Scout Report sent	☑
Noted in the NID File	☑
Location map pinned	☑
Approval or Disapproval Letter	☑
Date Completed, P. & A. or operations suspended	9-6-57
Pin changed on location map	☐
A[illegible] and Record of A & P	☐
Water Shut-Off Test	☐
Gas-Oil Ratio Test	☐
Well Log Filed	☑

6-17-71 Subsequent Report of Conducting Is Water Inj

FILE NOTATIONS

Entered in N I D File	X	Checked by Chief	X
Entered On S R Sheet	X	Copy N I D to Field Office	X
Location Map Pinned	X	Approval Letter	X
Card Indexed	X	Disapproval Letter	
I W R for State or Fee Land			

COMPLETION DATA:

Date Well Completed 9-2-57 — Location Inspected

OW X WW TA — Bond released State of Fee Land

GW OS PA

LOGS FILED

Driller's Log 11-19-57

Electric Logs (No.) 3

E X I E-I X GR GR-N X Micro

Lat Mi-L Sonic Others

Form 9-331 b
(April 1952)

			X
	13		

(SUBMIT IN TRIPLICATE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Budget Bureau No. 42-R359.4.
Approval expires 12-31-60.

Indian Agency Navajo

Allottee Tribal Lands

Lease No. 14-20-603-247

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL	X	SUBSEQUENT REPORT OF WATER SHUT-OFF	
NOTICE OF INTENTION TO CHANGE PLANS		SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF		SUBSEQUENT REPORT OF ALTERING CASING	
NOTICE OF INTENTION TO REDRILL OR REPAIR WELL		SUBSEQUENT REPORT OF REDRILLING OR REPAIR	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE		SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING		SUPPLEMENTARY WELL HISTORY	
NOTICE OF INTENTION TO ABANDON WELL			

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

July 3, 19 57

Well No. North Desert Creek 41-13 is located 660 ft. from {N} line and 660 ft. from {E} line of sec. 13

NE 13 (¼ Sec. and Sec. No.) 41S (Twp.) 23E (Range) SLBM (Meridian)

North Desert Creek (Field) San Juan (County or Subdivision) Utah (State or Territory)

The elevation is 4722 ft. (approx. ground)

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

1. Drill 11" hole to 1200'±.
2. Cement 8-5/8" casing at 1200'±.
3. Drill 7-7/8" hole to 5665'.
4. Cement 5-1/2" casing at 5665'±.
5. Clean out to 5650'±.
6. Perforate four ½" holes/ft 5485-5535.
7. Acidize with 200 gal mud acid and 2000 gal XFW acid.
8. Make production test.
9. Perforate four ½" holes/ft 5540-5635.
10. Acidize with 500 gal mud acid.
11. Make production test, establish initial rate.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Shell Oil Company

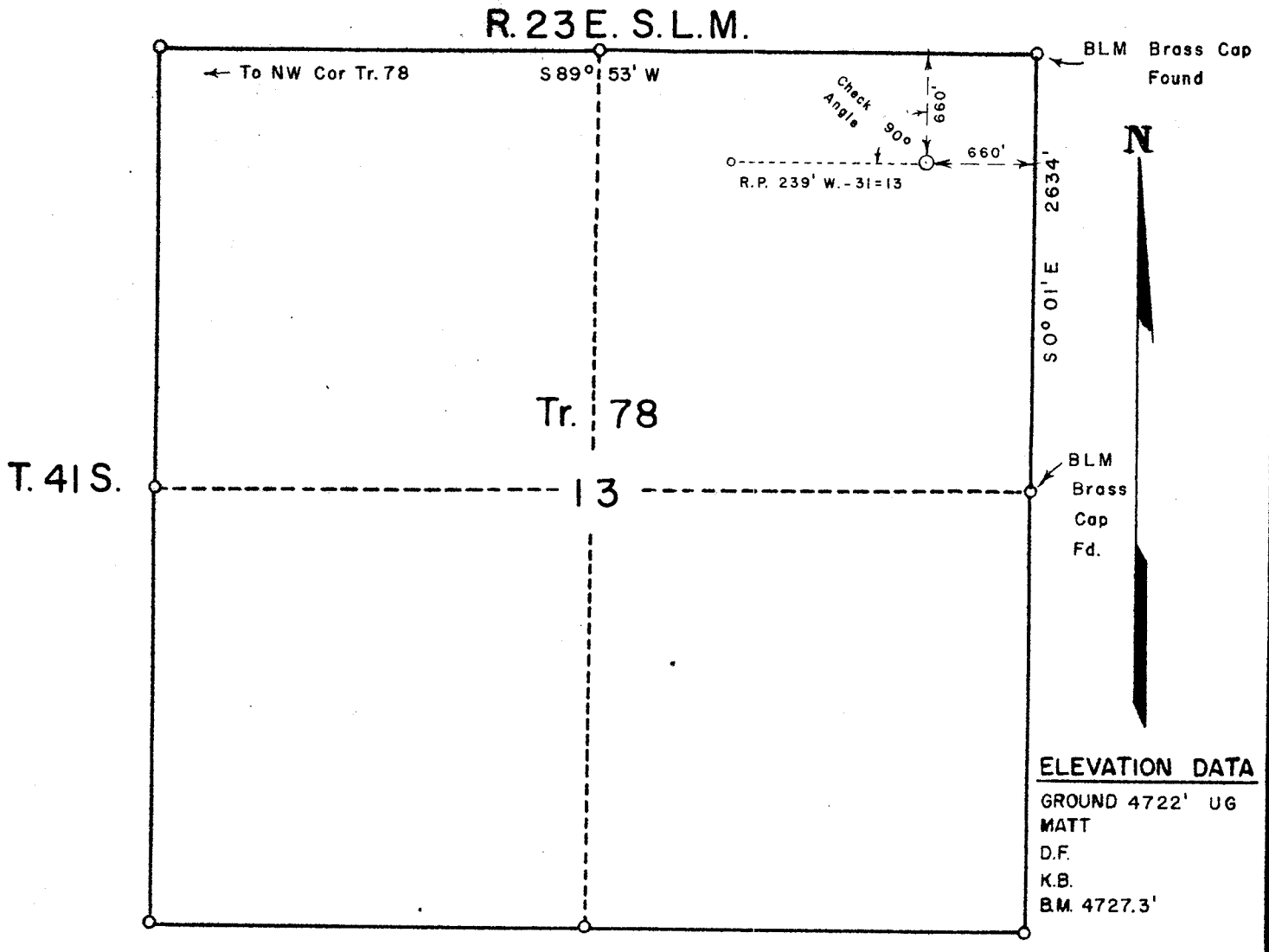
Address 108 N. Behrend

Farmington, New Mexico

By B W Shepard

Title B. W. Shepard
Exploitation Engineer

U. S. GOVERNMENT PRINTING OFFICE 16—8437b-8



REFERENCE POINT DATUM–

1"X 2" STAKES SET AT 10' N.,S.,E., & W. OF LOC.

1" x 2" stake and 3' flag set at 202' N., 217' E., 175' S., & 280' W.
1" x 2" hub and 10' flag set at Loc. being 660' S. and 660' W. of the NE Cor. of Sec. 13, T. 41 S., R. 23 E., SLM.
1" x 2" hub and 3' flag bears North 202' from Loc. for BM.

This is to certify that the above plat was prepared from field notes of actual surveys made by me or under my supervision, and that the same are true and correct to the best of my knowledge and belief.

John A. Kroeger

John A. Kroeger, Reg. L.S.
Utah Reg. No. 1648

REGISTERED LAND SURVEYOR
No. 1648
STATE OF UTAH

Drawn By: Ritter Checked By: JAK Date: 6/29/59	SHELL OIL COMPANY	Scale 1" = 1000'

LOCATION OF N. DESERT CREEK 41 - 13

SAN JUAN COUNTY, UTAH, Tr. 78, SEC. 13, T. 41 S., R. 23 E., S.L.M.

Budget Bureau No. 42-R359.4.
Approval expires 12-31-60.

Form 9-331 b
(April 1952)

			X
	13		

(SUBMIT IN TRIPLICATE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Indian Agency Navajo

Allottee Tribal Lands

Lease No. 14-20-603-247

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL	X	SUBSEQUENT REPORT OF WATER SHUT-OFF	
NOTICE OF INTENTION TO CHANGE PLANS		SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	
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NOTICE OF INTENTION TO SHOOT OR ACIDIZE		SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING		SUPPLEMENTARY WELL HISTORY	
NOTICE OF INTENTION TO ABANDON WELL			

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

July 3, 1957

Well No. 41-13 North Desert Creek is located 660 ft. from {N/S} line and 660 ft. from {E/W} line of sec. 13

NE 13 (¼ Sec. and Sec. No.) 41S (Twp.) 23E (Range) SLBM (Meridian)

North Desert Creek (Field) San Juan (County or Subdivision) Utah (State or Territory)

The elevation ~~of the derrick floor above sea level~~ is 4722 ft. (approx. ground)

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

1. Drill 11" hole to 1200'±.
2. Cement 8-5/8" casing at 1200'±.
3. Drill 7-7/8" hole to 5665'.
4. Cement 5-1/2" casing at 5665'±.
5. Clean out to 5650'±.
6. Perforate four ½" holes/ft 5485-5535.
7. Acidize with 200 gal mud acid and 2000 gal XFW acid.
8. Make production test.
9. Perforate four ½" holes/ft 5540-5635.
10. Acidize with 500 gal mud acid.
11. Make production test, establish initial rate.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

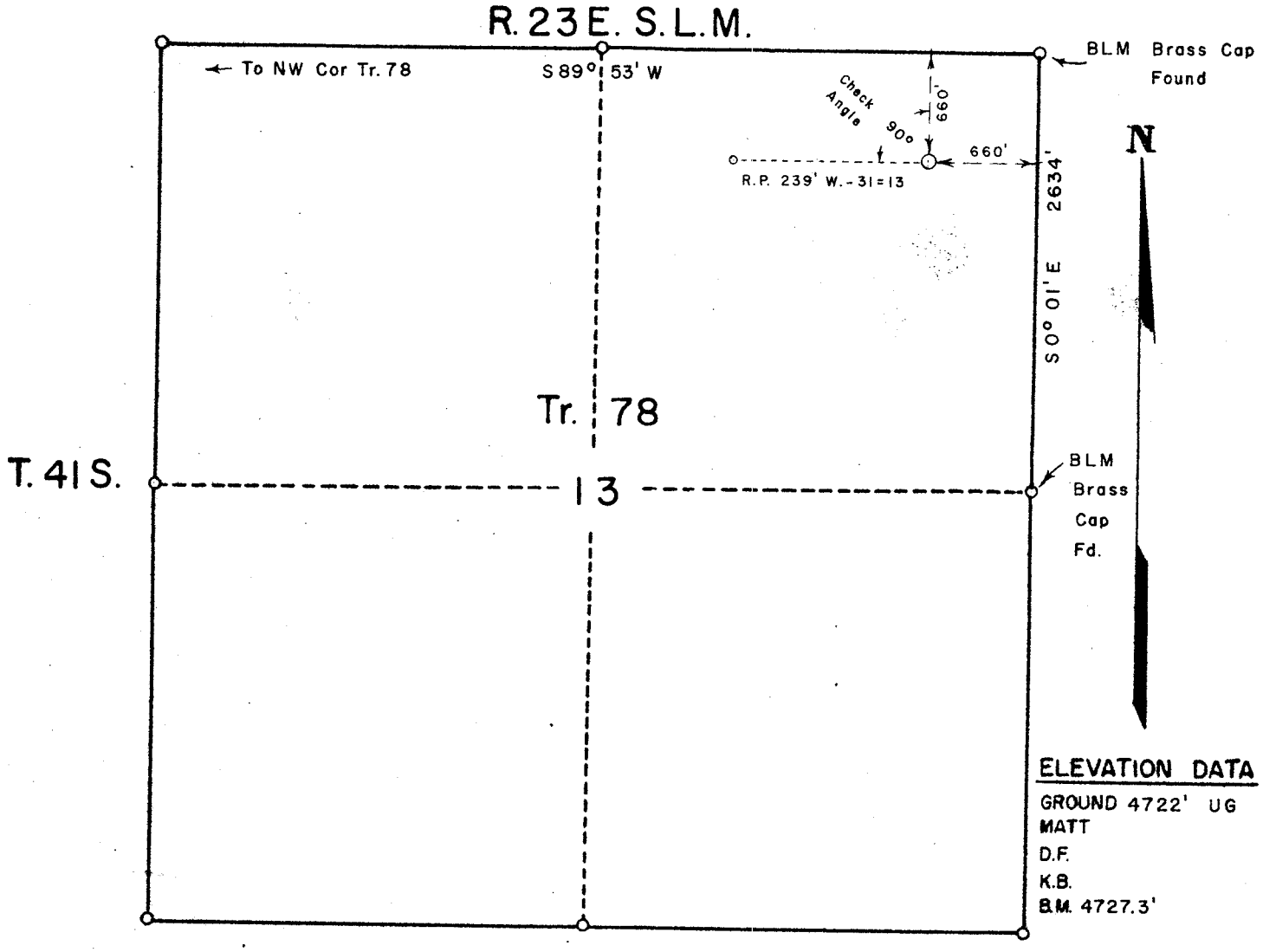
Company Shell Oil Company

Address 108 N. Behrend

Farmington, New Mexico

By B W Shepard

Title B. W. Shepard
Exploitation Engineer



REFERENCE POINT DATUM–
1"X2" STAKES SET AT 10' N.,S.,E., & W. OF LOC.

1" x 2" stake and 3' flag set at 202' N., 217' E., 175' S., & 280' W.
1" x 2" hub and 10' flag set at Loc. being 660' S. and 660' W. of the NE Cor. of Sec. 13, T. 41 S., R. 23 E., SLM.
1" x 2" hub and 3' flag bears North 202' from Loc. for BM.

This is to certify that the above plat was prepared from field notes of actual surveys made by me or under my supervision, and that the same are true and correct to the best of my knowledge and belief.

John A. Kroeger

John A. Kroeger, Reg. L.S.
Utah Reg. No. 1648

REGISTERED LAND SURVEYOR
Lic. 1648
STATE OF UTAH

Drawn By: Ritter	SHELL OIL COMPANY	Scale 1" = 1000'
Checked By: JAK		
Date: 6/29/59		

LOCATION OF N. DESERT CREEK 41 - 13

SAN JUAN COUNTY, UTAH, Tr. 78, SEC. 13, T. 41 S., R. 23 E., S.L.M.

July 8, 1957

Shell Oil Company
108 North Behrend
Farmington, New Mexico

Gentlemen:

This is to acknowledge receipt of your notice of intention to drill Well No. North Desert Creek 41-13, which is to be located 660 feet from the north line and 660 feet from the east line of Section 13, Township 41 South, Range 23 East, SLBM, San Juan County, Utah.

Please be advised that insofar as this office is concerned, approval to drill said well is hereby granted.

Yours very truly,

OIL & GAS CONSERVATION COMMISSION

CLEON B. FEIGHT
SECRETARY

CBF:on

cc: Phil McGrath/ Jerry Long
U.S.G.S. Farmington,
New Mexico

Form 9-331 b
(April 1952)

Budget Bureau No. 42-R359.4.
Approval expires 12-31-60.

			x
	13		

(SUBMIT IN TRIPLICATE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Indian Agency Navajo

Allottee Tribal Lands

Lease No. 14-20-603-247

Noted OK 8-14-57

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL		SUBSEQUENT REPORT OF WATER SHUT-OFF	
NOTICE OF INTENTION TO CHANGE PLANS		SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF		SUBSEQUENT REPORT OF ALTERING CASING	
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NOTICE OF INTENTION TO SHOOT OR ACIDIZE		SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING		SUPPLEMENTARY WELL HISTORY	x
NOTICE OF INTENTION TO ABANDON WELL			

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

August 6, 19 57

Well No. 41-13 (North Desert Creek) is located 660 ft. from {N} line and 660 ft. from {E} line of sec. 13

NE 13 (¼ Sec. and Sec. No.) 41S (Twp.) 23E (Range) SLBM (Meridian)

North Desert Creek (Field) San Juan (County or Subdivision) Utah (State or Territory)

The elevation of the Kelly bushing above sea level is 4760 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

(Spudded 7-19-57)

7-24,25-57 Ran and cemented 8-5/8", 24#, J-55 casing at 1238' with 200 sacks diamix followed by 200 sacks treated cement. Good returns to surface. Flanged up and waited on cement. Pressure tested BOP and casing with 700 psi. for 15 minutes, OK.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Shell Oil Company

Address 101 South Behrend

Farmington, New Mexico

By B W Shepard
B. W. Shepard

Title Exploitation Engineer

Form 9-331 b
(April 1952)

Budget Bureau No. 42-R359.4.
Approval expires 12-31-60.

			X
		13	

(SUBMIT IN TRIPLICATE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Indian Agency Navajo

Allottee Tribal Lands

Lease No. 14-20-603-247

Noted Out 8-14-57

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL		SUBSEQUENT REPORT OF WATER SHUT-OFF	
NOTICE OF INTENTION TO CHANGE PLANS		SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	
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NOTICE OF INTENTION TO SHOOT OR ACIDIZE		SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING		SUPPLEMENTARY WELL HISTORY	X
NOTICE OF INTENTION TO ABANDON WELL			

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

August 6, 19 57

North Desert Creek
Well No. 41-13 is located 660 ft. from {N} line and 660 ft. from {E} line of sec. 13

NE 13 (¼ Sec. and Sec. No.) 41S (Twp.) 23E (Range) SLBM (Meridian)

North Desert Creek (Field) San Juan (County or Subdivision) Utah (State or Territory)

The elevation of the Kelly bushing above sea level is 4760 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

(Spudded 7-19-57)

7-24,25-57 Ran and cemented 8-5/8", 24#, J-55 casing at 1238' with 200 sacks diamix followed by 200 sacks treated cement. Good returns to surface. Flanged up and waited on cement. Pressure tested BOP and casing with 700 psi. for 15 minutes, OK.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Shell Oil Company

Address 101 South Behrend

Farmington, New Mexico

By B W Shepard
B. W. Shepard
Title Exploitation Engineer

SHELL OIL COMPANY

DRILLING REPORT

FOR PERIOD ENDING 9-6-57

North Desert Creek (Ratherford) (FIELD)

San Juan, Utah (COUNTY)

North Desert Creek WELL NO. 41-13

13 (SECTION OR LEASE)

41S 23E (TOWNSHIP OR RANCHO)

Year 1957	DEPTHS FROM	DEPTHS TO	REMARKS
9-3 to 9-5	5680	TD	Moved in production rig. Pulled tubing, reran with sweet packer at 5592. Spotted 500 gal. mud acid, went away at vacuum (5510-5592). Injected 2000 gal. XFW acid followed by 2000 gal. Jel X-100, overflushed with 2000 gal. water. Maximum pressure 3000 psi., minimum pressure 2000 psi., final pressure 3000 pai., average injection rate 0.5 bbl./min. Bled pressure to 700 psi., well began to flow. Circulated water and retrieved side door choke. Ran through tool, acidized interval 5592-5680 with 1000 gal. XFW acid followed by 1000 gal. Jel X-100, overflushed with 1000 gal. water. Maximum and final pressure 1900 psi., average injection rate 2.7 bbls./min.
9-6			Swabbed well onto production. Produced 1-1/2 hours. Shut in, ran bottom hole pressure bomb, produced 1 hour.
			<u>Initial Production</u> Flowing 2080 B/D gross, 2080 B/D clean, 0% cut, gravity 41° API, 48/64" choke, 1420 MCF/D gas, 680 GOR, TP 320, CP 370 (2½ hour test) Completed 9-6-57.

CONDITION AT BEGINNING OF PERIOD

HOLE SIZE	HOLE FROM	HOLE TO	CASING SIZE	DEPTH SET
11	0	1355	8-5/8"	1238
7-7/8"	1355	5680	5-1/2"	5479

DRILL PIPE SIZES 4-1/2

B. B. Robinson
SIGNED

4A1 2-56 PRINTED IN U. S. A.

SHELL OIL COMPANY

DRILLING REPORT
FOR PERIOD ENDING 8-31-57

North Desert Creek
WELL NO. 41-13

North Desert Creek
(FIELD)

San Juan, Utah
(COUNTY)

13
(SECTION OR LEASE)

41S 23E
(TOWNSHIP OR RANCHO)

Year 1957	DEPTHS FROM	DEPTHS TO	REMARKS
			Location: 660' S and 660' W of NE Corner, Section 13, T. 41 S., R. 23 E., S.L.B.M., San Juan County, Utah.
			Elevations: DF 4732.3 Gr 4722.0 KB 4734.1
7-19 to 7-23	0	1130	Spudded 4:00 P.M. 7-19-57. Twisted off at 1130' leaving 8 drill collars in hole, ran and stuck overshot, broke hold on overshot, ran in with wash over pipe washed over top of fish at 915', recovered fish.
7-24 to 7-25	1130	1385	Drilled 255'. Ran and cemented (1227') 8-5/8", 24#, J-55 casing at 1238' with 200 sacks Diamix followed by 200 sacks treated construction cement. Good returns to surface. Flanged up and waited on cement. Pressure tested casing and BOP with 900 psi., O.K.
7-26 to 8-23	1385	5510	Drilled 4125'.
8-24			Ran Electrical Survey, Gamma Ray-Neutron and microcaliper.
8-25			Ran and cemented (5478') 5-1/2", 14#, J-55 casing at 5489' with 200 sacks construction cement. Held pressure (1500 psi.) for 15 minutes.
8-26 to 8-30	5510	5680	Drilled 170'. Cleaned out cement. Drilled 4-3/4" hole. Ran Induction-Electrical Survey and Gamma Ray-Neutron Log.
8-31	5680	TD	Ran 2-7/8" tubing. Released rig 7:00 A.M. Checked BOP daily.
			Mud Summary Wt. 8.6-10.6#/gal. Vis. 38-47 sec. WL 6-18 cc. FC 2/32 in.

Contractor: The New Drilling Company

Drillers: K. R. Phillips
D. Adcock
A. Aaron

CONDITION AT BEGINNING OF PERIOD

HOLE SIZE	HOLE FROM	HOLE TO	CASING SIZE	DEPTH SET

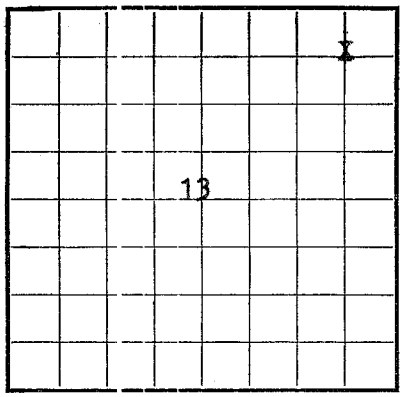
DRILL PIPE SIZES

R. R. Robinson
SIGNED

Form 9-330

Budget Bureau No. 42-R355.4.
Approval expires 12-31-60.

U. S. LAND OFFICE Window Rock, Ariz.
SERIAL NUMBER 14-20-603-247
LEASE OR PERMIT TO PROSPECT



LOCATE WELL CORRECTLY

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Noted 11-20

LOG OF OIL OR GAS WELL

Company Shell Oil Company Address 101 S. Behrend, Farmington, N. M.

Lessor or Tract Federal Field Ratherford State Utah

North Desert Creek
Well No. 41-13 Sec. 13 T. 41S R. 23E Meridian SLBM County San Juan

Location 660 ft. {N. / S.} of N Line and 660 ft. {E. / W.} of E Line of Section 13 Elevation 4734.1 KB
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed B W Shepard

Date October 23, 1957 Title Exploitation Engineer

The summary on this page is for the condition of the well at above date.

Commenced drilling July 19, 19 57 Finished drilling August 26, 19 57

OIL OR GAS SANDS OR ZONES

(*Denote gas by G*)

No. 1, from 5510 to 5680 No. 4, from to

No. 2, from to No. 5, from to

No. 3, from to No. 6, from to

IMPORTANT WATER SANDS

No. 1, from to No. 3, from None noted to

No. 2, from to No. 4, from to

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated From—	Perforated To—	Purpose
8-5/8	24#	8	Spang	1227	Baker	-	-	-	Surface
5-1/2	14#	8	Spang	5478	Baker	None	Open hole		Production

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
8-5/8	1238	200 Sx Diamix + 200	Displacement	-	-
5-1/2	5489	200	Displacement	-	-

PLUGS AND ADAPTERS

Heaving plug—Material Length Depth set

Adapters—Material Size

FOLD MARK

8-5/8	1238	200 Sx Diamix + 200	Displacement	-	-
5-1/2	5489	200	Displacement	-	-

FOLD MARK

PLUGS AND ADAPTERS

Heaving plug—Material ..... Length ..... Depth set .....

Adapters—Material ..... Size .....

SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out
			None			

TOOLS USED

Rotary tools were used from 0 feet to 5680 feet, and from - feet to - feet

Cable tools were used from - feet to - feet, and from - feet to - feet

DATES

October 23, 19 57 Put to producing September 6, 19 57

The production for the first 24 hours was 2080 barrels of fluid of which 100 % was oil; - % emulsion; - % water; and - % sediment. Gravity, ~~XXX~~ 41° API

If gas well, cu. ft. per 24 hours - Gallons gasoline per 1,000 cu. ft. of gas .....

Rock pressure, lbs. per sq. in. -

EMPLOYEES

The New Drilling Co.

K. R. Phillips, Driller A. Aaron, Driller

D. Adcock, Driller ....., Driller

FORMATION RECORD

FROM—	TO—	TOTAL FEET	FORMATION
1462	2309	847	Chinle
2309	2357	48	Shinarump
2357	2491	134	Moenkopi
2491	4495	2004	Cutler
4495	5472	977	Upper Hermosa
5472			Paradox

FROM— TO— TOTAL FEET FORMATION

[OVER]

FORMATION RECORD—Continued

Form 9-331 b
(April 1952)

Budget Bureau No. 42-R359.4.
Approval expires 12-31-60.

(SUBMIT IN TRIPLICATE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Indian Agency Navajo

Allottee Tribal Lands

Lease No. 14-20-603-247

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL		SUBSEQUENT REPORT OF WATER SHUT-OFF	
NOTICE OF INTENTION TO CHANGE PLANS		SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	x
NOTICE OF INTENTION TO TEST WATER SHUT-OFF		SUBSEQUENT REPORT OF ALTERING CASING	
NOTICE OF INTENTION TO REDRILL OR REPAIR WELL		SUBSEQUENT REPORT OF REDRILLING OR REPAIR	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE		SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING		SUPPLEMENTARY WELL HISTORY	
NOTICE OF INTENTION TO ABANDON WELL		Subsequent Report of Well Completion	x

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

September 10, 1957

Well No. North Desert Creek 41-13 is located 660 ft. from {N / ~~S~~} line and 660 ft. from {E / ~~W~~} line of sec. 13

NE 13 (¼ Sec. and Sec. No.) 41S (Twp.) 23E (Range) SLBM (Meridian)

(North Desert Creek) (Field) San Juan (County or Subdivision) Utah (State or Territory)

The elevation of the ~~derrick floor~~ Kelly Bushing above sea level is 4760 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

8-24-57 Ran and cemented 5-1/2" 14#, J-55 casing at 5489' with 200 sacks treated cement.

8-25-57 to 9-4-57 Drilled to 5623' and moved in completion rig. Ran Sweet packer, set at 5597'. Spotted 500 gal mud acid.

9-5-57 Acidized interval 5510-92' with 2000 gal XFW followed by 2000 gal retarded acid. Overflushed with 2000 gal water. Max. pressure 3000 psi. Min. pressure 2000 psi. Final pressure 3000 psi. Average injection rate 0.5 bbl/min. Well began to flow. Acidized interval 5592-5680' with 1000 gal XFW followed by 1000 gal X-100 acid. Overflushed with 1000 gal water. Initial injection pressure 0, final pressure 1900 psi, max. 1900 psi. Average injection rate 2.7 bbls/min.

(OVER)

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Shell Oil Company

Address 101 South Behrend
Farmington, New Mexico

By B W Shepard
B. W. Shepard

Title Exploitation Engineer

W/

9-6-57 <u>Initial Production</u>: 2080 B/D gross, 2080 B/D clean, 0% cut, gravity 41° API, 48/64" choke, T.P. 320 psi, C.P. 370 psi. gas 1420 MCF/D, GOR 680, trap pressure 60 psi. Completed 9-6-57.

OCT 2 1957

Form 9-331b
(April 1952)

Budget Bureau No. 42-R359.4.
Approval expires 12-31-60.

(SUBMIT IN TRIPLICATE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Indian Agency Navajo

Allottee Tribal Lands

Lease No. 14-20-603-247

Noted
CAK
10-7-57

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL		SUBSEQUENT REPORT OF WATER SHUT-OFF	
NOTICE OF INTENTION TO CHANGE PLANS		SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	X
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NOTICE OF INTENTION TO PULL OR ALTER CASING		SUPPLEMENTARY WELL HISTORY	
NOTICE OF INTENTION TO ABANDON WELL		Subsequent Report of Well Completion	X

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

September 10, 19 57

Well No. 41-13 (North Desert Creek) is located 660 ft. from {N} line and 660 ft. from {E} line of sec. 13

NE 13 (¼ Sec. and Sec. No.) — 41S (Twp.) — 23E (Range) — SLBM (Meridian)

RATHER FOOD

(North Desert Creek) (Field) — San Juan (County or Subdivision) — Utah (State or Territory)

The elevation of the Kelly Bushing above sea level is 4760 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

8-24-57 Ran and cemented 5-1/2" 14#, J-55 casing at 5489' with 200 sacks treated cement.

8-25-57 to 9-4-57 Drilled to 5623' and moved in completion rig. Ran Sweet packer, set at 5597'. Spotted 500 gal mud acid.

9-5-57 Acidized interval 5510-92' with 2000 gal XFW followed by 2000 gal retarded acid. Overflushed with 2000 gal water. Max. pressure 3000 psi. Min. pressure 2000 psi. Final pressure 3000 psi. Average injection rate 0.5 bbl/min. Well began to flow. Acidized interval 5592-5680' with 1000 gal XFW followed by 1000 gal X-100 acid. Overflushed with 1000 gal water. Initial injection pressure 0, final pressure 1900 psi, max. 1900 psi. Average injection rate 2.7 bbls/min.

(OVER)

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Shell Oil Company

Address 101 South Behrend

Farmington, New Mexico

By B. W. Shepard
B. W. Shepard

Title Exploitation Engineer

W

9-6-57 **Initial Production:** 2080 B/D gross, 2080 B/D clean, 0% cut, gravity 41° API, 48/64" choke, T.P. 320 psi, C.P. 370 psi. gas 1420 MCF/D, GOR 680, trap pressure 60 psi. Completed 9-6-57.

OCT 2 1957

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

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 [X] GAS WELL [ ] OTHER

2. NAME OF OPERATOR
Phillips Petroleum Company

3. ADDRESS OF OPERATOR
Box 2920, Casper, Wyoming 82601

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface
660' FNL; 660' FEL Sec. 13.

5. LEASE DESIGNATION AND SERIAL NO.
14-20-603-247

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
Navajo

7. UNIT AGREEMENT NAME
SW-I-4192

8. FARM OR LEASE NAME
Rutherford Unit

9. WELL NO.
13-41

10. FIELD AND POOL, OR WILDCAT
Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
13-41S-23E SLBM

12. COUNTY OR PARISH
San Juan

13. STATE
Utah

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)
4734 RKB

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	REPAIRING WELL	[ ]
FRACTURE TREAT	[ ]	MULTIPLE COMPLETE	[ ]	FRACTURE TREATMENT	[ ]	ALTERING CASING	[ ]
SHOOT OR ACIDIZE	[ ]	ABANDON*	[ ]	SHOOTING OR ACIDIZING	[ ]	ABANDONMENT*	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]	(Other)			
(Other) Convert to Water Injection			[X]				

(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.)*

Pull rods and tubing, rerun tubing with packer and set at 5450'. Connect for water injection. Acidize with 2500 gal. acid. Convert shut down oil well to water input.

Present Production: Shut Down Sept. 26, 1966.

