

NATIONAL PETROLEUM RESERVE IN ALASKA

HISTORY  
OF  
DRILLING OPERATIONS

U. S. NAVY  
SOUTH HARRISON BAY NO. 1

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

For the

U. S. GEOLOGICAL SURVEY  
Office of the National Petroleum Reserve in Alaska  
Department of the Interior  
JUNE 1983

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# SOUTH HARRISON BAY NO. 1

## INTRODUCTION

South Harrison Bay No. 1 is located in the National Petroleum Reserve in Alaska, formerly Naval Petroleum Reserve No. 4, North Slope, Alaska (Figure 1). The well is located 1,968 feet from the north line and 1,981 feet from the west line of protracted Section 6, Township 12 North, Range 2 East, Umiat Meridian (Latitude:  $70^{\circ}25'29.31''$  North; Longitude:  $151^{\circ}43'52.48''$  West). Alaska State Plane Coordinates are X = 287,561 and Y = 6,007,993, Zone 4. Elevations are: Kelly Bushing 45 feet; Ground 25 feet. Drilling related operations started with rig-up on November 10, 1976, and terminated on February 16, 1977.

The well was drilled to a total depth of 11,290 feet. The primary objectives of the well were the Sadlerochit and Lisburne Groups, with secondary interests in the Kuparuk Sandstone, Sag River Sandstone, and the basal sandstone in the Torok Formation. At the conclusion of the drilling and evaluation operations, the well was abandoned with cement plugs set at selected intervals.

Husky Oil NPR Operations, Inc. supervised and directed the drilling and support operations as prime contractor for the U.S. Navy. Parco, Inc. was the drilling contractor; Parco Rig 128, a TBA Helihost 2000, was used to drill the well.

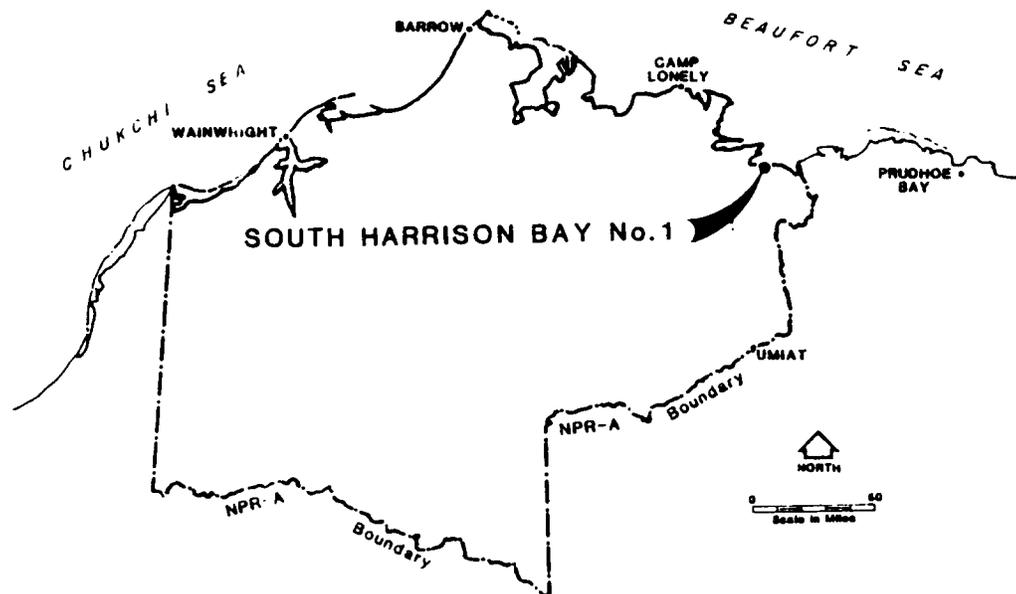


FIGURE 1 - WELL LOCATION MAP - SOUTH HARRISON BAY NO. 1

## DRILLING SUMMARY

The drilling pad at the South Harrison Bay No. 1 location was constructed during March of 1976. This early construction allowed for stabilization to occur during the summer of 1976. Field operations began on October 18, 1976, with the mobilization of construction crews to the South Harrison Bay location to prepare the pad. An Otter strip was prepared at the location and readied for service. An ice airstrip was constructed to accommodate C-130 Hercules aircraft.

Rig move-in operations began on October 28, 1976. The rig, Parco 128, was stacked at the East Teshekpuk No. 1 location, which was drilled during the previous winter. The rig move was conducted using Catco Rolligons over a winter trail between the two locations. The rig move from East Teshekpuk to South Harrison Bay was completed in 19 days, with 129 total loads hauled. Rig-up operations began on November 10, 1976. Rig-up was completed in 12 days, and the well spudded at 3:00 p.m., November 21, 1976.

Weather conditions during the rig move and rig-up were generally good. However, warm temperatures (+10° to +15°F), accompanied by winds of 25-30 knots for approximately four days, resulted in loss of the Otter strip and greatly hampered air transportation to and from the location.

During rig-up, 20" conductor had been set at 83' and cemented to surface with Permafrost cement. A 20" annular blowout preventer and diverter lines were installed on the 20" conductor. A 17-1/2" hole was drilled from 83' to 2640' (driller's depth). The 17-1/2" hole was logged from 2638' (logger's total depth) to the bottom of the 20" conductor with the BHC-Sonic/GR log and the DIL/SP. After logging, 2600' of 13-3/8" surface casing was run and cemented back to surface with 4,300 sacks of Permafrost cement.

A 13-5/8" 5,000 psi blowout-preventer stack (SRRA arrangement) was installed on the 13-5/8" split unihead wellhead. A 5,000 psi choke manifold and kill line was also installed. The 13-3/8" casing was tested to 2,500 psi and drilled out with a 12-1/4" bit. The formation below the shoe was tested to a 0.67 psi/ft. gradient.

A 12-1/4" hole was drilled from 2640' to 7022'. Core No. 1 was cut from 7022' to 7052' (30') and 13.6' were recovered. Drilling was continued to 7207'. Drill-Stem Test No. 1 (7119-7207') was run with packers set at 7108'-7117', with no fluid recovery. Drilling was resumed to 8400'. The 12-1/4" hole was logged from 8380' (logger's total depth) to 2600' with the DIL/SP, BHC-Sonic/GR, FDC/CNL/GR/CAL, and HDT-Dipmeter. Thirty sidewall cores were attempted from selected intervals; 22 were recovered.

Intermediate 9-5/8" casing was run and landed at 8370'. Two FO cementing collars were run in the string and landed at 2392' and 2199' for use if Arctic Pack procedures became necessary. The casing was cemented with 1,600 sacks of Class "G" cement containing friction reducer and retarder. Pressure rise during cementing indicated a ±3000' column rise behind the 9-5/8" casing.

Blowout-preventer equipment was tested, and the casing tested to 3,000 psi. The shoe was drilled out with an 8-1/2" bit to 8410'. The formation below the shoe was tested to a 0.61 psi/ft. gradient.

Drilling resumed with tight hole and lost-circulation problems. The hole was drilled to 9514' with tight spots from 8400' to 8700' and 30-90' of fill on trips. Drilling continued to 9682' when lost circulation was encountered, totaling 125 barrels of mud lost. Drilling continued to 10,154' with minor lost circulation. At 10,154' lost circulation occurred, with a loss of 350 barrels of mud. While testing blowout preventer and changing out the drilling line at 10,222', 200 barrels of mud were lost to the hole. Drilling continued with a 150-barrel mud loss while drilling at 10,322'. Drilling continued to 10,613' and Core No. 2 was cut from 10,613-10,628' (15'), recovering 13.8'. Tight hole was encountered between 9850' and 9800' on trip out with core. Drilling was resumed and an 8-1/2" hole drilled to 10,783', where lost circulation totaled 630 barrels. While drilling to 11,046', another 500 barrels of mud were lost. Drilling continued from 11,046-11,290' with no further loss of mud and minor fill on trips.

The 8-1/2" hole was logged from 11,274' (logger's total depth) with DIL/SP, BHC-Sonic/GR log, FDC/CNL/CAL/GR, HDT-Dipmeter. A CBL/VDL/CCL/GR log was run across zones of interest behind 9-5/8" casing. Twenty-four sidewall cores were attempted and five were recovered. A velocity survey was also recorded. All logs were recorded on magnetic tape, and computer-log interpretation presentations were prepared using Schlumberger's synergetic log systems. A single-shot deviation survey was run while drilling. The hole was, for all practical purposes, "straight". In the 17-1/2" hole, the maximum deviation at 2640' was 2-1/2°. In the 12-1/4" hole, the maximum deviation at 7026' was 2-1/2°. In the 8-1/2" hole the maximum deviation at 9514', 11,193' and 11,190' was 2°.

At the conclusion of the log evaluation, it was decided to plug back and test the zones 7120' to 7190' and 5680' to 5790'. Cement plugs were placed at selected intervals in the 8-1/2" hole. Plug No. 1 was set from 10,283' to 10,083' with 90 sacks of Class "G" retarded cement. Plug No. 2 was set from 9306' to 9106' with 75 sacks of Class "G" retarded cement. Plug No. 3 was set from 8991' to 8791' with 100 sacks Class "G" retarded cement. Plug No. 4 was set from 8424'-8324' with 70 sacks of Class "G" Neat cement. A Halliburton EZ drill retainer was set in the 9-5/8" casing at 8238'.

The interval 7290' to 7120' was perforated with Schlumberger's Hyperjet II casing guns at two jet shots per foot, one shot per foot 7155-7140', for Drill-Stem Test No. 2. The test was conducted with the packer at 7080' in the 9-5/8" casing and 1000' of water cushion. It is summarized as follows:

Initial flow 15 minutes, initial shut-in 30 minutes, final flow 120 minutes, final shut-in 123 minutes; no blow, gradually increasing to very weak blow in final flow period; fluid recovery too small to measure, water cushion and rat-hole mud; pressures recorded at 7051' were IHP 3,950 psi, IFP 546 psi, ISIP 647 psi, FFP 549 psi, FSIP 3,173 psi, FHP 3,936 psi.

At the end of the test, the perforations were squeezed through a retainer at 6315' (failed to set at 7035') with 65 sacks of Class "G" Neat cement. Ten sacks of cement were spotted on top of the retainer and the plug tested to 2,500 psi.

The interval 5680' to 5790' was perforated with 4 shots per foot for Drill-Stem Test No. 3. The packer was set at 5628' and the test conducted as follows with 1000' of water cushion:

Initial flow 15 minutes, initial shut-in 32 minutes, final flow 120 minutes, final shut-in 135 minutes; very weak blow increasing slightly at the ends of both flow periods; pressure recorded at 5741' were IHP 3,279 psi, IFP 550 psi, ISIP 1,953 psi, FFP 637 psi, FSIP 2,312 psi, FHP 3,279 psi. Recovery was too small to measure with 0.2 cubic feet of gas, trace dead oil and 2,400 cc mud in sample chambers.

At the conclusion of the test, a decision was made to plug and abandon the well. An EZ drill retainer was set at 5590' and 65 sacks of Class "G" Neat cement were squeezed into the perforations at 5680' to 5790'. Ten sacks of cement were spotted on top of the retainer. The 9-5/8" casing was cut at 2412' and retrieved. Both 9-5/8" FO cementers were also salvaged. A 75-sack Class "G" cement plug was placed across the interval 2392-2289'. At 2173' the drilling mud was reversed out with water and the water with diesel, allowing the well to be used in the USGS North Slope geothermal-measurement program.

The abandonment well marker was installed, and the rotary rig released at 12:01 a.m., February 8, 1977. The rig was rigged down and demobilized to Deadhorse. The drilling pad was cleaned and prepared as a staging and storage pad for Parco Rig 95.

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

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1. TYPE OF WORK  
 a. TYPE OF WELL: DRILL  DEEPEN  PLUG BACK   
 b. TYPE OF WELL: OIL WELL  GAS WELL  OTHER  SINGLE ZONE  MULTIPLE ZONE

2. NAME OF OPERATOR: Husky Oil NPR Operations, Inc.

3. ADDRESS OF OPERATOR: 3201 C Street, Suite 600, Anchorage, AK 99503

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)\*  
 At surface: x = 6,008,066.01 y = 287,382.03 Sec 6, T 12N, R2E  
 At proposed prod. zone: Same

5. LEASE DESIGNATION AND SERIAL NO.: None

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: None

7. UNIT ACQUISITION NAME: Naval Petroleum Reserve #4

8. FARM OR LEASE NAME: None

9. WELL NO.: So. Harrison Bay #1

10. FIELD AND POOL OR WILDCAT: Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 6, T12N, R2E, UPM

12. COUNTY OR PARISH: 13. STATE: No. Slope Alaska

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE\*: 130 miles southeast of Barrow

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drilg. unit line, if any)	81840'	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.	N/A	19. PROPOSED DEPTH	12,850'	20. ROTARY OR CABLE TOOLS	Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.): GL - 25 (est) KB - 45 (est)

22. APPROX. DATE WORK WILL START\*: December 1, 1976

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
26"	20"	94 (k-55)	80'	To surface w/Permafrost
17½"	13 3/8"	72 (ss-95)	2600'	To surface w/Permafrost
12½"	9 5/8"	53.5 (ss-95)	8800'	250 sacks w/"G"
8½"	7"	38 (N-80)	Liner	625 sacks w/"G"

This form is being filed for information purposes only. Please refer to letter from Director, Naval Petroleum & Oil Shale Reserves, Serial #594, 27 August 1968.

