
At proposed prod. zone
Same (straight hole)

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR P
25 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) 20,625'

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT. 14,850'

21. ELEVATIONS (Show whether DF, RT, GR, etc.)
Pad: 10'; KB: 27' (Estimated)

23. PROPOSED CAS

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER
26"	20"	133# (K-
12 1/4"	9 5/8"	53.5# (S
8 1/2"	7"	32# (N-8

BOP Program:

From 100' to 1500': 12", 3000 psi, SA
From 1500' to TD: 12", 3000 psi, SE
Choke Manifold

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to de
zone. If proposal is to drill or deepen directionally, give pertine
preventer program, if any.

24.
SIGNED Max S. Brewer

(This space for Federal or State office use)

NO.

BY

CONDITIONS OF APPROVAL, IF ANY:
SEE ATTACHED CONDITIONS

*See Inst

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

...ite 400, Anchorage, AK 99503 ...

(REPORT LOCATION CLEARLY. See space 17

...0' FWL; 3338' FSL
...RVAL:
...ame (straight hole)

...E BOX TO INDICATE NATURE OF NOTICE, ... DATA

...O:	SUBSEQUENT REPORT OF:
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐

...t Report of Spud

...D OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, ...ate of starting any proposed work. If well is directionally drilled, give subsurface locations and ...rtical depths for all markers and zones pertinent to this work.)*

...ided February 26, 1981, at 3:00 PM with a 12 1/4" bit. Prior to ...tor was set in a 24" dry drilled hole and cemented to surface with ...frost cement at 105' KB.

...Manu, and Type _____ Set @ _____ Ft.

...e foregoing is true and correct

...Brewer TITLE Chief of Operations DATE 4 MARCH 81

(This space for Federal or State office use)

...Weber TITLE DISTRICT SUPERVISOR DATE 3/6/81

*See Instructions on Reverse Side

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.
Tulageak Test Well No. 1

10. FIELD OR WILDCAT NAME
Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec 7, T21N, R14W, UM

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

14. API NO.

15. ELEVATIONS (SHOW DF KDB AND WD)
Pad: 10'; KB: 27'

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

...4. LOCATION OF WELL ... below.)
AT SURFACE: 11...
AT TOP PROD. INT...
AT TOTAL DEPTH:

16. CHECK APPROPRIAT... REPORT, OR OTHER...

NOTICE OF INTENT ...
TEST WATER SHUT-OFF
FRACTURE TREAT
SHOOT OR ACIDIZE
REPAIR WELL
PULL OR ALTER CASIN...
MULTIPLE COMPLETE
CHANGE ZONES
ABANDON*
(other) Subseque...

17. DESCRIBE PROPOSE... including estimated ... measured and true v...

This well was spu... spud, a 20" condu... 475 sacks of Perm...

Subsurface Safety Valve: ...

18. I hereby certify that t...

SIGNED ...

Conforms with pertinent provisions of 30 CFR 221.

AMENDED MAY 19, 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.)

well ☐ 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: 1140' FWL; 3338 FSL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH: Same (Straight hole)

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.: Tulageak Test Well No. 1

10. FIELD OR WILDCAT NAME: Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec 7, T21N, R14W, UM

12. COUNTY OR PARISH: North Slope

13. STATE: Alaska

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD): Pad: 10'; KB 27'

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*	☐		☐

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

(other) Subsequent Report of Running and Cementing 9 5/8" 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 12 1/4" hole to 2730'. Logged with DLL, FDC/CNL, BHC/Sonic, LSS, HDT. (all logs 2725'-105'). Shot 19 sidewall cores with 17 recovered.

Ran 63 jts 9 5/8", 53.5 # S-95 Buttress csg. Cemented with 1500 sks Permafrost 14.9 ppg cement. Good returns throughout. Csg shoe at 2720', F/C at 2632'. CIP 1:00 PM 2/5/81. Tested choke manifold, blind and pipe rams to 3000 psi; Hydril to 1500 psi. Tested 9 5/8" casing to 3000 psi. Drilled to 2740'. Tested formation to equivalent 12.0 ppg. mud (360 psi surface pressure with 9.6 ppg mud).

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

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

SIGNED _____ TITLE Chief of Operations DATE _____

(This space for Federal or State office use)

Conforms with pertinent provisions of 30 CFR 221.

_____ TITLE _____ DATE _____

*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 [X] 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: 1140' FWL; 3338' FSL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH: Same (straight hole)

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.
Tulageak Test Well No. 1

10. FIELD OR WILDCAT NAME
Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec 7, T21N, R14W, UM

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

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD)
Pad: 10'; KB: 27' (Est)

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*	[ ]	[X]
(other)		

RECEIVED
DEPUTY CONSERVATION
ONSHORE HELD

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

CONSERVATION DIVISION
U.S. GEOLOGICAL SURVEY
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.)*

This is a confirming notice to abandon Tulageak Test Well No. 1. This well was drilled to a depth of 4015', logged, and tested. No evidence of hydrocarbon bearing zones was discovered. Verbal approval was received from Jim Weber on March 21, 1981, to abandon Tulageak No. 1. Ran HRT/DLL/GR/SP, BHC/GR/TTI, FDC/CNL/GR/CAL, HDT Dipmeter, Sidewall Cores, HRT. A Drill Stem Test was run on the Sag River formation from 3770' to 3825'. Six hundred-twenty feet (4.59 barrels) of slightly water-cut mud was recovered. Set cement plug No. 1, 3950' to 3700', with 96 sacks Class "G", 14.9 ppg cement with 1% CFR-2. Set plug No. 2, 2800' to 2600', with 72 sacks Class "G", 14.9 ppg cement with 1% CFR-2. Displaced top 2000 feet of hole with diesel. Installed dry hole marker. Released rig March 23, 1981, at 12:00 noon.

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 27 April 1981

(This space for Federal or State office use)

Conforms with pertinent provisions of 30 CFR 221.

(Sgd.) Kenneth T. [illegible] TITLE [illegible] DATE _____

DISTRICT SUPERVISOR

*See Instructions on Reverse Side

Form 9-330
(Rev. 1-68)

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 ☐ Other Wildcat

b. TYPE OF COMPLETION: NEW WELL ☐ 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: 1140' FWL; 3338' FSL
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. UNIT AGREEMENT NAME: N/A
8. FARM OR LEASE NAME: National Petroleum Reserve in AK
9. WELL NO.: Tulageak Test Well No. 1
10. FIELD AND POOL, OR WILDCAT: Wildcat
11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec 7, T21N, R14W, UM
12. COUNTY OR PARISH: North Slope Borough
13. STATE: AK

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
2/26/81	3/19/81	N/A	Pad: 10'; KB: 27'	N/A

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
4015'	2600'	N/A	→	0' - TD	N/A

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*
N/A

25. WAS DIRECTIONAL SURVEY MADE: Yes

26. TYPE ELECTRIC AND OTHER LOGS RUN: DL/GR/SP, BHCS/GR/TTI, LSS/GR/TTI, FDC/CNL/GR/Cal, HDT Dipmeter, Temp, GR/SP/DLL, GR/Cal/CNL, FDC, GR/BHC, HDT-Dipmeter

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
20"	133# (K-55)	105'	26"	475' Sx Permafrost	None
9 5/8"	53.5# (S-95)	2720'	12 1/4"	1500 Sx Permafrost	None

29. N/A LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)

30. N/A TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)

RECEIVED
OCT 29 1981
CONSERVATION DIVISION
U.S. GEOLOGICAL SURVEY
ANCHORAGE, ALASKA

31. PERFORATION RECORD (Interval, size and number)
N/A

32. N/A ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED

33.* N/A PRODUCTION

DATE FIRST PRODUCTION	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.)

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 Mark Brewer TITLE Chief of Operations, ONPRA DATE 17 June 81

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

WELL COMPLETION REPORT
Tulageak Test Well No. 1
Page 2

INSTRUCTIONS

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.)