APPROVED BY DIVISION OF
OIL & GAS CONSERVATION
DATE 3-2-71
BY Paul A. Burchell

18. I hereby certify that the foregoing is true and correct
Original Signed By:
J. P. Denny
SIGNED J. P. DENNY TITLE Prod. Superintendent DATE Feb. 24, 1971

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

Orig. & 2 cc: USGS, Farmington, N.M.
2 cc: Utah O&GCC, Salt Lake
1 cc: File

*See Instructions on Reverse Side

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

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.)

5. LEASE DESIGNATION AND SERIAL NO.: 14-20-603-247

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Navajo

7. UNIT AGREEMENT NAME: SW-I-4192

8. FARM OR LEASE NAME: Katherford Unit

9. WELL NO.: 13W41

10. FIELD AND POOL, OR WILDCAT: Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: 13-41S-23E SLBM

1. OIL WELL ☐ GAS WELL ☐ OTHER: Water Injection Well

2. NAME OF OPERATOR: Phillips Petroleum Company

3. ADDRESS OF OPERATOR: Box 2920 Casper, Wyoming 82601

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

660' FNL; 660' FEL Sec. 13

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 4734 RKB

12. COUNTY OR PARISH: San Juan

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	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other) Convert to Water Injection			☒
(Other)				(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.) *

Pulled tubing, reran with Baker Lok-Set Packer set at 5452', Tubing intake 5455'. Acidized with 2500 gals. 15% Regular Acid, hooked up for water injection. Started injecting water 12:00 Noon June 8, 1971. WELL CONVERTED FROM OIL WELL TO WATER INJECTION WELL AND WELL NUMBER CHANGED FROM 13-41 to 13W41 Effective June 8, 1971.

Previous Production - Greater Aneth Field, Paradox Formation: Shut Down 9-26-66.

Present Injection Rate: Greater Aneth-Paradox Formation: 3028 BWPD on Vacuum.

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

SIGNED [signature] TITLE Production Superintendent DATE 6-14-71

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

Orig & 2cc - USGS Farmington, New Mexico
2cc - Utah O&GCC, Salt Lake City, Utah
1cc - Superior Oil Co., Cortez, Colo.
1cc - File

*See Instructions on Reverse Side

PHILLIPS PETROLEUM COMPANY
P. O. Box 2920
Casper, Wyoming 82601

June 11, 1971

In re: Ratherford Unit 13W41
(Formerly 13=41) - 660'
FNL, 660' FEL, Sec. 13,
T41S, R23E, San Juan
County, Utah

State of Utah
Oil & Gas Conservation Commission
1588 West North Temple
Salt Lake City, Utah 84116

Attention: Mr. Cleon B. Feight

Dear Sir,

In accordance with Rule E-4 of the Utah General Rules and Regulations, we wish to advise that Ratherford Unit Well No. 13-41 was converted to a water injection well effective June 8, 1971. The well had previously been classified as an oil well and had been shut down since September 26, 1966.

The well is now taking water at the rate of 3028 BWPD on vacuum and will henceforth be known as Ratherford Unit Well No. 13W41.

The attached USGS Form 9-331 furnishes details of this conversion.

Very Truly Yours,

PHILLIPS PETROLEUM COMPANY

J. P. Denny
Production Superintendent

HFS
Attach.

UTAH DIVISION OF OIL, GAS AND MINING
CASING-BRADENHEAD TEST

OPERATOR: Phillips Petroleum Company

FIELD: Greater Aneth LEASE: Rathertford Unit

WELL # 13W41 SEC. 13 TOWNSHIP 41S RANGE 23E

STATE (FED.) FEE DEPTH 5680 TYPE WELL INJ W MAX. INJ. PRESS.
SD 7/1/80

TEST DATE 6/17/86

CASING STRING	SIZE	SET AT	CMT	PRESSURE READINGS	REMARKS	FUTURE
SURFACE	8 5/8	1238	200		SI	
INTERMEDIATE	NONE					
PRODUCTION	5 1/2	5489	200			
TUBING	2 1/2	5454.75'				

Baker Loc-Set Pkr at 5452.25'

CASING STRING	SIZE	SET AT	CMT	PRESSURE READINGS	REMARKS	FUTURE
SURFACE						
INTERMEDIATE						
PRODUCTION						
TUBING						

CASING STRING	SIZE	SET AT	CMT	PRESSURE READINGS	REMARKS	FUTURE
SURFACE						
INTERMEDIATE						
PRODUCTION						
TUBING						

ATTACHMENT 3a:

Wtr. Injection Well

CL1-12A (REV. 1964)

CHEMICAL & GEOLOGICAL LABORATORIES

P. O. Box 2794
Casper, Wyoming

WATER ANALYSIS REPORT

OPERATOR Phillips Petroleum Co. DATE 5-27-83 LAB NO. W30480
WELL NO. Rutherford Unit LOCATION
FIELD FORMATION
COUNTY San Juan INTERVAL
STATE Utah SAMPLE FROM

REMARKS & CONCLUSIONS:

Specific gravity @68°F	1.0646
Oil and grease, mg/l	2.5
Aluminum (Al), mg/l	0.90
Iron (Fe), mg/l	0.3
Total Sulfides, mg/l	ND(0.1)

Cations	mg/l	meq/l	Anions	mg/l	meq/l
Sodium	24574	1068.99	Sulfate	1190	24.75
Potassium	396	10.14	Chloride	52000	1466.40
Lithium	-	-	Carbonate	0	0.00
Calcium	5982	298.50	Bicarbonate	190	3.12
Magnesium	1419	116.64	Hydroxide	-	-
Iron	-	-	Hydrogen sulfide	-	-
Total Cations		1494.27	Total Anions		1494.27

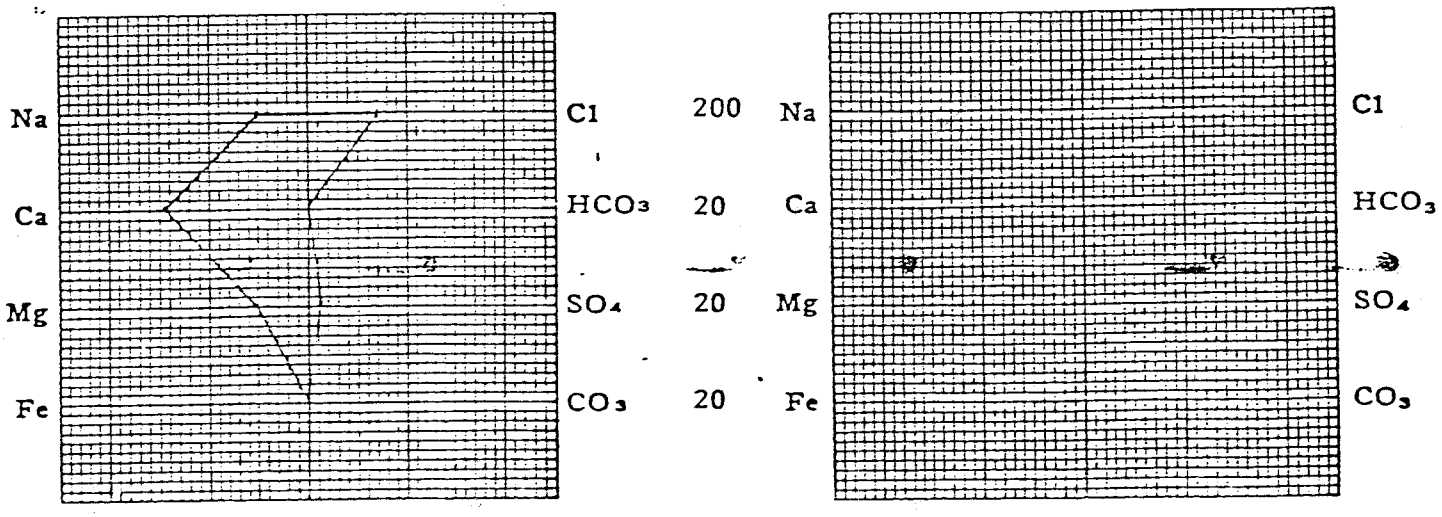
Total dissolved solids, mg/l 85655
NaCl equivalent, mg/l 86344
Observed pH 7.4

Specific resistance @ 68°F.:
Observed 0.095 ohm-meters
Calculated 0.086 ohm-meters

WATER ANALYSIS PATTERN

Sample above described

Scale
MEQ per Unit



(Na value in above graphs includes Na, K, and Li)
NOTE: Mg/l = Milligrams per liter Meq/l = Milligram equivalents per liter
Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

Formation Water

ATTACHMENT 3b:

CL1-12A (REV. 1964)

CHEMICAL & GEOLOGICAL LABORATORIES

P. O. Box 2794
Casper, Wyoming

WATER ANALYSIS REPORT

OPERATOR Phillips Petroleum Company
WELL NO. Ratherford Unit
FIELD
COUNTY San Juan
STATE Utah

DATE 7-22-83 LAB NO. W30636
LOCATION
FORMATION
INTERVAL
SAMPLE FROM Battery #1 Free water knockout (7-5-83) @ 10:35 S/N 28568

REMARKS & CONCLUSIONS:

Cations	mg/l	meq/l
Sodium	30147	1311.38
Potassium	429	10.98
Lithium	--	--
Calcium	6865	342.56
Magnesium	1738	124.86
Iron	--	--
Total Cations		1807.78

Anions	mg/l	meq/l
Sulfate	1380	28.70
Chloride	63000	1776.60
Carbonate	0	0.00
Bicarbonate	151	2.48
Hydroxide	--	--
Hydrogen sulfide	--	--
Total Anions		1807.78

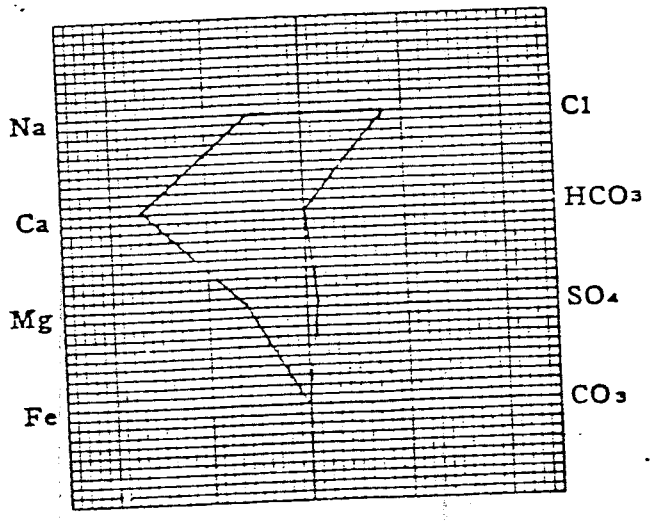
Total dissolved solids, mg/l	103633
NaCl equivalent, mg/l	104549
Observed pH	7.3

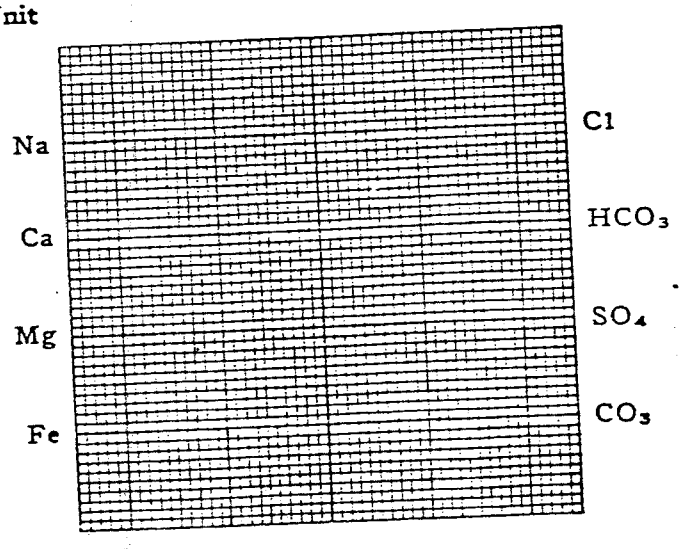
Specific resistance @ 68°F.:
Observed 0.087 ohm-meters
Calculated 0.078 ohm-meters

WATER ANALYSIS PATTERN

Sample above described

Scale
MEQ per Unit





(Na value in above graphs includes Na, K, and Li)
NOTE: Mg/l = Milligrams per liter Meq/l = Milligram equivalents per liter
Sodium chloride equivalent = by Dunlap & Hawthorne calculation from components

STATE OF UTAH
DIVISION OF OIL, GAS, AND MINING
ROOM 4241 STATE OFFICE BUILDING
SALT LAKE CITY, UTAH 84114
(801) 533-5771
(RULE I-5 & RULE I-4)

FORM NO. DOGM-UIC-1
(Revised 1982)

IN THE MATTER OF THE APPLICATION OF
PHILLIPS PETROLEUM COMPANY
ADDRESS P.O. BOX 2920
CASPER, WYOMING ZIP 82602
INDIVIDUAL ___ PARTNERSHIP X CORPORATION ___
FOR ADMINISTRATIVE APPROVAL TO DISPOSE OR INJECT FLUID INTO THE 13W41 WELL
SEC. 13 TWP. 41S RANGE 23E
SAN JUAN COUNTY, UTAH

CAUSE NO. C-3(B)

ENHANCED RECOVERY INJ. WELL	☒
DISPOSAL WELL	☐
LP GAS STORAGE	☐
EXISTING WELL (RULE I-4)	☒

APPLICATION

Comes now the applicant and shows the Corporation Commission the following:
1. That Rule I-5 (g) (iv) authorizes administrative approval of enhanced rcovery injections, disposal or LP Gas storage operations.
2. That the applicant submits the following information.

Lease Name: Ratherford Unit	Well No.: 13W41	Field: Greater Aneth	County: San Juan
Location of Enhanced Recovery Injection or Disposal Well: 13W41	Sec. 13	Twp. 41S	Rge. 23E
New Well To Be Drilled Yes ☐ No ☒	Old Well To Be Converted Yes ☐ No ☒	Casing Test Yes ☒ No ☐ Date 5-83	
Depth-Base Lowest Known Fresh Water Within ½ Mile: Wingate 1550'	Does Injection Zone Contain Oil-Gas-Fresh Water Within ½ Mile YES ☒ NO ☐	State What: Oil & Gas	
Location of Injection Source(s): Desert Creek Paradox I & II, San Juan River	Geologic Name(s) and Depth of Source(s): Desert Creek (5567'), San Juan River (Surface)		
Geologic Name of Injection Zone: Desert Creek I & II	Depth of Injection Interval: 5489 to 5680		
a. Top of the Perforated Interval: 5489	b. Base of Fresh Water: 1550'	c. Intervening Thickness (a minus b): 3939	
Is the intervening thickness sufficient to show fresh water will be protected without additional data? YES NO	See Attachment #4		
Lithology of Intervening Zones: See Attachment #1			
Injection Rates and Pressures: SD 7-1-80	Maximum ___ B/D ___ PSI		
The Names and Addresses of Those to Whom Notice of Application Should be Sent.			
Navajo Tribe, Minerals Dept., P.O. Box 146, Window Rock, AZ 86515			
Superior Oil, P.O. Box 4530, The Woodlands, TX 77380			
Texaco Inc., P.O. Box 2100, Denver, CO 80201			
Southland Royalty, 1000 Fort Worth Club Tower, Fort Worth, TX 76102			

State of Wyoming)
County of Natrona)

PHILLIPS PETROLEUM COMPANY
Applicant

Before me, the undersigned authority, on this day personally appeared A. E. Stuart known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states, that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.

Suscribed and sworn to before me this 21st day of Sept, 19 83

SEAL

DONALD L. HUDSON - Notary Public
County of Natrona State of Wyoming
My Commission Expires Nov. 3, 1986

Donald L. Hudson
Notary Public in and for Natrona Co., Wyoming

My commission expires ___, 19__

(OVER)

INSTRUCTIONS

1. Attach qualitative and quantitative analysis of representative sample of water to be injected and a qualitative and quantitive analysis of the injection formation of water.

2. Attach plat showing subject well and all known oil and gas wells, abandoned, drilling and dry holes within one-half mile, together and with the name of the operator(s).

3. Attach Drillers Log (Form DOGM-UIC-2). (Appropriate Surety must be on file with Conservation Division or appropriate government agencies.)

4. Attach Electric or Radioactivity Log of Subject well (if released).

5. Attach schematic drawing of subsurface facilities including; Size, setting depth, amount of cement used measured or calculated tops of cement surface, intermediate (if any) and production casings; size and setting depth of tubing; type and setting depth of packer; geologic name of injection zone showing top and bottom of injection interval.

6. If the application is for a NEW well the original and six (6) copies of the application and three (3) complete sets of attachments shall be mailed to the Division. For EXISTING well applications (Rule I-4) only ONE copy of the application and ONE complete set of attachments are required to be mailed to the Division.

7. The Division is required to send notice of application to he surface owner of the land within one-half mile of the injection well and to each operator of a producing leasehole within one-half mile of the injection well. List all required names and addresses in the appropriate space provided on the front of this form.

8. Notice that an application has been filed shall be published by the Division in a newspaper of general circulation in the county of publication before the application is approved. The notice shall include the name and address of applicant, location of proposed injection or disposal well, injection zone, injection pressure and volume. If no written objection is received within 15 days from date of publication the application may be approved administratively.

9. A well shall not be used for injection or disposal unless completed machine accounting Form DOGM-UIC-3b is filed by January 31st each year.

10. Approval of this application, if granted, is valid only as long as there is no substantial change in the operations set forth in the application. A substantial operation change requires the approval of a new application.

11. If there is less intervening thickness required by Rule I-5 (b) 4, attach sworn evidence and data.

12. For enhanced recovery projects, information required by Rule I-4 which is common to more than one well, need be reported only once on the application.

CASING AND TUBING DATA

NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
Surface	8-5/8	1238	200	Surface	Returns
Intermediate none					
Production	5-1/2	5489	200	4875	CALCULATED
Tubing	2-1/2	5454.75	Name - Type - Depth of Tubing Packer: Baker Loc-Set 5452.25		
Total Depth: 5680	Geologic Name - Inj. Zone: Desert Creek II	Depth - Top of Inj. Interval: 5489	Depth - Base of Inj. Interval: 5680		

FORM DOGM-UIC-2
(Rule I-5 (b) 2
(Revised 1982)

PLEASE TYPE OR USE BLACK INK ONLY

(To be filed within 30 days after drilling is completed)

LEASE NO. 14-20-603-247

DEPARTMENT OF NATURAL RESOURCES AND ENERGY

API NO. 43-037-15856

DIVISION OF OIL, GAS, AND MINING
Room 4241 State Office Building
Salt Lake City, Utah 84114

640 Acres
N
W E
S
Locate Well Correctly and Outline Lease

COUNTY San Juan SEC. 13 TWP. 41S RGE. 23E

COMPANY OPERATING Phillips Petroleum Company

OFFICE ADDRESS P.O. Box 2920

TOWN Casper STATE ZIP Wyoming 82602

FARM NAME -- WELL NO. 13W41

DRILLING STARTED 7-19 19 57 DRILLING FINISHED 7-26 19 57

DATE OF FIRST PRODUCTION 9-6-57 COMPLETED 9-6-57

WELL LOCATED NE ¼ NE ¼ ¼

660 FT. FROM ~~SL~~ NL OF ¼ SEC. & 660 FT. FROM ~~WL~~ EL OF ¼ SEC.

ELEVATION ~~DERRICK FLOOR~~ RKB 4760.24 GROUND 4748.14

TYPE COMPLETION

Single Zone

Multiple Zone X open hole

Comingled

LOCATION EXCEPTION

OIL OR GAS ZONES

Name	From	To	Name	From	To
Desert Creek I	5487	-			
Desert Creek II	--	5652			

CASING & CEMENT

Casing Set				Csg. Test	Cement		
Size	Wgt.	Grade	Feet	Psi	Sax	Fillup	Top
8-5/8	24	J-55	1227	900	200		surface
5-1/2	14	J-55	5478	1500	200	602	4875

TOTAL DEPTH 5680

PACKERS SET DEPTH Baker Loc-Set Pkr @ 5452

NOTE: THIS FORM MUST ALSO BE ATTACHED WHEN FILING PLUGGING FORM DOGM-UIC-6

COMPLETION & TEST DATA BY PRODUCING FORMATION

	1	2	3
FORMATION	Desert Creek I & II		
SPACING & SPACING ORDER NO.	40 acre Cause #C-3(B)		
CLASSIFICATION (DISPOSAL WELL, ENHANCED RECOVERY, LP GAS STORAGE)	Enhanced Recovery		
PERFORATED	Open hole		
INTERVALS	5489-5680		
ACIDIZED?	6-8-71 2500 gal.		
	Regular acid		
FRACTURE TREATED?	No		

INITIAL TEST DATA Converted to Injector 6-8-71

Date	6-8-71		
Oil, bbl./day	--		
Oil Gravity	--		
Gas, Cu. Ft./day	-- CF	CF	CF
Gas-Oil Ratio Cu. Ft./Bbl.	--		
Water-Bbl./day	2859		
Pumping or Flowing	--		
CHOKE SIZE	--		
FLOW TUBING PRESSURE	Vacuum		

A record of the formations drilled through, and pertinent remarks are presented on the reverse. (use reverse side)

I, the undersigned, being first duly sworn upon oath, state that this well record is true, correct and complete according to the records of this office and to the best of my knowledge and belief.

Telephone 307-237-3791 A.E. Stuart, Area Manager

Name and title of representative of company

Subscribed and sworn before me this _____ day of _____ 19 83

SEP 22 1983

Casper

WELL: 13W41

LOCATION: NENE Sec 13 - T41S - R23E

FIELD: GREATER ANETH

RESERVOIR: Desert Creek I+II

COMPLETION: 6.8.71

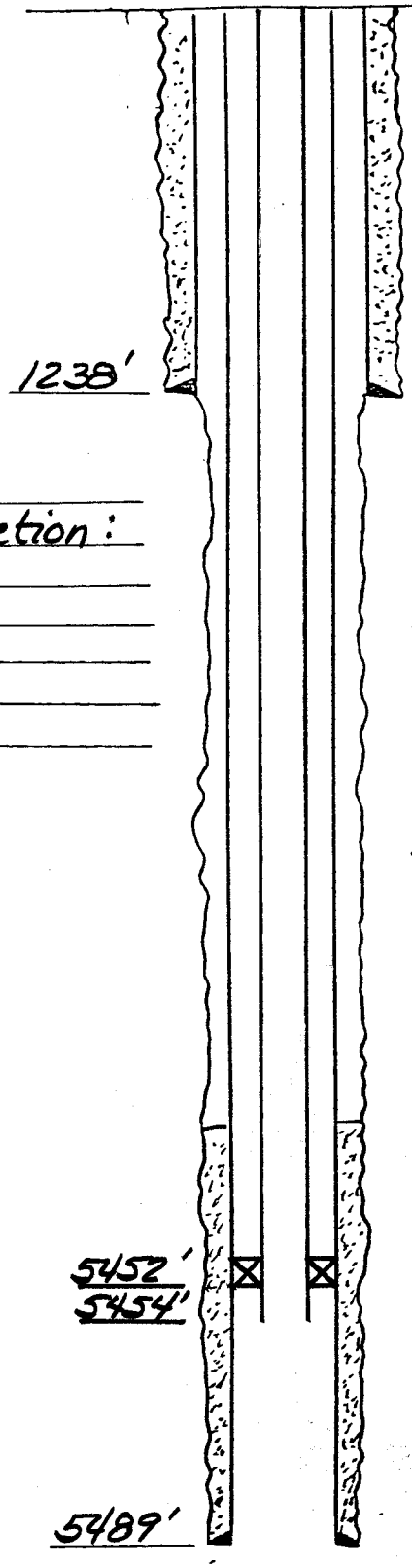
PRESENT STATUS: S.I.

RKB 4760'

GL 4748'

SURFACE CASING: 8 5/8" 24# J-55

PRODUCTION CASING: 5 1/2" 14# J-55

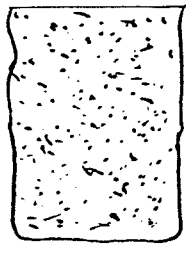


PERFORATIONS:
open hole completion:
5489'-5680'

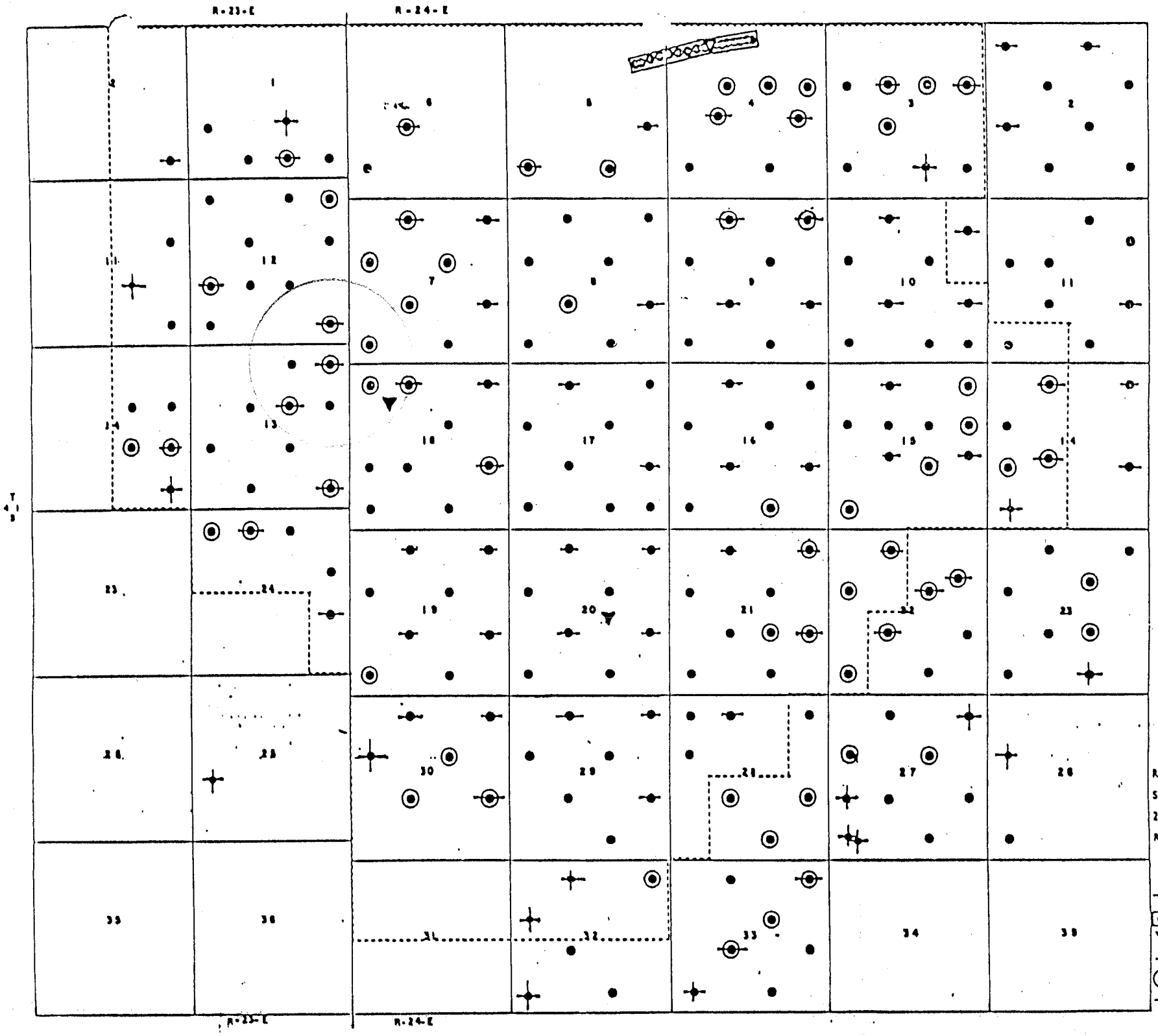
PACKER: Baker Loc-Set
Pkr @ 5452.25
Tubing: 2 1/2" @ 5454.75

PBTD: —

OTD: 5680'



Phillips Petroleum Company


R-23-E
R-24-E
T 41 S
RATHERFORD UNIT
SAN JUAN COUNTY, UTAH
2" = 1 mile
RCT 3-83
oil producer
water injector
water supply
domestic water
plugged & abandoned
shut in well
unit boundry

CHECKLIST FOR INJECTION WELL APPLICATION AND FILE REVIEW

Operator: Phillips Well No. Rutherford Unit A 13W41

County: San Juan T 41S R 23E Sec. 13 API# 43-037-15856

New Well ___ Conversion ___ Disposal Well ___ Enhanced Recovery Well ✓

	YES	NO
UIC Forms Completed	✓	
Plat including Surface Owners, Leaseholders, and wells of available record	✓	
Schematic Diagram	✓	
Fracture Information	✓	
Pressure and Rate Control	✓	
Adequate Geologic Information	✓	
Fluid Source	Desert Creek	

Analysis of Injection Fluid Yes ✓ No ___ TDS 85655

Analysis of Water in Formation to be injected into Yes ✓ No ___ TDS 103637

Known USDW in area Wingate Depth 1550

Number of wells in area of review 8 Prod. 4 P&A 0

Water 1 Inj. 3

Aquifer Exemption Yes ___ NA ✓

Mechanical Integrity Test Yes ___ No ✓

Date ___ Type ___

Comments: TOC 4875

Reviewed by: CBF

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)

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.)

1. OIL WELL ☐ GAS WELL ☐ OTHER Conversion
2. NAME OF OPERATOR: Phillips Oil Company
3. ADDRESS OF OPERATOR: P.O. Box 2920, Casper, WY 82602
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 660' FNL, 660' FEL, NENE
5. LEASE DESIGNATION AND SERIAL NO.: 14-20-603-247
6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Navajo
7. UNIT AGREEMENT NAME: SW-I-4192
8. FARM OR LEASE NAME: Ratherford Unit
9. WELL NO.: 13W41
10. FIELD AND POOL, OR WILDCAT: Greater Aneth
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 13-T41S-R23E
12. COUNTY OR PARISH: San Juan
13. STATE: Utah
14. PERMIT NO.: 43-037-15856
15. ELEVATIONS (Show whether DF, RT, GR, etc.): 4734' RKB

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF		PULL OR ALTER CASING		WATER SHUT-OFF		REPAIRING WELL	
FRACTURE TREAT		MULTIPLE COMPLETE		FRACTURE TREATMENT		ALTERING CASING	
SHOOT OR ACIDIZE	X	ABANDON*		SHOOTING OR ACIDIZING		ABANDONMENT*	
REPAIR WELL		CHANGE PLANS		(Other)			
(Other) Convert to Zone I Producer				(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.)*

It is proposed to convert Ratherford Unit #13W41 from a Zone I & II injection well to a Zone I producing well. After plugging back to Zone I, the well will be acidized with 2500 gallons of 28% HCL.

Federal approval of this action is required before commencing operations.

A 10' x 8' x 6' fenced pit will be constructed on location in a previously disturbed area. Upon completion of the workover, the pit will be dried and recovered.

5-BLM, Farmington, NM
2-Utah O&G CC, Salt Lake City, Utah
1-P. J. Adamson
1-B. Conner, 318B-TRW
1-J. R. Weichbrodt
1-C. M. Anderson
1-File RC

ACCEPTED BY THE STATE OF UTAH DIVISION OF OIL, GAS, AND MINING
DATE: 7/1/85
BY: John R. Baza

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

SIGNED A. E. Stuart TITLE Area Manager DATE June 6, 1985

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for ...

Mobil Oil Corporation

P.O. BOX 5444
DENVER, COLORADO 80217-5444

May 14, 1986

RECEIVED
MAY 16 1986
DIVISION OF
OIL, GAS & MINING

Utah Board of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Attn: R. J. Firth
Associate Director

SUPERIOR OIL COMPANY MERGER

Dear Mr. Firth:
On September 20, 1984, The Superior Oil Company (Superior) became a wholly owned subsidiary of Mobil Corporation. Since January 1, 1985, Mobil Oil Corporation (MOC), another wholly owned subsidiary of Mobil Corporation, has acted as agent for Superior and has operated the Superior-owned properties.