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 \_\_\_\_\_ TITLE Drilling Manager DATE October 19, 1976  
 (This space for Federal or State office use)

PERMIT NO. \_\_\_\_\_ APPROVAL DATE \_\_\_\_\_  
 Accepted for the (Orig. Sgd) RODNEY A. SMITH OIL AND GAS SUPERVISOR DATE OCT 29 1976  
 APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_  
 CONDITIONS OF APPROVAL, IF ANY: \_\_\_\_\_

STATE OF ALASKA

OIL AND GAS CONSERVATION COMMITTEE

PERMIT TO DRILL OR DEEPEN

1a. TYPE OF WORK <b>DRILL</b> <input checked="" type="checkbox"/> <b>DEEPEN</b> <input type="checkbox"/>			5.		
b. TYPE OF WELL OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/> SINGLE ZONE <input type="checkbox"/> MULTIPLE ZONE <input type="checkbox"/>			6. LEASE DESIGNATION AND SERIAL NO. None		
c. NAME OF OPERATOR Husky Oil NPR Operations, Inc.			7. IF INDIAN ALLOTTEE OR TRIBE NAME None		
d. ADDRESS OF OPERATOR 3201 C Street, Suite 600, Anchorage, AK 99503			8. UNIT FARM OR LEASE NAME Naval Petroleum Reserve #4		
e. LOCATION OF WELL At surface x = 6,008,066.01    y = 287,382.03    Sec 6, T12N, R2E A* proposed prod. zone Same			9. WELL NO. So. Harrison Bay #1		
13. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE* 130 miles southeast of Barrow			10. FIELD AND POOL OR WILDCAT Wildcat		
14. BOND INFORMATION			11. SECTION NUMBER-BOTTOM HOLE OBJECTIVE Sec 6, T12N, R2E, UPM		
15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE FT. At 0 to nearest drill unit if any: 81840'			12. NORTH SLOPE BURROUGH		
16. NO OF ACRES IN LEASE 23,680.000		17. NO. ACRES ASSIGNED TO THIS WELL			
18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL DRILLING COMPLETED OR APPLIED FOR FT. N/A		19. PROPOSED DEPTH 12,850'			
20. ROTARY OR CABLE TOOLS Rotary		21. APPROX. DATE WORK WILL START* December 1, 1976			
22. ELEVATIONS - Show whether DF, RT, CR, etc. GL - 25 (est), KB - 45 (est)					
23. PROPOSED CASING AND CEMENTING PROGRAM					
SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	GRADE	SETTING DEPTH	Quantity of cement
26"	20	94#	k-55	± 80'	To surface w/Permafrost
17½"	13 3/8"	72#	ss-95	± 2600'	To surface w/Permafrost
12½"	9 5/8"	53.5#	ss-95	± 8800'	250 sacks w/"G"
8½"	7"	38#	p-110	Liner	625 sacks w/"G"

This form is being filed for information purposes only. Please refer to letter from Director, Naval Petroleum & Oil Shale Reserves, Serial # 394, 27 August 1968.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM. If proposal is to deepen, 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.

24. I hereby certify that the foregoing is True and Correct

SIGNED \_\_\_\_\_ DATE \_\_\_\_\_ TITLE Drilling Manager

CONDITIONS OF APPROVAL, IF ANY		
SAMPLES AND CORE CHIPS REQUIRED <input type="checkbox"/> YES <input type="checkbox"/> NO	MID LOG <input type="checkbox"/> YES <input type="checkbox"/> NO	OTHER REQUIREMENTS
DIRECTIONAL SURVEY REQUIRED <input type="checkbox"/> YES <input type="checkbox"/> NO		A.P.I. NUMERICAL CODE

PERMIT NO. \_\_\_\_\_ APPROVAL DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_

\*See Instructions On Reverse Side

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE\*

(See other instructions on reverse side)

Form approved,  
Budget Bureau No. 42-R355.9.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG \*

1a. TYPE OF WELL: Oil WELL  GAS WELL  DRY  Other \_\_\_\_\_

b. TYPE OF COMPLETION: NEW WELL  WORK OVER  DEEP-EN  PLUG BACK  DIFF. CENVR.  Other Abandonment

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

3. ADDRESS OF OPERATOR  
3201 C Street, Anchorage, Ak. 99503

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)\*  
At surface x = 6,008,066.01 y = 287,382.03  
At top prod. interval reported below  
At total depth

5. LEASE DESIGNATION AND SERIAL NO.  
50-103-20007

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

7. UNIT AGREEMENT NAME  
N/A

8. FARM OR LEASE NAME  
Naval Pet. Reserve No.

9. WELL NO.  
South Harrison Bay No.

10. FIELD AND POOL, OR WILDCAT  
Wildcat

11. SEC. T. R. M., OR BLOCK AND SURVEY OR AREA  
Sec 6, T12N, R2E

14. PERMIT NO. DATE ISSUED  
N/A

12. COUNTY OR PARISH North Slope 13. STATE Alaska

15. DATE SPLODED 16. DATE T.D. REACHED 17. DATE COMPL. (Ready to prod.) 18. ELEVATIONS (DF, RB, BT, GR, ETC)\* 19. ELEV. CASING HEAD  
11/21/76 1/28/77 Abnd 2/8/77 25' GL(est), 45' KB(est) 25'(est)

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  
11,290MD 2289' N/A 0-11,290 None

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

25. WAS DIRECTIONAL SURVEY MADE  
No

26. TYPE ELECTRIC AND OTHER LOGS RUN  
DIL, BHC-Sonic, FDC/CNL/GR, HRD, CBL/VDL/GR, Velocity Survey

27. WAS WELL COBED  
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#	83'	26"	200 sx Permafrost II	None
13 3/8"	72	2600'	17 1/2"	4300 sx Permafrost II	None
9 5/8"	53.5#	8370'	12 1/2"	1600 sx Class "G"	2412'

29. LINER RECORD 30. TUBING RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)	SIZE	DEPTH SET (MD)	PACER SET (MD)

31. PERFORATION RECORD (Interval, size and number)

7155'-7290'	4" HyperJet II 2JSPF
7140'-55'	4" HyperJet II 1JSPF
7120'-40'	4" HyperJet II 2JSPF
5680'-5790'	4" HyperJet II 2JSPF

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

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
7290 - 7120	Retainer 75 sx Class "G"
5790 - 5680	Retainer 75 sx Class "G"

33. PRODUCTION

DATE FIRST PRODUCTION N/A PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump) N/A WELL STATUS (Producing or shut in) P and A

DATE OF TEST	HOURS TESTED	CHOKER SIZE	DR-DN FOR TEST PERIOD	OIL—BBL	GAS—MCF	WATER—BBL	GAS—L/RATE

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  
Plugging Details; DST Details

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

SIGNED \_\_\_\_\_ TITLE Drilling Manager DATE \_\_\_\_\_

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

REVISED JUNE 24, 1983

PLUGGING DETAILS  
SOUTH HARRISON BAY NO. 1

Plug No. 1

10,283' - 10,083'  
90 sx Class "G" 2/1/77

Plug No. 2

9306' - 9106'  
75 sx Class "G" 2/1/77

Plug No. 3

8991' - 8791'  
100 sx Class "G" 2/1/77

Plug No. 4

8424' - 8324'  
70 sx Class "G" 2/1/77

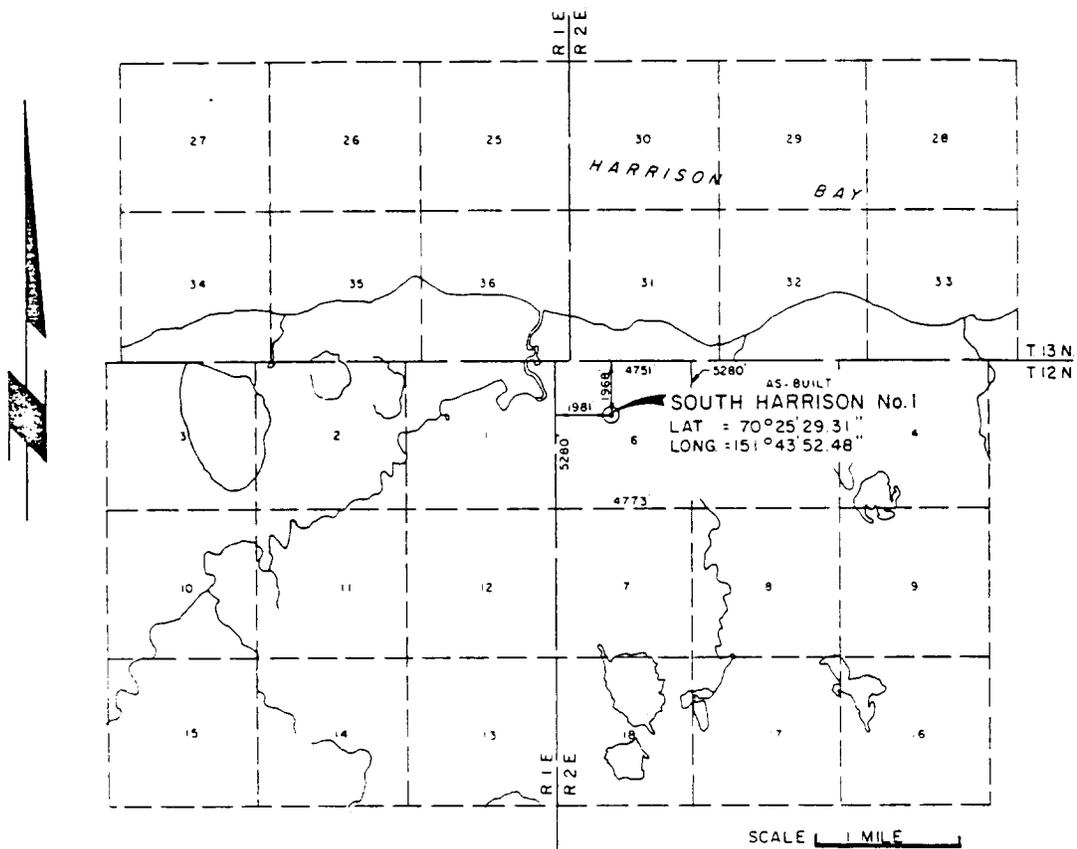
Cement retainer set @8238'

Cement retainer set @6315' squeezed with 75 sx Class "G" 2/3/77

Cement retainer set @5590', squeezed with 75 sx Class "G" 2/4/77

Plug No. 5

2392' - 2289'  
75 sx Class "G" 2/7/77



**CERTIFICATE OF SURVEYOR**

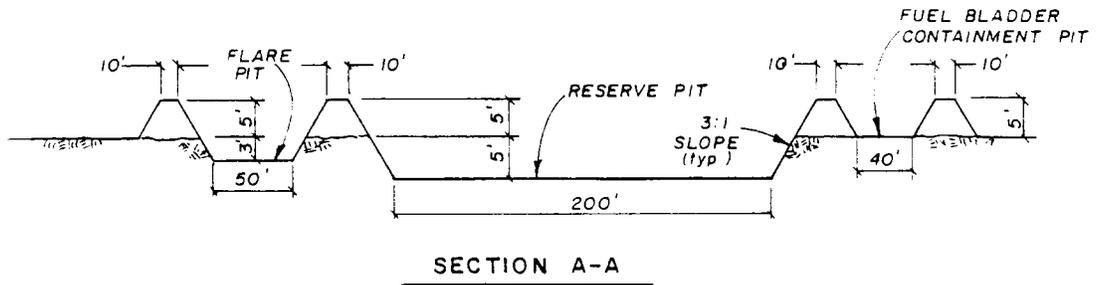
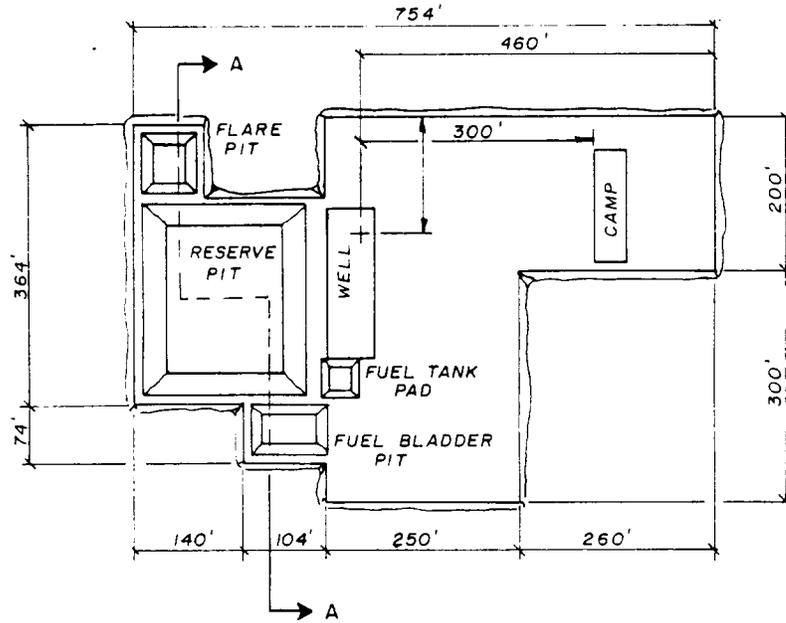
I hereby certify that I am properly registered and licensed to practice land surveying in the State of Alaska and that this plat represents a location survey made by me or under my supervision, and that all dimensions and other details are correct.



10-18-76      Andrew P. Potts  
 Date                      SURVEYOR

AS-BUILT <b>SOUTH HARRISON No. 1</b> Located in <small>NW 1/4 PROTRACTED SEC. 6, T. 12 N., R. 2 E., UMIAT MERIDIAN, AK</small> Surveyed for <b>HUSKY OIL</b> <small>NPR OPERATIONS INC</small>
Surveyed by <b>F. M. LINDSEY &amp; ASSOC.</b> <small>LAND &amp; HYDROGRAPHIC SURVEYORS          2502 West Northern Lights Boulevard Box 4-081          Anchorage Alaska</small>

SOUTH HARRISON BAY DRILLSITE



DRILL PAD DRAWING

## OPERATIONS HISTORY

DATE AND  
FOOTAGE  
DRILLED AS  
OF 6:00 A.M.

### ACTIVITY

11/10/76 Started rig-up operations. Rigged up subbase, draw works, four draw-works engines, three mud pumps, and four mud tanks. Ten percent rigged up.

11/11/76 Radio out. No communication with rig personnel.

11/12/76 Continued rigging up. Rigged up suitcases, water tanks, shedding, and console lines. Otter strip generator out; working to repair. Twenty percent rigged up.

11/13/76 Continued rigging up shedding. Put derrick together, worked on suitcases and heat lines. Twenty five percent rigged up.

11/14/76 Completed move out of East Teshekpuk. Worked on derrick and suitcases. Thirty percent rigged up.

11/15/76 Strung up blocks. Rigged up fuel lines. Starting casing, mud, and fuel haul from Lonely. Forty percent rigged up.

11/16/76 Raised derrick. Hauled casing, mud, and fuel from Lonely. Preparing to fire boilers. Herc strip should be completed tonight. Sixty percent rigged up.