31. 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.
Kingak Shale	2940'	2982'	Core No. 1: See subsequent pages
Sag River SS	3783	3816'	Core No. 2: See subsequent pages
Neruokpuk Fm	4005'	4015'	Core No. 3: See subsequent pages

38. GEOLOGIC MARKERS

NAME	TOP MEAS. DEPTH	TOP TRUE VERT. DEPTH
Gubik Fm	Surface	
Torok Shale	100'	
Torok Bottom-set Beds	1925'	
GR/Pebble Shale	2504'	
Kingak Shale	2950'	
U. Barrow	3542'	
L. Barrow	3640'	
Sag River SS	3764'	
Shublik Fm	3796'	
Neruokpuk Fm	3964'	

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671-233

CORE NO.	INTERVAL	DESCRIPTION		
1	2940-2982' (Cut 42'; Rec 38')	2940-2948'	-	Sh, blk-v dk gy, firm-brit, v carb, some slt, abunt fltg sd grn, abunt fltg cht & qtz peb, occ gvl or cbl size, R - SR, occ pyr strg.
		2949-2980'	-	Sh, m gy, firm, sub fis, thn bed, sli mica, tr pyr, ss, lt brn-gy, v f grn, SA - SR, fri, calc &/or dol in part, occ grn mica, slty, cly-filled in part, poor-fair sort, poor por, bri yel fluor w/good cut. This intv is lightly bioturbated sh, sds, & sltstn.
2	3783-3816' (Cut 33'; Rec 33')	3783-3784'	-	Ss, m gy, v f-slt, occ grdg sltst, tr f grn, SA-SR, mod hd, occ dk gy partings, calc, cly-filled in pt, tr glau, occ calcite-filled fracs, tr por, sl tr oil w/yel fluor.
		3784-3785'	-	Ss, m gy, v f-f grn, slty in pt, SA-SR, sl fri, occ dk grns, tr flau, sl calc, sl cly-filled in pt, p por, g-fr srtg, spotty brn oil stn w/dull orng fluor.
		3785-3786'	-	Ss, brn, (oil stn), v f-f grn SA-SR, some slt, fri, sl calc, sl cly-filled in pt, p por, fr-g srtg, even brn oil stn w/dull orng fluor.
		3786-3787'	-	Ss, m gy, w/dk gy arg ptgs and/or burrows, v f grn to slt, some f grn, SA-SR, sl fri, occ dk grns, tr glau, sl tr calc cmt, cly-fille, v poor - tr por, fr srtg, tr dull or fluor, no visible stn.
		3787-3788'	-	Ss as in 3786-87', pred dk gy, more arg, occ v thin sh ptgs.
		3788-3789'	-	Ss, m gy, w/spty brn oil stn, v f-f grn, some slt, SA-SR, sl fri, calc, occ dk grns, tr glau, sl cly-filled in pt, p w/some fr por, fairly g srtg, dull or fluor.
		3789-3791'	-	Ss, as in 3788-89', less oil stn & occ v s arg ptg.

CORE NO.	INTERVAL		DESCRIPTION
2 (Cont'd)	3791-3792'	-	Ss m gy, w/dk gy arg ptgs, v f-f grn, slty in pt, occ dk grns, tr glau, calc, p-tr por, f srtg, tr dull or fluor, tr stn.
	3792-3793'	-	Ss, as in 3791-92' w/incr in brn oil stn (approx 30%).
	3793-3794'	-	Ss, m gy, w/numerous dk gy arg ptgs, v f-f grn, slty grdg to sltst, occ dk grns, sl fri, calc, cly-filled, tr v p por, no fluor or stn.
	3794-3796'	-	Ss, as in 3793-94' w/occ cly-filled burrow.
	3796-3798'	-	Ss, m gy w/tr dk gy arg ptgs, v f-f grn, SA-SR, sl fri, occ dk grn, tr glau, tr cly-filled burrows and/or trails, p por, fairly g srtg, tr fluor, occ calcite-filled frac or ptg.
	3798-3799'	-	Ss, as in 3796-3798' w/inc arg ptgs and burrows, no fluor.
	3799-3801'	-	Ss, m gy, w/f dk arg ptgs, v f-slt, grdg to sltst, occ f grn, cly-filled, v sl calc in pt, tr por, p srtg, note fine arg ptgs make up 50% of rock.
	3801-3802'	-	Ss, m gy, w/few dk arg ptgs or burrows, v sl greenish cast, v f-f grn, some slt, cly-filled in pt, calc, occ dk grns, tr glau, f srtg, p por, occ spotty lt brn oil stn w/yel fluor.
	3802-3803'	-	Ss as in 3801-02', w/inc in arg ptgs & decrease in oil stn and fluor.
	3803-3804'	-	Ss, m gy, v f grn, occ f grn, v slty grdg to sltst, sl fri, sl calc, occ dk grn, tr glau, p srtg, tr por; sh, dk gy, sub-fis, slty, sdy, carb, tr pyr; this intv thin lams sd and sh, mostly sh.

CORE NO.	INTERVAL			DESCRIPTION
2 (Cont'd)		3804-3805'	-	Ss, m gy, w/v sl greenish cast, occ dk gy carb ptgs or burrow & trails, v f-f grn, some slt, calc, fri, occ dk grns, tr glau, f srtg, p por, tr yel fluor.
		3805-3807'	-	Ss, m gy, v sl greenish, freq dk gy arg ptgs, v f-f grn, slty grdg to sltst, v sl calc, mod hd, occ grn glau, f srtg, p to tr por.
		3807-3808'	-	Ss, m gy, sli greenish in pt, occ dk gy arg lams, v f-f grn, slty, mod hd, occ-freq dk grns, occ grn glau, p srtg, tr por.
		3808-3809'	-	Ss, m gy-gn to dk brn-gy, mottled, v f-f grn, slty, mod hd to sli fri, occ dk gy arg ptgs, freq glau grns, occ other dk grns, cly-filled, tr por, v p srtg.
		3809-3811'	-	Sltst, dk gy-brn w/freq large (up to .5 mm) gn glau grns, some v f sd, hd, calc.
		3811-3816'	-	Ss, m gy-gn, mod hd, v f-f grn, slty, cly-filled, occ to abunt glau, v sl calc to calc, freq dk gy-brn sh ptgs, tr por, p w/some f srtg.
3	4005-4015' (Cut 10'; Rec 10')	4005-4011'	-	Phyllite, v dk gy to blk, hd, steep cleavage, prob original bdg surf, occ qtz--or calc--filled fracs, frequent s pyr (?) xls.
		4011-4013'	-	Slate, v dk gy, hd, steep cleavage, occ pyr xls.
		4013-4015'	-	As in 4005-4011'.

Drill Stem Test No. 1 was conducted in the open hole over the interval 3770' to 3825'. A 530' water cushion was used. Surface chokes were 1/4" and 1/8" and the bottom hole choke was 3/4". All pressures listed below were recorded at 3811' and are the field data. The test is summarized as follows:

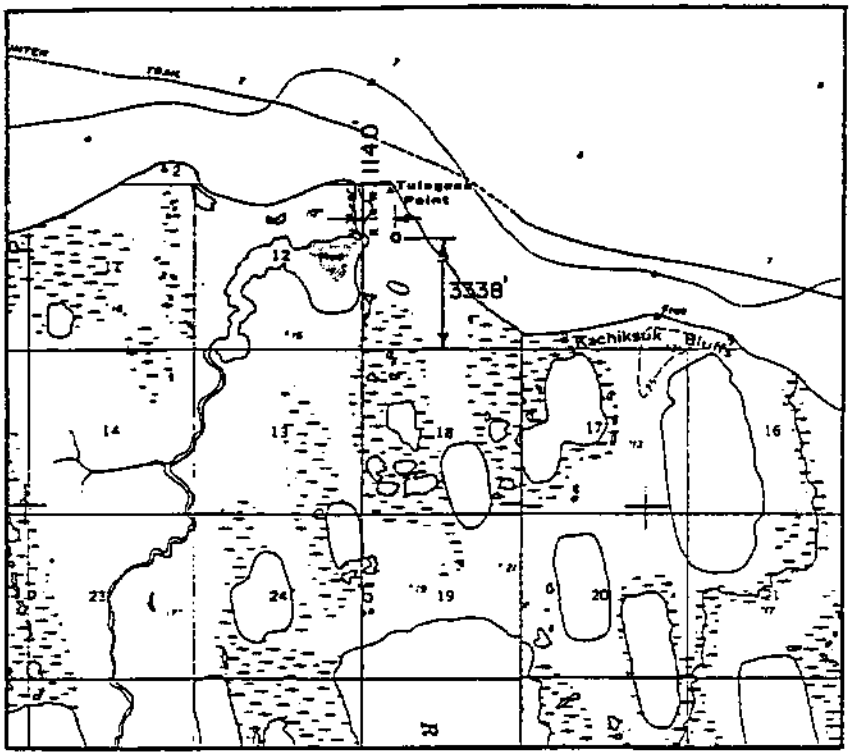
Initial Flow Period (30 minutes): Opened with weak blow, increasing to very strong blow in 15 minutes and continuing until shut in; Initial Hydrostatic Pressure 1,993 psi; Bottom Hole Flowing Pressure from 279 psi when opened to 545 psi at shut in.