On April 24, 1986, Superior was merged with Mobil Exploration and Producing North America Inc. (MEPNA), which is also a wholly owned subsidiary of Mobil Corporation. MEPNA is the surviving company of the merger.

This letter is to advise you that all properties held in the name of Superior will now be held in the name of MEPNA; and that these properties will continue to be operated by MOC as agent for MEPNA.

Attached is a listing of all wells and a separate listing of injection-disposal wells, Designation of Agent and an organization chart illustrating the relationships of the various companies. If you have any questions or require additional documentation of this merger, please feel free to contact me at the above address or (303) 298-2577.

Very truly yours,

R. D. Baker
Environmental Regulatory Manager

CNE/rd
CNE8661

(November 1983)
(Formerly 9-331)

DEPARTMENT OF THE INTERIOR
(Other instructions on reverse side)

BUREAU OF LAND MANAGEMENT

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.)

5. LEASE DESIGNATION AND SERIAL NO.: 14-20-603-247A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Navajo

7. UNIT AGREEMENT NAME: SW-I-4192

8. FARM OR LEASE NAME: Ratherford Unit

9. WELL NO.: 13W41

10. FIELD AND POOL, OR WILDCAT: Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 13-T41S-R23E

12. COUNTY OR PARISH: San Juan

13. STATE: Utah

1. OIL WELL ☐ GAS WELL ☐ OTHER: Water Injection Well

2. NAME OF OPERATOR: Phillips Petroleum Company

3. ADDRESS OF OPERATOR: P.O. Box 2920, Casper, WY 82602

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 660' FNL, 660' FEL (NE NE)

14. PERMIT NO.: 43-037-15856

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 4734' RKB

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF		PULL OR ALTER CASING		WATER SHUT-OFF		REPAIRING WELL	
FRACTURE TREAT		MULTIPLE COMPLETE		FRACTURE TREATMENT		ALTERING CASING	
SHOOT OR ACIDIZE	X	ABANDON*		SHOOTING OR ACIDIZING		ABANDONMENT*	
REPAIR WELL		CHANGE PLANS		(Other)			
(Other) Convert to Producer			X				

(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.)*

It is proposed to convert Ratherford Unit #13W41, an open hole completion, from a Zone I & II water injection well to a Zone I producer. Upon conversion, the well will be acidized with approximately 3000 gallons of 28% HCl Acid and placed on production.

A 10' x 8' x 6' fenced pit will be constructed on location in a previously disturbed area. Upon completion of the workover, the pit will be dried and recovered.

5-BLM, Farmington, NM
2-Utah O&G CC, Salt Lake City, Utah
1-P. J. Adamson
1-M. Williams, 302 TRW
1-J. R. Reno
1-B. J. Murphy
1-File RC

RECEIVED
NOV 06 1986
DIVISION OF
OIL, GAS & MINING

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

SIGNED D. C. Gill TITLE Area Manager DATE November 3, 1986

(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.

ACCEPTED BY THE STATE OF UTAH DIVISION OF OIL, GAS, AND MINING
DATE: 11-13-86
BY: John R. Baza

*See Instructions on Reverse Side

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.

UTAH
NATURAL RESOURCES
OIL, GAS AND MINING

3 Triad Center, Su 350, Salt Lake City, UT 84180-1203

Ph. (801)538-

030605

MONTHLY REPORT OF ENHANCED RECOVERY PROJECT - PART 2 Page 2

MAR 02 1987
DIVISION OF
OIL, GAS & MINING

MONTHLY MONITORING OF INJECTION WELLS

Well Name	Inj. Press.	Inj. Rate	Annulus Press.	Monthly Inj. Vol.
9W43	SI	SI		SI
10W21	SI	SI		SI
10W23	1750	272		8434
10W43	1800	38		1193
11W44	2250	246		7640
12W13	2275	106		3276
12W22	0	475		14,720
12W31 New well 1/27/87	0	509		2546
12W33 New well 1/29/87	0	699		2097
12W42	1650	538		16,689
12W44	SI	SI		SI
13W32	SI	SI		SI
13W41 (Converted to a producing oil well January 17, 1987.)				
13W42	2150	353		10,955
13W44	2175	313		9706
14W43	SI	SI		SI
15W21	1325	346		10728
15W23	2325	47		1462
15W43	2200	20		605
16W21	575	29		911
16W23	1875	160		4954
16W43	2300	86		2653

UTAH OIL AND GAS CONSERVATION COMMISSION

REMARKS: WELL LOG X ELECTRIC LOG ___ FILE X WATER SANDS ___ LOCATION INSP. ___ ED ___ SUB. REPORT/abd. ___

3-1-71 Notice of Intention to Convert to Water Injection
6-17-71 * Subsequent Report of Converting to Water Injection

DATE FILED 7-8-57

LAND: FEE & PATENTED STATE LEASE NO. PUBLIC LEASE NO. INDIAN 14-20-603-Nav. 247

DRILLING APPROVED: 7-8-57

SPUDDED IN: 6-19-57

COMPLETED: 9-6-57 PUT TO PRODUCING: 9-6-57 * 6-8-71

INITIAL PRODUCTION: 3080 BOPD, 1420 MCF/D (24 hr. test) * 3028 BWPD

GRAVITY A.P.I. [illegible]

GOR: 680:1

PRODUCING ZONES: 5570-5760 PARADOX

TOTAL DEPTH: 5760'

WELL ELEVATION 4722' GR; 4732' DF; 4734' KB

DATE ABANDONED:

FIELD: ~~Rathe~~rford Anett

UNIT: Rathe~~r~~rford

COUNTY: San Juan

WELL NO. RATHERFORD 41-13 (RATHERFORD 13W41) API NO. 43-037-15856

LOCATION 660 FT. FROM (N) ~~(S)~~ LINE, 660 FT. FROM (E) ~~(W)~~ LINE. NE NE ¼-¼ SEC. 13

TWP.	RGE.	SEC.	OPERATOR	TWP.	RGE.	SEC.	OPERATOR
41 S	23 E	13	~~PHILLIPS~~ Oil Co. ~~STATE OIL COMPANY~~				

GEOLOGIC TOPS:

QUATERNARY	Star Point	Chinle 1462'	Molas
Alluvium	Wahweap	Shinarump 2309'	Manning Canyon
Lake beds	Masuk	Moenkopi 2357'	Mississippian
Pleistocene	Colorado	Sinbad	Humbug
Lake beds	Sego	PERMIAN	Brazer
TERTIARY	Buck Tongue	Kaibab	Pilot Shale
Pliocene	Castlegate	Coconino	Madison
Salt Lake	Mancos	Cutler 2491'	Leadville
Oligocene	Upper	Hoskinnini	Redwall
Norwood	Middle	DeChelly	DEVONIAN
Eocene	Lower	White Rim	Upper
Duchesne River	Emery	Organ Rock	Middle
Uinta	Blue Gate	Cedar Mesa	Lower
Bridger	Ferron	Halgaite Tongue	Ouray
Green River	Frontier	Phosphoria	Elbert
	Dakota	Park City	McCracken
	Burro Canyon	Rico (Goodridge)	Aneth
	Cedar Mountain	Supai	Simonson Dolomite
	Buckhorn	Wolfcamp	Sevy Dolomite
	JURASSIC	CARBONIFEROUS	North Point
Wasatch	Morrison	Pennsylvanian	SILURIAN
Stone Cabin	Salt Wash	Oquirrh	Laketown Dolomite
Colton	San Rafeal Gr.	Weber	ORDOVICIAN
Flagstaff	Summerville	Morgan	Eureka Quartzite
North Horn	Bluff Sandstone	Hermosa 4495'	Pogonip Limestone
Almy	Curtis		CAMBRIAN
Paleocene	Entrada	Pardox 5472'	Lynch
Current Creek	Moab Tongue	Ismay	Bowman
North Horn	Carmel	Desert Creek	Tapeats
CRETACEOUS	Glen Canyon Gr.	Akah	Ophir
Montana	Navajo	Barker Creek	Tintic
Mesaverde	Kayenta		PRE-CAMBRIAN
Price River	Wingate	Cane Creek	
Blackhawk	TRIASSIC		

ACME VISIBLE CROZET VIRGINIA #100730-8

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)

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.)

5. LEASE DESIGNATION AND SERIAL NO.: 14-20-603- 247A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: NAVAJO

1. OIL WELL [XX] GAS WELL [ ] OTHER

7. UNIT AGREEMENT NAME: SW-I-4192

2. NAME OF OPERATOR: Phillips Petroleum Company

8. FARM OR LEASE NAME: Ratherford Unit

3. ADDRESS OF OPERATOR: P.O. Box 2920, Casper, WY 82602

9. WELL NO.: 13-41

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 660' FNL, 660' FEL NE NE

API# 43-037-15856

10. FIELD AND POOL, OR WILDCAT: Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 13-T41S-R23E

14. PERMIT NO.:

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 4734' RKB

12. COUNTY OR PARISH: San Juan

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	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	REPAIRING WELL	[ ]
FRACTURE TREAT	[ ]	MULTIPLE COMPLETE	[ ]	FRACTURE TREATMENT	[ ]	ALTERING CASING	[ ]
SHOOT OR ACIDIZE	[ ]	ABANDON*	[ ]	SHOOTING OR ACIDIZING	[ ]	ABANDONMENT*	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]	(Other) Convert to oil producer			[XX]
(Other)			[ ]				

(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.)*

Dec. 10, 1986 through Dec. 23, 1986

MI & RU 12/10/86. COOH to 5680'. Test for csg leak-scg leak @ 2700-18'. Set Hydromite/Cal-Seal across Zone II. WOC. TOC @ 5588'. Sqz csg leak at 2700-18' w/50 sx Class B cmt. WOC. Drill thru cmt. Test csg sqz, OK. COOH to 5588'. Acidize Zone I w/5000 gal 28% HCL. Swab back load. GIH w/rods and tbg. Set tbg at 5463'. RD WS 12/23/86. Started Pumping 1/17/87.

Injection Before shut-in

Production After 114 BWPD & 0 BOPD

RECEIVED
AUG 4 1987
DIVISION OF OIL GAS & MINING

4-BLM, Farmington, NM
2-Utah O&G CC, SLC, UT
1-M. Williams, B'Ville
1-J. Landrum, Denver
1-J. Reno, Cortez
1-Chieftain
1-Mobil Oil
1-Texaco, Inc.
1-Chevron USA
1-File RC

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

SIGNED D. C. Gill TITLE Area Manager DATE 7/27/87

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

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.

85 CM

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

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

RECEIVED
OCT 10 1991
DIVISION OF
OIL GAS & MINING

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: 14-20-603-247
6. If Indian, Allottee or Tribe Name: Navajo Tribal
7. If Unit or CA, Agreement Designation: Ratherford Unit SW-I-4192
8. Well Name and No.: Ratherford Unit #13-41
9. API Well No.: 43-037-15856
10. Field and Pool, or Exploratory Area: Greater Aneth
11. County or Parish, State: San Juan, Utah

1. Type of Well: [X] Oil Well [ ] Gas Well [ ] Other
2. Name of Operator: Phillips Petroleum Company
3. Address and Telephone No.: 5525 Hwy 64 NBU 3004, Farmington, NM 87401 (505) 599-3412
4. Location of Well (Footage, Sec., T., R., M., or Survey Description): Sec. 13, T41S, R23E

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[ ] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
[ ] Subsequent Report	[ ] Recompletion	[ ] New Construction
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[X] Casing Repair	[ ] Water Shut-Off
	[ ] Altering Casing	[ ] Conversion to Injection
	[ ] Other _____	[ ] Dispose Water
		(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

9-16-91
MIRU WSU and equipment. Pulled rods and pump. NDWH and NU BOP's. Released TAC and COOH w/tbg. GIH w/bit & scraper. Tagged @ PBTD 5624'. Circ. hole clean. COOH and LD bit and scraper. PU 5-1/2" RBP & PKR and GIH. Set RBP @ 5447'. Isolated csg leak. Opened well & dumped 2 sx sand down tbg & spot to end of tbg. for RBP. COOH & LD pkr. Go back in hole w/tbg open ended to 3916'. RU Dowell and pmped 15.3 bbls 15.8 density Class G cmt w/2% Calcium (75 sx), displaced w/18.5 bbls fresh wtr. Reversed out w/21 bbls fresh wtr. No cement returns. Drilled thru cmt @ 3920'. Circ. hole clean & PT csg to 300 psi. Circ. sand off RBP. Retrieved RBP & COOH. Ran production tbg w/SN @ 5609'. TAC set w/15,000#. ND BOP's & NU WH. Checked well for proper operation. Cleaned location and RDMO WSU and equipment.

NOTE: Louis Robinson w/PPCo received verbal approval to repair csg leak from Ken Townsend w/BLM on 9/19/91.

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

Signed L. E. Robinson Title Sr. Drlg. & Prod. Engr. Date 10-4-91

(This space for Federal or State office use)

Approved by _____ Title _____ Date _____
Conditions of approval, if any:

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.

*See Instruction on Reverse Side

The following two well locations fall into already designated active fields. They do not need to go before the Field Committee for approval, so could you just go ahead and update the different systems and make the necessary changes that are needed. Thanks a lot!!!

SAN JUAN COUNTY

Phillips Petroleum
Ratherford #41-13 (13W41)
NENE, Sec. 13, T. 41S, R. 23E
Designate into Greater Aneth Field

43-037-15856 POW

UINTAH COUNTY

Enron Oil and Gas
Old Squaw Crossing #2-27
C-SE, Sec. 27, T. 10S, R. 19E
Designate into Natural Buttes Field

43-047-31898

WO12

FORM 10

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

MONTHLY OIL AND GAS PRODUCTION REPORT

RECEIVED
AUG 16 1993
DIVISION OF
OIL, GAS & MINING

OPERATOR NAME AND ADDRESS:

P J KONKEL
PHILLIPS PETROLEUM COMPANY
5525 HWY 64 NBU 3004
FARMINGTON NM 87401

UTAH ACCOUNT NUMBER: N0772

REPORT PERIOD (MONTH/YEAR): 6 / 93

AMENDED REPORT ☐ (Highlight Changes)

Well Name API Number	Entity	Location	Producing Zone	Well Status	Days Oper	Production Volumes OIL(BBL)	GAS(MCF)	WATER(BBL)
#21-23 4303713754	06280	41S 24E 21	DSCR	POW	29	1374	883	58
#3-44 4303715031	06280	41S 24E 3	DSCR	POW	30	111	94	2905
#3-14 4303715124	06280	41S 24E 3	DSCR	POW	30	67	23	302
#9-12 4303715126	06280	41S 24E 9	DSCR	POW	30	112	654	17363
#9-14 4303715127	06280	41S 24E 9	DSCR	POW	30	201	315	423
#28-12 4303715336	06280	41S 24E 28	PRDX	POW	29	112	47	2428
#29-12 4303715337	06280	41S 24E 29	PRDX	POW	29	56	0	672
#29-32 4303715339	06280	41S 24E 29	DSCR	POW	29	1402	287	2224
#29-34 4303715340	06280	41S 24E 29	DSCR	POW	29	757	48	0
#30-32 4303715342	06280	41S 24E 30	DSCR	POW	29	588	1049	3744
#3-12 4303715620	06280	41S 24E 3	DSCR	POW	30	268	11	363
#9-34 4303715711	06280	41S 24E 9	DSCR	POW	30	45	46	9800
#10-12 4303715712	06280	41S 24E 10	DSCR	POW	30	45	23	1088
				TOTALS		5138	3480	41370

LISHA
8-18-93

COMMENTS: Effective July 1, 1993, Phillips Petroleum Company has sold its interest in the Ratherford Unit to Mobil Exploration and Producing U.S., Incorporated, P. O. Box 633, Midland, Texas 79702. Mobil assumed operations on July 1, 1993.

I hereby certify that this report is true and complete to the best of my knowledge. Date: 8/11/93

Name and Signature: PAT KONKEL Pat Konkel

Telephone Number: 505 599-3452

(6/93)

12W-44	43-037-16405	14-20-603-246A	SEC. 12, T41S, R23E	SE/SE 660 FSL; 660 FEL	PA'd
12W-44A	43-037-31543	14-20-603-246A	SEC. 12, T41S, R23E	SE/SE 807 FEL; 772 FSL	
13-11W	43-037-31152	14-20-603-247A	SEC. 13, T41S, R23E	NW/NW 500 FNL; 660 FWL	
13-12	43-037-31127	14-20-603-247A	SEC. 13, T41S, R23E	SW/NW 1705 FNL; 640 FWL	
13W-13	43-037-15851	14-20-603-247A	SEC. 13, T41S, R23E	NW/SW 1980 FSL; 4620 FEL	
13-14	43-037-31589	14-20-603-247A	SEC. 13, T41S, R23E	660 FSL; 660 FWL	
13-21	43-037-31128	14-20-603-247A	SEC. 13, T41S, R23E	NE/NW 660 FNL; 1920 FWL	
13W-22	43-037-15852	14-20-603-247A	SEC. 13, T41S, R23E	SE/NW 1988 FNL; 3300 FEL	
13-23	43-037-31129	14-20-603-247A	SEC. 13, T41S, R23E	NE/SW 1980 FSL; 1930 FWL	
~~13W-44~~	~~43-037-15853~~	~~14-20-603-247~~	~~SEC. 13, T41S, R23E~~	~~600 FSL; 3300 FEL~~	
13W-32	43-037-16406	14-20-603-247A	SEC. 13, T41S, R23E	1881 FNL; 1979 FEL	
13W-33	43-037-15855	14-20-603-247A	SEC. 13, T41S, R23E	NW/SE 1970 FSL; 1979 FEL	
13W-34	43-037-31130	14-20-603-247A	SEC. 13, T41S, R23E	SW/SE 660 FSL; 1980 FEL	
* 13-41	43-037-15856	14-20-603-247A	SEC. 13, T41S, R23E	NE/NE 660 FNL; 660 FEL	
13W-42	43-037-15857	14-20-603-247A	SEC. 13, T41S, R23E	SE/NE 2139; 585 FEL	
13-43	43-037-31131	14-20-603-247A	SEC. 13, T41S, R23E	NE/SE 1700 FSL; 960 FEL	
13W-44	43-037-16407	14-20-603-247A	SEC. 13, T41S, R23E	SE/SE 635 FSL; 659 FEL	
~~14-03~~	~~NA~~	~~14-20-603-4037~~	~~SEC. 11, T41S, R23E~~	~~SW/SW 660 FSL; 660 FEL~~	
14-32	43-037-15858	14-20-603-247A	SEC. 14, T41S, R23E	2130 FNL; 1830 FEL	
14-41	43-037-31623	14-20-603-247A	SEC. 14, T41S, R23E	NE/NE 521 FEL; 810 FNL	
14W-42	43-037-15860	14-20-603-247A	SEC. 14, T41S, R23E	SE/NE 1976 FNL; 653 FEL	
14W-43	43-037-16410	14-20-603-247A	SEC. 14, T41S, R23E	3300 FSL; 4770 FEL	
14-33	43-037-15859	14-20-603-247	SEC. 14, T41S, R23E	2130 FSL; 1830 FEL	
15-12	43-037-15715	14-20-603-355	SEC. 15, T41S, R24E	1820 FNL; 500 FWL	
15W-21	43-037-16411	14-20-603-355	SEC. 15, T41S, R24E	660 FNL; 1820 FWL	
15-22	43-037-30449	14-20-603-355	SEC. 15, T41S, R24E	SE/NW, 1980 FNL; 2050 FWL	
15-32	43-037-15717	14-20-603-355A	SEC. 15, T41S, R24E	1980 FNL; 1980 FEL	
15-33	43-037-15718	14-20-603-355	SEC. 15, T41S, R24E	NW/SE 1650 FSL; 1980 FEL	
15-41	43-037-15719	14-20-603-355	SEC. 15, T41S, R24E	660 FNL; 660' FEL	
15-42	43-037-30448	14-20-603-355	SEC. 15, T41S, R24E	SE/NE 2020 FNL; 820 FEL	
16W-12	43-037-15720	14-20-603-355	SEC. 16, T41S, R24E	SW/NW 1880 FNL; 660 FWL	
16-13	43-037-31168	14-20-603-355	SEC. 16, T41S, R24E	1980 FSL; 660 FWL	
16W-14	43-037-15721	14-20-603-355	SEC. 16, T41S, R24E	SW/SW 660 FSL; 660 FWL	
16W-21	43-037-16414	14-20-603-355	SEC. 16, T41S, R24E	NE/NW 660 FNL; 1880 FWL	
16W-23	43-037-15722	14-20-603-355	SEC. 16, T41S, R24E	NE/SW 1980 FSL; 1980 FWL	
16-32	43-037-15723	14-20-603-355	SEC. 16, T41S, R24E	1980 FNL; 1980' FEL	
16-34	43-037-15724	14-20-603-355	SEC. 16, T41S, R24E	660 FNL; 1980' FEL	
16-41	43-037-15725	14-20-603-355	SEC. 16, T41S, R24E	660 FNL; 660 FEL	
16W-43	43-037-16415	14-20-603-355	SEC. 16, T41S, R24E	NE/SE 2140 FSL; 820 FEL	
17-11	43-037-31169	14-20-603-353	SEC. 17, T41S, R24E	NW/NW 1075' FNL; 800' FWL	
17W-12	43-037-15726	14-20-603-353	SEC. 17, T41S, R24E	SW/NW 1980' FNL; 510' FWL	
17-13	43-037-31133	14-20-603-353	SEC. 17, T41S, R24E	NW/SW 2100' FSL; 660' FWL	
17W-14	43-037-15727	14-20-603-353	SEC. 17, T41S, R24E	SW/SW 660' FSL; 660' FWL	
17W-21	43-037-16416	14-20-603-353	SEC. 17, T41S, R24E	510' FNL; 1830' FWL	
17-22	43-037-31170	14-20-603-353	SEC. 17, T41S, R24E	1980' FNL; 1980' FWL	
17W-23	43-037-15728	14-20-603-353	SEC. 17, T41S, R24E	NE/SW 1980' FWL; 1880' FSL	
17-31	43-037-31178	14-20-603-353	SEC. 17, T41S, R24E	NW/NE 500' FNL; 1980' FEL	
17-32W	43-037-15729	14-20-603-353	SEC. 17, T41S, R24E	SW/NE 1830' FNL; 2030' FEL	
17-33	43-037-31134	14-20-603-353	SEC. 17, T41S, R24E	NW/SE 1980' FSL; 1845' FEL	
17-34W	43-037-15730	14-20-603-353	SEC. 17, T41S, R24E	SW/SE 560' FSL; 1880' FEL	
17W-41	43-037-15731	14-20-603-353	SEC. 17, T41S, R24E	610' FNL; 510' FEL	
17-42	43-037-31177	14-20-603-353	SEC. 17, T41S, R24E	SE/NE 1980; FNL, 660' FEL	
17-44	43-037-15732	14-20-603-353	SEC. 17, T41S, R24E	660 FSL; 660' FEL	
17W-43	43-037-16417	14-20-603-353	SEC. 17, T41S, R24E	NE/SE 1980' FSL; 660' FEL	
18-11	43-037-15733	14-20-603-353	SEC. 18, T41S, R24E	NW/NW 720' FNL; 730' FWL	
18-12W	43-037-31153	14-20-603-353	SEC. 18, T41S, R24E	SW/NW 1980' FNL; 560' FWL	
18W-21	43-037-16418	14-20-603-353	SEC. 18, T41S, R24E	NE/NW 660' FNL; 1882' FWL	
18-22	43-037-31236	14-20-603-353	SEC. 18, T41S, R24E	SW/NW 2200' FNL; 2210' FWL	
18W-23	43-037-30244	14-20-603-353	SEC. 18, T41S, R24E	NE/SW 2385' FSL; 2040' FWL	
18W-14	43-037-15735	14-20-603-353	SEC. 18, T41S, R24E	SW/SW 810' FSL; 600' FWL	
18-24	43-037-31079	14-20-603-353	SEC. 18, T41S, R24E	SE/SW 760' FSL; 1980' FWL	
18-31	43-037-31181	14-20-603-353	SEC. 18, T41S, R24E	NW/NE 795' FNL; 2090; FEL	
~~18W-32~~	~~43-037-15736~~	~~14-20-603-353~~	~~SEC. 18, T41S, R24E~~	~~SW/NE 2140' FNL; 1830' FEL~~	
18-33	43-037-31135	14-20-603-353	SEC. 18, T41S, R24E	NW/SE 1870' FSL; 1980' FEL	
18-34W	43-037-15737	14-20-603-353	SEC. 18, T41S, R24E	SW/SE 780' FSL; 1860 FEL	
18W-41	43-037-15738	14-20-603-353	SEC. 18, T41S, R24E	NE/NE 660' FNL; 660' FEL	
18-42	43-037-31182	14-20-603-353	SEC. 18, T41S, R24E	SE/NE 2120' FNL; 745' FEL	
18W-43	43-037-16419	14-20-603-353	SEC. 18, T41S, R24E	NE/SE 1980' FSL; 660' FEL	PA'd
18-44	43-037-31045	14-20-603-353	SEC. 18, T41S, R24E	SE/SE 660' FSL; 660' FEL	
19-11	43-037-31080	14-20-603-353	SEC. 19, T41S, R24E	NW/NW 660' FNL; 660' FWL	
19-12	43-037-15739	14-20-603-353	SEC. 19, T41S, R24E	600' FWL; 1980' FNL	
19-14	43-037-15740	14-20-603-353	SEC. 19, T41S, R24E	600' FSL; 660' FEL	

FORM 9

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

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.)

5. LEASE DESIGNATION & SERIAL NO.

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: NAVAJO TRIBAL

1. OIL WELL ☐ GAS WELL ☐ OTHER

7. UNIT AGREEMENT NAME: RATHERFORD UNIT

2. NAME OF OPERATOR: MOBIL OIL CORPORATION

8. FARM OR LEASE NAME

3. ADDRESS OF OPERATOR: P. O. BOX 633 MIDLAND, TX 79702

9. WELL NO.

RECEIVED SEP 13 1993

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

DIVISION OF OIL, GAS & MINING

10. FIELD AND POOL, OR WILDCAT: GREATER ANETH

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

14. API NO.

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

12. COUNTY: SAN JUAN

13. STATE: UTAH

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

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐
SHOOT OR ACIDIZE	☐	ABANDON	☐
REPAIR WELL	☐	CHANGE PLANS	☐
(Other)			

APPROX. DATE WORK WILL START _____

SUBSEQUENT REPORT OF:

WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
(Other) CHANGE OF OPERATOR			☐

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

DATE OF COMPLETION _____

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.)

* Must be accompanied by a cement verification report.

AS OF JULY1, 1993, MOBIL OIL CORPORATION IS THE OPERATOR OF THE RATHERFORD UNIT. ATTACHED ARE THE INDIVIDUAL WELLS.

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

SIGNED Shirley Todd TITLE ENV. & REG TECHNICIAN DATE 9-8-93

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

See Instructions On Reverse Side

(3/89)

FORM 11

STATE OF UTAH
/ISION OF OIL, GAS AND MINING

MONTHLY OIL AND GAS DISPOSITION REPORT

OPERATOR NAME AND ADDRESS:

L.B. Sheffield
~~BRIAN BERRY~~
~~M E P N A~~ MOBIL
~~POB 219031 1807A RENTWR~~ P.O. DRAWER G
DALLAS TX 75221-9031 CORTEZ, Co. 81321

UTAH ACCOUNT NUMBER: N7370

REPORT PERIOD (MONTH/YEAR): 7 / 93

AMENDED REPORT ☐ **(Highlight Changes)**

#931006 updated. fie

ENTITY NUMBER	PRODUCT	GRAVITY BTU	BEGINNING INVENTORY	VOLUME PRODUCED	DISPOSITIONS TRANSPORTED	USED ON SITE	FLARED/VENTED	OTHER	ENDING INVENTORY
05980	OIL			177609	177609	0			
	GAS			72101	66216	5885			
11174	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	TOTALS			249710	243825	5885			

RECEIVED
SEP 13 1993
DIVISION OF
OIL, GAS & MINING

COMMENTS: Please note address change. Mobil ~~ASSO~~ Production Reports will be compiled and sent from the Cortez, Co. office in the future.

I hereby certify that this report is true and complete to the best of my knowledge.

Date: 9/5/93

Name and Signature: Lowell B Sheffield

Telephone Number: ~~214 658 2528~~ 303 565 2212

(6/93)

FORM=NR0003.FRM 07/2

Sept 29, 1993

TO: Lisha Cordova - Utah Mining Oil & Gas

FROM: Janice Easley
BLM Farmington, NM
505 599-6355

Here is copy of Rutherford Unit Successor Operator.

4 pages including this one.

Ratherford Unit (GC)

RECEIVED
BLM
27 AM 11:44
070 FARMINGTON, NM
MINERAL RESOURCES
1
3
2
GPS
ALL SUPV.

Navajo Area Office
P. O. Box 1060
Gallup, New Mexico 87305-1060

ARES/543

JUL 2 6 1993

Mr. G. D. Cox
Mobil Exploration and
Producing North America, Inc.
P. O. Box 633
Midland, Texas 79702

Dear Mr. Cox:

Enclosed for your information and use is the approved Designation of Operator between the Phillips Petroleum Company and Mobil Exploration and Producing North America, Inc. for the Ratherford Unit.

Please note that all other concerned parties will be furnished their copy of the approved document.

Sincerely,

ACTING Area Director

Enclosure

cc: Bureau of Land Management, Farmington District Office w/enc.
TNN, Director, Minerals Department w/enc.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS

RECEIVED
BLM
93 JUL 27 AM 11:44
070 FARMINGTON, NM

DESIGNATION OF OPERATOR

Phillips Petroleum Company is, on the records of the Bureau of Indian Affairs, operator of the Ratherford Unit,

AREA OFFICE: Window Rock, Arizona
LEASE NO: Attached hereto as Exhibit "A"

and, pursuant to the terms of the Ratherford Unit Agreement, is resigning as Unit Operator effective July 1, 1993, and hereby designates

NAME: Mobil Exploration and Producing North America Inc., duly elected pursuant to the terms of the Ratherford Unit Agreement,

ADDRESS: P. O. Box 633, Midland, Texas 79702
Attn: G. D. Cox

as Operator and local agent, with full authority to act on behalf of the Ratherford Unit lessees in complying with the terms of all leases and regulations applicable thereto and on whom the authorized officer may serve written or oral instructions in securing compliance with the Operating Regulations (43 CFR 3160 and 25 CFR 211 and 212) with respect to (described acreage to which this designation is applicable):

Attached hereto as Exhibit "A"

Bond coverage under 25 CFR 211, 212 or 225 for lease activities conducted by the above named designated operator is under Bond Number 05202782 (attach copy). Evidence of bonding is required prior to the commencement of operations.

It is understood that this designation of operator does not relieve any lessee of responsibility for compliance with the terms of the leases and the Operating Regulations. It is also understood that this designation of operator does not constitute an assignment of any interest in the leases.

In case of default on the part of the designated operator, the lessees will make full and prompt compliance with all regulations, lease terms, stipulations, or orders of the Secretary of the Interior or his representative.

Attached is the appropriate documentation relevant to this document.

The designated operator agrees to promptly notify the authorized officer of any change in the operatorship of said Ratherford Unit.

Phillips Petroleum Company

June 17, 1993 By: M. B. Smith, J.
Attorney-in-Fact

Mobil Exploration and Producing
North America Inc.

June 11, 1993 By: B. D. Martiny
Attorney-in-Fact B.D. MARTINY

ACTING AREA DIRECTOR 7/9/93
APPROVED BY TITLE DATE

APPROVED PURSUANT, TO SECRETARIAL REDELEGATION ORDER 209 DM 8 AND 230 DM 3.

This form does not constitute an information collection as defined by 44 U.S.C. 3502 and therefore does not require OMB approval.