11/17/76 Continued rigging up. Completed winterizing. Set Halliburton bulk tanks. Set dog house. Cleaned location. Seventy percent rigged up.

11/18/76 Rigged up floor shed and canvas. Stacked floor. Rigged up steam, water, fuel, and electric lines. Rigged up Halliburton. Set fuel tanks. Cleaned location. Prepared to cement 20" conductor. Eighty percent rigged up.

11/19/76 Rigged up miscellaneous lines, steam heaters, and light wire. Welded on 20", 2,000 psi starter head and tested to 750 psi. Cemented 20" conductor pipe with 200 sacks Permafrost cement. Cement in place at 10:30 a.m. Built dikes around fuel tanks and installed liner. Hauled water to mud tanks. Nippled up 20" preventers. Received 1,920 sacks (four loads) of Permafrost II cement.

11/20/76 Riggged up on 20" casing and laid diverter lines to burn pit and reserve pit. Rebuilt drilling nipple. Mixed spud mud. Cleaned location.

11/21/76 Built diverter line to flare pit. Mixed spud mud. Hooked up choke manifold. Picked up 20" test plug and tested 20" blowout preventer to 1,000 psi. OK. Laid down plug. Riggged up drilling nipple and fill line. Picked up drilling assembly.

Well spudded at 3:00 p.m., November 21, 1976.

11/22/76 TD: 1110'; MW: 9.4; Vis: 62. Completed rigging up diverter line. Drilled to 515'; surveyed; continued drilling. Surveyed at 1068'.  
1027'

11/23/76 TD: 1810'; MW: 9.4; Vis: 37. Drilled to 1386'.  
700' Dropped survey and tripped out. Changed bit and tripped in. Flow line plugged. Unplugged same. Drilled to 1600'. Repacked swivel.

11/24/76 TD: 2640'; MW: 9.5; Vis: 42. Drilled to 2002' and  
830' surveyed. Drilled to 2218' and surveyed. Drilled to 2504'. Tripped for plugged bit. Reran bit. Worked balled bit and cleaned same. Drilled to 2640'. Circulated for logs.

11/25/76 TD: 2640'; MW: 9.4; Vis: 44. Circulated. Spotted  
0' 40 barrels gelled pill on bottom before logging. Riggged up Schlumberger and logged BHC-Sonic. Stopped at 482'. Pulled tool and removed centralizer springs. Ran BHC-Sonic/GR/Caliper 2638' to 87'. Ran DIL/SP from 2639' to 87'. Tripped in and circulated at 2640'. Conditioned hole for casing and tripped out.

11/26/76 TD: 2640'; MW: 9.5; Vis: 44. Ran 67 joints  
0' 13-3/8", 72#, S-95 Buttress casing to 2600'. Used 10 centralizers as per program. Ran duplex stinger on 4-1/2" drill pipe to duplex collar at 2557'. Circulated. Cemented with 4,300 sacks Permafrost II at 14.6 ppg. Circulated 800 sacks at 14.4 ppg returns. Cement in place at 1:00 a.m. Full returns. Pulled two stands and washed out Hydril. Tripped out.

11/27/76 TD: 2640'; MW: 8.5; Vis: 35.. Cleaned cellar and  
0' mud tanks. Set casing slips with 40,000 pounds, cut off landing joint and set back Hydril. Installed OCT unihead and tested pack-off to 2,000 psi. OK. Mixed mud and nipped up 13-5/8", 5,000 psi blowout preventers.

11/28/76  
0' TD: 2640'; MW: 8.5; Vis: 32. Installed blowout-preventer stack. Hooked up choke manifold. Reset rotary table.

11/29/76  
0' TD: 2640'; MW: 8.5; Vis: 37. Ran test plug. Tested pipe rams to 5,000 psi for 15 minutes. OK. Tested choke manifold to 5,000 psi for 15 minutes. OK. Tested Hydril to 2,500 psi for 15 minutes. OK. Installed wear bushing.

11/30/76  
604' TD: 3244'; MW: 8.9; Vis: 35. Picked up bottom-hole assembly. Strapped in. Tagged float at 2557'. Tested casing to 2,500 pounds for 15 minutes. OK. Very hard cement to shoe at 2602'. Drilled to 2650'. Formation broke at 600 psi. Pumped in at 400 psi (0.67 gradient). Drilled ahead to 3244'.

12/1/76  
986' TD: 4230'; MW: 9.6; Vis: 38. Drilling ahead.

12/2/76  
520' TD: 4750'; MW: 9.4; Vis: 37. Drilled to 4568'. Tripped. Laid down 27 joints of drill pipe in derrick. Changed bottom-hole assembly. Tripped in. Thawed swivel and kelly. Drilling ahead.

12/3/76  
585' TD: 5335'; MW: 9.9; Vis: 36. Drilling and surveying.

12/4/76  
277' TD: 5621'; MW: 10; Vis: 36. Drilling ahead to 5418'. Pulled out of hole. Laid down monel and junk sub. Cut drilling line. Drilling ahead.

12/5/76  
240' TD: 5861'; MW: 10; Vis: 35. Drilled ahead to 5861'. Tripped. Magnafluxed bottom-hole assembly. Laid down bit sub, one 8" drill collar, and one 6-3/4" drill collar. Steel-line measured.

12/6/76  
160' TD: 6021'; MW: 10.1; Vis: 35. Magnafluxed bottom-hole assembly, inside blowout preventers, kelly cock, and kelly. Laid down kelly. Steel-line measured to 2500' and circulated. Waited on kelly. Picked up and magnafluxed new kelly. Steel-line measured to total depth and drilled to 6021'. Jet on bit plugged.

12/7/76  
370' TD: 6391'; MW: 10.4; Vis: 37. Drilling with plugged jet in bit. Dragging on connections 60,000-80,000 pounds over string weight. Increased pump pressure and blew out plug. String drag reduced to normal. Drilled to 6391'. Dropped survey. Tripped out.

12/8/76  
219' TD: 6610'; MW: 10.4; Vis: 35. Tripped with new bit. Had 31' correction on steel-line measure (31' deep). Drilled from 6391' to 6610'.

12/9/76  
136' TD: 6746'; MW: 10.5; Vis: 34. Drilled from 6610' to 6685'. Worked on mud pump. Drilled from 6685' to 6746'. Dropped survey and tripped out. Tested blowout preventer (rams and choke to 3,800 psi. OK. Hydril to 2,200 psi. OK.). Blowout-preventer test pump would not go to 5,000 psi. Changing pump. Changed bit and tripped in. On bottom at 6:00 a.m.

12/10/76  
28' TD: 6014'; MW: 10.6; Vis: 34. Drilled from 6746' to 6790'. Repacked swivel. Drilled from 6790' to 7014'.

12/11/76  
28' TD: 7042'; MW: 10.5; Vis: 33. Drilled from 7014' to 7026'. Circulated and cleaned hole for Core No. 1. Dropped survey. Pulled out of hole. Picked up core barrel. Cut drilling line. Ran in hole. Circulated. Dropped ball. Cut Core No. 1 at 7022' (difference of 4' stretch).

12/12/76  
137' TD: 7179'; MW: 10.5; Vis: 33. Cut Core No. 1 to 7052'. Pulled out of hole. Laid down core barrel. Picked up shock sub and new bit. Ran in hole. Reamed 7022-7052'. Drilled 7052-7179'. Drilling ahead.

12/13/76  
28' TD: 7207'; MW: 10.5; Vis: 42. Drilled to 7200'. Circulated samples at 7200'. Drilled to 7207'. Repacked swivel. Circulated and conditioned hole for Drill-Stem Test No. 1. Made wiper trip. Circulated and conditioned hole. Picked up test tools. Ran in hole with 6000' water cushion. Set packers at 7108' and 7117'. Prepared to open tool.

12/14/76  
37' TD: 7244'; MW: 10.6; Vis: 35. Tested 7119-7207' (DST No. 1); IF-10 minutes; ISI-30 minutes; FF-60 minutes; FSI-60 minutes. Tool opened very weak; blow died in five minutes. IHP-4,025 psi; ISIP-2,795 psi; IFP-2,620 psi; FFP-2,620 psi; FSIP-2,825 psi; FHP-3,966 psi. Temperature: 170°F. No recovery. Reversed out. Pulled out of hole. Laid down test tools. Picked up bottom-hole assembly. Drilling ahead.

12/15/76  
106' TD: 7350'; MW: 10.5; Vis: 35. Short trip at 7322'. OK.

12/16/76  
110' TD: 7460'; MW: 10.5; Vis: 35. Drilled to 7362'. Tripped for bit. Drilling ahead.

12/17/76  
148' TD: 7608'; MW: 10.5; Vis: 40. Repacked swivel. Drilling.

12/18/76  
123' TD: 7731'; MW: 10.5; Vis: 40. Pulled out of hole at 7610' for new bit. Reamed 60' to bottom. Drilling ahead.

12/19/76  
49' TD: 7780'; MW: 10.5; Vis: 39. Repacked and replaced swivel. Repaired main drive chain. Circulated at 2550'. Waiting on swivel.

12/20/76  
174' TD: 7950'; MW: 10.5; Vis: 40. Drilling ahead.

12/21/76  
111' TD: 8065'; MW: 10.5; Vis: 41. Drilled to 7999' and tripped out. Tested blowout preventers. Tested rams (pipe and blind) to 5,000 psi and Hydril to 2,500 psi. OK. Tripped in and washed 38' to bottom. (One pump down just prior to trip. Fill due to reduced circulation rate.)

12/22/76  
162' TD: 8227'; MW: 10.6; Vis: 46. No. 2 pump down with broken rod.

12/23/76  
157' TD: 8384'; MW: 10.7; Vis: 52. Steel-line measured out with Bit No. 14. Made three-foot correction. No. 2 pump still down.

12/24/76  
16' TD: 8400'; MW: 10.7; Vis: 45. Drilled 16'. Conditioned hole for logging. Ran DIL 8380' to 2600'; BHC-Sonic/GR 8378' to 2600'. Going in hole with FDC/CNL.

12/25/76  
0' TD: 8400'; MW: 10.7; Vis: 41. Completed FDC/CNL/GR. Ran HRD. Reran FDC-CNL/GR from 4000' to 2600'. Ran 30-shot sidewall core gun. Shot 30 sidewall cores; recovered 22. Tripped in to condition hole. Broke circulation at 5000' going in.

12/26/76  
0' TD: 8400'; MW: 10.7; Vis: 60. Camp generator down 10:30 p.m. to 12:30 a.m. Changed turbo charger on Cat 3306 generator engine. Worked on road to airstrip with Cat. Rigged up to run 9-5/8" casing.

12/27/76  
0' TD: 8400'; MW: 10.2; Vis: 40. Rigged up to run 9-5/8" casing. Lost returns. Attempted to establish circulation while working pipe. Could circulate while picking up but would lose returns while slacking off. Continued running casing.

12/28/76  
0' TD: 8400'. Pits empty; cleaning tanks. Completed running 9-5/8" casing. Ran 212 joints 9-5/8", 53.5#, S-95 Buttress casing. Landed at 8369.7' KB. FC at 8287' KB, FO at 2391.93', FO at 2199.46' KB. Cemented with 1,000 sacks Class "G" with 1% CFR-2 + 0.2% HR-7. Displaced with 596 barrels. Did not bump plug. Final pump pressure: 1,300 psi. Bled back 3-1/2 barrels. Floats holding OK. Cement in place at 3:30 p.m., December 27. No returns during cementing. Pressure rise during cementing indicated ±3000' cement column rise behind pipe. Cement job OK. Backed out landing joint. Installed 9-5/8" packoff. Tested to 5,000 psi. OK. Installed wear bushing. Changed rams. Cleaned mud tanks. Laid down bottom-hole assembly.

12/29/76  
0' TD: 8400'; MW: 10.0; Vis: 40. Cleaned mud tanks; changed and tested pipe rams to 5,000 psi. OK. Tested Hydril to 2,500 psi. OK. Picked up bottom-hole assembly and steel-line measured in hole. Tagged cement at 8255'. Set 30,000-pound weight on plug. Plug is firm. Mixed mud and circulated and conditioned mud in hole.

12/30/76  
111' TD: 8511'; MW: 10.6; Vis: 43. Circulated and conditioned mud. Tested casing to 3,000 psi. OK. Drilled hard cement from 8255' to float collar at 8287'. Drilled hard cement to float shoe at 8370'. Cleaned out and drilled to 8410'. Tested formation to 0.61 psi/ft. equivalent grade with 500 psi surface pressure.

Corrected cement volume: 1,000 sacks reported on 12/28/76 should have been 1,600 sacks.

12/31/76  
164' TD: 8675'; MW: 10.6; Vis: 43. Washed and reamed 100' of fill after trip at 8627'. Cut drilling line and rubber drill pipe while going in hole.

1/1/77  
245' TD: 8920'; MW: 10.6; Vis: 45. Drilling ahead. Occasional fill on connections.

1/2/77  
120' TD: 9040'; MW: 10.8; Vis: 42. Drilled to 8962'. Tripped for new bit. Ran in hole. Washed and reamed 95' to bottom; 1,600-unit trip gas. Cut from 10.6 to 10.1. Increased weight to 10.8. Drilling ahead.

1/3/77  
195' TD: 9235'; MW: 10.8; Vis: 47. Made ten-stand wiper trip at 9184'. Pulled out of hole. OK. Worked through tight spots at 8422', 8516', and 8705', then washed and reamed 60' to bottom.

1/4/77  
118' TD: 9353'; MW: 11.0; Vis: 52. Made twelve-stand wiper trip at 9329'. Pulled out of hole. OK. Tight hole at 8454' and 8516' while going back in. Washed and reamed 50' to bottom. Trip gas 2,000 units. On trip-gas returns, circulated out foamy gas-cut mud.

1/5/77  
9' TD: 9362'; MW: 11.3; Vis: 49. Pulled eight stands. Tripped back to bottom. Had 73' of fill. Circulated and increased mud weight to 11.3 ppg. Waited on weather. Tripped out. Tight spot at 8500'. Losing an estimated two to five barrels of mud per hour.

1/6/77  
95' TD: 9457'; MW: 11.3; Vis: 46. Finished trip in with Bit No. 19. Tight spot at 8500'. Washed and reamed 60' to bottom. Loss of mud has stopped.