Initial Shut In (30 minutes): Initial Shut In Pressure 1,841 psi.

Final Flow Period (120 minutes): Opened with strong blow, decreasing to moderate in one minute, and to weak at shut in; Bottom Hole Flowing Pressure 545 psi at opening increasing to 684 psi at shut in.

Final Shut In (240 minutes): Final Shut In Pressure 1,841 psi; Final Hydrostatic Pressure 1,993 psi.

Recovery: 4.59 barrels of slightly water cut mud.



TULAGEAK 7-81

Lat. = 71° 11' 21.62" N
Long. = 155° 44' 00.82" W
Y = 6,287,738.37
X = 295,272.76
Zone 5

0 1/2 1 2
SCALE IN MILES

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.

DATE: DEC. 12, 1980

JOHN H. HERRING
49TH

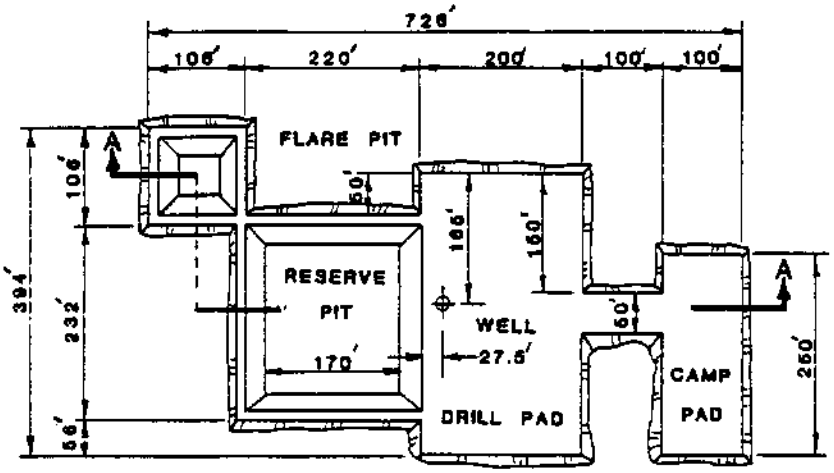
AS-STAKED LOCATION
FOR

TULAGEAK No. 1

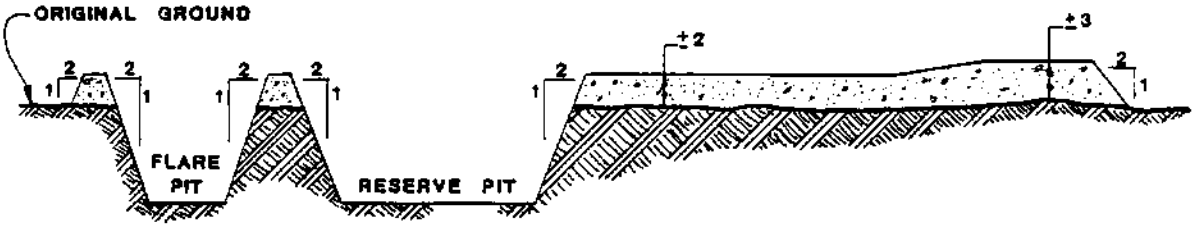
located in: NW 1/4 protracted Sec. 7, T. 21 N., R. 14 W., Umiat Meridian, Ak.

Surveyed for:
HUSKY OIL
NPR Operations Inc

Surveyed by: nana-bell · herring, inc.
engineers and land surveyors
2340 Arctic Blvd. Suite 202, Anchorage, Alaska 99503



PLAN VIEW



SECTION A - A

TULAGEAK DRILL PAD

OPERATIONS HISTORY

DATE AND DEPTH; FOOTAGE DRILLED AS OF 6:00 A.M.	ACTIVITY
2/16/81	Began moving rig from Walakpa No. 2 to Tulageak. Six Rolligon loads were moved today.
2/17/81	Continued with rig move.
2/18/81	Continued with rig move. The rig substructure, being moved by Rolligon, is off the ice road and temporarily stuck. Attempts are being made to get it back on the road. Kodiak's truck shop was destroyed by fire yesterday.
2/19/81	Rig move is approximately 80 percent complete. The substructure is back on the road.
2/20/81	Three loads of rig components remain to be moved. The camp is set and has heat but no water. The sewer plant is not yet operational. Rig-up will begin today, and the camp is expected to be operational today.
2/21/81	Rig move (a total of 34 Rolligon loads) is complete. All Rolligons left the location at midnight. Set substructure, draw works, dog house, and derrick. Changed out one mud pump. Camp is completely operational; rig-up is 65% complete.
2/22/81	Set four pump room units, mud tank, boilers, generators, boiler water tank, air heater, mechanics' shop, fuel tank, Howco cement unit, and logging unit. Hooked up fuel lines and heat ducts. Fired up air heater. Rigged up windwalls.
2/23/81	Strung derrick and miscellaneous lines; strung lights. Started air heater; hooked up steam lines. Raised derrick. Set ramp and catwalk. Continued working on Howco and Schlumberger units.
2/24/81	Finished firing boilers and repairing steam lines. Hooked up mud lines. Cut 20" casing. Welded on 20" casing head and tested weld to 200 psi. Set casing at 105'. Started Howco unit and heated water for cementing. Cleaned up yard; stacked mud. Built docks and stacked miscellaneous supplies on same.

2/25/81	Cemented 20" conductor with 475 sacks of Permafrost cement; 14.9 ppg slurry. Nippled up 13-3/8", 5,000 psi blowout preventer. Mixed mud; rigged up No. 2 pump. Rig-up is complete.
2/26/81	Completed nippling up blowout preventer stack. Hooked up accumulator, hydraulic lines, diverter lines, and choke manifold. Completed nippling up No. 2 pump. Repaired water and steam leaks. Picked up kelly; made up swivel; picked up rathole and mousehole. Worked on air compressors. Hooked up standpipe and rotary chain guard. Ran wear bushing. Picked up bottom-hole assembly.
2/27/81 625'	Total Depth: 730'; Mud Weight: 9.6; Viscosity: 34. Finished picking up bottom-hole assembly. Repaired air lines to mud pump. Pressure tested blowout preventers to 200 psi. Drilled cement from 57' to 105'. Repaired mud pump and lines. Pulled out of hole to unplug bit. Ran in hole; spudded well February 26, 1981, at 3:00 p.m. Surveyed at 503'; broke wireline. Reran survey. Drilled ahead.
2/28/81 840'	TD: 1570'; MW: 10.1; Vis: 35. Drilled to 995'; unplugged flow line. Drilled to 1099'; surveyed. Drilled ahead.
3/1/81 566'	TD: 2136'; MW: 10.1; Vis: 38. Drilled to 1756'; surveyed. Drilled to 2083'; surveyed. Tripped for new bit. Drilled ahead.
3/2/81 594'	TD: 2730'; MW: 10; Vis: 36. Drilled; worked on mud pump. Drilled; repaired recorder line. Drilled.
3/3/81 0'	TD: 2730'; MW: 10.1; Vis: 47. Circulated and conditioned hole for wiper trip. Dropped survey and made wiper trip. Circulated and conditioned mud. Unplugged flow line; circulated and conditioned mud. Pulled out of hole, steel-line measuring; no correction. Rigged up logging unit. Ran in hole and began logging with DLL tool. CPW broke and pulled into casing. Waited on parts.
3/4/81 0'	TD: 2730'; MW: 10.1; Vis: 49. Waited for parts to arrive. Ran DLL/GR/SP, FDC/CNL/GR/CAL, BHC-Sonic/GR/TTI, LSS/GR/TTI, and HDT-Dipmeter. Shot 19 sidewall cores with 17 recovered.
3/5/81 0'	TD: 2730'; MW: 10.3; Vis: 44. Rigged down logging unit. Ran in hole; had eight feet of fill on bottom. Circulated and conditioned hole for running