EXHIBIT "A"

ATTACHED TO AND MADE A PART OF DESIGNATION OF SUCCESSOR OPERATOR, RATHERFORD UNIT

EXHIBIT "C"

Revised as of September 29, 1992)

SCHEDULE OF TRACT PERCENTAGE PARTICIPATION

Tract Number	Description of Land	Serial Number and Effective Date of Lease	Tract Percentage Participation
1	S/2 Sec. 1, E/2 SE/4 Sec. 2, E/4 Sec. 11, and all of Sec. 12, T-41-S, R-23-E, S.L.M. San Juan County, Utah	14-20-603-246-A Oct. 5, 1953	11.0652565
2	SE/4 and W/2 SW/4 Sec. 5, the irregular SW/4 Sec. 6, and all of Sec. 7 and 8, T-41-S, R-24-E, San Juan County, Utah	14-20-603-368 Oct. 26, 1953	14.4159942
3	SW/4 of Sec. 4, T-41-S, R-24-E, San Juan County, Utah	14-20-603-5446 Sept. 1, 1959	.5763826
4	SE/4 Sec. 4, and NE/4 Sec. 9, T-41-S, R-24-E, San Juan County, Utah	14-20-603-4035 March 3, 1958	1.2587779
5	SW/4 of Sec. 3, T-41-S, R-24-E, S.L.M., San Juan County, Utah	14-20-603-5445 Sept. 3, 1959	.4667669
6	NW/4 of Sec. 9, T-41-S, R-24-E, S.L.M., San Juan County, Utah	14-20-603-5045 Feb. 4, 1959	1.0187043
7	NW/4, W/2 NE/4, and SW/4 Sec. 10, SE/4 Sec. 9, T-41-S, R-24-E, San Juan County, Utah	14-20-603-4043 Feb. 18, 1958	3.5097575
8	SW/4 Sec. 9, T-41-S, R-24-E, S.L.M. San Juan County, Utah	14-20-603-5046 Feb. 4, 1959	1.1141679
9	SE/4 Sec. 10 and S/2 SW/4 Sec. 11 T-41-S, R-24-E, San Juan County, Utah	14-20-603-4037 Feb. 14, 1958	2.6186804
10	All of Sec. 13, E/2 Sec. 14, and E/2 SE/4 and N/2 Sec. 24, T-41-S, R-23-E, S.L.M., San Juan County, Utah	14-20-603-247-A Oct. 5, 1953	10.3108861
11	Sections 17, 18, 19 and 20, T-41-S, R-24-E, San Juan County Utah	14-20-603-353 Oct. 27, 1953	27.3389265
12	Sections 15, 16, 21, and NW/4, and W/2 SW/4 Sec. 22, T-41-S, R-24-E, San Juan County, Utah	14-20-603-355 Oct. 27, 1953	14.2819339
13	W/2 Section 14, T-41-S, R-24-E, San Juan County, Utah	14-20-603-370 Oct. 26,1953	1.8500847
14	N/2 and SE/4, and E/2 SW/4 Sec. 29, NE/4 and E/2 SE/4 and E/2 W/2 irregular Sec. 30, and E/2 NE/4 Sec. 32, T-41-S, R-24-E, San Juan County, Utah	14-20-603-407 Dec. 10, 1953	6.9924969
15	NW/4 Sec. 28, T-41-S, R24-E San Juan County, Utah	14-20-603-409 Dec. 10, 1953	.9416393
16	SE/4 Sec. 3, T-41-S, R-24-E San Juan County, Utah	14-20-0603-6504 July 11, 1961	.5750254
17	NE/4 Sec. 3, T-41-S, R-24-E San Juan County, Utah	14-20-0603-6505 July 11, 1961	.5449292
18	NW/4 Sec. 3, T-41-S, R-24-E San Juan County, Utah	14-20-0603-6506 July 11, 1961	.5482788
19	NE/4 Sec. 4, T-41-S, R24-E San Juan County, Utah	14-20-0603-7171 June 11, 1962	.4720628
20	E/2 NW/4 Sec. 4, T-41-S, R-24-E San Juan County, Utah	14-20-0603-7172 June 11, 1962	.0992482
100% Indian Lands		TOTAL 12,909.74	100.0000000

Division of Oil, Gas and Mining

PHONE CONVERSATION DOCUMENTATION FORM

Route original/copy to:

[] Well File _____

(Location) Sec___Twp___Rng___

(API No.) _____

[] Suspense

(Return Date) _____

(To - Initials) _____

XXX Other

OPERATOR CHANGE

1. Date of Phone Call: 10-6-93 Time: 9:30

2. DOGM Employee (name) L. CORDOVA (Initiated Call XXX)

Talked to:

Name GLEN COX (Initiated Call [ ]) - Phone No. (915)688-2114

of (Company/Organization) MOBIL

3. Topic of Conversation: OPERATOR CHANGE FROM PHILLIPS TO MOBIL "RATHERFORD UNIT".

(NEED TO CONFIRM HOW OPERATOR WANTS THE WELLS SET UP - MEPNA AS PER BIA APPROVAL

OR MOBIL OIL CORPORATION AS PER SUNDRY DATED 9-8-93?)

4. Highlights of Conversation:

MR. COX CONFIRMED THAT THE WELLS SHOULD BE SET UNDER ACCOUNT N7370/MEPNA AS PER BIA APPROVAL, ALSO CONFIRMED THAT PRODUCTION & DISPOSITION REPORTS WILL NOW BE HANDLED OUT OF THEIR CORTEZ OFFICE RATHER THAN DALLAS.

MEPNA-

PO DRAWER G

CORTEZ, CO 81321

(303)565-2212

*ADDRESS CHANGE AFFECTS ALL WELLS CURRENTLY OPERATORED BY MEPNA, CURRENTLY REPORTED OUT OF DALLAS (MCELMO CREEK).

Division of Oil, Gas and Mining
OPERATOR CHANGE WORKSHEET

Routing:

1- VLC/7-SJ	
2- DTS/8-FILE	
3- VLC	
4- RJF	
5- LEC	
6- PL	

Attach all documentation received by the division regarding this change.
Initial each listed item when completed. Write N/A if item is not applicable.

XX Change of Operator (well sold)
☐ Designation of Operator
☐ Designation of Agent
☐ Operator Name Change Only

The operator of the well(s) listed below has changed (EFFECTIVE DATE: 7-1-93)

TO (new operator) MEPNA
(address) PO DRAWER G
CORTEZ, CO 81321
GLEN COX (915)688-2114
phone (303) 565-2212
account no. N7370

FROM (former operator) PHILLIPS PETROLEUM COMPANY
(address) 5525 HWY 64 NBU 3004
FARMINGTON, NM 87401
PAT KONKEL
phone (505) 599-3452
account no. N0772(A)

Well(s) (attach additional page if needed): *RATHERFORD UNIT (NAVAJO)

Name:	API:	Entity:	Sec	Twp	Rng	Lease Type:
SEE ATTACHED	43037-15856					

OPERATOR CHANGE DOCUMENTATION

Lec 1. (Rule R615-8-10) Sundry or other legal documentation has been received from former operator (Attach to this form). (Reg. 8-20-93) (6/93 Prod. Rpt. 8-16-93)

Lec 2. (Rule R615-8-10) Sundry or other legal documentation has been received from new operator (Attach to this form). (Reg. 8-31-93) (Rec'd 9-14-93)

N/A 3. The Department of Commerce has been contacted if the new operator above is not currently operating any wells in Utah. Is company registered with the state? (yes/no) _____ If yes, show company file number: _____.

Lec 4. **(For Indian and Federal Wells ONLY)** The BLM has been contacted regarding this change (attach Telephone Documentation Form to this report). Make note of BLM status in comments section of this form. Management review of **Federal and Indian** well operator changes should take place prior to completion of steps 5 through 9 below.

Lec 5. Changes have been entered in the Oil and Gas Information System (Wang/IBM) for each well listed above. (O&G wells 10-6-93) (WIW's 10-26-93)

Lec 6. Cardex file has been updated for each well listed above. (O&G wells 10-6-93) (WIW's 10-26-93)

Lec 7. Well file labels have been updated for each well listed above. (O&G wells 10-6-93) (WIW's 10-26-93)

Lec 8. Changes have been included on the monthly "Operator, Address, and Account Changes" memo for distribution to State Lands and the Tax Commission. (10-6-93)

Lec 9. A folder has been set up for the Operator Change file, and a copy of this page has been placed there for reference during routing and processing of the original documents.

– OVER –

PERATOR CHANGE WORKSHEET (CONTINUED) Initial each item when completed. Write N/A if item is not applicable.

ENTITY REVIEW

Lec 1. (Rule R615-8-7) Entity assignments have been reviewed for all wells listed above. Were entity changes made? (yes/no) ____ (If entity assignments were changed, attach copies of Form 6, Entity Action Form).

N/A 2. State Lands and the Tax Commission have been notified through normal procedures of entity changes.

BOND VERIFICATION (Fee wells only)

Lec/N/A 1. (Rule R615-3-1) The new operator of any fee lease well listed above has furnished a proper bond.

__ 2. A copy of this form has been placed in the new and former operators' bond files.

__ 3. The former operator has requested a release of liability from their bond (yes/no) ___. Today's date _____ 19___. If yes, division response was made by letter dated _____ 19___.

LEASE INTEREST OWNER NOTIFICATION RESPONSIBILITY

N/A 1. (Rule R615-2-10) The former operator/lessee of any **fee lease** well listed above has been notified by letter dated _____ 19___, of their responsibility to notify any person with an interest in such lease of the change of operator. Documentation of such notification has been requested.

DTS 11-10-93

N/A 2. Copies of documents have been sent to State Lands for changes involving **State leases**.

FILMING

✓ 1. All attachments to this form have been microfilmed. Date: 11-17 19 93.

FILING

Lec 1. Copies of all attachments to this form have been filed in each well file.

Lec 2. The original of this form and the original attachments have been filed in the Operator Change file.

COMMENTS

931006 BIA/Blm Approved 7-9-93.

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

5. Lease Designation and Serial No.
14-20-603-247A

6. If Indian, Allottee or Tribe Name
NAVAJO TRIBAL

SUNDRY NOTICES AND REPORTS ON WELLS

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

SUBMIT IN TRIPLICATE

7. If Unit or CA, Agreement Designation
RATHERFORD UNIT

1. Type of Well
[X] Oil Well [ ] Gas Well [ ] Other

8. Well Name and No.
13-41

2. Name of Operator
MOBIL OIL CORPORATION

9. API Well No.
43-037-15856

3. Address and Telephone No.
P.O. BOX 633, MIDLAND, TX 79702 (915)688-2585

10. Field and Pool, or Exploratory Area
GREATER ANETH

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
660' FNL, 660 FEL SEC.13, T41S, R23E

11. County or Parish, State
SAN JUAN, UT

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[ ] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
[X] Subsequent Report	[ ] Recompletion	[ ] New Construction
	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
[ ] Final Abandonment Notice	[ ] Altering Casing	[ ] Conversion to Injection
	[ ] Other REMEDIAL	[ ] Dispose Water
		(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. 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.)*

2-07-94 MIRU PU PARTED FISH RODS POOH W/ RODS ND WELLHEAD NU BOP REL TAC POOH W/180 JTS TBG PU BAILER & SCRAPPER RIH W25 STDS.
2-09-94 RUN OPEN HOLE LOGS W/HLS RIH W/PROD TBG & EQUIP PROBLEM W/TAC
2-10-94 RUN 178 JTS PROD TBF ND BOP SET TAC NU WELLHEAD RUN PUMP & RODS HANG WELL ON RDMO.

RECEIVED
MAR 10 1994

14. I hereby certify that the foregoing is true and correct
Signed Shirley Todd SHIRLEY TODD Title ENV. & REG TECH Date 3-5-94

(This space for Federal or State office use)
Approved by _____ Title _____ Date Tax Credit
Conditions of approval, if any:

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.

*See Instruction on Reverse Side

FORM 10

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING
355 West North Temple, 3 Triad, Suite 350, Salt Lake City, UT 84180-1203

MONTHLY OIL AND GAS PRODUCTION REPORT

OPERATOR NAME AND ADDRESS:

C/O MOBIL OIL CORP
M E P N A
PO DRAWER G
CORTEZ CO 81321

UTAH ACCOUNT NUMBER: N7370

REPORT PERIOD (MONTH/YEAR): 6 / 95

AMENDED REPORT ☐ **(Highlight Changes)**

Well Name API Number	Entity	Location	Producing Zone	Well Status	Days Oper	Production Volumes OIL(BBL)	GAS(MCF)	WATER(BBL)
#12-14 4303715844	06280	41S 23E 12	PRDX					
#12-23 4303715846	06280	41S 23E 12	PRDX					
#12-41 4303715849	06280	41S 23E 12	DSCR					
RATHERFORD 13-41 4303715856	06280	41S 23E 13	DSCR					
14-32 4303715858	06280	41S 23E 14	IS-DC					
#5-34 4303715983	06280	41S 24E 5	IS-DC					
-12 4303715991	06280	41S 24E 8	DSCR					
#8-21 4303715993	06280	41S 24E 8	DSCR					
#8-23 4303715994	06280	41S 24E 8	IS-DC					
#8-32 4303715995	06280	41S 24E 8	PRDX					
#8-34 4303715996	06280	41S 24E 8	PRDX					
#8-41 4303715997	06280	41S 24E 8	PRDX					
#E14-12 4303715998	06280	41S 24E 14	IS-DC					
					TOTALS			

COMMENTS: _____

hereby certify that this report is true and complete to the best of my knowledge. Date: _____

Name and Signature: _____ Telephone Number: _____

(12/93)

Division of Oil, Gas and Mining

PHONE CONVERSATION DOCUMENTATION FORM

Route original/copy to:

[] Well File _____

(Location) Sec___Twp___Rng___

(API No.) _____

[] Suspense

(Return Date) _____

(To - Initials) _____

XXX Other

OPER NM CHG

1. Date of Phone Call: 8-3-95 Time: _____

2. DOGM Employee (name) L. CORDOVA (Initiated Call [])

Talked to:

Name R. J. FIRTH (Initiated Call XX) - Phone No. ( )

of (Company/Organization) _____

3. Topic of Conversation: M E P N A / N7370

4. Highlights of Conversation:

OPERATOR NAME IS BEING CHANGED FROM M E P N A (MOBIL EXPLORATION AND PRODUCING NORTH AMERICA INC) TO MOBIL EXPLOR & PROD. THE NAME CHANGE IS BEING DONE AT THIS TIME TO ALLEVIATE CONFUSION, BOTH IN HOUSE AND AMONGST THE GENERAL PUBLIC.

*SUPERIOR OIL COMPANY MERGED INTO M E P N A 4-24-86 (SEE ATTACHED).

Division of Oil, Gas and Mining
OPERATOR CHANGE WORKSHEET

Routing:

1-LEC ✓	7-PL ✓
2-LWP ✓	8-SJ ✓
3-~~DTS~~	9-FILE ✓
4-VLC ✓	
5-RJF ✓	
6-LWP ✓	

Attach all documentation received by the division regarding this change.
Initial each listed item when completed. Write N/A if item is not applicable.

☐ Change of Operator (well sold) ☐ Designation of Agent
☐ Designation of Operator XXX Operator Name Change Only

The operator of the well(s) listed below has changed (EFFECTIVE DATE: 8-2-95)

TO (new operator) **MOBIL EXPLOR & PROD**
(address) **C/O MOBIL OIL CORP**
PO DRAWER G
CORTEZ CO 81321
phone (303) 564-5212
account no. N7370

FROM (former operator) **M E P N A**
(address) **C/O MOBIL OIL CORP**
PO DRAWER G
CORTEZ CO 81321
phone (303) 564-5212
account no. N7370

Well(s) (attach additional page if needed):

Name	API	Entity	Sec	Twp	Rng	Lease Type
** SEE ATTACHED **	037-16856					

OPERATOR CHANGE DOCUMENTATION

N/A 1. (Rule R615-8-10) Sundry or other legal documentation has been received from former operator (Attach to this form).

N/A 2. (Rule R615-8-10) Sundry or other legal documentation has been received from new operator (Attach to this form).

N/A 3. The Department of Commerce has been contacted if the new operator above is not currently operating any wells in Utah. Is company registered with the state? (yes/no) _____ If yes, show company file number: _____.

N/A 4. **(For Indian and Federal Wells ONLY)** The BLM has been contacted regarding this change (attach Telephone Documentation Form to this report). Make note of BLM status in comments section of this form. Management review of **Federal and Indian** well operator changes should take place prior to completion of steps 5 through 9 below.

Lec 5. Changes have been entered in the Oil and Gas Information System (Wang/IBM) for each well listed above. (8-3-95)

LWP 6. Cardex file has been updated for each well listed above. 8-31-95

LWP 7. Well file labels have been updated for each well listed above. 9-28-95

Lec 8. Changes have been included on the monthly "Operator, Address, and Account Changes" memo for distribution to State Lands and the Tax Commission. (8-3-95)

Lec 9. A folder has been set up for the Operator Change file, and a copy of this page has been placed there for reference during routing and processing of the original documents.

– OVER –

OPERATOR CHANGE WORKSHEET (CONTINUED) Initial each item when completed. Write N/A if item is not applicable.

ENTITY REVIEW

Lec 1. (Rule R615-8-7) Entity assignments have been reviewed for all wells listed above. Were entity changes made? (yes/no) ____ (If entity assignments were changed, attach copies of Form 6, Entity Action Form).

N/A 2. State Lands and the Tax Commission have been notified through normal procedures of entity changes.

BOND VERIFICATION (Fee wells only) * No Fee Lease Wells at this time!

N/A/Lec 1. (Rule R615-3-1) The new operator of any fee lease well listed above has furnished a proper bond.

___ 2. A copy of this form has been placed in the new and former operators' bond files.

___ 3. The former operator has requested a release of liability from their bond (yes/no) ___. Today's date _____ 19___. If yes, division response was made by letter dated _____ 19___.

LEASE INTEREST OWNER NOTIFICATION RESPONSIBILITY

N/A 1. (Rule R615-2-10) The former operator/lessee of any **fee lease** well listed above has been notified by letter dated _____ 19___, of their responsibility to notify any person with an interest in such lease of the change of operator. Documentation of such notification has been requested.

DTS 8/5/95

N/A 2. Copies of documents have been sent to State Lands for changes involving **State leases**.

FILMING

✓ 1. All attachments to this form have been microfilmed. Date: October 6 19 95.

FILING

___ 1. Copies of all attachments to this form have been filed in each well file.

___ 2. The original of this form and the original attachments have been filed in the Operator Change file.

COMMENTS

950803 WIC F5/Not necessary!

WE71/34-35

WORKSHEET
APPLICATION FOR PERMIT TO DRILL

APD RECEIVED: 01/27/96

API NO. ASSIGNED: 43-037-15856

WELL NAME: RUN 13-41 MULTI-LEG (RE-ENTRY)
OPERATOR: MOBIL EXPL & PROD (N7370)

PROPOSED LOCATION:
NENE 13 - T41S - R23E
SURFACE: 0660-FNL-0660-FEL
BOTTOM: 1105-FNL-0577-FWL
SAN JUAN COUNTY
GREATER ANETH FIELD (365)

LEASE TYPE: IND
LEASE NUMBER: 14-20-603-

PROPOSED PRODUCING FORMATION: DSCR

INSPECT LOCATION BY: / /		
TECH REVIEW	Initials	Date
Engineering		
Geology		
Surface		

RECEIVED AND/OR REVIEWED:

✓ Plat
✓ Bond: Federal [✓] State [] Fee []
(Number EXISTING WELL)
N Potash (Y/N)
N Oil shale (Y/N)
✓ Water permit
(Number NAVAJO ALLOTMENT)
N RDCC Review (Y/N)
(Date:)

LOCATION AND SITING:

✓ R649-2-3. Unit: RATHERFORD UNIT

___ R649-3-2. General.

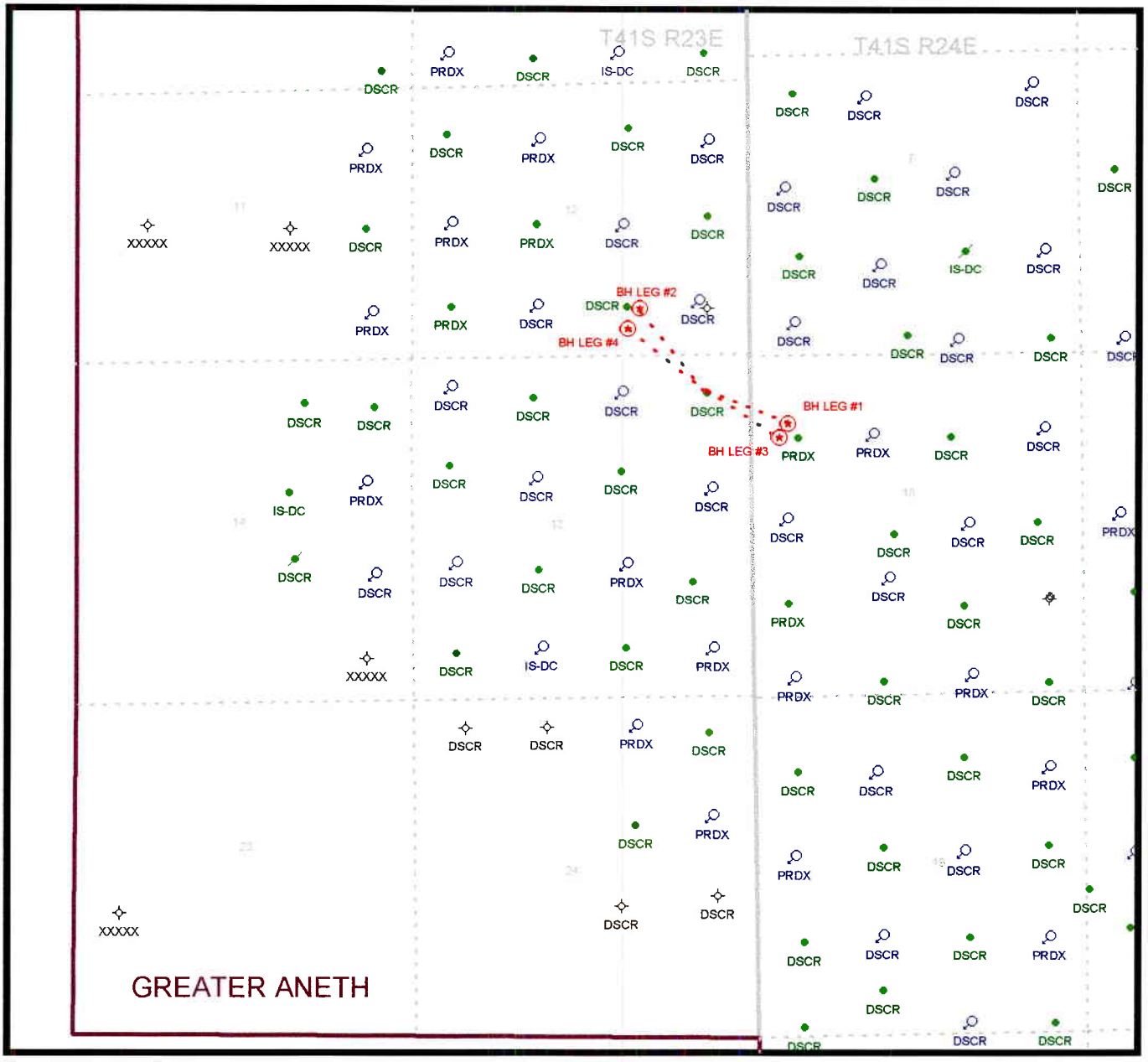
___ R649-3-3. Exception.

___ Drilling Unit.
Board Cause no: ___
Date: ___

COMMENTS: ___

STIPULATIONS: ___

OPERATOR: MOBIL EXPL & PROD
FIELD: GREATER ANETH
SEC, TWP, RNG: 13, 41S, 23E
COUNTY: SAN JUAN
UAC: R649-2-3 RATHERFORD UNIT



PREPARED:
DATE: 27-JAN-97

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: 14-20-603-
6. If Indian, Allottee or Tribe Name: NAVAJO TRIBAL
7. If Unit or CA, Agreement Designation: RATHERFORD UNIT
8. Well Name and No.: 13-41
9. API Well No.: 43-037-15856
10. Field and Pool, or exploratory Area: GREATER ANETH
11. County or Parish, State: SAN JUAN UT

1. Type of Well: [X] Oil Well [ ] Gas Well [ ] Other SIDETRACK
2. Name of Operator: Mobil Exploration & Producing U.S. Inc. as Agent for Mobil Producing TX & NM Inc.
3. Address and Telephone No.: P.O. Box 633, Midland, TX 79702 915-688-2585
4. Location of Well (Footage, Sec., T., R., M., or Survey Description): 660' FNL, 660' FEL SEC.13, T41S, R23E

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[X] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
	[ ] Recompletion	[ ] New Construction
[ ] Subsequent Report	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
[ ] Final Abandonment Notice	[ ] Altering Casing	[ ] Conversion to Injection
	[ ] Other SIDETRACK	[ ] Dispose Water

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

13. 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.)*

LATERAL #1 466' SOUTH & 1214' EAST FROM SURFACE SPOT ZONE 1b
LATERAL #2 1299'NORTH & 1050' WEST FROM SURFACE SPOT ZONE 1b
LATERAL #3 670' SOUTH & 1114' EAST FROM SURFACE SPOT ZONE 1a
LATERAL #4 1007'NORTH & 1243' WEST FROM SURFACE SPOT ZONE 1a

SEE ATTACHMENTS

RECEIVED
JAN 27 1997
DIV. OF OIL, GAS & MINING

14. I hereby certify that the foregoing is true and correct
Signed Shirley Houchins Title ENV. & REG. TECHNICIAN Date 01-22-97

(This space for Federal or State office use)
Approved by [signature] Title Petroleum Engineer Date 1/28/97
Conditions of approval, if any:

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.

* See Instruction on Reverse Side

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

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Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

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6. If Indian, Allottee or Tribe Name: NAVAJO TRIBAL
7. If Unit or CA, Agreement Designation: RATHERFORD UNIT
8. Well Name and No.: 13-41
9. API Well No.: 43-037-15856
10. Field and Pool, or exploratory Area: GREATER ANETH
11. County or Parish, State: SAN JUAN UT

1. Type of Well: [X] Oil Well [ ] Gas Well [ ] Other SIDETRACK
2. Name of Operator: Mobil Exploration & Producing U.S. Inc. as Agent for Mobil Producing TX & NM Inc.
3. Address and Telephone No.: P.O. Box 633, Midland, TX 79702 915-688-2585
4. Location of Well (Footage, Sec., T., R., M., or Survey Description): 660' FNL, 660' FEL SEC.13, T41S, R23E

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[X] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
[ ] Subsequent Report	[ ] Recompletion	[ ] New Construction
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
	[ ] Altering Casing	[ ] Conversion to Injection
	[ ] Other SIDETRACK	[ ] Dispose Water

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

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LATERAL #2 1299' NORTH & 1050' WEST FROM SURFACE SPOT ZONE 1b
LATERAL #3 670' SOUTH & 1114' EAST FROM SURFACE SPOT ZONE 1a
LATERAL #4 1007' NORTH & 1243' WEST FROM SURFACE SPOT ZONE 1a

SEE ATTACHMENTS

176 FWL x 337 FNL SEC 13 T41S R24E
224 x 613 FEL SEC 12 T41S R23E
136 FWL x 401 FNL SEC 18 T41S R24E
FSL
17 FSL x 677 FEL SEC 12 T41S-R23E

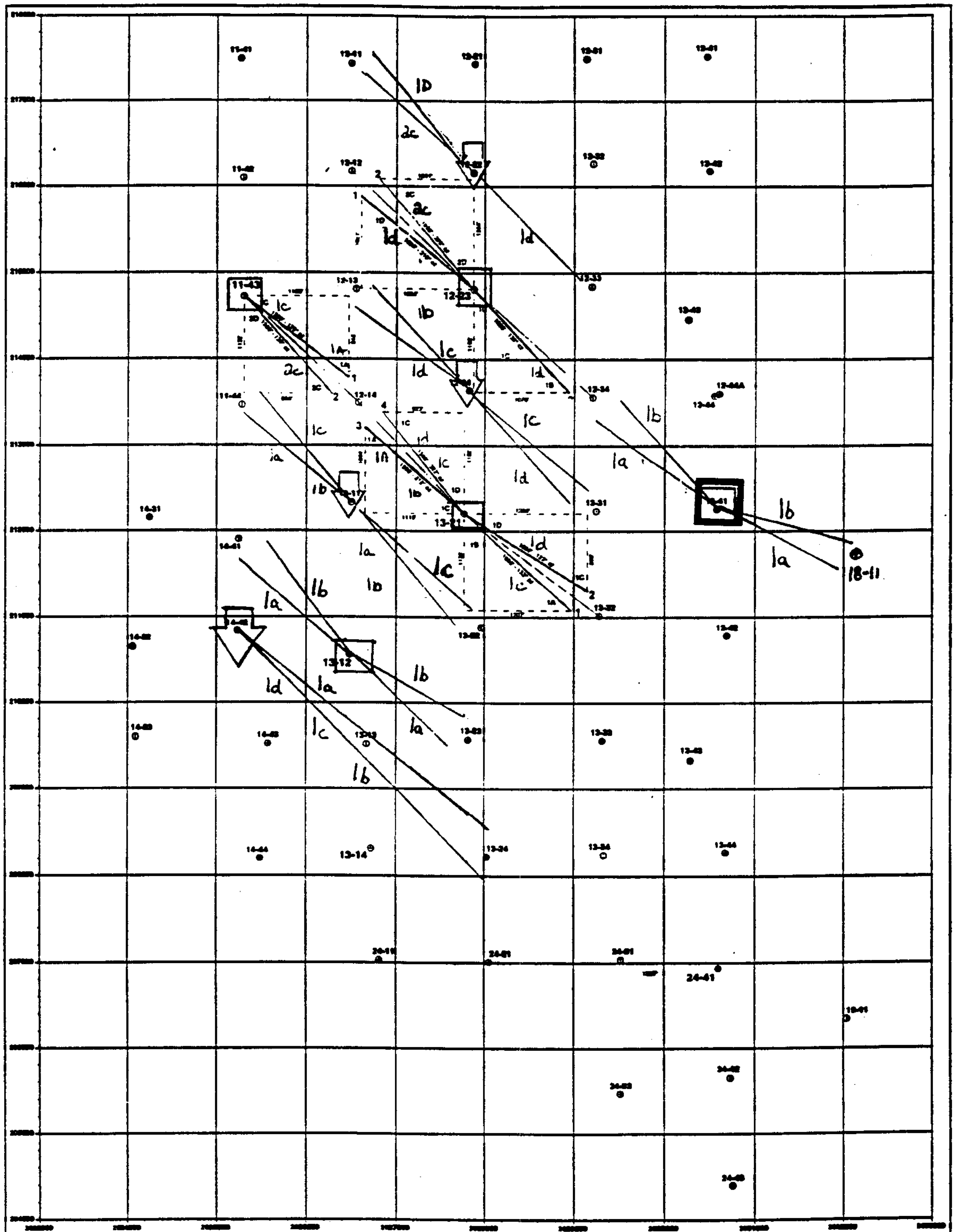
RECEIVED
JAN 27 1997
DIV. OF OIL, GAS & MINING

14. I hereby certify that the foregoing is true and correct
Signed: Shirley Houchins Title: ENV. & REG. TECHNICIAN Date: 01-22-97

(This space for Federal or State office use)
Approved by: [signature] Title: Petroleum Engineer Date: 1/28/97
Conditions of approval, if any:

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.

* See Instruction on Reverse Side



WIW

OIL

PROPOSED HORIZONTAL RE-ENTRIES

Mobil Exploration & Producing U.S. Inc.