1/7/77  
57' TD: 9514'; MW: 11.3; Vis: 52. Short trip at 9475'. Pulled tight from 9400' to 8550' (30,000 pounds to 40,000 pounds over string weight). Trip in OK. Washed and reamed 35' to bottom. Drilled to 9514' and tripped out. Pulled tight from 9440' to 9390' (60,000 pounds to 70,000 pounds over string weight), then to 8550' (25,000 pounds to 35,000 pounds over string weight). String weight in hole: 190,000 pounds.

1/8/77  
74' TD: 9588'; MW: 11.3; Vis: 53. Washed and reamed 28' to bottom with Bit No. 20. Went to bottom without drag.

1/9/77  
125' TD: 9713'; MW: 11.1; Vis: 41. Made short trip. 90,000 pounds over string weight for one stand. No drag after first 90'. Twenty feet of fill on short trip. Drilled ahead to 9682'. Lost 125 barrels of mud. Regained circulation. Drilling ahead.

1/10/77  
70' TD: 9783'; MW: 11.4; Vis: 44. Tripped in with Bit No. 21. Eight feet of fill and no tight spots.

1/11/77  
120' TD: 9903'; MW: 11.2; Vis: 43. Lost 90 barrels mud while making connection at 9846'. Added lost-circulation material to system. No drilling break. Possible loss point same as before at 9682'. Had full returns.

1/12/77  
65' TD: 9968'; MW: 11.2; Vis: 42. No tight hole on trip. Five feet of fill on trip at 9921'.

1/13/77  
117' TD: 10,085'; MW: 11.3; Vis: 42. Drilled to 10,045'. Made 18-stand trip. Nine feet of fill. No tight hole.

1/14/77  
69' TD: 10,154'; MW: 11.0; Vis: 45. Drilling. Lost 350 barrels mud. Pulled into casing. Rebuilt mud volume.

1/15/77  
66' TD: 10,220'; MW: 11.0; Vis: 43. Building mud volume. Ran ten stands. Circulated stage into hole. Eight feet of fill. Drilled ahead with full returns.

1/16/77  
47' TD: 10,267'; MW: 11.0; Vis: 42. Drilling ahead. Pulled out of hole. Tested blinds to 5,000 psi, Hydril to 2,500 psi. Changed out drilling line. Lost 200 barrels mud while changing. Ran in hole with 27' of fill. No tight hole.

1/17/77  
180' TD: 10,447'; MW: 11.0; Vis: 38. Lost 150 barrels mud while drilling at 10,322'.

1/18/77  
142' TD: 10,589'; MW: 11.0; Vis: 39. Short trip at 10,472'.

1/19/77  
24' TD: 10,613'; MW: 11; Vis: 39. Washed 40' to bottom. No fill; no tight hole. Steel-line measured at 10,613'. No correction. Picked up core barrel.

1/20/77  
15' TD: 10,628'; MW: 11; Vis: 42. Reamed with core head No. 1, 10,544' to 10,613'. Cut Core No. 2, 10,613-10,628'. Pulled out of hole. Stuck bit at 9832', 9850', 9801'. Jarred and bumped loose. Recovered 14 feet of Core No. 2. Took 300,000 pounds.

1/21/77  
132' TD: 10,760'; MW: 11.0; Vis: 41. Reamed 10,610' to 10,628'. Drilling ahead. No fill and no tight hole.

1/22/77  
23' TD: 10,783'; MW: 10.9; Vis: 38. Short trip at 10,779'. Had 31' of fill with no tight hole. Drilled to 10,783'. Lost circulation. Pulled up to casing at 8339'. Mixed mud and built volume. Started circulating at 4:00 a.m. Required 65 barrels to fill hole. Pumped down lost-circulation material pill. Lost approximately 300 barrels mud.

1/23/77  
52' TD: 10,835'; MW: 10.9; Vis: 40. Circulated at 8339', building volume. Staged in hole to 9760' and 10,783', breaking circulation. No tight hole and 8' of fill on bottom. Loss last 24 hours: 330 barrels. Total mud loss at 10,783': 630 barrels. Drilling with full returns. Bypassed shaker at 6:00 a.m.

1/24/77  
147' TD: 10,982'; MW: 10.8; Vis: 40. Lost 400 barrels mud last 24 hours while drilling. Full returns at report time.

1/25/77  
64' TD: 11,046'; MW: 10.8; Vis: 37. Tripped at 11,000'. Pulled ±90,000 over string weight off bottom (60'). Tripped in and reamed 90' to bottom. No fill (precautionary). Drilled and lost circulation at 11,046' (100 barrels). Pulled up to 8226'. Circulated with full returns.

1/26/77  
118' TD: 11,164'; MW: 10.7; Vis: 40. Tripped in to 9636' and broke circulation. Full returns. Ran back to bottom. Reamed and washed 60' to bottom at 11,046' (15' of fill). Full returns. Resumed drilling.

1/27/77  
71' TD: 11,235'; MW: 10.7; Vis: 39. Drilled to 11,193'. Tripped for new bit. Washed and reamed 60' to bottom (precautionary). No tight hole, no fill.

1/28/77  
55' TD: 11,290'; MW: 10.7; Vis: 39. Drilled ahead to 11,290'. Circulated. Made short trip; ten feet of fill. Circulated. Dropped survey. Pulled out of hole. Removed drill-pipe rubbers.

1/29/77  
0' TD: 11,290'; MW: 10.7; Vis: 38. Rigged up Schlumberger. Ran DIL, BHC/Sonic/GR, FDC/CNL/GR, HRD, CBL/CCL/GR, attempting to shoot 24 sidewall cores from Schlumberger total depth of 11,274'.

1/30/77  
0' TD: 11,290'; MW: 10.7; Vis: 40. Ran Schlumberger sidewall-core guns to 8900' and hit bridge. Tripped in with bit and cleaned out to total depth. Tripped out. Ran and shot 24 sidewall cores. Recovered five cores. Rigged up and ran Velocity Survey.

1/31/77  
0' TD: 11,290'; MW: 10.7; Vis: 40. Completed Velocity Survey. Lost locking arm off of logging tool at 9240-9246'. Tripped with bit and pushed junk to 10,300'. Tripped out and went in open ended with 4-1/2" drill pipe and prepared to set cement Plug No. 1.

2/1/77  
0' TD: 11,290'; MW: 10.5; Vis: 38. Set cement plugs as follows: Plug No. 1: 10,283' to 10,083' with 90 sacks Class "G" with 0.3% HR-7; Plug No 2: 9306' to 9106' with 75 sacks Class "G" with 0.3% HR-7; Plug No. 3: 8991' to 8791' with 100 sacks Class "G" with 0.3% HR-7; Plug No. 4: 8424' to 8324' with 70 sacks Class "G" Neat. Completed plugging at 11:30 a.m. Circulated. Tripped out and picked up Howco EZ drill retainer. Run and set at 8238'. Circulated and

conditioned mud. Laid down 66 joints of 4-1/2" drill pipe. Finished trip out. Rigged up Schlumberger to perforate.

2/2/77  
0'

TD: 11,290'; MW: 10.5; Vis: 38. Rigged up Schlumberger lubricator and tested to 500 psi. OK. Perforated 7290' to 7120' with Hyperjet II casing guns (325 shots). Interval 7155' to 7140' with one shot per foot; all others at two shots per foot. Rigged down Schlumberger. Picked up test tools. Got cross-over for test tools from Deadhorse. Went in hole with Drill-Stem Test No. 2.

2/3/77  
0'

TD: 11,290'; MW: 10.5; Vis: 48. Drill-Stem Test No. 2 interval 7120' to 7290' (170'). Tripped in with drill-stem test tools. Set packer at 7080'. Ran 1000' water cushion. Tool open at 7:55 a.m. No blow on initial flow (15 minutes); thirty minutes initial shut-in; 120 minutes final flow. Very weak blow on final flow. Final shut-in for 123 minutes. Dropped bar and reversed out. No fluid recovery. Pressures from upper outside recorder. IHP-3,950 psi; IFP-546 psi; ISIP-647 psi; FFP-549 psi; FSIP-3,173 psi; FHP-3,936 psi. BHT-168°F. MFE chamber recovered only 10.5 ppg drilling mud. Pulled drill-stem test tools. Picked up Howco EZ drill retainer. Would not set at 7035'. Picked up and set at 6315'. Tripped out. Ran back with retainer-setting tool.

2/4/77  
0'

TD: 11,290'; MW: 10.5; Vis: 38. Pumped into retainer and established injection rate of 1,700 psi; 4 BPM. Squeezed cement through retainer at 6315'. Pumped 75 sacks Class "G" cement. Pumped 65 sacks through retainer and spotted 10 sacks on top. Broke down at 3,000 psi. Pumped in at 4 BPM and 1,700 psi. ISDP-1,000 psi. Cement in place at 10:30 a.m., February 3. Pulled three stands and circulated. Tested plug to 2,500 psi. OK. Cement in place. Laid down 65 joints of drill pipe. Rigged up Schlumberger and perforated 5680-5790' at 2 shots per foot with Hyperjet II. Ran drill-stem test tools and set packer at 5628'. Ran 1000' water cushion. Tool open for initial flow at 4:15 a.m. Very weak blow. Shut in at 4:30 a.m. for initial shut-in. Opened at 5:02 a.m. for final flow. Very weak blow.

2/5/77  
0'

TD: 11,290'; MW: 10.6; Vis: 40. Completed Drill-Stem Test No. 3 (5680' to 5790'). Closed tool at 7:02 a.m. for two hour final shut in. Dropped bar and reversed circulation. Recovered water cushion and ±4 barrels rat-hole mud. Pulled packer loose with

2,500 pounds over string weight and tripped out. Pressures from lower outside recorder at 5741': IHP-3,279 psi; IFP-550 psi; ISIP-1,953 psi; FFP-637 psi; FSIP-2,312 psi; FHP-3,279 psi. BHT-140°F. MFE chamber recovered 2,400 cc of 10.2 ppg mud and 0.2 cubic feet gas with trace of dead oil. Picked up and ran Howco EZ drill retainer and set at 5590'. Pumped cement. Broke down formation with 3,700 psi. Injection rate : 5 BPM at 1,000 psi. Cemented with 75 sacks Class "G" cement, spotting 10 sacks on top of retainer. Initial pressure 850 psi; final pump pressure 450 psi. Cement in place at 8:20 p.m., February 4. Pulled three stands and one single. Circulated. Laid down 102 joints of 4-1/2" drill pipe and 22 6-3/4" drill collars and Jarco jars.

- 2/6/77  
0' TD: 11,290'; MW: 10.5; Vis: 40. Ran TriState 9-5/8" casing cutter and cut 9-5/8" casing at 2412'. Laid down cutter and ran TriState 9-5/8" casing spear and jars. Pulled 9-5/8" casing with 112,000 pounds. String weight in mud: 108,000 pounds. Laid down 9-5/8" casing.
- 2/7/77  
0' TD: 11,290'. Laid down 60 joints 9-5/8" casing (2404.76'). Ran in hole with 4-1/2" drill pipe open-ended to 2392'. Spotted 75 sacks Class "G" cement 2392' to 2289'. Cement in place at 1:00 p.m., February 6. Pulled out of hole. Laid down drill pipe to 2173'. Reversed out mud with water, water with diesel. Laid down 4-1/2" drill pipe. Nippled down blowout preventer. Cleaned mud pits.
- 2/8/77 Released rig at 12:01 a.m., February 8. Rigging down. Moved out blowout preventer. Filled hole with diesel. Installed well marker; cleaned mud pits. Released rig at 12:01 a.m. on February 8, 1977.
- 2/9/77 Continued rigging down. Moved equipment and rig to Herc strip.
- 2/10/77 Continued rigging down. Laid down derrick. Moved miscellaneous equipment to Herc strip.
- 2/11/77 Tearing down derrick. Moved miscellaneous equipment to Herc strip. Prepared Howco cementing unit for backhaul to Deadhorse. Shipped Martin Decker equipment to Fish Creek.
- 2/12/77 Continued rigging down. Received seven Herc skids. Started building Herc loads.

- 2/13/77 Continued rigging down. Derrick, A-frame, jack shaft, and draw works moved to Herc strip.
- 2/14/77 Continued rigging down.
- 2/15/77 Shop building remains to be rigged down. Hauled four Herc loads.
- 2/16/77 Inventoried miscellaneous rig equipment. Sorted out backhaul loads. Built Herc loads.

