

<b>NOTICE OF STAKING</b> (Not to be used in place of Application to Drill Form 9-331-C)		<b>RMOGA</b> 5/3/82	<b>5. Lease Number</b> total of 1920 acres U-32109 expires 3/31/86
1. Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other <input type="checkbox"/>		<b>6. If Indian, Allottee or Tribe Name</b> -----	
2. <b>Name of Operator</b> ARCO Oil and Gas Company, a Division of Atlantic Richfield Company		<b>7. Unit Agreement Name</b> Proposed Buck Knoll Unit	
3. <b>Address of Operator or Agent</b> P.O. Box 5540, Denver, Colorado 80217		<b>8. Farm or Lease Name</b> N/A	
4. <b>Surface Location of Well</b> surveyed at: (Governmental 1/4 or 1/4 1/4)  880' FSL and 1885' FWL Sec. 36-T37S-R4½W <b>Attach: Topographical or other acceptable map showing location, access road, and lease boundaries.</b>		<b>9. Well No.</b> ARCO Buck Knoll Unit #1	
14. <b>Formation Objective(s)</b> Kaibab @ 8847' Cedar Mesa @ 9359'		<b>10. Field or Wildcat Name</b> Wildcat	
15. <b>Estimated Well Depth</b> 9600'		<b>11. Sec., T., R., M., or Blk and Survey or Area</b> S.L.M. SE/4 SW/4 Sec. 36-T37S-R4½W	
		<b>12. County or Parish</b> Garfield Co.	<b>13. State</b> Utah

- 16. To Be Completed by Operator Prior to Onsite**
- a. Location must staked
  - b. Access Road Flagged
  - c. Sketch and/or map of location, showing road, pad dimensions, reserve pit, cuts, and fills  
(To be provided at onsite)

- 17. To Be Considered By Operators Prior to Onsite**
- a. H<sub>2</sub>S Potential
  - b. Private Surface Ownership
  - c. Cultural Resources (Archaeology)
  - d. Federal Right of Way

**RECEIVED**  
  
AUG 27 1984  
  
DIVISION OF OIL  
GAS & MINING

**18. Additional Information**

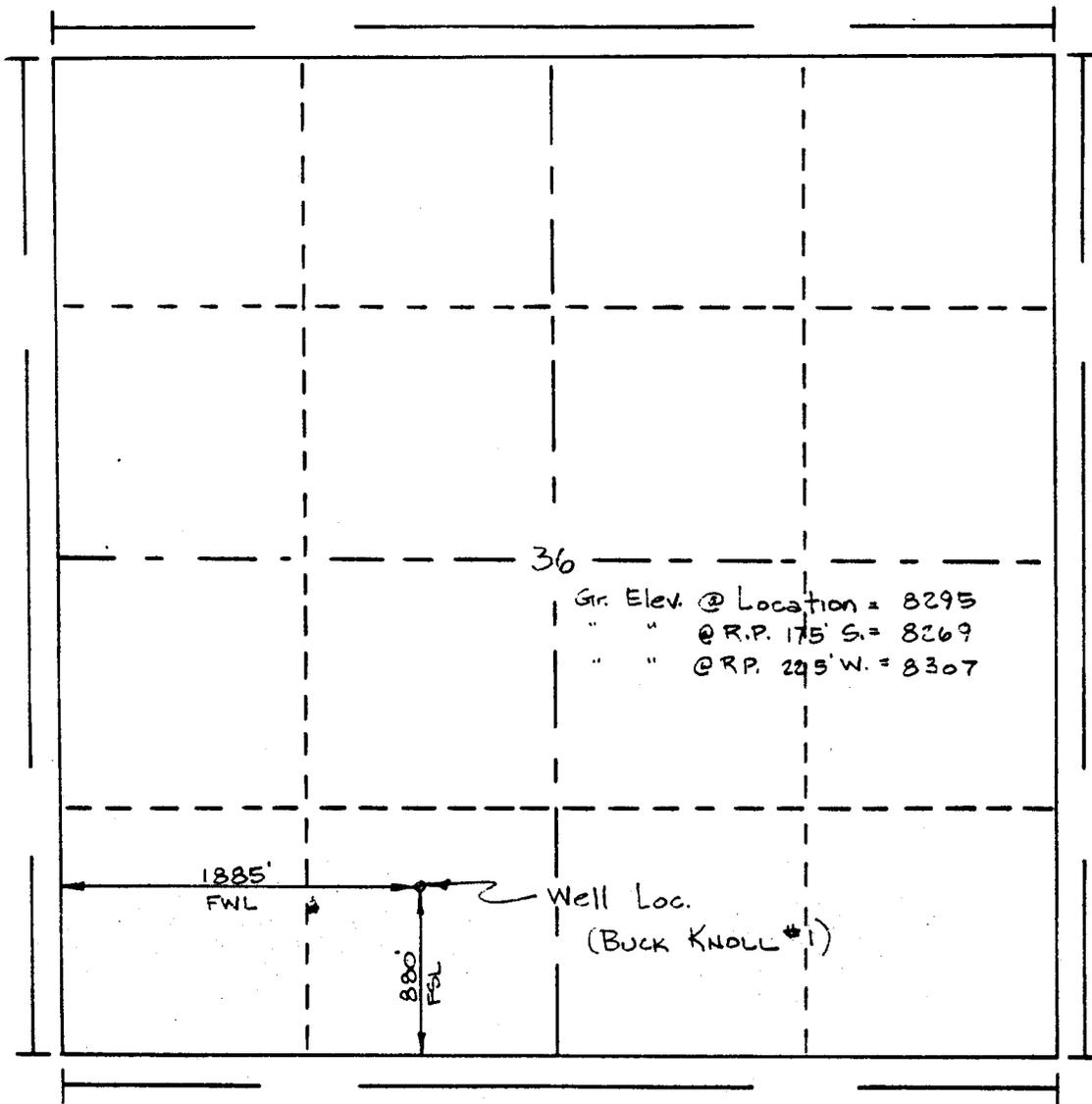
1. Attached are the certified survey plat, cross section and cuts and fills.
2. H<sub>2</sub>S is not anticipated but due to the uncertainty within the area, H<sub>2</sub>S safety equipment will be on location from surface to TD.

**19. Signed** W. A. Walther, Jr. <sup>HRC</sup> **Title** Operations Manager **Date** 8/21/84

3. The surface is administered by the U.S. Forest Service and is within the Dixie National Forest boundaries. Contact Mr. Clair Baldwin at (801) 676-8815.
4. For any questions regarding this permit, please contact Harold Engel at (303)293-7305 or Suzanne Barnes at (303)293-1077.
5. The Buck Knoll Unit was designated on June 26, 1984.
6. The proposed Buck Knoll Unit map is attached.
7. All access roads will be within the Buck Knoll Unit boundary, therefore, a Federal Right-of-Way is not required.



R. 4 1/2 W.



T. 37 S.



Gr. Elev. @ Location = 8295  
 " " @ R.P. 175' S. = 8269  
 " " @ R.P. 295' W. = 8307

Scale... 1" = 1000'

**Powers Elevation of Denver, Colorado**  
 has in accordance with a request from HARRY ENGLE  
 for ARCO OIL & GAS CO.  
 determined the location of BUCK KNOLL #1  
 to be 880' FSL & 1885' FWL of Section 36 Township 37 South  
 Range 4 1/2 West of the SALT LAKE Meridian  
 GARFIELD County, UTAH

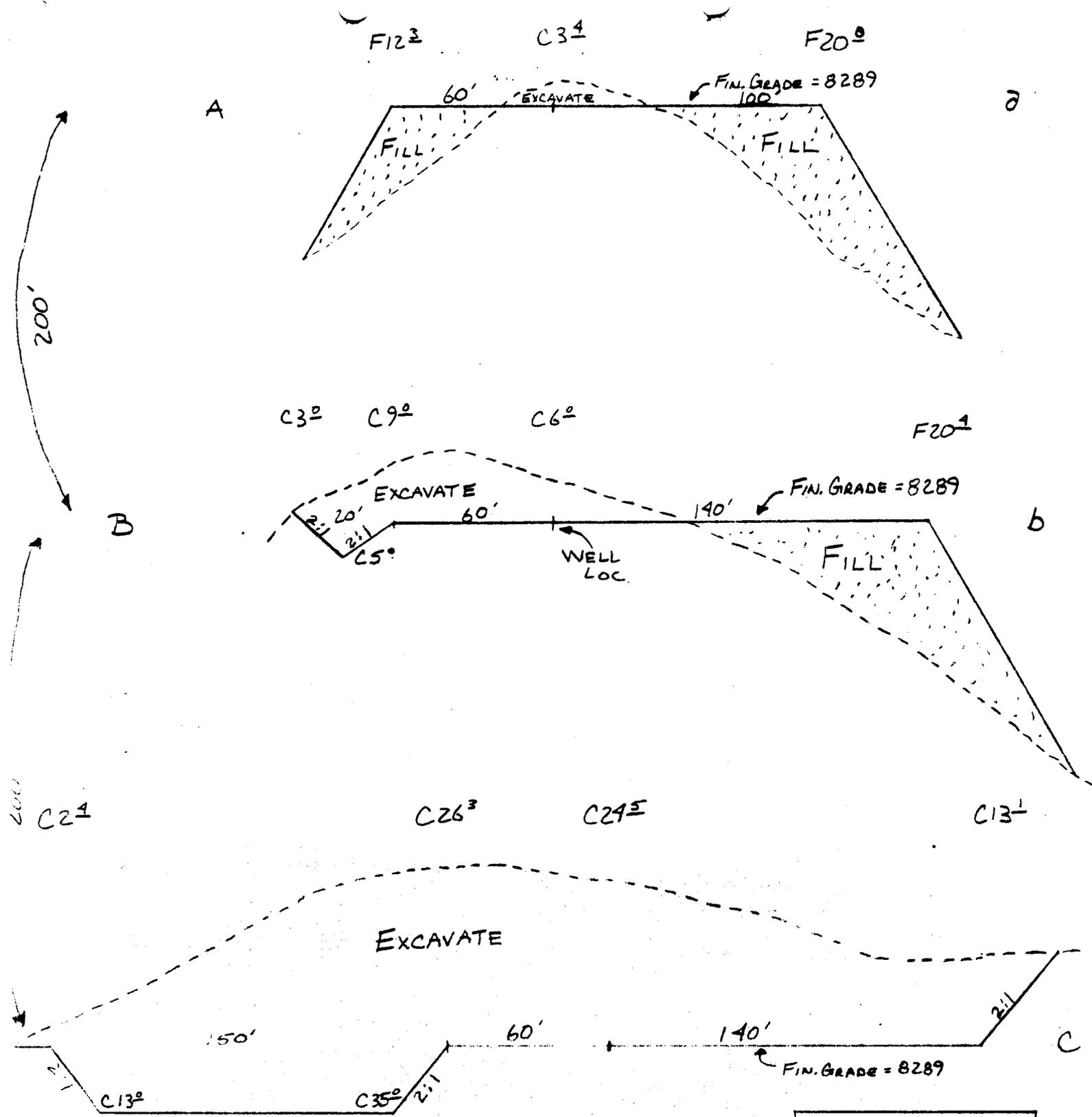
I hereby certify that this plat is an  
 accurate representation of a correct  
 survey showing the location of



Date: JULY 23, 1984

E. Samuel Stegeman  
 Licensed Engineer  
 State of COLORADO

No. 20596  
 "Utah exception"



----- EXISTING GROUND  
 \_\_\_\_\_ PROPOSED GRADE

(Cut or FILL) is Cut or FILL from EXISTING GROUND TO FINISH GRADE

SCALES: 1" = 50' Horiz.  
 1" = 20' Vert.  
 All sideslopes @ 1.5:1 unless marked otherwise

± 19,630 yd<sup>3</sup> FILL  
 ± 29,000 yd<sup>3</sup> CUT

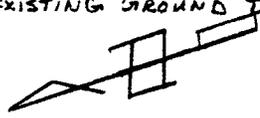
NOTE: YARDAGE MAY VARY WITH FINAL PAD SIZE

ARCO OIL & GAS  
 BUCK KNOLL #1  
 SE-SW 36-37S-4 1/2 W  
 GARFIELD Co., UTAH

July 24, 1983  
 B.A. UTLEY

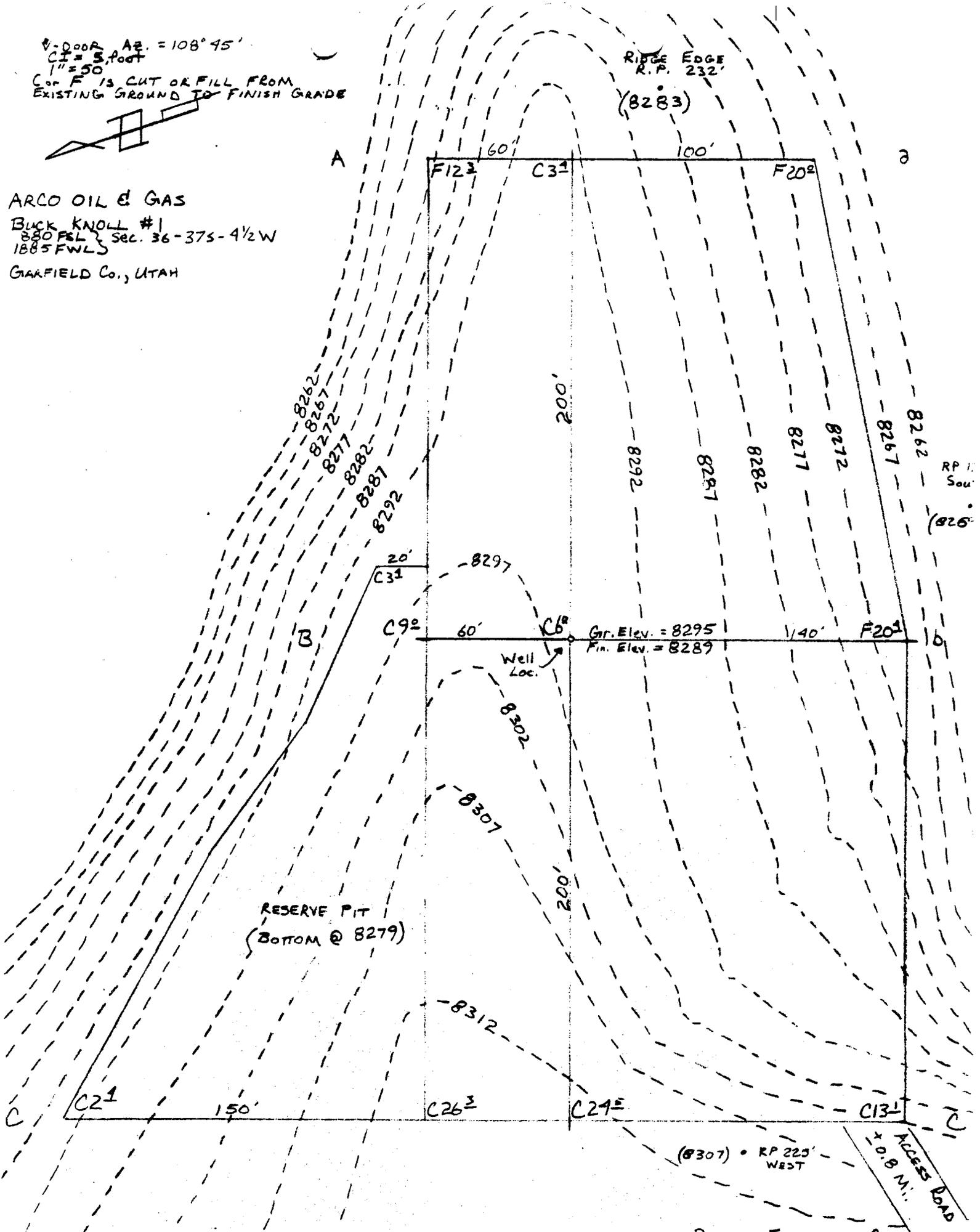
POWERS ELEVATION Co.  
 RICHFIELD, UTAH

$\Delta = 0.0004$  AZ. =  $108^{\circ}45'$   
 $CI = 5$  foot  
 $1" = 50'$   
 Cop F IS CUT OR FILL FROM  
 EXISTING GROUND TO FINISH GRADE



ARCO OIL & GAS  
 BUCK KNOLL #1  
 880 FSL, Sec. 36-37S-4 1/2 W  
 1885 FWL  
 GARFIELD Co., UTAH

RIDGE EDGE  
 R. P. 232'  
 (8283)



RESERVE PIT  
 (BOTTOM @ 8279)

Gr. Elev. = 8295  
 Fin. Elev. = 8289

(8307) • RP 225'  
 WEST

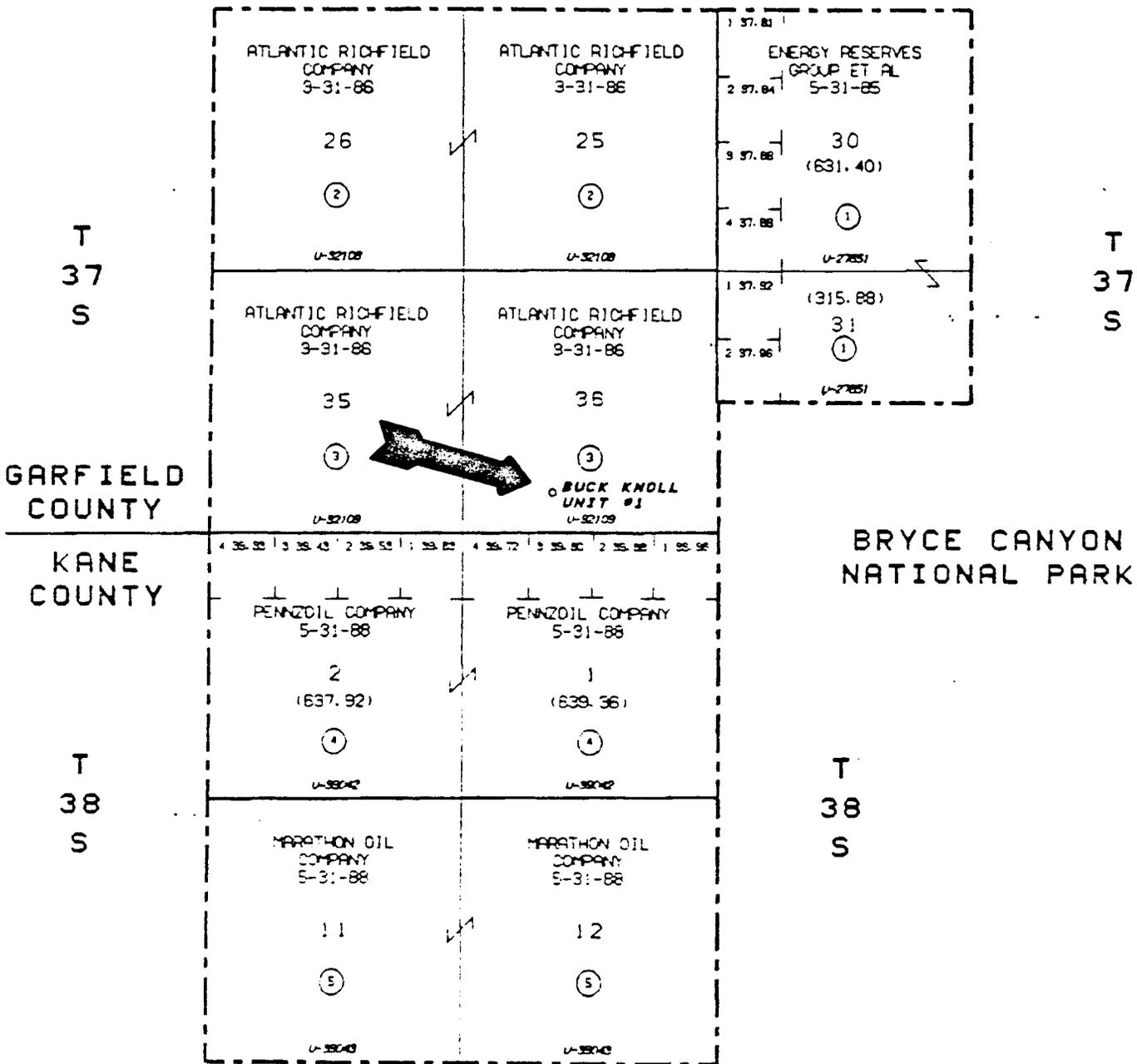
ACCESS ROAD  
 \* 0.8 MI.

POWERS ELEVATION Co.  
 RICHFIELD, UTAH

July 24, 1984  
 Brooks UTLEY

R 4 1/2 W

R 4 W



R 4 1/2 W

	ACREAGE	PERCENTAGE
 FEDERAL LANDS	6,084.58	100.00%
TOTAL	6,084.58	100.00%
 TRACT NUMBER		
 UNIT BOUNDARY		



NOTE: ALL SECTIONS ARE 640.00 ACRES UNLESS OTHERWISE NOTED

ARCO Exploration Company

Division of Atlantic Richfield Company  
WESTERN U.S. OPERATIONS  
DENVER, COLORADO

EXHIBIT "A"  
BUCK KNOLL UNIT AREA  
GARFIELD AND KANE  
COUNTIES, UTAH

DATE BY: _____	DATE: _____	BY: _____
DRAWN BY: _____	FILE NO: _____	DATE: _____
SCALE: _____	SCALE: _____	SCALE: _____
SCALE: _____	SCALE: _____	SCALE: _____

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

5. LEASE DESIGNATION AND SERIAL NO.

U-32109

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

N/A

7. UNIT AGREEMENT NAME

Buck Knoll Unit

8. FARM OR LEASE NAME

N/A

9. WELL NO.

Buck Knoll Unit #1

10. FIELD AND POOL, OR WILDCAT

Wildcat

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

Sec. 36-T37S-R4E-1/2W

12. COUNTY OR PARISH

Garfield

13. STATE

Utah

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK

DRILL

DEEPEN

PLUG BACK

b. TYPE OF WELL

OIL WELL

GAS WELL

OTHER

SINGLE ZONE

MULTIPLE ZONE

2. NAME OF OPERATOR

ARCO Oil and Gas Co., A Division of Atlantic Richfield Company

3. ADDRESS OF OPERATOR

P.O. Box 5540, Denver, CO 80217

RECEIVED

SEP 17 1984

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)\*

880' FSL & 1885' FWL, SE1/4 SW1/4

At proposed prod. zone

approx. the same

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE\*

Approx 33 mi SE of Panguitch, Utah

DIVISION OF OIL  
GAS & MINING

15. DISTANCE FROM PROPOSED\*  
LOCATION TO NEAREST  
PROPERTY OR LEASE LINE, FT.

880'

16. NO. OF ACRES IN LEASE

1920

17. NO. OF ACRES ASSIGNED  
TO THIS WELL

Not assigned

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

none

19. PROPOSED DEPTH

9600'

20. ROTARY OR CABLE TOOLS

Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.)

Ground elevation: 8295'

22. APPROX. DATE WORK WILL START\*

10-15-84

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
32"	24"	103#/ft cond	±150'	Cmt to surf-approx 450 sx
14-3/4"	10-3/4"	51#, K-55, STC	±4000'	Cmt to surf-approx 1630 sx
9-1/2"	5-1/2"	17#, L-80, LTC	9600'	Cmt to 500' above upper prod zone, approx. 570 sx

A 7-5/8" contingency string will be considered if hole conditions dictate. At that time a Sundry Notice will be filed. Propose to drill to 9600' to test the Kaibab fm @ 8847'. This permit is being filed in accordance with Onshore Oil & Gas Order Number 1.

Attachments:

- Drilling Program with Exhibits
- Surface Use Plan with Exhibits.
- ARCO Oil and Gas Company is the current lessee of record on the subject lease.
- The subject lease expires 3-31-86

For any questions concerning this subject please call Mr. Harry Engel of our Drilling Department at (303) 293-7305.

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 prevention program, if any.

24. SIGNED Larry Morse TITLE Operations Manager DATE 12 SEPT. 1984  
(This space for Federal or State office use)

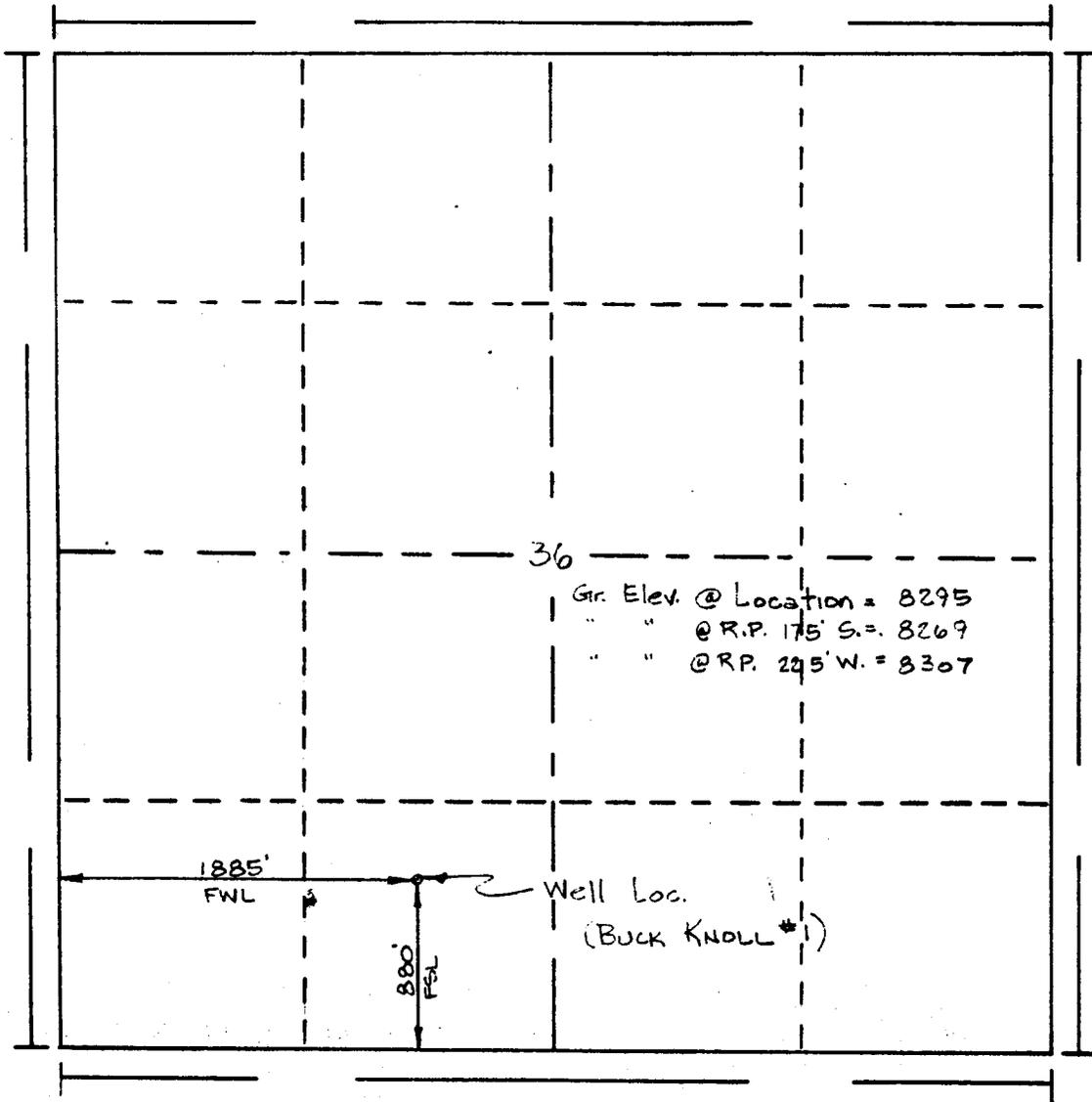
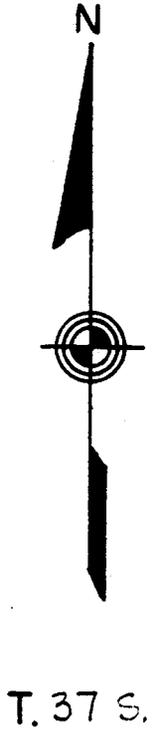
PERMIT NO \_\_\_\_\_

APPROVED BY THE STATE  
OF UTAH DIVISION OF  
OIL, GAS, AND MINING  
DATE 9/25/84  
BY: John R. Bays

APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_  
CONDITIONS OF APPROVAL, IF ANY:



R. 4 1/2 W.



Scale... 1" = 1000'

**Powers Elevation of Denver, Colorado**  
 has in accordance with a request from HARRY ENGLE  
 for ARCO OIL & GAS CO.  
 determined the location of BUCK KNOLL #1  
 to be 880' FSL & 1885' FWL of Section 36 Township 37 South  
 Range 4 1/2 West of the SALT LAKE Meridian  
 GARFIELD County, UTAH

I hereby certify that this plat is an  
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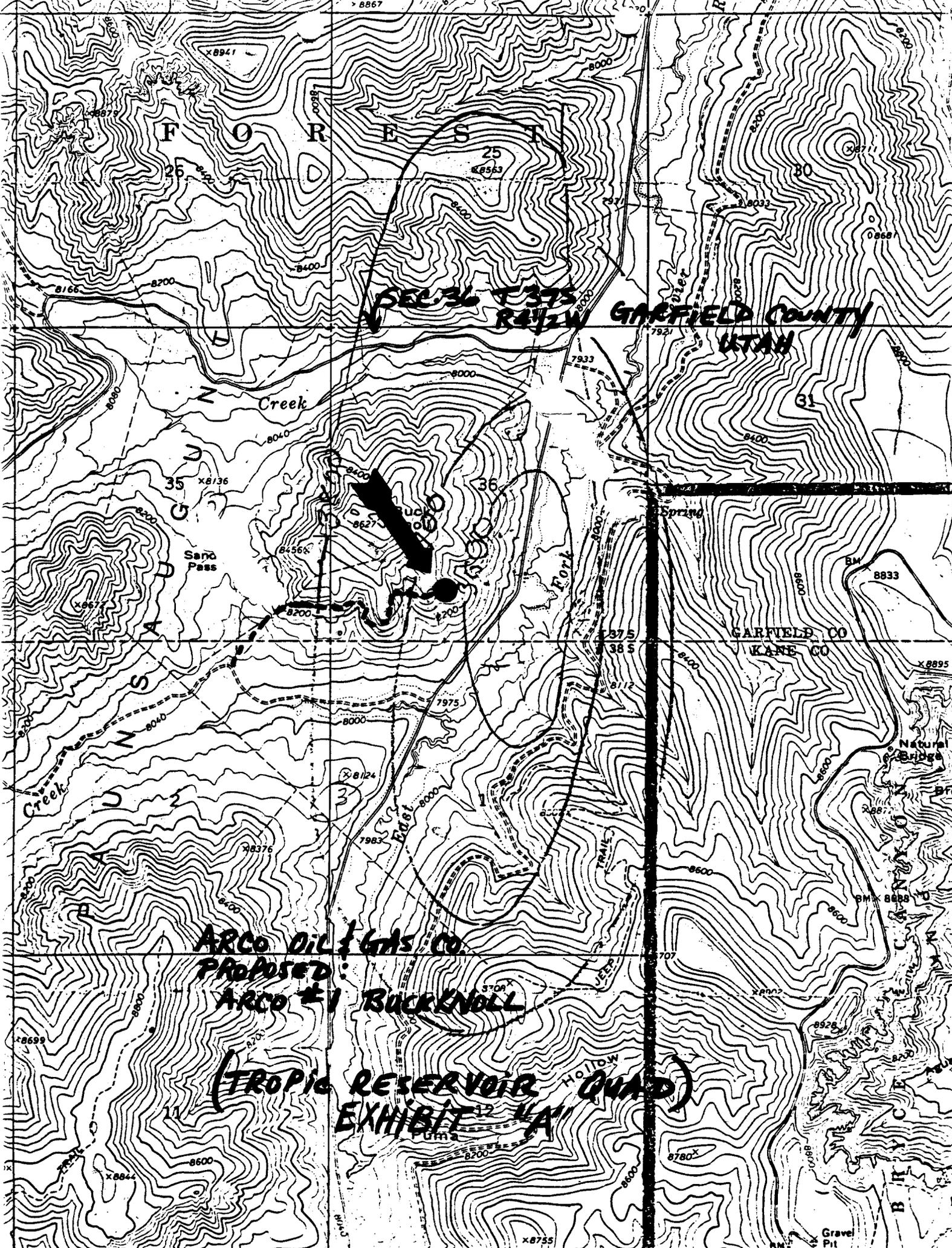


Date: JULY 23, 1984

E. Samuel Stegeman

Licensed Engineer  
State of COLORADO

No. 20596  
"Utah exception"



FOREST

GARFIELD COUNTY UTAH

GARFIELD CO KANE CO

ARCO OIL & GAS CO.  
PROPOSED  
ARCO #1 BACKHILL

(TROPIC RESERVOIR QUAD)  
EXHIBIT 1A

SECT 36 T37S R41W



Creek

Fork

Spring

Natural Bridge

Gravel Pit

8867

8600

8000

8200

8400

8875

8941

8563

8000

8667

8166

8200

8400

8000

8000

8000

8200

8080

8040

8000

7921

8400

8600

8136

8456

8200

7933

8833

8080

8040

8000

7375

8400

8000

8895

8080

8040

8000

7385

8400

8000

8895

8080

8040

8000

7812

8400

8000

8895

88376

7983

8000

8112

8400

8000

8895

8080

8040

8000

7907

8400

8000

8895

8669

8800

8200

8000

7707

8400

8000

8895

8644

8600

8200

8000

7780

8400

8000

8895

8735

8000

8895

BUREAU OF LAND MANAGEMENT  
CEDAR CITY DISTRICT  
CONDITIONS OF APPROVAL FOR PERMIT TO DRILL

Company: ARCO Oil & Gas Company

Well No.: Buck Knoll  
Unit #1

Location: SE/4 SW/4 Sec. 36-T37S-R4-1/2W S.L.M. Lease No.: U-32109

Onsite Inspection Date: August 29, 1984

All lease and/or unit operations will be conducted in such a manner that full compliance is made with applicable laws, regulations (43 CFR 3100), Onshore Oil and Gas Order No. 1, and the approved plan of operations. The operator is fully responsible for the actions of his subcontractors. A copy of these conditions will be furnished the field representative to ensure compliance.

A. DRILLING PROGRAM

1. Surface Formation and Estimated Formation Tops:

Straight Cliffs	- Surface	Sinbad	- 8254'
Tropic	- 1345'	Kaibab	- 8447'
Dakota	- 2442'	Toroweap	- 8750'
Carmel	- 2934'	Organ Rock	- 9110'
Navajo	- 4100'	Cedar Mesa	- 9359'
Chinle	- 6640'		
Shinarump	- 6998'		
Moenkopi	- 7127'		

2. Estimated depth at which oil, gas, water or other mineral-bearing zones are expected to be encountered:

Formation & Depth

Expected oil zones: Poss. Sinbad @ 8254'; Poss. Kaibab @ 8447'; Poss. Cedar Mesa @ 9359'

Expected gas zones:

Expected water zones: Poss Dakota @ 2442'; poss Cedar Mesa @ 9359'; Poss Navajo @ 4100'

Expected mineral zones: None anticipated

All fresh water and prospectively valuable minerals (as described by BLM at onsite) encountered during drilling will be recorded by depth, cased and cemented. All oil and gas shows will be tested to determine commercial potential.

3. Minimum Specifications for Pressure Control:

Exhibit "A" is a schematic diagram of the blowout preventer equipment. The annular preventer will be tested to 1500 psi and the pipe and blind rams will be tested to 3000 psi upon nipple up. Pipe rams will be operationally checked each 24-hour period, as will blind rams and annular preventer each time pipe is pulled out of the hole. All checks of BOP will be noted on Daily Drilling Reports. Accessories to BOP equipment will include an upper and lower kelly cock, a floor safety valve, a drill string BOP, and a choke manifold with equipment pressure rating equal to the BOP stack.

Choke manifold and safety valves will be pressure tested to 3000 psi upon nipple-up. Exhibit "A" also shows the proposed Accumulator Unit and Choke Manifold. Hydraulic controls for BOPE will be located at the Accumulator Unit with hand wheel back-up.

BOP systems will be consistent with API RP 53. Pressure tests will be conducted before drilling out from under all casing strings which are set and cemented in place. Blowout preventer controls will be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned. Preventers will be inspected and operated at least daily to ensure good mechanical working order, and this inspection recorded on the daily drilling report. Preventers will be pressure tested before drilling casing cement plugs. The Resource Area will be notified 48 hours in advance when pressure tests are to be conducted.

4. Proposed Casing Program:

<u>Casing</u>	<u>Hole Size</u>	<u>Hole Interval</u>	<u>Length</u>	<u>OD</u>	<u>Section Size Weight, Grade Connection</u>	<u>New/Used</u>
Conductor	32"	0 - 150'	150'	24"	103#, welded jt.	New
Surface	14-3/4"	0 - 4000'	4000'	10-3/4"	51# ,K-55,STC	New
Production	9-1/2"	0 - 9600'	9600'	5-1/2"	17#, L-80, LTC	New

Cement Program:

Conductor: Cmt to surf w/approx 450 sx Cl "H" neat cmt.

Surface Casing: 2 stages w/DV tool @ ±2650'  
 1st Stage: 4000'-2650': mix & pmp 310 sx "Lite" cmt + add mixed @ 12.7 ppg; yield 1.84 ft<sup>3</sup>/sx, foll'd by 320 sx Cl "H" + add mixed @ 16.4 ppg; yield 1.06 ft<sup>3</sup>/sx. 2nd Stage: 2650'-surf: mix & pmp 1000 sx "Lite" cmt + add mixed @ 12.7 ppg; yield 1.84 ft<sup>3</sup>/sx. Cmt will be circulated to surf.

Production Casing: Mix & pmp approx 570 sx Cl "H" w/2% CaCl<sub>2</sub> + add mixed @ 15.5 ppg, yield 1.22 ft<sup>3</sup>/sx. Est top of cmt @ 7900'.

Note: Hole conditions will dictate type and percentage of additives to be used.

All potentially productive hydrocarbon zones will be cemented to prevent communication. Actual production casing cement volumes will be based upon caliper log plus 15%-20% excess.

Anticipated cement tops will be reported as to depth, not the expected number of sacks. The Resource Area will be notified 48 hrs in advance when running casing strings and cement.

5. Type and Characteristic of Proposed Drilling Fluids:

Mud system will be gel-chemical for the surface hole with adequate stocks of sorptive agents on site to handle possible spills of fuel and oil on the surface. Adequate mud materials will be stockpiled on location to completely rebuild entire mud system volume (surface volume + hole volume). Surface volume estimated at ±500 bbls. An aerated mud system will be used below the surface casing.

<u>Depth</u>	<u>Type</u>	<u>Weight #/gal.</u>	<u>Visc. sec/qt.</u>	<u>Fluid Loss</u>
0'-4000'	Fresh water gel, lime, spud mud	8.3-8.6	30-40	No control
4000'-TD	Aerated mud	Hole conditions will dictate mud weights & rheological properties.		

No chromates or other toxic chemicals will be used in the mud system.  
 A shale shaker, desander, and desilter will be utilized to aid in solids control when drilling with mud.

Blooie line will be misted to reduce fugitive dust when air drilling.

6. Coring, Logging, and Testing Program:

- a. Coring: Three 60' cores in the Kaibab.
- b. DSTs: Four open hole DSTs are planned in the Kaibab.
- c. Logging as follows:

	<u>Open Hole</u>	<u>Cased Hole</u>
	BHCS/GR/SP/DIL-All csg pts to base of surf csg	CBL/CCL/GR/VDL-TD to TOC
FDC/CNL/GR/Cal	- " " " "	
Dipmeter	- " " " "	
VSP	- TD - surface	

Whether the well is completed as a dry hole or as a producer, "Well Completion and Recompletion Report and Log" (Form 3160-4) will be submitted to the District Office not later than thirty (30) days after completion of the well or after completion of operations being performed, in accordance with 43 CFR 3164. Two copies of all logs, core descriptions, core analyses, well test data, geologic summaries, sample description, and all other surveys or data obtained and compiled during the drilling, workover, and/or completion operations, will be filed with Form 3160-4. Samples (cuttings, fluids, and/or gases) will be submitted when requested by the Cedar City District Manager.

7. Abnormal Conditions, Bottom Hole Pressures and Potential Hazards:

No abnormal pressures or temperatures have been noted or reported in wells drilled in the area nor at the depths anticipated in this well. H<sub>2</sub>S is not anticipated at any depths in this well. However, due to lack of offset data, H<sub>2</sub>S safety equipment will be on location from surf to TD, a complete H<sub>2</sub>S contingency plan will be filed under a separate cover.

8. Anticipated Starting Dates and Notifications of Operations:

The operator will contact the Kaibab Resource Area at (801)642-2672, and the USFS in Panguitch, Utah at (801)676-8815, forty-eight (48) hours prior to beginning any dirt work on this location.

No location will be constructed or moved, no well will be plugged, and no drilling or workover equipment will be removed from a well to be placed in a suspended status without prior approval of the District Manager. If operations are to be suspended, prior approval of the District Manager will be obtained and notification given before resumption of operations.

The spud date will be reported orally to the Area Manager (Cedar City District at 801-586-2401) within a minimum of twenty-four (24) hours prior to spudding. Written notification in the form of a Sundry Notice (Form 3160-5) will be submitted to the District Office within twenty-four (24) hours after spudding. If the spudding occurs on a weekend or holiday, the written report will be submitted on the following regular work day.

In accordance with Onshore Oil and Gas Order No. 1, this well will be reported on Form 9-329, "Monthly Report of Operations", starting with the month in which operations commence and continue each month until the well is physically plugged and abandoned. This report will be filed directly with the BLM Cedar City District Office, P.O. Box 724, Cedar City, Utah 84741.

Immediate Report: Spills, blowouts, fires, leaks, accidents, or any other unusual occurrences shall be promptly reported to the Resource Area in accordance with requirements of NTL-3A.

If a replacement rig is contemplated for completion operations, a "Sundry Notice" (Form 3160-5) to the effect will be filed for prior approval of the District Manager, all conditions of this approval plan are applicable during all operations conducted with the replacement rig. In emergency situations, verbal approval to bring on a replacement rig will be approved by the District Petroleum Engineer.

ARCO Oil & Gas Company  
Buck Knoll Unit #1  
SE/4SW/4, Sec. 36-T37S-R4-1/2W S.L.M.  
Garfield County, Utah  
Page 5

Should the well be successfully completed for production, the District Manager will be notified when the well is placed in a producing status. Such notification will be sent by telegram or other written communication, not later than five (5) business days following the date on which the well is placed on production.

A first production conference will be scheduled within fifteen (15) days after receipt of the first production report. The Resource Area Office will coordinate the field conference.

No well abandonment operations will be commenced without the prior approval of the District Manager. In the case of newly drilled dry holes or failures, and in emergency situations, oral approval will be obtained from the District Petroleum Engineer. A "Subsequent Report of Abandonment" (Form 3160-5) will be filed with the District Manager within thirty (30) days following completion of the well for abandonment. This report will indicate where plugs were placed and the current status of surface restoration. Final abandonment will not be approved until the surface reclamation work required by the approved APD or approved abandonment notice has been completed to the satisfaction of the Area Manager or his representative, or the appropriate surface managing agency.

Approval to vent/flare gas during initial well evaluation will be obtained from the District Office. This preliminary approval will not exceed 30 days or 50 MMCF gas. Approval to vent/flare beyond this initial test period will require District Office approval pursuant to guidelines in NTL-4A.

Upon completion of approved plugging, a regulation marker will be erected in accordance with 43 CFR 3162.6. The marker will be constructed as follows: According to regulations.  
The top of the marker will be closed or capped.

The following minimum information will be permanently placed on the marker with a plate, cap or beaded-on with a welding torch:

"Fed" or "Ind", as applicable. "Well number, location by 1/4 1/4 section, township and range". "Lease number". "Operator".

Other: The anticipated spud date is October 29, 1984. Dirt work on the access road is estimated to take approximately 15 days to complete. Therefore dirt work is estimated to start October 15, 1984, or as soon as approval is received. ARCO Oil & Gas Company has in effect a \$150,000 Nation Wide Drilling Bond (#7943391) to cover drilling operations on all Federal lands. ARCO Oil & Gas Company is the current lessee of record on the subject lease.

B. SURFACE USE PLAN

1. Existing Roads:

- a. The location is approximately 33 miles southeast of Panguitch, Utah. The proposed wellsite and elevation plat are shown as Exhibit "B". Staking included two directional reference stakes.
- b. Exhibit "C" describes the route to location. From Panguitch, Utah, take Utah 89 south approx 7 miles to junction of Utah 12. Turn left onto Utah 12 & go 13.4 miles east, turn right at "East Fork of Sevier River Road", go south for 13.5 miles, turn right at "Kanab Creek" sign & go 0.6 miles to beginning of access road. Continue approx. 1.3 miles up Buck Knoll to drillsite.
- c. The "East Fork of Sevier River Road" will be upgraded and graveled with 4" of gravel (max diameter 1") for 4 miles north of "Kanab Creek Road". The "Kanab Creek Road" will be upgraded and graveled with 4" of gravel (max diameter 1") for 0.6 miles to the beginning of the drillsite access road. The "East Fork of Sevier River Road" & 0.6 mile of "Kanab Creek Road" will be maintained and kept free of snow during drilling & completion operations. Exhibit "C" shows all roads near the location.

2. Planned Access Roads to be Constructed:

1. Width will be 18' (top surface). Total length is 1.3 miles (from Kanab Creek to the drillsite).
2. Maximum grade will be 10-11%.
3. Cuts & fills will be kept to a minimum to reduce surface damage.
4. Turnouts will be placed to ensure safe passing.
5. The access road will be designed to ensure proper drainage, it is centerline flagged from Kanab Creek Road to the drillsite.
6. Eighteen 18" culverts will be installed at intervals of 400' ( $\pm 150'$  to accomodate natural drainage patterns) to provide adequate cross drainage. Seven additional culverts (as shown in Exhibit "D") will be installed at drainage crossings to provide additional drainage. A total of 25 culverts will be installed on the access road.
7. There will be two (2) fence cuts, cattleguards will be installed if operations continue in the spring.
8. All surfacing material if required will be from materials located at Mr. Dean Wentch's private pit. No surface material will be removed from Forest Lands.
9. There are no existing facilities on the proposed location.
10. Road construction will be in conformance with "Dixie Standards for Low Volume, Intermittent Use, Specified Local Roads" and Section 299 "Low Volume Road Construction". Exhibit "E" is a copy of Mr. Joseph G. Black (Supervisory Civil Engineer) recommendations and specifications.

Surface disturbance and vehicular travel will be limited to the approved location and access road. Any additional area needed will be approved by the District Ranager in advance.

Marketable trees greater than 14" in diameter will be cut and limbed and hauled to a designated area. All other trees will be cut and left for firewood.

Exhibit "F" is the soil report prepared by Mr. James T. Boyer. These requirements will be incorporated in the construction of the access road and drillsite.