Light Oil/EOR

Midland, Texas

Ratherford Unit

San Juan County, Utah

1996 Horizontal Producer Program

ENGINEERS CALCULATION SHEET

FOR

LOCATION RU # 13-41

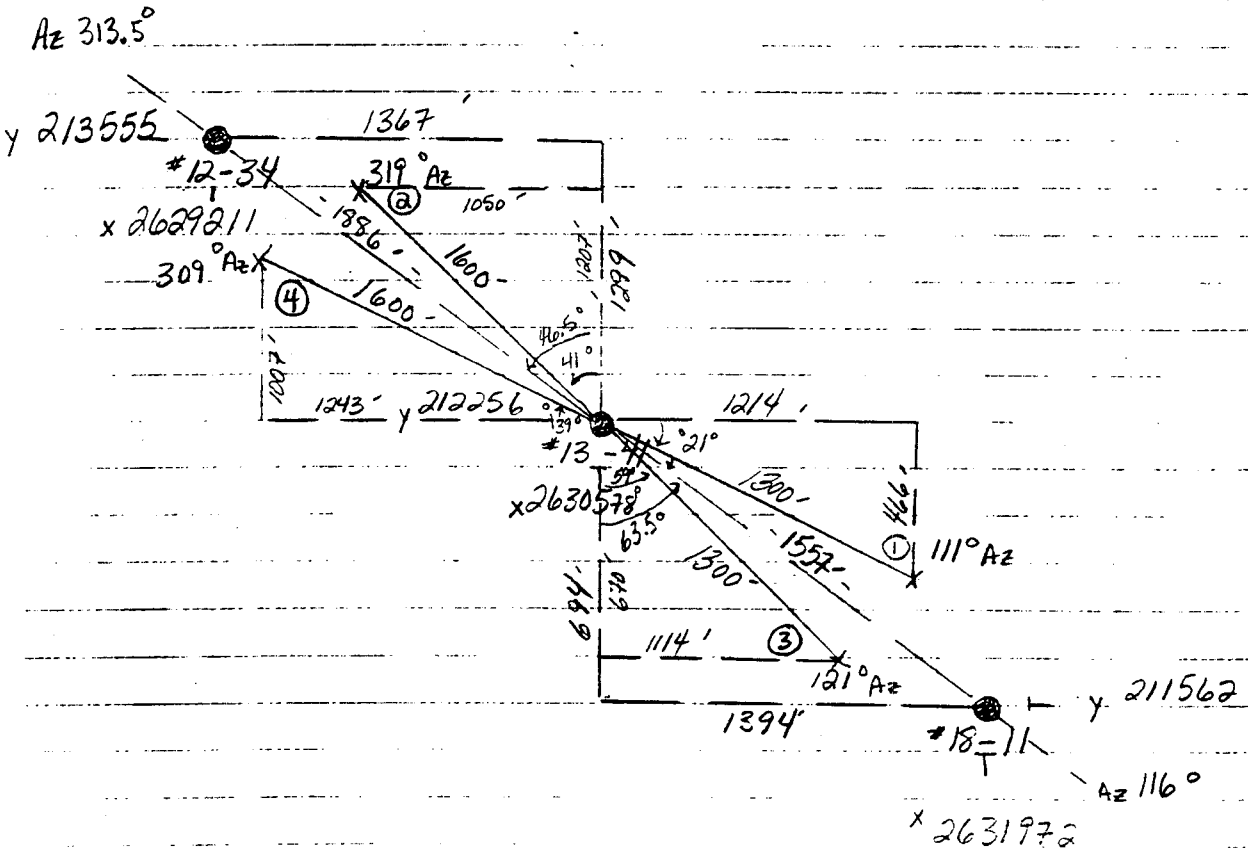
SUBJECT LATERAL RE-ENTRY

JOB OR AUTH. NO.

PAGE

DATE

BY



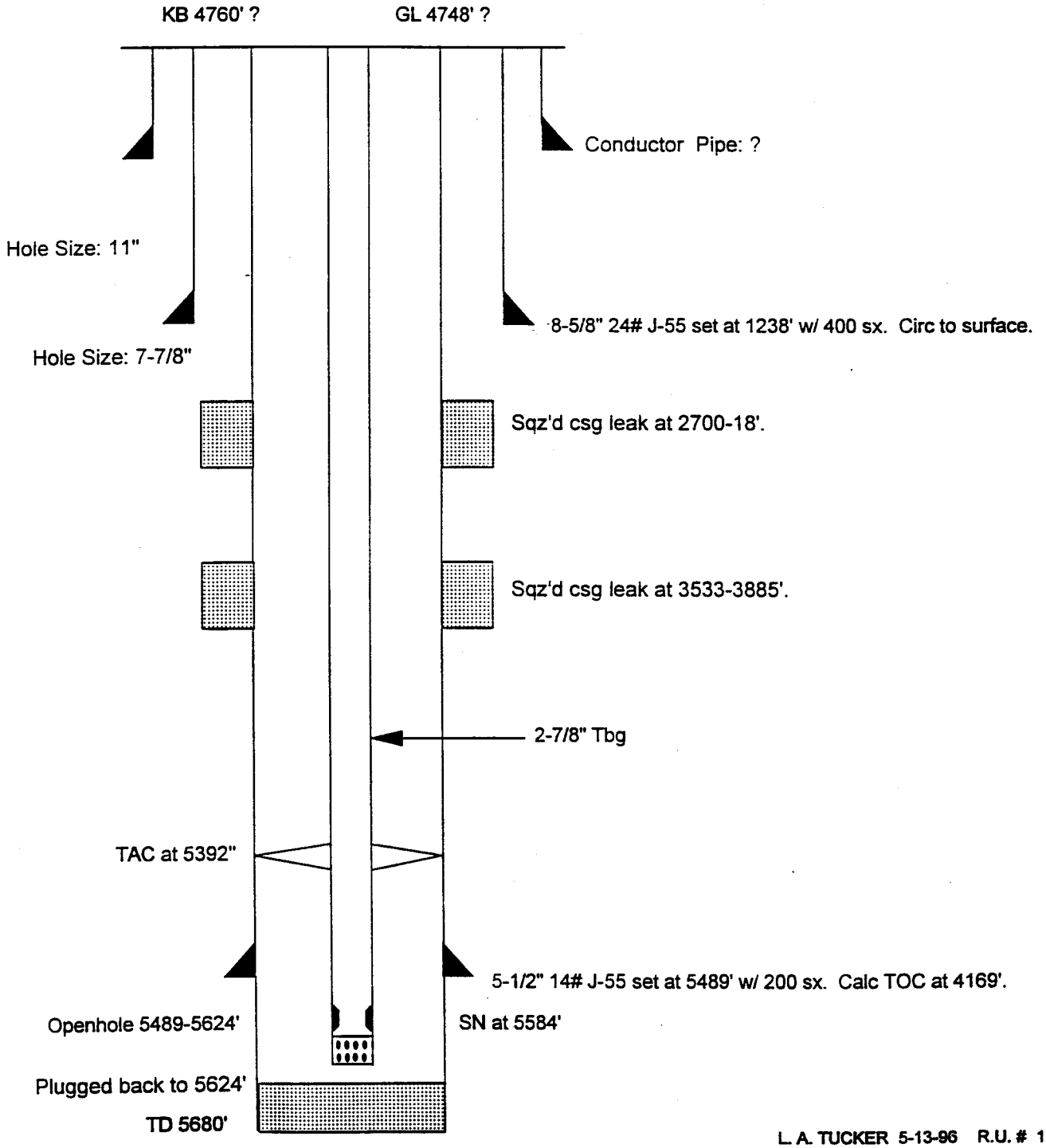
Lateral #	Zone	Landing TVD	DLP °	Hz Disp	Azimuth	Ft N/S	Ft E/W
1	1B	5523	88.7°	1300'	111°	466 S	1214 E
2	1B	5530	90.2°	1600'	319°	1207' N	1050' W
3	1A	5493	88.6°	1300'	121°	670 S	1114 E
4	1A	5495	90.0°	1600'	309°	1007' N	1243' W

RATHERFORD UNIT # 13-41

GREATER ANETH FIELD
660' FEL & 660' FNL
SEC 13-T41S-R23E
SAN JUAN COUNTY, UTAH
API 43-037-15856
PRISM 0043011

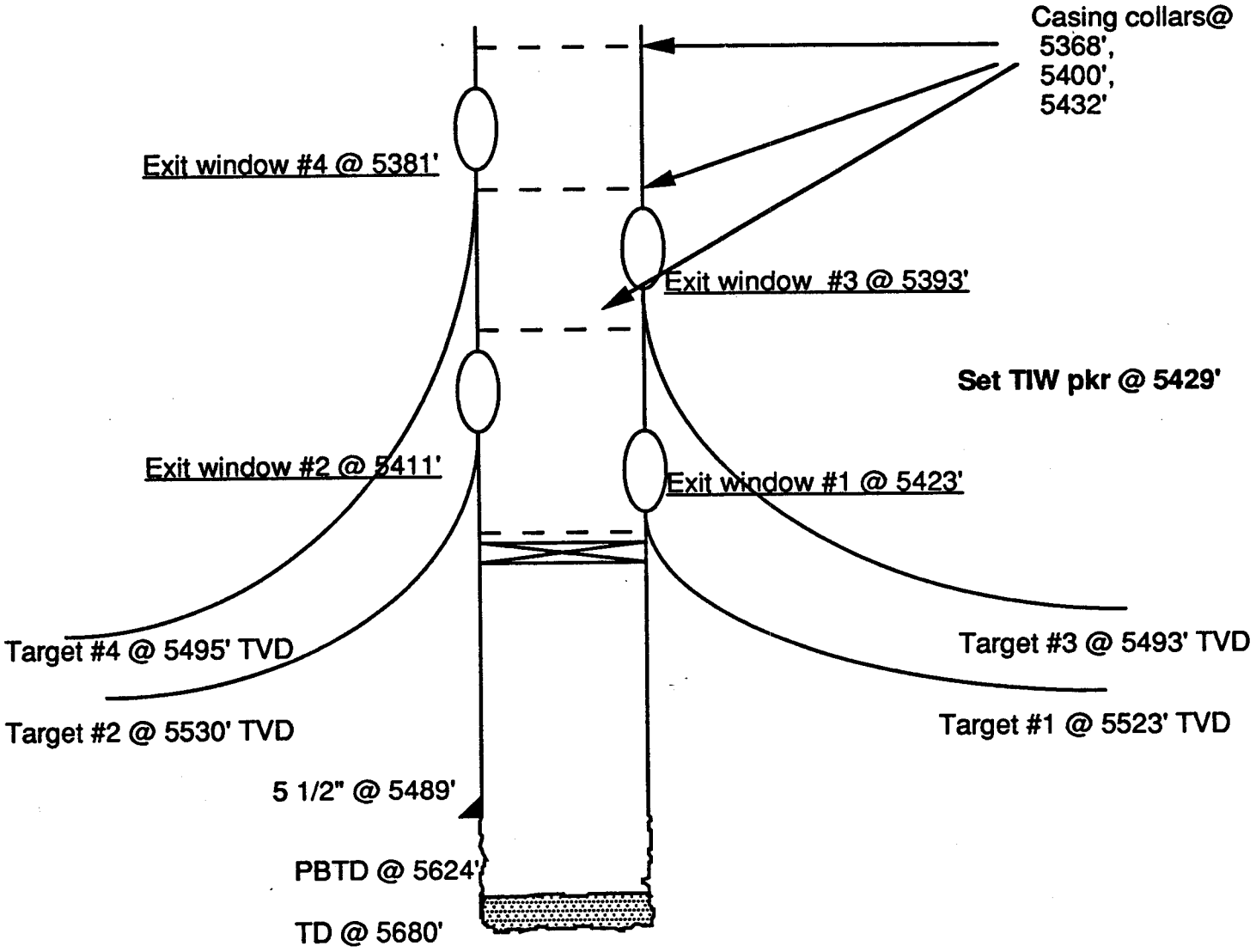
PRODUCER

Capacities:	bbl/ft	gal/ft	cuft/ft
2-7/8" 6.5#	.00579	.2431	.0325
5-1/2" 14#	.0244	1.0249	.1370
2-7/8"x5.5 14#	.0164	.6877	.0919



L. A. TUCKER 5-13-96 R.U. # 13-41

Whipstock plan for Ratherford #13-41



Window	Btm-Top of window	Extension length	Curve radius	Bearing
1	5423-14	-	100	111
2	5411-02	12	119	319
3	5393-84	30	100	121
4	5381-72	42	114	309

*The double spline is 2,42 ft long and the bottom of the whipstock, latch, and debris sub are 5.68 ft long. These lengths must be added to the extension lengths to determine the entire whipstock assembly length.

Ratherford Unit Well #13-41
Multilateral Horizontal Drilling Procedure

The objective of this procedure is to prepare this wellbore for sidetracking, sidetrack the subject well and drill multiple short radius horizontal laterals (1300-1700 ft).

1. Prepare location and dig working pit.

2. MIRU WSU, reverse unit, and H_2S equipment. Bullhead kill weight fluid down tubing.

3. Release packer, and pick up on wellhead to remove. ND wellhead and NU BOP's. Pressure test BOP's.

4. Continue to POH with tubing.

5. TIH with full gauge bit and casing scraper to PBTD. TOH with bit and scraper.

6. Ensure well will circulate, and set RTBP above perfs. **Pressure test casing to 1000 psi.**

7. RDMO WSU.

8. MIRU 24 hr WSU.

9. PU tubing, drill collars, and drill pipe in derrick and run in hole. Then POH and stand back.

10. RU wireline company and run gauge ring for casing down to packer setting depth.

11. Run packer on wireline and set using GR/CCL log to correlate with. RD wireline.

12. PU drillpipe with UBHO sub and latch assembly.

13. Latch into packer. Run gyro and obtain orientation of keyway on packer.

14. POH w/ gyro. POH w/ drill pipe and RIH w/ whipstock oriented on the surface for window azimuth desired.

15. Shear pilot mill bolt and start milling window.

16. POH and PU window mill and watermelon mill to finish window and drill 3 ft of formation.

17. POH w/ mills and RBIH w/ new mills to clean up window.

18. PU drill pipe and directional motors to drill curve. Use the gyro to drill until the inclination dictates that the gyro must be pulled.

19. Pull five stands of drill pipe and run steering tool to finish drilling the curve.

20. POH once curve is finished and PU lateral motor to drill the lateral using MWD.

21. Once lateral TD is reached, POH w/ directional equipment.

22. RIH w/ hook and retrieve whipstock.

23. PU new whipstock with extension in body for next window and orient on surface to desired azimuth.

24. Repeat steps 15-23, for each successive planned lateral.

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
James W. Carter
Division Director

1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801
801-538-5340
801-359-3940 (Fax)
801-538-7223 (TDD)

January 28, 1997

Mobil Exploration & Producing
P.O. Box 633
Midland, Texas 79702

Re: Ratherford Unit 13-41 (Re-entry) Well, 660' FNL, 660' FEL, NE NE, Sec. 13, T. 41 S., R. 23 E., San Juan County, Utah

Gentlemen:

Pursuant to the provisions and requirements of Utah Code Ann. 40-6-1 et seq., Utah Administrative Code R649-3-1 et seq., and the attached Conditions of Approval, approval to re-enter and drill the referenced well is granted.

This approval shall expire one year from the above date unless substantial and continuous operation is underway, or a request for extension is made prior to the expiration date. The API identification number assigned to this well is 43-037-15856.

Sincerely,

R. J. Firth
Associate Director

lwp
Enclosures
cc: San Juan County Assessor
Bureau of Land Management, Moab District Office

Operator: Mobil Exploration & Producing

Well Name & Number: Ratherford Unit 13-41 (Re-entry)

API Number: 43-037-15856

Lease: 14-20-603

Location: NE NE Sec. 13 T. 41 S. R. 23 E.

Conditions of Approval

1. General
   Compliance with the requirements of Utah Admin. R. 649-1 et seq., the Oil and Gas Conservation General Rules, and the applicable terms and provisions of the approved Application for Permit to Drill.

2. Notification Requirements
   Notify the Division within 24 hours following spudding the well or commencing drilling operations. Contact Jimmie Thompson at (801)538-5336.

   Notify the Division prior to commencing operations to plug and abandon the well. Contact Frank Matthews at (801)538-5334 or Mike Hebertson at (801)538-5333.

3. Reporting Requirements
   All required reports, forms and submittals shall be promptly filed with the Division, including but not limited to the Entity Action Form (Form 6), Report of Water Encountered During Drilling (Form 7), Weekly Progress Reports for drilling and completion operations, and Sundry Notices and Reports on Wells requesting approval of change of plans or other operational actions.

4. In accordance with Utah Admin. R. 649-3-11, Directional Drilling, submittal of a complete angular deviation and directional survey report is required.

DIVISION OF OIL, GAS AND MINING

SPUDDING INFORMATION

Name of Company: MOBIL EXPLORATION

Well Name: RATHERFORD UNIT 13-41

Api No. 43-037-15856

Section: 13 Township: 41S Range: 23E County: SAN JUAN

Drilling Contractor BIG "A"

Rig # 25

SPUDDED:

Date 4/6/97

Time

How ROTARY

Drilling will commence

Reported by BENNY BRIGGS

Telephone # 1-801-651-3473

Date: 4/7/97 Signed: JLT

ROCKY MOUNTAIN GEO-ENGINEERING
Well Logging • Consulting Geology • Coal Bed Methane Services • Computerized Logging Equipment & Software
ROCKY MOUNTAIN GEO-ENGINEERING CORP.
2450 INDUSTRIAL BLVD. • GRAND JUNCTION, CO 81505
(970) 243-3044 • (FAX) 241-1085

Thursday, May 01, 1997

RECEIVED
MAY 06 1997
DIV. OF OIL, GAS & MINING

Division of Oil & Gas Mining
State of Utah
355 W. North, Suite 350
Salt Lake City, UT 84180-1203

Re: Ratherford Unit 13-41 Legs 1,2,3, & 4
Sec. 13, T41S, R23E 43 037 15856
San Juan County, Utah

Dear Sirs:

Enclosed is the final computer colored log WITH LOGS for the above referenced well.

We appreciate the opportunity to be of service to you and look forward to working with you again in the near future.

If you have any questions regarding the enclosed data, please contact us.

Sincerely,

Bill Nagel

Bill Nagel
Senior Geologist

BN/dn

Enc. 1 Final Computer Colored Log w/Geology Report

cc Letter Only; Dana Larson; Mobil Oil; Midland, TX

MOBIL

RATHERFORD UNIT #13-41
HORIZONTAL LATERAL LEG #1
UPPER 1-B
POROSITY BENCH DESERT CREEK
SECTION 13, T41S, R23E
SAN JUAN, UTAH

GEOLOGY REPORT
by

DAVE MEADE / MARVIN ROANHORSE
ROCKY MOUNTAIN GEO-ENGINEERING CORP.
GRAND JUNCTION, COLORADO
(970) 243-3044

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WELL SUMMARY

OPERATOR:	MOBIL EXPLORATION & PRODUCTION U.S. INC.
NAME:	RATHERFORD UNIT #13-41 SE UPPER HORIZONTAL LATERAL LEG #1 IN 1-B UPPER POROSITY BENCH, DESERT CREEK
LOCATION:	SECTION 13, T41S, R23E
COUNTY/STATE:	SAN JUAN, UTAH
ELEVATION:	KB:4748' GL:4760'
SPUD DATE:	4/07/97
COMPLETION DATE:	4/11/97
DRILLING ENGINEER:	BENNY BRIGGS
WELLSITE GEOLOGY:	DAVE MEADE / MARVIN ROANHORSE
MUDLOGGING:	
ENGINEERS	DAVE MEADE / MARVIN ROANHORSE
CONTRACTOR:	BIG "A" RIG 25
TOOLPUSHER:	J. DEES / M. SMITH
HOLE SIZE:	4 3/4"
CASING RECORD:	SIDETRACK IN WINDOW AT 5425' MEASURED DEPTH
DRILLING MUD:	M-I
ENGINEER:	DANNE BEASON
MUD TYPE:	OIL EMULSION / POLYMER SWEEPS
DIRECTIONAL DRILLING CO:	SPEERY-SUN
ELECTICAL LOGGING:	NA
TOTAL DEPTH:	6824' MEASURED DEPTH TVD-5541.60'
STATUS:	TOH & PREPARE TO SET WHIPSTOCK #2

DRILLING CHRONOLOGY
RATHERFORD UNIT #13-41
SE UPPER 1-B HORIZONTAL LATERAL LEG # 1

DATE	DEPTH	DAILY	ACTIVITY
4/07/97	5418'	2'	SET BRIDGE PLUG-RUN JUNK BASKET W/WIRELINE-SET PACKER W/ WIRELINE- TIH W/ORIENTATION ASSEMBLY-CIR-RUN GYRO & ORIENT-TOH W/LATCH ASSEMBLY-PICK UP WHIPSTOCK-TIH W/WHIPSTOCK & STARTER MILL-LATCH & SHEAR OFF WHIPSTOCK-MILL 5418'-5420'-CIRC.-TOH-PICK UP WINDOW MILL & WATER MELLEON MILL-TIH
4/08/97	5420'	30'	CIRC.-MILL WINDOW FROM 5418'-5427'-CIRC. & TOOH-PICK UP CURVE ASSEMBLY-TIH-RUN WIRELINE & GYRO-TIME DRLG 5427'-5432'-DRLG & SURVEYS 5432'-5450'
4/09/97	5450'	109'	PULL GYRO - RUN STEERING TOOL-DLRG & DIR. SURVEYS 5450'-5590'-CIRC. OUT SMPLS @ 5590'-LAY DOWN 6 JNTS W/SWIVEL-LAY DOWN 4 JNTS W/ELEVATORS-PULL STEERING TOOL-LAY DOWN 36 JNTS OF 2 7/8" D.P.-TOOH-ADJUST BREAK LINKAGE-TOOH W/D.C. & PH-6 TUBEING-BREAK & LAY DOWN MONEL D.C.,MTR & BIT-PICK UP & MAKE UP LATERAL BHA & TEST-RUN 4 STDS PH-6-PICK UP 40 JNTS PH-6 & TIH W/ LATERAL ASSEMBLY
4/10/97	5590'	727'	TIH W/ LATERAL ASSEMBLY-BREAK CIRC.-WASH 2' TO BTM-SURVEY-DRLG & DIR SURVEYS
4/11/97	6317'	507'	DRLG & DIR SURVEYS- SURVEY & CIRC. OUT SMPLS @ 6824' (TD)-CIRC. & CONDITION HOLE-TOH-LAY DOWN LATERAL ASSEMBLY-PICK UP RETRIEVING HOOK-TIH-HOOK INTO WHIPSTOCK

DAILY ACTIVITY

Operator: MOBIL
Well Name: RATHERFORD UNIT #13-41 SE UPPER 1-B HORIZONTAL LATERAL LEG #1

DATE	DEPTH	DAILY	DATE	DEPTH	DAILY
4/07/97	5418'	2'			
4/08/97	5420'	30'			
4/09/97	5450'	140'			
4/10/97	5590'	727'			
4/11/97	6317'	507'			
TD	6824'	0'			

BIT RECORD

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 SE UPPER 1-B HORIZONTAL LATERAL LEG #1

RUN	SIZE	MAKE	TYPE	IN/OUT	FTG	HRS	FT/HR
#1(RR) BIT	4 3/4"	HTC	STR-30	5427'/ 5590'	163'	17	9.6
#2 BIT	4 3/4"	HTC	STR-30	5590'/ 6824'	1234'	31.5	39.2

Customer ... : Mobil
Platform ... : RATERFORD UNIT
Slot/Well .. : A/13-41, 1A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	GS	EASTINGS FEET	GS	VERTICAL SECTION	DOG LEG
5418	0.3	353	5417.32	52.99	N	10.6	W	-28.89	0
5427	3.1	99	5426.32	52.98	N	10.36	W	-28.66	35.51
5437	7.9	100.1	5436.27	52.81	N	9.42	W	-27.72	48.01
5447	13.2	101.2	5446.09	52.47	N	7.62	W	-25.92	53.04
5457	18.1	102.3	5455.72	51.92	N	4.98	W	-23.26	49.09
5467	23.2	103.4	5465.07	51.13	N	1.54	W	-19.77	51.15
5477	27.4	109.3	5474.12	49.91	N	2.55	E	-15.51	48.94
5487	31.6	111.3	5482.82	48.2	N	7.16	E	-10.59	43.13
5497	36.2	111.8	5491.11	46.15	N	12.35	E	-5.01	46.08
5507	41.2	112	5498.92	43.82	N	18.14	E	1.24	50.02
5517	46.7	111.9	5506.11	41.22	N	24.58	E	8.17	55
5527	52.4	111.6	5512.6	38.41	N	31.65	E	15.78	57.05
5537	58.2	111.2	5518.29	35.41	N	39.3	E	24	58.09
5547	64.1	111.2	5523.11	32.24	N	47.46	E	32.75	59
5557	69.9	112	5527.02	28.85	N	56.01	E	41.95	58.47
5567	76	112.9	5529.95	25.2	N	64.84	E	51.51	61.6
5577	82.5	115.4	5531.81	21.19	N	73.8	E	61.31	69.48
5590	86.6	114.3	5533.05	15.75	N	85.54	E	74.22	32.64
5619	87.9	112.2	5534.44	4.33	N	112.13	E	103.13	8.52
5650.8	88.9	108.8	5535.33	6.82	S	141.94	E	134.95	11.13
5682.7	89.3	108.6	5535.83	17.03	S	172.1	E	166.77	1.4
5714.5	89.6	109.3	5536.13	27.35	S	202.18	E	198.55	2.39
5746.2	89.1	108.3	5536.49	37.58	S	232.23	E	230.27	3.52
5778	89.4	108.6	5536.91	47.63	S	262.34	E	261.99	1.34
5809.8	90	110	5537.08	58.16	S	292.41	E	293.83	4.78
5841.6	92.5	112.3	5536.38	69.61	S	321.99	E	325.55	10.7
5873.3	92.3	112.1	5535.05	81.59	S	351.36	E	357.27	0.89
5905.1	91.2	110.7	5534.08	93.17	S	380.92	E	389.01	5.6
5936.9	91.5	111.8	5533.33	104.69	S	410.54	E	420.79	3.59
5968.7	90.5	111.8	5532.78	116.5	S	440.06	E	452.58	3.14
6000.4	90.7	112.8	5532.45	128.56	S	469.46	E	484.35	3.21
6032.2	91.8	113.9	5531.75	141.15	S	498.63	E	516.1	4.89
6064	91.8	113.4	5530.76	153.88	S	527.7	E	547.8	1.57
6095.7	88.2	112	5530.76	166.13	S	556.99	E	579.53	12.17
6126.7	89.2	112.5	5531.46	177.85	S	585.62	E	610.46	3.61
6157.6	88.5	111.8	5532.08	189.52	S	614.29	E	641.41	3.2
6189.5	89	112.5	5532.77	201.52	S	643.78	E	673.24	2.7
6221.3	89.9	112.8	5533.08	213.77	S	673.13	E	705.03	2.98

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHIN FEET	GS	EASTIN FEET	GS	VERTICAL SECTION	DOG LEG
6252.3	90.6	113.9	5532.94	226.07	S	701.64	E	736.05	4.2
6284.1	89.7	113.7	5532.86	238.92	S	730.75	E	767.83	2.9
6316	88.5	113.2	5533.36	251.61	S	760.01	E	799.7	4.08
6347.8	89.2	113.7	5534	264.23	S	789.1	E	831.38	2.71
6379.5	90.6	113.2	5534.05	276.87	S	818.24	E	863.11	4.68
6411.4	90.4	113	5533.78	289.35	S	847.52	E	894.92	0.89
6442.5	90.2	113	5533.61	301.53	S	876.21	E	926.07	0.64
6474.2	90.1	112.8	5533.53	313.87	S	905.42	E	957.76	0.71
6506.1	90.4	113.7	5533.39	326.45	S	934.7	E	989.61	2.98
6538	88.3	111.6	5533.75	338.72	S	964.1	E	1021.45	9.32
6569.8	88	111.3	5534.78	350.35	S	993.7	E	1053.25	1.33
6601.4	88.7	110.4	5535.69	361.61	S	1023.25	E	1084.88	3.6
6633.3	88.6	109.7	5536.44	372.53	S	1053.19	E	1116.74	2.22
6665	89.3	109.3	5537.02	383.13	S	1083.11	E	1148.47	2.54
6696.8	90.4	109.7	5537.11	393.73	S	1113.06	E	1180.24	3.68
6727.8	89.4	108.6	5537.16	403.89	S	1142.31	E	1211.18	4.8
6759.5	87.8	107.6	5537.94	413.75	S	1172.49	E	1242.89	5.94
6791	86.4	107	5539.53	423.1	S	1202.49	E	1274.24	4.84
6824	86.4	107	5541.6	432.73	S	1233.98	E	1307.1	0

MUD REPORT

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 SE UPPER 1-B HORIZONTAL LATERAL LEG #1

DATE	DEPTH	WT	VIS	PLS	YLD	GEL	PH	WL	CK	CHL	CA	SD	OIL	WTR
4/08/97	5420'	8.0	35	3	7	2/3	11.6	5.4	<1/32	2800	20	–	20%	80%
4/09/97	5493'	8.0	35	3	7	2/3	11.6	5.7	<1/32	2700	20	–	18%	82%
4/10/97	5690'	8.0	34	2	6	1/2	11.6	5.9	<1/32	2600	20	–	19%	81%
4/11/97	6824'	8.0	33	2	3	1/3	11.6	5.4	<1/32	12000	200	–	20%	80%

SAMPLE DESCRIPTIONS

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 SE UPPER 1-B HORIZONTAL LATERAL LEG #1

DEPTH	LITHOLOGY

5430.00 5440.00 "LS ltgybrn,brn,occ dkbrn,micxl-micsuc,crpxl,rthy,sl slty,sl chky,occ v sl-sl dol ip,scat dkbrn CHT,decr var col SH cvgs,NFSOC"

5440.00 5450.00 "LS incr brn-dkbrn,ltbrngy-ltgy,crpxl-micxl,micsuc-vfxl,rthy,occ dol ip,v sl shy-sl slty ip,scat dkbrn CHT,tr scat vari col SH cvgs,NFSOC"

5450.00 5460.00 "DOL wh-crm,tan-dkbrn,crpxl-micxl,slty-v slty,occ grdg to dol SLTST,mrly,arg,tt,NFSOC,w/v thn ANHY fl frac,scat crm-tan crpxl dol LS incl tt NFSOC,decr vari col SH cvgs"

5460.00 5470.00 "DOL AA,incr dkbrn CHT frag,decr vari col SH cvgs,tr LS AA"

5470.00 5480.00 "DOL crm-tan,occ wh-brn,crpxl-micxl,sl slty,occ v slty,chk,arg ip,scat dkbrn CHT frag,occ ANHY fl frac,sl lmy,rr crm crpxl arg LS incl,v rr vari col SH incl,tt,NFSOC"

5480.00 5490.00 "SH blk-dkgybrn,sbblky,rthy,dol-sl calc,mica,carb-sooty,w/v thn dkbn-brn-crm,micxl-crpxl,arg tt DOL & crm-tan-wh,crpxl,arg,tt LS,NFSOC"

5490.00 5500.00 "SH AA,w/crm-tan-gybrn crpxl-micxl,slty,sl dol LS,tt-v rr intxl POR,n vis STN,n-v p slow dif CUT & ltgybrn-gy crpxl-micxl arg-slty lmy DOL NFSOC"

5500.00 5510.00 "DOL crm-tan,ltbrn,occ wh,crpxl-micxl,rthy-cln,v sl alg,v rr gran,occ chk,tt-rr intxl-alg POR,tr dull yel FLOR,rr spty brn STN,tr slow-mod fast CUT,w/tr SH-LS AA,NFSOC"

5510.00 5520.00 "DOL AA,pred tt-v sl alg DOL PKST,w/intbd & grdg to alg DOL GRNST,tt-fr intxl-tr alg POR,fr dull yel FLOR,tr-fr ltbrn STN,tr-fr slow-mod fast stmg CUT,w/tr blk carb SH cvgs"

5520.00 5530.00 "DOL AA,incr DOL PKST,w/LS rich cmt & scat brn CHT frag,decr POR-FLOR-STN-CUT"

5530.00 5540.00 "DOL AA,POR-FLOR-STN-CUT AA,w/intbd tan-crm,crpxl-micxl,sl alg,dol LS,tt-tr intxl-alg POR,rr-tr bri yel FLOR,tr ltbrn STN,tr-fr slow stmg-slow dif CUT & scat CHT frag"

5540.00 5550.00 "INTBD LS w/DOL rich cmt & DOL w/LS rich cmt AA,POR-FLOR-STN-CUT AA"

5550.00 5560.00 "DOL lt-mbrn,brn,crpxl-micxl,rthy-chk,occ cln,lmy-LS rich cmt,abnt mic fos,alg,chty-scat mot CHT frag,tt-tr intxl-alg POR,tr dull yel FLOR,tr ltbrn-blk STN,tr fr slow-mod fast CUT,w/intbd ltbrn-crm alg LS AA"