DRILLING TIME ANALYSIS  
SOUTH HARRISON BAY NO. 1  
PARCO, INC., RIG 128  
Spud 11/21/76; Rig released 2/8/77  
Total Depth: 11,290 Feet

DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments
10-28																							20		Load Out Rig
10-29																							24		Load Out Rig
10-30																							24		Load Out Rig
10-31																							24		Load Out Rig
11-1																							24		Load Out Rig
11-2																							24		Load Out Rig
11-3																							24		Load Out Camp
11-4																							24		Set Up Camp
11-5																							24		Set Up Camp Work on Mud Tanks
11-6																							24		Build Shop Buildings Work on Shop Buildings
11-7																							24		and Equipment Insulate Hall Between Camp and Water Treatment Plant
11-8																							24		Clean Snow From Rig
11-9																							24		Rig Up
11-10	24																								Rigging Up
11-11	24																								Rigging Up

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
11-12	24																							Rigging Up	
11-13	24																							Rigging Up	
11-14	24																							Rigging Up	
11-15	24																							Rigging Up	
11-16	24																							Rigging Up	
11-17	24																							Rigging Up	
11-18	24																							Rigging Up	
11-19	24																							Rigging Up	
11-20								12				9											3	Nipple Up	
11-21	12	3		1								3												Drilling	Well Spudded at 3:00 p. m.
11-22	11 1/2	11 1/2	3 1/2	1				1 1/2															7	Drilling	Drill 17 1/2 Hole
11-23	14 1/2	14 1/2	3 1/2	1 1/2	1/2			1															2 1/2	Drilling	
11-24	3 1/2	3 1/2	5 1/2	1/2				8	5 1/2														1 1/2	Logging	Ran Schlumberger Wireline Logs
11-25	2	2	2					5	15															W.O.C.	Run 13 3/8" And Cement
11-26			4						1			6											13	Nipple Up and Test	

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
11-27												24												Testing BOP	
11-28												14 9/16												Nipple Up	
11-29	5			5 1/2	1 1/2			1 1/2				6										4 1/2		Pressure Up On Formation	Breakdown @ 0.67
11-30	22			1 1/2	1 1/2																			Drilling	
12-1	12			7 1/2	1																		3 1/2	Trip	
12-2	22				1																		1	Drilling	Drill Ahead
12-3	14 1/2			7 1/2	1/2			1/2															1	R.I.H.	
12-4	17			6 1/2				1/2																Strap Out Of Hole	
12-5	1 1/2			3				7 1/2															12	Circulating	
12-6	22 3/4					1 1/2																		Drilling	
12-7	13			8	3																			Drilling	
12-8	15			2 1/2	1			1/2				4											1	P.O.H.	
12-9	16 1/2			4	1 1/4							2												Drilling	
12-10	7			8 1/2	1/2			3 1/2															1	R.I.H.	
12-11	6 1/2			5 1/4												11							1 1/2	Drill Out Core Hole	Core No. 1: 7022' - 7052'

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	
12-12	8			3		1		8										12				4	P.O.H. for DST			
12-13	14 <sup>1</sup> / <sub>4</sub>		9 <sup>1</sup> / <sub>2</sub>																					Rig Up Test Head	DST No. 1: 7119-7207' FFP = 2620 FSP - 2825	
12-14	23 <sup>1</sup> / <sub>2</sub>			1 <sup>1</sup> / <sub>2</sub>																				Drilling	W/6000' Water Cushion	
12-15	14 <sup>1</sup> / <sub>4</sub>		7	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>																			Drilling		
12-16	22 <sup>1</sup> / <sub>2</sub>					1 <sup>1</sup> / <sub>2</sub>																		Drilling		
12-17	17	1 <sup>1</sup> / <sub>2</sub>	6	1 <sup>1</sup> / <sub>2</sub>																				Drilling		
12-18	9 <sup>1</sup> / <sub>2</sub>		8			1	1																4 <sup>1</sup> / <sub>2</sub>	Drilling		
12-19	21 <sup>1</sup> / <sub>2</sub>					1 <sup>1</sup> / <sub>4</sub>																		1 <sup>1</sup> / <sub>2</sub>	Drilling	
12-20	14 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>								2												1 <sup>1</sup> / <sub>2</sub>	Drilling	
12-21	23 <sup>1</sup> / <sub>2</sub>					1 <sup>1</sup> / <sub>4</sub>																			Drilling	
12-22	13 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>			1 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>																	Drilling	
12-23	7 <sup>1</sup> / <sub>4</sub>	2	4 <sup>1</sup> / <sub>2</sub>				5	4 <sup>1</sup> / <sub>2</sub>																1 <sup>1</sup> / <sub>4</sub>	Drilling	Running Schlumberger Wireline
12-24							24																		Logging	Loggs
12-25		3	7 <sup>1</sup> / <sub>2</sub>				10 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>																1 <sup>1</sup> / <sub>2</sub>	Repair 4" Valve	
12-26			3				1 <sup>1</sup> / <sub>2</sub>	19 <sup>1</sup> / <sub>2</sub>																	Rig Up to Run Casing	

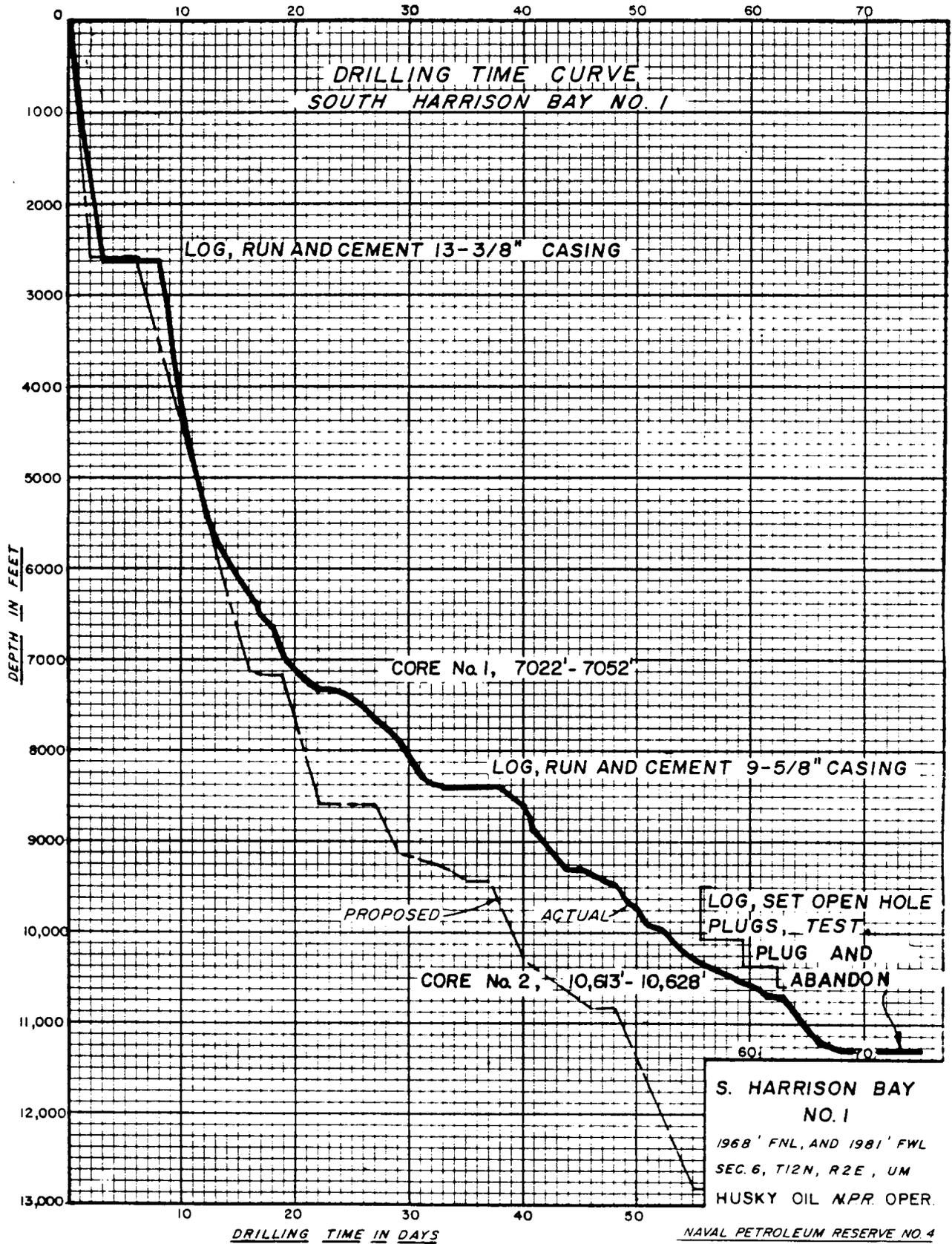
DATE	RIG UP/RIG DOWN	DRILLING	REAMING	TRIP	DEV. SURVEY	RIG MAINT.	RIG REPAIR	CIRC. & COND. MUD	LOGGING	CASING & CEMENT	W O C	NIPPLE UP/DOWN BOP	TEST BOP	CHANGE BHA	LOST CIRC.	FISHING	CORING	DST	PLUG BACK	SQUEEZE CEMENT	DIR. WORK	W O MAT./EQUIP.	OTHER	Operations at 6:00 a.m.	Comments		
12-27								3½		14½												6		Run 9 5/8" Casing			
12-28				6½	½			2½			12	2½													W.O.C. Circulate & Condition Mud		
12-29								15½														½			Test Shoe to 0.61		
12-30		8			½	½	1½															1			Drilling		
12-31		21½	¾	1½																							
1-1		12	3½	6½	½	½	1																			Drilling	
1-2		21½	1½	1																						Drilling	Tight Hole
1-3		21	2	1																						Drilling	Tight Hole
1-4		7	2	1	½			13½																		Drilling	Gas Cut Mud
1-5		13	2	7½				1½																		Trip	Fill On Trips
1-6		20	2	2																						Drilling	Losing Mud
1-7		12	1½	7½	½	½		1															1		Trip	Tight Hole	
1-8		21½	1	1½																						Drilling	Lost Circulation
1-9		14½		4½		½		2				½											2			Drilling	
1-10		21	1	1				2																		Drilling	

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DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC. SOUTH HARRISON BAY NO. 1															Page	6	of	8									
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		
1-11		13 $\frac{1}{4}$		7 $\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$																	2	Drilling	Lost Circulation	
1-12		22 $\frac{1}{2}$		1 $\frac{1}{2}$																						Drilling	No Tight Hole
1-13		19		1			4																			Drilling	
1-14		6	1	1			14																2	Condition Mud	Lost Circulation		
1-15		8	$\frac{1}{2}$	8	$\frac{1}{2}$	$\frac{1}{2}$						3 $\frac{1}{2}$											2 $\frac{3}{4}$	Run Survey			
1-16		24																								Drilling	Test Stack
1-17		22 $\frac{1}{4}$	$\frac{1}{2}$	1 $\frac{1}{4}$																						Drilling	Lost Circulation
1-18		11 $\frac{1}{2}$	$\frac{1}{2}$	9 $\frac{1}{4}$	1	$\frac{1}{2}$																	1 $\frac{1}{4}$	Mix and Pump Down LCM			
1-19			3 $\frac{3}{4}$	8												8 $\frac{3}{4}$							3 $\frac{1}{2}$	R.I.H.	Core No. 2: 10613' - 10628'		
1-20		15 $\frac{1}{2}$	2	5 $\frac{1}{2}$																			1	Drilling			
1-21		9 $\frac{1}{4}$		2 $\frac{1}{4}$			12 $\frac{1}{2}$																			Drilling	
1-22		3	1	1			20																			Circulate	Lost Circulation
1-23		23 $\frac{1}{2}$																						$\frac{1}{2}$	Drilling	Lost Circulation	
1-24		14 $\frac{1}{2}$		8	$\frac{1}{4}$	$\frac{1}{2}$																		$\frac{1}{2}$	Drilling	Lost Circulation	
1-25		17	1	3			3																			R.I.H.	Tight Hole

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	
1-26		14½		8½	½	½																		Drilling		
1-27		17½	¼	1½		¼	4½															¼		Drilling		
1-28				5½	½		1	17																Trip	Run Schlumberger Wireline Logs	
1-29			1½	8½		1¼	3½	9½														¼		Run Sidewall Core		
1-30				11				13																Run Wallock Geo Phone		
1-31				9			9			4½												1½		Pull 10 Stands		
2-1				4		2½	1	5½				½										3½		Rig Up To Perforate		
2-2				11		½												11½	1					Run In With Test Tools	Perf. 7120' - 7290' DST No. 2	
2-3				9½			2½					½						1½	3				7	Pick Up Stinger & R.I.H. Squeeze Perforations		
2-4				10½			1¼	3										9						In Final Flow Period At 6:00 a.m. Drift	Perf. 5680' - 5790' DST No. 3	
2-5				12																			12	Lay Down pp & Collars	Squeeze Perforations	
2-6				1			2																21	Lay Down CSG & CSG Tools		
2-7	12																						12	Lay Down D. P.		
2-8	24																								Rigging Down	Rig Released 12:01 a. m.
2-9	24																								Rigging Down	

DRILLING TIME ANALYSIS (HOURS) - HUSKY NPR OPERATIONS, INC.															SOUTH HARRISON BAY NO. 1					Page 8 of 8							
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		
2-10	24																										
2-11	24																								Rigging Down		
2-12	24																								Rigging Down		
2-13	24																								Rigging Down		
2-14	24																								Rigging Down		
2-15	24																								Rigging Down		
2-16	24																								Rigging Down		
	480	34½		24¼	4½	80½	12	27	-0-	23¼	1	-0-	459												Inventory		
TOTAL HOURS	940¼	326¼	22¼	190½	57½	60½	-0-	34	3	3½																	





DRILLING MUD RECORD

BAROID DIVISION  
N L Industries, Inc.

COMPANY Husky Oil & Gas Operations, Inc. STATE Alaska  
WELL 25, Barriam Bay #1 COUNTY  
CONTRACTOR Parker Drilling Co. LOCATION N. Slope  
STOCK POINT Fairbanks DATE 02-06-77 BAROID ENGINEER R. L. Dewees, Jr., L. Rintoul  
SEC 6 TWP 12N RNC 2E TOTAL DEPTH 9-5/8 inch or 8,370 ft.  
CASING PROGRAM: 20 inch or 83 ft.  
13-3/8 inch or 2,600 ft.  
9-5/8 inch or 8,370 ft.

Table with columns: DATE, DEPTH, WEIGHT, VISCOSITY, CELLS, FILTRATION, FILTRATION ANALYSIS, SAND, RETORT, CEC, REMARKS AND TREATMENT. Includes data for dates 12-24 to 1-27 and various mud properties and treatments.



**Baroid**

**Petroleum Services**

COMPANY Busky Oil NFR Operations Inc. STATE Alaska inch at 83 ft.  
 WELL South Harrison Bay #1 COUNTY \_\_\_\_\_ inch of 2,600 ft.  
 CONTRACTOR Parker Drilling Company LOCATION North Slope SEC 6 TWP 12N RNC 2E inch of 8,370 ft.  
 STOCK POINT Fairbanks DATE 02-05-77 BAROID ENGINEER R. L. Jewess TOTAL DEPTH \_\_\_\_\_ ft.