3. Location of Existing Wells Within a One-Mile Radius:

1. Water wells - none.
2. Injection wells - None
3. Disposal wells - None
4. Producing wells - None
5. Drilling wells - None
6. Temporarily abandoned wells - None
7. Abandoned wells - None
8. Shut-in wells - None
9. Monitoring or observation wells - None

4. Location of Tank Batteries and Production Facilities:

All permanent (onsite for six (6) months or longer) structures constructed or installed (including oil well pump jacks) will be painted a flat, nonreflective, earth tone color to match the standard environmental colors, as determined by the District Ranger. All facilities will be painted within six (6) months of installation. Facilities required to comply with the Occupational Safety and Health Act (OSHA) may be excluded.

If a tank battery is constructed on this lease, it will be surrounded by a dike of sufficient capacity to contain 1-1/2 times the storage capacity of the battery.

All loading lines and valves will be placed inside the berm surrounding the tank battery.

All site security guidelines identified in 43CFR 3162.7 regulations will be adhered to.

All off-lease storage, off-lease measurement, or commingling on-lease or off-lease will have prior written approval from the District Manager.

All product lines entering and leaving hydrocarbon storage tanks will be effectively sealed.

Gas meter runs for each well will be located within five hundred (500) feet of the wellhead. The gas flowline will be buried from the wellhead to the meter along with any other sections occurring on the pad. Meter runs will be housed and/or fenced.

The oil and gas measurement facilities will be installed on the well location or at a site that will accommodate design requirements. The oil and gas meters will be calibrated in place prior to any deliveries. Tests for meter accuracy will be conducted monthly for the first three (3) months on new meter installations and at least quarterly thereafter. The Area Manager will be provided with a date and time for the initial meter calibration and all future meter-proving schedules. A copy of the meter calibration reports will be submitted to the Resource Area Office. All meter measurement facilities will conform with the API standards for liquid hydrocarbons and the AGA standard for natural gas measurement.

ARCO Oil & Gas Company does not own or operate any facilities within a one-mile radius of the proposed location. This well is a wildcat. If the well is a producer, a Sundry Notice will be filed describing all proposed production facilities.

5. Location and Type of Water Supply:

A. All water needed for drilling purposes will be obtained from:

Tropic & East Fork Irrigation Company  
Contact: Mr. Franz Shakespear at (801)679-8749  
Water location is at the Kanab Creek, on the Kanab Creek Road across from the beginning of access road.

A temporary water use permit for this operation will be obtained from the Utah State Engineer & Tropic & East Fork Irrigation Company. Water obtained on private land, or land administered by another agency, will require approval from the owner or agency for use of the land. An approved temporary water use permit will be filed under a separate letter.

B. Water trucks will be used to haul water to location.

C. No water well will be drilled.

D. No water will be taken off Federal lands.

6. Source of Construction Material:

Pad construction material will be obtained from cut material located onsite. No material will be taken from lands other than the proposed location.

7. Methods of Handling Waste Disposal:

The reserve pit will be lined with a 20 mil PVC liner during construction. If necessary a suitable underlying base will be placed prior to the PVC liner installation. Exhibit "G" is the Hydrology Report prepared by Mr. Jim Probst, the recommendations contained within his report will be followed.

Three sides of the reserve pit will be fenced before drilling starts. The fourth side will be fenced as soon as the drilling is completed. The fence will be kept in good repair while the pit is drying. The fence will be four strands of barb wire.

All trash must be contained in a portable wire cage and disposed of at a sanitary landfill. No burning will take place. Operator will be responsible for trash and roadside litter generated by their operation along their access route.

Produced waste water will be confined to a lined pit for a period not to exceed ninety (90) days after initial production. During the ninety (90) day period, an application for approval of a permanent disposal method and location, along with the required water analysis, will be submitted for the District Manager's approval pursuant to Onshore Oil and Gas Order No. 3 (NTL-2B).

Drill cuttings will be buried in the reserve pit. Drilling fluids will be handled and disposed of in the reserve pit. Any fluids produced during drilling test or while making production test will be collected in a test tank. Any spills of oil gas, salt water or other noxious fluids will be cleaned up and removed.

Chemical toilet facilities will be provided for human waste. Garbage and non-flammable waste will be handled in a closed wire cage. Drill fluids, water, drilling mud and tailings will be kept in reserve pit.

After the rig moves out, all materials will be cleaned up and no adverse materials will be left on location. All dangerous open pits will be fenced during drilling and kept closed until such time as the pit is leveled.

Exhibit "H" is the Landscape Management Report prepared by Mr. Max E. Molyreux, the recommendations contained in the report will be utilized in the reclamation of the drillsite and access road.

#### 8. Ancillary Facilities:

Living facilities will be required. They will be located onsite. Three (3) or four (4) trailers will be on location, they will be equipped with concrete septic tanks (closed system). The septic tanks will be pumped as required. No waste will be disposed of on location. The closed concrete septic tank will conform to local health regulations.

#### 9. Well Site Layout:

The reserve pit will be located on the north side of location. Exhibit "I" is drillsite location as staked. Exhibit "J" shows planned cuts and fills.

ARCO Oil & Gas Company  
Buck Knoll Unit #1  
SE/4SW/4, Sec. 36-T37S-R4-1/2W S.L.M.  
Garfield County, Utah  
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The top 12" of soil material will be removed from the location and stockpiled separately off the location on the South and/or West sides. Topsoil along the access road will be reserved in place adjacent to the road. If inadequate topsoil is stockpiled, the operator will bring in suitable material from outside sources at his expense.

A trash pit will not be allowed on location.

Exhibit "K" is a diagram of the rig and equipment.

10. Plans for Restoration of Surface

Immediately upon completion of drilling, the location and surrounding area will be cleared of all remaining debris, materials, trash and junk not required for production. Before any dirt work to restore the location takes place, the reserve pit must be completely dry.

The operator or his contractor will notify the District Ranger in Panguitch at (801)676-8815 forty-eight (48) hours before starting reclamation work that involves earthmoving equipment and upon completion of restoration measures.

Before any earthwork to restore the location takes place, the reserve pit will be dry and all trash (barrels, metal, etc.) it contains must be removed from public lands. Any dispersal of clarified drilling mud/drilled fluids over the drill location is subject to the approval of the District Ranger.

All disturbed topsoil will be evenly distributed over the disturbed area.

The stockpiled topsoil will be evenly distributed over the disturbed areas.

ARCO Oil and Gas Company  
Buck Knoll Unit #1  
SE/4SW/4, Sec. 36-T37S-R4-1/2W S.L.M.  
Garfield County, Utah  
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All disturbed areas will be scarified with the contour to a depth of 8-12 inches. Do not smooth pads out, leave a roughened surface.

Seed will be broadcast or drilled during a period specified by the District Ranger. Seeding will be repeated until vegetation is successfully established. Seeding will be done in presence of the authorized officer. Seed mixture will be prescribed by the District Ranger.

The reserve pit and that portion of the location and access road not needed for production or production facilities will be reclaimed. The time required to complete the reclamation will depend upon the area to be reclaimed. ARCO Oil and Gas Company agrees to begin reclamation as soon as weather conditions are suitable and further agrees to complete the project in a timely manner. Reclamation of the access road & drillsite will be accomplished according to the District Ranger, Panguitch, Utah.

11. Surface and Mineral Ownership:

The location surface is administered by the US Forest Service and is within the Dixie National Forest. The mineral rights are Federal, administered by the BLM.

12. Other Information:

For any questions regarding this permit, please contact Mr. Harold Engel of our Drilling Department at (303)293-7305.

ARCO Oil and Gas Company  
Buck Knoll Unit #1  
SE/4SW/4, Sec. 36-T37S-R4-1/2W S.L.M.  
Garfield County, Utah  
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There will be no deviation from the proposed drilling and/or workover program without prior approval from the District Manager. Safe drilling and operating practices must be observed. All wells, whether drilling, producing, suspended, or abandoned, will be identified in accordance with 43 CFR 3162.2.

"Sundry Notice and Report on Wells" (Form 3160-5) will be filed for approval for all changes of plans and other operations in accordance with 43 CFR 3164.

The dirt contractor will be provided with an approved copy of the surface use plan.

Exhibit "L" is the Cultural Resource Management Report prepared by Nina B. Swidler. No evidence of any archaeological sites were located and the District Ranger recommended that no further studies be conducted. However, if any cultural resources are found during construction, all work will stop and the District Ranger will be notified.

This permit will be valid for a period of one (1) year from the date of approval. After permit termination, a new application will be filed for approval for any future operations.

Exhibit "M" is a copy of the proposed Buck Knoll Unit Area. This well is the first proposed well within the unit area.

13. Lessee's or Operator's Representative and Certification:

Larry Morse  
ARCO Oil and Gas Company  
P. O. Box 5540  
Denver, Colorado 80217  
Bus. Tele: (303) 293-7031

J<sup>M</sup>M. McCarthy  
ARCO Oil and Gas Company  
P. O. Box 5540  
Denver, Colorado 80217  
Bus. Tele: (303) 293-7127  
Res. Tele: (303) 293-1339

ARCO Oil & Gas Company  
Buck Knoll Unit #1  
SE/4SW/4, Sec. 36-T37S-R4-1/2W S.L.M.  
Garfield County, Utah  
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Certification:

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drillsite and access route; that I am familiar with the conditions which currently exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and, that the work associated with the operations proposed herein will be performed by ARCO Oil and Gas Company and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved. This statement is subject to the provisions of 18 U.S.C. 1001 for the filing of a false statement.

12 SEPT. 1984  
Date

J. M. Morse  
Larry Morse  
Operations Manager  
ARCO Oil and Gas Company  
HRC  
KUP

ARCO Oil & Gas Company  
Buck Knoll Unit #1  
SE/4SW/4, Sec. 36-T37S-R4-1/2W S.L.M.  
Garfield County, Utah

The onsite inspection was held 8/29/84

PARTICIPANTS:

Harold R. Engel

Leonard Henney

Peter Kilbourne  
Mark Littlefield  
Theron Mitchell  
Clair Baldwin  
Thomas Heney

TITLES:

Drilling Engineer, ARCO Oil & Gas  
Company

Ross Construction Company

BLM  
BLM  
BLM  
USFS - Dixie National Forest  
USPS - Bryce Canyon Nat'l Park

Ranger District Office contact is Mr. Clair Baldwin

Office phone: (801)676-8815

City: Panguitch

State: Utah

Kanab Resource Area Manager's address and contacts are:

Address: P.O. Box 459, Kanab, Utah 84741

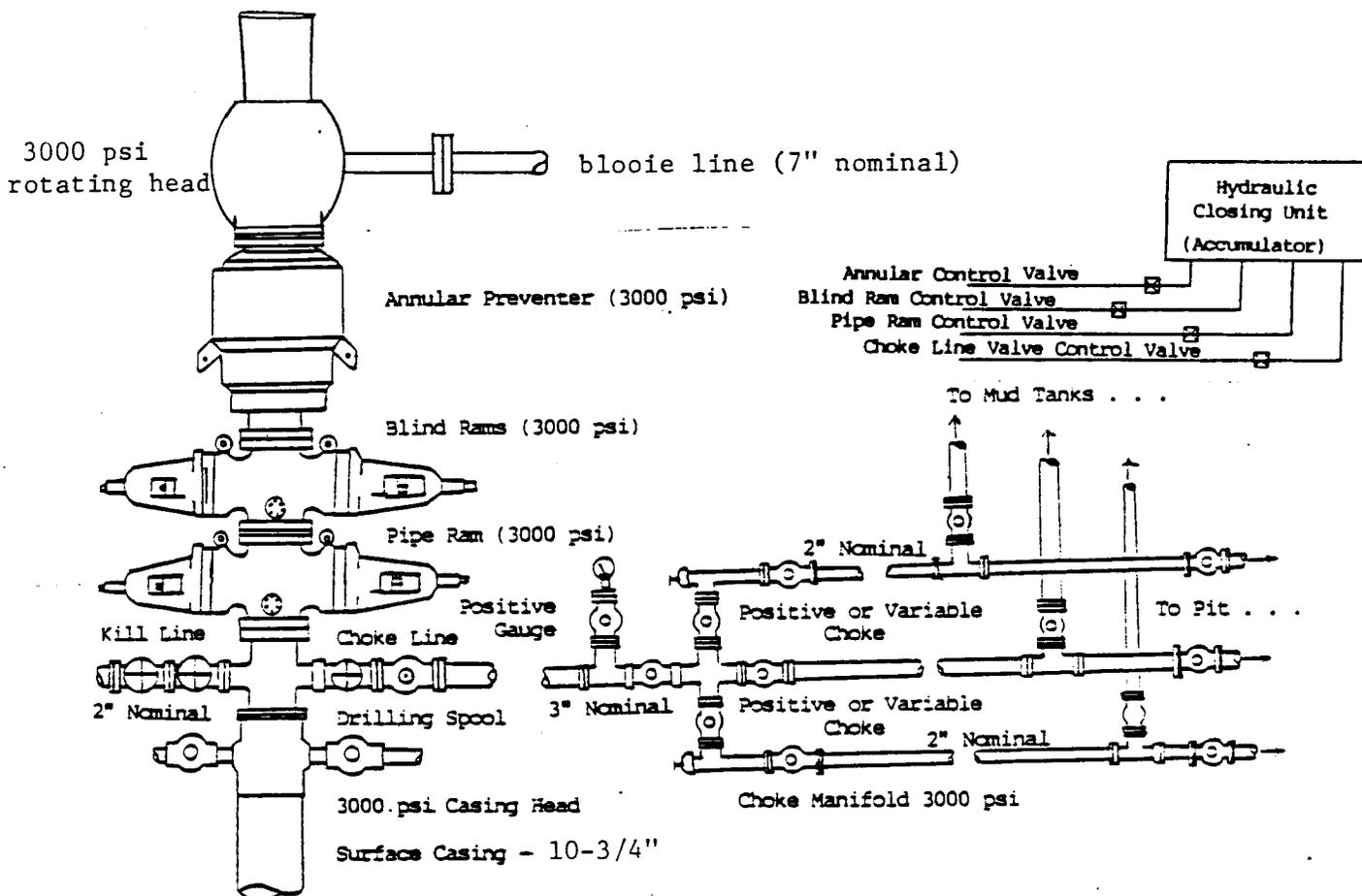
Your contact is: Mr. Pete Kilbourne  
Office phone: (801)644-2672

Cedar City District Office contact is Mr. Paul Carter

Address: P.O. Box 724  
Cedar City, Utah 84720

Office phone: (801)586-2401

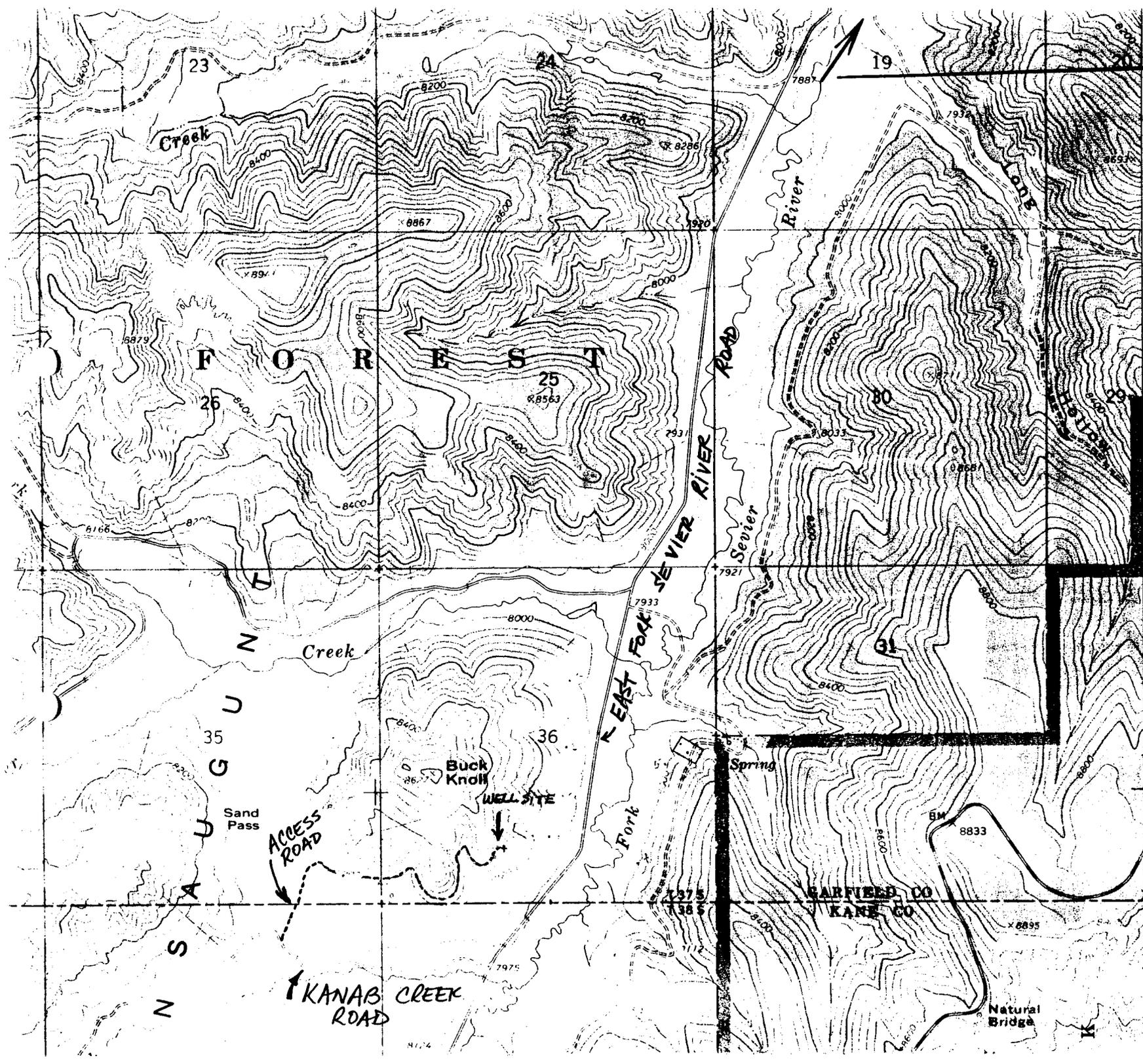
EXHIBIT "A"  
Well Control Equipment  
3M-10-SRRA



1. All BOP equipment shall be fluid and/or mechanically operated.
2. BOP's and all fittings will be in good working condition and rated at 3000 psi W.P. minimum.
3. Equipment through which bit must pass shall be at least as large as casing size being drilled.
4. Nipple above BOP shall be at least same size as casing being set.
5. Upper Kelly Cock and lower Kelly Cock shall be 3000 psi W.P. minimum.
6. Floor safety valve (full opening) and drill string BOP with appropriate rated pressure shall be available on rig floor with connections or subs to fit any tool joint in string.
7. Minimum size for choke line shall be 3 inches nominal diameter, minimum size for vent lines downstream of chokes shall be 2 inches nominal, and vent line which by-passes shall be a minimum of 3 inches nominal and shall be as straight as possible.
8. Fluid lines from accumulator to BOP's and all remote control fluid lines shall be steel and rated at or above maximum accumulator pressure. Lines shall be bundled and protected from damage.
9. Rams will be used in following positions: (ARCO Drl. Supv. may reverse ram location)

	<u>Drilling</u>	<u>Running Casing</u>
Upper Ram	Blind	Blind
Lower Ram	Drillpipe	Casing Rams
10. Minimum size for kill line is 2 inches nominal.
11. Extensions and hand wheels shall be installed.

ALL SPECIFICATIONS LISTED ARE PER API-RP53

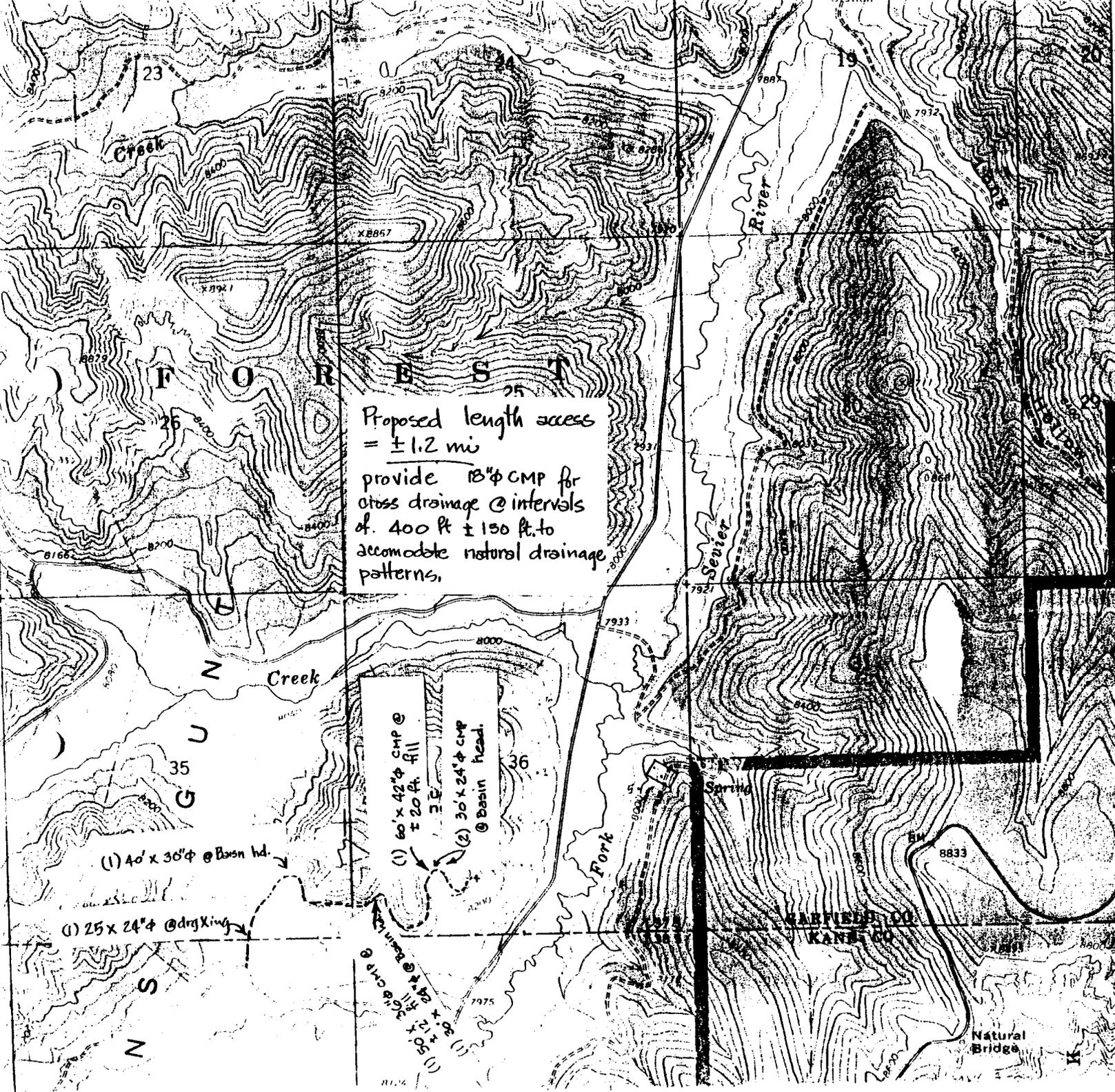


APPROX. 9 MILES  
TO UTAH (12)

EXHIBIT "c"  
ARCO Oil & Gas Co.  
BUCK KNOLL UNIT  
#1.  
SE 1/4 SW 1/4 Sec. 36  
T 37S - R 4 1/2 W  
GARFIELD COUNTY  
UTAH

(BRYCE POINT) 3559 1/2 SW  
4157  
4156  
32'30"  
BRYCE CANYON 9 MI.  
1/4 MI. TO UTAH 22 & 34

TROPIC RESERVOIR  
UTAH, QUAD



Proposed length access  
 = ± 1.2 mi  
 provide 18"φ CMP for  
 cross drainage @ intervals  
 of 400 ft ± 150 ft. to  
 accomodate natural drainage  
 patterns.

(1) 60' x 42" CMP @  
 ± 20 ft. fill  
 (2) 30' x 24" CMP  
 @ Basin head.

(1) 40' x 30" φ @ Basin hd.

(1) 25' x 24" φ @ drg King

(1) 50' x 36" φ CMP @  
 Basin head  
 (1) 50' x 24" φ CMP @  
 Basin head

EXHIBIT "D"

Buck Knoll #1

SE-SW 36-37S-4 1/2 W  
 Garfield Co, UT.

4159  
 (BRYCE POINT  
 3559 11 SW  
 4157  
 4156  
 32'30"  
 BRYCE CANYON 9 MI.  
 1/4 MI. TO UTAH 22 & 54

GARFIELD CO  
 KANE CO

Natural  
 Bridge



Reply to: 7700 Transportation System

Date: August 21, 1984

Subject: Buck Knoll Oil and Gas Drill Site Access Roads

To: Clair Baldwin, Powell District Ranger

On August 17th, 1984, I made an on-the-ground inspection of the above referenced access road proposals. Following are my comments and concerns regarding the proposed routes.

A. "Primary" Drill Site Location

Access to the general area of the proposed drill site is presently provided by the East Fork Road (F.S. #30087) and the Kanab Creek Road (F.S. #30105). The first 8 miles of the East Fork road are constructed to a 24-foot, double lane, crushed aggregate surfaced roadway. This portion of roadway is presently adequate for drill rig access. The rest of the East Fork and Kanab Creek roads are constructed to a variable width, single lane road standard with turnouts. Spot surfacing with pit run material, native to the area, occurs on portions of these roadway sections. At present, these sections of roadway are adequate for drill rig access during the normal access period for the area. Some slickness may be encountered during wet periods. From Kanab Creek to the drill site will require the construction of approximately one mile of new roadway. The general route, as flagged on the ground, appears to be satisfactory provided measures are taken to correct possible problem areas. These are summarized below.

1. Soil types along the flagged route vary considerably ranging from sand to silty clay to pit run gravel. The sand and silty clay pose potential problems of erosion and slumping if exposed to running and/or ponding water. The contact zone involving the silty clay material is of particular concern because of past problems encountered with this material in other areas of the East Fork. If exposed to water, this material slumps very easily. It is important therefore, that adequate drainage and surfacing be included in the construction of the road in these areas.
2. The proposed alignment contains several steep pitches. The sections with grades in excess of 6% should be ditched and culverts installed to control and remove surface runoff.
3. Several sections contain sideslopes in excess of 60%. Full bench construction should be used in all areas where sideslopes exceed 50%.
4. The recently adopted "Dixie Standards for Low Volume, Intermittent Use, Specified Local Roads", and Section 299, "Low Volume Road Construction" specifications of the Forest Service Standard Specifications are recommended for use in the new road construction. Copies are attached.

Start of Exhibit "E"

1/7



### B. Alternate Drill Site Location

Access to this site is presently available via the East Fork Road (F.S. #30087) and the East Side Road (F.S. #30098). Minor blading and spot surfacing with pit run or crushed aggregate is all that would be necessary to access this site during the normal access season. From an access standpoint, this site is much more desirable.

Regardless of the alternative selected, if winter access is necessary, the following additional stipulations should be imposed for use of the roads.

1. Pit run or crushed aggregate surfacing should be placed on the East Fork and Kanab Creek roads at spot locations from Tropic Spring to the drill site location. The surfacing should be placed to a depth of 4-inches minimum and a width of 14-feet.
2. Snow should be removed from the bottom of the ditch line to beyond the shoulder of the road. A trench section down the center of the road is not satisfactory as this tends to compact snow in the ditch line and concentrate runoff down the center of the road.
3. During periods of snowmelt when the road surface becomes soft and/or saturated with water, the road should be closed to use if serious rutting is occurring.
4. Public traffic should be discouraged from using the roads during the winter months.
5. The permittee should be required to maintain the roads during his period of use, and perform a final blading when and if the site is abandoned.

All of the above comments apply to the development stages of the well only. If a producing well is discovered, additional stipulations including upgrading of the road standards should be imposed. These improvement standards should be based on the potential and foreseeable use of the well and associated support services needed to service the site.

  
JOSEPH G. BLACK  
Supervisory Civil Engineer

Dixie National Forest

1. Widths. Use a 14 foot roadway for excavation cost allowance, tolerance Class F (plus 2 feet width). If contractor wishes to construct a 12 foot roadway, approval will be granted; however, the allowable cost must not exceed the cost of a 14 foot roadway.
2. Grades. Up to 16 percent. Must provide for control of water.
3. Clearing. Use 14 feet roadway for cost allowance. Require no clearing above top of cut slope. Protect trees outside of roadway from damage. Clearing width shall be 16 feet as measured from toe of cut slope (ditch line).
4. Waste Areas. Roadside waste areas will be approved on an as needed basis.
5. Slash Disposal. Lop and scatter ROW slash except where road goes through "dog hair" or where adjacent timber sale slash must have more intensive treatment. Use appropriate language from Timber Sale Contract Clause C6.7. Allow slash up to 5 inches in diameter to be scattered within roadway as long as concentrations do not exceed 1 foot in depth and do not extend higher than 2 feet below the subgrade.
6. Cut and Fill Slopes. Fill slopes at angle of repose. Cut slopes at 1:1.
7. Turnouts. Utilize natural openings, landing areas, etc. Design no turnouts except for lengthy sideslope situations (generally greater than 12 percent sideslopes) where natural turnout opportunities don't exist.
8. Turnarounds. Design none, except in rare cases where terminus is on a side slope (generally greater than 12 percent) with no natural turnaround area.
9. Alignment-Rolling Grades. Take advantage of opportunities to lay road lightly on the land and roll grades to control water.
10. Cleanup and Final Blading. Apply something like the Region 2 specification that provides for the finished road to allow a 4x2 pickup to travel at 5 mph. Eliminate practice of requiring final smooth blading to be followed by logging activity that will roughen up the road.
11. Tolerances. Apply tolerance Class F from standard specification 203.16.
12. Seeding and Mulching. Provide for none. Let timber sale handle with E.C. funds as is done for temporary roads.
13. Surfacing. Almost never. Provide only where absolutely essential. Surfacing will be the exception rather than the rule.

14. Drainage Structures.

- Live streams: culvert or ford
- Intermittent streams: generally ford or armored dip
- Provide inside ditch only where absolutely essential
- Provide "driveable dips" where grade cannot be rolled
- Provide, where needed, for cross-ditching after timber sale activity to assure control of water. (Cross ditches may need to be severe in some cases to discourage traffic.)

15. Mobilization Costs. Calculate actual estimated costs rather than use a flat percent of project cost. Don't duplicate costs in timber sale appraisal.

16. Flag Line Survey. This will be the standard. Provide "stationing" about every 100 feet. Don't flag clearing limits.

17. Design Speed. 5 mph.

18. Length. Generally no less than one-fourth mile.

19. Signs. None.

20. "Spot Design". Provide for more intensive design of short critical portions of road.

21. Future Maintenance. Very limited maintenance contemplated between entries. Generally, only for control of water and operation of drainage structures.

22. Closures. Forest LMP should provide for some flexibility. Where necessary and practical, roads can be physically closed between entries. Should evaluate on a case-by-case basis. In some cases, traffic discouragement may be all that would be practical.

SECTION 299-LOW VOLUME ROAD CONSTRUCTION

DESCRIPTION

299.01  
Work

This work shall consist of clearing and grubbing, excavation and embankment, and erosion control. Clearing and grubbing shall include treatment of merchantable timber, and disposal of construction slash, including all designated trees. Excavation and embankment shall include drainage excavation, shaping and roadway, including approaches, turnarounds, ditches and drainage dips, and disposal of all excavated material, regardless of its nature. Erosion control, when DESIGNATED, consists of furnishing and placing required seed, fertilizer, limestone, mulch, and tackifier. Construction of the roadway shall be in conformance with the dimensions SHOWN ON THE DRAWINGS and DESIGNATED on the ground.

MATERIALS

299.02  
Requirements

Materials shall meet the following requirements:

(a) Seed shall meet the requirements of Federal Specification JJJ-S-181 and shall have been tested within the past six months.

(b) Mulch shall be grass, hay, or grain straw in an air dry condition or wood cellulose fiber. Mulch shall be free of noxious weeds, mold, or materials injurious to plant growth.

(c) Fertilizer shall be a standard commercial grade furnished in sealed containers with name, weight, and contents clearly marked.

(d) Limestone shall be a ground calcic or dolomitic limestone containing not less than 85 percent of total (calcium and magnesium) carbonates.

(e) Tackifier shall be emulsified asphalt Grade SS-1, SS-1h, CSS-1, or CSS-1h.

CONSTRUCTION

299.03  
Clearing &  
Disposal

All trees, snags, downed timber, brush, and stumps within the clearing limits shall be removed and disposed of by:

(a) Decking or removing timber meeting utilization standards.

(b) Decking unmerchantable timber as SHOWN ON THE DRAWINGS.

(c) Treating the construction slash by one or more of the following methods as SHOWN ON DRAWINGS:

Method A- Incorporating construction slash in the embankment.

Method B- Windrowing construction slash outside the clearing limits. When slash is windrowed, it shall be placed approximately parallel to the roadway outside the toe of the fill slope.

Method C- Scattering construction slash outside the clearing limits.

Method D- Piling for future disposal.

Slash shall not be deposited in stream courses.

Designated fire-dangerous or unstable trees outside the clearing limits that might fall on the roadway shall be felled and disposed of in accordance with (a), (b), or (c).

299.04  
Pioneering

Pioneering operations shall not undercut the final back slope, deposit material outside the roadway limits, or restrict drainage.

299.05  
Grubbing

Grubbing limits shall be as SHOWN ON THE DRAWINGS. Stumps outside the grubbing limits may remain, but shall be cut no higher than 12" above the original ground measured on the uphill side unless otherwise SHOWN ON THE DRAWINGS.

299.06  
Excavation &  
Embankment

The roadway shall be constructed to conform to the typical sections SHOWN ON THE DRAWINGS. Embankment may be placed by side casting and end dumping.

The location and requirements for use of borrow material and any requirements for the removal and disposition of unsuitable or excess material will be as SHOWN ON THE DRAWINGS.

Rocks too large to be incorporated in the embankment shall be placed outside the traveled way on the downhill side, so that they will not roll, obstruct drainage, or hinder the use and the maintenance of the roadbed.

To facilitate seeding, slopes shall be left in a roughened condition.

Unless otherwise SHOWN ON THE DRAWINGS, the roadbed shall be shaped and finished to that ordinarily accomplished by a crawler tractor with dozer to provide drainage of surface

water. Individual rocks, within the roadbed, shall not protrude over 4 inches above the subgrade. A motor grader finish is not required.

Unless otherwise SHOWN ON THE DRAWINGS, the traveled way width shall not exceed the specified dimension by more than 2 feet.

299.07  
Erosion Control

Seasonal limitations for seeding are SHOWN ON THE DRAWINGS. The seeding shall not be accomplished during windy weather, nor when the ground is excessively wet, nor when the ground is frozen. The methods and rates of application, and types of seed, fertilizer, limestone, mulch, and tackifier shall be as SHOWN ON THE DRAWINGS. Materials shall be applied uniformly to the areas to be treated.

MEASUREMENT

299.08  
Method of  
Measurement

The method of measurement will be "Designed Quantities" (DQ), in accordance with Section 106.

PAYMENT

299.09  
Basis of  
Payment

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
299 (01) Low Volume Road . . . . .	STA
299 (02) Low Volume Road . . . . .	MI
299 (03) Low Volume Road . . . . .	L.S.

END of Exhibit "E"

7/7

**ARCO #1 - BUCK KNOLL  
PROPOSED WELL SITE  
SOIL REPORT**

On August 2, 1984, I accompanied Jim Probst, Max Molyneux and Nina Swidler on an on-site review of the proposed primary and alternate well sites in the Buck Knoll area of the Powell Ranger District. Following are comments in EA format.

**AFFECTED ENVIRONMENT**

**Primary Well Site** - This site occurs on the southeast side of Buck Knoll. Buck Knoll consists of steep sideslopes with moderately sloping ridges. Geology consists of sandstone and shale of the Kaiparowits formation from the base of the knoll to the upper sideslopes. The top of the knoll consists of limestone of the Wasatch formation. A significant amount of watershed rehabilitation work was performed on the steep slopes in the past. This restoration work is mainly in the form of trenches, most of which are still in fairly good condition. The trenches were seeded and have been stabilized with a good grass cover and invading shrubs. Natural erosion rates are moderate to high particularly on the droughty south and west aspects with limestone derived soils. Active sheet and rill erosion is evident in those areas.

**Alternate Well Site** - This site occurs on a moderately sloping ridge south of Bridge Hollow. Geology consists of limestone from the Wasatch formation. The area was furrowed and seeded in the past as part of the watershed restoration program in the East Fork. In addition, the area was planted to ponderosa pine in 1962. Natural erosion rates are moderately low.

**EFFECTS OF IMPLEMENTATION**

**Primary Well Site** - Approximately one mile of road will be constructed to the well site from the Kanab Creek road. A significant amount of soil disturbance will be incurred on the steep sideslopes of Buck Knoll. In addition, this well site will be leveled which will involve approximately three to four acres. Although the Kaiparowits-Wasatch contact zone will be crossed almost the entire length of the road, there is no surface evidence of wetness that would tend to initiate slumping of cut slopes. During high moisture years, cut bank failure may be a possibility. Accelerated erosion due to road construction and site development will occur particularly during the first three years following construction. At least two of the watershed trenches will be utilized as a road bed, thereby negating the value of those trenches. However, the area has been stabilized and the loss of these upper trenches should not have an adverse impact on the watershed below.

**Alternate Well Site** - The east side road will be used for access to the site. The only earth disturbing activity will be leveling of the site. Approximately three to four acres will be involved. Accelerated erosion will increase from earth disturbance, particularly during the first three years following construction. Slumping is not expected to be a problem on this site.

**CONCLUSIONS**

From the soil and water resource standpoint, there will be less earth disturbance at the alternate site and therefore less erosion. Neither site is

start of Exhibit "F" 1/2

expected to have significant long term adverse impacts, however the primary site will have a much greater short term adverse impact. Slumping is not expected to occur under normal climatic conditions on the primary site, but could occur during above normal moisture years. No slumping is expected on the alternate site.

**MITIGATING REQUIREMENTS**

1. Minimize road cuts by following contour of the slopes and minimizing road widths.
2. Surface roads for all-weather access.
3. Stabilize cut and fill slopes by hydro-mulching or other appropriate method.
4. Place impermeable liner in reserve pits. Place layer of sand under liner to protect from punctures.

*Jim Bayer*  
JAMES T. BAYER  
Soil Scientist

End of Exhibit "F" 2/2

## BUCK KNOLL EXPLORATORY WELL DRILL SITES (ARCO)

### HYDROLOGY REPORT

I have reviewed Jim Bayer's report on these sites and concur with his conclusions and recommendations. I agree that the alternate site on the east side of the valley would appear to present the fewest watershed impacts due primarily to the lesser amount of land disturbance required there.

#### Affected Environment

##### A. Buck Knoll Site

The proposed drill pad is located on a narrow sloping bench approximately 350 feet above and 660 feet to the west of the East Fork of the Sevier River. The access road leading to this site will traverse steep slopes above Kanab Creek - a tributary of the East Fork. No springs or seeps have been identified in the immediate vicinity of the drill pad or along the road alignment. There is virtually no watershed area above and tributary to the drill pad. Because of its salient location in relation to Buck Knoll it is unlikely that there is any subsurface flow towards the drill pad.

The limestone bedrock at the drill site is relatively permeable due to fracturing and jointing. It readily conveys ground water until it is impeded by a restricting layer. Such layers of less permeable shales occur within the Wasatch and Kaiparowitz formations and are probably responsible for the springs which occur at the base of Buck Knoll to the west. The East Fork supports ~~nine~~ sport fisheries. Its water quality is generally excellent although it is known to have a relatively high background level of dissolved iron. Both the East Fork and Kanab Creek are subject to high sediment loads during periods of spring snow melt and summer storm runoff.

Average annual precipitation at the Buck Knoll site is approximately 25 inches. Snowfall depths exceeding 3 feet are not uncommon during the winter months in this area. Approximately 65% of the total annual precipitation is normally received as snowfall.

##### B. Alternate Site

This site is located on a similar topographic feature approximately 100 feet above and 450 feet east of the East Fork of the Sevier River. It is very similar hydrologically to the previous described site. However, it appears to have a little more space available, is easier to access and would require no new road construction.

#### Probable Impacts

The increased erosion associated with these drilling sites is covered in the soils report. There should be no contamination of surface or groundwaters by drilling fluids if the reserve pits are properly lined and if no breaks in the impounding structures occur. If breaks or leaks do occur in the dikes at the reserve pits, the trenches and furrows below the pad should interrupt overland flow and minimize the amount of waste water which could directly enter the East

Start Exhibit "G" 1/2

Fork. However, spilled wastes could contaminate local subsurface flow systems and eventually be conveyed to the East Fork via seeps and springs surfacing in the valley bottoms.

### Recommendations

The excavated pits at either site will likely be finished in fractured bedrock and will require an impermeable liner. A suitable underlying base will be necessary whether the liner is bentonite or an impermeable sheeting. The extremely limited space on the Buck Knoll site will require construction of the pit at least partially on a side slope. It is imperative that the impounding dikes be constructed so as to withstand breaching. There will be little opportunity to install secondary structures to cope with an emergency situation. I strongly recommend that our Forest Engineers be involved in the review of the engineering plans submitted by the oil company and also be present during construction phases.

The drill pad site should be constructed to drain towards one of the reserve pits. Where necessary a berm should be constructed around the perimeter of the pad to prevent runoff from leaving the site. The pits should be sized to accommodate anticipated runoff as well as the drilling fluid.

The access road on Buck Knoll crosses and/or follows some of the old contour trenches on the side slopes. Sufficient road drainage features should be employed in reaches of the road above these trenches so that runoff is distributed over several cells instead of all being directed to a single cell. This should help prevent breaching of the remaining trenches or their cross dikes.



JIM PROBST  
Hydrologist

JP/jn

End of Exhibit "G" 2/2

## ARCO NO. 1 - BUCK KNOLL

### Proposed Well Site Landscape Management Report

#### Affected Environment

Primary Well Site. The proposed well site is located on the south-east side of Buck Knoll. Buck Knoll consists of steep side slopes and moderately sloping ridges. Past watershed activities have modified the side slopes. Contour trenches cut around the hill modifying the steep slopes with terraces and the natural environment with man made structures. The vegetation on Buck Knoll is ponderosa pine with manzanita and grass understory. The site is to the west of the East Fork road and Bryce Canyon National Park. Because of the topography and the location of the well site it will not be visible from major travel routes within the Park or the East Fork road. However, the proposed access road comes around a brush covered steep hill side south of Buck Knoll. Approximately one-third of this road will be visible from the East Fork road which at that point is a sensitivity Level II road.

Alternate Well Site. This site is located on a moderately sloping ridge south of Bridge Hollow. The area is adjacent to an existing road and within one-eighth mile of the Park boundary. The road is a low sensitivity Level III road which is used for management of Forest products and used by recreationists only slightly during the fall hunting season. Vegetation is ponderosa pine with grass understory. The proposed site was logged in the past and now contains 4-5 foot trees. Ditches have been laid in the area to prevent erosion. The proposed well site will be visible from the East Fork road which is a sensitivity Level II road. The portion of the Park near the site does not have any major travel routes. For the site to be visible from the Park, people would have to be in an area where there are no roads, trails, or major attractions.

#### Effects of Implementation

Primary Well Site. Approximately one mile of new road will need to be constructed to reach the proposed site. To accomplish this, the alignment will cross some steep side slopes that have little vegetation to screen the road. The well site will be visible from the East Fork road and Kanab Creek. The cuts and fills on the road will blend in with the existing contour trenches after a time, but they will always be visible. The drill pad will not likely be visible from the road due to its location on the ridge. The tower may be visible while it is in place.

Alternate Well Site. The east side road will be used to access the well site and there will be no need to disturb any more soil only to level the pad. The possibility of having the pad on different levels will cut down the amount of cut and fill. The pad will be visible from the East Fork road and the cuts and fills will be evident. The existing contouring will help to lessen the impact.

Start Exhibit "H" 1/2

### Conclusions

Both of the proposed well locations will have some visual impact on the East Fork road. However, the time of year in which the activity takes place should be when the number of people using the road is at a minimum; therefore the impact will be lessened. This will favor the alternate site because it can be recontoured and revegetated after the activity and the impact can be mitigated. The road to the primary drill site is on a hillside where it will be difficult rehab and the impact will remain for some time. The alternate site may have some impact on the Park due to noise depending on the amount of noise involved in the drilling operation.

### Mitigating Requirements

1. Restrict the physical operations to coincide with the time when the minimum number of people are in the area.
2. Revegetate all cut and fill slopes by the end of the next growing season.
3. If the alternate site is used step the drill pad to minimize cuts and fills.

*Max E. Molyneux*

MAX E. MOLYNEUX  
Landscape Architect

MM/jn

End Exhibit "H" 2/2

V-CORR. Az. = 108° 45'  
 C.I. = 5, foot  
 1" = 50'  
 Cop F is CUT OR FILL FROM  
 EXISTING GROUND TO FINISH GRADE

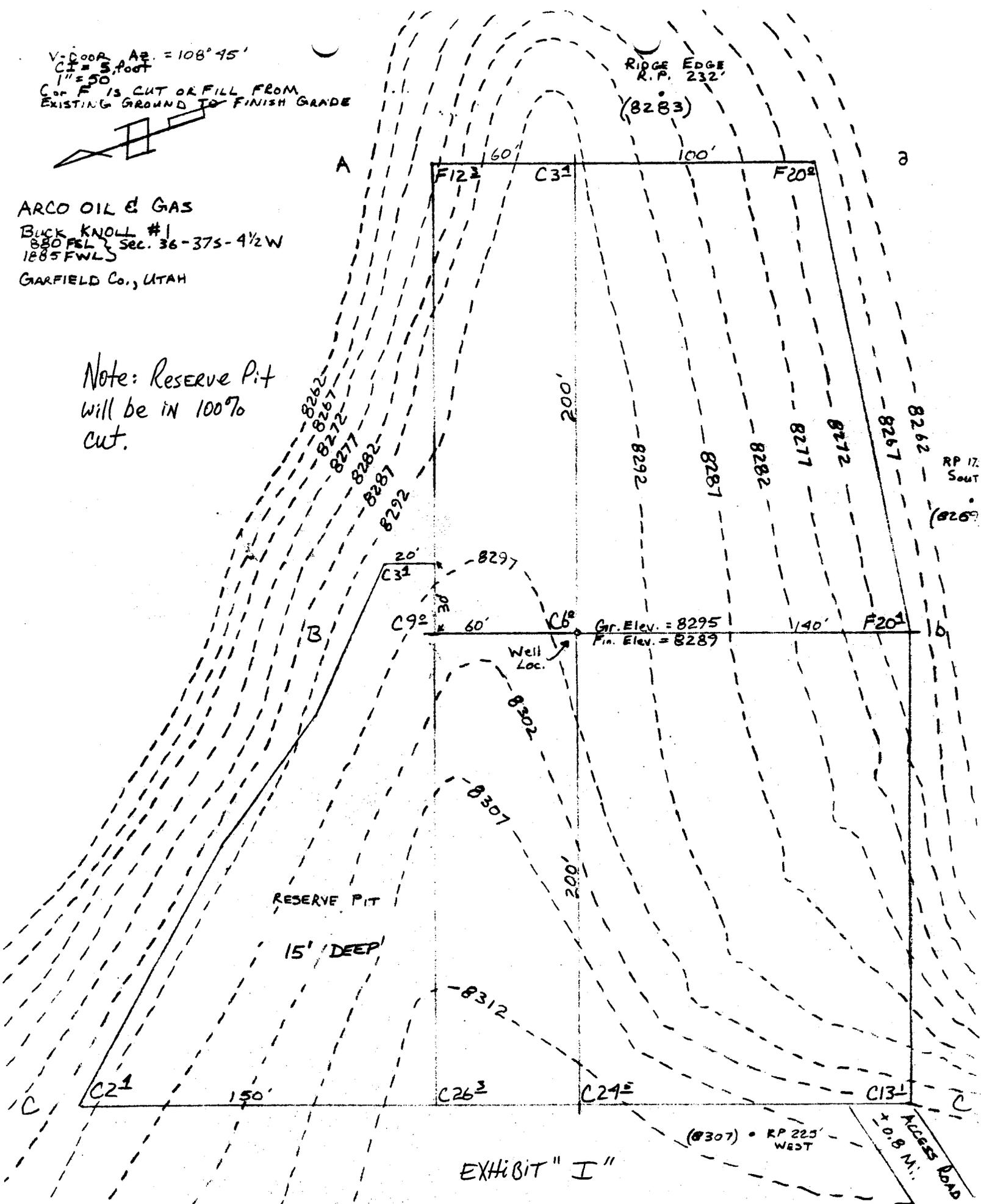


ARCO OIL & GAS  
 BUCK KNOLL #1  
 880 FSL } Sec. 36-37S-4 1/2 W  
 1885 FWLS  
 GARFIELD Co., UTAH

Note: Reserve Pit  
 will be in 100%  
 cut.