	9-5/8" casing. Pulled out of hole. Rigged up and ran 63 joints of 9-5/8", 53.5#, Buttress casing. Ran in hole with stab-in tool and rigged up to circulate. Circulated and conditioned hole for cementing.
3/6/81 0'	TD: 2730'. Circulated while preparing blowout preventers to set casing slips. Cemented 9-5/8" casing with 1,500 sacks Permafrost cement mixed at 14.9 ppg, with 14.6 ppg returns at surface. Preceded cement with 40 barrels water ahead and two barrels water behind. Displaced with 19-1/2 barrels water. Casing shoe at 2720'; float collar at 2632'; centralizers at 2710', 2673', 2630', 2583', 2497', 2413', 2329', 167', 128' and 86'. Cement was in place at 1:00 p.m. Pulled out of hole with drill pipe. Nippled down blowout preventers. Picked up 9-5/8" casing hanger; set 9-5/8" casing slips with full casing load. Cut off casing; installed packing support; had to grind off one side of packing support ring.
3/7/81 0'	TD: 2730'; MW: 9.0; Vis: 33. Nippled up blowout preventer stack. Tested blowout preventer equipment. Tested choke manifold to 3,000 psi; tested Hydril to 1,500 psi. Had two flange leaks and had to replace seal ring below blowout preventer. Replaced seal gaskets on test plug three times. Installed wear bushing. Picked up 8-1/2" bit; ran in hole. Strapped in hole; tagged FO at 2627'.
3/8/81 217'	TD: 2947'; MW: 9.6; Vis: 36. Tested casing; tested upper and lower kelly valves to 3,000 pounds. Drilled float collar, two shoe joints and float shoe at 2720'; drilled 10 feet of cement below float shoe. Drilled from 2730' to 2740'. Circulated bottoms up. Closed pipe rams; pressured up on formation to 12.0 ppg mud weight equivalent (360 psi surface pressure). Drilled from 2740' to 2940'. Circulated bottoms up. Dropped survey and pulled out of hole. Picked up core barrel; ran in hole. Circulated and dropped ball. Cut Core No. 1, 2940' to 2947'.
3/9/81 148'	TD: 3095'; MW: 9.9; Vis: 47. Continued cutting the core, 2947' to 2952'. Worked on mud-pump motor. Finished cutting Core No. 1 to 2982'. Pulled out of hole with core barrel. Laid down core; stood core barrel in derrick. Recovered 38 feet of core. Ran in hole with bit; washed and reamed 60 feet to bottom. Drilled to 3095'.
3/10/81 227'	TD: 3322'; MW: 9.9; Vis: 45. Drilled to 3322'; dropped survey. Pulled out of hole.

3/11/81 117'	TD: 3439'; MW: 9.9; Vis: 47. Tripped for bit; washed and reamed from 2970' to 3260'; tight hole. Surveyed at 3240'. Washed and reamed from 3260' to 3322'. Drilled from 3322' to 3385'. Laid down one joint of 3-1/2" drill pipe and lower Kelly valve. Drilled to 3439'.
3/12/81 102'	TD: 3541'; MW: 9.9; Vis: 40. Drilled to 3505'; dropped survey. Tripped for bit; washed and reamed 30 feet to bottom. Drilled ahead.
3/13/81 103'	TD: 3644'; MW: 10.0; Vis: 42. Drilled to 3560'; circulated samples. Drilled; repaired mud pump. Drilled ahead.
3/14/81 26'	TD: 3670'; MW: 10.1; Vis: 41. Pulled four stands; tight hole; had 40,000 pounds drag. Picked up kelly; worked pipe through tight spot at 3376'. Picked up too high and wedged blocks in crown section. Cut and slipped 590 feet of drilling line; finished pulling out of hole. Pulled wear bushing. Tested blowout preventer equipment: Hydril to 1,500 pounds; all other equipment to 3,000 pounds. Reset wear bushing. Safety reamed 30 feet to bottom; had seven feet of fill on bottom. Drilled to 3653'; circulated samples. Drilled to 3660'; circulated samples. Drilled ahead.
3/15/81 113'	TD: 3783'; MW: 9.7; Vis: 37. Drilled to 3747'; circulated samples. Drilled to 3783'; circulated samples. Started losing partial returns; lost 100 barrels mud. Slowed pump down to one-half rate with full returns. Conditioned mud.
3/16/81 33'	TD: 3816'; MW: 9.9; Vis: 43. Circulated and conditioned mud at 3783'; dropped survey. Pulled out of hole, steel-line measuring; no correction. Replaced brake blocks. Picked up core barrel and ran in hole to 3723'; hole tight. Reamed and washed 60 feet to bottom; had eight feet of fill. Circulated bottoms up and dropped ball. Cut Core No. 2, 3783' to 3803'. Repaired No. 1 mud pump and welded on mud line. Continued coring to 3816'; pulled out of hole with core.
3/17/81 64'	TD: 3880'; MW: 9.9; Vis: 44. Laid down core and stood core barrel in derrick. Recovered 33 feet of core. Picked up bit and ran in hole to 3780'. Safety reamed 36 feet to bottom; had eight feet of fill on bottom. Drilled to 3880'. Lost 50 barrels of mud at 3880' in five minutes. Shut down pump; pulled 95 feet

up hole. Filled annulus with water. Fluid dropped one foot each two minutes. Mixed 30-barrel lost-circulation material pill at 9.8 ppg with 10 sacks medium Quickseal and 15 sacks fine Nut Plug. Ran bit to bottom; kelly froze up. Rigged up circulating sub and spotted lost-circulation material pill on bottom; pill in place at 4:15 a.m. Had 75% returns while spotting pill. Thawed kelly and standpipe with bit 95 feet off bottom. Circulated with 100% returns.

3/18/81
100'

TD: 3980'; MW: 9.8; Vis: 41. Thawed stand pipe and kelly. Drilled to 3900'; circulated samples. Drilled ahead.

3/19/81
26'

TD: 4006'; MW: 9.8; Vis: 46. Drilled to 4005'; circulated bottoms up. Pulled out of hole to 3950'; reamed from 3950' to 4005'. Circulated while waiting for 40-knot winds to diminish. Dropped survey; pulled out of hole. Picked up core barrel and ran in hole to 3950'. Reamed from 3950' to 4005'; no fill; hole tight. Began cutting Core No. 3 at 4005'.

3/20/81
9'

TD: 4015'; MW: 9.8; Vis: 45. Cut Core No. 3 to 4015'; pulled out of hole with core. Laid down core and core barrel; recovered 10 feet of core. Ran in hole with bit and reamed core hole. Circulated; pulled out of hole for logs, steel-line measuring; no correction. Rigged up logging unit. Ran Temperature Survey; attempted to run DLL but tool failed.

3/21/81
0'

TD" 4015'; MW: 9.8; Vis: 47. Ran DLL/SP/GR; FDC/CNL/GR/CAL, BHC-Sonic/GR, and HDT-Dipmeter. Shot 20 sidewall cores; recovered 18. Ran second Temperature Survey. Ran in hole to 2688'; circulated bottoms up at casing shoe. Finished running in hole; no fill. Circulated and conditioned hole and mud for drill-stem test.