DATE	DEPTH feet	WEIGHT lb/gal	VISCOSITY Sec API	PV of	Yp	GELS 10 sec 10 min	pH	Strip D Meter D	FILTRATION HTHP (Coke of 30 psi)	FILTRATE ANALYSIS			SAND %	RETORT Oil Water %	CEC Mud, me/ml	REMARKS AND TREATMENT
										Cl ppm	Ca ppm	Solids %				
1-27																
1-28	11.00	10.7	32	21	9	27.5	10.0	6	1	53.7	350	0	25	16	84	Conl. hole. Come out to log logging.
1-28	11.00	10.7	39	21	9	27.5	10.0	6	1	53.5	350	0	25	16	84	35' fill. Clean out trip.
1-30	11.00	10.7	40	21	9	27.5	10.0	6	1	53.8	350	0	25	16	84	ferent plugs.
1-31	11.00	10.7	40	22	9	27.5	10.0	6	1	43.9	400	0	25	16	84	2-4 Drill
2-1	11.00	10.5	38	18	9	27.5	11.0	5.2	1	54.3	450	120	25	15	85	perf & test - squeeze.
2-2	7.10	10.5	38	18	9	27.5	11.0	5.1	1	54.3	500	110	25	15	85	perf & test - squeeze.
2-3	7.10	10.5	48	20	9	27.5	10.5	6	1	54.0	400	0	25	15	85	perf & test - squeeze.
2-4	7.10	10.5	38	19	9	27.5	10.5	6	1	53.8	400	50	25	15	85	

MATERIAL	AMOUNT	COST \$	MATERIAL	AMOUNT	COST \$
Baroid	4,761		Bicarb. of soda	38	
Acuarel	1,951		Fori-trim	8	
Alproxin	833		CCC	171	
XL-20	120		Jel Con	45	
Caustic soda	457		Soltex	153	
Soda Ash	39		Nicatex, Fine	792	
For-Ex	189		Alum. Silicate	6	
Con Det.	6		Drayage		
			Sales Tax		
			<b>TOTAL COST</b>		

**MUD MATERIALS  
Used (Total)**

**DRILLING MUD RECORD**

BIT RECORD  
Husky Oil NPR Operations, Inc.  
South Harrison Bay No. 1 - Sec. 6, T12N, R2E, North Slope, Alaska

BIT NO.	BIT SIZE	BIT MFR.	BIT TYPE	SER. NO. OF BIT	JET SIZE			DEPTH OUT	FTGE.	HRS. RUN	ACC. HRS.	FT. PER HR.	WEIGHT (1000LBS)	ROTARY R.P.M.	VERT. DEV. PRESS.	PUMPS LINER SPM.	MUD WT.	VIS	DULL CODE				
					1	2	3												T	B	G		
1	17 1/2	HTC	OSCWA	FE814	18	18	18	1386	1303	17	17	76	40	110	1	900	5 1/2	80	9.4	37	5	8	1
2	17 1/2	HTC	OSCWA	JH610	18	18	18	2640	1254	21	38	72	40	120	1 3/4	900	5 1/2	80	9.5	42	2	2	1
3	12 1/4	HTC	OSCWA	FZ850	14	14	14	4568	1928	39	77	49	45	100	1 1/4	1900	5 1/2	80	9.4	37	4	6	1
4	12 1/4	HTC	OSCWA	HA425	14	14	14	5418	850	32	109	26	50	100	1 1/4	1800	5 1/2	72	9.5	42	5	7	1
5	12 1/4	HTC	OSCWA	HX801	14	14	14	5861	443	21 1/2	130.5	20	50	88	1 1/2	1800	5 1/2	72	9.4	36	5	8	1
6	12 1/4	HTC	OSCWA	FX960	14	14	14	6191	530	3 1/4	157	26	50	80	1	2000	5 1/2	72	10	35	4	7	1
7	12 1/4	HTC	OSCWA	FZ922	14	14	14	6746	380	1 1/2	3 1/4	15	50	90	0	2000	5 1/2	72	10.4	37	2	8	1
8	12 1/4	Smith	DSJ	803EF	14	14	14	7026	330	1 1/4	206	9+	55	80	2 1/2	2000	5 1/2	72	10.4	37	2	6	1
9	12 1/4	HTC	XIG	ZB312	14	14	14	7205	179	1 1/2	220.5	12	50	80	2	2100	5 1/2	65	10.5	37	2	1	1
10	12 1/4	Smith	2JS	418EJ	14	14	14	7462	157	1 1/4	3 1/4	5	60	45	2100	5 1/2	70	10.5	36	3	1	1	
11	12 1/4	HTC	XIG	ZB403	15	15	15	7610	284	1 1/4	289	8	40/	40/	2100	5 1/2	70	10.5	36	8	5	1	
12	12 1/4	HTC	XIG	ZB026	15	15	15	7756	146	1 1/2	309.5	7	60	50	2100	5 1/2	70	10.2	37	4	1	1	
13	12 1/4	HTC	XIG	ZB310	15	15	15	8002	246	1 1/4	3 1/4	7	50	50	2100	5 1/2	70	10.3	42	5	4	1	
14	12 1/4	HTC	XIG	ZB027	15	15	15	8492	290	1 1/4	381	7	50	50	2100	5 1/2	70	10.6	42	5	1	1	
15	12 1/4	HTC	XIG	ZB402	15	15	15	8400	108	8 1/4	1 1/4	13	50	50	2100	5 1/2	70	10.6	39	1	1	1	
16	8 1/2	HTC	XIG	EP877	16	16	16	8627	227	1 1/2	3 1/4	10.5	40	55	1 1/2	1700	5 1/2	61	10.5	41	4	4	1
17	8 1/2	HTC	XIG	KX407	11	11	11	8962	335	3 1/4	1 1/2	10+	40	55	X	1700	5 1/2	61	10.6	42	8	4	1
18	8 1/2	Smith	F2	698FC	10	10	10	9362	400	5 1/2	493	6+	40	40	1 1/4	1900	5 1/2	40	11.0	51	8	4	1
19	8 1/2	Smith	F2	357DX	10	10	10	9514	152	37	530	4+	40	40	2	1900	5 1/2	40	11.3	48	8	4	1
20	8 1/2	Smith	F2	66470	10	10	10	9710	196	35 1/2	1 1/2	5 1/2	40	40	X	2000	5 1/2	40	11.4	48	8	4	1
21	8 1/2	Smith	F2	702DD	10	10	10	9921		3 1/4	1 1/4		40	40		2000	5 1/2	40	11.3	44	8	4	1
22	8 1/2	Smith	F3	926CL	10	10	10	10,224	301	55	659		40	40		2000	5 1/2	40	11.2	41	8	3	1
23	8 1/2	Smith	F3	767CL	10	10	10	10,589	367	1 1/4	1 1/2		40	40		2000	5 1/2	40	11.2	41	8	3	1
24	8 1/2	SEC	M44N	6369N	11	11	11	10,613	24	6	718		40	40		2000	5 1/2	40	10.8	39	6	4	1
25	8 1/2	Smith	F3	CV092	10	10	10	11,000	372	58	776	6.4	40	40		2000	5 1/2	40	10.8	37	8	7	1
26	8 1/2	Smith	F3	CV098	10	10	10	11,193	193	36	812	5.4	40	40		2000	5 1/2	40	10.7	39	8	4	1
27	8 1/2	Smith	JJS	DD513	10	10	10	11,290	97	18 1/2	1 1/4	5.3	40	40		2000	5 1/2	40	10.7	39	4	4	1

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## CASING DATA

### INTRODUCTION

Casing programmed for South Harrison Bay No. 1 was as follows: 20" conductor at  $\pm 80'$ ; 13-3/8" at 2600'; 9-5/8" at 8800'; 7" liner to a total depth of 12,850' if needed for formation evaluation.

Actual casing run was 20" at 83'; 13-3/8" at 2600', 9-5/8" at 8370'. A 7" liner was not necessary for evaluation.

**CASING TALLY  
SUMMARY SHEET**

DATE: November 26, 1976  
TALLY FOR 13 3/8 CASING

FIELD: Naval Petroleum Reserve No. 4

LEASE & WELL NO. So. Harrison Bay No. 1

SUMMARY OF PAGE MEASUREMENTS		
PAGE	NO OF JOINTS	FEET
PAGE 1	67	2572
PAGE 2		43
PAGE 3		
PAGE 4		
PAGE 5		
PAGE 6		
PAGE 7		
PAGE 8		
PAGE 9		
TOTAL		

SUMMARY OF DEPTH CALCULATIONS		
	NO OF JOINTS	FOOTAGE FEET
1 TOTAL CASING ON RACKS	67	2572
2 LESS CASING CUTS NOS		43
3 TOTAL (1 - 2)		2529
4 SHOE LENGTH		2
5 FLOAT LENGTH		1
6 MISCELLANEOUS EQUIPMENT LENGTH		
7 TOTAL CASING AND EQUIPMENT (3 + 4 + 5 + 6)		2576
8 (KB REFERENCE)		23
9 <b>Landing Depth</b>		<b>2600</b>

Weight indicator before cementing \_\_\_\_\_ after slack-off \_\_\_\_\_ inches slack off

SUMMARY OF STRING AS RUN							
WEIGHT GRADE	THREAD	MANUFACTURER	CONDITION NEW/USED	LOCATION IN STRING	NO OF JOINTS	FOOTAGE	INTERVAL
72	SS95	Butt.	New	JT NO THRU NO			
				JT NO THRU NO			
				JT NO THRU NO			
				JT NO THRU NO			
				JT NO THRU NO			
				JT NO THRU NO			
				JT NO THRU NO			

CASING TALLY

DATE: November 26, 1976

FIELD NPR-4 LEASE & WELL NO. So. Harrison Bay No. 1 TALLY FOR 13 3/8 " CASING

JOINT NO	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR
	FEET	00'S	FEET	00'S	
1	39	30	37	35	72#  SS-95
2	40	88	41	43	
3	41	18	37	80	
4	40	58	38	00	
5	38	67	37	76	
6	37	86	37	71	
7	40	60	40	97	
8	36	00	39	69	
9	37	40	41	50	
0	40	33	37	12	
TOTAL A	392	80	389	33	

JOINT NO	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR
	FEET	00'S	FEET	00'S	
1	40	75	38	60	
2	39	02	38	06	
3	37	23	37	88	
4	38	24	38	93	
5	36	23	38	28	
6	38	93	40	94	
7	34	20	38	92	
8	40	37	38	52	
9	37	95	38	36	
0	33	92	39	65	
TOTAL D	376	84	388	14	

1	37	17	38	50
2	41	60	40	76
3	42	00	41	96
4	36	58	37	13
5	38	09	40	22
6	37	43	40	43
7	40	77	35	55
8	41	10	40	03
9	37	36	35	77
0	40	60	38	60
TOTAL B	393	20	388	95

1	41	48		
2	38	21		
3	38	47		
4	38	04		
5	38	38		
6	39	65		
7	11	94		
8				
9				
0				
TOTAL E	243	17		

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

TOTAL A	392	80	389	33
TOTAL B	393	20	388	95
TOTAL C				
TOTAL D	376	84	388	14
TOTAL E			243	17
TOTAL PAGE			2572	43

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**CASING OR LINER CEMENT JOB**

Lease Naval Petroleum Reserve No. 4 Well So. Harrison Bay No. 1 Date November 26, 1976

Size Casing 13 3/8 Setting Depth 2600' Top (liner hanger) \_\_\_\_\_

Hole Size 17 1/2 " Mud Gradient 0.488 psi/ft; 9.4 lb/gal Viscosity 44

**Casing Equipment**

13 3/8 Howco shoe 13 3/8 Howco float located 43.02 feet

above shoe 2557' (DV, FO) collars located at \_\_\_\_\_ feet

and \_\_\_\_\_ feet

10 centralizers located per drilling procedures. Thread locked

bottom three joints.

\_\_\_\_\_ scratchers located \_\_\_\_\_

Liner hanger and pack off (describe) \_\_\_\_\_

Miscellaneous (baskets, etc.) \_\_\_\_\_

**Cement (around shoe)**

	<u>No.</u> <u>Sacks</u>	<u>Brand</u>	<u>Type</u>	<u>Additives</u>	<u>Slurry</u> <u>Weight</u>	<u>Slurry</u> <u>Volume</u>
(1)	<u>4300</u>	<u>Permafrost II</u>			<u>14.4</u>	
(2)						

Cement through (DV, FO) Collar at \_\_\_\_\_ feet

	<u>No.</u> <u>Sacks</u>	<u>Brand</u>	<u>Type</u>	<u>Additives</u>	<u>Slurry</u> <u>Weight</u>	<u>Slurry</u> <u>Volume</u>
(3)						
(4)						

**CASING TALLY  
SUMMARY SHEET**

DATE: December 27, 1976  
TALLY FOR 9 5/8" CASING

LEASE & WELL NO. South Harrison Bay No. 1

FIELD Naval Petroleum Reserve No. 4

SUMMARY OF PALE MEASUREMENTS			SUMMARY OF DEPTH CALCULATIONS		
	NO OF JOINTS	FEET	NO OF JOINTS	FEET	FEET
PAGE 1	100	3875			
PAGE 2	100	3874			
PAGE 3	16	596			
PAGE 4					8333
PAGE 5					200
PAGE 6					160
PAGE 7					955
PAGE 8					8346
PAGE 9					22
TOTAL					8369

Weight indicator before cementing \_\_\_\_\_ after slack-off \_\_\_\_\_ inches slack left off

Casing hung off on OCT 9 5/8" fluted hanger.