RIDGE EDGE  
 R.P. 232'

(8283)



RP 17  
 South  
 (8269)

Gr. Elev. = 8295  
 Fin. Elev. = 8289

RESERVE PIT  
 15' DEEP

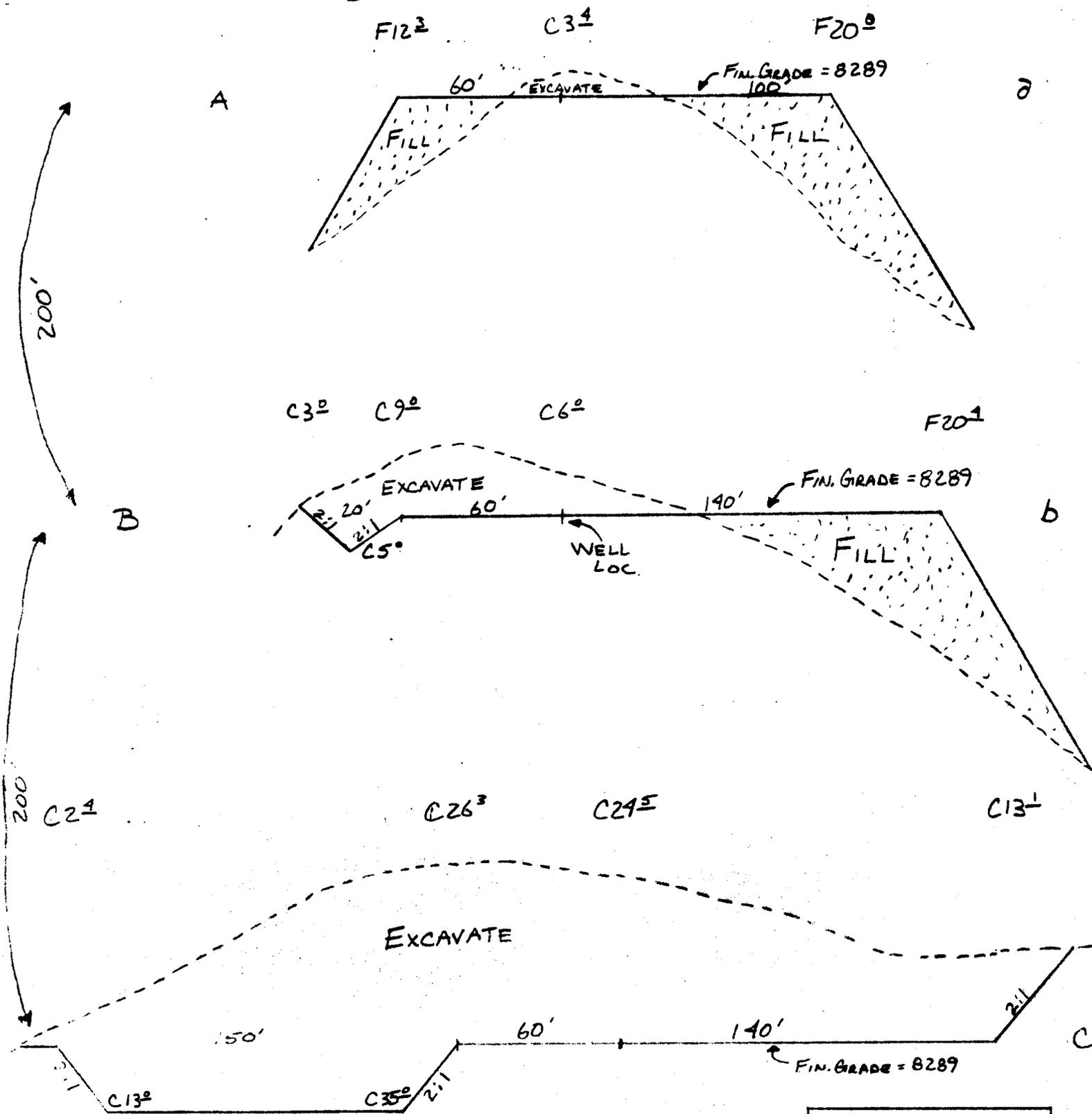
EXHIBIT "I"

(8307) • RP 225  
 WEST

ACCESS ROAD  
 ± 0.8 MI.

July 24, 1984  
 Brooks UTLEY

POWERS ELEVATION Co.  
 RICHFIELD, UTAH



--- EXISTING GROUND  
 ——— PROPOSED GRADE

Cor F is Cut or Fill from  
 EXISTING GROUND TO FINISH GRADE

SCALES: 1" = 50' Horiz.  
 1" = 20' Vert.  
 All sideslopes @ 1.5:1  
 unless marked otherwise

± 19,630 yd<sup>3</sup> FILL  
 ± 29,000 yd<sup>3</sup> CUT

NOTE: YARDAGE MAY VARY  
 WITH FINAL PAD SIZE

EXHIBIT "J"

July 24, 1983  
 B.L. UTLEY

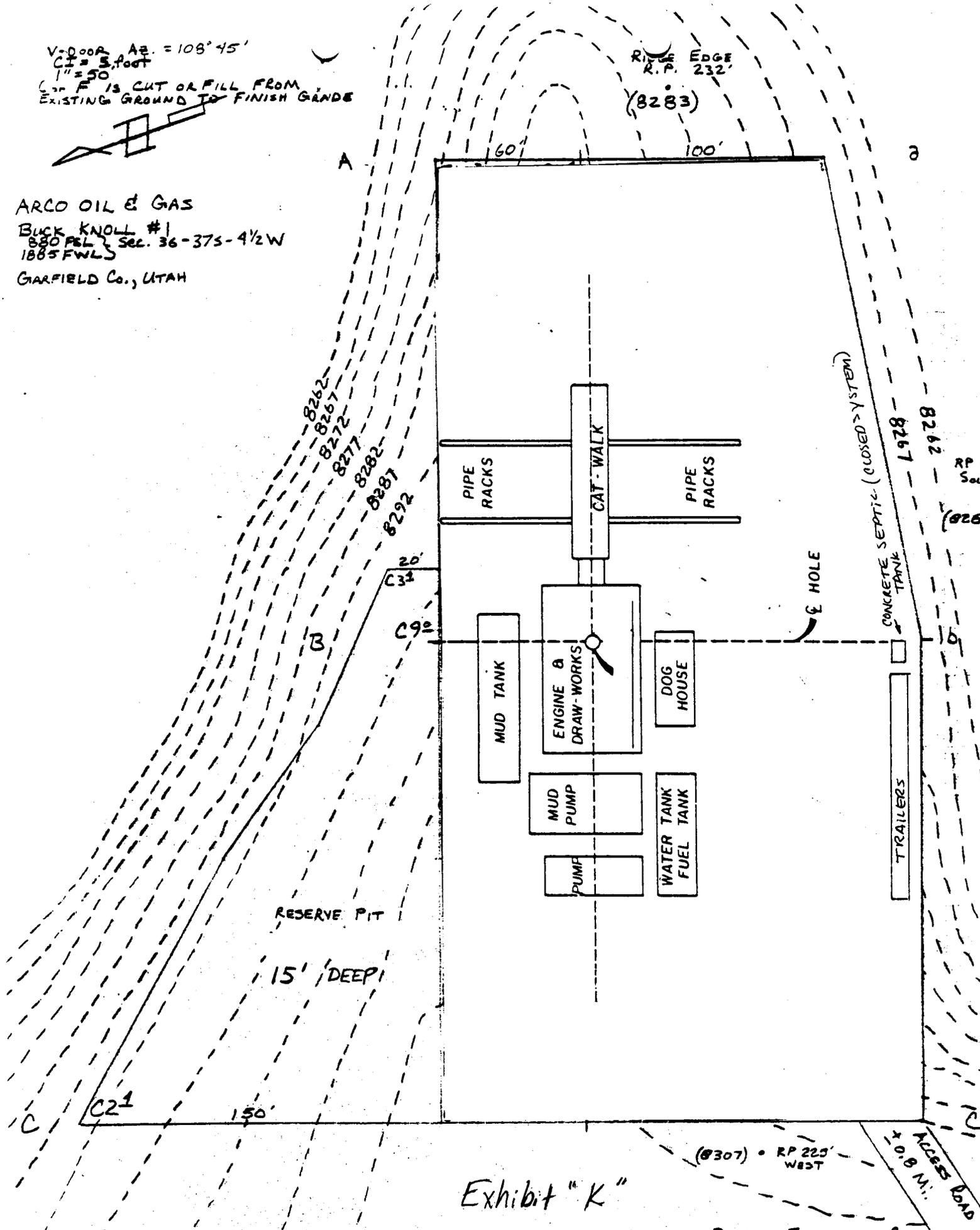
ARCO OIL & GAS  
 Buck KNOLL #1  
 SE-SW 36-37S -4 1/2 W  
 GARFIELD Co., UTAH

POWERS ELEVATION Co.  
 RICHFIELD, UTAH

V-Door Az. = 108° 45'  
 C.I. = 3.00 FT  
 1" = 50'  
 C.P. F IS CUT OR FILL FROM  
 EXISTING GROUND TO FINISH GRADE

RIDGE EDGE  
 R.P. 232  
 (8283)

ARCO OIL & GAS  
 BUCK KNOLL #1  
 880 PBL Sec. 36-37S-4 1/2 W  
 1885 FWLS  
 GARFIELD Co., UTAH



RP 175  
 SOUTH  
 (8288)

(8307) • RP 225  
 WEST

Exhibit "K"

POWERS ELEVATION Co.  
 RICHFIELD, UTAH

July 21, 1984  
 BROOKS UTLEY

ARCO OIL & GAS COMPANY:

Proposed Well Site, ARCO No. 1  
Buck Knoll Cultural Resource Management Report

On August 2, 1984, I accompanied Jim Probst, Hydrologist, Jim Bayer, Soil Scientist and Max Molyneux, Landscape Architect for a preliminary survey of two proposed well site locations for ARCO Oil & Gas Co.

The primary well site (1 on the map) is located in T37S, R4 1/2W, Section 36, SE1/4SW1/4, on a ridge on the SE side of Buck Knoll, west of the East Fork, Sevier River. With the assistance of Max Molyneux, the proposed new road route, stemming from upper Kanab Creek road to the site, was surveyed for cultural resource values. The survey was accomplished by walking parallel transects along the flagged road route, approximately 5-15 meters apart. The well site was surveyed by walking parallel transects in a N/S direction. No evidence of any archaeological sites were located on the surface at this time. Prior to any activity the area should be surveyed by ARCO's contracting archaeologist.

The alternative site (2 on the map) is located in T37S, R4 1/2W, Section 36, NE1/4/SE1/4, on a ridge south of Bridge Hollow, east side of the East Fork, Sevier River, and adjacent to the NW boundary of Bryce Canyon National Park. The existing east side road will be used for access to the site and no new roads are needed. The area was furrowed and planted with ponderosa pine in approximately 1962. I did an informal meandering survey through the area and saw four chert flakes (2 secondary, 2 tertiary) on the furrowed surface on the lower slope of the ridge. Therefore, if this site is selected, ARCO's contracting archaeologist should record and evaluate the significance of this site.

*Nina B. Swidler*

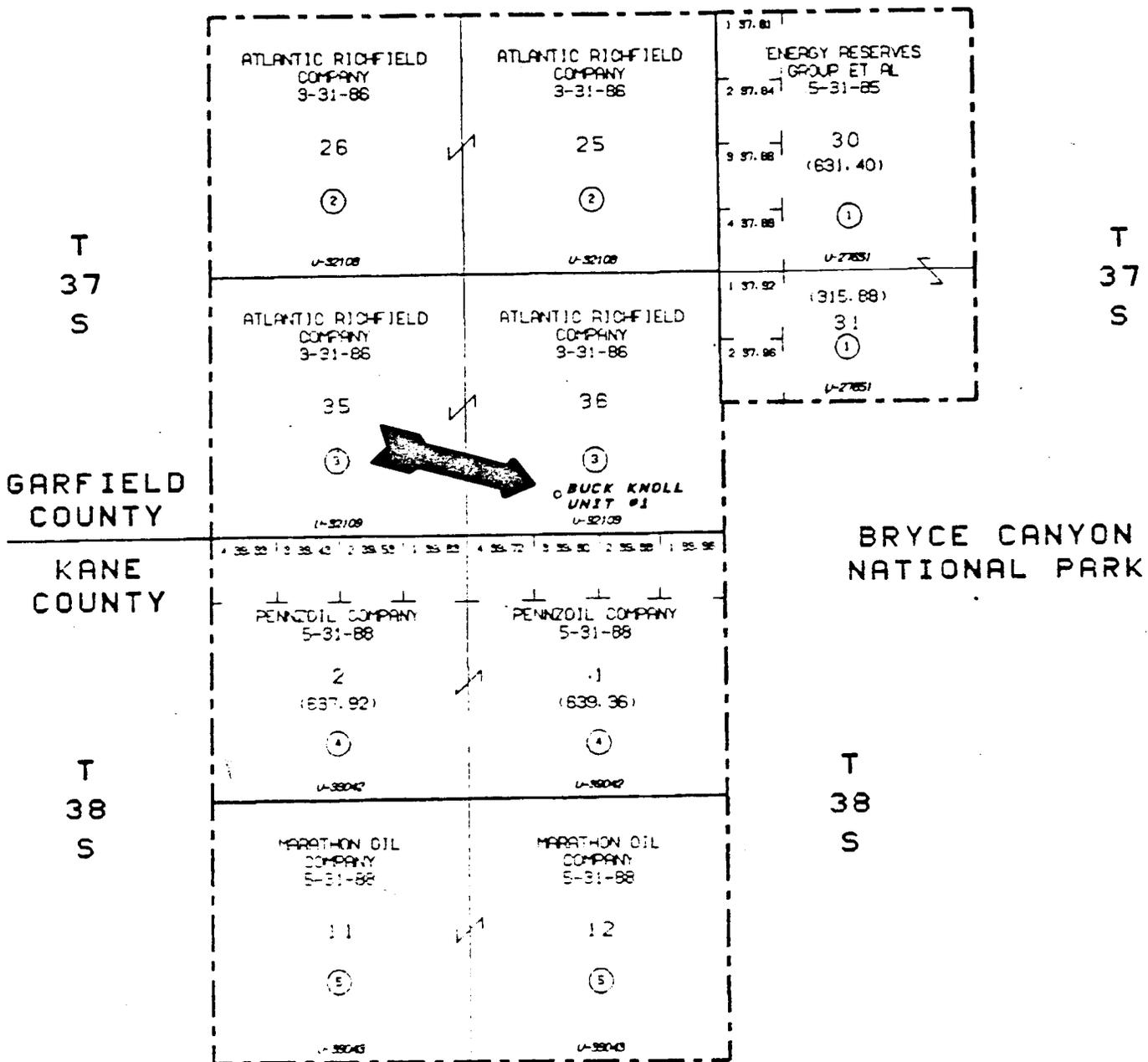
NINA B. SWIDLER  
Archaeologist

NBS/jn

*Exhibit "L" 1/1*

R 4 1/2 W

R 4 W



R 4 1/2 W

	ACREAGE	PERCENTAGE
FEDERAL LANDS	6,064.56	100.00%
TOTAL	6,064.56	100.00%

(2) TRACT NUMBER  
 - - - - - UNIT BOUNDARY



NOTE: ALL SECTIONS ARE 640.00 ACRES UNLESS OTHERWISE NOTED

**ARCO Exploration Company**

Division of Atlantic Richfield Company  
 WESTERN U.S. OPERATIONS  
 DENVER, COLORADO

**EXHIBIT "M"**  
 BUCK KNOLL UNIT AREA  
 GARFIELD AND KANE  
 COUNTIES, UTAH

MADE BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 DRO BY: \_\_\_\_\_ TOS NO: \_\_\_\_\_  
 HORIZ. SCALE: \_\_\_\_\_ FILE NO: \_\_\_\_\_  
 VERT. SCALE: \_\_\_\_\_ APPROV BY: \_\_\_\_\_

OPERATOR Crude Oil & Gas Co. DATE 9-20-84

WELL NAME Buck Knoll #1

SEC SESW 36 T 37S R 4 1/2 W COUNTY Griffith

43-017-30126  
API NUMBER

Std.  
TYPE OF LEASE

POSTING CHECK OFF:

<input type="checkbox"/>	INDEX	<input type="checkbox"/>	HL	<input type="checkbox"/>
<input type="checkbox"/>	NID	<input type="checkbox"/>	PI	<input type="checkbox"/>
<input type="checkbox"/>	MAP	<input type="checkbox"/>		<input type="checkbox"/>

PROCESSING COMMENTS:

No other wells within 1000'

Need water permit

---



---



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APPROVAL LETTER:

SPACING:  A-3 \_\_\_\_\_ UNIT  c-3-a \_\_\_\_\_ CAUSE NO. & DATE

c-3-b  c-3-c

SPECIAL LANGUAGE:

1- Water

2- BOP - 5000 psi - 10 3/4" csq

---



---



---

RECONCILE WELL NAME AND LOCATION ON APD AGAINST SAME DATA ON PLAT MAP.

AUTHENTICATE LEASE AND OPERATOR INFORMATION

VERIFY ADEQUATE AND PROPER BONDING

AUTHENTICATE IF SITE IS IN A NAMED FIELD, ETC.

APPLY SPACING CONSIDERATION

ORDER \_\_\_\_\_

UNIT \_\_\_\_\_

c-3-b

c-3-c

CHECK DISTANCE TO NEAREST WELL.

CHECK OUTSTANDING OR OVERDUE REPORTS FOR OPERATOR'S OTHER WELLS.

IF POTASH DESIGNATED AREA, SPECIAL LANGUAGE ON APPROVAL LETTER

IF IN OIL SHALE DESIGNATED AREA, SPECIAL APPROVAL LANGUAGE.



STATE OF UTAH  
NATURAL RESOURCES  
Oil, Gas & Mining

Scott M. Matheson, Governor  
Temple A. Reynolds, Executive Director  
Dianne R. Nielson, Ph.D., Division Director

4241 State Office Building - Salt Lake City, UT 84114 - 801-533-5771

September 25, 1984

Arco Oil and Gas Company  
A Division of Atlantic Richfield Company  
P. O. Box 5540  
Denver, Colorado 80217

Gentlemen:

Re: Well No. Buck Knoll #1 - SE SW Sec. 36, T. 37 S, R. 4 1/2 W  
880' FSL, 1885' FWL - Garfield County, Utah

Approval to drill the above referenced oil well is hereby granted in accordance with Rule C-3(c), General Rules and Regulations and Rules of Practice and Procedure, subject to the following stipulations:

1. Prior to commencement of drilling, receipt by the Division of evidence providing assurance of an adequate and approved supply of water.
2. Blowout prevention equipment with a minimum of 5000 psi working pressure should be used after drilling out of 10 3/4" casing.

In addition, the following actions are necessary to fully comply with this approval:

1. Spudding notification to the Division within 24 hours after drilling operations commence.
2. Submittal to the Division of completed Form OGC-8-X, Report of Water Encountered During Drilling.
3. Prompt notification to the Division should you determine that it is necessary to plug and abandon this well. Notify John R. Baza, Petroleum Engineer, (Office) (801) 533-5771, (Home) 298-7695 or R. J. Firth, Associate Director, (Home) 571-6068.
4. Compliance with the requirements and regulations of Rule C-27, Associated Gas Flaring, General Rules and Regulations, Oil and Gas Conservation.

Page 2  
Arco Oil and Gas Company  
Well No. Buck Knoll #1  
September 25, 1984

5. This approval shall expire one (1) year after date of issuance unless substantial and continuous operation is underway or an application for an extension is made prior to the approval expiration date.

The API number assigned to this well is 43-017-30126.

Sincerely,



R. J. Firth  
Associate Director, Oil & Gas

as  
Enclosures  
cc: Branch of Fluid Minerals

ARCO Oil and Gas Company  
Rocky Mountain District  
707 17th Street  
Mailing address: P.O. Box 5540  
Denver, Colorado 80217  
Telephone 303 293 4600



RECEIVED

SEP 27 1984

DIVISION OF OIL  
& MINING

September 24, 1984

State of Utah  
Division of Oil, Gas and Mining  
4241 State Office Building  
Salt Lake City, Utah 84114

Attn: Arlene Sollis

RE: Spacing Exception  
ARCO Buck Knoll Unit #1 Well  
880' FSL & 1885' FWL, SE/4 SW/4, Sec. 36-T37S-R4-1/2W  
Garfield County, Utah

Dear Ms. Sollis:

This letter is to confirm our telephone conversation on September 21, 1984 concerning the above subject.

The subject well is proposed as the unit obligation well for the Buck Knoll Unit. The well was surveyed at the above mentioned location to accommodate land and geological considerations. However, due to steep topographical conditions, it was not practical to survey the location to meet the spacing regulations. For the location to meet the spacing regulations, it would have to be moved 60' south. Exhibit "A", attached, clearly shows that moving the location 60' south would put it in very steep terrain making it virtually impossible to construct a drillsite location.

Considering the above, ARCO Oil and Gas Company requests administrative approval of this exception location. ARCO Oil and Gas Company is the lessee of record within a 660' radius of the exception location. For any questions regarding this letter, please call me at (303)293-7305.

Sincerely,

*Harold R. Engel*  
Harold R. Engel  
Drilling Engineer *KEP*

Attachment

HRE/gc

cc: Land Department - Deb Pracko  
Sr. Drlg. Engineer - J.E. Onisko  
Well File

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

U-32109

N/A

Buck Knoll Unit

N/A

Buck Knoll Unit #1

Wildcat

Sec. 36-T37S-R4-1/2W

Garfield Utah

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

A. TYPE OF WORK: DRILL  DEEPEN  PLUG BACK

B. TYPE OF WELL: OIL WELL  GAS WELL  OTHER  SINGLE ZONE  MULTIPLE ZONE

C. NAME OF OPERATOR: ARCO Oil and Gas Co., A Division of Atlantic Richfield Company

D. ADDRESS OF OPERATOR: P.O. Box 5540, Denver, CO 80217

E. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)  
880' TSL & 1885' FWL, SE1/4 SW1/4  
At proposed prod. zone approx. the same

F. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE:  
Approx 33 mi SE of Panguitch, Utah

13. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drive, well, etc. if any)	880'	16. NO. OF ACRES IN LEASE	1920	17. NO. OF ACRES ASSIGNED TO THIS WELL	Not assigned
15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST WELL DRILLING COMPLETED OR APPLIC FOR ON THIS LEASE, FT.	none	19. PROPOSED DEPTH	9600'	20. ROTARY OR CABLE TOOLS	Rotary
21. ELEVATIONS (Show whether DF, RT, GR, etc.) Ground elevation: 8295'				22. APPROX. DATE WORK WILL START 10-15-84	

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
--------------	----------------	-----------------	---------------	--------------------

RECEIVED  
OCT 25  
DIVISION OF OIL  
GAS & MINING

24. SIGNED: Larry Morse TITLE: Operations Manager DATE: 12 SEPT. 1984

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

APPROVED BY: M.S. Jensen TITLE: District Manager DATE: 12 Oct 1984

CONDITIONS OF APPROVAL: Conditions of Approval are attached.

NOTICE OF APPROVAL

FLAIRING OR VENTING OF GAS IS SUBJECT TO NTL4-A DATED 1/1/80

CONDITIONS OF APPROVAL ATTACHED TO OPERATORS COPY

BUREAU OF LAND MANAGEMENT  
CEDAR CITY DISTRICT  
CONDITIONS OF APPROVAL FOR PERMIT TO DRILL

Company: ARCO Oil & Gas Company

Well No.: Buck Knoll  
Unit #1

Location: SE/4 SW/4 Sec. 36-T37S-R4-1/2W S.L.M.

Lease No.: U-32109

A COPY OF THESE CONDITIONS SHOULD BE FURNISHED YOUR  
FIELD REPRESENTATIVE TO INSURE COMPLIANCE

All lease and/or unit operations are to be conducted in such a manner that full compliance is made with the applicable laws, regulations (43 CFR 3160), approved plan of operations. The operator is considered fully responsible for the actions of his subcontractors. The following items are emphasized:

1. There shall be no deviation from the proposed drilling and/or workover program as approved. Safe drilling and operating practices must be observed. All wells, whether drilling, producing, suspended, or abandoned shall be identified in accordance with 43 CFR 3162.6. Any changes in operations must have prior approval of this office. Pressure tests are required before drilling out from under all casing strings set and cemented in place. Blowout preventer controls must be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned. Preventers will be inspected and operated at least daily to insure good mechanical working order, and this inspection recorded on the daily drilling report. Preventers will be pressure tested before drilling casing cement plugs. All BOP pressure tests must be recorded on the daily drilling report.
2. All shows of fresh water and minerals will be reported and protected. A sample will be taken of any water flows and furnished this office for analysis. All oil and gas shows will be adequately tested for commercial possibilities, reported and protected.
3. No location will be constructed or moved, no well will be plugged, and no drilling or workover equipment will be removed from a well to be placed in a suspended status without prior approval of this office. If operations are to be suspended, prior approval of this office must be obtained and notification given before resumption of operations.

In the event abandonment of the hole is desired, an oral request may be granted by this office, but must be timely followed within 15 days with a "Notice of Intention to Abandon" (Form 3160-5). Unless the plugging is to take place immediately upon receipt of oral approval, the District Manager must be notified at least 48 hours in advance of the plugging of the well in order that the representative may witness plugging operation. If a well is suspended or abandoned, all pits must be fenced immediately until they are backfilled. The "Subsequent Report of Abandonment" (Form 3160-5) must be submitted within 15 days after the actual plugging of the well bore, reporting where the plugs were placed, and the current status of the surface restoration. If surface restoration has not been completed at that time, a followup report on Form 3160-5 should be filed when all surface restoration has been completed and the location is considered ready for final inspection.

The spud date will be reported orally to the respective District Manager's office within 48 hours after spudding. If the spudding occurs on a weekend or holiday, wait until the following regular workday to make this report.

Periodic drilling progress reports must be filed directly with the District Office on a frequency and form or method as may be acceptable to the District Manager.

In accordance with NTL-1, this well must be reported on Form 3160-6 "Monthly Report of Operations," starting with the month in which operations commence and continue each month until the well is physically plugged and abandoned. This report should be filed, in duplicate, directly with Royalty Management Accounting Center, Minerals Management Service, P.O. Box 2859, Casper, Wyoming 82602.

Any change in the program must be approved by the District Manager. "Sundry Notices and Reports on Wells" (Form 3160-5) must be filed for all changes of plans and other operations in accordance with 43 CFR 3162.4.1. Emergency approval may be obtained orally, but such approval does not waive the written report requirement. Any additional construction, reconstruction, or alteration of the facilities, including roads, gathering lines, batteries, etc., which will result in the disturbance of new ground will require the filing of a suitable plan pursuant to NTL-6, and prior approval by the District Manager.

5. Whether the well is completed as a dry hole or as a producer, "Well Completion and Recompletion Report and Log" (Form 3160-4) will be submitted not later than 15 days after completion of the well or after completion of operations being performed, in accordance with Onshore Oil and Gas Order No. 1; VIII. Reports and Activities Required after Well Completion. Two copies of all logs run, core descriptions, core analyses, well-test data, geologic summaries, sample descriptions, and all other surveys or data obtained and compiled during the drilling, workover, and/or completion operations, will be filed with Form 3160-4. Samples (cutting, fluid, and/or gas) will be submitted only when requested by this office.
6. Significant surface values are not involved at this location. Accordingly, you must notify the District Manager at least 24 hours prior to commencing field operations to allow this office to have personnel present for consultation during the construction of roads and locations.

The Cedar City District Office Address is:

1579 North Main, Cedar City, Utah 84720  
(801) 586-2401

Your contact is: Theron Mitchell  
Office Phone: (801) 586-2401  
Home Phone (801) 826-4347 or 586-2719

7. Unless otherwise specified herein, construction and maintenance of surface facilities approved under this plan shall be in accordance with the guidelines set forth in the BLM/FS/GS Oil and Gas Brochure entitled, "Surface Operating Standards for Oil and Gas Exploration and Development." This includes but is not limited to such items as road construction and maintenance, handling of top soil and rehabilitation.

8. If a replacement rig is contemplated for completion operations, a "Sundry Notice" to that effect must be filed, for prior approval of the District Manager, and all conditions of this approved plan are applicable during all operations conducted with the replacement rig.
9. Pursuant to NTL-2B requirements regarding disposal facilities for new wells, this is authorization for unlined pit disposal of the water produced from this well for a period of 90 days from the date of initial production for sales purposes. During this period, an application for approval of the permanent disposal method, along with the required water analysis and other information must be submitted for the District Manager's approval. Failure to timely file an application within the time allowed will be considered an incident of noncompliance, and will be grounds for issuing a shut-in order until the application is submitted.
10. This permit is valid for a period of one year from the date of approval. If construction does not commence within 90 days from approval, the operator must contact this office 15 days prior to beginning construction. Construction under adverse conditions may require additional stipulations. If the permit terminates, any surface disturbance created under the application must be rehabilitated in accordance with the approved plan. After termination, it is required that a new application be filed for approval for any future operations.
11. If a tank battery is constructed on this lease, it must be surrounded by a fire wall of sufficient capacity to adequately contain the storage capacity of the battery.
12. This Application for Permit to Drill is approved subject to the requirement that, should the well be successfully completed for production, this office must be notified when it is placed in a producing status. Such notification will be by telegram or other written communications, and must be received in this office by not later than the first business day next following the date on which the well is placed on production. The notification shall provide, as a minimum, the following informational items:
- a. Operator name, address and telephone number.
  - b. Well name and number.
  - c. Well location ( $\frac{1}{4}$ ,  $\frac{1}{4}$  Section, Township, Range and Prime Meridian).
  - d. Date was placed in a producing status.
  - e. The nature of the well's production, i.e. crude oil, or crude oil and casinghead gas, or natural gas and entrained liquid hydrocarbons.
  - f. The OCS, Federal or Indian lease prefix and number of which the well is located, otherwise, the non-Federal or non-Indian land category, i.e. State or private.
  - g. If appropriate, the unit agreement name, number and participating area name.
  - h. If appropriate, the communication agreement number.

SUPPLEMENTAL STIPULATIONS OF APPROVAL ATTACHED

1. The proposed access must follow the flagged route which runs above the unstable clay shale zone near the base of Buck Knoll. If wet unstable geologic zones are encountered during construction, additional engineering measures, as specified by the Authorized Officer, will be required to provide adequate drainage and stability.

The newly constructed access road from the Kanab Creek Road to the drill site will be closed (put to bed) after final reclamation.

2. Approval of the proposed action only relates to the area held by Lease #32109. Access to the lease will require additional authorization from the Dixie National Forest.

3. All limbs and trees of 3 inches or greater in diameter at the ~~base~~ must be lopped and scattered such that no vegetative waste material exceeds 2 feet above the ground. Merchantable timber will be cut, limbed, lopped, and hauled to a specified location at the junction of Kanab Creek Road and the newly constructed access road.

8. If a replacement rig is contemplated for completion operations, a "Sundry Notice" to that effect must be filed, for prior approval of the District Manager, and all conditions of this approved plan are applicable during all operations conducted with the replacement rig.

9. Pursuant to NTL-2B requirements regarding disposal facilities for new wells, this is authorization for unlined pit disposal of the water produced from this well for a period of 90 days from the date of initial production for sales purposes. During this period, an application for approval of the permanent disposal method, along with the required water analysis and other information must be submitted for the District Manager's approval. Failure to timely file an application within the time allowed will be considered an incident of noncompliance, and will be grounds for issuing a shut-in order until the application is submitted.
10. This permit is valid for a period of one year from the date of approval. If construction does not commence within 90 days from approval, the operator must contact this office 15 days prior to beginning construction. Construction under adverse conditions may require additional stipulations. If the permit terminates, any surface disturbance created under the application must be rehabilitated in accordance with the approved plan. After termination, it is required that a new application be filed for approval for any future operations.
11. If a tank battery is constructed on this lease, it must be surrounded by a fire wall of sufficient capacity to adequately contain the storage capacity of the battery.
12. This Application for Permit to Drill is approved subject to the requirement that, should the well be successfully completed for production, this office must be notified when it is placed in a producing status. Such notification will be by telegram or other written communications, and must be received in this office by not later than the first business day next following the date on which the well is placed on production. The notification shall provide, as a minimum, the following informational items:
  - a. Operator name, address and telephone number.
  - b. Well name and number.
  - c. Well location ( $\frac{1}{4}$ ,  $\frac{1}{4}$  Section, Township, Range and Prime Meridian).
  - d. Date was placed in a producing status.
  - e. The nature of the well's production, i.e. crude oil, or crude oil and casinghead gas, or natural gas and entrained liquid hydrocarbons.
  - f. The OCS, Federal or Indian lease prefix and number of which the well is located, otherwise, the non-Federal or non-Indian land category, i.e. State or private.
  - g. If appropriate, the unit agreement name, number and participating area name.
  - h. If appropriate, the communication agreement number.

SUPPLEMENTAL STIPULATIONS OF APPROVAL ATTACHED

1. The proposed access must follow the flagged route which runs above the unstable clay shale zone near the base of Buck Knoll. If wet unstable geologic zones are encountered during construction, additional engineering measures, as specified by the Authorized Officer, will be required to provide adequate drainage and stability.

The newly constructed access road from the Kanab Creek Road to the drill site will be closed (put to bed) after final reclamation.

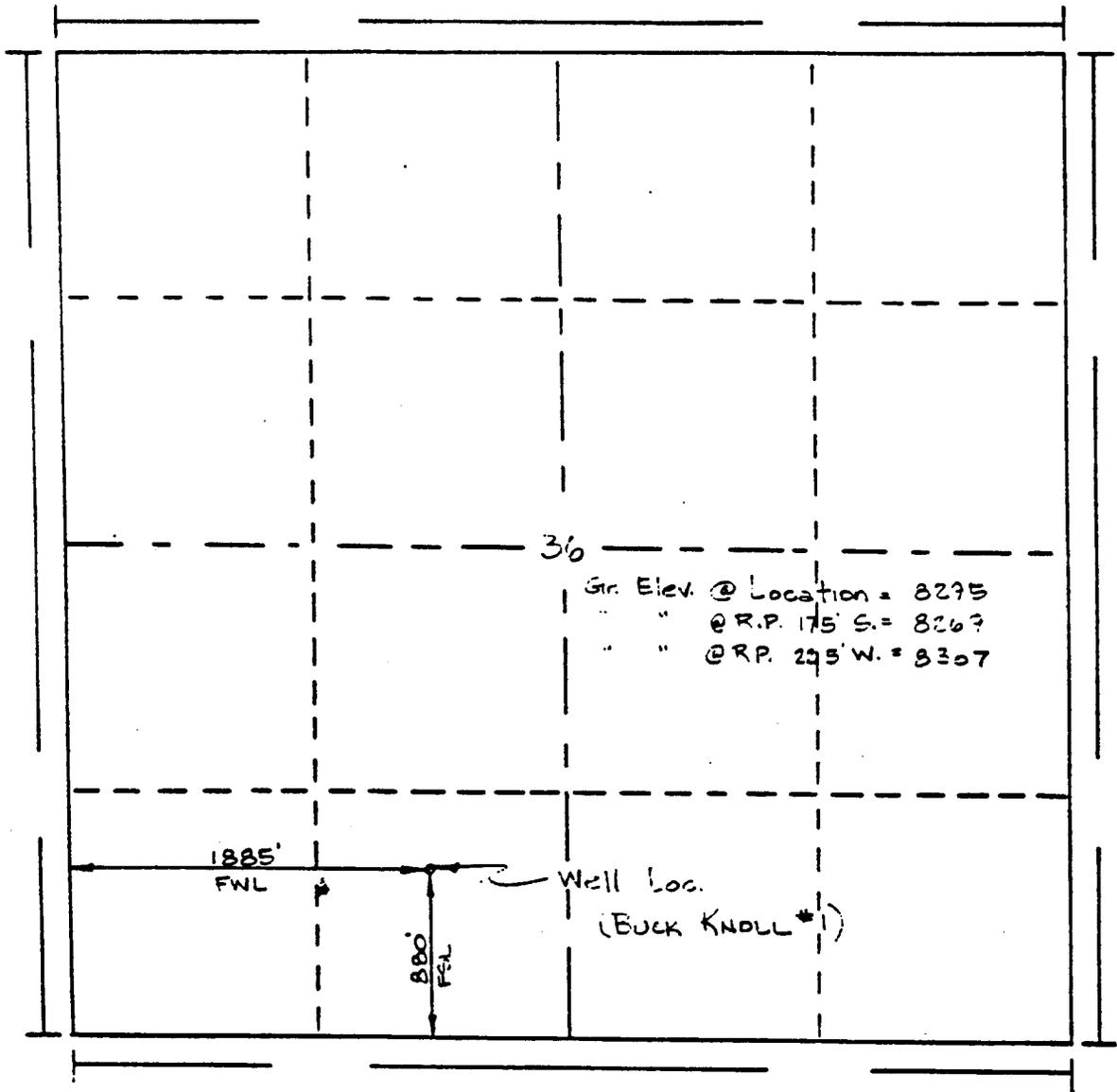
2. Approval of the proposed action only relates to the area held by Lease #32109. Access to the lease will require additional authorization from the Dixie National Forest.

3. All limbs and trees of 3 inches or greater in diameter at the ~~ETB~~ must be lopped and scattered such that no vegetative waste material exceeds 2 feet above the ground. Merchantable timber will be cut, limbed, lopped, and hauled to a specified location at the junction of Kanab Creek Road and the newly constructed access road.



EXHIBIT "B"

R. 4 1/2 W.



T. 37



Scale... 1" = 1000'

Powers Elevation of Denver, Colorado has in accordance with a request from HARRY ENGLE for ARCO OIL & GAS CO.

determined the location of BUCK KNOLL #1 to be 880' FSL & 1885' FWL of Section 36 Township 37 South Range 4 1/2 West of the SALT LAKE Meridian GARFIELD County, UTAH

I hereby certify that this plat is an accurate representation of a correct survey showing the location of



Date: JULY 23, 1984

S. Samuel Stegeman  
Licensed Engineer  
State of Colorado

No. 20596

**UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT**

**SUBMIT IN TRIPPLICATE\***  
\*Other instructions on reverse side

Form approved.  
Budget: Bureau No. 1004-0135  
Expires August 31, 1985

LEASE DESIGNATION AND SERIAL NO.  
U-32109

**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 "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/>		7. UNIT AGREEMENT NAME Buck Knoll Unit
2. NAME OF OPERATOR ARCO Oil and Gas Company, Division of Atlantic Richfield Company		8. FARM OR LEASE NAME NA
3. ADDRESS OF OPERATOR P.O. Box 5540, Denver, Colorado 80217		9. WELL NO. Buck Knoll Unit #1
4. LOCATION OF WELL. Report location clearly and in accordance with any State requirements.* See also space 17 below. At surface 880' FSL & 1885' FWL SE/4 SW/4		10. FIELD AND POOL, OR WILDCAT Wildcat
14. PERMIT NO.		11. SEC., T., R., M., OR BLEK. AND SURVEY OR AREA 36-37S-4-1/2W
15. ELEVATIONS (Show whether DF, FT, OR, ETC.) 8295'		12. COUNTY OR PARISH 13. STATE Garfield Utah

**Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data**

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input checked="" type="checkbox"/>	(Other) <input type="checkbox"/>	

\*Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.

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.)\*

Propose to revise casing design to:

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	CEMENT
22"	16"	75 <sup>#</sup>	800'	Cmt to surface
14-3/4"	10-3/4"	45.5 <sup>#</sup>	4000'	Cmt to surface

From originally proposed: 16" casing as contingency only.

Subsequent changes in pressure control equipment to include 16", 3000 psi SRRA BOP stack from 800' feet to 4000 feet. The 10-3/4" casing design is as was included with the original permit. This setting depth may be modified as hole conditions dictate and will be approved at that time.

**ACCEPTED**  
**APPROVED BY THE STATE**  
**OF UTAH DIVISION OF**  
**OIL, GAS, AND MINING**  
DATE: 7/11/84  
BY: John R. Baga

**RECEIVED**

**OCT 26**

DIVISION OF OIL  
GAS & MINING

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

SIGNER J. B. Morse TITLE Operations Manager DATE 10-22-84

(This space for Federal or State office use)

APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_  
CONDITIONS OF APPROVAL, IF ANY:

Federal approval of this action is required before commencing operations.

DIVISION OF OIL, GAS AND MINING

SPUDDING INFORMATION

API #43-017-30126

NAME OF COMPANY: ARCO OIL & GAS CO.

WELL NAME: BUCK KNOLL UNIT #1

SECTION SE SW 36 TOWNSHIP 37S RANGE 4 1/2 W COUNTY Garfield

DRILLING CONTRACTOR Loffland

RIG # 58

SPUDED: DATE 10-30-84

TIME 10:45 AM

HOW Rotary

DRILLING WILL COMMENCE \_\_\_\_\_

REPORTED BY Suzanne

TELEPHONE # 303-293-1077

DATE 10-30-84 SIGNED AS

TIGHT HOLE.  
UNIT STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLE  
(Other instructions  
reverse side)

Form approved.  
Budget Bureau No. 1004-0135  
Expires August 31, 1985

LEASE DESIGNATION AND SERIAL NO

U-32109

IF INDIAN, ADOPTED OR TRIBE NAME

NA

UNIT AGREEMENT NAME  
Buck Knoll Unit

FARM OR LEASE NAME  
NA

WELL NO.  
Buck Knoll Unit #1

FIELD AND POOL, OR WILDCAT  
Wildcat

SEC. T., R., M., OR S.E. AND  
SURVEY OR AREA  
36-37S-4-1/2W

14. PERMIT NO.  
43-017-30126

15. ELEVATIONS (Show whether OF, TO, OR, etc.)  
8295'

12. COUNTY OR PARISH: 13. STATE  
Garfield Utah

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF	<input type="checkbox"/>	PLUG OR ALTER CASING	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	MULTIPLE COMPLETE	<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>	ABANDON*	<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>	CHANGE PLANS	<input type="checkbox"/>
(Other)			

SUBSEQUENT REPORT OF:

WATER SHUT-OFF	<input type="checkbox"/>	REPAIRING WELL	<input type="checkbox"/>
FRACTURE TREATMENT	<input type="checkbox"/>	ALTERING CASING	<input type="checkbox"/>
SHOOTING OR ACIDIZING	<input type="checkbox"/>	ABANDONMENT*	<input type="checkbox"/>
(Other) SPUD & CASING	<input type="checkbox"/>		

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

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.)

MI & RU Loffland Rig #58. Dry hole digger completed digging 18" hole to 80' 10-22-84. Opened hole to a 30" hole. Ran and cemented 24" conductor pipe @ 120' KB. SPUD 14-3/4" hole 10-30-84. Drilled to 820'. Opened hole to a 22" hole. RU and ran 21 jts 16" 75#, K-55, STC casing and landed @ 808'KB. Cemented as follows: 30 bbls water, pump 700 sx 65/35 + 0.5% CFR-2 + 2% CaCl<sub>2</sub> (12.8 ppg) followed by 330 sx Class "H" + 2% CaCl<sub>2</sub> + 1/4#/sx flocele (15.6 ppg). Displace with 10 bbls water. Full returns. Float held. Tested BOPE to 250 psi for 5 mins and 2000 psi for 15 mins - held OK. Drilled cement and drilling ahead on 11-7-84.

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

SIGNER L.B. Morse TITLE Operations Manager DATE 11-8-84

(This space for Federal or State office use)

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

CONDITIONS OF APPROVAL, IF ANY:

\*See Instructions on Reverse Side

District	Rocky Mountain	County or Parish	Garfield	State	Utah
Field	Utah High Plateau	Lease or Unit	Buck Knoll Unit	Well no.	#1

10/24/84	Day -1. Have rec'd 22 rig loads. Drld 30" hole to 80' GL, and set 24" conductor. (PTD: 9600')
10/25/84	Day -2. Cont' RU.
10/26/84	Day -3. Wrkg on road. (24" @ 80' GL) Set & cmt 24" cond @ 80' GL. Set cellar. Dug rathole. RU. Wrk on road.
10/27-29/84	Day -6. RU. (24" @ 90' GL - corr'd) Cont RU. Set mud logging unit. Put lnr in reserve pit.
10/30/84	Day -7. Cont RU. (24" @ 115' RKB) PU BHA & tag up @ 115'. Mix spud mud. Accept rig 1500 hrs 10/29/84.
10/31/84 462	Day-1 (347') - Drlg. (24" @ 120' RKB corr'd) MW: 8.8# Vis: 85 Pv/Yp: 12/60 Fin mixing mud. SPUD 1045 hrs 10/30/84. Drld 14-3/4" hole to PD.

ARCO Oil and Gas Company  
Rocky Mountain District  
707 17th Street  
Mailing address: P.O. Box 5540  
Denver, Colorado 80217  
Telephone 303 293 4600



November 9, 1984

State of Utah  
Department of Natural Resources  
Division of Oil, Gas and Mining  
4241 State Office Building  
Salt Lake City, Utah 84114

Re: Monthly Report of Operations  
Well No. Buck Knoll Unit #1  
SE SW Sec.36-T37S-R4-1/2W  
Garfield Co., Utah

Gentlemen:

Attached, in duplicate, is the Monthly Report of  
Operations for the month of October,  
1984, on the subject well.

This well was spudded on October 30, 1984.