5560.00 5570.00 "DOL AA,pred DOL GRNST w/fr-g intxl-alg POR,tr-fr ltbrn-rr blk STN,fr slow-mod fast CUT, & intbd LS crm-tan,ltbrn,micxl,occ crpxl,DOL rich cmt,tr intxl-rr alg POR,tr ltbrn-blk STN,fr CUT"

5570.00 5580.00 "DOL AA,incr DOL & LS PKST,decr POR-FLOR-STN-CUT"

DEPTH	LITHOLOGY

5580.00 5590.00 "DOL ltbrn-brn,micxl-vfxl,occ crpxl,rthy-cln,occ chk,w/LS rich cmt & tt LS PKST incl,sl alg,v rr CHT frag,tr intxl-rr alg POR,tr-fr dull yel FLOR,tr scat ltbrn-rr spty blk STN,tr slow-mod fast CUT"

5590.00 5610.00 "ABNT VARI COL SH CVGS P SPLS"

5590.00 5610.00 "DOL ltbrn-brn,occ crm-tan,crpxl-micxl,occ vfxl,v sl gran,occ alg,occ LS rich cmt,rr mic fos,rr ANHY xl-incl,tt-fr intxl-rr alg POR,tr spty dull yel FLOR,scat rr ltbrn STN,rr fr slow-mod fast stmg CUT"

5610.00 5620.00 "DECR VARI COL SH CVGS FR SPL"

5610.00 5620.00 "DOL AA,POR-FLOR-STN-CUT AA,w/tr intbd crm-tan,micxl-crpxl,dol,LS PKST,tt-v rr intxl POR,n-v rr spty FLOR,n-v rr ltbrn STN,v p slow dif CUT"

5620.00 5630.00 "DOL tan-brn,occ mbrn,micxl-crpxl,rr vfxl,gran ip,sl alg,v rr mic fos,anhy ip,w/LS rich cmt,pred DOL PKST,tt-tr intxl-alg POR,tr-fr dull yel FLOR,rr spty brn STN,tr slow-mod fast CUT,w/thn crm-tan intbd LS PKST"

5630.00 5640.00 "DOL & LS AA,POR-FLOR-STN-CUT AA"

5640.00 5650.00 "DOL tan-brn,mbrn ip,AA,incr DOL GRNST,w/ LS rich cmt ip,fr intxl-rr alg POR,fr dull yel FLOR,tr-fr ltbrn STN,fr slow-mod fast stmg CUT,scat ltbrn-gybrn CHT frag, & crm-tan,crpxl-micxl LS PKST,tt-v rr intxl POR,rr bri yel FLOR,n-v rr STN,p slow dir CUT"

5650.00 5660.00 "DOL & LS AA,POR-FLOR-STN-CUT AA"

5660.00 5670.00 "DOL AA,v LS rich cmt,POR-FLOR-STN-CUT AA,w/LS crm-tan,occ brn,crpxl-micxl,v rr gran,pred alg LS PKST,v sl anhy,DOL rich cmt,tt-rr intxl-v rr alg POR,rr spty bri yel FLOR,n-rr spty ltbrn STN,tr fr mod fast stmg CUT"

5670.00 5680.00 "INCR LS PKST AA,rr scat CHT frag,w/DOL tan-brn,crpxl-vfxl,gran ip,pred alg DOL PKST,w/tr DOL GRNST,anhy ip,occ LS rich cmt,fr intxl-alg POR,fr dull yel FLOR,tr-fr ltbrn-v rr blk STN,fr slow-mod fast stmg CUT"

5680.00 5690.00 "INTBD alg LS & DOL PKST,occ GRNST,AA"

5690.00 5700.00 "DOL tan-brn,occ gybrn,crpxl-vfxl,gran ip,occ alg,intbd DOL PKST & GRNST,v sl anhy,rr mic fos,tt-fr intxl-alg POR,tr-fr dull yel FLOR,tr ltbrn-blk STN,fr slow-mod fast stmg CUT,w/scat sl alg LS PKST & GRNST POR-FLOR-STN-CUT AA"

5700.00 5710.00 "INCR ALG LS PKST & GRNST tan-ltbrn,crm-wh,crpxl-vfxl,rthy,anhy,dol-DOL rich cmt,tr-fr intxl-alg POR,tr-fr dull-bri yel FLOR,tr ltbrn-v rr blk STN,fr slow-fast stmg CUT W/DOL AA"

5710.00 5720.00 "LS AA,w/intbd LS rich cmt in DOL AA"

5720.00 5730.00 "LS crm-tan-brn,occ gybrn,crpxl-vfxl,gran,micsuc ip,alg,w/DOL rich cmt,v sl anhy-r r xl-incl,v rr mic fos,tr-fr intxl-alg POR,fr-g dull-bri yel FLOR,fr ltbrn-v rr blk STN,tr-fr slow-mod fast stmg CUT,W/intbd DOL PKST & GRNST AA,POR-FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

5730.00 5740.00 "DOL ltbrn-brn,occ dkbrn-gybrn,crpxl-vfxl,gran ip,occ alg,sl suc,pred DOL GRNST,w/occ DOL PKST,occ LS rich cmt,tr-fr intxl-alg POR,fr dull yel FLOR,tr ltbrn-brn,occ blk STN,fr slow-mod fast CUT,w/intbd alg LS PKST & GRNST AA"

5740.00 5760.00 "LS ltbrn-brn,occ tan,gybrn-mbrn ip,micxl-vfxl,gran,suc-micsuc,occ LS PKST,alg,w/DOL rich cmt,occ v thn DOL PKST-GRNST incl,sl anhy,v rr CHT frag,mic fos,fr-g intxl-alg POR,fr-g bri-dull yel FLOR,fr-g lt-dkbrn-rr blk STN,fr slow-mod fast stmg CUT"

5760.00 5770.00 "LS AA,pred LS GRNST,w/DOL rich cmt,& thn DOL GRNST-PKST incl,AA"

5770.00 5780.00 "LS brn-mbrn,occ ltbrn-gybrn,occ tan,crpxl-vfxl,gran,micsuc-suc,alg,occ LS PKST incl,w/tr DOL rich cmt-DOL PKST-GRNST incl,v sl anhy,rr mic fos,fr-g intxl-alg POR,fr-g dull-bri yel FLOR,fr-g brn STN,occ blk dd o STN,fr-g slow-fast stmg CUT"

5780.00 5790.00 "LS AA,occ Ost fos,v rr oolicastic,incr brn-mbrn gybrn micxl sl gran-alg DOL PKST & GRNST incl-DOL incl-DOL rich cmt,w/occ fr intxl-alg POR,dull yel FLOR,scat brn-blk STN,tr slow-mod fast stmg CUT in DOL"

5790.00 5800.00 "LS lt-mbrn,occ dkbrn-tan,micxl-vfxl,gran,suc ip,alg,sl anhy,scat mic fos,w/tr DOL incl AA-DOL rich cmt,fr-g intxl-alg POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-blk STN,fr-g slow-mod fast CUT"

5800.00 5810.00 "LS AA,w/incr DOL ltbrn-mbrn,occ dkbrn,micxl-vfxl,crpxl ip,gran-micsuc,suc ip,rthy,alg,abnt LS rich cmt,v sl mic fos,alg,pred DOL GRNST,occ DOL PKST,tr-g intxl-alg POR,fr-g dull yel FLOR,tr-g lt-mbrn STN,occ blk dd o STN,fr slow-mod fast CUT"

5810.00 5820.00 "LS AA,pred alg GRNST,occ PKST,w/POR-FLOR-STN-CUT AA,occ scat v lmy DOL AA"

5820.00 5830.00 "LS lt-dkbrn,occ tan,micxl-vfxl,occ crpxl,gran-micsuc,suc ip,alg,pred LS GRNST,occ LS PKST,w/DOL rich cmt,occ scat DOL GRNST-PKST incl,rr mic fos,fr-g intxl-fr alg POR,fr-g dull-bri yel FLOR,fr-g brn-v rr blk STN,fr-g slow-mod fast CUT"

5830.00 5840.00 "LS AA,v rr oolicatic,pred LS GRNST,w/DOL rich cmt,& thn DOL GRNST-PKST incl,AA"

5840.00 5850.00 "LS lt-mbrn,occ dkbrn-tan,micxl-vfxl,gran,suc ip,alg,sl anhy,scat mic fos,w/tr DOL incl AA-DOL rich cmt,fr-g intxl-alg POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-blk STN,fr-g slow-mod fast CUT"

5850.00 5860.00 "LS AA,sl anhy,POR-FLOR-STN-CUT AA,w/incr tan-brn,crpxl-vfxl,micsuc,sl alg,DOL GRNST-occ scat DOL PKST,LS rich cmt,tr intxl-v sl alg POR,tr dull yel FLOR,tr spty ltbrn-blk STN,fr slow-mod fast CUT"

5860.00 5870.00 "LS lt-mbrn,occ dkbrn-tan,micxl-vfxl,gran,suc ip,alg,sl anhy,scat mic fos,w/tr DOL incl AA-DOL rich cmt,fr-g intxl-alg POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-blk STN,fr-g slow-mod fast CUT"

5870.00 5880.00 "LS AA,v rr oolicatic,pred LS GRNST,w/DOL rich cmt,& thn DOL GRNST-PKST incl,AA"

5880.00 5900.00 "LS lt-dkbrn,occ crm,crpxl-vfxl,gran,alg,occ micsuc-suc,rthy,w/scat sl alg DOL GRNST & PKST,occ DOL rich cmt,rr ANHY xl-incl,rr mic fos,fr-g intxl-tr alg POR,fr-g dull-bri yel FLOR,fr-g lt-dkbrn STN,occ blk dd o STN,fr-g slow-fast stmg CUT"

DEPTH	LITHOLOGY

5900.00 5910.00 "LS lt-dkbrn,occ ltgybrn,crm,crpxl-vfxl,gran,alg,occ micsuc-suc,rthy,w/scat sl alg DOL GRNST & PKST,occ DOL rich cmt,rr ANHY xl-incl,rr mic fos,fr-g intxl-tr alg-ooc POR,fr-g dull-bri yel FLOR,fr-g lt-dkbrn STN,occ blk dd o STN,fr-g slow-fast stmg CUT"

5910.00 5920.00 "LS AA,pred LS GRNST,w/DOL rich cmt,& thn DOL GRNST-PKST incl,POR-FLOR-STN-CUT AA"

5920.00 5930.00 "LS AA,crpxl-vfxl-micsuc,gran,alg,occ suc,rthy,w/scat sl alg DOL GRNST & PKST,occ DOL rich cmt,rr ANHY xl-incl,rr mic fos,fr-g intxl-tr alg-ooc POR,fr-g dull-bri yel FLOR,fr-g lt-dkbrn STN,occ blk dd o STN,fr-g slow-fast stmg CUT"

5930.00 5940.00 "LS AA,pred LS GRNST,w/DOL rich cmt,& thn DOL GRNST-PKST incl,POR-FLOR-STN-CUT AA"

5940.00 5950.00 "LS lt-dkbrn-brn,occ ltgybrn,crm,vfxl-micsuc,crpxl-gran,alg-ooc,rthy,w/scat sl alg DOL GRNST & PKST,occ DOL rich cmt,rr ANHY xl-incl,rr mic fos,g intxl/alg POR,fr-g dull-bri yel FLOR,fr-g lt-dkbrn/occ blk dd o STN,g slow-fast stmg CUT"

5950.00 5970.00 "LS brn-lt-dkbrn,occ crm,vfxl-micsuc,agl-ooc,gran-crpxl,rthy,w/scat sl alg DOL GRNST & PKST,occ DOL rich cmt,vrr ANHY xl-incl,rr mic fos,g intxl/alg-ooc POR,fr-g dull-bri yel FLOR,g lt-dkbrn/occ blk dd o STN,g fast stmg-blooming CUT"

5970.00 5990.00 "LS brn-lt-dkbrn,occ crm,vfxl-micsuc,ooc-agl,crpxl-gran,rthy,w/scat sl alg DOL GRNST & PKST,occ DOL rich cmt,vrr ANHY xl-incl,rr mic fos,g intxl/alg-ooc POR,g even dull-bri yel FLOR,g lt-dkbrn/occ blk dd o STN,g slow-fast stmg CUT"

5990.00 6000.00 "LS AA,pred LS GRNST,w/DOL rich cmt,& thn DOL GRNST-PKST incl,POR-FLOR-STN-CUT AA"

6000.00 6010.00 "LS brn-lt-dkbrn,occ crm,agl-ooc-vfxl-micsuc,crpxl-gran,rthy,ool,w/scat sl alg DOL GRNST & PKST,occ DOL rich cmt,tr ANHY incl-POR fl,tr mic fos,fr-g ooc-agl-intxl POR,g even dull-bri yel FLOR,g lt-dkbrn/incr blk dd o STN,g fast stmg-blooming CUT"

6010.00 6020.00 "LS AA,pred ool-occ agl LS GRNST,w/occ DOL rich cmt & thn DOL GRNST-PKST incl,POR-FLOR-STN-CUT AA"

6020.00 6030.00 "LS brn-lt-dkbrn,occ crm,ooc-agl,vfxl-micsuc,crpxl-gran,rthy,w/tr scat sl alg DOL GRNST & PKST,occ DOL rich cmt,tr ANHY incl-POR fl,rr mic fos,fr-g agl-ooc-intxl POR,g even dull-bri yel FLOR,g lt-dkbrn/incr blk dd o STN,g fast stmg-blooming CUT"

6030.00 6040.00 "LS AA,pred ooc LS/intbd GRNST,w/DOL rich cmt & rr thn DOL GRNST-PKST incl,POR-FLOR-STN-CUT AA"

6040.00 6050.00 "LS AA,ooc-vfxl-micsuc,agl-crpxl-gran,occ DOL rich cmt,tr trnsl-wh sil-chty ool frag,vrr ANHY AA,tr ool fos,g ooc-agl/intxl POR,g even dull-bri yel FLOR,g lt-dkbrn/incr blk dd o STN,g fast stmg-blooming CUT"

DEPTH	LITHOLOGY

6050.00 6060.00 "LS brn-lt-dkbrn,ooc-vfxl-micsuc,agl-crpxl-gran,occ DOL rich cmt,rr ANHY incl-POR fl,rr mic fos,fr-g agl-ooc-intxl POR,g even dull-bri yel FLOR,g lt-dkbrn/incr blk dd o STN,g fast stmg-blooming CUT"

6060.00 6070.00 "LS AA,pred ooc LS/intbd GRNST,w/DOL rich cmt,rr sil-chty frag AA,POR-FLOR-STN-CUT AA"

6070.00 6080.00 "LS brn-lt-dkbrn,occ crm,ooc-agl,vfxl-micsuc,crpxl-gran,rthy,w/scat sil-chty frag/rr ool incl,occ DOL rich cmt,rr ANHY incl-POR fl,tr ool fos,g ooc-agl/intxl POR,g even dull-bri yel FLOR,g lt-dkbrn/blk dd o STN,g fast stmg-blooming CUT"

6080.00 6090.00 "LS AA,pred ooc LS,tr scat sil-chty frag/ool fos incl,rr trnsl-clr xln ANHY,occ sl dol ip/tr DOL cmt,g ooc-agl-tr intxl POR,g even dull-mod bri yel FLOR,g ltbrn-brn/occ dkbrn STN,tr blk dd o STN,g mod fast-fast strmg CUT"

6090.00 6100.00 "LS AA,incr amt scat trnsl-wh sil-chty frag/ool fos incl,rr scat bf-tan CHT,rr ANHY AA,POR-FLOR-STN-CUT AA"

6100.00 6110.00 "LS brn-ltbrn,occ dkbrn,ooc-vfxl-micsuc,occ agl-crpxl-gran,occ v sl dol ip,tr sil-CHT AA,rr trnsl-clr ANHY frag,rr mic fos & ool,g ooc/tr agl-intxl POR,g even dull-bri yel FLOR,g lt-dkbrn/rr blk dd o STN,g fast stmg-blooming CUT"

6110.00 6120.00 "LS AA,tr scat sil-chty frag/ool fos incl,rr trnsl-clr xln ANHY,occ sl dol ip/tr DOL cmt,g ooc-agl/tr intxl POR,g even dull bri yel FLOR,g ltbrn-brn/occ dkbrn STN,g mod fast-fast strmg CUT"

6120.00 6130.00 "LS AA,incr amt scat trnsl-wh sil-chty frag/ool fos incl,rr scat bf-tan CHT,rr ANHY AA,POR-FLOR-STN-CUT AA"

6130.00 6140.00 "LS brn-ltbrn,occ dkbrn,ooc-vfxl-micsuc,occ agl-crpxl-gran,occ v sl dol ip,rr trnsl-clr ANHY frag,rr mic fos & ool,g ooc/tr agl-intxl POR,g even dull-bri yel FLOR,g lt-dkbrn/tr blk dd o STN,g blooming-fast stmg CUT"

6140.00 6150.00 "LS AA,pred ooc LS/intbd GRNST,w/DOL rich cmt & rr thn DOL GRNST-PKST incl,POR-FLOR-STN AA/occ blk dd o STN,CUT AA"

6150.00 6160.00 "LS AA,tr scat sil-chty frag/ool fos incl,rr trnsl-clr xln ANHY,occ sl dol ip/tr DOL cmt,g ooc-agl/tr intxl POR,g even dull bri yel FLOR,g brn-dkbrn/occ blk dd o STN,g blooming-fast strmg CUT"

6160.00 6170.00 "LS brn-lt-dkbrn,ooc-agl,vfxl-micsuc,occ crpxl-gran,rthy,tr CHT AA,rr DOL GRNST & PKST-grdg to dol LS,rr ANHY AA,tr mic fos & ool,rr OST fos,g ooc-agl/intxl POR,g even dull-mod bri yel FLOR,g brn-ltbrn/incr blk dd o STN,g blooming-fast strmg CUT"

6170.00 6180.00 "LS AA,rr scat sil-CHT frag/ool fos incl,vrr trnsl-clr xln ANHY,occ sl dol ip/tr DOL cmt,g ooc-agl/tr intxl POR,g even dull yel FLOR,g ltbrn-dkbrn/tr blk dd o STN,g slow-mod fast strmg CUT"

6180.00 6190.00 "LS AA,pred ooc LS/intbd GRNST w/DOL rich cmt & rr thn intbd DOL GRNST-PKST incl,grdg to lmy DOL,rr ANHY AA,POR-FLOR-STN AA/occ blk dd o STN,CUT AA"

6190.00 6200.00 "LS AA,w/ decr amt DOL GRNST & PCKST,POR-FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

6200.00 6210.00 "LS brn-ltbrn,occ dkbrn,ooc-vfxl-micsuc,occ agl-crpxl-gran,occ v sl dol ip,tr trnsl-clr ANHY frag,tr mic fos & ool,g ooc/tr agl-intxl POR,g even dull yel FLOR,g lt-dkbrn/tr blk dd o STN,g blooming-fast stmg CUT"

6210.00 6220.00 "LS brn-lt-dkbrn,ooc-agl,vfxl-micsuc,occ crpxl-gran,rthy,tr CHT AA,tr DOL GRNST & PKST/occ lmy cmt-grdg to lmy DOL,rr ANHY AA,tr mic fos & ool,g ooc-agl/intxl POR,g even dull-mod bri yel FLOR,g brn-ltbrn/incr blk dd o STN,g blooming-fast strmg CUT"

6220.00 6230.00 "LS AA,tr scat sil-CHT frag/ool fos incl,vrr trnsl-clr xln ANHY,occ sl dol ip/tr DOL cmt,g ooc-agl/tr intxl POR,g even dull yel FLOR,g brn-dkbrn/occ blk dd o STN,g blooming-fast strmg CUT"

6230.00 6240.00 "LS AA,w/ decr amt DOL GRNST & PCKST,POR-FLOR-STN-CUT AA"

6240.00 6250.00 "LS brn-ltbrn,occ dkbrn,ooc-vfxl-micsuc,occ agl-crpxl-gran,occ v sl dol ip,tr mic fos & ool,g ooc/tr agl-intxl POR,g even dull yel FLOR,g brn-dkbrn/incr blk dd o STN,g blooming-fast stmg CUT"

6250.00 6260.00 "LS brn,occ lt-dkbrn,ooc,agl-vfxl,micsuc,occ crpxl-gran,rthy,tr CHT AA,rr DOL GRNST & PKST/occ lmy cmt-grdg to lmy DOL,tr mic fos & ool,g ooc-agl/intxl POR,g even dull yel FLOR,g brn/occ blk dd o STN,g blooming-fast strmg CUT"

6260.00 6270.00 "LS AA,pred ool-occ agl LS GRNST,rr DOL cmt & vrr thn DOL GRNST-PKST grdg to lmy DOL,tr scat CHT AA,POR-FLOR-STN-CUT AA"

6270.00 6280.00 "LS AA,tr scat sil-CHT frag/ool fos incl,rr trnsl-clr xln ANHY,occ sl dol ip/tr DOL cmt,g ooc-agl/tr intxl POR,g even dull yel FLOR,g brn-dkbrn/occ blk dd o STN,g mod fast strmg CUT"

6280.00 6290.00 "LS brn,occ lt-dkbrn,ooc,agl-vfxl,micsuc,occ crpxl-gran,rthy,tr CHT AA,rr DOL GRNST & PKST/occ lmy cmt-grdg to lmy DOL,tr mic fos & ool,rr trnsl xln ANHY,g ooc-agl/intxl POR,g even dull yel FLOR,g brn/occ blk dd o STN,g mod fast strmg CUT"

6290.00 6300.00 "LS AA,POR-FLOR-STN-CUT AA"

6300.00 6310.00 "LS AA,pred ool-occ agl LS GRNST,rr DOL cmt & vrr thn DOL GRNST-PKST grdg to dol LS,tr scat CHT AA,POR-FLOR-STN-CUT AA"

6310.00 6320.00 "LS AA,tr scat sil-CHT frag/ool fos incl,rr trnsl-clr xln ANHY,occ sl dol ip/tr DOL cmt,g ooc-agl/tr intxl POR,g even dull yel FLOR,g brn-dkbrn/occ blk dd o STN,g mod fast strmg CUT"

6320.00 6330.00 "LS AA,pred ool-occ agl LS GRNST,rr DOL cmt & vrr thn DOL GRNST-PKST grdg to lmy DOL,tr scat CHT AA,POR-FLOR-STN-CUT AA"

6330.00 6340.00 "LS AA,tr scat sil-CHT frag/ool fos incl,vrr trnsl-clr xln ANHY,occ sl dol ip/tr DOL cmt,g ooc-agl/tr intxl POR,g even dull yel FLOR,g brn-dkbrn/occ blk dd o STN,g fast strmg CUT"

6340.00 6350.00 "LS brn,occ lt-dkbrn,ooc,agl-vfxl,micsuc,occ crpxl-gran,rthy,tr CHT AA,rr DOL GRNST & PKST/occ lmy cmt-grdg to dol LS,tr mic fos & ool,rr trnsl xln ANHY,g ooc-agl/intxl POR,g even dull yel FLOR,g brn/occ blk dd o STN,g mod fast strmg CUT"

6350.00 6360.00 "LS AA,POR-FLOR-STN-CUT AA"

FORMATION TOPS

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 SE UPPER 1-B HORIZONTAL LATERAL LEG #1

FORMATION NAME		SAMPLES MEASURED DEPTH	SAMPLES TRUE VERTICAL DEPTH	DATUM KB:4760
LOWER ISMAY		5451'	5450'	-690'
GOTHIC SHALE		5476'	5472'	-712'
DESERT CREEK		5492'	5487'	-727'
DC 1-A		5498'	5492'	-732'
DC 1-B		5549'	5524'	-764'

GEOLOGICAL SUMMARY

AND

ZONES OF INTEREST

The Mobil Exploration and Production U.S. Inc., Ratherford Unit #13-41 Horizontal Leg #1, Section 13, T41S, R23E, was a re-entry of the Mobil Ratherford Unit #13-41, a sidetrack in a southeasterly direction from 5427' measured depth, 5426' true vertical depth, on March 7, 1997. Leg #1 reached a measured depth of 6824', true vertical depth of 5541.6' at total depth, horizontal displacement of 1307' and true vertical plane 107 degrees, on April 11, 1997. The lateral was drilled with no problems. Since this well used live oil in an emulation while drilling, the background gases noted on the accompanying mud log remained high, as well as the samples being contaminated to a certain extent with live oil through out the well. Also the well did make a minor amount of oil from the formation while drilling the lateral section.

The primary objective of the Ratherford Unit #13-41 Horizontal Lateral Leg #1 was the upper 1-B Porosity Bench, to identify and define the porosity benches, their effective porosity, staining and reservoir properties in the Desert Creek Member of the Upper Paradox Formation.

The Lower Ismay, Gothic Shale, the transition zone at the top of the Desert Creek, and the 1-A zone were encountered while drilling Leg #1. Kick off point for this lateral was in the lower 1/3 of the Upper Ismay Member. The base of the Upper Ismay was very poorly represented in the samples due to the abundance of Permian Cutler shale in the first several samples. The Upper Ismay seen in the samples was predominately white to cream, occasionally tan, cryptocrystalline to microcrystalline, chalky, cherty, fossiliferous limestone, occasionally grading to or having interbedded very thin, very argillaceous, brown to gray brown, microcrystalline to microsucrosic dolomite. The dolomite graded into the very thin, carbonaceous, dolomitic shale of the Hovenweep.

The top of the Lower Ismay was picked at 5451' measured depth, 5450' true vertical depth, at the base of the very thin Hovenweep shale. The Lower Ismay was a cream to tan, some light gray-brown to dark brown, cryptocrystalline to microcrystalline, chalky to clean, slightly limy, occasionally anhydritic with some anhydrite filled fractures, slightly cherty dolomite with a trace of scattered micro fossils, occasionally marly to very marly, no to rare intercrystalline to fractured porosity, with no to very rare spotty dull yellow fluorescence, none to very rare light brown stain, and only a trace of very poor slow diffuse cut. There was very thin interbedded limestone, which were white to cream, occasionally tan, cryptocrystalline, occasionally microcrystalline, dolomitic, anhydritic, argillaceous, slightly silty to very silty, very tight, with no visible porosity, fluorescence, and stain or cut. In the base of the Lower Ismay, the dolomites and limestone became increasingly argillaceous and graded into the Gothic Shale. These basal dolomites and very thin limestones had no to very rare spotty intercrystalline, fluorescence, stain, and cut.

The top of the Gothic Shale is at 5476' measured depth, 5472' true vertical depth. The Gothic Shale was predominantly dark gray to black, silty, carbonaceous, brittle to firm, subblocky to blocky to platy, calcareous to slightly dolomitic and slightly micaceous. The top of the Gothic was gradational from the very thin interbedding of very argillaceous, carbonaceous limestone and very argillaceous, limy dolomite, with the dolomite grading into very dolomitic, carbonaceous shale. The top of the Gothic was picked predominantly by the decrease in penetration rate and the increased percentage of shale in the samples.

Between the Gothic Shale and Desert Creek Porosity Members is a transitional zone, which appears to be gradational. The top of the Desert Creek is commonly picked at the Gothic Shale to transition zone facies change, which in this well occurred at a measured depth of 5492' and a true vertical depth of 5487'. In this well, the zone was predominantly a very limy and very silty dolomite. The dolomite was gray to gray brown, cryptocrystalline to microcrystalline, with some dolomitic marlstone, very slightly sandy, with thinly interbedded limestone which was cream to light gray brown, cryptocrystalline to rarely microcrystalline, slightly dolomitic and occasionally silty to very silty and sandy in part. The dolomites and limestones were predominately tight with very rare intercrystalline porosity that showed some anhydrite fillings. These dolomites and limestones had no to very poor fluorescence stain and cut. The dolomite and limestone graded into and had cyclic deposits of marlstones, and very rare dolomitic to slightly calcareous, black, carbonaceous mudstones. .

The top of the Desert Creek 1-A zone was picked at 5498' measured depth, 5942' true vertical depth. The pick is base on the increase in rate of penetration and sample interpretation. The top was picked in this lateral mainly based on the first dolomite grainstone porosity below the Desert Creek top and the first occurrence of a light brown to brown, microcrystalline to very finely crystalline to microsucrosic, dolomite grainstone, with interbedded dolomitic algal limestones near the top and base of the zone. The limestone was predominately tight with very rare streaks of intercrystalline to algal porosity; some chert fragments, and no to a trace of fluorescence, stain and cut. The dolomites had fair intercrystalline to a very slight trace of algal porosity, very rare to a trace of dull yellow fluorescence, spotty brown stain and a poor slow diffuse to moderately fast streaming cut.

The 1-B zone was picked at a measured depth of 5549', 5524' true vertical depth in tight interbedded tan to light brown, occasionally cream limestone and dolomite packstones. These limestones and dolomites had very rare microfossils, rare scattered dark brown to dark gray brown chert fragments and were very slightly anhydritic. The packstones had very poor intercrystalline porosity, and very poor sample shows.

As the curve was being completed in the 1-B zone the dolomite became cleaner and increasing granular and algal. While drilling the curve through the 1-B zone, it appeared that the 1-B porosity bench was possibly defined by the interval 5549' measured depth, 5424' true vertical depth to a possible 5610' measured depth, 5540' true vertical depth. The top of the porosity Bench was marked by gradational facies change. A drilling break from 3 minutes per foot to 1 minute per foot was noted from a measured depth of 5559', 5527.5' true vertical depth, to 5567' measured depth, 5530' true vertical depth, in the top 2 1/2 feet of the best porosity in the 1-B zone. The drilling break was in an algal dolomite grainstone, which had very thin interbedded limestone packstones and very lime rich cement. The base of the porosity zone was not encountered while landing the curve.

At a measured depth of 5590', 5532.8' true vertical depth, with a horizontal displacement of 72', in the slightly tighter algal dolomite grainstones and thin dolomite and limestone packstones just below the best porosity of the 1-B porosity horizon, a trip was made to change the bottom hole assemblies and pick up the MWD tool. When drilling was resumed in the 1-B lateral, the well bore was turned upwards to require the best porosity of the 1-B porosity zone. The best porosity of the 1-B zone was encountered at a measured depth of 5698'; 5533' true vertical depth. The interval from a measured depth of 5590', 5533' true vertical depth, with a horizontal displacement of 72' to a measured depth of 5698', 5536' true vertical depth, and a horizontal displacement of 183'; was predominately a light brown to brown, occasionally cream to medium brown, cryptocrystalline to microcrystalline, some very finely crystalline to granular, slightly algal dolomite grainstones and packstones with increasingly limestone rich cement. Interbedded with the dolomites and increasing with depth were cream to tan, occasionally brown, algal, and dolomitic limestone packstones. When the lateral reached a horizontal displacement of 183', the porosity was encountered and the lithology became predominately algal limestone packstones and grainstones, with a very dolomite rich cement and very thin slightly algal dolomite packstones and grainstones.

From a measured depth of 5698', to a measured depth of 6070', 5531' true vertical depth, 555' horizontal displacement, as the 1-B zone forced the well bore upwards at a slight angle, the porosity was in a light brown to brown, occasionally dark brown, microcrystalline to very fine crystalline, microsucrosic to granular, algal limestone grainstones. The limestones had very rare micro fossils, were very slightly anhydritic with traces of anhydrite crystals to rare inclusions, rare scattered limy dolomite packstones and grainstone fragments to inclusions and occasionally dolomite rich cement, scattered chert fragments, occasional oolites and oolicastic porosity, traces of algal material, traces of scattered dark brown stain and very rare black oil stain residue* in the porosities. A change to predominately oolicastic porosity was noted at a measured depth of 5900', 5534' true vertical depth, and a horizontal displacement of 385'. The dolomites and limestones had predominantly fair to good intercrystalline and traces of algal to very rare oolicastic porosity. Through this interval the fluorescence was fair to good, the staining was moderate to fair and cuts ranging from slow to good moderately fast to slow steady streaming. A slight increase in limestone and dolomite packstones with a very slight decrease in porosity was noted at 6070' measured depth, 5531' true vertical depth, with a horizontal displacement of 555'. The increase in packstone was due to a vertical facies change as the well bore approached the top of the best porosity zone and neared the upper limit of the zone.