3/22/81
0'

TD: 4015'; MW: 9.8; Vis: 44. Pulled out of hole for drill-stem test; picked up drill-stem test tools. Ran in hole with tools and a 530-foot water cushion. Set bottom packer at 3825', center packer at 3770', and top packer at 3761', with 190-foot tail pipe. Opened tool for 30 minutes with initial 1" blow increasing to 20" blow in 15 minutes in bucket of water. Blow decreased to 4" at end of final flow period. Initial flowing pressure during first period was 279 psi; the final flowing pressure during the first period was 545 psi. The initial shut-in period was 30 minutes with a shut-in pressure of 1,841 psi. The second (and final) flow period was for 120 minutes with an initial flowing pressure of 545 psi and a final

	flowing pressure of 684 psi. The final shut-in period was 240 minutes with a shut-in pressure of 1,841 psi. Initial and final hydrostatic pressures were 1,993 psi. All pressures were taken from Pressure Gauge No. 7581, located at 3811'. The final flow period began with an immediate 20" blow; it decreased to a 7" blow in one minute and to a 4" blow at end of period. Five hundred thirty feet of water and 620 feet of slightly water-cut mud were recovered. The surface choke used in this test was 1/8"; the bottom choke was 3/4". Unseated packer and pulled out of hole. Reversed out fluids. Finished pulling out of hole and laying down drill-stem test tools.
3/23/81	TD: 4015'; PBTD: 2600'; MW: 9.6; Vis: 42. Finished laying down drill-stem test tools; laid down drill collars and jars. Ran in hole with drill pipe; circulated and conditioned mud. Set Plug No. 1 from 3950' to 3700' with 96 sacks Class "G" cement with 1% CFR-2; followed with one barrel water and 23 barrels mud; slurry weight 14.9 ppg. Pulled out of hole 18 stands to 2800'; circulated and conditioned mud. Set Plug No. 2 from 2800' to 2600' with 72 sacks Class "G" cement with 1% CFR-2; followed with one barrel water and 16 barrels mud. Pulled out of hole 14 stands; laid down drill pipe. Waited on cement. Ran in hole with drill pipe to 2000'. Circulated and pumped water; displaced with 2,500 gallons diesel.
3/24/81	TD: 4015'; PBTD: 2600'. Finished displacing mud with diesel from 2000' to surface. Laid down 3-1/2" drill pipe. Nippled down blowout preventers; installed companion flange and head; cleaned mud pits. Laid down kelly; rigged down floor, mud pumps, and lines. Released rig March 23, 1981, at 12:00 noon.
3/25/81 through 4/2/81	Rigged down and cleaned location. Moved the rig by Hercules aircraft to Fairbanks. Moved the rig camp to the South Barrow Pressure Reducing Station for future use in the Barrow Gas Field.

DRILLING TIME ANALYSIS

TULAGEAK TEST WELL NO. 1

BRINKERHOFF SIGNAL, INC., RIG 31

Spudded 2/26/81, Rig released 3/23/81

Total Depth: 4,015 Feet

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. TULAGEAK TEST WELL NO. 1 Page 1 of 3

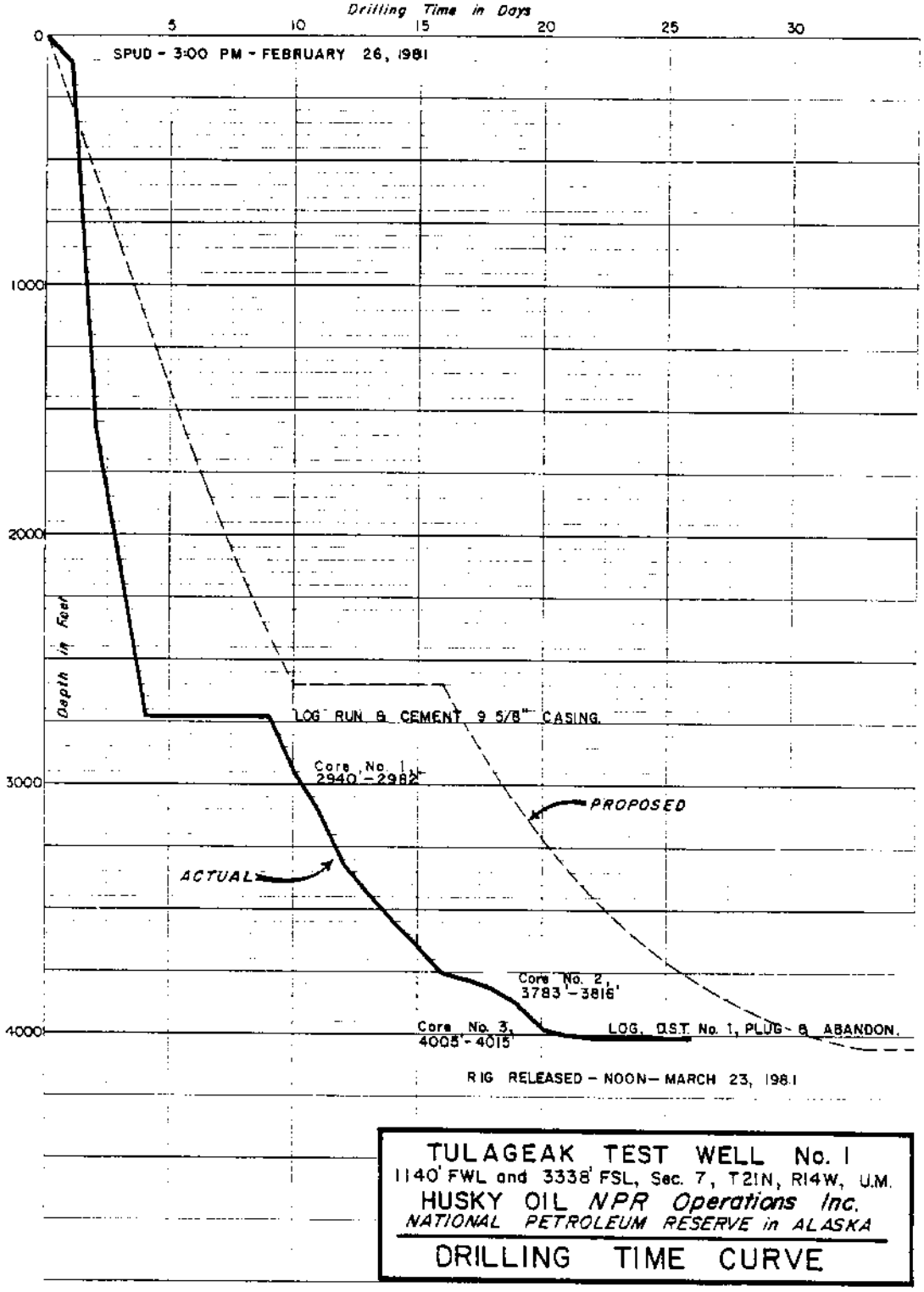
DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
1981 2-16																							24	Moving Rig	
2-17																							24	Moving Rig	
2-18																							24	Moving Rig	
2-19																							24	Moving Rig	
2-20	24																							Rigging Up	
2-21	24																							Rigging Up	
2-22	24																							Rigging Up	
2-23	24																							Rigging Up	
2-24										4		20												Cementing 20"	Set 20" at 105'
2-25	6											18												Mixing Mud	
2-26		10	3	2								6											3	Picking Up BHA	Spudded Well at 3:00 p.m.
2-27		20			2½																		1½	Drilling	
2-28		22		1	1																			Drilling	
3-1		20		3½			½																	Drilling	
3-2		5½		7½				9½															1¾	Drilling	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. TULAGEAK TEST WELL NO. 1 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
3-3				½					23¼															Logging	Ran Schlumberger Wireline Logs
3-4				5				4½	6½	8														Logging	
3-5				5				6		4	9													Circulating	Ran 9 5/8" Casing
3-6												12	12											Nippling Up BOP	
3-7		12		3½	½			2					4										2	Testing BOP	
3-8		5½		8½			1	½									8½							Coring	Core No. 1: 2940' - 2982'
3-9		24																						Drilling	
3-10		14½	3	4½	1½																		½	POH For New Bit	
3-11		19	½	4	½																			Drilling	
3-12		22					1	1																Drilling	
3-13		5½	½	7									7½										3½	RIH With New Bit	
3-14		21¾						2¼																Drilling	
3-15		2½	1½	6	½		5¾	5½									2¼							Circulating	Core No. 2: 3783' - 3816'
3-16		13½	1	5			1½										1½						1½	Breaking Down Core Barrel	
3-17		9½					7¾	4¾															2	Thawing Standpipe	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. TULAGEAK TEST WELL NO. 1 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
3-18		13½		5				5½																Drilling	
3-19			4½	8				3½	3								5							Coring	Core No. 3: 4005' - 4015'
3-20				1½				1	21½															Logging	Ran Schlumberger Wireline Logs
3-21				11				6										7						Circulating	DST No. 1
3-22				11½				½			6								6					Laying Down DST Tool	
3-23	4			3½				4½			1	11												Pumping Diesel	Released Rig at 12:00 Noon
3-24	24																							Rigging Down	
3-25	24																							Rigging Down	
3-26	24																							Rigging Down	
3-27																							24	Loading Rig	
3-28																							24	Loading Rig	
3-29																							24	Loading Rig	
	178	14		6½		17½		54½		16		23½		-0-		17¼		6		-0-			183		
TOTAL HOURS	240½		103½		-0-		57		16		67		-0-		-0-		7		-0-		-0-				