Very truly yours,

*B. R. Still*

B. R. Still  
Supervisor, Operations Info. Group

BRS:af

RECEIVED  
NOV 13 1984  
DIVISION OF OIL  
GAS & MINING

**UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT**

Form 3160-6  
(November 1983)  
(Formerly 9-329)

**MONTHLY REPORT  
OF  
OPERATIONS**

Lease No. U-3210  
Communitization Agreement No. \_\_\_\_\_  
Field Name Utah High Plateau  
Unit Name \_\_\_\_\_  
Participating Area \_\_\_\_\_  
County Garfield State Utah  
Operator Atlantic Richfield Co.

Amended Report (Buck Knoll Unit #1)

The following is a correct report of operations and production (including status of all unplugged wells) for the month of October, 1984

(See Reverse of Form for Instructions)

This report is required by law (30 U.S.C. 189, 30 U.S.C. 359, 25 U.S.C. 396d), regulation (43 CFR 3162.4-3), and the terms of the lease. Failure to report can result in the assessment of liquidated damages, (43 CFR 3160), penalties, shutting down operations, or basis for recommendation to cancel the lease and forfeit the bond (43 CFR 3160).

Well No.	Sec. & 1/4 of 1/4	TWP	RNG	Well Status	Days Prod.	*Barrels of Oil	*MCF of Gas	*Barrels of Water	Remarks
1	SE SW Sec. 36	37S	R4-1	DRG	0	0	0	0	This well was spudded on October 30, 1984.  Please see attached drilling report.

**RECEIVED**  
NOV 13 1984  
DIVISION OF OIL  
GAS & MINING

\*If none, so state.

**DISPOSITION OF PRODUCTION (Lease, Participating Area, or Communitized Area basis)**

	Oil & Condensate (BBLs)	Gas (MCF)	Water (BBLs)
*On hand, Start of Month	0	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX
*Produced	0	0	0
*Sold	0	0	XXXXXXXXXXXXXXXXXXXX
*Spilled or Lost	0	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX
*Flared or Vented	XXXXXXXXXXXXXXXXXXXX	0	XXXXXXXXXXXXXXXXXXXX
*Used on Lease	0	0	XXXXXXXXXXXXXXXXXXXX
*Injected	0	0	0
*Surface Pits	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	0
*Other (Identify)	0	0	0
*On hand, End of Month	0	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX
*API Gravity/BTU Content	0	0	XXXXXXXXXXXXXXXXXXXX

Authorized Signature: B. R. Stiel Address: P.O. Box 5540, Denver, CO 80217  
Title: Supervisor, Operations Info. Group Page 1 of 1

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

TIGHT HOLE  
**UNITED STATES**  
**DEPARTMENT OF THE INTERIOR**  
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPlicate  
(Other instructions on re-  
verse side)

Form approved.  
Budget Bureau No. 1004-0135  
Expires August 31, 1985

**SUNDRY NOTICES AND REPORTS ON WELLS** **CONFIDENTIAL**

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.  
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. <input type="checkbox"/> OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER		5. LEASE DESIGNATION AND SERIAL NO. U-52169	
2. NAME OF OPERATOR ARCO Oil and Gas Company, Division of Atlantic Richfield Company		6. IF INDIAN, ALLOTTEE OR TRIBE NAME NA	
3. ADDRESS OF OPERATOR P.O. Box 5540, Denver, Colorado 80217		7. UNIT AGREEMENT NAME Forest Creek Divide	
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface  130' FNL & 2435' FWL NE/4 NW/4		8. FARM OR LEASE NAME NA	
14. PERMIT NO. 43-017-30127		9. WELL NO. Divide Unit #1	
15. ELEVATIONS (Show whether OF, ST, GR, etc.) 7085' GL		10. FIELD AND POOL, OR WILDCAT Wildcat	
		11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA 28-31S-2W	
		12. COUNTY OR PARISH Garfield	13. STATE Utah

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) <u>Confidential Status</u>	
(Other) <input type="checkbox"/>		(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

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.)\*

Permission is hereby requested to hold this well in a CONFIDENTIAL status.

RECEIVED

DEC 05 1984

DIVISION OF  
OIL, GAS & MINING

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

SIGNED L.B. Morse TITLE Operations Manager DATE 11-30-84  
(This space for Federal or State office use)

APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_  
 CONDITIONS OF APPROVAL, IF ANY:

\*See Instructions on Reverse Side

ARCO Oil and Gas Company  
Rocky Mountain District  
707 17th Street  
Mailing address: P.O. Box 5540  
Denver, Colorado 80217  
Telephone 303 293 4600



December 10, 1984

State of Utah  
Department of Natural Resources  
Division of Oil, Gas and Mining  
4241 State Office Building  
Salt Lake City, Utah 84114

Re: Monthly Report of Operations  
Well No. Buck Knoll Unit #1  
SE SW Sec.36-T37S-R4-1/2W  
Garfield Co., Utah

Gentlemen:

Attached, in duplicate, is the Monthly Report of  
Operations for the month of November,  
19<sup>84</sup>, on the subject well.

This well was spudded on October 30, 1984.

Very truly yours,

*B. R. Still*  
B. R. Still  
Supervisor, Operations Info. Group

BRS:af

TIGHT HOLE  
**UNITED STATES**  
**DEPARTMENT OF THE INTERIOR**  
**BUREAU OF LAND MANAGEMENT**

SUBMIT IN TRIP  
(Other instructions on reverse side)

Form approved.  
Budget Bureau No. 1004-0135  
Expires August 31, 1985

**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 "APPLICATION FOR PERMIT—" for such proposals.)

<p><b>1. OIL WELL</b> <input checked="" type="checkbox"/> <b>GAS WELL</b> <input type="checkbox"/> <b>OTHER</b> <input type="checkbox"/></p> <p><b>2. NAME OF OPERATOR</b> ARCO Oil and Gas Company, Division of Atlantic Richfield Company</p> <p><b>3. ADDRESS OF OPERATOR</b> P.O. Box 5540, Denver, Colorado 80217</p> <p><b>4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)</b> At surface 880' FSL &amp; 1885' FWL SE/4 SW/4</p> <p><b>14. PERMIT NO.</b> 43-017-30126</p>	<p><b>5. LEASE DESIGNATION AND SERIAL NO.</b> U-32109</p> <p><b>6. IF INDIAN, ALLOTTEE OR TRIBE NAME</b> NA</p> <p><b>7. UNIT AGREEMENT NAME</b> Buck Knoll Unit</p> <p><b>8. FARM OR LEASE NAME</b> NA</p> <p><b>9. WELL NO.</b> Buck Knoll Unit #1</p> <p><b>10. FIELD AND POOL, OR WILDCAT</b> Wildcat</p> <p><b>11. SEC., T., B., M., OR BLK. AND SURVEY OR AREA</b> 36-37S-4 1/2 W</p> <p><b>12. COUNTY OR PARISH</b> Garfield</p> <p><b>13. STATE</b> Utah</p>
<p><b>15. ELEVATIONS (Show whether DP, RT, GR, etc.)</b> 8295'</p>	<p><b>CONFIDENTIAL</b></p>

**16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data**

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input type="checkbox"/>	SHOOTING OR ACIDISING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) <u>10-3/4" casing</u>	
(Other) <input type="checkbox"/>		(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

**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 ahead. Core #1 3062-3064, Core #2 3064-3084. Drilled to 4633'. Logged. RU and ran 113 jts 10-3/4" K-55 & J-55, 45.5# casing and landed @ 4627'. Pump 80 bbls water and 1950 sx lite with 2% CaCl<sub>2</sub> + 1/4#/sx celloseal, followed by 250 sx Class "H" with 2% CaCl<sub>2</sub> + 1/4#/sx celloseal. Second stage cement job - pumped 10 bbls water, 400 sx Class "H" with 2% CaCl<sub>2</sub> + 1/4#/sx celloseal. Full returns. Tested BOP to 3000 psi for 15 mins - OK.

Drilled cement and drilling ahead 12-4-84.

RECEIVED

DEC 13 1984

DIVISION OF  
OIL, GAS & MINING

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

SIGNED L.B. Morse TITLE Operations Manager DATE 12-10-84  
L.B. Morse

(This space for Federal or State office use)

APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_  
CONDITIONS OF APPROVAL, IF ANY:

\*See Instructions on Reverse Side

**UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT**

Form 3160-6  
(November 1983)  
(Formerly 9-329)

**MONTHLY REPORT  
OF  
OPERATIONS**

Lease No. U-321  
Communitization Agreement No. \_\_\_\_\_  
Field Name Utah High Plateau  
Unit Name \_\_\_\_\_  
Participating Area \_\_\_\_\_  
County Garfield State Utah  
Operator Atlantic Richfield Co.

Amended Report (Buck Knoll Unit #1)

The following is a correct report of operations and production (including status of all unplugged wells) for the month of November, 1984

(See Reverse of Form for Instructions)

This report is required by law (30 U.S.C. 189, 30 U.S.C. 359, 25 U.S.C. 396d), regulation (43 CFR 3162.4-3), and the terms of the lease. Failure to report can result in the assessment of liquidated damages, (43 CFR 3160), penalties, shutting down operations, or basis for recommendation to cancel the lease and forfeit the bond (43 CFR 3160).

Well No.	Sec. & 1/4 of 1/4	TWP	RNG	Well Status	Days Prod.	*Barrels of Oil	*MCF of Gas	*Barrels of Water	Remarks
1	SE SW Sec. 36	37S	R4-1	DRG	0	0	0	0	This well was spudded on October 30, 1984.  Please see attached drilling report.

**RECEIVED**  
DEC 14 1984  
DIVISION OF  
OIL, GAS & MINING

\*If none, so state.

**DISPOSITION OF PRODUCTION (Lease, Participating Area, or Communitized Area basis)**

	Oil & Condensate (BBLs)	Gas (MCF)	Water (BBLs)
*On hand, Start of Month	0	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
*Produced	0	0	0
*Sold	0	0	XXXXXXXXXXXXXXXXXX
*Spilled or Lost	0	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
*Flared or Vented	XXXXXXXXXXXXXXXXXX	0	XXXXXXXXXXXXXXXXXX
*Used on Lease	0	0	XXXXXXXXXXXXXXXXXX
*Injected	0	0	0
*Surface Pits	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX	0
*Other (Identify)	0	0	0
*On hand, End of Month	0	XXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXX
*API Gravity/BTU Content	0	0	XXXXXXXXXXXXXXXXXX

Authorized Signature: B. R. Still Address: P.O. Box 5540, Denver, CO 80217  
Title: Supervisor, Operations Info. Group Page 1 of 1

District	County or Parish	State
Rocky Mountain	Garfield	Utah
Field	Lease or Unit	Well no.
Utah High Plateau	Buck Knoll Unit	#1
11/1/84 820	Day-2 (358') - Chg'g BHA. (24" @ 120' RKB corr'd) MW: 8.8# Vis: 52 Pv/Yp: 5/32 Drl'd 14-3/4" hole to PD. POH, chg'g BHA. Surveys: 3/4° @ 494', 1/2° @ 553', 0° @ 616', 684' & 784'.	
11/2/84 820	Day-3 (0') - Opng hole. (24" @ 120' RKB corr'd) MW: 9.0# Vis: 62 Pv/Yp: 10/55 PU HO. Opn 14-3/4" hole to 22" f/115-435'. Survey: 0° @ 820'.	
11/3-5 820	Day-6 (0') - Tstg BOPs. (16" @ 808') MW: 9.3# Vis: 40 Pv/Yp: 8/5 Opnd hole to 22" f/435-820'. POH. Run 21 jts 16", 75#, K-55, ST&C. Lnd @ 808'. RIH w/stinger on DP to insert flt clr. Pmp 30 BW, 700 sx 65:35:6 cmt w/add & 330 sx "H" w/add. Displ w/wtr. Full returns thruout w/gd cmt returns to surf. POH w/stinger & DP. WOC. Cut off 16" csg. Install wellhd & BOPs. Tstg BOPs. (AC \$374M)	
11/6/84 820	Day-7 (0') - Drlg cmt. (16" @ 808') MW: 9.3# Vis: 40 Pv/Yp: 8/5 Tst BOPs. Instl bell nple. PU BHA. Tst 16" to 1000# - OK. Tag cmt @ 716'. Drlg insert clr & hard cmt.	
11/7/84 1485	Day-8 (665') - Drlg. (16" @ 808') MW: 9.1# Vis: 38 Pv/Yp: 7/9 Drl'd cmt & shoe & drld 14-3/4" hole to PD. Surveys: 3/4° @ 869', 1° @ 1000' & 1394'.	
11/8/84 2050	Day-9 (565') - Drlg. (16" @ 808') MW: 9.0# Vis: 38 Pv/Yp: 9/1 Drl'd 14-3/4" hole to PD w/TFNB @ 1929'. Surveys: 1° @ 1665', 1-1/4° @ 1919'.  (AFE \$2,276M)	
11/9/84 2636	Day-10 (586') - Drlg. (16" @ 808') MW: 9.2# Vis: 56 Pv/Yp: 20/7 Drl'd 14-3/4" hole to PD. Surveys: 1° @ 2184' & 2529'.	
11/10-13 3496	Day-14 (860') - Drlg. (16" @ 808') MW: 9.3# Vis: 63 Pv/Yp: 19/15 Drl'd to 3060'. POH. RIH w/CB. Bridge 2041-2102'. Wash 65' to btm. Cut Core #1, 3060-3064'. POH. Rec'd 4-1/2' core. RIH w/CB. Cut Core #2, 3064-84'. POH. Rec'd 20-1/2' core. RIH w/bit. Rnd core hole. Drl'd 14-3/4" hole to PD. Surveys: 1° @ 2814' & 3067'. 3/4° @ 3349'.	
11/14/84 3667	Day-15 (171') - Drlg. (16" @ 808') MW: 9.1# Vis: 44 Pv/Yp: 9/7 Drl'd 14-3/4" hole to PD w/TFNB @ 3517'. Survey: 1° @ 3454'.	
11/15/84 4051	Day-16 (384') - Drlg. (16" @ 808') MW: 9.0# Vis: 43 Pv/Yp: 9/7 Drl'd 14-3/4" hole to PD. 100 BM lost in last 24 hrs; cure mud loss w/LCM. Currently drlg w/full returns. Survey: 3/4° @ 3748'.	

District

County or Parish

Utah

Well no.

Rocky Mountain

Garfield

Lease or Unit

#1

Field

Utah High Plateau

Buck Knoll Unit

11/16/84	4260	Day-17 (209') - Drlg. (16" @ 808') MW: 9.0# Vis: 52 Pv/Yp: 15/8 Drl'd 14-3/4" hole to PD. Survey: 3/4° @ 4104'.
11/17-19	4490	Day-20 (230') - Drlg. (16" @ 808') MW: 9.0# Vis: 56 Pv/Yp: 15/12 Drl'd 14-3/4" hole to 4263'. POH w/drag 4150-4000'. Inspect BHA & LD cracked XO & NRS. RIH w/B#6, wsh bridges 4027' & 4107'. Wsh 50' to btm. Drl'd 4263-4458'. POH w/tite spts 100' off btm. Chg BHA. RIH w/B#7, hit bridge @ 3199'. Could not wrk thru bridge. POH. Chg BHA. RIH. Wsh & rm tite spts 3661-4458'. Drl'd to PB w/B#7. Surveys: 3/4° @ 4263', 1-1/4° @ 4458'.
11/20/84	4589	Day-21 (99') - Drlg. (16" @ 808') MW: 9.1# Vis: 60 Pv/Yp: 20/11 Drl'd 14-3/4" hole to PD. Lost returns @ 4514'. Spt LCM pill & regain returns.
11/21/84	4658	Day-22 (69') - POH. (16" @ 808') MW: 9.0# Vis: 66 Pv/Yp: 25/12 Drl'd 14-3/4" hole to PD. Lost returns. POH 5 stds. Mix & pmp LCM pill. Hole became sticky. Strt POH w/kelly on. Partially plugged bit. Hole freed up. Presently POH.
11/22-26	4658	Day-27 (0') - Rng OH logs. (16" @ 808') MW: 9.2# Vis: 54 Pv/Yp: 18/6 Cont POH to 1158'. Hole becoming tite. Wrkd up to 1033'. Pipe became stuck @ 1033'. Jarred on stuck pipe f/10 hrs w/partial returns. Pmpd LCM sweep & regain full returns. Cont'd jarring on stuck pipe w/90-95% returns f/10-1/2 hrs. RU Pengo WL. Run freept & BO shot. BO drl string @ 910'. Left 189' fsh in hole. RD WL unit. Wrk free pipe out of hole. repair drwks. PU 14-3/4" bit & TIH to 807'. Wsh & rm to 910' (TOF). Circ & cond hole. POH 2 stds. Hole staying full. RIH to TOF. Circ & cond hole. POH w/14-3/4" bit. MU wsh pipe & TIH to TOF. Wsh over fsh f/910-968'. Fish fell dn hole. POH. PU 14-3/4" bit & RIH to 928'. Wsh & rm 928-1078'. Cont'd RIH to 2149'. Tagged TOF. Circ & cond hole. POH. PU fshg tools & TIH to 2149'. Screw into TOF & estab circ. Wrk fsh free. POH & LD fsh & fshg tools. PU 14-3/4" bit & BHA. TIH to 2158'. Wsh & rm 2158-4658'. Lost 40 BM while rmg. Circ & cond hole. Sht trip. Circ & cond hole. POH. RU Schl & run OH logs. (AC \$732M)
11/27/84	4633 (corr'd)	Day-28 - Rng 10-3/4" csg. (16" @ 808') MW: 9.1# Vis: 47 Pv/Yp: 19/6 Ran DLL/MSFL/SP/GR, LDT/CNL/GR/Cal, BHCS/GR/Calip & Dipmeter f/4625' (LTD) to 808'. TIH. Circ & cond hole f/10-3/4" csg. POH. RU csg crew. Began rmg 10-3/4" csg.

District Rocky Mountain	County or Parish Garfield	State Utah
Field Utah High Plateau	Lease or Unit Buck Knoll Unit	Well no. #1

Date and depth as of 8:00 a.m.	Complete record for each day while drilling or workover in progress
11/28/84 4633	<p>Day-29 (0') - WOC. (10-3/4" @ 4627')</p> <p>MW: 9.1# Vis: 47 Pv/Yp: 19/6</p> <p>Ran DFFS, 2 jts 10-3/4", 45.5#, J-55, BTC csg, DFFC, 19 jts 10-3/4" 45.5# J-55 BTC csg, 73 jts 10-3/4" 45.5# K-55 BTC csg, stage tool 19 jts 10-3/4" 45.5# K-55 BTC csg. Brk circ &amp; wsh 10-3/4" csg 5' to 4627' w/DFFC @ 4542' &amp; stage tool @ 761'. RU Western. Cmtd 10-3/4" csg w/80 BW preflush foll'd by 1950 sx Lite cmt w/add, foll'd by 250 sx Cl "H" cmt w/add. Received full returns while pmg cmt. SD 30 min to release top plug. Began displ, lost returns. Press began bldg after 76.2 bbls displ (calc displ 437 bbls). Press csg to 2000 psi. No fld movement. Opn stage tool. Circ &amp; cond mud thru stage tool. Cmt 2nd stage w/400 sx Cl "H" cmt w/add w/full returns. Close stage tool. CIP @ 2200 hrs 11/27/84. RD Western. WOC.</p>
11/29/84 4633	<p>Day-30 (0') - WOC. (10-3/4" @ 4627')</p> <p>MW: 9.1# Vis: 47 Pv/Yp: 19/6</p> <p>WOC. RIH w/1" tbg dn 16" x 10-3/4" annulus to 200'. Cmt backside w/110 sx Cl "H" cmt w/add to surf. POH w/1" tbg. WOC.</p>
11/30/84 4633	<p>Day-31 (0') - Tst BOPE. (10-3/4" @ 4627')</p> <p>MW: 9.1# Vis: 47 Pv/Yp: 19/6</p> <p>Cut 16" csg. ND 20" BOPE. Cut 10-3/4" csg. Weld on 10-3/4" 3000 psi WP csghd &amp; tst same. NU BOPE &amp; press tst.</p>

ARCO Oil and Gas Company  
Rocky Mountain District  
707 17th Street  
Mailing address: P.O. Box 5540  
Denver, Colorado 80217  
Telephone 303 293 4600



January 18, 1985

RECEIVED  
JAN 23 1985

Division of  
OIL, GAS & MINING

CONFIDENTIAL

State of Utah  
Department of Natural Resources  
Division of Oil, Gas and Mining  
4241 State Office Building  
Salt Lake City, Utah 84114

Re: Monthly Report of Operations  
Well No. Buck Knoll Unit #1  
SE SW Sec.36-T37S-R4-1/2W  
Garfield Co., Utah

Gentlemen:

Attached, in duplicate, is the Monthly Report of Operations for the month of December, 1984, on the subject well.

This well was spudded on October 30, 1984.

Very truly yours,

*B. R. Still*

B. R. Still  
Supervisor, Operations Info. Group

BRS:af

**UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT**

Form 3160-6  
(November 1983)  
(Formerly 9-329)

**MONTHLY REPORT  
OF  
OPERATIONS**

Lease No. U-32100  
 Communitization Agreement No. \_\_\_\_\_  
 Field Name Utah High Plateau  
 Unit Name \_\_\_\_\_  
 Participating Area \_\_\_\_\_  
 County Garfield State Utah  
 Operator Atlantic Richfield Co.

Amended Report (Buck Knoll Unit #1)

The following is a correct report of operations and production (including status of all unplugged wells) for the month of December, 19 84

(See Reverse of Form for Instructions)

This report is required by law (30 U.S.C. 189, 30 U.S.C. 359, 25 U.S.C. 396d), regulation (43 CFR 3162.4-3), and the terms of the lease. Failure to report can result in the assessment of liquidated damages, (43 CFR 3160), penalties, shutting down operations, or basis for recommendation to cancel the lease and forfeit the bond (43 CFR 3160).

Well No.	Sec. & 1/4 of 1/4	TWP	RNG	Well Status	Days Prod.	*Barrels of Oil	*MCF of Gas	*Barrels of Water	Remarks
1	SE SW Sec. 36	37S	R4-1	DRG	0	0	0	0	This well was spudded on October 30, 1984.  This well is drilling.

**RECEIVED**  
 JAN 23 1985  
 DIVISION OF  
 OIL, GAS & MINING

\*If none, so state.

**DISPOSITION OF PRODUCTION (Lease, Participating Area, or Communitized Area basis)**

	Oil & Condensate (BBLs)	Gas (MCF)	Water (BBLs)
*On hand, Start of Month	0	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX
*Produced	0	0	0
*Sold	0	0	XXXXXXXXXXXXXXXXXXXX
*Spilled or Lost	0	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX
*Flared or Vented	XXXXXXXXXXXXXXXXXXXX	0	XXXXXXXXXXXXXXXXXXXX
*Used on Lease	0	0	XXXXXXXXXXXXXXXXXXXX
*Injected	0	0	0
*Surface Pits	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	0
*Other (Identify)	0	0	0
*On hand, End of Month	0	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX
*API Gravity/BTU Content	0	0	XXXXXXXXXXXXXXXXXXXX

Authorized Signature: B. R. Steel Address: P.O. Box 5540, Denver, CO 80217

Title: Supervisor, Operations Info. Group Page 1 of 1

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

1/26/85

ARCO

Buck Knolls Unit #1

SESW Sec 36, 37S, 412W

Garfield Co

Proposed P&A

TR. 10, 119!

Plugging Orders from BLM.

Form 3160-5  
(November 1983)  
(Formerly 9-331)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE\*  
(Other instructions on reverse side)

5. LEASE DESIGNATION AND SERIAL NO.

U-32109

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

NA

7. UNIT AGREEMENT NAME

Buck Knoll Unit

8. FARM OR LEASE NAME

NA

9. WELL NO.

Buck Knoll Unit #1

10. FIELD AND POOL, OR WILDCAT

Wildcat

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

36-37S-4 1/2 W

12. COUNTY OR PARISH 13. STATE

Garfield

Utah

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 "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL  GAS WELL  OTHER

2. NAME OF OPERATOR

ARCO Oil and Gas Company, Division of Atlantic Richfield Company

3. ADDRESS OF OPERATOR

P.O. Box 5540, Denver, Colorado 80217

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.\*  
See also space 17 below.)  
At surface

880' FSL & 1885' FWL SE 1/4 SW 1/4

14. PERMIT NO.

43-017-30126

15. ELEVATIONS (Show whether OF, RT, GR, etc.)

8295' GL

**CONFIDENTIAL**

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF

FRACTURE TREAT

SHOOT OR ACIDIZE

REPAIR WELL

(Other)

PULL OR ALTER CASING

MULTIPLE COMPLETION

ABANDON\*

CHANGE PLANS

SUBSEQUENT REPORT OF:

WATER SHUT-OFF

FRACTURE TREATMENT

SHOOTING OR ACIDIZING

(Other)

REPAIRING WELL

ALTERING CASING

ABANDONMENT\*

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

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 ahead to 8680'. Ran DST #1 8656'-8680'. Cut Core #2 8680'-8699'.  
Core #3 8699'-8710'. DST #2 8780'-8829'. DST #3 8910'-8950'. Core #4  
8960'-8970'. DST #4 9542'-9624'. Core #5 9802'-9809'. Drilled to 10,119'  
Total Depth. Logged. Ran DST #5 10,060'-10,119'. Propose to P&A as follows:

- Plug #1 6900'-6600'
- Plug #2 4500' Retainer
- Plug #3 760'-550'
- Plug #4 94'-Surface

Verbal approval received from A. Raffoul (BLM) and S. Bates (State Oil & Gas).

ACCEPTED BY THE STATE  
OF UTAH DIVISION OF  
OIL, GAS, AND MINING

DATE: 2/20/85  
BY: John R. Bates

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

SIGNED

*L.B. Morse*  
L.B. Morse

TITLE Operations Manager

DATE 1-31-85

(This space for Federal or State office use)

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

\*See Instructions on Reverse Side

Form 3160-5  
(November 1983)  
(Formerly 9-331)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIP DATE  
(Other instructions on re-  
verse side)

5. LEASE DESIGNATION AND SERIAL NO.  
U-32109

6. IF INDIAN, ALLOTTEE OR TRIBE NAME  
NA

7. UNIT AGREEMENT NAME  
Buck Knoll Unit

8. FARM OR LEASE NAME  
NA

9. WELL NO.  
Buck Knoll Unit #1

10. FIELD AND POOL, OR WILDCAT  
Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA  
36-37S-4 1/2 W

12. COUNTY OR PARISH  
Garfield

13. STATE  
Utah

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 "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL  GAS WELL  OTHER

2. NAME OF OPERATOR  
ARCO Oil and Gas Company, Division of Atlantic Richfield Company

3. ADDRESS OF OPERATOR  
P.O. Box 5540, Denver, Colorado 80217

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.\*  
See also space 17 below.)  
At surface  
880' FSL & 1885' FWL SE 1/4 SW 1/4

14. PERMIT NO.  
43-017-30126

15. ELEVATIONS (Show whether DP, RT, GR, etc.)  
8295' GL

**CONFIDENTIAL**

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input checked="" type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) <input type="checkbox"/>	

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

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.)\*

Finished DST #5. RIH OE with DP and set plugs as follows:

- Plug #1 6900' - 6600' with 135 sx Class "H" cement + 1% CaCl<sub>2</sub>
- Plug #2 RETAINER @ 4500' with 90 sx Class "H" cement + 1% CaCl<sub>2</sub>
- Plug #3 760' - 550' with 90 sx Class "H" cement + 1% CaCl<sub>2</sub>
- Plug #4 94' - Surface with 23 sx Class "H" cement + 1% CaCl<sub>2</sub>

Released rig 1-28-85.

ACCEPTED BY THE STATE  
OF UTAH DIVISION OF  
OIL, GAS, AND MINING  
DATE: 2/20/85  
BY: John R. Baya

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

SIGNED L.B. Morse / hly TITLE Operations Manager DATE 1-31-85  
L.B. Morse

(This space for Federal or State office use)

APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_  
CONDITIONS OF APPROVAL, IF ANY:

\*See Instructions on Reverse Side

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

SUBMIT IN DUPLICATE

(See other instructions on reverse side)

Form approved.  
Budget Bureau No. 1004-0137  
Expires August 31, 1985

14

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. RENVR.  Other

**CONFIDENTIAL**

5. LEASE DESIGNATION AND SERIAL NO.

U-32109

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

NA

7. UNIT AGREEMENT NAME

Buck Knoll Unit

8. FARM OR LEASE NAME

NA

9. WELL NO.

Buck Knoll Unit #1

10. FIELD AND POOL, OR WILDCAT

Wildcat

11. SEC. T. R. M. OR BLOCK AND SURVEY OR AREA

36-37S-4½W

12. COUNTY OR PARISH

Garfield

13. STATE

Utah

2. NAME OF OPERATOR  
ARCO Oil and Gas Company, Division of Atlantic Richfield Company

3. ADDRESS OF OPERATOR

P.O. Box 5540, Denver, Colorado 80217

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)\*

At surface 880' FSL & 1885' FWL SE¼ SW¼

At top prod. interval reported below ---

At total depth ---

API #43-017-30126

14. PERMIT NO. BLM DATE ISSUED 10-12-84

15. DATE SPUDDED 10-30-84 16. DATE T.D. REACHED 1-22-85 17. DATE COMPL. (Ready to prod.) P&A 1-28-85 18. ELEVATIONS (DF. RKB. RT. GB. ETC.)\* 8295' GL 8325' KB 8295' 19. ELEV. CASINGHEAD

20. TOTAL DEPTH, MD & TVD 10,119' 21. PLUG. BACK T.D., MD & TVD Surface P&A 22. IF MULTIPLE COMPL., HOW MANY\* P&A 23. INTERVALS DRILLED BY ROTARY TOOLS 0-10119' CABLE TOOLS ---

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)\* 25. WAS DIRECTIONAL SURVEY MADE NO

PLUGGED AND ABANDONED

26. TYPE ELECTRIC AND OTHER LOGS RUN

DLL/LDT/CNL BHC-Sonic

LOGS

27. WAS WELL CORRED YES

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

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
24"	---	120' KB	---	Conductor	NONE
16"	75#	808' KB	22"	1030 SX	NONE
10-3/4"	45.5#	4627' KB	14-3/4"	2200 SX	NONE

29. LINER RECORD				30. TUBING RECORD			
SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)	SIZE	DEPTH SET (MD)	PACKER SET (MD)
---	NONE	P & A	---	---	---	NONE	P & A

31. PERFORATION RECORD (Interval, size and number)		32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.	
INTERVAL	SIZE	DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
---	NONE	P & A	---

33. PRODUCTION							
DATE FIRST PRODUCTION	PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump)	WELL STATUS (Producing or shut-in)					
---	PLUGGED AND ABANDONED	P&A					
DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD	OIL—BSL.	GAS—MCF.	WATER—BSL.	GAS-OIL RATIO
---	---	---	PLUGGED AND ABANDONED	---	---	---	---
FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE	OIL—BSL.	GAS—MCF.	WATER—BSL.	OIL GRAVITY-API (CORR.)	
---	---	---	PLUGGED AND ABANDONED	---	---	---	

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

35. LIST OF ATTACHMENTS  
Daily Well History DST's

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records  
SIGNED L.B. Morse TITLE Operations Manager DATE 2-4-85

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

38. GEOLOGIC MARKERS

7. 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.	NAME	TOP	
					MEAS. DEPTH	TRUE VERT. DEPTH
Core #1	3062'	3084'		Tropic	2150'	
Core #2	8680'	8699'		Dakota	3022'	
Core #3	8699'	8710'		Entrada	3550'	
Core #4	8960'	8970'		Carmel	3650'	
Core #5	9802'	9809'		Navajo	4652'	
				Kayenta	6917'	
				Wingate	7070'	
				Chinle	7164'	
DST #1	8565'	8680'	Recovered 2400 cc OCM	Moenkopi	7612'	
DST #2	8780'	8829'	Recovered 2500 cc mud	Sinbad	8770'	
DST #3	8910'	8950'	Recovered 300 cc mud + 2000 cc Sulpher wtr	Kaibab	8957'	
DST #4	9542'	9624'	Recovered 2400 cc MCW	Toroweap	9248'	
DST #5	10060'	10119'	Recovered 2370 cc water	Cedar Mesa	9760'	

~~CONFIDENTIAL~~  
~~CONFIDENTIAL~~

TIGHT HOLE

BUCK KNOLL UNIT #1  
SE $\frac{1}{4}$  SW $\frac{1}{4}$  Section 36-37S-4 $\frac{1}{2}$ W  
Garfield County, Utah

CONFIDENTIAL

PLUGGED AND ABANDONED AS FOLLOWS:

PLUG #1 6900'-6600' 135 sx Class "H" cement + 1% CaCl<sub>2</sub>  
PLUG #2 Retainer @ 4500' 90 sx Class "H" cement + 1% CaCl<sub>2</sub>  
PLUG #3 760'-550' 90 sx Class "H" cement + 1% CaCl<sub>2</sub>  
PLUG #4 4'-Surface 23 sx Class "H" cement + 1% CaCl<sub>2</sub>

ARCO Oil and Gas Company  
Rocky Mountain District  
707 17th Street  
Mailing address: P.O. Box 5540  
Denver, Colorado 80217  
Telephone 303 293 4600



RECEIVED

FEB 15 1985

DIVISION OF OIL  
& GAS & MINING

February 8, 1985

State of Utah  
Department of Natural Resources  
Division of Oil, Gas and Mining  
4241 State Office Building  
Salt Lake City, Utah 84114

Re: Monthly Report of Operations  
Well No. Buck Knoll Unit #1  
SE SW Sec.36-T37S-R4-1/2W  
Garfield Co., Utah

Gentlemen:

Attached, in duplicate, is the Monthly Report of  
Operations for the month of January,  
1985, on the subject well.

This well was spudded on October 30, 1984.

Very truly yours,

B. R. Still  
Supervisor, Operations Info. Group

BRS:af

**UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT**

Form 3160-6  
(November 1983)  
(Formerly 9-329)

**MONTHLY REPORT  
OF  
OPERATIONS**

Lease No. U-32109  
Communitization Agreement No. \_\_\_\_\_  
Field Name Utah High Plateau  
Unit Name \_\_\_\_\_  
Participating Area \_\_\_\_\_  
County Garfield State Utah  
Operator Atlantic Richfield Co.

Amended Report (Buck Knoll Unit #1)

The following is a correct report of operations and production (including status of all unplugged wells) for the month of January, 1985

(See Reverse of Form for Instructions)

This report is required by law (30 U.S.C. 189, 30 U.S.C. 359, 25 U.S.C. 396d), regulation (43 CFR 3162.4-3), and the terms of the lease. Failure to report can result in the assessment of liquidated damages, (43 CFR 3160), penalties, shutting down operations, or basis for recommendation to cancel the lease and forfeit the bond (43 CFR 3160).

Well No	Sec. & 1/4 of 1/4	TWP	RNG	Well Status	Days Prod.	*Barrels of Oil	*MCF of Gas	*Barrels of Water	Remarks
1	SE SW Sec. 36	37S	R4-1	P&A	0	0	0	0	This well was spudded on October 30, 1984.  Final Report- P&A 1/28/85.

**RECEIVED**  
  
FEB 15 1985  
  
DIVISION OF OIL  
GAS & MINING

\*If none, so state.

**DISPOSITION OF PRODUCTION (Lease, Participating Area, or Communitized Area basis)**

	Oil & Condensate (BBLs)	Gas (MCF)	Water (BBLs)
*On hand, Start of Month	0	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX
*Produced	0	0	0
*Sold	0	0	XXXXXXXXXXXXXXXXXXXX
*Spilled or Lost	0	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX
*Flared or Vented	XXXXXXXXXXXXXXXXXXXX	0	XXXXXXXXXXXXXXXXXXXX
*Used on Lease	0	0	XXXXXXXXXXXXXXXXXXXX
*Injected	0	0	0
*Surface Pits	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	0
*Other (Identify)	0	0	0
*On hand, End of Month	0	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX
*API Gravity/BTU Content	0	0	XXXXXXXXXXXXXXXXXXXX

Authorized Signature: B. P. Steel Address: P.O. Box 5540, Denver, CO 80217  
Title: Supervisor, Operations Info. Group Page 1 of 1

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

## TIGHT HOLE

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BUCK KNOLL UNIT #1  
 SE $\frac{1}{2}$  SW $\frac{1}{2}$  Section 36-37S-41W  
 Garfield County, Utah

10/24/84		Have rec'd 22 rig loads. Drld 30" hole to 80' GL, and set 24" conductor.
10/25/84		Day -2. Cont' RU. (24" @ 80' GL)
10/26/84		Day -3. Wrkg on road. (24" @ 80' GL) Set & cmt 24" cond @ 80' GL. Set cellar. Dug rathole. RU. Wrk on road.
10/27-29		Day -6. RU. (24" @ 90' GL - corr'd) Cont RU. Set mud logging unit. Put lnr in reserve pit.
10/30/84		Day -7. Cont RU. (24" @ 115' RKB) PU BHA & tag up @ 115'. Mix spud mud. Accept rig 1500 hrs 10/29/84.
10/31/84	462	Day-1 (347') - Drlg. (24" @ 120' RKB corr'd) MW: 8.8# Vis: 85 Pv/Yp: 12/60 Fin mixing mud. SPUD 1045 hrs 10/30/84. Drld 14-3/4" hole to PD.
11/1/84	820	Day-2 (358') - Chg'g BHA. (24" @ 120' RKB corr'd) MW: 8.8# Vis: 52 Pv/Yp: 5/32 Drld 14-3/4" hole to PD. POH, chg'g BHA. Surveys: 3/4° @ 494', 1/2° @ 553', 0° @ 616', 684' & 784'.
11/2/84	820	Day-3 (0') - Opng hole. (24" @ 120' RKB corr'd) MW: 9.0# Vis: 62 Pv/Yp: 10/55 PU HO. Opn 14-3/4" hole to 22" f/115-435'. Survey: 0° @ 820'.
11/3-5	820	Day-6 (0') - Tstg BOPs. (16" @ 808') MW: 9.3# Vis: 40 Pv/Yp: 8/5 Opnd hole to 22" f/435-820'. POH. Run 21 jts 16", 75#, K-55, ST&C. Lnd @ 808'. RIH w/stinger on DP to insert flt clr. Pmp 30 BW, 700 sx 65:35:6 cmt w/add & 330 sx "H" w/add. Displ w/wtr. Full returns thruout w/gd cmt returns to surf. POH w/stinger & DP. WOC. Cut off 16" csg. Install wellhd & BOPs. Tstg BOPs.
11/6/84	820	Day-7 (0') - Drlg cmt. (16" @ 808') MW: 9.3# Vis: 40 Pv/Yp: 8/5 Tst BOPs. Instl bell nple. PU BHA. Tst 16" to 1000# - OK. Tag cmt @ 716'. Drlg insert clr & hard cmt.

BUCK KNOLL UNIT #1  
SE $\frac{1}{4}$  SW $\frac{1}{4}$  Section 36-37S-4 $\frac{1}{2}$ W  
Garfield County, Utah

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11/7/84	1485	Day-8 (665') - Drlg. MW: 9.1# Vis: 38 Pv/Yp: 7/9 Drl'd amt & shoe & drld 14-3/4" hole to PD. Surveys: 3/4° @ 869', 1° @ 1000' & 1394'. (16" @ 808')
11/8/84	2050	Day-9 (565') - Drlg. MW: 9.0# Vis: 38 Pv/Yp: 9/1 Drl'd 14-3/4" hole to PD w/TFNB @ 1929'. Surveys: 1° @ 1665', 1-1/4° @ 1919'. (16" @ 808')
11/9/84	2636	Day-10 (586') - Drlg. MW: 9.2# Vis: 56 Pv/Yp: 20/7 Drl'd 14-3/4" hole to PD. Surveys: 1° @ 2184' & 2529'. (16" @ 808')
11/10-13	3496	Day-14 (860') - Drlg. MW: 9.3# Vis: 63 Pv/Yp: 19/15 Drl'd to 3060'. POH. RIH w/CB. Bridge 2041-2102'. Wsh 65' to btm. Cut Core #1, 3060-3064'. POH. Rec'd 4-1/2' core. RIH w/CB. Cut Core #2, 3064-84'. POH. Rec'd 20-1/2' core. RIH w/bit. Rnd core hole. Drl'd 14-3/4" hole to PD. Surveys: 1° @ 2814' & 3067', 3/4° @ 3349'. (16" @ 808')
11/14/84	3667	Day-15 (171') - Drlg. MW: 9.1# Vis: 44 Pv/Yp: 9/7 Drl'd 14-3/4" hole to PD w/TFNB @ 3517'. Survey: 1° @ 3454'. (16" @ 808')
11/15/84	4051	Day-16 (384') - Drlg. MW: 9.0# Vis: 43 Pv/Yp: 9/7 Drl'd 14-3/4" hole to PD. 100 BM lost in last 24 hrs; cure mud loss w/LCM. Currently drlg w/full returns. Survey: 3/4° @ 3748'. (16" @ 808')
11/16/84	4260	Day-17 (209') - Drlg. MW: 9.0# Vis: 52 Pv/Yp: 15/8 Drl'd 14-3/4" hole to PD. Survey: 3/4° @ 4104'. (16" @ 808')

BUCK KNOLL UNIT #1  
SE $\frac{1}{4}$  SW $\frac{1}{4}$  Section 36-37S-4 $\frac{1}{2}$ W  
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- 11/17-19 4490 Day-20 (230') - Drlg. (16" @ 808')  
MW: 9.0# Vis: 56 Pv/Yp: 15/12  
Drl'd 14-3/4" hole to 4263'. POH w/drag 4150-4000'. Inspect BHA & LD cracked XO & NRS. RIH w/B#6, wsh bridges 4027' & 4107'. Wsh 50' to btm. Drl'd 4263-4458'. POH w/tite spts 100' off btm. Chg BHA. RIH w/B#7, hit bridge @ 3199'. Could not wrk thru bridge. POH. Chg BHA. RIH. Wsh & rm tite spts 3661-4458'. Drl'd to PB w/B#7. Surveys: 3/4° @ 4263', 1-1/4° @ 4458'.
- 11/20/84 4589 Day-21 (99') - Drlg. (16" @ 808')  
MW: 9.1# Vis: 60 Pv/Yp: 20/11  
Drl'd 14-3/4" hole to PD. Lost returns @ 4514'. Spt LCM pill & regain returns.
- 11/21/84 4658 Day-22 (69') - POH. (16" @ 808')  
MW: 9.0# Vis: 66 Pv/Yp: 25/12  
Drl'd 14-3/4" hole to PD. Lost returns. POH 5 stds. Mix & pmp LCM pill. Hole became sticky. Strt POH w/kelly on. Partially plugged bit. Hole freed up. Presently POH.
- 11/22-26 4658 Day-27 (0') - Rng OH logs. (16" @ 808')  
MW: 9.2# Vis: 54 Pv/Yp: 18/6  
Cont POH to 1158'. Hole becoming tite. Wrkd up to 1033'. Pipe became stuck @ 1033'. Jarred on stuck pipe f/10 hrs w/partial returns. Pmp'd LCM sweep & regain full returns. Cont'd jarring on stuck pipe w/90-95% returns f/10-1/2 hrs. RU Pengo WL. Run freept & BO shot. BO drl string @ 910'. Left 189' fsh in hole. RD WL unit. Wrk free pipe out of hole. repair drwks. PU 14-3/4" bit & TIH to 807'. Wsh & rm to 910' (TOF). Circ & cond hole. POH 2 stds. Hole staying full. RIH to TOF. Circ & cond hole. POH w/14-3/4" bit. MJ wsh pipe & TIH to TOF. Wsh over fsh f/910-968'. Fish fell dn hole. POH. PU 14-3/4" bit & RIH to 928'. Wsh & rm 928-1078'. Cont'd RIH to 2149'. Tagged TOF. Circ & cond hole. POH. PU fshg tools & TIH to 2149'. Screw into TOF & estab circ. Wrk fsh free. POH & LD fsh & fshg tools. PU 14-3/4" bit & BHA. TIH to 2158'. Wsh & rm 2158-4658'. Lost 40 BM while rng. Circ & cond hole. Sht trip. Circ & cond hole. POH. RU Schl & run OH logs.
- 11/27/84 4633 Day-28 - Rng 10-3/4" csg. (16" @ 808')  
(corr'd) MW: 9.1# Vis: 47 Pv/Yp: 19/6  
Ran DLL/MSFL/SP/GR, LDT/CNL/GR/Cal, BHCS/GR/Calip & Dipmeter f/4625' (LTD) to 808'. TIH. Circ & cond hole f/10-3/4" csg. POH. RU csg crew. Began rng 10-3/4" csa.

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Garfield County, Utah

- 11/28/84 4633 Day-29 (0') - WOC. (10-3/4" @ 4627')  
MW: 9.1# Vis: 47 Pv/Yp: 19/6  
Ran DFFS, 2 jts 10-3/4", 45.5#, J-55, BTC csg, DFFC, 19 jts 10-3/4" 45.5#  
J-55 BTC csg, 73 jts 10-3/4" 45.5# K-55 BTC csg, stage tool 19 jts 10-3/4"  
45.5# K-55 BTC csg. Brk circ & wsh 10-3/4" csg 5' to 4627' w/DFFC @ 4542'  
& stage tool @ 761'. RU Western. Cmtd 10-3/4" csg w/80 BW preflush foll'd  
by 1950 sx Lite cmt w/add, foll'd by 250 sx Cl "H" cmt w/add. Received  
full returns while pmg cmt. SD 30 min to release top plug. Began displ,  
lost returns. Press began bldg after 76.2 bbls displ (calc displ 437  
bbls). Press csg to 2000 psi. No fld movement. Opn stage tool. Circ & cond  
mud thru stage tool. Cmt 2nd stage w/400 sx Cl "H" cmt w/add w/full  
returns. Close stage tool. CIP @ 2200 hrs 11/27/84. RD Western. WOC.
- 11/29/84 4633 Day-30 (0') - WOC. (10-3/4" @ 4627')  
MW: 9.1# Vis: 47 Pv/Yp: 19/6  
WOC. RIH w/1" tbg dn 16" x 10-3/4" annulus to 200'. Cmt backside w/110 sx  
Cl "H" cmt w/add to surf. POH w/1" tbg. WOC.
- 11/30/84 4633 Day-31 (0') - Tst BOPE. (10-3/4" @ 4627')  
MW: 9.1# Vis: 47 Pv/Yp: 19/6  
Cut 16" csg. ND 20" BOPE. Cut 10-3/4" csg. Weld on 10-3/4" 3000 psi WP  
csghd & tst same. NU BOPE & press tst.
- 12/1-3 4633 Day-34 (0') - NU Rot Hd (10-3/4" @ 4627')  
MW: 8.8# Vis: 46 Pv/Yp: 10/28  
Finish tst BOPs. Inspect BHA. PU 9-7" DCs. DO DV collar @ 763' (DP meas).  
Drld cmt 825-4542'. Drld FC @ 4542'. DO to 4582'. POH. Log CBL/CCL.  
Replace seals in Hydril. NU Rot head.
- 12/4/84 4684 Day-35 (51') - POH. (10-3/4" @ 4627')  
MW: 8.9# Vis: 46 Pv/Yp: 9/36  
Tst BOPs. Tst csg. RIH w/ 9-7/8" bit. Drld cmt 4582-4626' & FS @ 4627'.  
Drld 9-7/8" hole 4633-4684'. POH f/bit & BHA chg.
- 12/5/84 4814 Day-36 (130') - Drlg. (10-3/4" @ 4627')  
MW: 8.9# Vis: 43 Pv/Yp: 9/32  
RIH. Drld. 9-7/8" hole to PD. Lost 800 BM while drlg to PD.
- 12/6/84 4983 Day-37 (169') - Drlg. (10-3/4" @ 4627')  
MW: 8.9# Vis: 38 Pv/Yp: 9/7  
Drld 9-7/8" hole to PD. Lost 700 BM in last 24 hrs. Survey: 1° @ 4800'.