As the well bore was oriented toward the horizontal from 6070' measured depth to 6500' measured depth, 5533' true vertical depth, 985' horizontal displacement, the limestones were predominately brown to light brown, occasionally medium brown to mottled, cryptocrystalline to microcrystalline, occasionally very finely crystalline to microsucrosic, oolicastic to slightly algal, with slightly dolomite rich cement and scattered very thin dolomite packstone, rare scattered anhydrite inclusions and cement, and occasional chert fragments. The oolicastic to slightly algal limestones grainstones and packstones had fair to good oolicastic to slightly intercrystalline to algal porosity, fair to good dull yellow fluorescence, a fair to good brown stain, scattered black dead oil stain and a good moderately fast to fast streaming cut.

The well was turned downward at a shallow angle to follow the dip of the zone from 6500' to a total depth of 6824' measured depth, 5541.6' true vertical depth, with a horizontal displacement of 1307'. Through this interval the lithology remained brown to light brown, occasionally tan, cryptocrystalline to microcrystalline, occasionally microsucrosic to very finely crystalline, some granular, oolicastic to slightly algal limestone grainstones and increasing amounts of limestone packstone; with traces of slightly oolitic to algal dolomite packstone, anhydrite inclusions and crystals, scattered crinoid fossils, and with varying amounts of dolomite rich cement. The limestones had fair oolicastic to traces of intercrystalline to algal porosity, fair dull yellow fluorescence, a trace to fair brown stain, scattered black dead oil stain and a fair amount of good moderately fast to fast streaming cut. As the lateral approached termination from a measured depth of 6695', 5537' true vertical depth, with a horizontal displacement of 1178' to the total depth of 6824', an increase in limestone packstones and an associated decrease in the oolicastic, intercrystalline and algal porosity was noted.

The lateral was terminated at a total measured depth of 6824', true vertical depth 5541' and a horizontal displacement of 1307'. The lateral was terminated in an oolicastic to slightly algal limestone grainstone with increasing amounts of limestone packstone and interbedded thin, slightly oolitic dolomite packstone with scattered cherts.

In tracking the well bore through the 1-B bench, there were facies changes with in the limestones. The changes noted in the limestones were horizontal, with vertical changes from oolicastic limestones to oolitic dolomite packstone as the well bore approached the top and base of the 1-B zone. The 1-B zone was projected to thicken and dip downward as the lateral continued toward the RU# 18-11 well. In tracking the top and base of the zone, it appears that the dip remained horizontal to a horizontal displacement of 1000', at this point the zone appeared to thicken and dip downward toward the 1-B zone of the RU#18-11.

Predominant facies changes were associated with the rock classification with in the limestones and were associated with the depositional environment, as the environment of deposition changed laterally and also when approaching the top or base of the 1-B zone. With the classification changes, the porous oolicastic to algal limestones encountered were of primary deposition and were continuous through out the 1-B zone penetrated, with the effective or the better porosity being associated with the oolicastic limestone facies, which had fair to good oolicastic, and some intercrystalline to algal porosities, and the absence of any major anhydrite plugging. The limestone and dolomite packstones encountered had porosities which were predominately tighter and with very poorer visible permabilities. The limestones noted from a horizontal displacement of approximately 1180' to 1307' had poorer visible porosities.

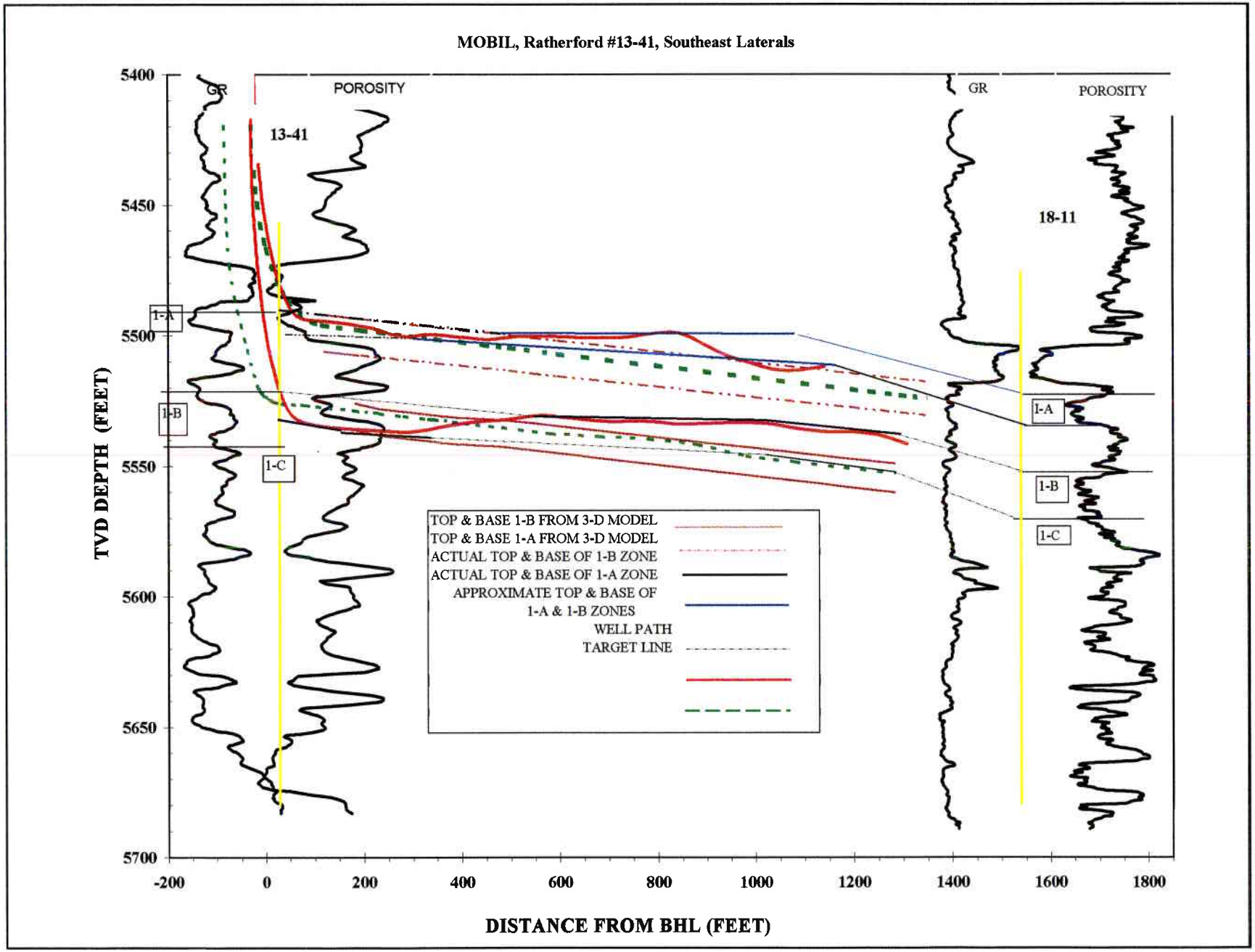
From the top of the 1-B porosity bench to a total measured depth of 6824', the limestone lithology was rather consistent, ranging from light brown to medium brown, rare dark brown, micro crystalline to very fine crystalline, occasionally microsucrosic to granular, with scattered, tighter limestone and dolomite packstones and some anhydrite matrixes. The limestones had fair to good oolitic to oolicastic with intercrystalline and algal porosities and a good constant dull to bright yellow fluorescence, with slight decreases when noticeable amounts of tight limestone and dolomite packstone were present. The staining in the limestones ranged from trace to good light brown to traces of black dead oil stain and the associated cuts being trace to good moderately fast to fast streaming, with only occasional slow cuts. The porosity, fluorescence, staining and cuts in the slightly oolitic to very slightly algal limestone and dolomite packstones encountered were rare to a slight trace, and were rather inconsistent through out the lateral in the 1-B zone. The sample shows were affected in part due to the presence of the oil emulsion in the drilling fluid used through out the curve and lateral sections.

The conclusion drawn from the southeasterly 1-B porosity bench in Lateral Leg 1, is that in this area the limestone porosity, was enhanced by the presence of the oolicastic material and traces of algal material. Also, having and effect on the porosity, were the cryptocrystalline to microcrystalline limestone and dolomite packstones which were thinly interbedded in the oolicastic limestones, which in turn graded vertically into dolomitic limestone packstone. Staining was predominately fair to moderate good, with some black dead oil staining was trapped in the oolicastic and algal matrix. The lateral used the a proposed projected target line as a reference point through the bench, drilling however followed the line of best porosity which was above the target line beginning at a horizontal displacement of approximately 420'.

It appears that upon completion of the lateral, that the lateral was drilled to completion entirely in the 1-B zone. At one point the lateral was 11' high to the proposed 1-B zone target line and was approaching the projected 1-B target line near the termination. The effective porosity was continuous through the lateral, becoming thicker as the 1-B zone approached the RU #18-11 offset well bore, near the termination of the lateral.

While drilling the lateral, the high background gas was due in part to the oil emulsion used in the drilling fluid, which was indicated by the significant amounts of heavies noted on the chromatograph (C_3 through C_5), but as the lateral was continued the well did make minor amount of oil. This lateral can be interpreted to have good reservoir qualities through most of the lateral. It appears that the porosities are well enough developed to enhance the overall performance of the zone.

*The black residual staining has been called by Dr. Dave Eby & others as "bitchimum" and is also known as "dead oil" ("dd o stn" on mud logs). This staining is associated with the movement of oil over long periods of time and is a good indicator of producible hydrocarbons when associated with productive porosities, but can also be found in porosities that have been filled by anhydrites and other material at later dates.


MOBIL, Ratherford #13-41, Southeast Laterals
GR
POROSITY
13-41
GR
POROSITY
18-11
1-A
1-B
1-C
I-A
1-B
1-C
TVD DEPTH (FEET)
5400
5450
5500
5550
5600
5650
5700
-200
0
200
400
600
800
1000
1200
1400
1600
1800
DISTANCE FROM BHL (FEET)
TOP & BASE 1-B FROM 3-D MODEL
TOP & BASE 1-A FROM 3-D MODEL
ACTUAL TOP & BASE OF 1-B ZONE
ACTUAL TOP & BASE OF 1-A ZONE
APPROXIMATE TOP & BASE OF 1-A & 1-B ZONES
WELL PATH
TARGET LINE

RECEIVED
MAY 06 1997
DIV. OF OIL, GAS & MINING

MOBIL

RATHERFORD UNIT #13-41
HORIZONTAL LATERAL LEG #2
UPPER 1-B
POROSITY BENCH DESERT CREEK
SECTION 13, T41S, R23E
SAN JUAN, UTAH

GEOLOGY REPORT
by
DAVE MEADE / MARVIN ROANHORSE
ROCKY MOUNTAIN GEO-ENGINEERING CORP.
GRAND JUNCTION, COLORADO
(970) 243-3044

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WELL SUMMARY

OPERATOR:	MOBIL EXPLORATION & PRODUCTION U.S. INC.
NAME:	RATHERFORD UNIT #13-41 NW UPPER HORIZONTAL LATERAL LEG #2 IN 1-B UPPER POROSITY BENCH, DESERT CREEK
LOCATION:	SECTION 13, T41S, R23E
COUNTY/STATE:	SAN JUAN, UTAH
ELEVATION:	KB:4748' GL:4760'
SPUD DATE:	4/12/97
COMPLETION DATE:	4/17/97
DRILLING ENGINEER:	BENNY BRIGGS / LEWIS SIMMON
WELLSITE GEOLOGY:	DAVE MEADE / MARVIN ROANHORSE
MUDLOGGING:	
ENGINEERS	DAVE MEADE / MARVIN ROANHORSE
CONTRACTOR:	BIG "A" RIG 25
TOOLPUSHER:	J. DEES / M. SMITH
HOLE SIZE:	4 3/4"
CASING RECORD:	SIDETRACK IN WINDOW AT 5413' MEASURED DEPTH
DRILLING MUD:	M-I
ENGINEER:	DANNE BEASON
MUD TYPE:	OIL EMULSION / POLYMER SWEEPS
DIRECTIONAL DRILLING CO:	SPEERY-SUN
ELECTICAL LOGGING:	NA
TOTAL DEPTH:	6980' MEASURED DEPTH TVD-5510.64'
STATUS:	TOH & PREPARE TO SET WHIPSTOCK #3

DRILLING CHRONOLOGY
RATHERFORD UNIT #13-41
NW UPPER 1-B HORIZONTAL LATERAL LEG # 2

DATE	DEPTH	DAILY	ACTIVITY
4/11/97	6317'	507'	DRLG & DIR SURVEYS- SURVEY & CIRC. OUT SMPLS @ 6824' (TD)-CIRC. & CONDITION HOLE-TOH-LAY DOWN LATERAL ASSEMBLY-PICK UP RETRIEVING HOOK-TIH-HOOK INTO WHIPSTOCK
4/12/97	5406'	7'	TOH W/ WHIPSTOCK-LAY DOWN HOOK ASSEMBLY-PICK UP NEW WHIPSTOCK & EXTENTION-ORIENT-JET & CLEAN PITS-FILL W/FRESH WATER-TIH-LATCH IN WHIPSTOCK & SHEAR OFF-MILL W/STARTER MILL-5406'-5408'-CIRC.-TOH-PICK UP WINDOW MILL-TIH-MILL-5406'-5413'
4/13/97	5413'	16'	MILL -5413'-LAY DOWN 11 JNTS DP-TOH-LAY DOWN MILL ASSEMBLY-PICK UP BIT & CURVE ASSEMBLY-TIH-RUN IN W/WIRELINE & GYRO-PARTED WIRELINE-PULL WIRELINE GYRO-RIG UP WIRELINE & RUN GYRO-TIME DRLG 5413'-5420'-DRLG 5420'-5429'
4/14/97	5429'	163'	DRLG & SURVEYS-PULL GYRO & RIG UP & RUN IN STEERING TOOL-DRLG & DIR SURVEYS-CIR. SPLS @ 5592'-PULL STEERING TOOL-TOH-LAY DOWN CURVE ASSEMBLY-PICK UP BIT & LATERAL ASSEMBLY-TEST SAME-TIH
4/15/97	5592'	335'	TIH-PICK UP SWIVEL & BREAK CIRC.-SURVEY-DRLG & DIR SURVEYS
4/16/97	5927'	635'	DRLG & DIR SURVEYS
4/17/97	6562'	418'	DRLG & DIR SURVEYS-CIRC, BOTTOMS UP @ 6980'(TD)-LAY DOWN 4 JNTS D.P.-DISPLACE HOLE W/10# BRINE WATER-TOH-LAY DOWN LATERAL ASSEMBLY-PICK UP HOOK & TIH-LATCH INTO WHIPSTOCK & SHEAR OFF-CIRC.BOTTOMS UP-TOH

DAILY ACTIVITY

Operator: MOBIL
Well Name: RATHERFORD UNIT #13-41 NW UPPER 1-B HORIZONTAL LATERAL LEG #2

DATE	DEPTH	DAILY	DATE	DEPTH	DAILY
4/11/97	6317'	507'			
4/12/97	5406'	7'			
4/13/97	5413'	16'			
4/14/97	5429'	163'			
4/15/97	5592'	335'			
4/16/97	5927'	635'			
4/17/97	6562'	418'			
TD	6980'				

BIT RECORD

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 NW UPPER 1-B HORIZONTAL LATERAL LEG #2

RUN	SIZE	MAKE	TYPE	IN/OUT	FTG	HRS	FT/HR
#1(RR) BIT	4 3/4"	HTC	STR-30	5413'/ 5592'	179'	9.5	18.84
#2 BIT	4 3/4"	HTC	STR-30	5592'/ 6980'	1388'	58.5	23.7

Customer ... : Mobil
Platform ... : RATERFORD UNIT
Slot/Well .. : A/13-41,2A1

MEASURED DEPTH	ANGLE DEG	DIRECTIO DEG	TVD	NORTH IN FEET	GS	EAST IN FEET	GS	VERTICAL SECTION	DOG LEG
5406	0.3	0.94	5405.32	52.92	N	10.6	W	46.89	0
5413	3.7	329.9	5412.31	53.14	N	10.71	W	47.13	49.23
5423	8.3	328.2	5422.26	54.03	N	11.26	W	48.16	46.03
5433	13.1	326.5	5432.08	55.59	N	12.26	W	50	48.1
5443	17.8	324.8	5441.72	57.78	N	13.77	W	52.64	47.21
5453	22.5	323.2	5451.1	60.57	N	15.8	W	56.07	47.32
5463	27.2	321.5	5460.17	63.89	N	18.37	W	60.27	47.54
5473	31.8	319.8	5468.87	67.69	N	21.49	W	65.19	46.75
5483	36	320.2	5477.17	71.96	N	25.08	W	70.76	42.06
5493	40.1	321.2	5485.05	76.73	N	28.98	W	76.92	41.46
5503	44.8	322	5492.42	82.02	N	33.17	W	83.66	47.31
5513	50	322.4	5499.19	87.84	N	37.68	W	91.01	52.08
5523	54.8	322.2	5505.29	94.11	N	42.52	W	98.92	48.03
5533	60	322.1	5510.67	100.75	N	47.69	W	107.33	52.01
5543	65.3	321.8	5515.27	107.75	N	53.16	W	116.19	53.07
5553	70.4	321.8	5519.04	115.02	N	58.89	W	125.44	51
5563	75.6	321.6	5521.96	122.52	N	64.81	W	134.99	52.04
5570	79.4	321.4	5523.47	127.87	N	69.07	W	141.82	54.36
5580	86	322.3	5524.74	135.67	N	75.19	W	151.72	66.6
5592	89.5	322	5525.21	145.14	N	82.55	W	163.69	29.27
5610.13	90	320.3	5525.29	159.25	N	93.92	W	181.81	9.77
5642.02	88.7	317.4	5525.66	183.26	N	114.9	W	213.69	9.96
5673.92	88.6	316.9	5526.41	206.64	N	136.59	W	245.56	1.6
5705.74	89.2	317.8	5527.02	230.04	N	158.14	W	277.36	3.4
5737.57	89.2	318.2	5527.46	253.69	N	179.44	W	309.19	1.26
5769.3	90.3	318.5	5527.6	277.4	N	200.52	W	340.91	3.59
5801.12	91.5	318.2	5527.1	301.18	N	221.67	W	372.73	3.89
5832.88	91.7	318.5	5526.21	324.9	N	242.77	W	404.47	1.13
5864.6	92.5	318.9	5525.05	348.71	N	263.69	W	436.17	2.82
5896.45	92.1	319.2	5523.77	372.75	N	284.54	W	467.99	1.57
5928.33	91.2	319.7	5522.86	396.96	N	305.26	W	499.86	3.23
5960.15	92.3	320.8	5521.88	421.41	N	325.6	W	531.66	4.89
5991.91	91.9	322	5520.72	446.22	N	345.4	W	563.37	3.98
6023.68	91.7	322.6	5519.72	471.34	N	364.82	W	595.07	1.99
6055.53	91.1	323.1	5518.94	496.72	N	384.05	W	626.84	2.45
6087.25	90.2	321.9	5518.58	521.88	N	403.35	W	658.49	4.73
6119.01	91.9	321.3	5518	546.77	N	423.08	W	690.21	5.68
6150.73	92.9	320.3	5516.67	571.33	N	443.11	W	721.89	4.46

Customer ... : Mobil
Platform ... : RATERFORD UNIT
Slot/Well .. : A/13-41,2A1

MEASURED DEPTH	ANGLE DEG	DIRECTIO DEG	TVD	NORTHIN FEET	GS	EASTIN FEET	GS	VERTICAL SECTION	DOG LEG
6182.5	92.1	320.6	5515.29	595.8	N	463.32	W	753.62	2.69
6214.29	90	319.7	5514.71	620.2	N	483.68	W	785.4	7.19
6246.04	91.8	321	5514.21	644.64	N	503.94	W	817.13	6.99
6277.8	89.2	320.3	5513.93	669.2	N	524.07	W	848.87	8.48
6309.54	89.4	319.4	5514.32	693.46	N	544.54	W	880.61	2.9
6341.3	88.8	319.7	5514.82	717.62	N	565.14	W	912.36	2.11
6372.28	87.5	319.4	5515.82	741.19	N	585.23	W	943.32	4.31
6403.28	87.3	318.2	5517.22	764.49	N	605.63	W	974.29	3.92
6435.15	89.8	318.5	5518.03	788.29	N	626.8	W	1006.15	7.9
6467.03	91.1	318.2	5517.78	812.11	N	647.98	W	1038.02	4.18
6498.11	92	319.6	5516.94	835.52	N	668.41	W	1069.09	5.35
6529.95	90.1	319.2	5516.35	859.69	N	689.12	W	1100.92	6.1
6561.87	89	317.5	5516.6	883.54	N	710.34	W	1132.84	6.34
6593.6	91.1	317.3	5516.58	906.9	N	731.81	W	1164.55	6.65
6625.38	94.7	316.8	5514.97	930.12	N	753.43	W	1196.27	11.44
6657.24	91.8	317.1	5513.16	953.37	N	775.14	W	1228.05	9.15
6688.41	91	316.8	5512.4	976.14	N	796.42	W	1259.2	2.74
6720.14	90.4	317.3	5512.01	999.36	N	818.03	W	1290.9	2.46
6751.78	89.9	317.1	5511.93	1022.57	N	839.53	W	1322.53	1.7
6783.68	91.4	316.4	5511.57	1045.81	N	861.39	W	1354.4	5.19
6815.58	90.4	315.3	5511.07	1068.69	N	883.6	W	1386.25	4.66
6847.41	89.5	315	5511.1	1091.26	N	906.05	W	1418.01	2.98
6879.15	88	313.8	5511.79	1113.46	N	928.72	W	1449.63	6.05
6911.02	89.4	313.8	5512.51	1135.51	N	951.72	W	1481.36	4.39
6942.77	92.2	315.5	5512.07	1157.82	N	974.3	W	1513.01	10.32
6980	92.2	315.5	5510.64	1184.35	N	1000.37	W	1550.15	0

MUD REPORT

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 NW UPPER 1-B HORIZONTAL LATERAL LEG #2

DATE	DEPTH	WT	VIS	PLS	YLD	GEL	FH	WL	CK	CHL	CA	SD	OIL	WTR
4/11/97	6824'	8.0	33	2	3	1/3	11.6	5.4	<1/32	12000	200	--	20%	80%
4/12/97	5407'	8.4	26	--	--	--	11.6	N/C	--	4000	80	--	0%	100%
4/13/97	5413'	8.4	26	--	--	--2	11.6	N/C	--	4500	0	--	0%	100%
4/14/97	5430'	8.2	32	2	2	1/2	11.6	6.1	<1/32	10000	40	--	0%	100%
4/15/97	5724'	8.3	31	2	2	1/2	11.6	6.4	<1/32	11000	80	--	4%	96%
4/16/97	6200'	8.2+	30	1	2	0/0	11.6	10.6	<1/32	10000	80	--	8%	92%
4/17/97	6900'	8.3	29	1	2	0/0	11.6	12.9	<1/32	11000	120	--	8%	92%

SAMPLE DESCRIPTIONS

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 NW UPPER 1-B HORIZONTAL LATERAL LEG #2

DEPTH	LITHOLOGY

5413.00 5420.00 "LS crm-tan-ltbrn,crpxl,occ micxl,rthy,v sl slty,dol ip,occ ltbrn CHT frag,scat ANHY xl,w/intbd brn-gybrn micxl-crpxl sl lmy arg DOL,scat tr intxl POR,rr-tr dull-bri yel FLOR,n-v rr spty brn STN,v p slow dif-slow stmg CUT"

5420.00 5430.00 "DOL dkbrn-brnblk,crpxl,dns,occ sl shy/tr intbd LS AA,occ sl slty,lmy ip,grdg to dol LS,tt-rr intxl POR,n-rr v dull orng mnrl FLOR,rr brn STN,no CUT"

5430.00 5440.00 "LS brn-dkbrn,ltgybrn,occ tan-crm,micxl-crpxl,rthy,slty ip,occ arg-sl mrly,sl chky,tr trnsl-clr xln ANHY incl,occ sl dol,scat dk brn CHT,rr-tr intxl POR,rr-tr scat dull yel FLOR,rr ltbrn STN,p-fr dif/v slow strmg CUT"

5440.00 5450.00 "DOL AA,rthy,dns,shy ip,occ sl lmy-calc,tr trnsl xln ANHY incl,rr LS incl,tt-tr intxl POR,tr scat spty dull yel FLOR,fr brn STN,p dif CUT"

5450.00 5460.00 "DOL ltgybrn-brn-dkbrn,micxl-crpxl,rthy-slty,arg,sl lmy,w/tan-ltgybrn crpxl dol arg LS incl,scat dkbrn CHT frag,mrly ip,occ grdg to blk dol sl carb SH,tt-v rr intxl POR,n-v rr spty yel FLOR,n vis STN,n-v p slow dif CUT"

5460.00 5470.00 "DOL AA,incr ltgybrn,POR-FLOR-STN-CUT AA"

5470.00 5480.00 "SH dkgybrn-blk,blky-sbplty,plty ip,brit,dol,sl calc,mica,slty-mica ip,carb,sooty,w/thn DOL AA & tt crpxl crm-tan LS,v rr intxl POR,spty bri yel FLOR,n vis STN,n-v p slow dif CUT"

5480.00 5490.00 "SH blk,occ dkgybrn-dkgy,sbplty-sbblky,sl calc,v dol,mica,slty,carb-sooty,w/tr DOL ltbrn-crm,tan-brn,crpxl,occ micxl,rthy-slty,tt-v rr intxl POR,n-v rr spty FLOR,NSOC,rr LS AA"

5490.00 5500.00 "DOL AA,occ ltbrn-brn,micxl-vfxl ip,AA,w/rr SH-LS AA"

5500.00 5510.00 "LS crm-tan,ltbrn,occ wh,crpxl-micxl,vfxl-gran-micsuc ip,cln-chk,occ ool-oolicastic ip,w/scat brn-dkbrn micxl-vfxl DOL GRNST incl,LS-tr oolicastic-rr intxl POR,tr dull-bri yel FLOR,tr-fr ltbrn STN-rr blk dd o STN,fr slow-fast stmg CUT,tr SH AA"

5510.00 5520.00 "LS AA,pred LS PKST,v rr ool,w/DOL PKST,tt-v rr POR-FLOR-STN-CUT"

5520.00 5530.00 "LS crm-tan,occ wh,crpxl-micxl,v rr DOL cmt,v sl anhy,occ chty,v rr Crin fos,tt-v rr intxl POR,NFSOC,w/intbd brn-mbrn,micxl-vfxl,occ gran-micsuc,lmy DOL,scat mic fos,tr-fr intxl POR,tr dull yel FLOR,occ ltbrn STN,fr slow-mod fast stmg CUTY"

5530.00 5540.00 "LS AA,sl alg,ool-oolicastic,w/tr trip ltbrn-trnsl mot CHT & DOL PKST-GRNST AA,POR-FLOR-STN-CUT AA"

5540.00 5550.00 "LS AA,w/tr DOL PKST,occ CHT frag,incr ool POR,FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

5550.00 5560.00 "LS AA,incr POR-FLOR-STN-CUT,tr ltbrn-gybrn-brn,crpxl-micxl,occ micsuc,v sl ool lmy DOL,n-v intxl-v sl ool POR,rr dull yel FLOR,scat ltbrn STN,tr slow dif-slow stmg CUT,v rr ool mot CHT frag"

5560.00 5570.00 "LS lt-mbrn,occ wh-crm,crpxl-vfxl,occ gran,misuc,sl alg-v oolicastic,DOL rich cmt,v rr mic fos,tr sl ool mot CHT frag,occ DOL incl AA,tr-fr oolicastic-tr alg-intxl POR,tr-fr dull yel FLOR,tr ltbrn STN,v rr blk dd o STN,fr-g slow-mod fast stmg CUT"

5570.00 5580.00 "LS AA,incr micxl-crpxl LS PKST,DOL-CHT AA,POR-FLOR-STN-CUT AA"

5580.00 5592.00 "LS pred brn-mbrn,occ ltbrn-crm,crpxl-vfxl,micsuc-gran ip,occ alg,oolicastic ip,v sl anhy,w/DOL rich cmt & scat DOL PKST incl,occ grdg to LS PKST,incr LS GRNST,fr-g dull-bri yel FLOR,fr ltbrn STN,v rr blk dd o STN,fr-g slow-mod fast stmg CUT"

5592.00 5610.00 "LS ltbrn-tan,occ crm-off wh,brn,micxl-crpxl-gran,micsuc,occ ooc-agl,rthy,cln,tr chky prtg-fl,LS PCKST/var col SH cvgs,rr ool mot CHT,rr mic fos,fr-tr intxl/ooc-agl POR,fr even dull yel FLOR,fr ltbrn/rr blk dd o STN,g dif/tr slow strmg CUT"

5610.00 5620.00 "LS ltbrn-tan,occ crm-off wh,brn,micxl-micsuc,agl-ooc,crpxl-gran,rthy,cln,tr chky prtg-fl,tr ool mot CHT,rr mic fos,fr-g intxl/ooc-agl POR,fr even dull/tr scat mod bri yel FLOR,fr ltbrn/tr blk dd o STN,g dif/tr slow strmg CUT"

5620.00 5630.00 "LS AA,occ crm,v rr vfxl-misuc,pred oolicastic LS PKST,DOL rich cmt ip,fr-g oolicastic-tr intxl-alg POR,fr-g dull-bri yel FLOR,fr ltbrn STN,occ spty blk dd o STN,fr-g mod fast stmg CUT,v rr ltbrn-brn micxl DOL PKST incl,tt,NFSOC"

5630.00 5640.00 "LS AA,POR-FLOR-STN-CUT AA,DOL AA"

5640.00 5650.00 "LS tan-crm,brn-mbrn,crpxl-vfxl,gran-micsuc ip,occ DOL rich cmt,ool-oolicastic,sl alg,v rr scat CHT frag,occ LS PKST-v rr lmy DOL PKST,fr-g intxl-oolicastic-tr alg POR,fr-g dull-bri yel FLOR,fr-g ltbrn-brn STN,rr blk dd o STN,fr-g slow-mod fast stmg CUT"

5650.00 5660.00 "LS AA,POR-FLOR-STN-CUT AA,occ scat ltbrn-brn mot CHT frag,DOL PKST AA"

5660.00 5670.00 "LS AA,sl incr in dol LS PKST,POR-FLOR-STN-CUT AA,DOL AA"

5670.00 5680.00 "LS tan-ltbrn-brn,occ crm,mot ip,crpxl-vfxl,occ gran-micsuc,oolicastic,tr DOL rich cmt,occ micxl,tan LS PKST,v sl anhy,occ sl alg,w/v rr trnsl-
ltbrn mot,ool-trip CHT frag,LS-fr-g oolicatic-tr-fr intxl-rr alg POR,fr dull-bri yel FLOR,fr ltbrn STN, rr blk dd o STN,fr-g mod fast-fast stmg CUT"

5690.00 5700.00 "LS AA,sl incr oolicastic POR,incr DOL cmt& CHT frag,decr POR-FLOR-STN-CUT"

5700.00 5710.00 "LS ltbrn-tan,crm,brn-mbrn,crpxl-micxl,occ vfxl-gran,oolicastic,sl alg,occ LS GRNST,incr LS PKST,v rr DOL PKST incl,tr ltbrn sl ool CHT frag-trip ip,tr-fr oolicastic-tr intxl-rr alg POR,tr-fr ltbrn-v rr blk STN,tr of fr mod fast-fast stmg CUT"

5710.00 5720.00 "LS AA,incr dol LS PKST,rr lmy DOL PKST,tr ltbrn CHT frag,v sl anhy"

DEPTH	LITHOLOGY

5720.00 5730.00 "LS tan-brn,mbrn,occ crm,micxl-vfxl,occ crpxl,rthy,DOL rich cmt ip,micsuc,occ oolicastic-v rr alg mat,pred LS GRNST,tr ltbrn-brn CHT frag,incr LS PKST,v rr v lmy micxl DOL PKST incl,tr-fr ool-tr intxl-v rr alg POR,tr ltbrn-v rr blk STN,tr-fr mod fast CUT"