Drilling Time in Days
0
5
10
15
20
25
30
SPUD - 3:00 PM - FEBRUARY 26, 1981
1000
2000
3000
4000
Depth in Feet
LOG RUN & CEMENT 9 5/8" CASING.
Core No. 1, 2940'-2982'
PROPOSED
ACTUAL
Core No. 2, 3783'-3816'
Core No. 3, 4005'-4015'
LOG, D.S.T. No. 1, PLUG & ABANDON.
RIG RELEASED - NOON - MARCH 23, 1981
TULAGEAK TEST WELL No. 1
1140' FWL and 3338' FSL, Sec. 7, T21N, R14W, U.M.
HUSKY OIL NPR 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: 20 inch at 105 ft.

WELL Tulageak Test Well No. 1 COUNTY North Slope Borough 9 5/8 inch at 2720 ft.

CONTRACTOR Brinkerhoff Signal, Inc. LOCATION NPRA SEC 7 TWP 21N RNG 14W ____ inch at ____ ft.

STOCKPOINT ____ DATE ____ BAROID ENGINEER ____ TOTAL DEPTH 4015 ft.

DATE	DEPTH	WEIGHT	VISCOSITY		Yp	GELS	pH	FILTRATION			FILTRATE ANALYSIS				SAND	RETORT			CEC	REMARKS AND TREATMENT
1981	feet	lb/gal	Sec API @ °F	PV @ °F		10 sec/ 10 min	Strip Ø Meter Ø	ml API	HTHP @ °F	Cake 32nds	Pm	Pf/Mf	Cl ppm	Ca ppm	%	Solids %	Oil %	Water %	Mud, me/ml	
2/26	105	9.0	32	4	7	5/6	7.0	23.5		4			38000	21280		3	0	97		
27	650	9.6	34	5	20	7/11	7.0	18.6		4			32000	17920	1/4	7	0	93		
28	1540	10.1	35	8	26	8/12	7.0	22		4			32000	17920	1/4	10	0	90		
3/1	2120	10.1	38	10	30	10/18	7.0	25		4			42000	23520	1/4	10	0	90		
2	2700	10.0	36	8	24	8/15	7.0	26		4			42000	23520	1/4	10	0	90		
3	2730	10.1	47	13	33	11/21	7.0	19.5		4			47000	26320	1/4	11	0	89		
4	2730	10.1	49	16	40	14/21	7.0	19.6		4			45000	25200	1/4	11	0	89		
5	2730	10.3	44	11	33	12/18	7.0	19		4			43000	24080	1/4	11	0	89		
6	2730	10.3	35	10	20	7/12	7.0	22		4			40000	22400	1/4	10	0	90		
7	2730	9.0	33	3	9	3/5	7.0	14.5		3			33000	18480	Tr	3	0	97		
8	2942	9.6	36	7	11	2/4	7.0	13.0		3			36000	20160	Tr	6	0	94		
9	3085	9.9	47	18	19	6/20	7.0	7.5		2			41000	22960	1/4	9	0	91		
10	3323	9.9	45	13	19	8/20	7.0	10.6		2			37000	20720	1/4	10	0	90		
11	3435	9.9	47	16	23	12/25	7.0	8.0		2			44000	24640	1/4	10	0	90		
12	3535	9.9	40	12	18	10/22	7.0	12.0		2			40000	22400	1/4	10	0	90		
13	3644	10.0	42	13	19	9/18	7.0	8.5		2			42000	23520	1/4	10	0	90		
14	3661	10.1	41	15	20	9/20	7.0	7.0		2			38000	21280	1/4	10	0	90		
15	3783	9.7	37	8	9	6/12	7.0	6.8		2			35000	19600	1/4	8	0	92		Lost circulation; reduced mud wt.
16	3818	9.9	43	12	21	10/21	7.0	12.5		3			44000	24640	1/4	9	0	91		
17	3880	9.9	44	16	18	10/22	7.0	13.0		3			43000	24080	1/4	9	0	91		
18	3977	9.8	41	13	14	7/12	7.0	14.5		3			39000	21840	1/4	8	0	92		
19	4005	9.8	46	18	19	9/20	7.0	5.9		2			35000	19600	1/4	8	0	92		
20	4015	9.8	45	16	18	8/18	7.0	6.2		2			34000	19040	1/4	8	0	92		
21	4015	9.7	47	17	18	11/21	7.0	6.4		2			33000	18400	1/4	8	0	92		
22	4015	9.8	44	16	15	11/20	7.0	6.4		2			32500	18200	1/4	8	0	92		
23	4015	9.6	42	11	14	8/12	7.0	8.4		2			27000	15000	1/4	7	0	93		

BIT RECORD

COMPANY	CONTRACTOR	COUNTY	STATE
Husky Oil NPR Operations, Inc	Brinkerhoff Drilling Company	North Slope Borough	Alaska

LEASE	WELL NO	SEC	TOWNSHIP	RANGE	BLOCK	FIELD
National Petroleum Reserve	Tulageak T. W. No. 1	7	21N	14W		

TOOL PUSHER	DRILL PIPE — MAKE — SIZE — TYPE	DRAW WORKS	
DAY DRILLER	TOOL JOINT — MAKE — SIZE — TYPE	POWER — H.P.	UNDER SURF
EVENING DRILLER	DRILL COLLAR — NO — O.D. — I.D. — LENGTH	PUMP NO. 1 — MAKE — MODEL — STROKE	INT. DATE
MORNING DRILLER	DRILL COLLAR — NO — O.D. — I.D. — LENGTH	PUMP NO. 2 — MAKE — MODEL — STROKE	T.D. DATE

BIT NO	BIT SIZE	BIT MFGR	BIT TYPE	SERIAL NO OF BIT	JET SIZE 1	2	3	DEPTH OUT	FTGE	HOURS RUN	ACC HOURS	FT/HR	WEIGHT 1000 LBS	ROTARY R P M	VERT DEV	PUMP PRESS	PUMPS No.	Liner	SPM	MUD Wt	Vis	DULL CODE T	B	G	REMARKS FORMATION, CIRC FLUID, ETC	DATE
1	12¼	STC	SDS	AN0831	11	11	11	2083	1978	55	55	35.9	25000	160	3°	1500	1/2	5½	55	10.1	35	4	4	I		
2	12¼	STC	SDS	AL8773	11	11	11	2730	647	25.5	80.5	25.4	25000	140	3°	1500	"	5½	55	"	35	3	3	I	Pulled for logs.	
3	8½	STC	DSJ	MJ334	10	10	10	2940	210	12	92.5	17.5	20000	100	2½°	1300	"	5½	55	9.6	36	6	5	I		
CH1	8½	Chri	MC201	IW4236	-	-	-	2982	42	8.5	101	4.9	20000	60/65	-	1500	"	5½	55	9.9	47	G	D	O	D	Cored base of Pebble Sh & top of Kingak
4	8½	STC	SDGH	BH7447	10	10	11	3322	340	34	135	10.0	20/25	80/100	1½°	1650	"	5½	52/53	9.9	45	5	6	1/8	Shale & siltstone	
5	8½	Sec	M44NG	993199	10	10	11	3505	183	28.5	163.5	6.4	25000	90	2°	1650	"	5½	52/53	9.9	40	7	3	I	Shale & siltstone	
6	8½	Reed	S13C	921869	10	12	12	3644	139	28	191.5	5.0	25000	75	-	1600	"	5½	52/53	10.1	41	8	4	I	Kingak formation	
7	8½	HTC	J-22	JS-215	11	11	11	3783	139	24.75	215.75	5.7	22/25	50	1°	1625	"	5½	53/54	10.1	41	1	3	O		
CH1	8½	Chri	MC201	IW-4236	-	-	-	3816	33	3.75	219.5	8.8	15000	65	-	1600	"	5½	72/45	9.9	43	G	D	O	D	
RR7	8½	HTC	J-22	JS-215	11	11	11	4005	189	36.6	256	5.2	22/25	50	3/4°	1200	2	5½	90	9.8	46	2	7	I		
CH1	8½	Chri	MC201	JW-4236	-	-	-	4015	10	4	260	2.5	18/20	55/60	-	1700	1/2	5½	58/40	9.8	46	G	D	O	D	

SMITH REPRESENTATIVE _____ PHONE _____

Compliments of SMITH TOOL
P.O. BOX C19511 • IRVINE, CALIF. 92713
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 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.