## TIGHT HOLE

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BUCK KNOLL UNIT #1  
SE $\frac{1}{4}$  SW $\frac{1}{4}$  Section 36-37S-4 $\frac{1}{2}$ W  
Garfield County, Utah

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12/7/84	5260	Day-38 (277') - Drlg. (10-3/4" @ 4627')
		MW: 9.1# Vis: 60 Pv/Yp: 14/9
		Drl'd 9-7/8" hole to PD. Lost 450 BM in last 24 hrs. Survey: 3/4° @ 5100'.
12/8-10	6065	Day-041 (805') - Drlg. (10-3/4" @ 4627')
		MW: 8.9# Vis: 43 Pv/Yp: 13/11
		Drl'd 9-7/8" hole to 5375'. Pmp LCM pill & TFB #3. While POH, tite @ 4747'. Worked pipe free & POH. Stabilizer found to be balled up. RIH. Reamed 5144-5188'. Wsh 77' to btm. Drl'd to PD. Surveys: 1° @ 5350', 2-1/2° @ 5680', 3° @ 5804', 3-1/4° @ 5993'.
12/11/84	6270	Day-42 (205') - Drlg. (10-3/4" @ 4627')
		MW: 9.0# Vis: 42 Pv/Yp: 13/7
		Drl'd 9-7/8" hole to 6221'. Pmp LCM pill. Drl'd to PD. No mud loss f/last 24 hrs. Survey: 3-3/4° @ 6181'.
12/12/84	6465	Day-43 (195') - Drlg. (10-3/4" @ 4627')
		MW: 9.0# Vis: 46 Pv/Yp: 14/7
		Drl'd 9-7/8" hole to PD. No mud lost.
12/13/84	6700	Day-44 (235') - Surveying. (10-3/4" @ 4627')
		MW: 9.0# Vis: 45 Pv/Yp: 17/7
		Circ btms up. POH. Chg bit & BHA. RIH w/B #4. Wsh & rm 65' to btm. Drlg 9-7/8" hole to PD. Surveying @ rept time. Surveys: 4-1/4° @ 6434', 3-1/2° @ 6670'.
12/14/84	6990	Day-45 (290') - POH. (10-3/4" @ 4627')
		MW: 9.0# Vis: 49 Pv/Yp: 16/6
		Drl'd 9-7/8" hole to PD. Circ up drlg break @ 6812'. Short trip to csg shoe. Hole tite lst two stds off btm. POH for new bit. Survey 5° @ 6922'.
12/15-17	7418	Day-48 (428') - Circ samples. (10-3/4" @ 4627')
		MW: 9.0# Vis: 45 Pv/Yp: 16/6
		Circ samples. TOH. Inspect BHA (replace 1 DC). RIH w/bit #5. Drl'd to 7246'. Drp survey, POH. RIH w/bit #6. Drl'd to 7418'. Circ btms up f/samples. Survey: 5° @ 7222'.

## TIGHT HOLE

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BUCK KNOLL UNIT #1  
SE $\frac{1}{4}$  SW $\frac{1}{4}$  Section 36-37S-4 $\frac{1}{2}$ W  
Garfield County, Utah

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12/18/84	7539	Day-49 (121') - Drlg. (10-3/4" @ 4627') MW: 9.0# Vis: 45 Pv/Yp: 15/6 Circ samples @ 7418'. Drld to 7486'. Circ 5' drlg brk (7481'-7486'). Drld to 7536'. TFB #7. W & R f/7443'-7536'. Drld to PD. Survey: 5-1/4° @ 7474'.
12/19/84	7672	Day-50 (133') - Drlg. (10-3/4" @ 4627') MW: 9.1# Vis: 47 Pv/Yp: 18/2 Drld 9-7/8" hole to PD w/drlg brk f/7571'-7575' (no shows).
12/20/84	7762	Day-51 (90') - Drlg. (10-3/4" @ 4627') MW: 9.0# Vis: 46 Pv/Yp: 17/6 Drld 9-7/8" hole to PD w/TFB #8 @ 7687'. Survey: 6° @ 7653'.
12/21/84	7938	Day-52 (176') - Drlg. (10-3/4" @ 4627') MW: 9.0# Vis: 53 Pv/Yp: 18/11 Drld 9-7/8" hole to PD. Surveys: 3-1/4° @ 7777', 4-1/4° @ 7841'.
12/22-26	8607	Day-57 (669') - Insp BHA. (10-3/4" @ 4627') MW: 9.0# Vis: 47 Pv/Yp: 12/5 Drld & surveyed 9-7/8" hole to PD. Strt TOH. Stuck DP w/bit @ 7414'. Spt 40 bbl "Neo-Free". Pipe came free while rmg free-pt tools. Wrk pipe out of hole. Surveys: 4° @ 7902', 3-1/4° @ 7998', 2-1/2° @ 8092' & 8118', 2-1/4° @ 8278', 3° @ 8371', 3-1/2° @ 8467', 4° @ 8592'.
12/27/84	8607	Day-58 (0') - Rng @ 7437'. (10-3/4" @ 4627') MW: 9.0# Vis: 44 Pv/Yp: 14/8 Insp HWDP & BHA. Chg out SS, jars & nmr. PU B#5 RR & 2 IBSS. RIH to 6579'. Repair Wt Ind. Wsh & rm 6579-7437'.
12/28/84	8664	Day-59 (57') - Circ & cond hole f/DST #1. (10-3/4" @ 4627') MW: 9.0# Vis: 45 Pv/Yp: 12/5 Wsh & rm 7437-8607'. Drld 9-7/8" hole to PD. Circ & cond hole f/DST #1.
12/29-31	8699	Day-62 (corr'd) (19') - Cutting Core #2. (10-3/4" @ 4627') MW: 9.0# Vis: 43 Pv/Yp: 12/4 Circ & cond hole. TOH. PU tst tools & TIH. Run DST #1, Moenkopi fm, 8656-8680', 15-45-240-60 mins: IHP 4224 & FHP 4135, IFP 41-54, ISIP 79, FFP 54-41, FSIP 41. DP recovery: 30' vy sli OCM. Smp1 Chmbr recovery: 100 cc oil & 2400 cc OCM. Tst BOPE. TIH. Circ & cond. TOH. PU CB & TIH.

## TIGHT HOLE

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BUCK KNOLL UNIT #1  
SE $\frac{1}{4}$  SW $\frac{1}{4}$  Section 36-37S-4 $\frac{1}{2}$ W  
Garfield County, Utah

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- 1/1-2/85 8829 Day-64 (130') - POH f/DST #2. (10-3/4" @ 4627')  
MW: 8.9# Vis: 44 Pv/Yp: 13/6  
Cut Core #3, 8699-8710'. POH. Rec'd 100% of core. LD CB. RIH. Wash & rm 8624-8710'. Drld to 8809'. Circ smpls. Drld 9-7/8" hole to PD w/sli shows. 46 std sht trip. Circ & cond. POH f/DST #2. Survey: 4° @ 8719'.
- 1/3/85 8829 Day-65 (0') - RIH w/B#6. (10-3/4" @ 4627')  
MW: 8.9# Vis: 44 Pv/Yp: 12/5  
POH f/DST #2. Make up tst tools & RIH. Ran DST #2, 8779-8829', 15-45-240-60 mins: IHP 4234 & FHP 4172, IFP 22-33, ISIP 33, FFP 21-21, FSIP 28. DP recovery: 7-10 gal mud w/sli tr oil. Smpl Chmbr recovery: 2500 cc mud. POH & LD tst tools. PU B#6 & RIH.
- 1/4/85 8950 Day-66 (121') - Wrkg stuck pipe. (10-3/4" @ 4627')  
MW: 9.0# Vis: 43 Pv/Yp: 13/5  
RIH w/B#6. Wash & rm 109' to btm - no fill. Drld 9-7/8" hole to 8918'. Circ drlg brk. Drld to 8930'. Circ smpls. Drld to 8950'. Prep to POH f/DST tools. Stuck pipe w/bit @ 8948'. Mix oil base pill & spt same. Wrkg pipe & cmop 1 bbl pill ea hr. Survey: 5° @ 8841'.
- 1/5-7 8950 Day-69 (0') - Circ & cond mud. (10-3/4" @ 4627')  
MW: 8.7# Vis: 45 Pv/Yp: 15/10  
Wrk stuck pipe. Ran freest survey. Aerate mud system & wrk pipe. Moved pipe to 8945'. Could not wrk free. Ran stry shot & BO @ 8882'. (Top of 1st DC). POH. PU screw-in sub & jars. Screw into fsh & jarred same loose. POH to 8914'. Circ btms up, unloading lots of sh. POH. LD fsh tools. Cln & inspect BHA (BHA packed off w/sh & clay). RIH. Wash & rm 8800-8950'. Lrg vol of clay & sh over shaker. Circ & cond mud.
- 1/8/85 8950 Day-70 (0') - Tstg DST #3. (10-3/4" @ 4627')  
MW: 8.9# Vis: 41 Pv/Yp: 10/7  
Circ & wrk pipe. 30 std sht trip w/little drag. Circ & cond mud. 35 std sht trip w/no drag. Circ hole cln. POH. PU & RIH w/DST tools. Tst DST #3, 8910-8950', Sinbad fm. Opn tools @ 0504 hrs 1/8/85. Sli blw (2"), incr'g to 4" in 15 min. SI @ 0519 hrs f/ISIP.
- 1/9/85 8960 Day-71 (10') - POH f/CB. (10-3/4" @ 4627')  
MW: 9.0# Vis: 42 Pv/Yp: 12/6  
Ran DST #3, 8910-8950', 15-45-240-120 mins: IHP 4165 & FHP 4165, IFP 66-242, ISIP 3335, FFP 229-883, FSIP 1738. DP recovery: 620' MCW & 1240' wtr. Smpl Chmbr recovery: 300 cc mud & 2000 cc wtr. POH & LD tst tools. PU bit & BHA & RIH. Drld 9-7/8" hole to PD. POH f/Core #4.

BUCK KNOLL UNIT #1  
SE $\frac{1}{2}$  SW $\frac{1}{2}$  Section 36-37S-4 $\frac{1}{2}$ W  
Garfield County, Utah

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- 1/10/85 8971 Day-72 (11') - Drlg. (10-3/4" @ 4627')  
MW: 8.9# Vis: 47 Pv/Yp: 15/8  
PU CB & RIH to csg shoe. Slip & cut drlg line. FIH. Wsh 85' to btm. Cut  
Core #4 8960-70'. POH, LD core & CB. Rec'd 10' core. RIH. Wsh & rm  
8923-70'. Drld 9-7/8" hole to PD.
- 1/11/85 9077 Day-73 (106') - Drlg. (10-3/4" @ 4627')  
MW: 8.9# Vis: 50 Pv/Yp: 16/10  
Drld to 8987'. Circ f/smpls. Drld to 9036'. Circ f/smpls. Drld to 9065'.  
Lost comp returns. Mix & pmp LCM pill & regained returns. Drld 9-7/8" hole  
to PD w/full returns. Survey: 4° @ 9006'.
- 1/12-14 9456 Day-76 (379') - Drlg. (10-3/4" @ 4627')  
MW: 8.9# Vis: 39 Pv/Yp: 13/1  
Drld to 9090'. Sht trip. Drld to 9129', circ drlg brk. Drld to 9230' &  
lost returns. Pmpd LCM sweep & regain returns. Drld to 9266' & circ drlg  
brk. Drld to 9340' & lost returns. Pmp LCM sweep & regain returns. Drld to  
9387'. TFNB. Drld 9-7/8" hole to PD. Total mud lost over 3-day period -  
590 bbls. Survey: 2-1/2° @ 9210'.
- 1/15/85 9611 Day-77 (155') - Drlg. (10-3/4" @ 4627')  
MW: 8.9# Vis: 44 Pv/Yp: 14/6  
Drld to 9459' & lost compl returns. Pmpd 2 LCM pills & regained returns.  
Drld to 9560'. Circ drlg brk. Drld 9-7/8" hole to PD. Survey: 2-3/4° @  
9442'.
- 1/16/85 9624 Day-78 (13') - Testing. (10-3/4" @ 4627')  
MW: 8.8# Vis: 45 Pv/Yp: 13/6  
Drld 9-7/8" hole to PD. Circ & cond mud. 38 std sht trip - tite on 1st 5 &  
21st stds. Lost returns while RIH. Spt 50 bbl LCM pill & regained full  
returns. Observe FL, hole stndg full. Circ & cond. POH - no drag. PU DST  
tools & RIH. Tstd DST #4.
- 1/17/85 9637 Day-79 (13') - Drlg. (10-3/4" @ 4627')  
MW: 8.8# Vis: 52 Pv/Yp: 19/5  
Ran DST #3, 9542-9624', 15-45-240-120 mins: IHP 4555 & FHP 4542, IFP  
154-154, ISIP 2028, FFP 154-255, FSIP 1940. DP recovery: 540' MCW. Smpl  
Chmbr recovery: 2400 cc MCW. BHT 152°F. POH & LD tst tools. MU BHA & RIH  
to csg shoe. Slip & cut drlg line. RIH. Wsh 120' to btm. Drld 9-7/8" hole  
to PD.

BUCK KNOLL UNIT #1  
SE $\frac{1}{4}$  SW $\frac{1}{4}$  Section 36-37S-4 $\frac{1}{2}$ W  
Garfield County, Utah

**CONFIDENTIAL**

- 1/18/85 9794 Day-80 (157') - Drlg. (10-3/4" @ 4627')  
MW: 8.7# Vis: 45 Pv/Yp: 14/6  
Drl'd 9-7/8" hole to 9729' & lost returns. Mix & spt LCM pill & regained returns. Drl'd 9-7/8" hole to PD.
- 1/19-21 10,009 Day-83 (215') - Circ samples up. (10-3/4" @ 4627')  
MW: 8.7# Vis: 47 Pv/Yp: 16/6  
Drl'd to 9802'. Circ drlg brk. Circ btm up & shrt trip. POH. MU CB & RIH. Wsh 110' to btm. Cut core #5 9802'-9809' - lost complete returns. Mix & spot LCM pill. Plugged core bbl. POH. LD core & CB. Rec'd 6.25'. RIH w/bit, wsh 55' to btm. Drl'd to 9879' & circ drlg brk. Drl'd to 9911' & circ drlg brk. Drl'd to 9968' & circ drlg brk. Drl'd 9-7/8" hole to PD. Currently circ drlg brk.
- 1/22/85 10,119 Day-84 (110') - Circ & cond. (10-3/4" @ 4627')  
MW: 8.9# Vis: 47 Pv/Yp: 16/6  
Drl'd to 10,050'. Circ 5' drlg brk. Drl'd 9-7/8" hole to PD. Circ btms up. 10 std shrt trip. Circ & cond for logs.
- 1/23/85 10,119 Day-85 (0') - Logging. (10-3/4" @ 4627')  
MW: 8.9# Vis: 47 Pv/Yp: 16/7  
Circ btms up. Lost returns. Spt LCM pill & regained returns. Drop survey & POH to 10-3/4" shoe. Circ & WO Schl. POH. Ran DLL f/TD to csg shoe. Ran LDT - tool failed. Rng BHC Sonic @ report time.
- 1/24/85 10,119 Day-86 (0') - Logging. (10-3/4" @ 4627')  
MW: 8.7# Vis: 42 Pv/Yp: 12/3  
Ran BHC-Sonic TD-4627'. Ran Dipmeter & LDT TD-4627'. RD Schl. RU ARCO WL truck. Presently rng VSP survey.
- 1/23/85 10,119 Day-85 (0') - Logging. (10-3/4" @ 4627')  
MW: 8.9# Vis: 47 Pv/Yp: 16/7  
Circ btms up. Lost returns. Spt LCM pill & regained returns. Drop survey & POH to 10-3/4" shoe. Circ & WO Schl. POH. Ran DLL f/TD to csg shoe. Ran LDT - tool failed. Rng BHC Sonic @ report time.
- 1/24/85 10,119 Day-86 (0') - Logging. (10-3/4" @ 4627')  
MW: 8.7# Vis: 42 Pv/Yp: 12/3  
Ran BHC-Sonic TD-4627'. Ran Dipmeter & LDT TD-4627'. RD Schl. RU ARCO WL truck. Presently rng VSP survey.

## TIGHT HOLE

11

BUCK KNOLL UNIT #1  
 SE $\frac{1}{4}$  SW $\frac{1}{4}$  Section 36-37S-4 $\frac{1}{2}$ W  
 Garfield County, Utah

CONFIDENTIAL

1/25/85 10,119

Day-87 TD - PU tst tools f/DST #4. (10-3/4" @ 4627')  
 MW: 8.7# Vis: 46 Pv/Yp: 16/4  
 Fin mg VSP survey. TIH w/bit. Circ & cond hole f/DST #4 & smpls. TOH. PU  
 tst tools f/DST #4, 10,060-10,119', Cedar Mesa fm.

1/26-28 10,119

Day-90 TD PBD: Surf - ND BOPs. (10-3/4" @ 4627')  
 MW: 8.7# Vis: 47 Pv/Yp: 14/6  
 RIH w/DST tools. Ran DST #5, 10,060-10,119', Cedar Mesa fm, 15-45-240-120  
 mins: IHP 4718 & FHP 4692, IFP 134-248, ISIP 3134, FFP 261-578, FSIP  
 2724. DP recovery: 1347' (20 bbls) MCW. Smp1 Chmbr recovery: 2370 cc wtr.  
 BHT 162°F. POH, LD tst tools. RIH w/BHA. POH & LD same. RIH OE to 9233'.  
 LD DP to 6910'. With DP OE @ 6900', set Plug #1 6900-6600'. LD DP to  
 4992'. Pmpd 300 BM f/res pit into fm. POH. Ran gauge ring to 4575'. Set  
 cmt rtnr @ 4500' on WL. RIH w/stinger & stab into rtnr. Pmpd 600 BM into  
 fm. Pmpd 90 sx Cl "H" + add, left 2.9 bbls cmt on top rtnr. LD DP to  
 760'. Set Plug #3, 90 sx Cl "H" + add. LD DP to 94'. Pmpd 23 sx Cl "H" +  
 add & cmtd to surf. LD DP. ND BOPs & cln mud pits.

1/29/85 10,119

Day-91 TD PBD: Surf - FINAL REPORT - WELL P & A 1/28/85.  
 (10-3/4" @ 4627')  
 Fin'd clnq mud pits & ND BOPs. RR 1200 hrs 1/28/85.

District

To: State of Utah - Natural Resources  
Oil & Gas Mining Commission  
3 Trade Center, Ste 350  
Salt Lake City - UT 84180-1203

From: ARCO Exploration - G. S. Wise  
P.O. Box 5540  
Denver CO 80217

Enclosed     Under separate cover     Via \_\_\_\_\_

Subject: Completion Data -

Quantity	Map number & description
15	#1 Buck Knoll (1) Dual Laterlog-MSFL; (1) Borehole Compensated Sonic; (1) Litho Density Compensated Neutron; (5) Drill Stem Test Reports; (1) Core Analysis Report; (5) Water Analysis Reports; (1) Mudlogging Summary
8	#1 Chambers (1) Dual Laterlog-MSFL; (1) Borehole Compensated Sonic; (1) Compensated Neutron Formation Density; (4) Drill Stem Test Reports; (1) Core Analysis Report.
11	#1 Deadman Hollow (1) Dual Laterlog-MSFL; (1) Borehole Compensated Sonic; (1) Litho Density-Compensated Neutron; (2) Drill Stem Test Reports; (1) Core Analysis Report; (5) Water Analysis Reports

Note—Please verify and acknowledge receipt, by signing and returning the second copy of this transmittal.

Signed by C. Hayes for G. S. Wise

**RECEIVED** 3/18/85

Received by

MAR 20 1985

Remarks

Page 1 of 2

DIVISION OF OIL  
 GAS & MINING

Please sign, date +  
 return 2nd copy.

FLOPETROL JOHNSTON

Schlumberger

# WELL PERFORMANCE TEST REPORT

A Production Systems Analysis (NODAL)  
Based On  
Drillstem Test Data

Test Date  
12-29-84

Report No.:  
42984 E

**COMPANY**

**ARCO OIL & GAS**

**WELL**

**BUCK KNOLL # 1**

**TEST IDENTIFICATION**

Test Type ..... OPEN HOLE  
Test Number ..... 1  
Formation ..... MOGKUPI  
Test Interval ..... 8640 - 8664 FT.  
Reference Depth ..... KELLY BUSHING

**WELL LOCATION**

Field..... WILD CAT  
County..... GARFIELD  
State..... UTAH  
Sec / Twn / Rng ..... S36 T37S R4-1/2 W  
Elevation..... 8295 FT.

**HOLE CONDITIONS**

Total Depth (MVD/TVD) ..... 8664 FT.  
Hole Size / Deviation Angle ..... 9 7/8"/STRAIGHT  
Csg / Liner ID ..... NA  
Perf'd Interval ..... NA  
Shot Density / Phasing ..... NA  
Gun Type / Perf Cond ..... NA

**MUD PROPERTIES**

Mud Type ..... LOW LIME  
Mud Weight ..... 9.0 LB/GAL  
Mud Resistivity ..... .76 OHM -M @ 50°F  
Filtrate Resistivity ..... 1.01 OHM -M @ 50°F  
Filtrate Chlorides ..... 10000 PPM  
Filtrate Nitrates..... NOT GIVEN

**INITIAL TEST CONDITIONS**

Gas Cushion Type ..... NONE  
Surface Pressure ..... NA  
Liquid Cushion Type ..... NONE  
Height Above DST Valve ..... NA

**TEST STRING CONFIGURATION**

Pipe Length / ID..... 8216.53 FT./3.826 IN.  
Collar Length / ID ..... 372 FT./2.37 IN.  
Packer Depth(s)..... 8633 & 8640 FT.  
BH Choke Size..... 15/16 IN.

**NET PIPE RECOVERY**

Volume	Fluid Type	Physical Properties
0.08 BBL	OIL	ASSUMED 40° API
0.74 BBL	MUD	.95 OHM -M @ 50°F 8000 PPM CL.

**NET SAMPLE CHAMBER RECOVERY**

Volume	Fluid Type	Physical Properties
100 CC	OIL	ASSUMED 40° API
2400 CC	MUD	1.6 OHM -M @ 50°F 7000 PPM CL.

Pressure: 8 PSIG    GOR: \_\_\_    GLR: \_\_\_

**INTERPRETATION RESULTS**

Reservoir Pressure @Gauge Depth: NA  
Gauge Depth ..... 8644 FT.  
Hydrostatic Gradient ..... NA  
Potentiometric Surface ..... NA  
Effective Permeability to ..... NA  
Transmissibility ..... NA  
Skin Factor / Damage Ratio..... NA  
Omega / Lambda (2φ System)..... NA  
Radius of Investigation ..... NA  
Measured Wellbore Storage ..... NA

**ROCK / FLUID / WELLBORE PROPERTIES**

Reservoir Temperature..... 152°F  
Analysis Fluid Type..... NA  
Formation Volume Factor ..... NA  
Viscosity ..... NA  
Z-Factor (gas only)..... NA  
Net Pay..... 24 FT.  
Porosity ..... 5%  
Total System Compressibility..... NA  
Wellbore Radius..... 0.411 FT.  
Expected Wellbore Storage..... NA

**FLOW RATE DURING DST**

**4.66 BLPD avg. / 1.7 BLPD last rate**

**MAXIMUM FLOW RATE POTENTIAL AFTER COMPLETION**

RECEIVED

MAR 20 1985

DIVISION OF OIL  
GAS & MINING

This rate is based on a specific completion design & producing time. Call FJS

FJS-5 B14059

# BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 42984E

COMPANY : ARCO OIL & GAS COMPANY

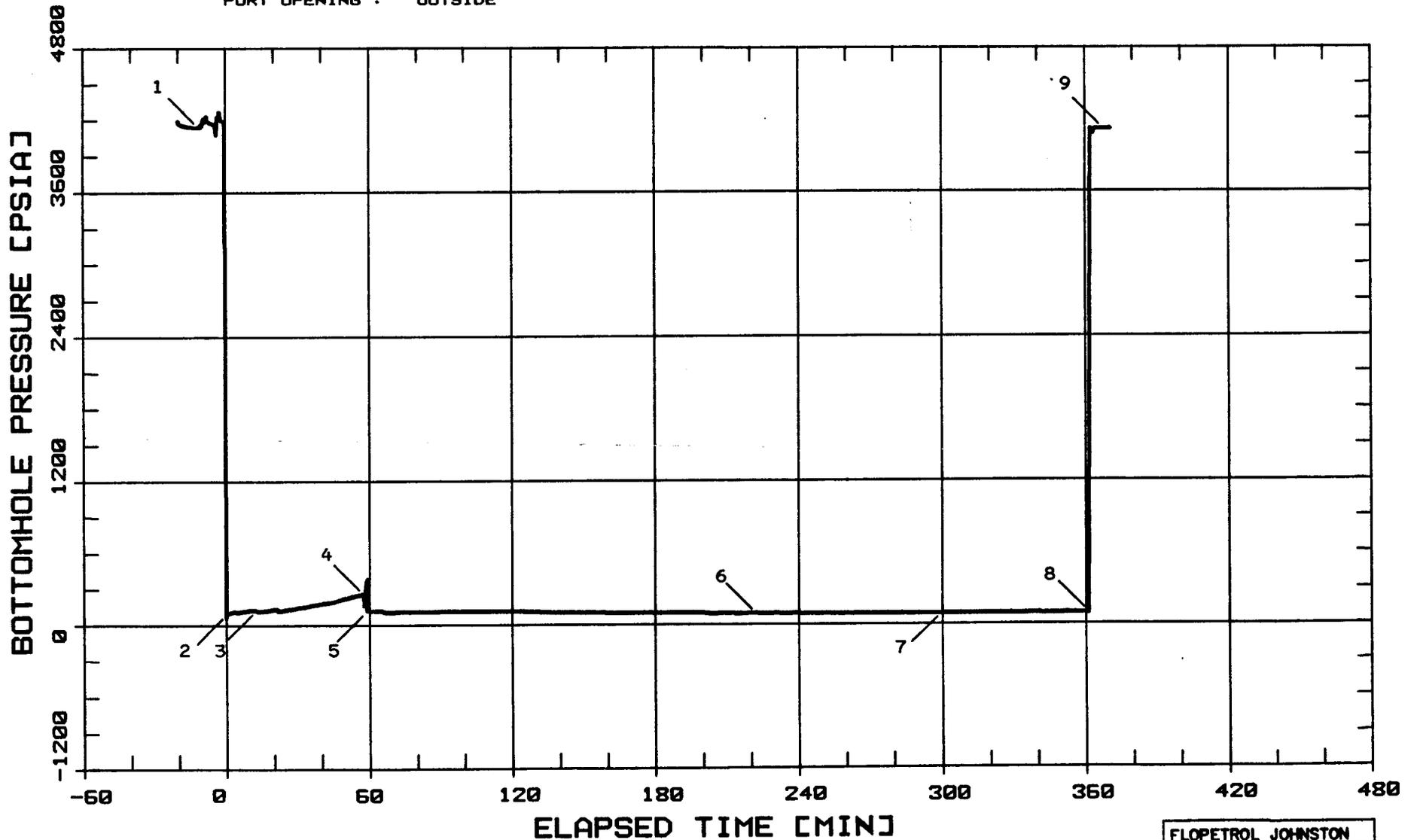
INSTRUMENT NO. J-1401

WELL : BUCK KNOLL UNIT #1

DEPTH : 8644 FT

CAPACITY : 6400 PSI

PORT OPENING : OUTSIDE



FLOPETROL JOHNSTON  
SCHLUMBERGER

**DST EVENT SUMMARY**

Field Report # 42984 E

DATE (M/D/Y)	TIME (HR:MIN)	EVENT E.T. (MIN)	EVENT DESCRIPTION	LABEL PT. #	SURFACE PRESSURE (PSIG)	FLOOR MANIFOLD CHOKE SIZE (64ths INCH)
12-29-84	0901	—	SET PACKER	1		1/4"
	0903	—	OPENED TEST TOOL FOR INITIAL FLOW	2		"
			VERY WEAK SURFACE BLOW			
	0918	—	CLOSED TEST TOOL FOR INITIAL SHUT-IN	3		"
	0928		BLOW DIED			"
	1003		FINISHED SHUT-IN	4		"
	1004	—	OPENED TEST TOOL FOR FINAL FLOW	5		"
			NO BLOW THROUGHOUT FLOW PERIOD			
	1245		CYCLED TOOL	6		"
	1404	—	CLOSED TEST TOOL FOR FINAL SHUT-IN	7		"
	1504	—	FINISHED FINAL SHUT-IN	8		"
	1509	—	UNSEATED PACKER	9		—
		—	REVERSED OUT			
		—	BEGAN TRIP OUT OF HOLE			

\*\*\*\*\*  
 \* WELL TEST DATA PRINTOUT \*  
 \*\*\*\*\*

FIELD REPORT # : 42984E  
 COMPANY : ARCO OIL & GAS COMPANY  
 WELL : BUCK KNOLL UNIT #1

INSTRUMENT # : J-1401  
 CAPACITY [PSI] : 6400.  
 DEPTH [FT] : 8644.0  
 PORT OPENING : OUTSIDE  
 TEMPERATURE [DEG F] : 152.0

LABEL POINT INFORMATION  
 \*\*\*\*\*

#	TIME OF DAY		DATE	EXPLANATION	ELAPSED TIME, MIN	BOT HOLE PRESSURE PSIA
	HH:MM:SS	DD-MM				
1	8:51:29	29-DC	HYDROSTATIC MUD	-11.51	4143	
2	9: 3: 0	29-DC	START FLOW	0.00	86	
3	9:15:32	29-DC	END FLOW & START SHUT-IN	12.53	122	
4	10: 0:23	29-DC	END SHUT-IN	57.39	257	
5	10: 1:46	29-DC	START FLOW	58.77	112	
6	12:44:52	29-DC	CYCLED TOOL	221.87	86	
7	14: 2:26	29-DC	END FLOW & START SHUT-IN	299.43	86	
8	15: 4: 0	29-DC	END SHUT-IN	361.00	90	
9	15:10:32	29-DC	HYDROSTATIC MUD	367.53	4119	

SUMMARY OF FLOW PERIODS  
 \*\*\*\*\*

PERIOD	START ELAPSED TIME, MIN	END ELAPSED TIME, MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA
1	0.00	12.53	12.53	86	122
2	58.77	299.43	240.66	112	86

SUMMARY OF SHUTIN PERIODS  
 \*\*\*\*\*

PERIOD	START ELAPSED TIME, MIN	END ELAPSED TIME, MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	FINAL FLOW PRESSURE PSIA	PRODUCING TIME, MIN
1	12.53	57.39	44.86	122	257	122	12.53
2	299.43	361.00	61.57	86	90	86	253.19

TEST PHASE : FLOW PERIOD # 1

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA
HH:MM:SS	DD-MM	*****	*****	*****
9: 3: 0	29-DC	0.00	0.00	86
9: 8: 0	29-DC	5.00	5.00	106
9:13: 0	29-DC	10.00	10.00	120
9:15:32	29-DC	12.53	12.53	122

TEST PHASE : SHUTIN PERIOD # 1

FINAL FLOW PRESSURE [PSIA] = 122  
 PRODUCING TIME [MIN] = 12.53

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
HH:MM:SS	DD-MM	*****	*****	*****	*****	*****
9:15:32	29-DC	12.53	0.00	122	0	
9:16:32	29-DC	13.53	1.00	114	-9	1.131
9:17:32	29-DC	14.53	2.00	114	-9	0.861
9:18:32	29-DC	15.53	3.00	116	-7	0.714
9:19:32	29-DC	16.53	4.00	118	-4	0.616
9:20:32	29-DC	17.53	5.00	121	-1	0.545
9:21:32	29-DC	18.53	6.00	124	1	0.490
9:22:32	29-DC	19.53	7.00	127	4	0.446
9:23:32	29-DC	20.53	8.00	129	7	0.409
9:24:32	29-DC	21.53	9.00	121	-1	0.379
9:25:32	29-DC	22.53	10.00	115	-7	0.353
9:27:32	29-DC	24.53	12.00	122	-1	0.311
9:29:32	29-DC	26.53	14.00	128	6	0.278
9:31:32	29-DC	28.53	16.00	136	13	0.251
9:33:32	29-DC	30.53	18.00	141	19	0.229
9:35:32	29-DC	32.53	20.00	148	26	0.211
9:37:32	29-DC	34.53	22.00	155	33	0.196
9:39:32	29-DC	36.53	24.00	161	39	0.182
9:41:32	29-DC	38.53	26.00	167	45	0.171
9:43:32	29-DC	40.53	28.00	175	52	0.161
9:45:32	29-DC	42.53	30.00	183	60	0.152
9:50:32	29-DC	47.53	35.00	205	83	0.133
9:55:32	29-DC	52.53	40.00	231	108	0.118
10: 0:23	29-DC	57.39	44.86	257	135	0.107

TEST PHASE : FLOW PERIOD # 2

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA
HH:MM:SS	DD-MM	*****	*****	*****
10: 1:46	29-DC	58.77	0.00	112
10: 6:46	29-DC	63.77	5.00	115
10:11:46	29-DC	68.77	10.00	101
10:16:46	29-DC	73.77	15.00	103
10:21:46	29-DC	78.77	20.00	104
10:26:46	29-DC	83.77	25.00	105
10:31:46	29-DC	88.77	30.00	108
10:36:46	29-DC	93.77	35.00	110
10:41:46	29-DC	98.77	40.00	111
10:46:46	29-DC	103.77	45.00	111
10:51:46	29-DC	108.77	50.00	110
10:56:46	29-DC	113.77	55.00	110
11: 1:46	29-DC	118.77	60.00	111
11: 6:46	29-DC	123.77	65.00	111
11:11:46	29-DC	128.77	70.00	104
11:16:46	29-DC	133.77	75.00	101
11:21:46	29-DC	138.77	80.00	99
11:26:46	29-DC	143.77	85.00	97
11:31:46	29-DC	148.77	90.00	97
11:36:46	29-DC	153.77	95.00	97
11:41:46	29-DC	158.77	100.00	96
11:46:46	29-DC	163.77	105.00	96
11:51:46	29-DC	168.77	110.00	96
11:56:46	29-DC	173.77	115.00	96
12: 1:46	29-DC	178.77	120.00	95
12: 6:46	29-DC	183.77	125.00	95
12:11:46	29-DC	188.77	130.00	94
12:16:46	29-DC	193.77	135.00	94
12:21:46	29-DC	198.77	140.00	93
12:26:46	29-DC	203.77	145.00	87
12:31:46	29-DC	208.77	150.00	88
12:36:46	29-DC	213.77	155.00	88
12:41:46	29-DC	218.77	160.00	88
12:46:46	29-DC	223.77	165.00	88
12:51:46	29-DC	228.77	170.00	88
12:56:46	29-DC	233.77	175.00	88
13: 1:46	29-DC	238.77	180.00	88
13: 6:46	29-DC	243.77	185.00	88
13:11:46	29-DC	248.77	190.00	86
13:16:46	29-DC	253.77	195.00	86
13:21:46	29-DC	258.77	200.00	86
13:26:46	29-DC	263.77	205.00	86
13:31:46	29-DC	268.77	210.00	86
13:36:46	29-DC	273.77	215.00	86
13:41:46	29-DC	278.77	220.00	85
13:46:46	29-DC	283.77	225.00	85
13:51:46	29-DC	288.77	230.00	85
13:56:46	29-DC	293.77	235.00	85
14: 1:46	29-DC	298.77	240.00	86

TEST PHASE : FLOW PERIOD # 2

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA
HH:MM:SS	DD-MM	*****	*****	*****
14: 2:26	29-DC	299.43	240.66	86

TEST PHASE : SHUTIN PERIOD # 2

FINAL FLOW PRESSURE [PSIA] = 86  
 PRODUCING TIME [MIN] = 253.19

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
HH:MM:SS	DD-MM	*****	*****	*****	*****	*****
14: 2:26	29-DC	299.43	0.00	86	0	
14: 3:26	29-DC	300.43	1.00	86	0	2.405
14: 4:26	29-DC	301.43	2.00	86	0	2.106
14: 5:26	29-DC	302.43	3.00	86	0	1.931
14: 6:26	29-DC	303.43	4.00	86	0	1.808
14: 7:26	29-DC	304.43	5.00	86	0	1.713
14: 8:26	29-DC	305.43	6.00	86	0	1.635
14: 9:26	29-DC	306.43	7.00	86	0	1.570
14:10:26	29-DC	307.43	8.00	86	0	1.514
14:11:26	29-DC	308.43	9.00	86	0	1.464
14:12:26	29-DC	309.43	10.00	86	0	1.420
14:14:26	29-DC	311.43	12.00	85	-1	1.344
14:16:26	29-DC	313.43	14.00	84	-2	1.281
14:18:26	29-DC	315.43	16.00	84	-2	1.226
14:20:26	29-DC	317.43	18.00	85	-1	1.178
14:22:26	29-DC	319.43	20.00	86	0	1.135
14:24:26	29-DC	321.43	22.00	86	0	1.097
14:26:26	29-DC	323.43	24.00	86	0	1.063
14:28:26	29-DC	325.43	26.00	86	0	1.031
14:30:26	29-DC	327.43	28.00	86	0	1.002
14:32:26	29-DC	329.43	30.00	86	0	0.975
14:37:26	29-DC	334.43	35.00	87	1	0.916
14:42:26	29-DC	339.43	40.00	88	2	0.865
14:47:26	29-DC	344.43	45.00	87	1	0.821
14:52:26	29-DC	349.43	50.00	87	1	0.783
14:57:26	29-DC	354.43	55.00	89	3	0.748
15: 2:26	29-DC	359.43	60.00	90	4	0.718
15: 4: 0	29-DC	361.00	61.57	90	4	0.709

FLOPETROL JOHNSTON

Schlumberger

# WELL PERFORMANCE TEST REPORT

A Production Systems Analysis (NODAL)  
Based On  
Drillstem Test Data

Test Date  
01-02-85

Report No.:  
43014 E

COMPANY

## ARCO OIL & GAS

WELL

## BUCK KNOLL # 1

TEST IDENTIFICATION

Test Type .....: OPEN HOLE  
Test Number .....: 2  
Formation .....: SINBAD  
Test Interval .....: 8779.5 - 8829 FT.  
Reference Depth .....: KELLY BUSHING

WELL LOCATION

Field .....: WILD CAT  
County .....: GARFIELD  
State .....: UTAH  
Sec/Twn/Rng .....: S36 T37S R4 1/2 W  
Elevation .....: 8295 FT.

HOLE CONDITIONS

Total Depth (MVD/TVD) .....: 8829 FT.  
Hole Size / Deviation Angle .....: 9 7/8"/STRAIGHT  
Csg / Liner ID .....: NA  
Perf'd Interval .....: NA  
Shot Density / Phasing .....: NA  
Gun Type / Perf Cond .....: NA

MUD PROPERTIES

Mud Type .....: LOW LIME  
Mud Weight .....: 9.0 LB/GAL  
Mud Resistivity .....: .9 OHM -M @ 60°F  
Filtrate Resistivity .....: .87 OHM -M @ 61°F  
Filtrate Chlorides .....: 9500 PPM  
Filtrate Nitrates .....: NDT GIVEN

INITIAL TEST CONDITIONS

Gas Cushion Type .....: NONE  
Surface Pressure .....: NA  
Liquid Cushion Type .....: NONE  
Height Above DST Valve .....: NA

TEST STRING CONFIGURATION

Pipe Length / ID .....: 8316.67 FT./4.276 IN.  
Collar Length / ID .....: 399.5 FT./2.37 IN.  
Packer Depth(s) .....: 8772.5 & 8779.5 FT.  
BH Choke Size .....: 15/16 IN.

NET PIPE RECOVERY

Volume	Fluid Type	Physical Properties
0.28 BBL	MUD	.1 OHM -M @ 74°F 9500 PPM CL.

NET SAMPLE CHAMBER RECOVERY

Volume	Fluid Type	Physical Properties
2500 CC	MUD	.1 OHM -M @ 72°F 9500 PPM CL.

Pressure: 1 PSIG    GOR: --    GLR: --

INTERPRETATION RESULTS

Reservoir Pressure @Gauge Depth: NA  
Gauge Depth .....: 8786 FT.  
Hydrostatic Gradient .....: NA  
Potentiometric Surface .....: NA  
Effective Permeability to .....: NA  
Transmissibility .....: NA  
Skin Factor / Damage Ratio .....: NA  
Omega / Lambda (2φ System) .....: NA  
Radius of Investigation .....: NA  
Measured Wellbore Storage .....: NA

ROCK / FLUID / WELLBORE PROPERTIES

Reservoir Temperature .....: 153°F  
Analysis Fluid Type .....: NA  
Formation Volume Factor .....: NA  
Viscosity .....: NA  
Z-Factor (gas only) .....: NA  
Net Pay .....: NA  
Porosity .....: NA  
Total System Compressibility .....: NA  
Wellbore Radius .....: NA  
Expected Wellbore Storage .....: NA

FLOW RATE DURING DST

### 1.6 BLPD avg. / 2.6 BLPD last rate

MAXIMUM FLOW RATE POTENTIAL AFTER COMPLETION

RECEIVED  
MAR 20 1985

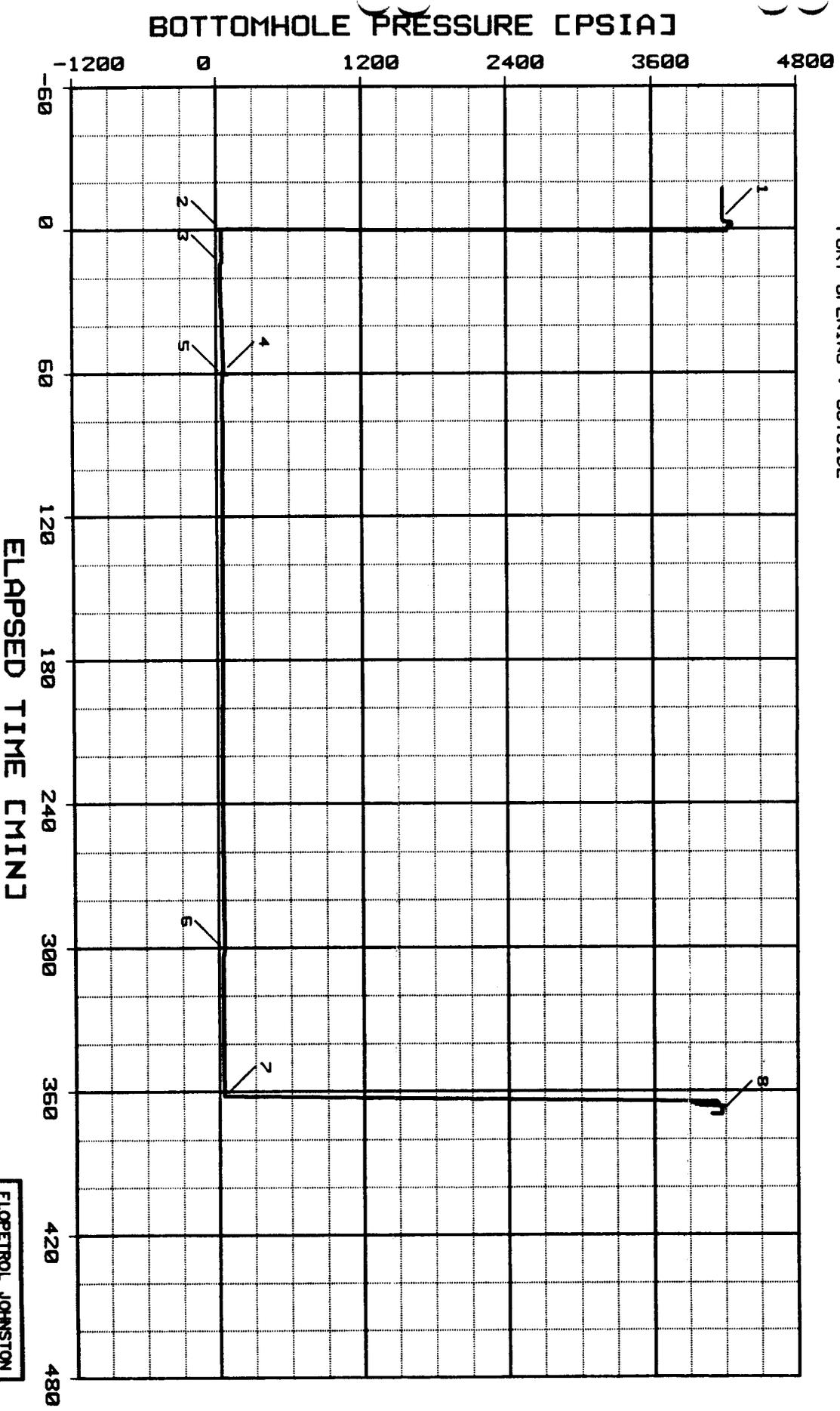
DIVISION OF OIL

This rate is based on a specific completion design & producing time. Call FJS for details.