SUMMARY OF STRING AS RUN								
WEIGHT	GRADE	THREAD	MANUFACTURER	CONDITION NEW USED	LOCATION IN STRING	NO OF JOINTS	FOOTAGE	INTERVAL
53.5	S-95	Butl.	Lone Star	New	JT NO			
					THRU NO			
					JT NO			
					THRU NO			
					JT NO			
					THRU NO			
					JT NO			
					THRU NO			
					JT NO			
					THRU NO			
					JT NO			
					THRU NO			

NOTE: Top of Lower F.O. Collar @ 2391.93'  
Top of Upper F.O. Collar @ 2199.46  
9 5/8" Casing Pack-off Assembly Seal w/16000 Foot-Pound of Torque

CASING TALLY

DATE: December 27, 1976

FIELD NPR-4 LEASE & WELL NO. So. Harrison Bay No. 1 TALLY FOR 9 5/8 " CASING

JOINT NO	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR
	FEET	00'S	FEET	00'S	
1	38	22	39	72	
2	39	88	37	92	
3	40	88	37	28	
4	39	03	38	51	
5	39	00	40	79	
6	40	93	40	00	
7	41	14	39	10	
8	41	11	41	02	
9	37	92	40	31	
0	38	72	41	11	
TOTAL A	396	83	395	76	

JOINT NO	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR
	FEET	00'S	FEET	00'S	
1	3	F.O. 85	41	08	
2	37	93	39	40	
3	38	45	38	44	
4	39	14	41	38	
5	39	50	38	10	
6	39	61	35	86	
7	38	75	39	03	
8	39	62	39	97	
9	38	42	38	24	
0	40	83	39	53	
TOTAL D	356	10	391	03	

1	41	22	37	52	
2	41	46	41	02	
3	37	80	39	22	
4	40	72	36	71	
5	40	54	40	40	
6	40	78	39	62	
7	39	80	40	91	
8	37	86	39	18	
9	41	10	37	90	
0	40	63	41	28	
TOTAL B	398	04	393	76	

1	38	22	34	89	
2	39	85	37	08	
3	39	04	39	38	
4	39	21	37	43	
5	40	88	38	24	
6	41	08	40	22	
7	39	21	39	88	
8	39	57	41	16	
9	39	46	40	10	
0	40	88	39	47	
TOTAL E	397	40	387	85	

1	38	74	35	93	
2	41	90	38	77	
3	41	30	40	72	
4	39	80	40	28	
5	38	59	03	F.O. 85	
6	38	92	34	88	
7	38	30	40	74	
8	41	00	41	24	
9	38	23	41	22	
0	41	26	38	24	
TOTAL C	401	91	355	87	

TOTAL A	396	83	355	87
TOTAL B	398	04	356	10
TOTAL C	401	91	397	40
TOTAL D	395	76	391	03
TOTAL E	393	76	387	85
TOTAL PAGE	1986	30	1888	25

CASING TALLY

DATE: December 27, 1976

FIELD NPR-4 LEASE & WELL NO. So. Harrison Bay No. 1 TALLY FOR 9 5/8 " CASING

JOINT NO.	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR.
	FEET	00'S	FEET	00'S	
1	2	00	41	50	53.5 S-95
2	40	95	41	09	
3	38	12	39	98	
4	1	50	38	71	
5	38	22	40	70	
6	40	41	38	72	
7	39	08	40	96	
8	38	76	36	38	
9	38	00	41	12	
0	41	00	41	38	
TOTAL A	318	14	400	54	

JOINT NO.	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR.
	FEET	00'S	FEET	00'S	
1	41	11	41	34	53.5 S-95
2	38	29	34	69	
3	40	86	40	62	
4	38	89	40	59	
5	38	00	39	13	
6	41	00	40	78	
7	36	76	40	58	
8	40	84	40	40	
9	37	20	41	16	
0	38	78	40	88	
TOTAL D	390	73	400	17	

1	41	11	37	93
2	36	70	41	00
3	41	10	39	73
4	40	70	38	95
5	40	89	37	40
6	40	84	41	29
7	39	93	37	68
8	38	38	37	80
9	41	40	37	62
0	39	02	38	10
TOTAL B	400	52	387	50

1	38	09	40	73
2	37	02	38	88
3	39	02	36	18
4	37	10	39	82
5	39	38	40	18
6	39	18	38	40
7	39	83	39	04
8	40	21	39	23
9	40	33	39	17
0	42	44	39	23
TOTAL E	392	60	390	86

1	40	76	36	70
2	38	94	37	78
3	37	94	40	81
4	39	08	38	32
5	39	92	41	04
6	38	79	40	74
7	38	58	40	19
8	41	00	41	00
9	40	98	40	44
0	40	96	40	54
TOTAL C	396	95	397	56

TOTAL A	318	14	397	56
TOTAL B	400	52	390	73
TOTAL C	396	95	392	60
TOTAL D	400	54	400	17
TOTAL E	387	50	390	86
TOTAL PAGE	1903	65	1971	57

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CASING TALLY

DATE: December 27, 1977

FIELD NPR-4 LEASE & WELL NO. So. Harrison Bay No. 1 TALLY FOR 9 5/8 " CASING

JOINT NO	FIRST MEASUREMENT		CHECK MEASUREMENT		WT GR
	FEET	00'S	FEET	00'S	
1	40	91			
2	38	44			
3	38	02			
4	37	98			
5	40	84			
6	40	53			
7	35	96			
8	38	85			
9	39	52			
0	39	73			
TOTAL A	389	78			

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

1	40	18			
2	41	18			
3	40	95			
4	40	76			
5	40	88			
6	02	85	OCT Hanger		
7					
8					
9					
0					
TOTAL B	206	80			

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					
TOTAL B					
TOTAL C					
TOTAL D					
TOTAL E					
TOTAL PAGE	636	76			

**CASING OR LINER CEMENT JOB**

Lease Naval Petroleum Reserve No.4 Well So. Harrison Bay No. 1 Date December 27, 1976

Size Casing 9 5/8 Setting Depth 8370 Top (liner hanger) \_\_\_\_\_

Hole Size 12 1/4 " Mud Gradient 0.56 psi/ft; 10.7 lb/gal Viscosity 60

**Casing Equipment**

Howco shoe. Howco float located 82.87 feet

above shoe. @ 8287.03' (DV, FO) collars located at 2391.93 feet

and 2199.46 feet.

Nine Howco centralizers located one on each of the first five joints

above shoe and one on each joint above and below F.O. collars.

\_\_\_\_\_ scratchers located \_\_\_\_\_

Liner hanger and pack off (describe) OCT fluted hanger and pack-off

Miscellaneous (baskets, etc.) \_\_\_\_\_

**Cement (around shoe)**

	<u>No.</u> <u>Sacks</u>	<u>Brand</u>	<u>Type</u>	<u>Additives</u>	<u>Slurry</u> <u>Weight</u>	<u>Slurry</u> <u>Volume</u>
(1)	<u>1,000</u>	<u>Howco</u>	<u>"G"</u>	<u>1% CFR-2 and 0.2% HR-7</u>	<u>15.8</u>	<u>328 Bbls</u>
(2)	_____	_____	_____	_____	_____	_____

**Cement through (DV, FO) Collar at \_\_\_\_\_ feet**

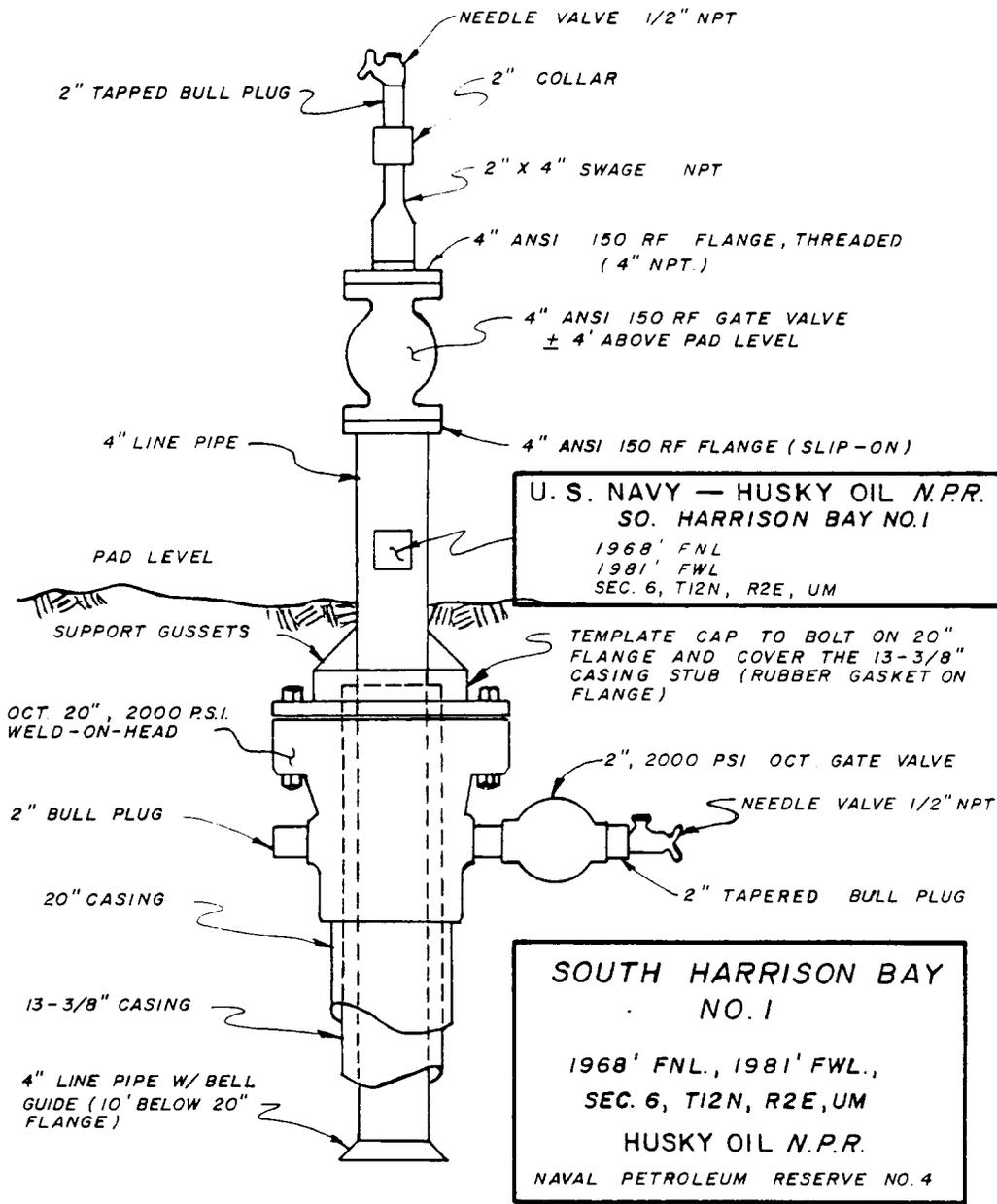
	<u>No.</u> <u>Sacks</u>	<u>Brand</u>	<u>Type</u>	<u>Additives</u>	<u>Slurry</u> <u>Weight</u>	<u>Slurry</u> <u>Volume</u>
(3)	_____	_____	_____	_____	_____	_____
(4)	_____	_____	_____	_____	_____	_____

NOTE: Could not circ hole. Mixed cement and displaced w/586 bbls. Did not bump plug. Over displaced 10 bbls. Final dump DSI 1360#. Bled back 3.5 bbls. Float holding. Cemented in place at 3:30 p.m., December 27, 1976.

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ABANDONMENT HEAD



## RIG INVENTORY

### Mast and Substructure

Lee C. Moore 136' x 1,025,000 GNC helicopter capable hi-floor mast complete with 6-sheave crown block, crown safety platform, winterized racking platform, erection equipment, ladder, tongs, counter weights, with a 21' floor, cold-temperature construction, Model 27415B, Serial No. 13624.

### Draw Works

TBA 2000 single-drum draw works, Serial No. 619-01 complete with air controls, Parkersburg 40" Type 343 hydromatic brake, Serial No. 48933, OIME four engine flat set oilbath compound with 2 way Crown-o-matic.

### Catworks

OIME independent catworks, with two Foster Automatic catheads, Breakout Serial No. 24AH504, makeup Serial No. 37AH249 torque tube drive and oilbath chain rotary drive.

### Compressors

Three - Quincy Model 315-15 Serial Nos. 827974-L; 827967-L; Spare 826362-S.

### Power

4 Caterpillar D343B turbo charged diesel engines, Serial Nos. 62B10305, 62B11441, 62B10537, 62B10816, all with radiator, rated 345 HP continuous, 425 intermittent, 500 HP maximum each, complete with Barber Kill Switch.

Twin Disc torque converters, Serial Nos.: 247128, 247780, 247784, 247775 and power shift transmissions Serial Nos.: 395521, 395518, 397287, 365527.

### Winterization

Northwest Tent and Awning neolon rig enclosure, with 100 mph wind load design.

### Drilling Line

One 1-1/4 x 6,000' drill line.  
Two 1-1/4 x 3,200' drill lines.

### Travelling Equipment

Ideco Shorty 5-sheave, 265-ton travelling block - hook combination Model UTB-265, Serial No. 208.

Set (2) 2-3/4" x 108" elevator links.

Continental-Emsco LA-400 quick change assembly Serial No. 6597-0389.

4-1/2" x 40' hexagon kelly.

Varco 4KRS Pin drive bushing.

#### Rotary Table

Ideco 23-D Model SPR23D, 24" rotary table, Serial No. 306 with solid Varco pin drive, master bushing, Serial No. S27E.

#### Power Tongs

Lamb - Power Unit - Model LS353, Serial No. 337  
Tong Model 16,000 Serial No. SN382-C  
Range 2-3/8 to 16"

#### Kelly Spinner

Foster - Type 77, Serial No. 77-02-10 hydraulic, 30 HP hydraulic unit, Serial No. JH6392012.

#### Weight Indicators

Type D - with National Type D Anchor.  
Cameron - Type G - Serial No. 73J5278

#### Automatic Driller

Swaco Unit 681

#### Survey Winch

Commercial Electric Drive Co. Model MMG 15DRS, Serial No. 210, line measuring device with transmissions powered by 7-1/2 HP electric motor.

#### Air Hoist

Ingersol Rand HU air hoist complete, Serial No. 41789.

#### Pipe Racks - Catwalks

Four Sets (8) steel pipe racks.

Two Catwalks.

#### Boilers

Four Napanee 50 HP, Model 33650B, Serial Nos. 75937, 75938, 75939, 75940 automatic boilers.

One lot of heaters, blowers, piping controls for heating.

### Air Heaters

One Air Heaters Inc. Model IDF-20F, Serial No. 117, maximum burner capacity of 3,500,000 BTU with Iron Fireman "Whirlpower" Space Conditioner, Model C-2400 electric controls and other necessary appurtenances.

One master air heater, Serial No. 2256581.

One master air heater, Serial No. 2256583.

### Drill Pipe and Drill Collars

10,000' plus (340 joints) of 4-1/2" Grade E drill pipe, plastic coated, equipped with 4-1/2" EH connection, flush - hard banded.

5,000' plus (170 joints) of 4-1/2" Grade X-95 drill pipe, plastic coated, equipped with 4-1/2" EH connections, not hard banded.

Ten 8" O.D. x 2-13/16" I.D. x 30' with 5" H-90 connections with zip lift recess, flush-hard banding.

Thirty 6-3/4" O.D. x 2-13/16" I.D. x 30' with 5" H-90 connections with zip lift recess, flush-hard banding.

### Subs

One upper kelly cock.

One lower kelly cock, 4-1/2" EH box x 4-1/2" EH pin.

Two saver subs, 4-1/2" EH box x 4-1/2" EH pin.

Two changeover subs, 4-1/2" EH box x 5" H-90 pin.

Two changeover subs, 4-1/2" EH box x 6-5/8" regular pin.

One 4-1/2" EH pin x 6-5/8" regular box.

Two 6-5/8" regular box x 6-5/8" regular box.

Two 5" H-90 Box x 4-1/2" regular box.