Casing programmed for Tulageak Test Well No. 1 was as follows: 20" conductor at ±100'; 9-5/8" casing at ±2600'; and a 7" liner from 2600' to a total depth of 4050' if needed for evaluation of hydrocarbon bearing zones. Actual casing run was 20" conductor at 105' and 9-5/8" casing at 2720'. The 7" liner was not needed.

The upper 2000' of the 9-5/8" annulus was displaced with diesel when the well was abandoned. This was to allow re-entry into the upper well bore by U. S. Geological Survey personnel in the future to take temperature measurements.

CASING TALLY
SUMMARY SHEET

DATE: March 2, 1981

FIELD National Petroleum Reserve in AK LEASE & WELL NO. Tulageak Test Well No. 1 TALLY FOR 9 5/8 " CASING

SUMMARY OF PAGE MEASUREMENTS

	NO OF JOINTS	FEET	00'S
PAGE 1	50	2174	15
PAGE 2	13	543	84
PAGE 3			
PAGE 4			
PAGE 5			
PAGE 6			
PAGE 7			
PAGE 8			
PAGE 9			
TOTAL	63	2717	99

SUMMARY OF DEPTH CALCULATIONS

		NO OF JOINTS	FOOTAGE FEET	FOOTAGE 00'S
1	TOTAL CASING ON RACKS	70	3016	93
2	LESS CASING OUT OTS NOS	7	298	94
3	TOTAL (1 - 2)	63	2717	99
4	SHOE LENGTH		1	95
5	FLOAT LENGTH		1	77
6	MISCELLANEOUS EQUIPMENT LENGTH		-	-
7	TOTAL CASING AND EQUIPMENT FROM CEMENT HEAD (3 + 4 + 5 + 6)		2721	71
8	LESS WELL DEPTH (KB REFERENCE)		20	20
9	"UP" ON LANDING JOINT		1	71

Weight indicator before cementing: _____ ; 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
53.5	S-95	Buttress	U.S. Steel	New	JT NO 1 THRU NO 63	63		
					JT NO THRU NO			
					JT NO THRU NO			
					JT NO THRU NO			
					JT NO THRU NO			
					JT NO THRU NO			
					JT NO THRU NO			

PAGE 1 OF 2 CASING TALLY DATE March 1, 1981

FIELD NPRA LEASE & WELL NO. Tulageak Test Well No. 1 TALLY FOR 9 5/8 IN. CASING

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR
1	45	05			
2	41	32			
3	46	05			
4	42	56			
5	44	34			
6	42	46			
7	41	11			
8	41	46			
9	42	77			
0	39	85			
TOTAL A	422	97			

JOINT NO.	FIRST MEASUREMENT FEET	FIRST MEASUREMENT 00'S	CHECK MEASUREMENT FEET	CHECK MEASUREMENT 00'S	WT GR
1	46	53			
2	42	20			
3	45	29			
4	37	20			
5	46	40			
6	46	10			
7	40	90			
8	45	09			
9	47	10			
0	45	70			
TOTAL D	442	51			

1	41	30			
2	41	70			
3	41	95			
4	45	32			
5	33	15			
6	46	66			
7	42	74			
8	42	10			
9	46	93			
0	46	20			
TOTAL B	428	05			

1	42	45			
2	46	17			
3	46	55			
4	46	45			
5	41	43			
6	41	97			
7	41	55			
8	46	53			
9	44	52			
0	44	06			
TOTAL E	441	68			

1	46	42			
2	46	00			
3	45	05			
4	46	40			
5	42	18			
6	41	55			
7	41	76			
8	42	70			
9	45	13			
0	41	75			
TOTAL C	438	94			

TOTAL A	422	97		
TOTAL B	428	05		
TOTAL C	438	94		
TOTAL D	442	51		
TOTAL E	441	68		
TOTAL PAGE	2174	15		

PAGE 2 OF 2 **CASING TALLY** DATE: March 2, 1981

FIELD NPRA LEASE & WELL NO. Tulageak Test Well No. 1 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	40	87			
2	42	37			
3	45	65			
4	36	00			
5	36	80			
6	41	06			
7	46	83			
8	43	66			
9	42	05			
0	38	50			
TOTAL A	413	79			

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

1	42	60			
2	41	70			
3	45	75			
4					
5					
6					
7					
8					
9					
0					
TOTAL B	130	05			

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	413	79		
TOTAL B	130	05		
TOTAL C				
TOTAL D				
TOTAL E				
TOTAL PAGE	543	84		

CASING AND CEMENTING REPORT

WELL NAME Tulageak Test Well No. 1

LOCATION National Petroleum Reserve in Alaska

RAN CASING AS FOLLOWS:

63	Jts	9 5/8"	53.5#	S-95	Buttress	Range 3
	Jts					
	Jts					

Shoe @ 2720' Float @ 2632' DV @ -

Centralizers 2710', 2673', 2630', 2583', 2497', 2413', 2329', 167', 128', and 86'

FIRST STAGE

Sx of Cement 1500 Type Pmfst Additives None % Excess 80

Preflush 40 Barrels Water Initial Pressure 500

Displacement 19.5 bbls. Final Pressure 500

Plug Down 1:00 ~~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 _____

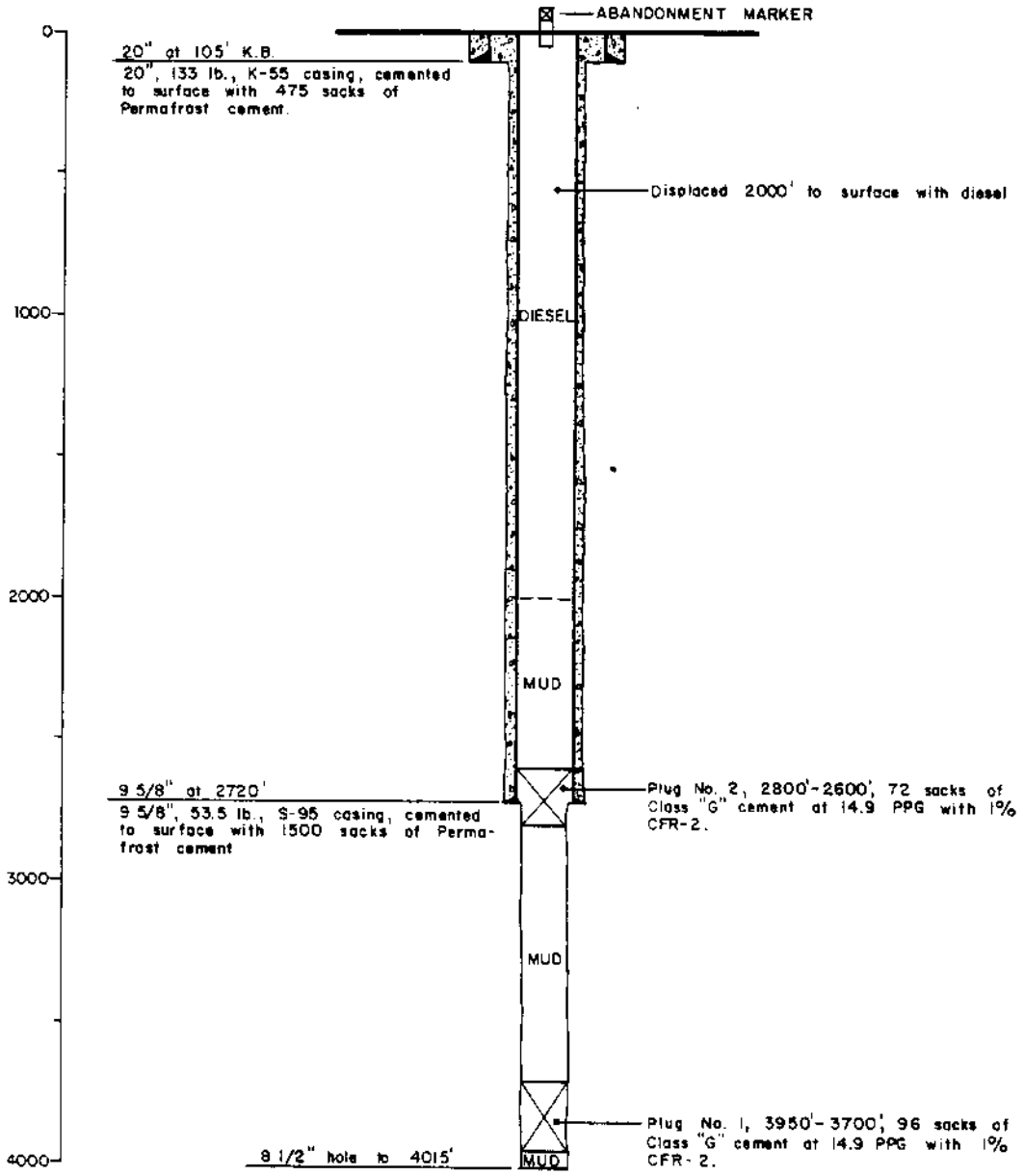
KB to Top of Cut Off Casing _____ Length of Landing Jt Removed _____