FJS-5 B14059

# BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 43014E      COMPANY : ARCO OIL & GAS CO.  
INSTRUMENT NO. J-2000      WELL : BUCK KNOLL UNIT #1  
DEPTH : 8786 FT  
CAPACITY : 6400 PSI  
PORT OPENING : OUTSIDE



FLOPETROL JOHANSTON



\*\*\*\*\*  
 \* WELL TEST DATA PRINTOUT \*  
 \*\*\*\*\*

FIELD REPORT # : 43014E

COMPANY : ARCO OIL & GAS CO.  
 WELL : BUCK KNOLL UNIT #1

INSTRUMENT # : J-2000  
 CAPACITY [PSI] : 6400.  
 DEPTH [FT] : 8786.0  
 PORT OPENING : OUTSIDE  
 TEMPERATURE [DEG F] : 153.0

LABEL POINT INFORMATION  
 \*\*\*\*\*

#	TIME OF DAY	DATE	EXPLANATION	ELAPSED TIME, MIN	BOT HOLE PRESSURE PSIA
#	HH:MM:SS	DD-MM			
1	14:49:42	2-JA	HYDROSTATIC MUD	-4.30	4188
2	14:54: 0	2-JA	START FLOW	0.00	43
3	15: 8:19	2-JA	END FLOW & START SHUT-IN	14.31	45
4	15:52:51	2-JA	END SHUT-IN	58.85	58
5	15:54:21	2-JA	START FLOW	60.35	49
6	19:54:56	2-JA	END FLOW & START SHUT-IN	300.93	45
7	20:56: 0	2-JA	END SHUT-IN	362.00	37
8	21: 2:36	2-JA	HYDROSTATIC MUD	368.60	4164

SUMMARY OF FLOW PERIODS  
 \*\*\*\*\*

PERIOD	START ELAPSED TIME, MIN	END ELAPSED TIME, MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA
1	0.00	14.31	14.31	43	45
2	60.35	300.93	240.58	49	45

SUMMARY OF SHUTIN PERIODS  
 \*\*\*\*\*

PERIOD	START ELAPSED TIME, MIN	END ELAPSED TIME, MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	FINAL FLOW PRESSURE PSIA	PRODUCING TIME, MIN
1	14.31	58.85	44.54	45	58	45	14.31
2	300.93	362.00	61.07	45	37	45	254.89

TEST PHASE : FLOW PERIOD # 1

TIME OF DAY	DATE	ELAPSED TIME	DELTA TIME	BOT HOLE PRESSURE
HH:MM:SS	DD-MM	TIME, MIN	TIME, MIN	PSIA
14:54:0	2-JA	0.00	0.00	43
14:59:0	2-JA	5.00	5.00	43
15:04:0	2-JA	10.00	10.00	43
15:08:19	2-JA	14.31	14.31	45

TEST PHASE : SHUTIN PERIOD # 1

FINAL FLOW PRESSURE [PSIA] = 45  
 PRODUCING TIME [MIN] = 14.31

TIME OF DAY	DATE	ELAPSED TIME	DELTA TIME	BOT HOLE PRESSURE	DELTA P	LOG HORNER TIME
HH:MM:SS	DD-MM	TIME, MIN	TIME, MIN	PSIA	PSI	TIME
15:08:19	2-JA	14.31	0.00	45	0	
15:09:19	2-JA	15.31	1.00	32	-12	1.185
15:10:19	2-JA	16.31	2.00	32	-12	0.911
15:11:19	2-JA	17.31	3.00	33	-12	0.761
15:12:19	2-JA	18.31	4.00	33	-12	0.661
15:13:19	2-JA	19.31	5.00	33	-12	0.587
15:14:19	2-JA	20.31	6.00	34	-11	0.530
15:15:19	2-JA	21.31	7.00	34	-11	0.483
15:16:19	2-JA	22.31	8.00	34	-11	0.445
15:17:19	2-JA	23.31	9.00	34	-11	0.413
15:18:19	2-JA	24.31	10.00	35	-10	0.386
15:20:19	2-JA	26.31	12.00	36	-9	0.341
15:22:19	2-JA	28.31	14.00	38	-7	0.306
15:24:19	2-JA	30.31	16.00	38	-6	0.277
15:26:19	2-JA	32.31	18.00	40	-5	0.254
15:28:19	2-JA	34.31	20.00	42	-3	0.234
15:30:19	2-JA	36.31	22.00	43	-2	0.218
15:32:19	2-JA	38.31	24.00	44	0	0.203
15:34:19	2-JA	40.31	26.00	46	1	0.190
15:36:19	2-JA	42.31	28.00	47	2	0.179
15:38:19	2-JA	44.31	30.00	48	3	0.169
15:43:19	2-JA	49.31	35.00	51	6	0.149
15:48:19	2-JA	54.31	40.00	55	10	0.133
15:52:51	2-JA	58.85	44.54	58	13	0.121

TEST PHASE : FLOW PERIOD # 2

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA
HH:MM:SS	DD-MM	*****	*****	*****
15:54:21	2-JA	60.35	0.00	49
15:59:21	2-JA	65.35	5.00	48
16: 4:21	2-JA	70.35	10.00	48
16: 9:21	2-JA	75.35	15.00	48
16:14:21	2-JA	80.35	20.00	48
16:19:21	2-JA	85.35	25.00	48
16:24:21	2-JA	90.35	30.00	48
16:29:21	2-JA	95.35	35.00	48
16:34:21	2-JA	100.35	40.00	47
16:39:21	2-JA	105.35	45.00	46
16:44:21	2-JA	110.35	50.00	45
16:49:21	2-JA	115.35	55.00	45
16:54:21	2-JA	120.35	60.00	45
16:59:21	2-JA	125.35	65.00	44
17: 4:21	2-JA	130.35	70.00	44
17: 9:21	2-JA	135.35	75.00	43
17:14:21	2-JA	140.35	80.00	43
17:19:21	2-JA	145.35	85.00	43
17:24:21	2-JA	150.35	90.00	42
17:29:21	2-JA	155.35	95.00	42
17:34:21	2-JA	160.35	100.00	42
17:39:21	2-JA	165.35	105.00	42
17:44:21	2-JA	170.35	110.00	42
17:49:21	2-JA	175.35	115.00	42
17:54:21	2-JA	180.35	120.00	42
17:59:21	2-JA	185.35	125.00	41
18: 4:21	2-JA	190.35	130.00	41
18: 9:21	2-JA	195.35	135.00	40
18:14:21	2-JA	200.35	140.00	39
18:19:21	2-JA	205.35	145.00	39
18:24:21	2-JA	210.35	150.00	39
18:29:21	2-JA	215.35	155.00	39
18:34:21	2-JA	220.35	160.00	39
18:39:21	2-JA	225.35	165.00	39
18:44:21	2-JA	230.35	170.00	39
18:49:21	2-JA	235.35	175.00	39
18:54:21	2-JA	240.35	180.00	39
18:59:21	2-JA	245.35	185.00	39
19: 4:21	2-JA	250.35	190.00	39
19: 9:21	2-JA	255.35	195.00	39
19:14:21	2-JA	260.35	200.00	39
19:19:21	2-JA	265.35	205.00	40
19:24:21	2-JA	270.35	210.00	41
19:29:21	2-JA	275.35	215.00	41
19:34:21	2-JA	280.35	220.00	41
19:39:21	2-JA	285.35	225.00	42
19:44:21	2-JA	290.35	230.00	44
19:49:21	2-JA	295.35	235.00	44
19:54:21	2-JA	300.35	240.00	45

TEST PHASE : FLOW PERIOD # 2

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA
19:54:56	2-JA	300.93	240.58	45

TEST PHASE : SHUTIN PERIOD # 2

FINAL FLOW PRESSURE [PSIA] = 45  
 PRODUCING TIME [MIN] = 254.89

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
19:54:56	2-JA	300.93	0.00	45	0	
19:55:56	2-JA	301.93	1.00	34	-11	2.408
19:56:56	2-JA	302.93	2.00	34	-11	2.109
19:57:56	2-JA	303.93	3.00	34	-11	1.934
19:58:56	2-JA	304.93	4.00	34	-11	1.811
19:59:56	2-JA	305.93	5.00	34	-11	1.716
20: 0:56	2-JA	306.93	6.00	34	-10	1.638
20: 1:56	2-JA	307.93	7.00	34	-10	1.573
20: 2:56	2-JA	308.93	8.00	35	-10	1.517
20: 3:56	2-JA	309.93	9.00	35	-10	1.467
20: 4:56	2-JA	310.93	10.00	35	-10	1.423
20: 6:56	2-JA	312.93	12.00	35	-10	1.347
20: 8:56	2-JA	314.93	14.00	35	-10	1.283
20:10:56	2-JA	316.93	16.00	35	-10	1.229
20:12:56	2-JA	318.93	18.00	35	-10	1.181
20:14:56	2-JA	320.93	20.00	35	-10	1.138
20:16:56	2-JA	322.93	22.00	35	-10	1.100
20:18:56	2-JA	324.93	24.00	35	-10	1.065
20:20:56	2-JA	326.93	26.00	35	-10	1.034
20:22:56	2-JA	328.93	28.00	35	-10	1.004
20:24:56	2-JA	330.93	30.00	35	-10	0.978
20:29:56	2-JA	335.93	35.00	35	-10	0.918
20:34:56	2-JA	340.93	40.00	35	-10	0.868
20:39:56	2-JA	345.93	45.00	35	-10	0.824
20:44:56	2-JA	350.93	50.00	35	-10	0.785
20:49:56	2-JA	355.93	55.00	36	-9	0.751
20:54:56	2-JA	360.93	60.00	37	-8	0.720
20:58: 0	2-JA	362.00	61.07	37	-8	0.714

FLOPETROL JOHNSTON

Schlumberger

# WELL PERFORMANCE TEST REPORT

A Production Systems Analysis (NODAL)  
Based On  
Drillstem Test Data

Test Date  
01-08-85

Report No.:  
42986 E

COMPANY

**ARCO OIL & GAS**

WELL

**BUCK KNOLL #1**

TEST IDENTIFICATION

Test Type .....: OPEN HOLE  
Test Number .....: 3  
Formation .....: KIBAB  
Test Interval .....: 8910 - 8950 FT.  
Reference Depth .....: KELLY BUSHING

WELL LOCATION

Field.....: WILD CAT  
County.....: GARFIELD  
State.....: UTAH  
Sec / Twn / Rng .....: S36 T37S R4 1/2W  
Elevation.....: 8295 FT.

HOLE CONDITIONS

Total Depth (MVD/TVD) .....: 8950 FT.  
Hole Size / Deviation Angle .....: 9 7/8" / STRAIGHT  
Csg / Liner ID .....: NA  
Perf'd Interval .....: NA  
Shot Density / Phasing .....: NA  
Gun Type / Perf Cond .....: NA

MUD PROPERTIES

Mud Type .....: LOW LIME  
Mud Weight .....: 9.0 LB/GAL  
Mud Resistivity .....: .76 OHM -M @ 50°F  
Filtrate Resistivity .....: 1.01 OHM -M @ 50°F  
Filtrate Chlorides .....: 10000 PPM  
Filtrate Nitrates.....: NOT GIVEN

INITIAL TEST CONDITIONS

Gas Cushion Type .....: NONE  
Surface Pressure .....: NA  
Liquid Cushion Type .....: NONE  
Height Above DST Valve .....: NA

TEST STRING CONFIGURATION

Pipe Length / ID.....: 8500 FT. / 3.826 IN.  
Collar Length / ID .....: 340 FT. / 2.37 IN.  
Packer Depth(s).....: 8903 & 8910 FT.  
BH Choke Size.....: 15/16 IN.

NET PIPE RECOVERY

Volume	Fluid Type	Physical Properties
25.61 BBL	WATER	TOP: 1.5 OHM -M @ 60°F 350 PPM CL.
		BTM: 1.2 OHM -M @ 60°F 600 PPM CL.

NET SAMPLE CHAMBER RECOVERY

Volume	Fluid Type	Physical Properties
0.405 SCF	GAS	CORRECTED TO PWF
2000 CC	WATER	1.2 OHM -M @ 60°F 600 PPM CL.
300 CC	MUD	
Pressure: 60 PSIG		GOR: -- GLR: 28.0

INTERPRETATION RESULTS

Reservoir Pressure @ Gauge Depth: NA  
Gauge Depth .....: 8916 FT.  
Hydrostatic Gradient .....: NA  
Potentiometric Surface .....: NA  
Effective Permeability to .....: NA  
Transmissibility .....: NA  
Skin Factor / Damage Ratio.....: NA  
Omega / Lambda (2φ System).....: NA  
Radius of Investigation .....: NA  
Measured Wellbore Storage .....: NA

ROCK / FLUID / WELLBORE PROPERTIES

Reservoir Temperature .....: 152°F  
Analysis Fluid Type .....: NA  
Formation Volume Factor .....: NA  
Viscosity .....: NA  
Z-Factor (gas only).....: NA  
Net Pay .....: 40 FT.  
Porosity .....: 5%  
Total System Compressibility.....: NA  
Wellbore Radius.....: NA  
Expected Wellbore Storage.....: NA

FLOW RATE DURING DST

**144.7 BWPD avg. / 90.5 BWPD last rate**

MAXIMUM FLOW RATE POTENTIAL AFTER COMPLETION

**RECEIVED**

**MAR 20 1985**

This rate is based on a specific completion design & producing time. Call FJS for details

**DIVISION OF OIL**

FJS-5 B14059

# BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 42986E

COMPANY : ARCO OIL & GAS

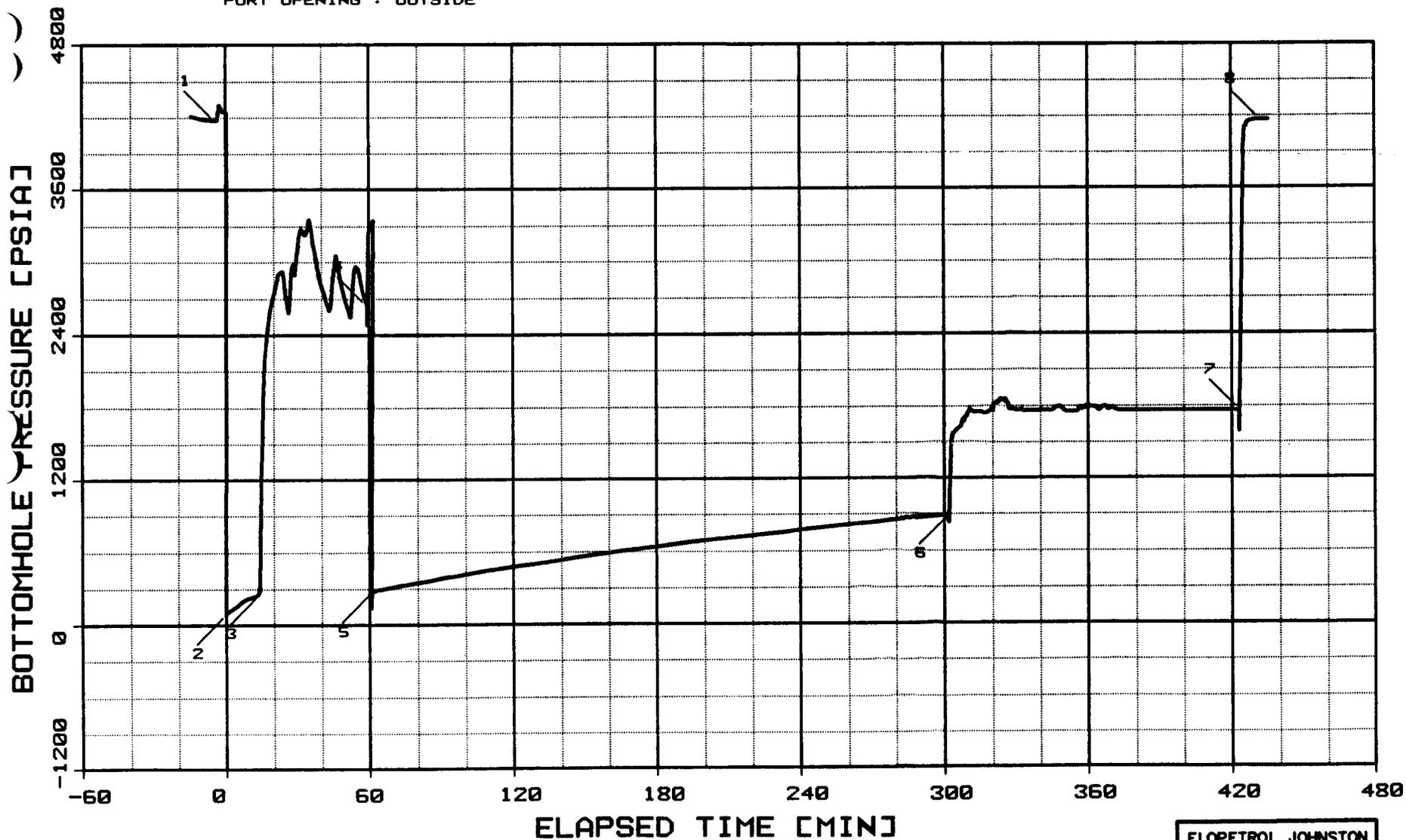
INSTRUMENT NO. J-1400

WELL : BUCK KNOLL #1

DEPTH : 8916 FT

CAPACITY : 6400 PSI

PORT OPENING : OUTSIDE



FLOPETROL JOHNSTON

**DST EVENT SUMMARY**

Field Report # 42986 E

DATE (M/D/Y)	TIME (HR:MIN)	EVENT E.T. (MIN)	EVENT DESCRIPTION	LABEL PT. #	SURFACE PRESSURE (PSIG)	FLOOR MANIFOLD CHOKE SIZE (64ths INCH)
1-8-85	0502	—	SET PACKER	1		1/8" BUBBLE HOSE
	0504	—	OPENED TEST TOOL FOR INITIAL FLOW	2		"
			1" BLOW IN WATER			
	0509		3" BLOW IN WATER			"
	0514		4" BLOW IN WATER			"
	0519	—	CLOSED TEST TOOL FOR INITIAL SHUT-IN	3		"
	0604		FINISHED SHUT-IN	4		"
	0606	—	OPENED TEST TOOL FOR FINAL FLOW	5		"
			1/4" BLOW IN WATER			
	0621		3" BLOW IN WATER			"
	0636		5" BLOW IN WATER			"
	0656		7" BLOW IN WATER			"
	0706		7 1/2" BLOW IN WATER			"
	0746		7" BLOW IN WATER			"
	0806		7" BLOW IN WATER			"
	0836		8" BLOW IN WATER			"
	0846		7" BLOW IN WATER			"
	0906		6 1/2" BLOW IN WATER			"
	1007	—	CLOSED TEST TOOL FOR FINAL SHUT-IN	6		"
			4 1/2" BLOW IN WATER			
	1207	—	FINISHED FINAL SHUT-IN	7		"
	1210	—	UNSEATED PACKER	8		—
		—	REVERSED OUT			
		—	BEGAN TRIP OUT OF HOLE			

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 \* WELL TEST DATA PRINTOUT \*  
 \*\*\*\*\*

FIELD REPORT # : 42986E  
 COMPANY : ARCO OIL & GAS  
 WELL : BUCK KNOLL #1

INSTRUMENT # : J-1400  
 CAPACITY [PSI] : 6400.  
 DEPTH [FT] : 8916.0  
 PORT OPENING : OUTSIDE  
 TEMPERATURE [DEG F] : 152.0

LABEL POINT INFORMATION  
 \*\*\*\*\*

#	TIME OF DAY		DATE	EXPLANATION	ELAPSED TIME, MIN	BOT HOLE PRESSURE PSIA
	HH:MM:SS	DD-MM				
1	4:59:09		8-JA	HYDROSTATIC MUD	-4.85	4174
2	5:04:00		8-JA	START FLOW	0.00	89
3	5:17:58		8-JA	END FLOW & START SHUT-IN	13.96	251
4	6:03:08		8-JA	END SHUT-IN	59.13	2632
5	6:04:58		8-JA	START FLOW	60.97	267
6	10:05:56		8-JA	END FLOW & START SHUT-IN	301.93	892
7	12:07:00		8-JA	END SHUT-IN	423.00	1756
8	12:15:50		8-JA	HYDROSTATIC MUD	431.84	4164

SUMMARY OF FLOW PERIODS  
 \*\*\*\*\*

PERIOD	START	END	DURATION	START	END
	ELAPSED TIME, MIN	ELAPSED TIME, MIN		MIN	PRESSURE PSIA
1	0.00	13.96	13.96	89	251
2	60.97	301.93	240.96	267	892

SUMMARY OF SHUTIN PERIODS  
 \*\*\*\*\*

PERIOD	START	END	DURATION	START	END	FINAL FLOW	
	ELAPSED TIME, MIN	ELAPSED TIME, MIN		MIN	PRESSURE PSIA	PRESSURE PSIA	PRESSURE PSIA
1	13.96	59.13	45.17	251	2632	251	13.96
2	301.93	423.00	121.07	892	1756	892	254.92

TEST PHASE : FLOW PERIOD # 1

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA
HH:MM:SS	DD-MM	*****	*****	*****
5: 4: 0	8-JA	0.00	0.00	89
5: 9: 0	8-JA	5.00	5.00	162
5:14: 0	8-JA	10.00	10.00	221
5:17:58	8-JA	13.96	13.96	251

TEST PHASE : SHUTIN PERIOD # 1

FINAL FLOW PRESSURE [PSIA] = 251  
 PRODUCING TIME [MIN] = 13.96

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
HH:MM:SS	DD-MM	*****	*****	*****	*****	*****
5:17:58	8-JA	13.96	0.00	251	0	
5:18:58	8-JA	14.96	1.00	1243	992	1.175
5:19:58	8-JA	15.96	2.00	1980	1729	0.902
5:20:58	8-JA	16.96	3.00	2323	2072	0.752
5:21:58	8-JA	17.96	4.00	2501	2250	0.652
5:22:58	8-JA	18.96	5.00	2605	2354	0.579
5:23:58	8-JA	19.96	6.00	2729	2478	0.522
5:24:58	8-JA	20.96	7.00	2788	2537	0.476
5:25:58	8-JA	21.96	8.00	2893	2641	0.439
5:26:58	8-JA	22.96	9.00	2916	2665	0.407
5:27:58	8-JA	23.96	10.00	2905	2654	0.379
5:29:58	8-JA	25.96	12.00	2623	2372	0.335
5:31:58	8-JA	27.96	14.00	2966	2715	0.300
5:33:58	8-JA	29.96	16.00	3060	2809	0.272
5:35:58	8-JA	31.96	18.00	3270	3019	0.249
5:37:58	8-JA	33.96	20.00	3233	2982	0.230
5:39:58	8-JA	35.96	22.00	3258	3007	0.213
5:41:58	8-JA	37.96	24.00	3018	2767	0.199
5:43:58	8-JA	39.96	26.00	2812	2561	0.187
5:45:58	8-JA	41.96	28.00	2677	2426	0.176
5:47:58	8-JA	43.96	30.00	2611	2360	0.166
5:52:58	8-JA	48.96	35.00	2768	2517	0.146
5:57:58	8-JA	53.96	40.00	2934	2683	0.130
6: 2:58	8-JA	58.96	45.00	2644	2393	0.117
6: 3: 8	8-JA	59.13	45.17	2632	2381	0.117

TEST PHASE : FLOW PERIOD # 2

TIME OF DAY DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA
10: 5:56 8-JA	301.93	240.96	892

TEST PHASE : SHUTIN PERIOD # 2

FINAL FLOW PRESSURE [PSIA] = 892  
 PRODUCING TIME [MIN] = 254.92

TIME OF DAY DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
10: 5:56 8-JA	301.93	0.00	892	0	
10: 6:56 8-JA	302.93	1.00	1471	579	2.408
10: 7:56 8-JA	303.93	2.00	1577	685	2.109
10: 8:56 8-JA	304.93	3.00	1596	704	1.934
10: 9:56 8-JA	305.93	4.00	1616	724	1.811
10:10:56 8-JA	306.93	5.00	1630	738	1.716
10:11:56 8-JA	307.93	6.00	1686	794	1.638
10:12:56 8-JA	308.93	7.00	1706	814	1.573
10:13:56 8-JA	309.93	8.00	1744	852	1.517
10:14:56 8-JA	310.93	9.00	1769	877	1.467
10:15:56 8-JA	311.93	10.00	1759	867	1.423
10:17:56 8-JA	313.93	12.00	1749	857	1.347
10:19:56 8-JA	315.93	14.00	1741	849	1.283
10:21:56 8-JA	317.93	16.00	1741	849	1.229
10:23:56 8-JA	319.93	18.00	1773	881	1.181
10:25:56 8-JA	321.93	20.00	1828	936	1.138
10:27:56 8-JA	323.93	22.00	1850	958	1.100
10:29:56 8-JA	325.93	24.00	1828	936	1.065
10:31:56 8-JA	327.93	26.00	1771	879	1.034
10:33:56 8-JA	329.93	28.00	1762	870	1.005
10:35:56 8-JA	331.93	30.00	1770	879	0.978
10:40:56 8-JA	336.93	35.00	1757	865	0.918
10:45:56 8-JA	341.93	40.00	1759	867	0.868
10:50:56 8-JA	346.93	45.00	1790	898	0.824
10:55:56 8-JA	351.93	50.00	1751	859	0.785
11: 0:56 8-JA	356.93	55.00	1782	890	0.751
11: 5:56 8-JA	361.93	60.00	1789	897	0.720
11:10:56 8-JA	366.93	65.00	1792	900	0.692
11:15:56 8-JA	371.93	70.00	1760	868	0.667
11:20:56 8-JA	376.93	75.00	1757	865	0.643
11:25:56 8-JA	381.93	80.00	1757	865	0.622
11:30:56 8-JA	386.93	85.00	1757	865	0.602
11:35:56 8-JA	391.93	90.00	1757	865	0.583
11:40:56 8-JA	396.93	95.00	1757	865	0.566
11:45:56 8-JA	401.93	100.00	1757	865	0.550
11:50:56 8-JA	406.93	105.00	1757	865	0.535
11:55:56 8-JA	411.93	110.00	1757	865	0.521

TEST PHASE : SHUTIN PERIOD # 2  
 FINAL FLOW PRESSURE [PSIA] = 892  
 PRODUCING TIME [MIN] = 254.92

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
HH:MM:SS	DD-MM	*****	*****	*****	*****	*****
12: 0:56	8-JA	416.93	115.00	1756	864	0.507
12: 5:56	8-JA	421.93	120.00	1756	864	0.495
12: 7: 0	8-JA	423.00	121.07	1756	864	0.492

FLOPETROL JOHNSTON

**Schlumberger**

# WELL PERFORMANCE TEST REPORT

A Production Systems Analysis (NODAL)  
Based On  
Drillstem Test Data

Test Date  
1-16-85

Report No.:  
42987 E

**COMPANY**

**ARCO OIL & GAS**

**WELL**

**BUCK KNOLL  
UNIT 1**

**TEST IDENTIFICATION**

Test Type ..... OPEN HOLE  
Test Number ..... 4  
Formation ..... TOROWEEP  
Test Interval ..... 9542 - 9624 FT.  
Reference Depth ..... KELLY BUSHING

**WELL LOCATION**

Field ..... WILD CAT  
County ..... GARFIELD  
State ..... UTAH  
Sec / Twn / Rng ..... S36 T37S R4 1/2W  
Elevation ..... 8295 FT.

**HOLE CONDITIONS**

Total Depth (MVD/TVD) ..... 9624 FT.  
Hole Size / Deviation Angle ..... 9 7/8" / STRAIGHT  
Csg / Liner ID ..... NA  
Perf'd Interval ..... NA  
Shot Density / Phasing ..... NA  
Gun Type / Perf Cond ..... NA

**MUD PROPERTIES**

Mud Type ..... LOW LIME  
Mud Weight ..... 9.0 LB/GAL  
Mud Resistivity ..... 1.4 OHM -M @ 50°F  
Filtrate Resistivity ..... 1.3 OHM -M @ 50°F  
Filtrate Chlorides ..... 250 PPM  
Filtrate Nitrates ..... NOT GIVEN

**INITIAL TEST CONDITIONS**

Gas Cushion Type ..... NONE  
Surface Pressure ..... NA  
Liquid Cushion Type ..... NONE  
Height Above DST Valve ..... NA

**TEST STRING CONFIGURATION**

Pipe Length / ID ..... 9093 FT. / 3.5 IN.  
Collar Length / ID ..... 247 FT. / 2.37 IN.  
Packer Depth(s) ..... 9535 & 9542 FT.  
BH Choke Size ..... 15/16 IN.

**NET PIPE RECOVERY**

Volume	Fluid Type	Physical Properties
2.46 BBL	WATER	TOP: 1.1 OHM-M @ 78°F
2.46 BBL	MUD	MID: 1.4 OHM-M @ 50°F
		BTM: 2.2 OHM-M @ 50°F
		CL'S: 150/250/250 PPM

**NET SAMPLE CHAMBER RECOVERY**

Volume	Fluid Type	Physical Properties
2400 CC	WATER	1.7 OHM -M @ 76°F
		400 PPM CL.
Pressure: 10 PSIG		GOR: --- GLR: ---

**INTERPRETATION RESULTS**

Reservoir Pressure @ Gauge Depth: NA  
Gauge Depth ..... 9548 FT.  
Hydrostatic Gradient ..... NA  
Potentiometric Surface ..... NA  
Effective Permeability to ..... NA  
Transmissibility ..... NA  
Skin Factor / Damage Ratio ..... NA  
Omega / Lambda (2φ System) ..... NA  
Radius of Investigation ..... NA  
Measured Wellbore Storage ..... NA

**ROCK / FLUID / WELLBORE PROPERTIES**

Reservoir Temperature ..... 152°F  
Analysis Fluid Type ..... NA  
Formation Volume Factor ..... NA  
Viscosity ..... NA  
Z-Factor (gas only) ..... NA  
Net Pay ..... 55 FT.  
Porosity ..... <5%  
Total System Compressibility ..... NA  
Wellbore Radius ..... .411 FT.  
Expected Wellbore Storage ..... NA

**FLOW RATE DURING DST**

**28 BLPD avg. / 8 BLPD**

**MAXIMUM FLOW RATE POTENTIAL AFTER COMPLETION**

MAR 20 1985

DIVISION OF OIL  
GAS & MINING

This rate is based on a specific completion design & producing time. Call FJS for

# BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 42987E

COMPANY : ARCO OIL & GAS COMPANY

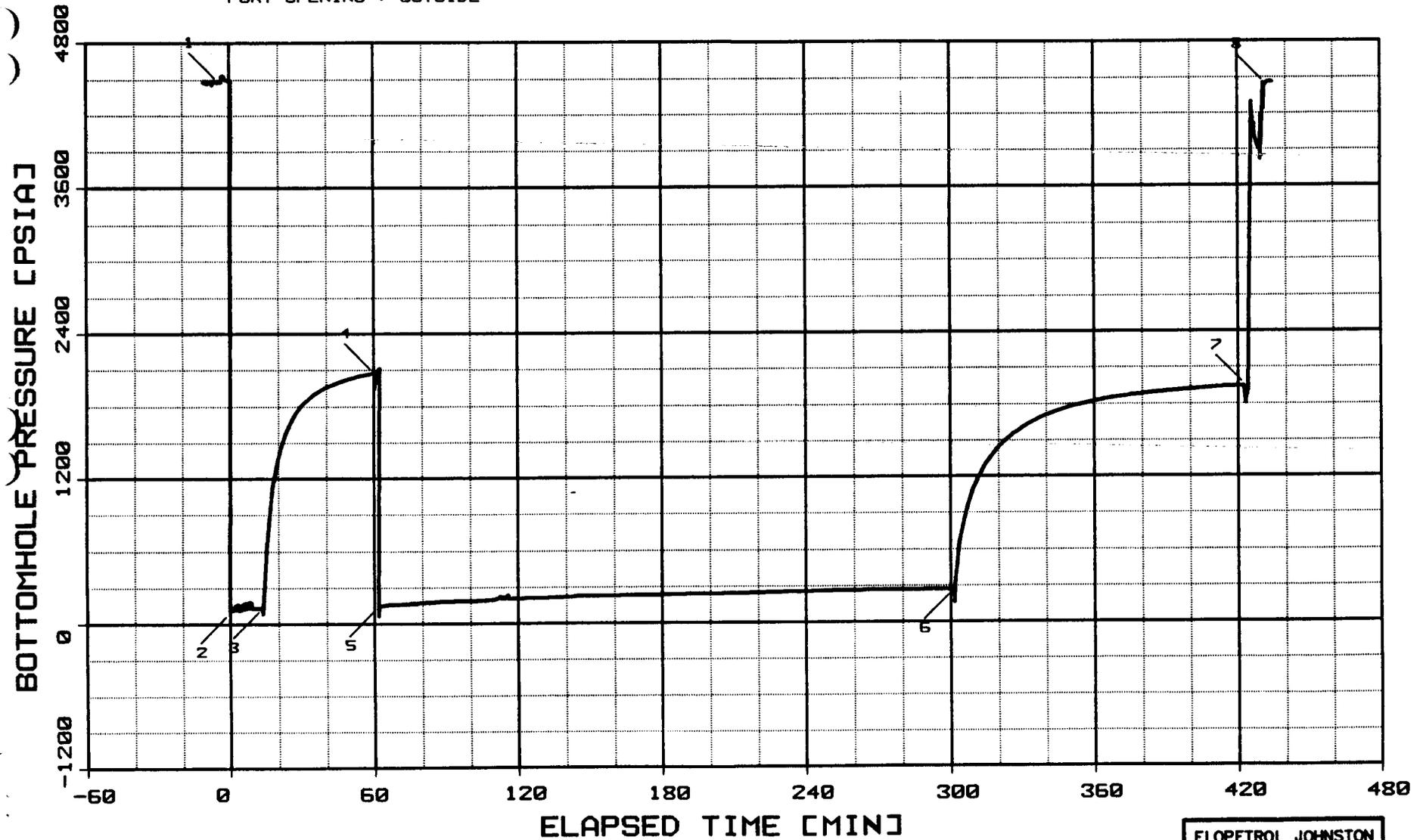
INSTRUMENT NO. J-1400

WELL : BUCK KNOLL UNIT #1

DEPTH : 9548 FT

CAPACITY : 6400 PSI

PORT OPENING : OUTSIDE



FLOPETROL JOHNSTON

**DST EVENT SUMMARY**

Field Report # 42987 E

DATE (M/D/Y)	TIME (HR:MIN)	EVENT E.T. (MIN)	EVENT DESCRIPTION	LABEL PT. #	SURFACE PRESSURE (PSIG)	FLOOR MANIFOLD CHOKE SIZE (64ths INCH)
1-16-85	0321	—	SET PACKER	1		1/8" BUBBLE HOSE
	0324	—	OPENED TEST TOOL FOR INITIAL FLOW	2		"
	0339	—	CLOSED TEST TOOL FOR INITIAL SHUT-IN	3		"
			1 1/4" BLOW IN WATER			
	0414		BLOW DIED			"
	0424		FINISHED SHUT-IN	4		"
	0427	—	OPENED TEST TOOL FOR FINAL FLOW	5		"
			1/4" BLOW IN WATER			
	0527		1/4" BLOW IN WATER			"
	0627		1/4" BLOW IN WATER			"
	0727		VERY WEAK SURFACE BLOW IN WATER			"
	0827	—	CLOSED TEST TOOL FOR FINAL SHUT-IN	6		"
			SLIGHT BLOW IN WATER			
	1027	—	FINISHED FINAL SHUT-IN	7		"
	1033	—	UNSEATED PACKER	8		—
		—	REVERSED OUT			
		—	BEGAN TRIP OUT OF HOLE			

\*\*\*\*\*  
 \* WELL TEST DATA PRINTOUT \*  
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FIELD REPORT # : 42987E

INSTRUMENT # : J-1400

COMPANY : ARCO OIL & GAS COMPANY

CAPACITY [PSI] : 6400.

WELL : BUCK KNOLL UNIT #1

DEPTH [FT] : 9548.0

PORT OPENING : OUTSIDE

TEMPERATURE [DEG F] : 152.0

LABEL POINT INFORMATION

\*\*\*\*\*

#	TIME OF DAY		DATE	EXPLANATION	ELAPSED TIME, MIN	BOT HOLE PRESSURE PSIA
	HH:MM:SS	DD-MM				
1	3:19:30	16-JA		HYDROSTATIC MUD	-4.50	4476
2	3:24: 0	16-JA		START FLOW	0.00	91
3	3:37:28	16-JA		END FLOW & START SHUT-IN	13.47	130
4	4:24:10	16-JA		END SHUT-IN	60.16	2072
5	4:25:58	16-JA		START FLOW	61.96	143
6	8:25:29	16-JA		END FLOW & START SHUT-IN	301.48	267
7	10:27: 0	16-JA		END SHUT-IN	423.00	1944
8	10:35:59	16-JA		HYDROSTATIC MUD	431.98	4439

SUMMARY OF FLOW PERIODS

\*\*\*\*\*

PERIOD	START ELAPSED TIME, MIN	END ELAPSED TIME, MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA
1	0.00	13.47	13.47	91	130
2	61.96	301.48	239.52	143	267

SUMMARY OF SHUTIN PERIODS

\*\*\*\*\*

PERIOD	START ELAPSED TIME, MIN	END ELAPSED TIME, MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	FINAL FLOW PRESSURE PSIA	PRODUCING TIME, MIN
1	13.47	60.16	46.69	130	2072	130	13.47
2	301.48	423.00	121.52	267	1944	267	252.99

TEST PHASE : FLOW PERIOD # 1

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA
3:24:00	16-JA	0.00	0.00	91
3:29:00	16-JA	5.00	5.00	125
3:34:00	16-JA	10.00	10.00	128
3:37:28	16-JA	13.47	13.47	130

TEST PHASE : SHUTIN PERIOD # 1

FINAL FLOW PRESSURE [PSIA] = 130  
 PRODUCING TIME [MIN] = 13.47

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
3:37:28	16-JA	13.47	0.00	130	0	
3:38:28	16-JA	14.47	1.00	372	242	1.160
3:39:28	16-JA	15.47	2.00	661	531	0.888
3:40:28	16-JA	16.47	3.00	893	763	0.740
3:41:28	16-JA	17.47	4.00	1070	940	0.640
3:42:28	16-JA	18.47	5.00	1201	1071	0.567
3:43:28	16-JA	19.47	6.00	1306	1176	0.511
3:44:28	16-JA	20.47	7.00	1390	1261	0.466
3:45:28	16-JA	21.47	8.00	1464	1334	0.429
3:46:28	16-JA	22.47	9.00	1529	1399	0.397
3:47:28	16-JA	23.47	10.00	1580	1450	0.371
3:49:28	16-JA	25.47	12.00	1668	1538	0.327
3:51:28	16-JA	27.47	14.00	1738	1608	0.293
3:53:28	16-JA	29.47	16.00	1794	1664	0.265
3:55:28	16-JA	31.47	18.00	1838	1708	0.243
3:57:28	16-JA	33.47	20.00	1871	1741	0.224
3:59:28	16-JA	35.47	22.00	1900	1770	0.207
4:01:28	16-JA	37.47	24.00	1925	1795	0.193
4:03:28	16-JA	39.47	26.00	1946	1816	0.181
4:05:28	16-JA	41.47	28.00	1964	1834	0.171
4:07:28	16-JA	43.47	30.00	1981	1851	0.161
4:12:28	16-JA	48.47	35.00	2016	1886	0.141
4:17:28	16-JA	53.47	40.00	2044	1914	0.126
4:22:28	16-JA	58.47	45.00	2065	1935	0.114
4:24:10	16-JA	60.16	46.69	2072	1942	0.110

## TEST PHASE : FLOW PERIOD # 2

TIME OF DAY	DATE	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE PRESSURE PSIA
HH:MM:SS	DD-MM	*****	*****	*****
4:25:58	16-JA	61.96	0.00	143
4:30:58	16-JA	66.96	5.00	151
4:35:58	16-JA	71.96	10.00	158
4:40:58	16-JA	76.96	15.00	162
4:45:58	16-JA	81.96	20.00	170
4:50:58	16-JA	86.96	25.00	176
4:55:58	16-JA	91.96	30.00	176
5: 0:58	16-JA	96.96	35.00	181
5: 5:58	16-JA	101.96	40.00	187
5:10:58	16-JA	106.96	45.00	190
5:15:58	16-JA	111.96	50.00	203
5:20:58	16-JA	116.96	55.00	202
5:25:58	16-JA	121.96	60.00	205
5:30:58	16-JA	126.96	65.00	207
5:35:58	16-JA	131.96	70.00	211
5:40:58	16-JA	136.96	75.00	212
5:45:58	16-JA	141.96	80.00	215
5:50:58	16-JA	146.96	85.00	220
5:55:58	16-JA	151.96	90.00	220
6: 0:58	16-JA	156.96	95.00	221
6: 5:58	16-JA	161.96	100.00	223
6:10:58	16-JA	166.96	105.00	224
6:15:58	16-JA	171.96	110.00	225
6:20:58	16-JA	176.96	115.00	226
6:25:58	16-JA	181.96	120.00	229
6:30:58	16-JA	186.96	125.00	230
6:35:58	16-JA	191.96	130.00	232
6:40:58	16-JA	196.96	135.00	232
6:45:58	16-JA	201.96	140.00	235
6:50:58	16-JA	206.96	145.00	236
6:55:58	16-JA	211.96	150.00	238
7: 0:58	16-JA	216.96	155.00	241
7: 5:58	16-JA	221.96	160.00	243
7:10:58	16-JA	226.96	165.00	246
7:15:58	16-JA	231.96	170.00	247
7:20:58	16-JA	236.96	175.00	250
7:25:58	16-JA	241.96	180.00	252
7:30:58	16-JA	246.96	185.00	254
7:35:58	16-JA	251.96	190.00	256
7:40:58	16-JA	256.96	195.00	258
7:45:58	16-JA	261.96	200.00	259
7:50:58	16-JA	266.96	205.00	260
7:55:58	16-JA	271.96	210.00	260
8: 0:58	16-JA	276.96	215.00	262
8: 5:58	16-JA	281.96	220.00	263
8:10:58	16-JA	286.96	225.00	264
8:15:58	16-JA	291.96	230.00	265
8:20:58	16-JA	296.96	235.00	266
8:25:29	16-JA	301.48	239.52	267

TEST PHASE : SHUTIN PERIOD # 2  
 FINAL FLOW PRESSURE [PSIA] = 267  
 PRODUCING TIME [MIN] = 252.99

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
HH:MM:SS	DD-MM	*****	*****	*****	*****	*****
8:25:29	16-JA	301.48	0.00	267	0	
8:26:29	16-JA	302.48	1.00	441	173	2.405
8:27:29	16-JA	303.48	2.00	601	333	2.105
8:28:29	16-JA	304.48	3.00	721	454	1.931
8:29:29	16-JA	305.48	4.00	819	552	1.808
8:30:29	16-JA	306.48	5.00	901	633	1.713
8:31:29	16-JA	307.48	6.00	968	701	1.635
8:32:29	16-JA	308.48	7.00	1031	764	1.570
8:33:29	16-JA	309.48	8.00	1088	821	1.514
8:34:29	16-JA	310.48	9.00	1137	870	1.464
8:35:29	16-JA	311.48	10.00	1183	916	1.420
8:37:29	16-JA	313.48	12.00	1255	988	1.344
8:39:29	16-JA	315.48	14.00	1318	1051	1.280
8:41:29	16-JA	317.48	16.00	1372	1105	1.226
8:43:29	16-JA	319.48	18.00	1420	1153	1.178
8:45:29	16-JA	321.48	20.00	1463	1196	1.135
8:47:29	16-JA	323.48	22.00	1500	1233	1.097
8:49:29	16-JA	325.48	24.00	1534	1266	1.062
8:51:29	16-JA	327.48	26.00	1563	1296	1.031
8:53:29	16-JA	329.48	28.00	1590	1323	1.002
8:55:29	16-JA	331.48	30.00	1614	1347	0.975
9: 0:29	16-JA	336.48	35.00	1668	1401	0.915
9: 5:29	16-JA	341.48	40.00	1713	1446	0.865
9:10:29	16-JA	346.48	45.00	1748	1481	0.821
9:15:29	16-JA	351.48	50.00	1778	1511	0.782
9:20:29	16-JA	356.48	55.00	1803	1536	0.748
9:25:29	16-JA	361.48	60.00	1824	1556	0.717
9:30:29	16-JA	366.48	65.00	1841	1574	0.690
9:35:29	16-JA	371.48	70.00	1857	1589	0.664
9:40:29	16-JA	376.48	75.00	1870	1603	0.641
9:45:29	16-JA	381.48	80.00	1882	1614	0.619
9:50:29	16-JA	386.48	85.00	1892	1625	0.599
9:55:29	16-JA	391.48	90.00	1902	1635	0.581
10: 0:29	16-JA	396.48	95.00	1911	1644	0.564
10: 5:29	16-JA	401.48	100.00	1918	1651	0.548
10:10:29	16-JA	406.48	105.00	1924	1657	0.533
10:15:29	16-JA	411.48	110.00	1932	1664	0.519
10:20:29	16-JA	416.48	115.00	1937	1670	0.505
10:25:29	16-JA	421.48	120.00	1943	1676	0.493
10:27: 0	16-JA	423.00	121.52	1944	1676	0.489

FLOPETROL JOHNSTON

Schlumberger

# WELL PERFORMANCE TEST REPORT

A Production Systems Analysis (NODAL)  
Based On  
Drillstem Test Data

Test Date  
1-25-85

Report No.:  
42988 E

COMPANY

**ARCO OIL & GAS**

WELL

**BUCK KNOLL  
UNIT 1**

TEST IDENTIFICATION

Test Type .....: OPEN HOLE  
Test Number .....: 5  
Formation .....: CEDAR MESA  
Test Interval .....: 10060 - 10119 FT.  
Reference Depth .....: KELLY BUSHING

WELL LOCATION

Field.....: WILD CAT  
County.....: GARFIELD  
State.....: UTAH  
Sec / Twn / Rng .....: S36T37SR4 1/2W  
Elevation.....: 8295 FT.

HOLE CONDITIONS

Total Depth (MVD/TVD) .....: 10119 FT.  
Hole Size / Deviation Angle .....: 9 7/8"/STRAIGHT  
Csg / Liner ID .....: NA  
Perf'd Interval .....: NA  
Shot Density / Phasing .....: NA  
Gun Type / Perf Cond .....: NA

MUD PROPERTIES

Mud Type .....: LOW LIME  
Mud Weight .....: 9.0 LB/GAL  
Mud Resistivity .....: 1.4 OHM -M @ 60°F  
Filtrate Resistivity .....: 1.3 OHM -M @ 60°F  
Filtrate Chlorides .....: 250 PPM  
Filtrate Nitrates.....: NA

INITIAL TEST CONDITIONS

Gas Cushion Type .....: NONE  
Surface Pressure .....: NA  
Liquid Cushion Type .....: NONE  
Height Above DST Valve .....: NA

TEST STRING CONFIGURATION

Pipe Length / ID.....: 9475 FT./3.5 IN.  
Collar Length / ID .....: 340 FT./2.37 IN.  
Packer Depth(s).....: 10053 & 10060 FT.  
BH Choke Size.....: 15/16 IN.

NET PIPE RECOVERY

Volume	Fluid Type	Physical Properties
8.1 BBL	WATER	1.4 OHM -M @ 65°F 650 PPM CL.
5.13 BBL	MUD	

NET SAMPLE CHAMBER RECOVERY

Volume	Fluid Type	Physical Properties
2370 CC	WATER	1.6 OHM -M @ 65°F 850 PPM CL.

Pressure: 10 PSIG    GOR: ---    GLR: ---

INTERPRETATION RESULTS

Reservoir Pressure @Gauge Depth: NA  
Gauge Depth .....: 10066 FT.  
Hydrostatic Gradient .....: NA  
Potentiometric Surface .....: NA  
Effective Permeability to .....: NA  
Transmissibility.....: NA  
Skin Factor / Damage Ratio.....: NA  
Omega / Lambda (2φ System).....: NA  
Radius of Investigation .....: NA  
Measured Wellbore Storage .....: NA

ROCK / FLUID / WELLBORE PROPERTIES

Reservoir Temperature .....: 162°F  
Analysis Fluid Type .....: NA  
Formation Volume Factor .....: NA  
Viscosity .....: NA  
Z-Factor (gas only).....: NA  
Net Pay.....: 40 FT.  
Porosity .....: <5%  
Total System Compressibility.....: NA  
Wellbore Radius.....: .411 FT.  
Expected Wellbore Storage.....: NA

FLOW RATE DURING DST

**75 BLPD avg. / 45 BLPD last rate**

MAXIMUM FLOW RATE POTENTIAL AFTER COMPLETION

RECEIVED

20 1985

DIVISION OF OIL  
GAS & MINING

This rate is based on a specific completion design & producing time. Call FJS for details.