Twelve throw-away subs, 4-1/2" EH box x 4-1/2" EH pin.

Two pick up subs - 5" H-90 pin.

Two pick up subs - 6-5/8" regular pin.

One stabbing valve, cross-over, 6-5/8" regular pin x 4-1/2" EH box.

One stabbing valve, cross-over, 5" H-90 pin x 4-1/2" EH box.

Two changeover subs - 6-5/8" regular pin x 5" H-90 box.

One inside B.O.P., 4-1/2" EH x 4-1/2" EH.

Two hydro back pressure valves, STOP ED 1937, Serial No. 51306 - 6-5/8" Reg. Box - Pin complete with No. 31031 STOP Ring No. 18345-4 drop valve Serial No. 50381, 5" H-90 pin complete with No. 31031 STOP ring and one 8345-4 drop valve.

#### Handling Tools

One 8" collar elevator, MGG 7-1/2 7-1/2 ID.

One 6-3/4" collar elevator MGG 6-3/16 ID.

Two 4", 18° MGG, pipe elevators.

#### Slips

One set 5-1/2" x 7" Woolley Type A collar slips.

One set 6-3/4" x 8-1/4" Woolley type A collar slips.

Two sets 4-1/2" Woolley drill pipe slips.

#### Casing Tools

##### Elevators

One 20" H-150 Web Wilson, 150-ton elevator plus pickup elevator.

One 16" H-150 Web Wilson, 150-ton elevator plus pickup elevator.

One 13-3/8" H-150 Web Wilson, 150-ton elevator plus pickup elevator.

One 9-5/8" H-150 Web Wilson, 150-ton elevator plus pickup elevator.

One 7" H-150 Web Wilson, 150-ton elevator plus pickup elevator.

##### Slips

One Type HCS 20" hinged spider, inserts for 16" and 20" casing.

One set each CMSX casing slips for 20" and 16" casing.

##### Combination

One B.J. 350-ton, 13-3/8" slips and elevators complete with 13-3/8", 9-5/8" and 7" inserts with Varco solid master bushing complete with 13-3/8", 9-5/8" and 7" casing inserts with Varco slips for 7", 9-5/8" and 13-3/8" and 16" casing.

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Workshop

One 40" x 38" integral with rig shelter.

Cementing Unit

Mixing Skid Complete.

Incinerator

Howell Refractories - Model CY100, Serial No. 1054.

Water Pump and Line

G-D Duplex FFFXFE, Serial No. 625496 and Detroit diesel Model PTA-41081.

5,200' lighting line.

Fishing Equipment

149' (5 joints) of 10-3/4" 55.5# wash pipe.

150' (5 joints) of 8" 31# wash pipe.

10-3/4" and 8-1/8" wash pipe drive sub.

10-3/4" and 8-1/8" conventional shoe.

9-5/8" and 7" junk subs.

10-3/4" elevators with 8-1/8" inserts.

Bowen series 150-8-1/8" overshot assembly No. 9815 with:

- 6" grapples
- 6" mill control packs
- 6-3/4" grapple
- 6-3/4" cut lipped guide
- 6-3/4" pack off.

Bowen series 150-10-5/8" overshot assembly No. 5321 with:

- 9" grapples
- 9" cut lipped guide
- 9" pack off
- 8" back grapple
- 8" plain control packer.

One 8-1/8" O.D. Bowen Junk Basket complete with convention Type "A" shoe, magnetic insert assembly, Shoe No. 61955.

One junk sub 9-5/8" x 6-5/8" pin box.

One junk sub 7" x 4-1/2" regular pin box.

One 11-1/4" O.D. Bowen Junk Basket complete with conventional Type "A" shoe and magnetic insert assembly No. 61977.

#### Intercom System

Sound Service - 8 station telephone system.

#### Fire Fighting Equipment

Two wheeled Ansuls, Model WDC-150D

14 hand Ansuls 30#.

#### Safety Equipment

Six Scott airpicks with Bauer compressor Model TA13E, Serial No. 97762 with spare bottle.

One Safety Supply resuscitator.

Two First Aid Kits.

Stretcher baskets.

#### Tractor and Crane

Caterpillar D-5 crawler tractor, Serial No. 963495 complete with cab angle dozer Prentice hydraulic crane Serial No. 8T-Z1208-7307 with hydraulic outrigger.

#### Fork Lift

Caterpillar Tow Motor, Model V60B, Serial No. 83M345 complete with cab.

#### Accumulator - Tank Cap - 244 Gal.

Koomey - T-15160-3S, Serial No. 5339, with triplex pressure pump, Model T315-15-3, Serial No. 731376B-514 with two air pumps.

Koomey remote control station ERC-6, Serial No. 5339.

#### Blowout Preventers

One 20" Shaffer spherical preventer with 20", 2,000-lb. flanged bottom, BHM 217, Serial No. 4427.

One 13-5/8" Shaffer Spherical preventer, 13-5/8", 5,000 lb. with hub bottom, HN-210, Serial No. 59965.

Two 13-5/8" Shaffer LWS Autolock single-gate preventers with hub top and bottom, two 3" hubbed outlets, Serial Nos. 139659-51 and 139659-49.

One 13-5/8" Shaffer LWS Autolock single-gate shear ram preventer, hubbed top and bottom, two 3" hubbed outlets, Serial Nos. 13969648.

One 13-5/8" 5,000 PSI hubbed spool with two 3" hubbed outlets.

One 13-5/8" 5,000 PSI hubbed spool with two 3" hubbed outlets - spare.

Four 13-5/8" 5,000 PSI CIW clamps.

Twenty-one 3" 5,000 PSI CIW clamps.

Three 3" 5,000 PSI clamps - spare.

Seven 3" flanged 5,000 PSI Shaffer manual valves, Serial Nos. B0210, B0207, B0130, B0151, B0202, B0133, B0212.

One 2" 5,000 PSI Shaffer manual valve Serial Nos. B0303.

Two 3" flanged to hub 5,000 PSI Shaffer, changeover flanges.

Four Shaffer 3" PSI hydraulic valves, Serial Nos. B0477, B0474, B0224, B0475.

Six 3" flanged to hub adapters.

Three 3" hub to hub adapters.

One 3" hub to hub adapters, 3" spare.

One 3" welded hub 5,000 PSI - In use.

Four 3" 5,000 PSI blank hub.

Two 3" 5,000 PSI blank flanged.

Two 3" four way block cross studded 5,000 PSI.

One 3" three way cross flanged 5,000 PSI.

One 3" manual Shaffer adjustable Type 34 standard trim choke.

Two 3" 5,000 PSI hubbed Shaffer checked valves.

Two bulk assemblies for 13-5/8" CIW clamp - spare.

Two Ten ton Coffing chain hoist No. M-1007-F.

Two Three ton Coffing Chain Hoist No. M-304-F.

## Pumps

Three Halliburton HT400 triplex mud pumps, Serial Nos. HT825, HT8609 complete with Gist fluid ends, Serial Nos. 167, 165, 164 and 168.

## Mud System

Eight helicopter portable steel mud tanks with internal piping and walkways. 12' x 8' x 10', approximate total capacity 1,000 bbls.

Double Thompson Shale Shakers, Model B54-D, Serial Nos. B54D-285.

Four mud mixing units. Cat. D330, Serial Nos. 4B6622, 4B6634, 4B6213, 4B6636 with Ash centrifugal pumps, Type B-6-5, Serial Nos. 13540-UH, 13541-UH, 13542-UH, 13543-UH.

Two Automatic Mud Hoppers - Thompson with Crofts, Serial Nos. 320 1116-6 and EXP 3485661 right angle drives.

One conventional Mud Hoppers.

One Swaco Degasser, Serial No. 843 complete IR Type 30 Model 255, vacuum pump Serial No. 30T324689.

One Pioneer 12 cone desilter, Model J12-45, 12 cone silt master, Serial No. CP4-154 with one 30 HP electric motor, Serial No. S3-03233-069.

One Pioneer Centrifuge, Serial No. C1304 complete with a Power Unit Serial No. SPU-5 with Ash pump Model B65, Serial No. 13544UH.

One Ash pump Model B65, Serial No. 13544UH.

One Pioneer desander Model S2-12, Serial No. 7363 with Caterpillar, Cat. D330, Serial No. 4B6639, with Ash pump, Serial No. 13452UH.

Two Kelly Hoses 3" Max. W.P. 4,000 PSI - Serial Nos. MAC-0404 and MKA-007R.

## Alarm System

One Measurand, Model 2013, Serial No. 55.

## Water Tanks

Eight steel enclosed water tanks, approximately 900 barrels total.

## Fuel Tanks

Eight steel enclosed diesel fuel tanks, approximately 900 barrels.

### Light Plants

Three Caterpillar D-3306, 125KW, 60 cycle generators each powered by Cat D-3306 turbo charged diesel engines, Serial Nos. 66D10106 Gen-100TH3651, 66D10101. Gen-100TH3658, 66D10105, Gen-1002H3660.

### Dog House

Helicopter, insulated aluminum top mounted dog house with knowledge box, storage bins.

### Welders

One Lincoln Shield Arc, SAE 300-220 electric welding machine, Serial No. A717780, complete with necessary leads, diesel power 220F, Serial No. 695854-6469.

One Lincoln Shield Arc, SAE 300, DC welder, Type S-7038, Serial No. TAM6547.

Two Oxy Acetylene sets complete.

### Toolpushers Unit

1973, 4 wheel drive Ford Crew Cab, Model F260, Serial No. F268CR68851.

### Storage Cabinets

Three helicopter portable bins, 6' high x 8' wide x 4' deep, 8 bins per side.

### Shale and Sand Augers

Two 6" x 22' screw conveyors with 7-1/2 HP electric motors and shaft mounted gear reducers, Couttf Model.

Three Westinghouse electric motors.

### Exhaust Fans

One Squirrel.

One conveyor belt for shale remover - Universal Trof belt Model No. KL18-4500, Serial No. 1071548.

### Portable Centrifuge Pumps

One electric 3" pump Model 15CCE, Barns.

Two Yellow Dogs.

Three-inch Pumps.

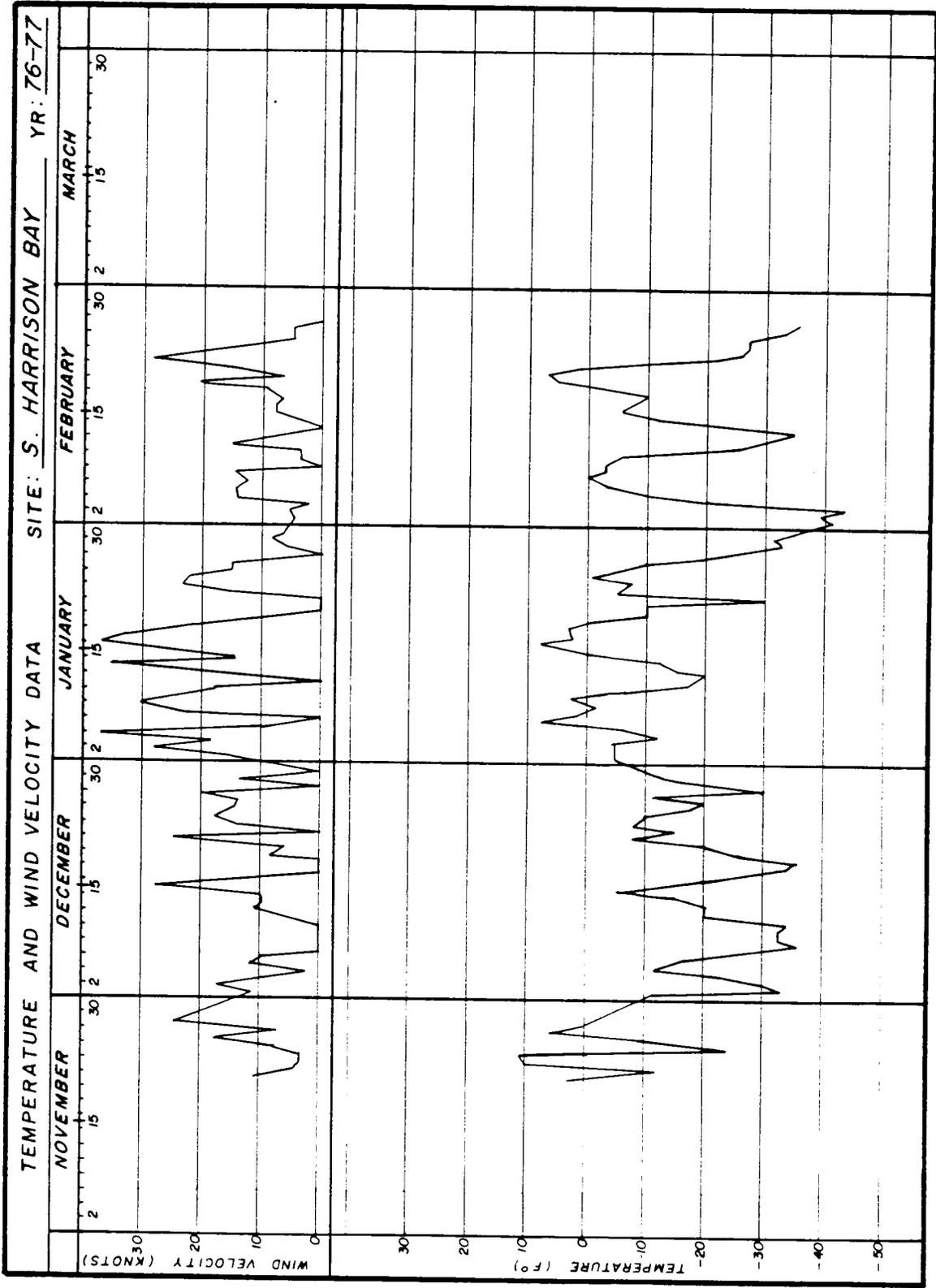
## Environmental Equipment

One Marina Type ADS water treatment system including (1) hypochlorinator (2) sediment filter (3) iron filter (4) taste filter (5) water softner. All unitized in 8' x 40' steel insulated building with a 4,500 gallon water tank. Two Maytag washers and dryers.

One Met-Pro IPC 2 4000 sewage treatment unit sr. 5990-1.

One Comptro A-20 oil-fired pathological waste disposal unit.

The above two items unitized in a 19' x 40' steel insulated building with all piping and heating.



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