Weight Indicator Before Cementing _____ lbs.

Weight Indicator After Slacking Off _____ lbs.

Inches Slacked Off _____

Remarks:



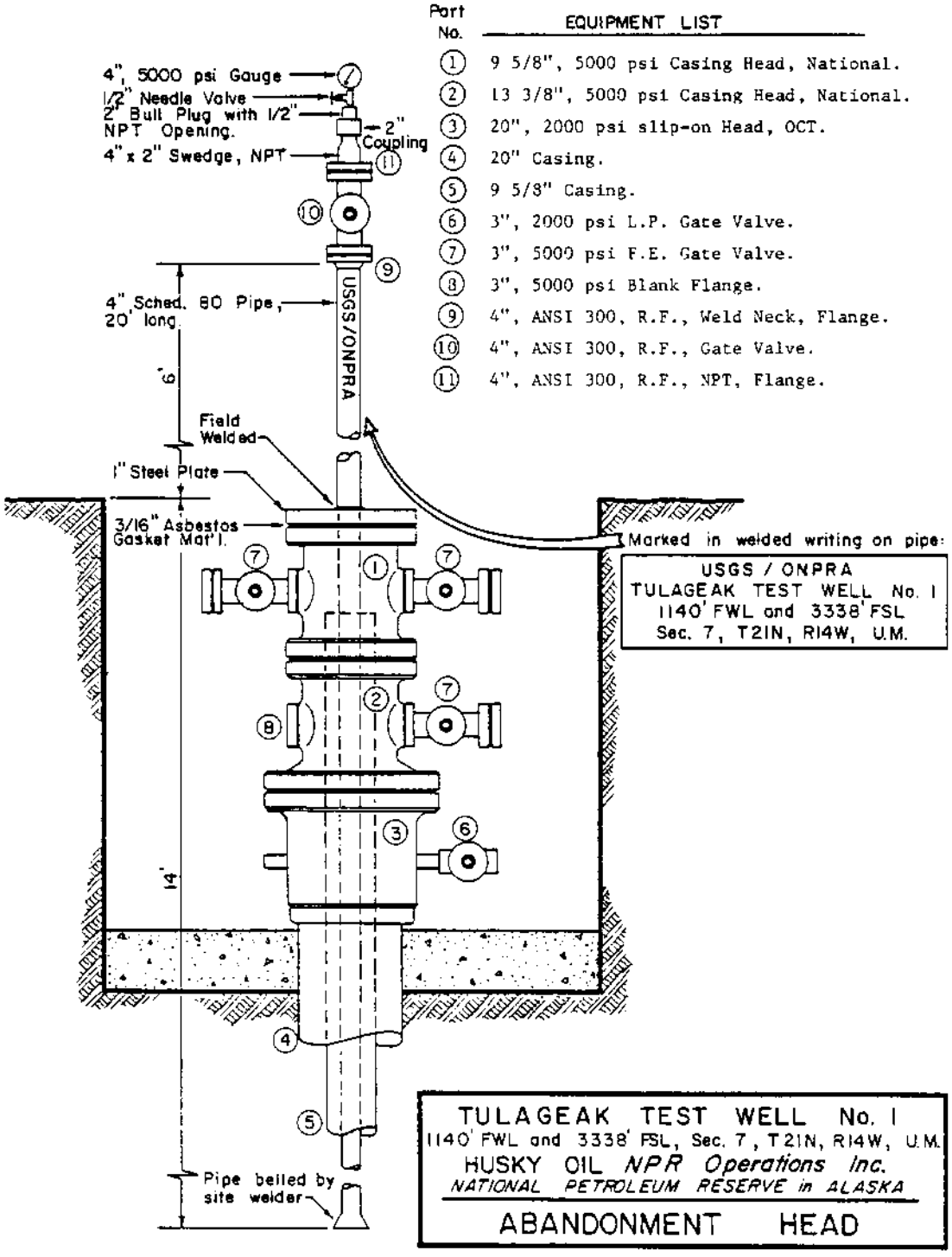
TULAGEAK TEST WELL No. 1

1140' FWL and 3338' FSL, Sec. 7, T21N, R14W, U.M.

HUSKY OIL *NPR Operations Inc.*

NATIONAL PETROLEUM RESERVE in ALASKA

WELLBORE SCHEMATIC


Part No.
EQUIPMENT LIST
1 9 5/8", 5000 psi Casing Head, National.
2 13 3/8", 5000 psi Casing Head, National.
3 20", 2000 psi slip-on Head, OCT.
4 20" Casing.
5 9 5/8" Casing.
6 3", 2000 psi L.P. Gate Valve.
7 3", 5000 psi F.E. Gate Valve.
8 3", 5000 psi Blank Flange.
9 4", ANSI 300, R.F., Weld Neck, Flange.
10 4", ANSI 300, R.F., Gate Valve.
11 4", ANSI 300, R.F., NPT, Flange.
4", 5000 psi Gauge
1/2" Needle Valve
2" Bull Plug with 1/2" NPT Opening.
4" x 2" Swedge, NPT
2" Coupling
4" Sched. 80 Pipe, 20' long.
USGS/ONPRA
6'
Field Welded
1" Steel Plate
3/16" Asbestos Gasket Mat'l.
14'
Pipe belled by site welder
Marked in welded writing on pipe:
USGS / ONPRA
TULAGEAK TEST WELL No. 1
1140' FWL and 3338' FSL
Sec. 7, T21N, R14W, U.M.
TULAGEAK TEST WELL No. 1
1140' FWL and 3338' FSL, Sec. 7, T21N, R14W, U.M.
HUSKY OIL NPR Operations Inc.
NATIONAL PETROLEUM RESERVE in ALASKA
ABANDONMENT HEAD

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 feet high with 9 foot wide front by spread cantilever. Gross nominal capacity 290,000 pounds 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' 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.

Tong

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-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 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 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 draw works 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 - 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 preventer, 10,000 pound Hydril, 4-1/2" XH.
One - inside preventer, 10,000 pound Hydril, 3-1/2" IF.

Choke Manifold

Three-inch, 3000 pound, 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 pound, Grade E, 4-1/2" XH joints; 5,000 feet, 3-1/2", 15.5 pound, Grade E, 3-1/2" IF joints.

Drill Collars

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