FJS-5 B14059

# BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 42988E

COMPANY : ARCO OIL & GAS COMPANY

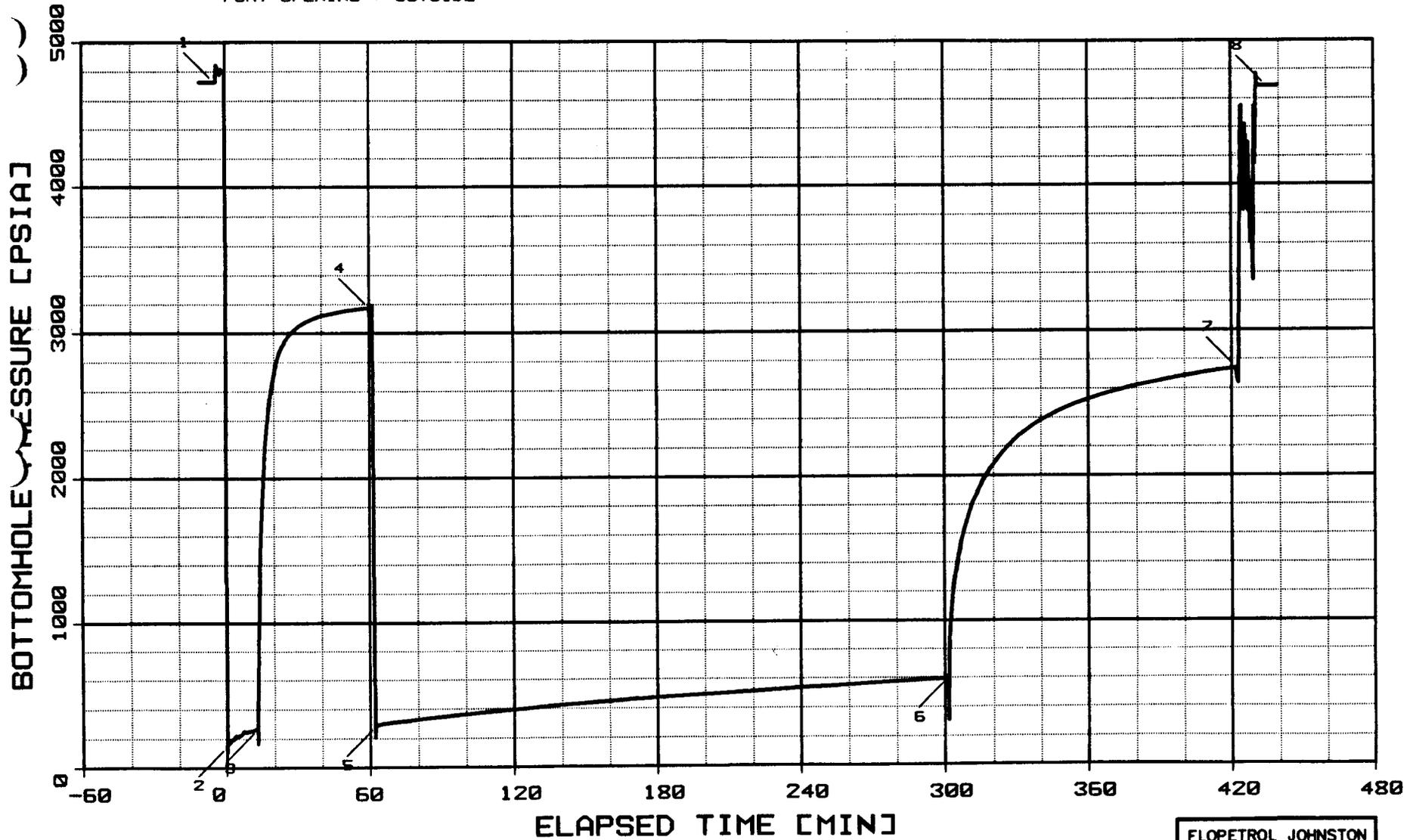
INSTRUMENT NO. J-230

WELL : BUCK KNOLL UNIT #1

DEPTH : 10066 FT

CAPACITY : 6400 PSI

PORT OPENING : OUTSIDE



FLOPETROL JOHNSTON

**DST EVENT SUMMARY**

DATE (M/D/Y)	TIME (HR:MIN)	EVENT E.T. (MIN)	EVENT DESCRIPTION	LABEL PT. #	SURFACE PRESSURE (PSIG)	FLOOR MANIFOLD CHOKE SIZE (64ths INCH)
1-25-85	1140	—	SET PACKER	1		1/8" BUBBLE HOSE
	1142	—	OPENED TEST TOOL FOR INITIAL FLOW	2		"
			SURFACE BLOW IN WATER			
	1157	—	CLOSED TEST TOOL FOR INITIAL SHUT-IN	3		"
			3" BLOW IN WATER			
	1242		FINISHED SHUT-IN	4		"
	1244	—	OPENED TEST TOOL FOR FINAL FLOW	5		"
			SURFACE BLOW IN WATER			
	1249		1" BLOW IN WATER			"
	1259		2" BLOW IN WATER			"
	1314		2 1/4" BLOW IN WATER			"
	1344		2 1/4" BLOW IN WATER			"
	1414		2" BLOW IN WATER			"
	1444		2" BLOW IN WATER			"
	1524		1 1/2" BLOW IN WATER			"
	1534		1 1/4" BLOW IN WATER			"
	1544		1" BLOW IN WATER			"
	1644	—	CLOSED TEST TOOL FOR FINAL SHUT-IN	6		"
			1" BLOW IN WATER			
	1844	—	FINISHED FINAL SHUT-IN	7		"
	1851	—	UNSEATED PACKER	8		—
		—	REVERSED OUT			
		—	BEGAN TRIP OUT OF HOLE			

TEST PHASE : FLOW PERIOD # 1

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA
HH:MM:SS	DD-MM	*****	*****	*****
11:42:0	25-JA	0.00	0.00	147
11:47:0	25-JA	5.00	5.00	213
11:52:0	25-JA	10.00	10.00	251
11:55:10	25-JA	13.16	13.16	264

TEST PHASE : SHUTIN PERIOD # 1

FINAL FLOW PRESSURE [PSIA] = 264  
 PRODUCING TIME [MIN] = 13.16

TIME OF DAY	DATE	ELAPSED TIME, MIN	DELTA TIME, MIN	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
HH:MM:SS	DD-MM	*****	*****	*****	*****	*****
11:55:10	25-JA	13.16	0.00	264	0	
11:56:10	25-JA	14.16	1.00	1229	964	1.151
11:57:10	25-JA	15.16	2.00	1821	1557	0.880
11:58:10	25-JA	16.16	3.00	2135	1870	0.731
11:59:10	25-JA	17.16	4.00	2358	2094	0.632
12:0:10	25-JA	18.16	5.00	2512	2247	0.560
12:1:10	25-JA	19.16	6.00	2629	2365	0.504
12:2:10	25-JA	20.16	7.00	2720	2455	0.459
12:3:10	25-JA	21.16	8.00	2796	2532	0.422
12:4:10	25-JA	22.16	9.00	2848	2584	0.391
12:5:10	25-JA	23.16	10.00	2888	2623	0.365
12:7:10	25-JA	25.16	12.00	2950	2686	0.322
12:9:10	25-JA	27.16	14.00	2993	2729	0.288
12:11:10	25-JA	29.16	16.00	3025	2760	0.261
12:13:10	25-JA	31.16	18.00	3049	2785	0.238
12:15:10	25-JA	33.16	20.00	3069	2805	0.220
12:17:10	25-JA	35.16	22.00	3084	2820	0.204
12:19:10	25-JA	37.16	24.00	3098	2834	0.190
12:21:10	25-JA	39.16	26.00	3109	2845	0.178
12:23:10	25-JA	41.16	28.00	3119	2854	0.167
12:25:10	25-JA	43.16	30.00	3127	2863	0.158
12:30:10	25-JA	48.16	35.00	3144	2880	0.139
12:35:10	25-JA	53.16	40.00	3156	2892	0.124
12:40:10	25-JA	58.16	45.00	3166	2902	0.111
12:41:52	25-JA	59.87	46.71	3170	2905	0.108

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
DALLAS, TEXAS

CORE ANALYSIS REPORT

FOR

ARCO OIL & GAS

BUCK KNOLL # 1  
WILDCAT  
GARFIELD, UTAH

**RECEIVED**

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**DIVISION OF OIL  
GAS & MINING**

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
 DALLAS, TEXAS

ARCO OIL & GAS  
 BUCK KNOLL # 1  
 WILDCAT  
 GARFIELD, UTAH

DATE : 20-NOV-1984  
 FORMATION : DAKOTA SD  
 DRLG. FLUID: WBM  
 LOCATION : SEC. 36-T37S-R4.5W

FILE NO : 3803-003361  
 ANALYSTS : DS/EV  
 ELEVATION: 8295 GL

CONVENTIONAL ANALYSIS-B.L. POROSITY

SAMPLE NUMBER	DEPTH	PERM. TO AIR (MD) MAXIMUM	AIR (MD) 90 DEG	POR. He	FLUID OIL	SATS. WTR	GRAIN DEN	DESCRIPTION
1	3059.0-60.0	1.51		20.4	0.0	48.3	2.66	SD WH FNGRN SL/CALC
	3060.0-64.0							SHALE & SD SL/SHY -- NO ANALYSIS
	3064.0-68.0							SHALE -- NO ANALYSIS
2	3068.0-69.0	243.		23.0	0.0	55.8	2.67	SD WH FNGRN SL/CALC
3	3069.0-70.0	262.		22.0	0.0	79.7	2.69	SD WH FNGRN SL/CALC
4	3070.0-71.0	116.		20.5	0.0	69.4	2.70	SD WH FNGRN SL/CALC
5	3071.0-72.0	243.		21.7	0.0	63.7	2.70	SD WH FNGRN SL/CALC
6	3072.0-73.0	0.26		6.6	0.0	74.9	2.69	SD WH VFGRN SL/CALC
7	3073.0-74.0	122.		11.8	0.0	59.1	2.68	SD WH FNGRN SL/CALC
8	3074.0-75.0	41.		11.9	0.0	51.0	2.68	SD WH FNGRN SL/CALC
9	3075.0-76.0	34.		11.4	0.0	62.3	2.68	SD WH FNGRN SL/CALC
10	3076.0-77.0	0.04		4.7	0.0	62.2	2.70	SD WH VFGRN SL/CALC
11	3077.0-78.0	0.85		16.9	0.0	83.9	2.65	SD WH VFGRN
12	3078.0-79.0	118.		22.8	0.0	76.9	2.65	SD WH FNGRN SL/CALC
13	3079.0-80.0	0.03		8.4	0.0	89.3	2.62	SD-SLT LTGRN VFGRN
14	3080.0-81.0	0.02		7.4	0.0	92.3	2.64	SD-SLT LTGRN VFGRN SL/CALC
15	3081.0-82.0	0.02		11.2	0.0	91.0	2.64	SD-SLT LTGRN VFGRN SL/CALC
16	3082.0-83.0	0.03		11.3	0.0	87.8	2.64	SD-SLT LTGRN VFGRN SL/CALC
17	3083.0-84.0	0.02		10.8	0.0	93.1	2.65	SD-SLT LTGRN VFGRN SL/CALC

\*\* DENOTES FRACTURE PERMEABILITY

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*

DALLAS, TEXAS

ARCO OIL & GAS  
BUCK KNOLL # 1

DATE : 20-NOV-1984  
FORMATION : DAKOTA SD

FILE NO. : 3803-003361  
ANALYSTS : DS/EV

\*\*\* CORE SUMMARY AVERAGES FOR 1 ZONE \*\*\*

DEPTH INTERVAL: 3059.0 TO 3084.0

FEET OF CORE ANALYZED : 17.0 FEET OF CORE INCLUDED IN AVERAGES: 17.0

-- SAMPLES FALLING WITHIN THE FOLLOWING RANGES WERE AVERAGED --

PERMEABILITY HORIZONTAL RANGE (MD.) : 0.00 TO 300. (UNCORRECTED FOR SLIPPAGE)  
HELIUM POROSITY RANGE (%) : 0.0 TO 100.0  
OIL SATURATION RANGE (%) : 0.0 TO 100.0  
WATER SATURATION RANGE (%) : 0.0 TO 100.0

SHALE SAMPLES EXCLUDED FROM AVERAGES.

AVERAGES FOR DEPTH INTERVAL: 3059.0 TO 3084.0

AVERAGE PERMEABILITY (MILLIDARCIES)		PRODUCTIVE CAPACITY (MILLIDARCY-FEET)	
ARITHMETIC PERMEABILITY	: 70.	ARITHMETIC CAPACITY	: 1182.
GEOMETRIC PERMEABILITY	: 2.4	GEOMETRIC CAPACITY	: 41.
HARMONIC PERMEABILITY	: 0.07	HARMONIC CAPACITY	: 1.2
AVERAGE POROSITY (PERCENT)	: 14.3	AVERAGE TOTAL WATER SATURATION (PERCENT OF PORE SPACE)	: 71.0
AVERAGE RESIDUAL OIL SATURATION (PERCENT OF PORE SPACE)	: 0.0	AVERAGE CONNATE WATER SATURATION (PERCENT OF PORE SPACE)	:

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
 DALLAS, TEXAS

PERMEABILITY VS POROSITY

COMPANY: ARCO OIL & GAS  
 FIELD : WILDCAT

WELL : BUCK KNOLL # 1  
 COUNTY, STATE: GARFIELD, UTAH

AIR PERMEABILITY : MD - HORIZONTAL ( UNCORRECTED FOR SLIPPAGE )  
 POROSITY : PERCENT ( HELIUM )

DEPTH INTERVAL	RANGE & SYMBOL	PERMEABILITY		POROSITY		POROSITY AVERAGE	PERMEABILITY AVERAGES		
		MINIMUM	MAXIMUM	MIN.	MAX.		ARITHMETIC	HARMONIC	GEOMETRIC
3059.0 - 3084.0	1 (+)	0.001	300.0	0.0	46.0	14.3	70.	0.07	2.4

1000

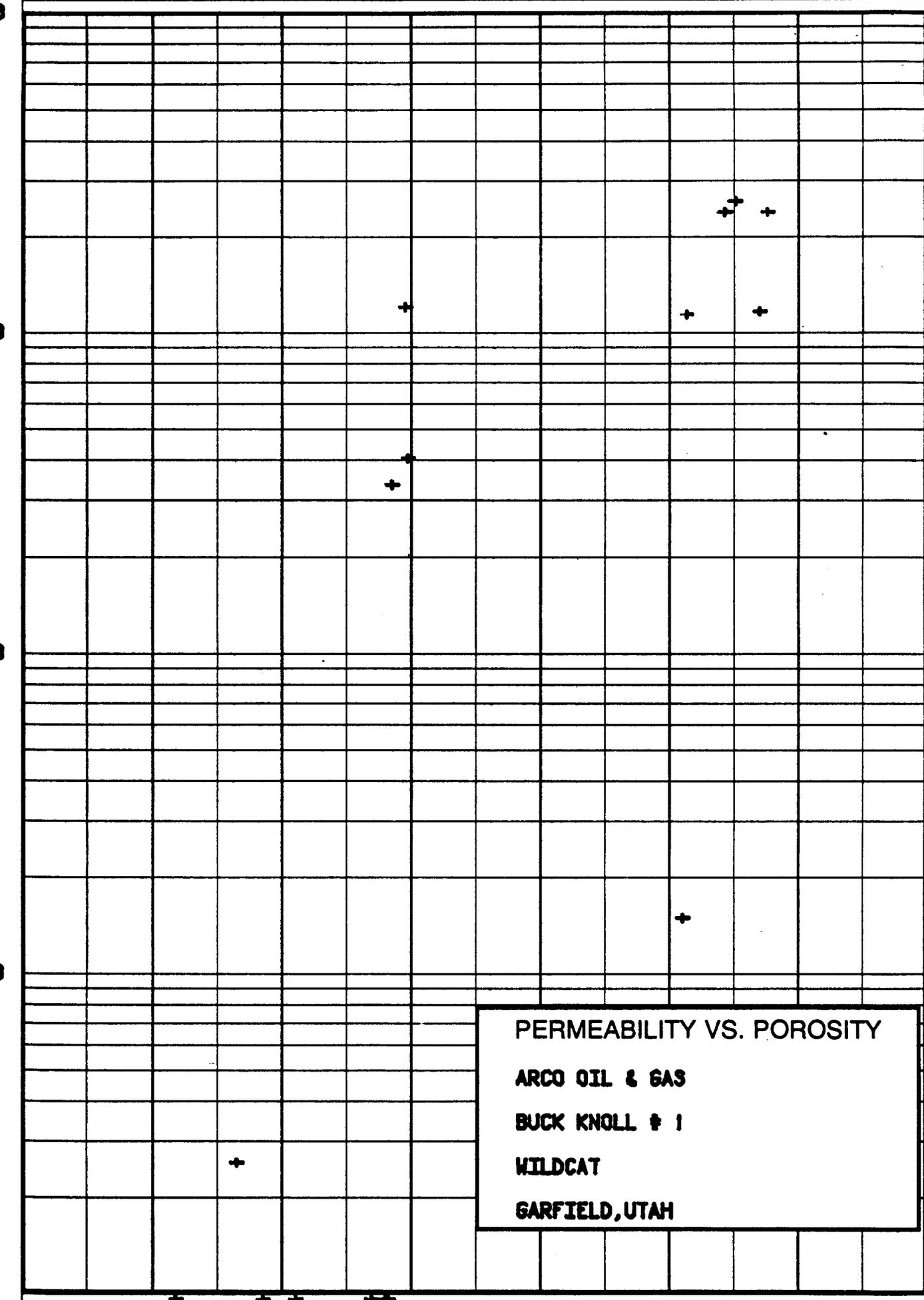
PERMEABILITY: MILLIDARCIES

100

10

1.0

0.1



PERMEABILITY VS. POROSITY  
 ARCO OIL & GAS  
 BUCK KNOLL # 1  
 WILDCAT  
 GARFIELD, UTAH

0.0 4.0 8.0 12.0 16.0 20.0 24.0

POROSITY: PERCENT

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
 DALLAS, TEXAS

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: ARCO OIL & GAS  
 FIELD : WILDCAT

WELL : BUCK KNOLL # 1  
 COUNTY, STATE: GARFIELD, UTAH

AIR PERMEABILITY : MD. ( HORIZONTAL ) RANGE USED 0.001 TO 300.  
 POROSITY : PERCENT ( HELIUM ) RANGE USED 0.0 TO 46.0

(PERMEABILITY UNCORRECTED FOR SLIPPAGE)

DEPTH LIMITS : 3059.0 - 3084.0 INTERVAL LENGTH : 25.0  
 FEET ANALYZED IN ZONE : 17.0 LITHOLOGY EXCLUDED : NONE

DATA SUMMARY

POROSITY AVERAGE	PERMEABILITY AVERAGES		
	ARITHMETIC	HARMONIC	GEOMETRIC
14.3	70.	0.07	2.4

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
 DALLAS, TEXAS

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: ARCO OIL & GAS  
 FIELD : WILDCAT

WELL : BUCK KNOLL # 1  
 COUNTY, STATE: GARFIELD, UTAH

GROUPING BY POROSITY RANGES

POROSITY RANGE	FEET IN RANGE	AVERAGE POROSITY	AVERAGE PERM. (GEOM.)	(ARITH)	FREQUENCY (PERCENT)	CUMULATIVE FREQUENCY (%)
4.0 - 6.0	1.0	4.7	0.040	0.040	5.9	5.9
6.0 - 8.0	2.0	7.0	0.072	0.140	11.8	17.6
8.0 - 10.0	1.0	8.4	0.030	0.030	5.9	23.5
10.0 - 12.0	6.0	11.4	1.1	33.	35.3	58.8
16.0 - 18.0	1.0	16.9	0.850	0.850	5.9	64.7
20.0 - 22.0	3.0	20.9	35.	120.	17.6	82.4
22.0 - 24.0	3.0	22.6	196.	208.	17.6	100.0

TOTAL NUMBER OF FEET = 17.0

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
 DALLAS, TEXAS

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: ARCO OIL & GAS  
 FIELD : WILDCAT

WELL : BUCK KNOLL # 1  
 COUNTY, STATE: GARFIELD, UTAH

GROUPING BY PERMEABILITY RANGES

PERMEABILITY RANGE	FEET IN RANGE	AVERAGE PERM. (GEOM.)	AVERAGE PERM. (ARITH)	AVERAGE POROSITY	FREQUENCY (PERCENT)	CUMULATIVE FREQUENCY (%)
0.020 - 0.039	5.0	0.024	0.024	9.8	29.4	29.4
0.039 - 0.078	1.0	0.040	0.040	4.7	5.9	35.3
0.156 - 0.312	1.0	0.260	0.260	6.6	5.9	41.2
0.625 - 1.250	1.0	0.850	0.850	16.9	5.9	47.1
1.250 - 2.500	1.0	1.5	1.5	20.4	5.9	52.9
20.- 40.	1.0	34.	34.	11.4	5.9	58.8
40.- 80.	1.0	41.	41.	11.9	5.9	64.7
80.- 160.	3.0	119.	119.	18.4	17.6	82.4
160.- 320.	3.0	249.	249.	22.2	17.6	100.0

TOTAL NUMBER OF FEET = 17.0

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
 DALLAS, TEXAS

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: ARCO OIL & GAS  
 FIELD : WILDCAT

WELL : BUCK KNOLL # 1  
 COUNTY, STATE: GARFIELD, UTAH

POROSITY-FEET OF STORAGE CAPACITY LOST FOR SELECTED POROSITY CUT OFF

POROSITY CUT OFF	FEET LOST	CAPACITY LOST (%)	FEET REMAINING	CAPACITY REMAINING (%)	ARITH MEAN	MEDIAN
0.0	0.0	0.0	17.0	100.0	14.3	11.5
2.0	0.0	0.0	17.0	100.0	14.3	11.5
4.0	0.0	0.0	17.0	100.0	14.3	11.5
6.0	1.0	1.9	16.0	98.1	14.9	11.7
8.0	3.0	7.7	14.0	92.3	16.0	12.0
10.0	4.0	11.2	13.0	88.8	16.6	17.0
12.0	10.0	39.3	7.0	60.7	21.0	21.7
14.0	10.0	39.3	7.0	60.7	21.0	21.7
16.0	10.0	39.3	7.0	60.7	21.0	21.7
18.0	11.0	46.3	6.0	53.7	21.7	22.0
20.0	11.0	46.3	6.0	53.7	21.7	22.0
22.0	14.0	72.1	3.0	27.9	22.6	
24.0	17.0	100.0	0.0	0.0		

TOTAL STORAGE CAPACITY IN POROSITY-FEET = 242.8

**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
 DALLAS, TEXAS

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

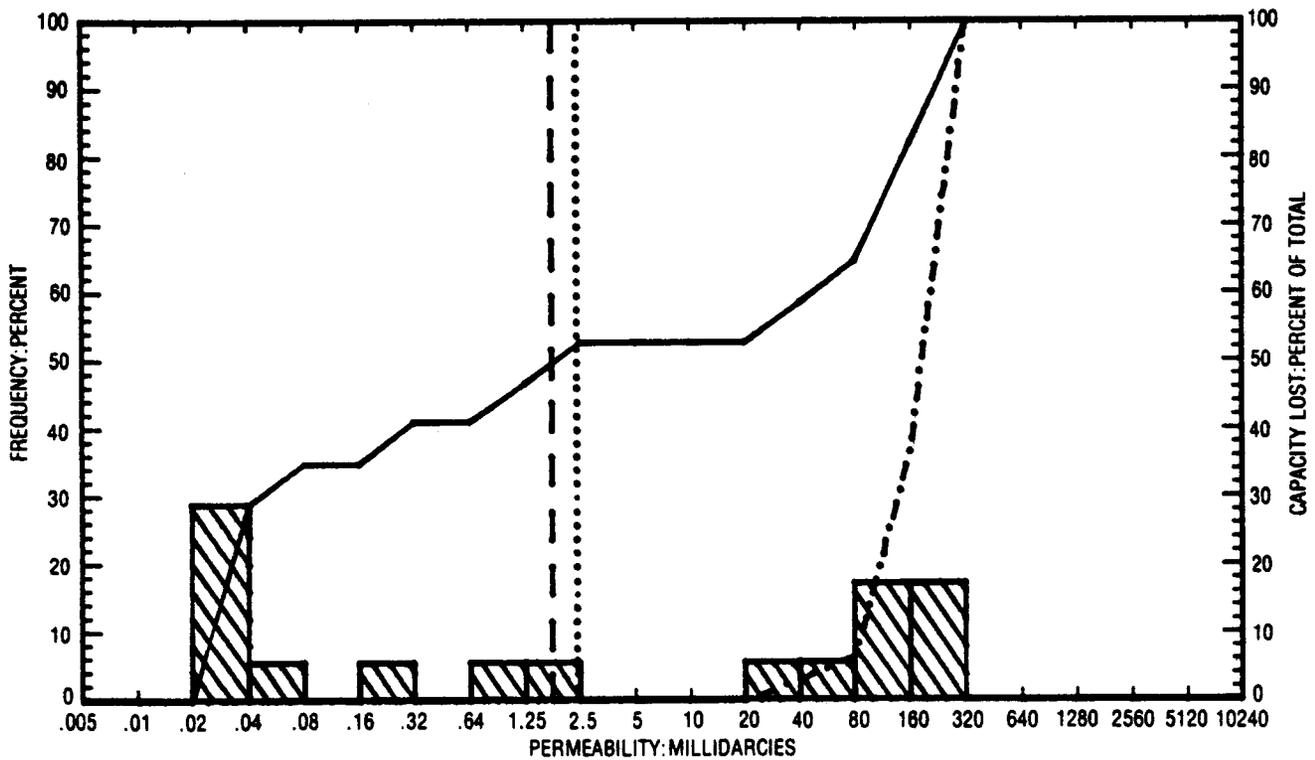
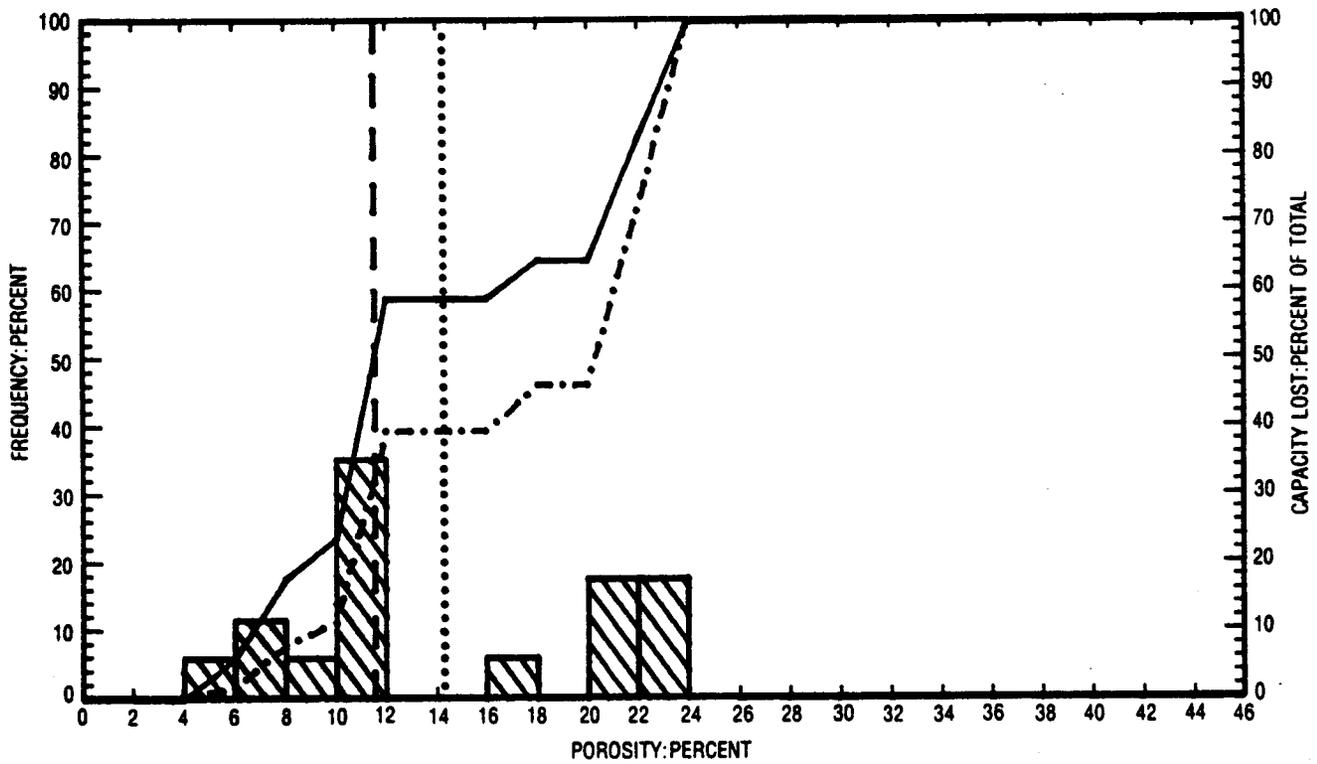
COMPANY: ARCO OIL & GAS  
 FIELD : WILDCAT

WELL : BUCK KNOLL # 1  
 COUNTY, STATE: GARFIELD, UTAH

MILLIDARCY-FEET OF FLOW CAPACITY LOST FOR SELECTED PERMEABILITY CUT OFF

PERMEABILITY CUT OFF	FEET LOST	CAPACITY LOST (%)	FEET REMAINING	CAPACITY REMAINING (%)	GEOM MEAN	MEDIAN
0.005	0.0	0.0	17.0	100.0	2.42	1.77
0.010	0.0	0.0	17.0	100.0	3.37	1.77
0.020	0.0	0.0	17.0	100.0	2.42	1.77
0.039	5.0	0.0	12.0	100.0	16.73	80.00
0.078	6.0	0.0	11.0	100.0	28.96	89.80
0.156	6.0	0.0	11.0	100.0	28.96	89.80
0.312	7.0	0.0	10.0	100.0	46.40	100.79
0.625	7.0	0.0	10.0	100.0	46.40	100.79
1.250	8.0	0.1	9.0	99.9	72.36	113.14
2.500	9.0	0.2	8.0	99.8	117.37	126.99
5.	9.0	0.2	8.0	99.8	117.37	126.99
10.	9.0	0.2	8.0	99.8	117.37	126.99
20.	9.0	0.2	8.0	99.8	117.37	126.99
40.	10.0	3.1	7.0	96.9	140.10	142.54
80.	11.0	6.6	6.0	93.4	171.94	160.00
160.	14.0	36.7	3.0	63.3	249.18	
320.	17.0	100.0	0.0	0.0		

TOTAL FLOW CAPACITY IN MILLIDARCY-FEET (ARITHMETIC) = 1181.78



### PERMEABILITY AND POROSITY HISTOGRAMS

ARCO OIL & GAS  
 BUCK KNOLL # 1  
 WILDCAT  
 GARFIELD, UTAH

**LEGEND**  
 ARITHMETIC MEAN POROSITY .....  
 GEOMETRIC MEAN PERMEABILITY .....  
 MEDIAN VALUE - - - - -  
 CUMULATIVE FREQUENCY ————  
 CUMULATIVE CAPACITY LOST - · - · - ·



**CORE LABORATORIES, INC.**

*Petroleum Reservoir Engineering*

COMPANY ARCO OIL & GAS COMPANY FILE NO. 3803-003361  
 WELL BUCK KNOLL # I DATE 20-NOV-1984 ENGRS. DS;EV  
 FIELD WILDCAT FORMATION DAKOTA SD ELEV. 8295 GL  
 COUNTY GARFIELD STATE UTAH DRLG. FLD. WBM CORES \_\_\_\_\_

# CoRes Log

## CORE and RESISTIVITY EVALUATION

These analyses, opinions or interpretations are based on observations and material supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted) but Core Laboratories, Inc. and its officers and employees assume no responsibility and make no warranty or representations as to the productivity, proven operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

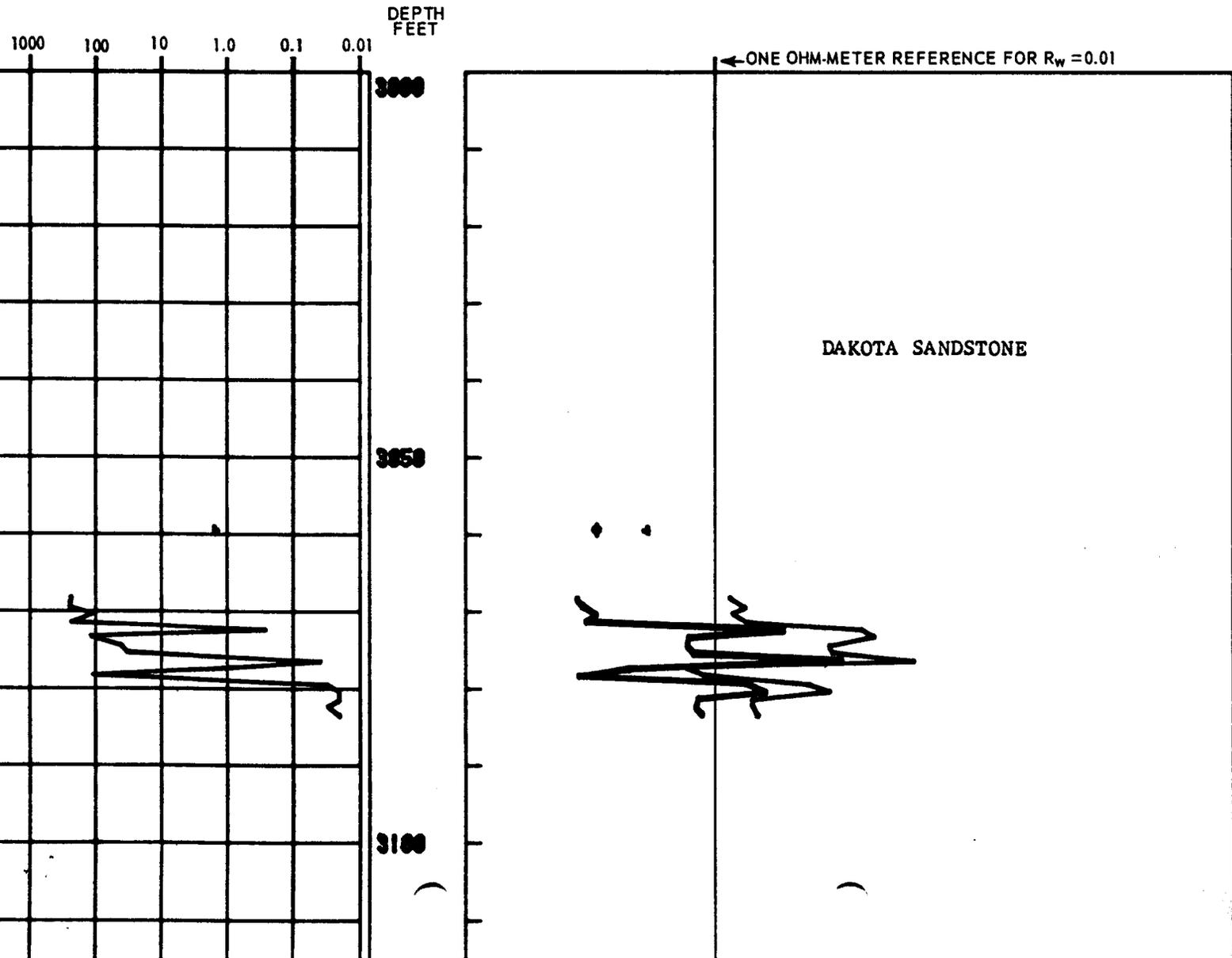
RESISTIVITY PARAMETERS:  $a = 1.0$   $m = 2.0$   $n = 2.0$  . Depths 3059 to 3084 .  
 $a =$  \_\_\_\_\_  $m =$  \_\_\_\_\_  $n =$  \_\_\_\_\_ . Depths \_\_\_\_\_ to \_\_\_\_\_ .

PERMEABILITY  
MILLIDARCIES

**CORE ANALYSIS CALCULATED RESISTIVITY**

$R_o$  = OHM-METERS AT 100%  $S_w$  \_\_\_\_\_

$R_{mp}$  = OHM-METERS AT CRITICAL  $S_w$  \_\_\_\_\_



# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

LAB #: W85004-4      DATE: 1/7/85

OPERATOR: Arco Oil & Gas

WELL #: Buck Knoll #1

FIELD:

COUNTY: Garfield      STATE: Utah

LOCATION:

FORMATION:

INTERVAL:

SAMPLE ORIGIN:

REMARKS: DST #1 Sample Chamber

CONFIDENTIAL

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	3142	136.69	SULFATE	5760	119.81
POTASSIUM	66	1.69	CHLORIDE	260	7.33
CALCIUM	92	4.59	CARBONATE	240	7.99
MAGNESIUM	2	0.16	BICARBONATE	488	8.00
			HYDROXIDE		
TOTAL CATIONS = 143.13			TOTAL ANIONS = 143.13		

CALCULATED TDS MG/L = 9802  
 NACl EQUIVALENTS MG/L = 8132  
 OBSERVED PH = 11.0

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 0.97  
 CALCULATED = 0.80

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JAN 20 1985

DIVISION OF OIL  
 GAS & MINING

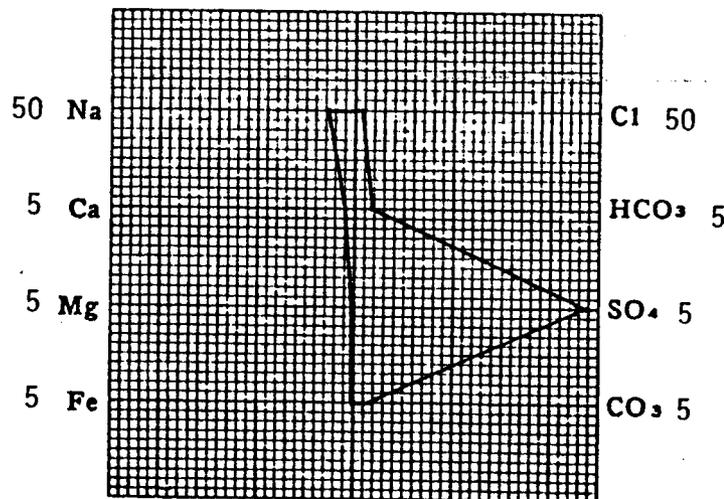
(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent =  
 by Dunlap & Hawthorne  
 calculation from components

WATER ANALYSIS PATTERN

Scale  
 MEQ per Unit



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# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

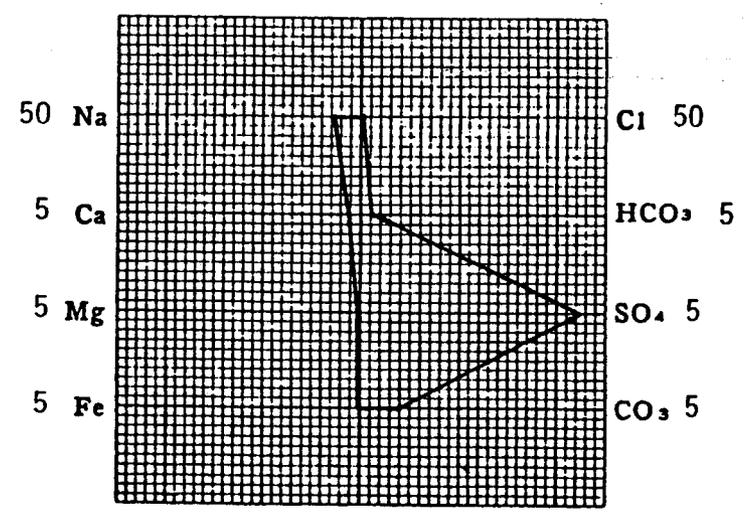
**LAB #:** W85004-3      **DATE:** 1/7/85      **OPERATOR:** Arco Oil & Gas  
**WELL #:** Buck Knoll #1      **FIELD:**  
**COUNTY:** Garfield      **STATE:** Utah      **LOCATION:**  
**FORMATION:**      **INTERVAL:**  
**SAMPLE ORIGIN:**      **REMARKS:** DST #1 Bottom

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	3162	137.56	SULFATE	5360	111.49
POTASSIUM	44	1.13	CHLORIDE	240	6.77
CALCIUM	108	5.39	CARBONATE	600	19.98
MAGNESIUM	2	0.16	BICARBONATE	366	6.00
			HYDROXIDE		
TOTAL CATIONS = 144.24			TOTAL ANIONS = 144.24		

CALCULATED TDS MG/L = 9696  
 NACl. EQUIVALENTS MG/L = 8260  
 OBSERVED PH = 11.7

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 0.97  
 CALCULATED = 0.79

**WATER ANALYSIS PATTERN**  
 Scale  
 MEQ per Unit



(Na value in above graph includes Na and K)  
 NOTE: Mg/l = milligrams per liter  
       Meq/l = milligram equivalent per liter  
 Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

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# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

LAB #: W85004-1      DATE: 1/7/85

OPERATOR: Arco Oil & Gas

WELL #: Buck Knoll #1

FIELD:

COUNTY: Garfield

STATE: Utah

LOCATION:

FORMATION:

INTERVAL:

SAMPLE ORIGIN:

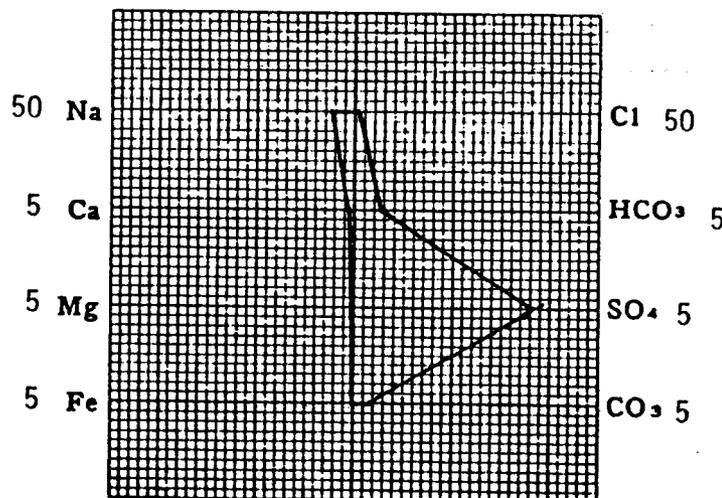
REMARKS: DST #1 Top

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	2684	116.76	SULFATE	4400	91.52
POTASSIUM	46	1.18	CHLORIDE	220	6.20
CALCIUM	34	1.70	CARBONATE	240	7.99
MAGNESIUM	1	0.08	BICARBONATE	854	14.01
			HYDROXIDE		
TOTAL CATIONS = 119.72			TOTAL ANIONS = 119.72		

CALCULATED TDS MG/L = 8046  
 NACL EQUIVALENTS MG/L = 6679  
 OBSERVED PH = 11.1

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 1.19  
 CALCULATED = 1.03

WATER ANALYSIS PATTERN  
 Scale  
 MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent =  
 by Dunlap & Hawthorne  
 calculation from components

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# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

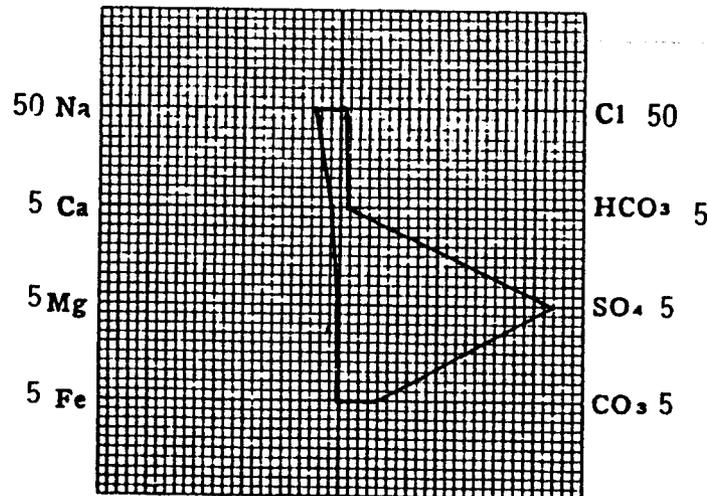
LAB #: W85004-2      DATE: 1/7/85      OPERATOR: Arco Oil & Gas  
 WELL #: Buck Knoll #1      FIELD:  
 COUNTY: Garfield      STATE: Utah      LOCATION:  
 FORMATION:      INTERVAL:  
 SAMPLE ORIGIN:      REMARKS: DST #1 Middle

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	3100	134.84	SULFATE	5280	109.82
POTASSIUM	46	1.18	CHLORIDE	240	6.77
CALCIUM	88	4.39	CARBONATE	600	19.98
MAGNESIUM	2	0.16	BICARBONATE	244	4.00
			HYDROXIDE		
TOTAL CATIONS = 140.57			TOTAL ANIONS = 140.57		

CALCULATED TDS MG/L = 9476  
 NACl EQUIVALENTS MG/L = 8091  
 OBSERVED PH = 11.6

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 0.99  
 CALCULATED = 0.81

**WATER ANALYSIS PATTERN**  
 Scale  
 MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent =  
 by Dunlap & Hawthorne  
 calculation from components

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# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

LAB #: W85008-1      DATE: 1/14/85      OPERATOR: Arco Oil & Gas  
 WELL #: Buck Knoll #1      FIELD:  
 COUNTY: Garfield      STATE: Utah      LOCATION: Sec 36 T37S R4.5W  
 FORMATION:      INTERVAL: 8779.5-8829  
 SAMPLE ORIGIN: DST #2 Top      REMARKS: Sampled 1/2/85

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	2832	123.20	SULFATE	5360	111.49
POTASSIUM	24	0.61	CHLORIDE	330	9.31
CALCIUM	273	13.63	CARBONATE	480	15.98
MAGNESIUM	2	0.16	BICARBONATE	-	
			HYDROXIDE	14	0.82
TOTAL CATIONS = 137.60			TOTAL ANIONS = 137.60		

CALCULATED TDS MG/L = 9315  
 NaCl EQUIVALENTS MG/L = 7924  
 OBSERVED PH = 10.7

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 0.91  
 CALCULATED = 0.82

RECEIVED

JAN 20 1985

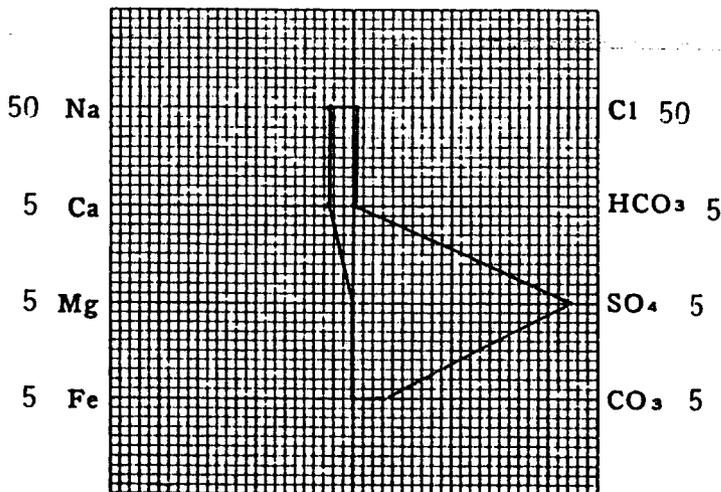
DIVISION OF OIL  
GAS & MINING

(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
Meq/l = milligram equivalent per liter

Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

WATER ANALYSIS PATTERN  
Scale  
MEQ per Unit



# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

LAP #: W85008-2      DATE: 1/14/85

OPERATOR: Arco Oil & Gas

WELL #: Buck Knoll #1

FIELD:

COUNTY: Garfield      STATE: Utah

LOCATION: Sec 36 T37S R4.5W

FORMATION:

INTERVAL: 8779.5-8829

SAMPLE ORIGIN: DST #2 Middle

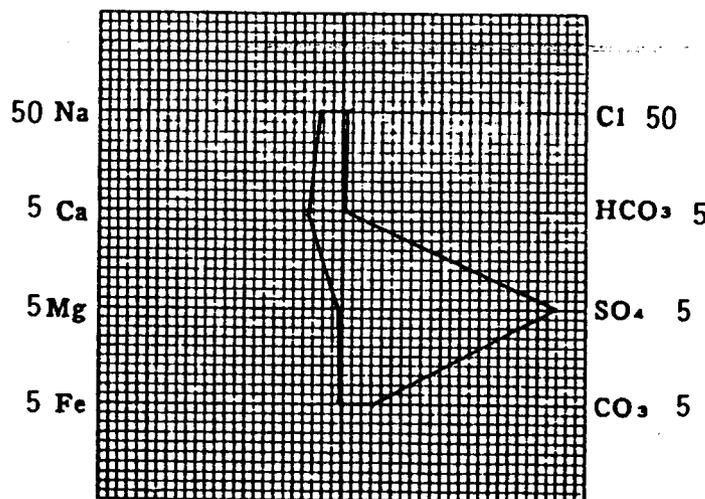
REMARKS: Sampled 1/2/85

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	2766	120.30	SULFATE	5280	109.82
POTASSIUM	45	1.15	CHLORIDE	230	6.49
CALCIUM	330	16.47	CARBONATE	456	15.18
MAGNESIUM	9	0.74	BICARBONATE	-	
			HYDROXIDE	122	7.17
TOTAL CATIONS =			TOTAL ANIONS =		
		138.66			138.66

CALCULATED TDS MG/L = 9238  
 NACl. EQUIVALENTS MG/L = 7864  
 OBSERVED PH = 11.8

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 0.87  
 CALCULATED = 0.83

WATER ANALYSIS PATTERN  
 Scale  
 MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

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# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

LAB #: W85008-3      DATE: 1/14/85

OPERATOR: Arco Oil & Gas

WELL #: Buck Knoll #1

FIELD:

COUNTY: Garfield      STATE: Utah

LOCATION: Sec 36 T37S R4.5W

FORMATION:

INTERVAL: 8779.5-8829

SAMPLE ORIGIN: DST #2 Sampler

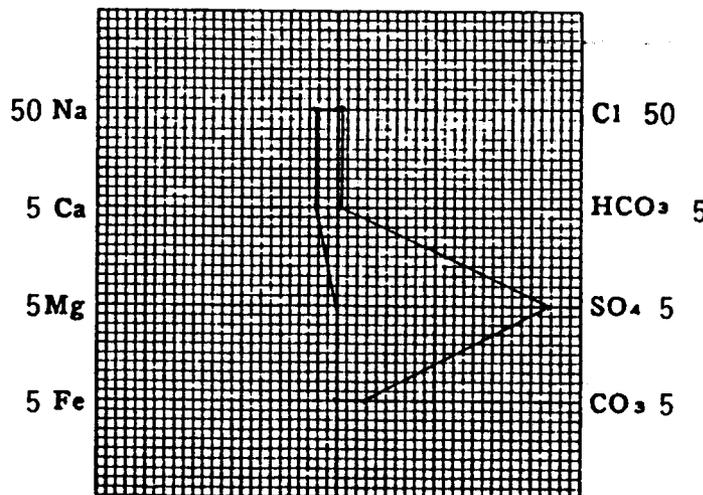
REMARKS: Sampled 1/2/85

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	2806	122.08	SULFATE	5280	109.82
POTASSIUM	52	1.33	CHLORIDE	260	7.33
CALCIUM	237	11.83	CARBONATE	432	14.26
MAGNESIUM	7	0.58	BICARBONATE	-	-
			HYDROXIDE	75	4.41
TOTAL CATIONS = 135.82			TOTAL ANIONS = 135.82		

CALCULATED TDS MG/L = 9149  
 NaCl EQUIVALENTS MG/L = 7771  
 OBSERVED PH = 11.9

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 0.88  
 CALCULATED = 0.84

WATER ANALYSIS PATTERN  
 Scale  
 MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

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# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

LAB #: W85009-1      DATE: 1/14/85      OPERATOR: Arco Oil & Gas  
 WELL #: Buck Knoll #1      FIELD:  
 COUNTY: Garfield      STATE: Utah      LOCATION: Sec 36 T37S R4.5W  
 FORMATION:      INTERVAL:  
 SAMPLE ORIGIN: DST #3 Top      REMARKS:

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	2298	99.94	SULFATE	4640	96.51
POTASSIUM	100	2.56	CHLORIDE	230	6.49
CALCIUM	241	12.03	CARBONATE	24	0.80
MAGNESIUM	35	2.88	BICARBONATE	830	13.61
			HYDROXIDE		
TOTAL CATIONS = 117.41			TOTAL ANIONS = 117.41		

**RECEIVED**

CALCULATED TDS MG/L = 7977  
 NACl. EQUIVALENTS MG/L = 6508  
 OBSERVED PH = 8.5

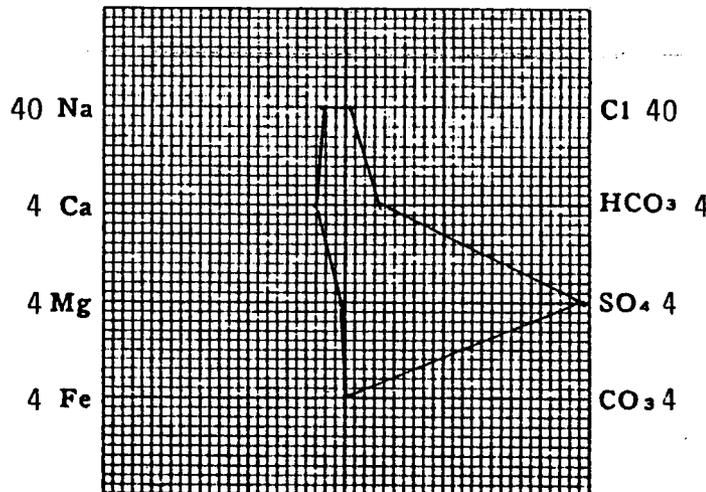
SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 1.29  
 CALCULATED = 1.05

**JAN 20 1985**

**DIVISION OF OIL  
GAS & MINING**

WATER ANALYSIS PATTERN

Scale  
MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
Meq/l = milligram equivalent per liter

Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

LAB #: W85009-2      DATE: 1/14/85

OPERATOR: Arco Oil & Gas

WELL #: Buck Knoll #1

FIELD:

COUNTY: Garfield

STATE: Utah

LOCATION: Sec 36 T37S R4.5W

FORMATION:

INTERVAL:

SAMPLE ORIGIN: DST #3 Middle

REMARKS:

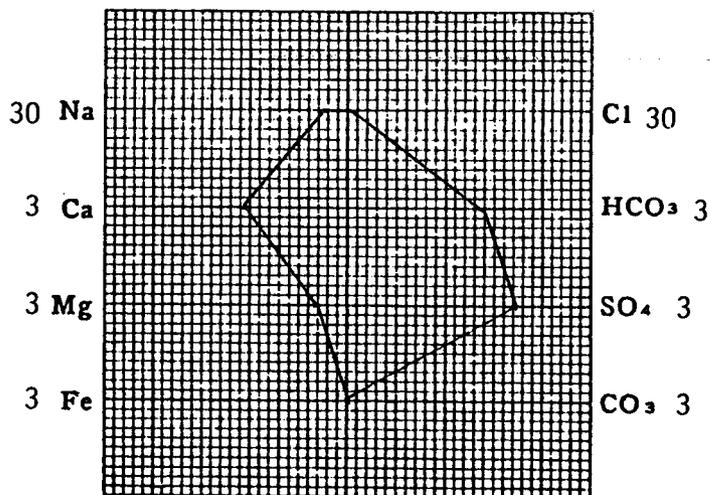
CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	1249	54.33	SULFATE	2480	51.58
POTASSIUM	275	7.04	CHLORIDE	380	10.72
CALCIUM	650	32.43	CARBONATE	-	
MAGNESIUM	123	10.11	BICARBONATE	2537	41.61
			HYDROXIDE		
TOTAL CATIONS = 103.91			TOTAL ANIONS = 103.91		

CALCULATED TDS MG/L = 6407  
 NACl EQUIVALENTS MG/L = 5200  
 OBSERVED PH = 7.1

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 1.44  
 CALCULATED = 1.26

### WATER ANALYSIS PATTERN

Scale  
MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

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# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

LAB #: W85009-3      DATE: 1/14/85

OPERATOR: Arco Oil & Gas

WELL #: Buck Knoll #1

FIELD:

COUNTY: Garfield

STATE: Utah

LOCATION: Sec 36 T37S R4.5W

FORMATION:

INTERVAL:

SAMPLE ORIGIN: DST #3 Bottom

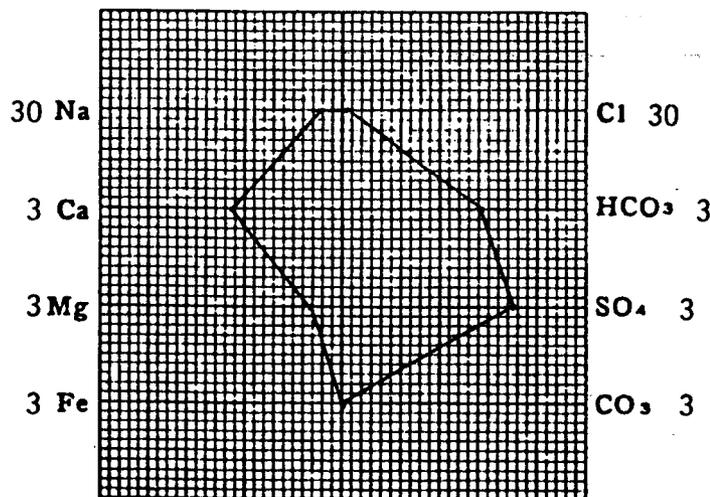
REMARKS:

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	1262	54.90	SULFATE	2520	52.42
POTASSIUM	256	6.55	CHLORIDE	380	10.72
CALCIUM	680	33.93	CARBONATE	-	-
MAGNESIUM	119	9.78	BICARBONATE	2562	42.02
			HYDROXIDE		
TOTAL CATIONS = 105.16			TOTAL ANIONS = 105.16		

CALCULATED TDS MG/L = 6479  
 NACl. EQUIVALENTS MG/L = 5252  
 OBSERVED PH = 7.1

SPECIFIC RESISTANCE AT 68F (OHM-CM):  
 OBSERVED = 1.38  
 CALCULATED = 1.25

WATER ANALYSIS PATTERN  
 Scale  
 MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

LAP #: W85009-4      DATE: 1/14/85

OPERATOR: Arco Oil & Gas

WELL #: Buck Knoll #1

FIELD:

COUNTY: Garfield

STATE: Utah

LOCATION: Sec 36 T37S R4.5W

FORMATION:

INTERVAL:

SAMPLE ORIGIN: DST #3 Sampler

REMARKS:

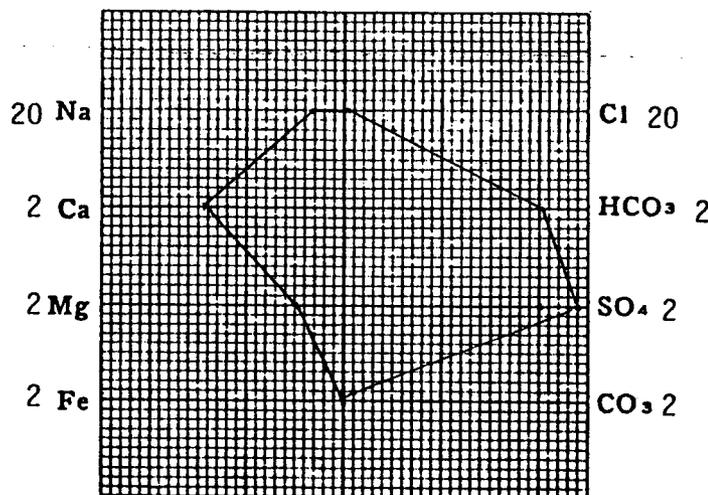
CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	1252	54.48	SULFATE	2320	48.26
POTASSIUM	257	6.58	CHLORIDE	390	11.00
CALCIUM	570	28.44	CARBONATE	-	
MAGNESIUM	119	9.78	BICARBONATE	2440	40.02
			HYDROXIDE		
TOTAL CATIONS = 99.28			TOTAL ANIONS = 99.28		

CALCULATED TDS MG/L = 6110  
 NACL EQUIVALENTS MG/L = 4972  
 OBSERVED PH = 7.2

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 1.47  
 CALCULATED = 1.32

### WATER ANALYSIS PATTERN

Scale  
MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

LAP #: W85012-1      DATE: 1/24/85

OPERATOR: Arco Oil & Gas

WELL #: Buck Knoll #1

FIELD:

COUNTY: Garfield      STATE: Utah

LOCATION: Sec 36 T37S R4.5W

FORMATION:

INTERVAL:

SAMPLE ORIGIN: Top

REMARKS: DST #4

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	2347	102.11	SULFATE	4760	99.01
POTASSIUM	36	0.92	CHLORIDE	60	1.69
CALCIUM	270	13.47	CARBONATE	300	9.99
MAGNESIUM	-	-	BICARBONATE	354	5.81
			HYDROXIDE		
TOTAL CATIONS = 116.50			TOTAL ANIONS = 116.50		

CALCULATED TDS MG/L = 7947  
 NACl EQUIVALENTS MG/L = 6595  
 OBSERVED PH = 11.3

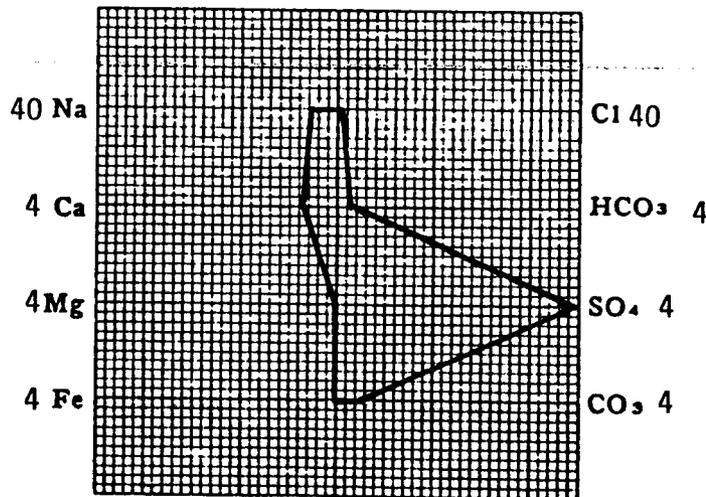
SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 1.12  
 CALCULATED = 1.04

**RECEIVED**

**MAR 20 1985**

**DIVISION OF OIL  
 GAS & MINING**

WATER ANALYSIS PATTERN  
 Scale  
 MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

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# CORE LABORATORIES, INC. ANALYTICAL REPORT

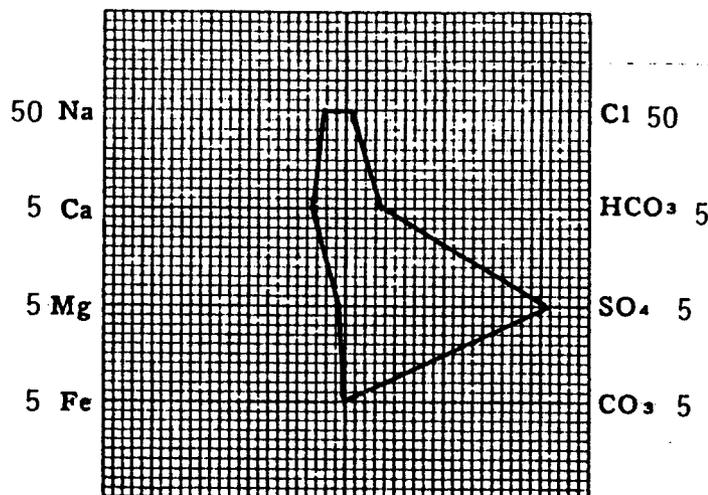
LAB #: W85012-2      DATE: 1/24/85      OPERATOR: Arco Oil & Gas  
 WELL #: Buck Knoll #1      FIELD:  
 COUNTY: Garfield      STATE: Utah      LOCATION: Sec 36 T37S R4.5W  
 FORMATION:      INTERVAL:  
 SAMPLE ORIGIN: Middle      REMARKS: DST #4

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	2400	104.38	SULFATE	4960	103.17
POTASSIUM	61	1.56	CHLORIDE	160	4.51
CALCIUM	330	16.47	CARBONATE	-	
MAGNESIUM	35	2.88	BICARBONATE	1074	17.61
			HYDROXIDE		
TOTAL CATIONS = 125.29			TOTAL ANIONS = 125.29		

CALCULATED TDS MG/L = 8475  
 NaCl EQUIVALENTS MG/L = 6857  
 OBSERVED PH = 8.3

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 1.19  
 CALCULATED = 0.98

**WATER ANALYSIS PATTERN**  
 Scale  
 MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent =  
 by Dunlap & Hawthorne  
 calculation from components

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# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

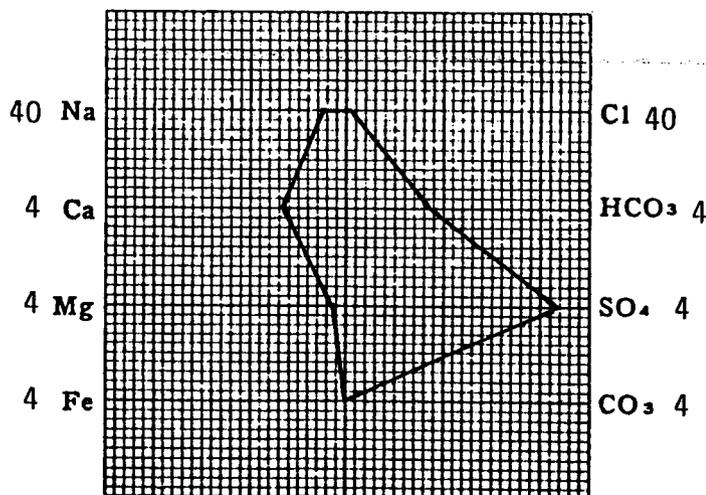
LAB #: W85012-3      DATE: 1/24/85      OPERATOR: Arco Oil & Gas  
 WELL #: Buck Knoll #1      FIELD:  
 COUNTY: Garfield      STATE: Utah      LOCATION: Sec 36 T37S R4.5W  
 FORMATION:      INTERVAL:  
 SAMPLE ORIGIN: Bottom      REMARKS: DST #4

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	2134	92.85	SULFATE	4200	87.36
POTASSIUM	101	2.59	CHLORIDE	190	5.36
CALCIUM	520	25.95	CARBONATE	-	
MAGNESIUM	65	5.34	BICARBONATE	2074	34.01
			HYDROXIDE		
TOTAL CATIONS = 126.73			TOTAL ANIONS = 126.73		

CALCULATED TDS MG/L = 8231  
 NaCl EQUIVALENTS MG/L = 6619  
 OBSERVED PH = 7.9

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 1.19  
 CALCULATED = 1.03

WATER ANALYSIS PATTERN  
 Scale  
 MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent =  
 by Dunlap & Hawthorne  
 calculation from components

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# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

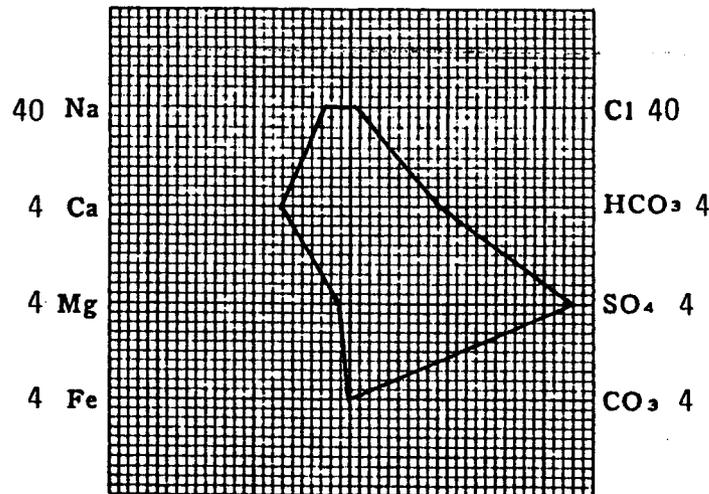
LAB #: W85012-4      DATE: 1/24/85      OPERATOR: Arco Oil & Gas  
 WELL #: Buck Knoll #1      FIELD:  
 COUNTY: Garfield      STATE: Utah      LOCATION: Sec 36 T37S R4.5W  
 FORMATION:      INTERVAL:  
 SAMPLE ORIGIN: Sampler      REMARKS: DST #4

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	2301	100.11	SULFATE	4400	91.52
POTASSIUM	90	2.30	CHLORIDE	270	7.61
CALCIUM	570	28.44	CARBONATE	-	
MAGNESIUM	57	4.69	BICARBONATE	2220	36.41
			HYDROXIDE		
TOTAL CATIONS = 135.54			TOTAL ANIONS = 135.54		

CALCULATED TDS MG/L = 8781  
 NACl. EQUIVALENTS MG/L = 7071  
 OBSERVED PH = 7.8

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 1.16  
 CALCULATED = 0.92

WATER ANALYSIS PATTERN  
 Scale  
 MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent =  
 by Dunlap & Hawthorne  
 calculation from components

# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

LAB #: W85019-4      DATE: 2/7/85

OPERATOR: Arco Oil & Gas

WELL #: Buck Knoll #1

FIELD:

COUNTY: Garfield      STATE: Utah

LOCATION: Sec 36 T37S R4.5W

FORMATION:

INTERVAL:

SAMPLE ORIGIN: DST #5 Sample Chamber

REMARKS:

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	1923	83.64	SULFATE	3550	73.84
POTASSIUM	370	9.47	CHLORIDE	560	15.79
CALCIUM	410	20.46	CARBONATE	-	
MAGNESIUM	97	7.97	BICARBONATE	2037	33.41
IRON	28	1.50	HYDROXIDE		
TOTAL CATIONS = 123.04			TOTAL ANIONS = 123.04		

RECEIVED

CALCULATED TDS MG/L = 7941  
 NACl EQUIVALENTS MG/L = 6519  
 OBSERVED PH = 7.1

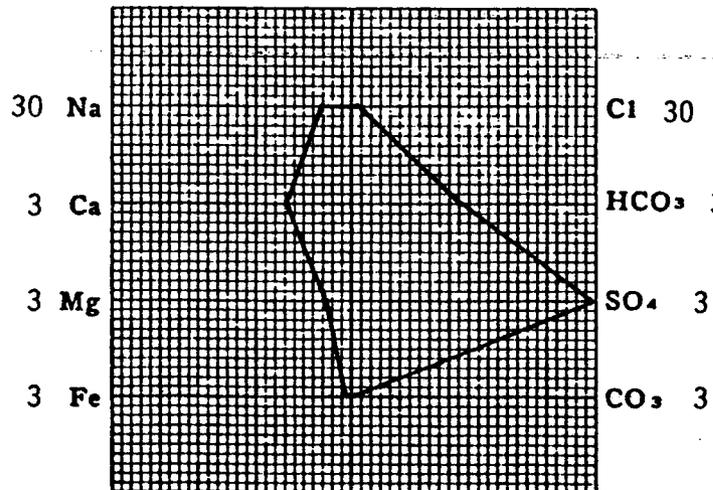
SPECIFIC RESISTANCE AT 68F (OHM-CM):  
 OBSERVED = 1.19  
 CALCULATED = 1.04

MAR 20 1985

DIVISION OF OIL  
 GAS & MINING

**WATER ANALYSIS PATTERN**

Scale  
 MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent =  
 by Dunlap & Hawthorne  
 calculation from components

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# CORE LABORATORIES, INC. ANALYTICAL REPORT

LAB #: W85019-3      DATE: 2/7/85

OPERATOR: Arco Oil & Gas

WELL #: Buck Knoll #1

FIELD:

COUNTY: Garfield      STATE: Utah

LOCATION: Sec 36 T37S R4.5W

FORMATION:

INTERVAL:

SAMPLE ORIGIN: DST #5 Bottom

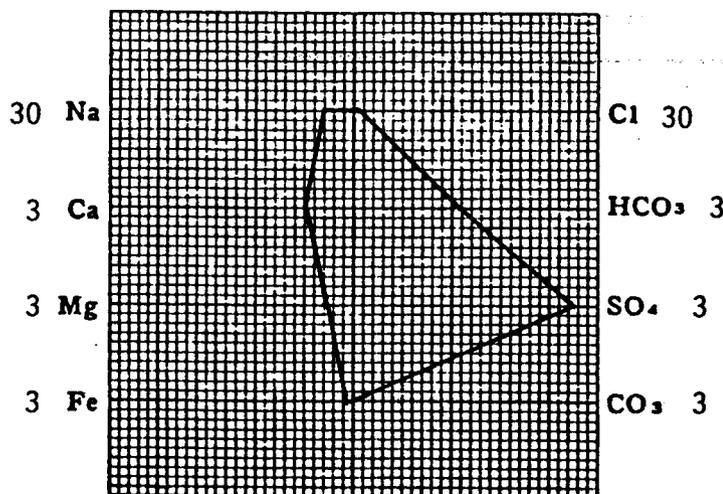
REMARKS:

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	1881	81.83	SULFATE	3250	67.60
POTASSIUM	360	9.22	CHLORIDE	550	15.51
CALCIUM	300	14.97	CARBONATE	-	
MAGNESIUM	101	8.30	BICARBONATE	2001	32.82
IRON	30	1.61	HYDROXIDE		
TOTAL CATIONS = 115.93			TOTAL ANIONS = 115.93		

CALCULATED TDS MG/L = 7458  
 NACl EQUIVALENTS MG/L = 6138  
 OBSERVED PH = 7.7

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 1.20  
 CALCULATED = 1.09

WATER ANALYSIS PATTERN  
 Scale  
 MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

These analyses, opinions or interpretations are based on observations and material supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations, as to the productivity, proper operations, or profitability of any oil, gas, coal or other mineral, property, well or sand in connection with which such report is used or relied upon.

# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

LAB #: W85019-2      DATE: 2/7/85

OPERATOR: Arco Oil & Gas

WELL #: Buck Knoll #1

FIELD:

COUNTY: Garfield      STATE: Utah

LOCATION: Sec 36 T37S R4.5W

FORMATION:

INTERVAL:

SAMPLE ORIGIN: DST #5 Middle

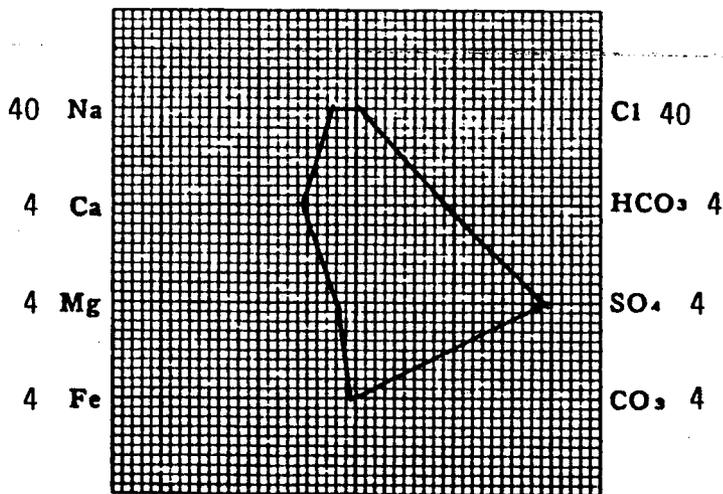
REMARKS:

CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	2034	88.48	SULFATE	3700	76.96
POTASSIUM	360	9.22	CHLORIDE	500	14.10
CALCIUM	430	21.46	CARBONATE	-	
MAGNESIUM	95	7.81	BICARBONATE	2245	36.82
IRON	17	0.91	HYDROXIDE		
TOTAL CATIONS = 127.88			TOTAL ANIONS = 127.88		

CALCULATED TDS MG/L = 8242  
 NACL EQUIVALENTS MG/L = 6729  
 OBSERVED PH = 7.7

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 1.14  
 CALCULATED = 1.02

WATER ANALYSIS PATTERN  
 Scale  
 MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

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# CORE LABORATORIES, INC.

## ANALYTICAL REPORT

LAB #: W85019-1      DATE: 2/7/85

OPERATOR: Arco Oil & Gas

WELL #: Buck Knoll #1

FIELD:

COUNTY: Garfield      STATE: Utah

LOCATION: Sec 36 T37S R4.5W

FORMATION:

INTERVAL:

SAMPLE ORIGIN: DST #5 Top

REMARKS:

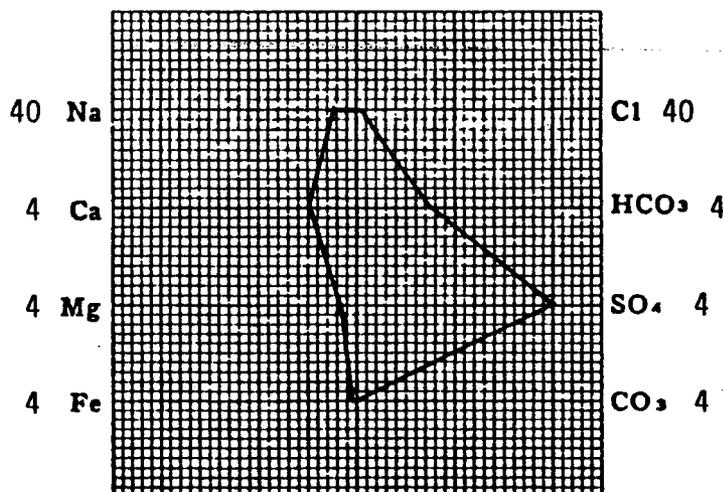
CATIONS	MG/L	MEQ/L	ANIONS	MG/L	MEQ/L
SODIUM	1988	86.49	SULFATE	3800	79.04
POTASSIUM	195	4.99	CHLORIDE	300	8.46
CALCIUM	400	19.96	CARBONATE	-	
MAGNESIUM	68	5.59	BICARBONATE	1830	30.01
IRON	9	0.48	HYDROXIDE		
TOTAL CATIONS = 117.51			TOTAL ANIONS = 117.51		

CALCULATED TDS MG/L = 7661  
 NACl EQUIVALENTS MG/L = 6211  
 OBSERVED PH = 8.0

SPECIFIC RESISTANCE AT 68F (OHM-M):  
 OBSERVED = 1.22  
 CALCULATED = 1.08

### WATER ANALYSIS PATTERN

Scale  
MEQ per Unit



(Na value in above graph includes Na and K)

NOTE: Mg/l = milligrams per liter  
 Meq/l = milligram equivalent per liter

Sodium chloride equivalent =  
 by Dunlap & Hawthorne  
 calculation from components



**CORE LABORATORIES, INC.**

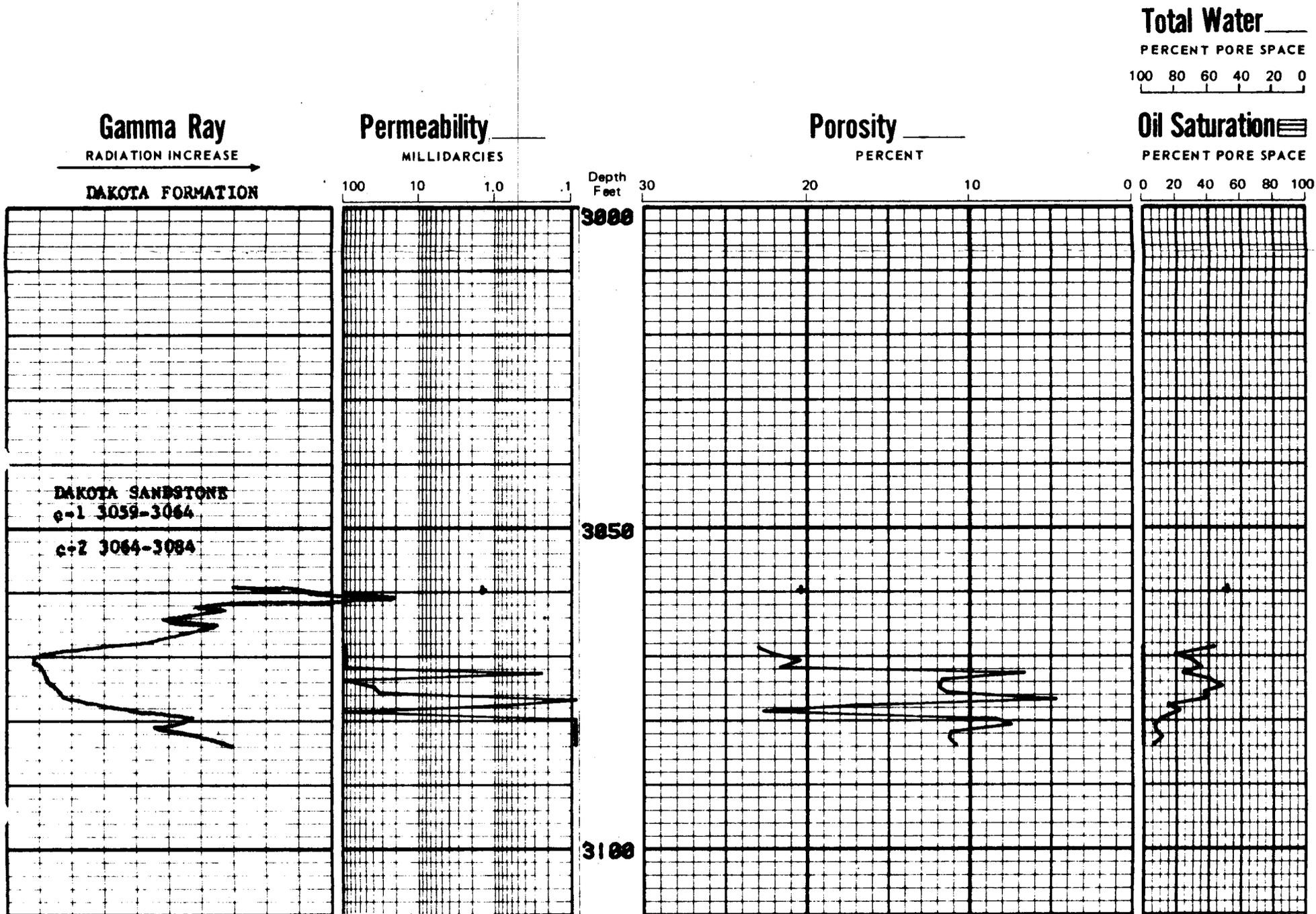
*Petroleum Reservoir Engineering*

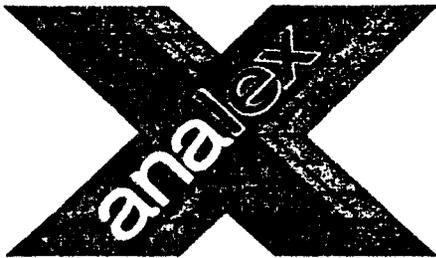
COMPANY **ARCO OIL & GAS** FILE NO. **3883-883361**  
 WELL **BUCK KNOLL # 1** DATE **20-NOV-1984**  
 FIELD **WILDCAT** FORMATION **DAKOTA** ELEV. **8295 6L**  
 COUNTY **GARFIELD** STATE **UTAH** DRLG. FLD. **WBM** CORES \_\_\_\_\_  
 LOCATION **SEC. 36-T379-R4.5W**

# CORRELATION COREGRAPH

These analyses, opinions or interpretations are based on observations and material supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc., (all errors or omissions excepted); but Core Laboratories, Inc., and its officers and employees, assume no responsibility and make no warranty or representations as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

VERTICAL SCALE: 5" = 100'





DIVISION OF XCO

1860 Lincoln Street, Suite 780, Denver, Colorado 80203

(303) 863-0014

CONFIDENTIAL

ARCO EXPLORATION COMPANY

BUCK KNOLL UNIT #1

880' FXL, 1885' FNL

SECTION 36 - T37S - R4½W

GARFIELD COUNTY, UTAH

LOGGING GEOLOGISTS: Brad Eisman  
H. Brad Boschetto  
Willis E. Wilcoxon  
ANALEX

RECEIVED

MAR 20 1985

DIVISION OF OIL  
& GAS & MINING

RESUME

OPERATOR: Arco Exploration Company  
WELL NAME & NUMBER: Buck Knoll Unit #1  
LOCATION: 880' FSL, 1885' FNL  
Section 36 - T37S - R4½W  
COUNTY & STATE: Garfield County, Utah  
SPUD DATE: October 30, 1984  
COMPLETION DATE (TD): January 21, 1985  
ELEVATIONS: GL: 8,295' KB: 8,326'  
TOTAL DEPTH: 10,119'  
CONTRACTOR: Loffland Brothers  
RIG: #58  
MUD PUMPS: National  
GEOLOGISTS: Mike Bingham, Tadeo Schultz  
ENGINEERS: Bart Richardson, Don McKelvy  
TOOL PUSHERS: Weldo Woolsey, Junior Woods  
MUD TYPE: Low Lime  
MUD COMPANY: Milchem  
MUD ENGINEERS: Skip Ogle, Dan Reid  
HOLE SIZES: 22" to 820', 14-3/4" to 4,660', 9-7/8" to TD  
CASING: 16" to 820', 10-3/4" to 4,660'  
LOGGING GEOLOGISTS: Brad Eisman, Brad Boschetto, Willis Wilcoxon - ANALEX  
TYPE UNIT: Flame Ionization Detection  
CORE INTERVALS: #1: 3,067'-3,072'; #2: 3,064'-3,084'; #3: 8,680'-8,710'  
#4: 8,960'-8,970'; #5: 9,802'-9,807'  
DST INTERVALS: #1: 8,640'-8,664'; #2: 8,780'-8,829'; #3: 8,910'-8,950'  
#4: 9,542'-9,624'  
DST COMPANY: Flopetrol Schlumberger  
BOTTOM FORMATION: Cedar Mesa  
WELL STATUS: Plug and Abandon

## SUMMARY AND CONCLUSIONS

Arco Exploration's Buck Knoll Unit #1 was spudded on October 30, 1984. Surface formation in the area is the Tertiary Wasatch. Spud depth was 115' and the formation was the Strait Cuffs. Drilling proceeded to 820', where the 14-3/4" hole was opened to 22" and a string of 16" surface casing was set.

The Tropic Shale was topped at 2,242'. Samples were predominantly dark gray to graybrown, poorly indurated shales with stringers of like-colored siltstones. No hydrocarbon shows were noted through this interval.

The top of the Dakota was picked at the first good coal, which came in at 3,031'. Background gas increased from 0.01% to a peak of 0.52% at 3,034'. Chromatograph breakdown showed nearly equal amounts of C1, C2, C3, iC4, and nC4, all at about 0.04%. The decision was made to core. A total of 25' were cut in two cores. They contained a fine-grained, white, friable sand with a trace of dead oil stain. The associated gas can be viewed as a dead oil show where the lighter aromatics are gone and only the heavies are left. Complete evaluation on this zone may prove useful in future prospects in the area.

The Carmel formation was topped at 4,080'. Samples showed a massive lime section at the top, down to 4,120', followed by interbedded sands and limes with some anhydrite stringers. No shows were noted in this formation.

Drilling proceeded to 4,658', where circulation was lost. As no samples were available, it was thought that this marked the top of the Navajo Sandstone. The hole was conditioned for a string of 10-3/4" intermediate casing. The drill string became stuck while tripping out and a freepoint survey revealed 189' of stuck pipe from 905' to 1,094'. The pipe was successfully fished out and casing was set.

Drilling resumed and samples were a clear to translucent, unconsolidated, well rounded, well sorted sand. Mud returns were never completely lost, although an average of 300 barrels were lost daily. No shows were seen in the Navajo.

The Kayenta formation was topped at 6,916'. Samples showed a redbrown to orange brown siltstone. The drill rate averaged 5 minutes/foot through this formation.

The Triassic Chinle came in at 7,166'. It was predominantly a red to red-brown, poorly indurated, platy to blocky shale. There were a few siltstone and sandstone stringers in the Chinle, none of which had any visible hydrocarbon shows. The drill rate averaged 7-1/2 minutes/foot.

The sample top of the Moenkopi is a difficult pick, as the lithology change is gradational. A possible top is at 7,650'. Samples were interbedded shales and siltstones which were occasionally anhydritic. A few sand stringers were noted. A section of dolomite in the bottom part of the Moenkopi was topped at 8,512'. At 8,526' a slight oil show was noted in the dolomite. It was light gray, microcrystalline, sucrosic with poor intercrystalline porosity. There was occasional black oil stain with a slow yellow streaming cut and a good milky crush cut. Samples became shales and siltstones again at 8,548'. Drilling continued to 8,640', where a sand was topped. The background gas increased from a diesel contaminated 0.36% to 0.42%. The gas chromatograph showed an increase in C1 to 0.029%, up from 0.015% with a slight trace of C2 and C3.

## SUMMARY AND CONCLUSIONS (Cont.)

Samples showed a brown, friable, well sorted sandstone. There was an abundance of intergranular brown oil stain. Ultraviolet examination showed abundant dull yellow fluorescence with a fast yellow white streaming cut. A good orange residual ring was noted along with a visible brown residual ring. Intergranular porosity was in the 3 to 5% range and is supported by the drilling rate which never broke. Drilling was stopped at 8,664' and the interval from 8,640' to 8,664' was drill stem tested. Two feet of oil and 28' of oil cut mud was recovered. Electric logs on this zone showed no permeability and low porosity. A 30' core was then cut and showed a tight cross bedded sand in the first 2', followed by 28' of shale with interbedded siltstones with abundant anhydrite laminae. This lower Moenkopi sand will have to be fully evaluated for future drilling in the area. It doesn't appear to be commercial in this well.

The Sinbad formation was topped at 8,776'. It was marked by a change in lithology from redbrown shales and siltstones to a white, gray dolomite. Shows were encountered 8' into the Sinbad and continued throughout the formation. No gas was associated with these shows and were all sample cuts and fluorescence. Porosities on a whole were less than 5% in the dolomite. A drill stem test was run from 8,780' to 8,829'. Recovery was 10 gallons of drilling mud with a few drops of oil. Pressures were very low. The Sinbad will have to be completely evaluated for future prospects in the area.

The top of the Kaibab formation was marked by the first appearance of chert in the samples and came in at 8,945'. Since this formation was the primary objective in this well, the top 5' were drill stem tested, along with the bottom 34' of the Sinbad. 620' of mud cut sulfur water and 1,240' of sulfur water were recovered. The charts showed erratic flow pressures. These were due to the mud being aerated in order to fish out stuck pipe. Ten more feet were cut and it was decided to core 10'. Examination revealed one foot of gray, platy, poorly indurated shale with a trace of dead oil stain, followed by 3' of tight medium to coarse grained sandstone showing a trace of dead oil stain. The remainder of the core was predominantly gray white, microcrystalline, slightly cherty dolomite showing very little or no porosity and no hydrocarbon shows.

Drilling continued in the Kaibab with the samples being predominantly a cherty dolomite and a few sandstone stringers in the top 100' of the formation. The bottom 150' were a whiteto light gray, occasionally fossiliferous limestone. No oil shows were seen. The drill rate averaged 10 to 15 minutes per foot through the Kaibab.

The Toroweap formation was topped at 9,250'. It was marked by a pronounced drill break and lithology change. The upper 230' were white to light brown, fine-grained sandstones with minor interbedded tan limes and traces of white granular anhydrite. A 4' sand interval at 9,392' showed a light brown oil stain and a slow yellow streaming cut, but no increase in the background was noted.

Samples changed to a buff-brown, microcrystalline, occasionally fossiliferous dolomite which showed some spotty oil stain and dull yellow fluorescence with a slow yellow streaming cut. The show interval was from 9,500' to 9,590'. The drilling rate broke from an average of 8 min/ft down to 4 min/ft at 9,558'. The break netted 48' and a DST was run from 9,542'-9,624'. The recovery yielded 542' of mud cut water and low pressures. The remainder of the Toroweap contained traces of heavy oil in light gray dolomite and sands with no or very little porosity.

FORMATION SUMMARY (Cont.)

Samples from 9,640' to 9,790' were dolomites which graded into buff, medium to fine grained, poorly sorted sandstones with spotty brown to black oil stain, having good to fair crush cuts and occasional very slow streaming cuts. By 9,790' samples were predominantly sandstone. It is thought that this might be the top of the Cedar Mesa or possibly a transition zone between the Cedar Mesa and Organ Rock above. A 7' core was cut from 9,802' to 9,809' with 96% recovery. Examination revealed a white, well sorted, very fine grained sandstone with poor to no intergranular porosity. Ultraviolet examination showed no fluorescence or cut.

Drilling continued and a slight show was noted at 9,858' to 9,860'. Occasional sections of claystones were encountered below 9,860'. There were very slight shows at 9,960', 10,000'-40', 10,054', and 10,090'. Drilling was stopped at 10,119' and electric logs were run along with a velocity survey. The decision was made to drill stem test the interval 10,064'-10,119'. The test recovered 1,347' of mud cut water and low pressures. This zone is wet, but should be fully evaluated for future drilling ventures in the area.



STATE OF UTAH  
NATURAL RESOURCES  
Oil, Gas & Mining

Norman H. Bangerter, Governor  
Dee C. Hansen, Executive Director  
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

January 31, 1986

TO: Jean Doutre, Oil and Gas Field Specialist  
FROM: Dorothy Swindel, Oil and Gas Field Specialist *DS*  
RE: Garfield County Inspections

The attached information concerns inspections which I conducted in Garfield County. The list includes 16 plugged and abandoned wells which require no further inspections. The file folder contains some of the more recently plugged wells in the county, but certainly does not contain all the plugged wells in Garfield County. This material was compiled to assist you in your inspections of that area, and prevent any repetitious inspections. All producing and/or shut-in wells will need their yearly inspection this summer.

ATTACHMENT 1 (continued)

RYDER SCOTT OIL COMPANY

Marsh 1-32

Sec.32, T.35S, R.4E,

*P4A.*

ARCO OIL AND GAS COMPANY

Buck Knoll Unit #1

Sec.36, T.37S, R.4 1/2 W,

ARCO OIL AND GAS COMPANY

Forest Creek Divide Unit #1

Sec.28, T.31S, R.2W,