5730.00 5740.00 "LS AA,incr LS PKST,sl decr oolicastic-alg POR,decr FLOR-STN-CUT"

5740.00 5750.00 "LS AA,pred ltbn-crm-tan,crpxl-micxl,sl dol LS PKST,w/scat v dol LS GRNST incl,bcmg v lmy DOL PKST ip,scat CHT frag,FLOR-POR-STN-CUT AA"

5750.00 5760.00 "LS AA,incr dol & ool LS PKST,rr LS WKST,rr mic fos,occ lmy ltbrn crpxl-micxl DOL PKST incl,tr ltbrn CHT frag,tr ool-intxl-v rr alg POR,tr-fr ltbrn STN,n-v rr blk dd o STN,tr slow-mod fast-fast stmg CUT"

5760.00 5770.00 "LS AA,occ ltbrn crpxl LS WKST,tr ltbrn CHT frag,v rr lmy DOL PKST,incr oolicastic LS GRNST w/depth,incr POR-FLOR-STN-CUT w/depth"

5770.00 5780.00 "LS crm-tan,ltbrn,occ brn-wh,crpxl-vfxl,plty ip,occ oolicastic,gran-micsuc ip,intbd LS GRNST & PKST w/sl DOL rich cmt,tr ltbrn-trnsl CHT frag,alg ip,tr-fr intxl-rr oolicastic-alg POR,tr ltbrn-n-v rr blk STN,tr of fr slow-fast stmg CUT"

5780.00 5790.00 "LS AA,incr plty,decr LS GRNST,scat CHT frag,n-rr DOL rich cmt,POR-FLOR-STN-CUT AA"

5790.00 5800.00 "LS AA,incr ltbrn-trnsl CHT frag-sl trip-ool,tr intxl-ool-rr alg POR,tr dull-bri yel FLOR,rr-tr ltbrn-brn,v rr blk STN,tr mod fast stmg CUT"

5800.00 5810.00 "LS crm-tan,ltbrn-brn,crpxl-micxl,occ vfxl-gran,occ micsuc,oolicastic,chty-tr ltbrn-trnsl CHT,pred LS PKST,occ GRNST,sl DOL rich cmt,rr DOL PKST,chk ip,tt-tr oolicastic-rr intxl-alg POR,tr dull-bri yel FLOR,tr spty ltbrn-rr blk STN,tr slow-mod fast CUT"

5810.00 5820.00 "LS AA,incr LS GRNST-oolicastic,decr FLOR-STN,POR-CUT AA"

5820.00 5830.00 "LS tan-ltbrn,occ crm-brn,crpxl-micxl,rr micsuc,plty-chk,occ oolicastic,tr DOL rich cmt,tr CHT frag,pred LS PKST,tt-tr intxl-oolicastic POR,rr-tr dull-bri yel FLOR,spty ltbrn-rr blk STN,rr-tr slow-fast stmg CUT"

5830.00 5840.00 "LS AA,crpxl-micxl,rr micsuc-occ,plty-chk,tr DOL rich cmt,tr CHT frag,pred LS PKST,tt-tr intxl-oolicastic POR,FLOR AA,spty ltbrn-brn/rr blk STN,rr-tr slow-fast stmg CUT"

5840.00 5850.00 "LS AA,incr LS PCKST,decr oolicastic,decr FLOR-STN,POR-CUT AA"

5850.00 5860.00 "LS tan-ltbrn,occ crm-brn,crpxl-micxl,rr micsuc,incr plty-chk,rr oolicastic,tr DOL rich cmt,rr CHT frag,pred LS PKST,tt-tr intxl/rr oolicastic POR,rr-tr even dull yel FLOR,spty ltbrn/rr blk STN,rr-tr slow stmg CUT"

5860.00 5870.00 "LS AA,LS PCKST/intbd plty-chky ptrgs,occ sl DOL ip,vrr trnsl ANHY frag,vrr CHT AA,tt-rr intxl POR,FLOR-STN-CUT AA"

5870.00 5880.00 "LS tan-ltbrn-brn,occ crm,crpxl-micxl,rr micsuc,pred LS PCKST/scat plty-chk frag,rr DOL rich cmt,tr CHT frag,tt-tr intxl POR,rr dull yel FLOR,spty ltbrn-brn/vrr blk STN,rr slow dif CUT"

5880.00 5890.00 "LS AA,pred LS PCKST/tr scat plty-chk frag,vrr trnsl xln ANHY,POR-FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

5890.00 5900.00 "LS brn,tan,occ dkbrn,crm-ltgybrn,crpxl-micxl,rr micsuc-ooc,rthy,cln,dns,LS PCKST,tr DOL rich cmt,tr CHT frag,rr scat plty-chk frag,tt-tr intxl/rr oolicastic POR,tr scat dull-mod bri yel FLOR,tr brn-ltbrn/rr blk STN,fr dif/tr slow stmg CUT"

5900.00 5910.00 "LS tan-brn,ltgybrn-crm,ltgy-off wh.occ dkbrn,crpxl-micxl,occ ooc-micsuc,pred cln,dns,occ plty-chk & sl slty,tr scat micsuc DOL frag,rr trnsl xln ANHY & mic fos,tr-fr intxl/occ ooc POR,tr scat mod bri yel FLOR,fr brn-ltbrn/tr blk STN,fr slow strm CUT"

5910.00 5920.00 "LS AA,pred LS PCKST/tr scat plty-chk frag,vrr trnsl xln ANHY,tt-tr intxl POR,no-vrr scat v dull yelorng FLOR,tr brn-ltbrn/rr blk STN,vp dull orngyel res ring CUT"

5920.00 5930.00 "LS AA,pred LS PCKST/tr scat plty-chk frag,vrr trnsl xln ANHY,POR-FLOR-STN-CUT AA"

5930.00 5940.00 "LS AA,LS PCKST/incr intbd plty-chky ptrgs-frag,occ v sl slty ip,tr trnsl ANHY frag,vrr mic fos,tt-rr intxl POR,FLOR-STN-CUT AA"

5940.00 5950.00 "LS tan-brn,ltgybrn-crm,ltgy-off wh.occ dkbrn,crpxl-micxl,rr ooc-micsuc,pred cln,dns,occ plty-chk,rr trnsl xln ANHY,tr-fr intxl POR,n-rr scat dull yel FLOR,fr brn-ltbrn/rr blk STN,vp vdull yelorng res ring CUT "

5950.00 5960.00 "LS brn,tan,occ dkbrn,crm-ltgybrn,crpxl-micxl,rr micsuc-vfxl,rthy,cln,dns,LS PCKST,tr DOL rich cmt,tr scat plty-chk frag,rr xln AHNY,tt-fr intxl POR,rr scat dull yel FLOR,tr brn-ltbrn/rr blk STN,vp v dull orngyel res ring CUT"

5960.00 5970.00 "LS AA,LS PCKST/incr intbd plty-chky ptrgs-frag,occ dol ip,grdg to lmy DOL,POR-FLOR-STN-CUT AA"

5970.00 5980.00 "LS AA,LS PCKST/tr scat intbd plty-chky ptrgs-frag,tr LS GRNST,dol ip,rr trnsl ANHY frag,rr scat CHT frag,vrr mic fos,tt-fr intxl POR,FLOR-STN-CUT AA"

5980.00 5990.00 "LS brn,tan,occ dkbrn,crm-ltgybrn,crpxl-micxl-vfxl,rthy,cln,dns,LS PCKST/incr DOL rich cmt & decr scat plty-chk frag,rr xln AHNY,tr-fr intxl POR,rr scat dull yel FLOR,tr brn-ltbrn/rr blk STN,vp v dull orngyel res ring CUT"

5990.00 6000.00 "LS crm-tan-brn,crpxl-micxl,occ vfxl,rthy-chk,occ DOL rich cmt,pred v sl ool LS PKSTN,scat LS GRNST,occ trnsl-brn CHT frag,v rr lmy tt crpxl-micxl DOL PKST,tr intxl-v rr ool POR,tr spty dull yel FLOR,rr spty ltbrn-v rr blk STN,tr slow dif-slow stmg CUT"

6000.00 6010.00 "LS AA,incr gran-micsuc,incr oolicastic,bcmg pred LS GRNST,tr DOL rich cmt,rr DOL PKST,scat CHT frag,tr-fr intxl-tr oolicastic-v rr alg POR,tr-fr dull-bri yel FLOR,tr ltbrn-v rr blk STN,tr slow-incr mod fast stmg CUT"

6010.00 6020.00 "LS AA pred LS PKST,DOL AA,scat CHT frag,POR-FLOR-STN-CUT AA"

6020.00 6030.00 "LS tan-brn,occ mbrn,crpxl-micxl,occ vfxl-gran,oolicastic ip,some micsuc,pred LS PKSTN,incr LS GRNST,tr DOL PKST incl-DOL rich cmt,rr mic fos,scat ltbrn CHT frag,tr-fr intxl-oolicastic POR,tr-fr dull yel FLOR,tr-fr ltbrn-v rr blk STN,tr-fr slow-fast CUT"

DEPTH	LITHOLOGY

6030.00 6040.00 "LS AA,incr gran-LS GRNST,incr oolicastic POR,tr-fr dull-bri yel FLOR,tr-fr ltbrn-rr blk STN,tr-fr slow-mod fast CUT,decr DOL PKST & CHT frag"

6040.00 6050.00 "LS ltbrn-brn,crpxl-vfxl,micsuc-gran,oolicastic,tr DOL rich cmt,pred LS GRNST,POR-FLOR-STN-CUT AA"

6050.00 6060.00 "LS tan-crm,brn-mbrn,crpxl-vfxl,gran-micsuc,oolicastic-v sl alg,pred LS GRNSTN,w/thn LS PKST & DOL PKST incl,DOL rich cmt ip,v sl anhy,scat ltbrn-bf CHT frag,fr-g intxl-ool-rr alg POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-rr blk STN,tr-fr mod fast stmg CUT"

6060.00 6070.00 "LS AA,incr DOL PKST,sl decr POR-FLOR-STN-CUT AA"

6070.00 6089.00 "LS tan-mbrn,crm-wh ip,crpxl-vfxl,gran-micsuc,oolicastic-sl alg,pred LS GRNSTN,w/thn LS PKST & DOL PKST incl,DOL rich cmt ip,v sl anhy,scat bf CHT frag,fr-g intxl-ool-rr alg POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-rr blk STN,fr-g mod fast-fast stmg CUT"

6090.00 6100.00 "LS AA,incr DOL rich LS PKST & LS rich DOL PKST,decr intxl POR,tr-fr dull-bri yel FLOR,fr ltbrn-rr blk STN,fr-g mod fast-fast stmg CUT"

6100.00 6110.00 "LS tan-brn-mbrn,crpxl-micxl,occ vfxl-gran,micsuc ip,pred dol oolicastic LS PKST,occ LS GRNST,v sl alg,v rr anhy,occ lmy brn DOL PKST incl,tr bf CHT frag,tr-fr ool-tr intxl-rr alg POR,tr-fr dull-bri yel FLOR,tr-fr ltbrn STN,tr-g mod fast-fast stmg CUT"

6110.00 6120.00 "LS AA,incr oolicastic mat,sl anhy-v rr POR fl,DOL-CHT AA,POR-FLOR-STN-CUT AA"

6120.00 6130.00 "LS AA,v rr DOL PKST frag,CHT AA,decr FLOR-POR,STN-CUT AA"

6130.00 6140.00 "LS tan-brn-mbrn,micxl-vfxl,gran-suc,occ crpxl tan LS PKST,pred dol oolicastic LS GRNST,v rr ANHY xl-incl,rr scat CHT frag,fr-g intxl-ool-v rr alg POR,fr-g dull-bri yel FLOR,tr-g ltbrn-rr blk STN,fr-g mod fast-fast stmg CUT"

6140.00 6150.00 "LS AA,incr LS GRNSTN,incr DOL rich cmt,tr micsuc mbrn DOL PKSTN w/n-v rr intxl POR,scat bf CHT frag,v rr ANHY xl-POR fl,fr-g intxl-ool POR,n-v rr alg POR,FLOR-STN-CUT AA"

6150.00 6160.00 "LS AA,sl incr lmy-v lmy DOL PKSTN,scat CHT frag,incr ool POR,FLOR-STN-CUT AA"

6160.00 6170.00 "LS ltbrn-mbrn,occ dkbnr,crpxl-vfxl,gran-micsuc ip,v oolicastic,fr DOL rich cmt,v sl alg,rthy,v sl anhy,tr scat lmy DOL PKSTN & CHT frag,fr-g ool-tr intxl-v rr alg POR,fr-g dull-bri yel FLOR,fr-g ltbrn-v rr blk STN,fr-g mod fast-fast stmg CUT"

6170.00 6180.00 "LS AA,n-v rr DOL PKST incl,sl incr oolicastic dol LS PKST,tr-g intxl-ool POR,n-v rr alg POR,fr-g dull-bri yel FLOR,fr-g ltbrn STN,n-vrr spty blk dd o STN,fr-g mod fast-fast stmg CUT"

6180.00 6190.00 "LS AA,incr DOL rich cmt-incr ltbrn-gybrn crpxl-micxl lmy DOL PKST w/n-v rr intxl POR,n-v rr FSOC,LS-POR-FLOR-STN-CUT AA"

6190.00 6200.00 "LS ,decr DOL PKST,POR-FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

6200.00 6210.00 "LS lt-dkbrn,tan,crpxl-vfxl,gran-micsuc ip,occ oolicastic,chty-rr tan CHT frag,dol-DOL rich cmt,occ lt-mbrn micxl DOL PKST,fr-g intxl-ool-v rr alg POR,fr dull-bri yel FLOR,fr-g lt-dkbrn STN,tr-fr mod fast-fast stmg CUT"

6210.00 6220.00 "LS AA,incr dol mixl sl ool LS PKST,incr bf CHT frag,rr DOL PKST,incr POR-FLOR-STN-CUT"

6220.00 6230.00 "LS AA,n-v rr DOL PKST,incr bf CHT frag,pred mbrn dol LS GRNST,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr-g ltbrn-v rr blk STN,fr-g mod fast stmg CUT"

6230.00 6240.00 "LS AA,incr dol LS PKST,w/v lmy micsuc DOL PKST incl,tr bf-brn CHT frag,pred gran dol LS GRNST,fr-g dull-bri yel FLOR,fr intxl-ool-v rr alg POR,fr lt-mbrn-rr blk STN,fr-g slow-fast stmg CUT"

6240.00 6250.00 "LS brn-mbrn,occ tan-gybn,crpxl-vfxl,gran,micsuc ip,oolicastic ip,DOL rich cmt,DOL PKST AA,n-v rr CHT frag,POR-FLOR-STN-CUT AA"

6250.00 6260.00 "LS tan-brn-mbrn,crpxl-micxl,vfxl-gran ip,occ micsuc,DOL rich cmt,oolicastic ip,intbd LS PKST & GRNST,chty-trnsl-bf CHT frag,w/tan-brn micxl DOL PKST-rr GRNST v lmy,tr-fr intxl-ool POR,fr dull-bri yel FLOR,n-fr ltbrn STN,fr-g slow-fast stmg CUT"

6260.00 6270.00 "LS AA,incr v dol chty LS GRNST,oolicastic ip,decr DOL incl,CHT AA,incr POR-FLOR-STN-CUT"

6270.00 6280.00 "LS brn-mbrn,occ tan-crm-dkbrn,micxl-vfxl,occ crpxl,gran-micsuc,oolicastic ip,sl tr DOL PKST incl,occ bf-brn CHT frag,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr brn-mbrn STN,occ v rr blk dd o STN,fr-g mod fast-fast stmg CUT"

6280.00 6290.00 "LS tan-ltbrn,pred crpxl-v sl ool-sl dol-LS PKST,occ LS GRNST,incr bf-brn CHT frag,decr POR-FLOR-STN-CUT AA"

6290.00 6300.00 "LS tan-brn,occ m-dkbrn,crpxl-micxl,occ vfxl-gran,rr micsuc,incr oolicastic LS PKST,occ LS GRNST,tr bf-brn CHT frag,occ brn-gybrn DOL PKST,tr-fr ool-intxl POR,tr-fr dull-bri yel FLOR,tr lt-mbrn STN,rr dd o STN,rr slow-fr
mod fast-fast CUT"

6300.00 6310.00 "LS AA,pred micxl-vfxl,gran-micsuc,oolicastic,occ alg,incr DOL rich LS GRNST,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr-g ltbrn STN,rr blk dd o STN,fr mod fast-fast stmg CUT"

6310.00 6320.00 "LS tan,ltbrn-brn,occ crm-off wh,crpxl-micxl-vfxl,ooc-agl,occ mmicsuc,pred OOC PCKST LS/tr scat ool-pel,scat tan-bf CHT frag,occ DOL rich cmt occ grdg to lmy DOL,POR-FLOR-STN-CUT AA"

6320.00 6330.00 "LS AA,incr v dol chty LS GRNST,CHT AA,incr pel-ool,POR-FLOR-STN-AA,g dif-slow strmg CUT"

6330.00 6340.00 "LS brn-tan,mbrn,crpxl-micxl-vfxl,gran-micsuc-ooc ip,tr DOL rich cmt,pred LS PKST w/incr GRNST,scat bf CHT frag,w/tan-brn micxl DOL PKST-rr GRNST v lmy,tr xln ANHY,tr-fr intxl/rr ool POR,fr scat dull-mod bri yel FLOR,fr ltbrn/tr brn STN,CUT AA"

6340.00 6350.00 "LS AA,micxl-crpxl-vfxl,micsuc-gran,occ ooc ip,pred LS GRNST w/scat sl chky PCKST,scat CHT& ANHY frag,w/brn-dkbrn micsuc-micxl DOL PKST & GRNST,fr-g intxl/vrr ool POR,fr scat dull-mod bri yel FLOR,fr ltbrn/tr brn STN,g mod fast-fast strmg CUT AA"

DEPTH	LITHOLOGY

6350.00 6360.00 "DOL brn-dkbrn,occ tan,micxl-micsuc,gran,GRNST intbd/LS AA,grdg to dol LS,g intxl/occ oolclastic POR,g even dull-mod bri yel FLOR,g brn-dkbrn STN,g dif/tr slow strmg CUT"

6360.00 6370.00 "LS AA,incr v dol LS GRNST,occ oolicastic ip,w/DOL AA,tr CHT AA,incr POR-FLOR-STN-CUT AA"

6370.00 6380.00 "LS AA,pred micxl-gran-micsuc,oolicastic,occ gran-alg,incr DOL rich LS GRNST,fr-g intxl/occ ool POR,fr-g dull-bri yel FLOR,fr-g brn-dkbrn/rr blk dd o STN,g dif/slow stmg CUT"

6380.00 6390.00 "LS brn-mbrn,occ tan-gybn,micxl-micsuc-gran,occ crpxl-vfxl,oolicastic-agl ip,DOL rich cmt,DOL GRNST AA,n-rr CHT frag,POR-FLOR-STN-CUT AA"

6390.00 6400.00 "LS AA,pred v dol LS GRNST,incr oolicastic ip,w/DOL AA,g intxl-ooc POR,g dull/spty mod bri yel FLOR,g brn-dkbrn/tr blk dd o STN,g dif/slow strmg CUT"

6400.00 6410.00 "LS tan-brn-mbrn,crpxl-micxl,occ vfxl-gran,tr ooc-micsuc,tr DOL rich cmt,pred LS PKST/intbd GRNST,chty-trnsl-bf CHT frag,w/brn micxl DOL PKST-rr GRNST v lmy,tr-fr intxl/tr ool POR,fr dull-bri yel FLOR,n-fr ltbrn-brn STN,g slow-mod fast stmg CUT"

6410.00 6420.00 "LS AA,pred PCKST/incr micsuc GRNST,decr DOL PCKST & GRNST,scat CHT AA,occ plty-chk,fr-gintxl POR,g even dull-mod bri yel FLOR,g-fr br-ltbrn STN,g fast strmg CUT"

6420.00 6430.00 "LS brn-mbrn,occ tan-gybrn,micxl-micsuc-gran,occ crpxl-vfxl,ooc-agl ip,DOL GRNST/DOL rich cmt,occ grdg to calc-lmy DOL ip,rr CHT frag,POR-FLOR-STN AA,fr-g dif/tr slow strmg CUT"

6430.00 6440.00 "LS AA,incr v dol-dol LS GRNST,tr intbd ooc LS GRNSTip,w/DOL AA,rr CHT AA,incr POR-FLOR-STN-CUT AA"

6440.00 6450.00 "LS tan-brn,occ ltgybrn,mbrn,crpxl-micxl-vfxl,gran,tr ooc-micsuc,DOL rich cmt,pred LS PKST/intbd GRNST,scat bf CHT frag,w/brn micxl DOL PKST-rr GRNST v lmy,tr-fr intxl/tr ool POR,fr dull-bri yel FLOR,fr ltbrn-brn STN,g mod fast stmg CUT"

6450.00 6460.00 "LS AA,pred micsuc GRNST/scat PCKST,decr DOL PCKST & GRNST,tr CHT AA,rr plty-chk,fr-g intxl/rr ooc POR,g even dull-mod bri yel FLOR,g-fr br-ltbrn STN,g fast strmg CUT"

6460.00 6470.00 "LS AA,pred LS GRNST/occ dol cmt,scat LS PCKST,tr ooc LS GRNST,tr brn-tan crpxl-micxl DOL-grdg to calc DOL,incr scat bf-tan CHT frag,incr POR-FLOR-STN-CUT AA"

6470.00 6480.00 "LS tan-brn,occ mbrn,crpxl-micxl-vfxl,gran,tr ooc-micsuc,cmt,pred LS PKST,occ intbd GRNST/DOL rich cmt,scat bf CHT frag,rr brn micxl DOL PKST & GRNST,tr-fr intxl/tr ool POR,fr dull-bri yel FLOR,fr ltbrn-brn STN,g mod fast-slow stmg CUT"

6480.00 6490.00 "LS AA,pred LS GRNST/occ sl dol cmt,tr intbd ooc LS GRNST ip,w/scat sl chk PCKST AA,tr trnsl-clr xln ANHY incl-frag,rr CHT AA,g-fr intxl/rr ooc POR,FLOR-STN-CUT AA"

6490.00 6500.00 "LS brn-mbrn,occ chky tan-gybn,micxl-micsuc-gran,occ crpxl-vfxl,occ ooc-agl ip,pred DOL GRNST/tr DOL cmt,scat PCKST,g-fr intxl/tr ooc POR,FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

6500.00 6510.00 "LS tan-brn,occ m-dkbrn,micxl-micsuc-crpxl,gran-ooc,DOL GRNST/tr dol cmt,scat PCKST,incr ooliclastic,g-fr intxl-ooc POR,fr-g dull-mod bri yel FLOR,g brn-ltbrn/occ dk brn-blk STN,fr-g dif/tr slow strmg CUT "

6510.00 6520.00 "LS AA/incr scat-occ intbd PCKST,rr scat plty-chk frag,tr bf-tan scat CHT,POR-FLOR-STN-CUT AA"

6520.00 6530.00 "LS AA,pred LS GRNST/incr dol cmt,scat crpxlt PCKST,tr ooliclastic GRNST,tr scat CHT AA,g-fr intxl/rr ooc POR,FLOR-STN-CUT AA"

6530.00 6540.00 "LS AA,pred LS GRNST/tr sl dol cmt,w/scat sl chk crpxl PCKST,rr scat CHT frag AA,rr-tr scat ooc,g-fr intxl/rr ooc POR,FLOR-STN-CUT AA"

6540.00 6550.00 "LS brn-mbrn,occ tan,gran-micsuc-ooc,micxl-vfxl,occ crpxl,DOL GRNST/occ DOL rich cmt,bcmg incr oolicalstic,tr scat DOL PCKST,rr bf CHT,g intxl-ooc POR,g dull-mod bri yel FLOR,g brn-dkbrn/tr blk dd o STN,g fast strmg CUT"

6550.00 6560.00 "LS AA,pred LS GRNST/tr sl dol cmt,w/scat sl chk crpxl PCKST,tr scat bf CHT frag,rr-tr scat ooc frag,g-fr intxl/rr ooc POR,FLOR-STN-CUT AA"

6560.00 6570.00 "LS brn,occ mbrn,tan,micxl-ooc-agl,micsuc-gran,occ crpxl-vfxl,pred DOL GRNST/tr DOL cmt,scat PCKST,g-fr intxl/tr ooc POR,FLOR-STN-CUT AA"

6570.00 6580.00 "LS brn,occ tan,mbrn,micxl-vfxl-gran,tr ooc-micsuc,DOL rich cmt,pred LS GRNST/scat micxl PKST,tr DOL GRNST-grdg to lmy DOL,tr-fr intxl/tr ool POR,fr dull-bri yel FLOR,fr ltbrn-brn STN,g mod fast stmg CUT"

6580.00 6590.00 "LS brn-mbrn,occ tan,micxl-ooc-micsuc,gran-vfxl,occ crpxl,DOL GRNST/tr DOL rich cmt,incr ooliclastic,scat PCKST,g-fr intxl/ ooc POR,FLOR-STN-CUT AA"

6590.00 6600.00 "LS brn-ltbrn,crm-off wh,micxl-crpxl,ooc-gran,vfxl-micsuc,DOL GRNST/tr DOL cmt,occ intbd ooc,scat v chk plty crpxl PCKST,tr trnsl xln ANHY,g intxl-ooc POR,fr-g scat mod bri-dull yel FLOR,fr-g brn-ltbrn STN,g mod fast strmg CUT"

6600.00 6610.00 "LS AA,ooc GRNST/tr micsuc strk & incr DOL cmt,scat crm-off wh plty-chk prty-incl w/rr trnsl xln ANHY incl,g-fr ooc-intxl POR,g even mod bri-dull yel FLOR,g brn/occ blk dd o STN,"

6610.00 6620.00 "LS AA,pred LS GRNST/ DOL rich cmt,occ grdg to lmy-calc DOL,tr scat crpxl PCKST,rr scat CHT frag AA,g-fr ooc-intxl POR,g-fr dull-mod bri yel FLOR,g ltbrn-brn STN,g-fr slow-mod fast strmg CUT"

6620.00 6640.00 "LS AA,pred LS GRNST w/scat PCKST,tr scat CHT frag,w/brn-dkbrn micsuc-micxl DOL PKST & GRNST,occ grdg to lmy-calc DOL,fr-g intxl-ool POR,g-fr even dull-mod bri yel FLOR,fr ltbrn-brn/tr blk dd o STN,g mod fast-fast strmg CUT AA"

6640.00 6650.00 "LS brn-ltbrn,occ tan,AA,pred LS GRNST w/scat PCKST,tr scat CHT frag,w/brn-dkbrn micsuc-micxl DOL PKST & GRNST,occ grdg to lmy-calc DOL,fr-g intxl-ool POR,g-fr even dull-mod bri yel FLOR,fr ltbrn-brn/tr blk dd o STN,g mod fast-fast strmg CUT AA"

DEPTH	LITHOLOGY

6650.00 6660.00 "LS brn-ltbr,tan,occ ltgybrn,micxl-gran-ooc,vfxl-crpxl-agl,pred GRNST LS/tr DOL cmt & occ ooc,scat crpxl PCKST LS/rr mic fos incl,rr plty-chk prtgs-frag,g intxl/ooc-agl POR,g-fr scat dull-mod bri yel FLOR,g brn/scat blk dd o STN,g mod fast-fast strmg CUT"

6660.00 6670.00 "LS brn-ltbr,tan,occ ltgybrn,micxl-vfxl-oolicastic,crpxl-agl ip,pred GRNST LS/tr DOL cmt,rr crpxl ool PCKST LS,rr bf CHT frag,v rr gybrn micxl DOL PKST,g intxl/ool-agl POR,g-fr bri-occ dull yel FLOR,g brn-rr blk dd o STN,g mod fast-fast strmg CUT"

6670.00 6680.00 "LS AA,w/rr scat DOL PKST-v rr scat CHT frag,POR-FLOR-STN-CUT AA"

6680.00 6690.00 "LS lt-dkbrn,micxl-vfxl,gran-suc,oolicatic-v sl alg,pred ool LS GRNST,w/tr DOL rich cmt,tr bf-brn CHT frag,rr crpxl brn-gybrn lmy DOL PKST frag,fr-g intxl-ool-v rr alg POR,fr-g dull-bri yel FLOR,fr-g ltbrn-v rr blk STN,g mod fast-fast stmg CUT"

6690.00 6700.00 "LS AA,decr DOL PKST-CHT frag,POR-FLOR-STN-CUT AA"

6700.00 6710.00 "LS brn-dkbrn,occ ltbrn,ooliclastic,micxl-gran,pred ooc LS GRNST,tr brn-gybrn micxl-crpxl lmy DOL PKST incl,v rr mic fos,occ scat bf CHT frag,g intxl-fr ool POR,fr-g dull-bri yel FLOR,g lt-dkbrn STN,n-v rr blk dd o STN,fr-g mod fast-fast stmg CUT"

6710.00 6720.00 "LS AA,decr lmy DOL PKST,POR-FLOR-STN-CUT"

6720.00 6730.00 "LS brn-mbrn,micxl-vfxl,gran-suc,occ oolicastic,v sl alg,n-v rr lmy micxl DOL PKST, v rr bf-brn CHT frag,v rr ANHY xl-incl,g intxl-fr ool-rr alg POR,g dull-bri yel FLOR,g lt-dkbrn STN,n-v rr blk dd o STN,fr-g mod fast-fast stmg CUT"

6730.00 6740.00 "LS AA,incr DOL PKST-CHT frag,POR-FLOR-STN-CUT AA"

6740.00 6750.00 "LS m-dkbrn-brn,micxl-vfxl,gran-micsuc,oolicastic ip,dol-DOL rich cmt ip,pred ool LS PKST,v rr ANHY xl-incl,rr scat CHT frag,occ v lmy micxl DOL PKST incl,g intxl-fr ool-rr alg POR,g dull-bri yel FLOR,g brn-rr blk STN,g mod fast-fast CUT"

6750.00 6760.00 "LS AA,sl decr DOL PKST-CHT frag,POR-FLOR-STN-CUT AA"

6760.00 6770.00 "LS lt-mbrn-brn,micxl-vfxl,gran-micsuc,sl decr oolicastic mat,occ dol-DOL rich cmt,pred ool LS GRNST-rr LS PKST,rr ANHY xl,rr scat CHT frag,occ v lmy micxl DOL PKST incl,g intxl-fr ool-rr alg POR,g dull-bri yel FLOR,g brn-rr blk STN,g mod fast-fast CUT"

6770.00 6780.00 "LS AA,scat DOL PKST aa,v rr scat CHT frag,POR-FLOR-STN-CUT AA"

6780.00 6790.00 "LS AA,v rr DOL PKST, occ scat bf CHT frag,POR-FLOR-STN-CUT AA"

6790.00 6800.00 "LS lt-brn,rr mbrn,micxl-vfxl,gran-micsuc,occ oolicastic mat,occ dol-DOL rich cmt,pred ool LS GRNST w/intbd LS PKST,rr ANHY xl,v rr bf CHT frag,v rr lmy micxl DOL PKST incl,g intxl-fr ool-rr alg POR,g dull-bri yel FLOR,g brn-rr blk STN,g mod fast-fast CUT"

6800.00 6810.00 "LS lt-mbrn-brn,micxl-vfxl,gran-micsuc,sl decr oolicastic mat,occ dol-DOL rich cmt,pred ool LS GRNST-rr LS PKST,rr ANHY xl,rr scat CHT frag,occ v lmy micxl DOL PKST incl,g intxl-fr ool-rr alg POR,g dull-bri yel FLOR,g brn-rr blk STN,g mod fast-fast CUT"

DEPTH	LITHOLOGY

6810.00 6820.00 "LS AA,scat DOL PKST aa,v rr scat CHT frag,POR-FLOR-STN-CUT AA"

6820.00 6830.00 "LS AA,v rr DOL PKST, occ scat bf CHT frag,POR-FLOR-STN-CUT AA"

6830.00 6840.00 "LS lt-mbrn-brn,micxl-vfxl,gran-micsuc,decr oolicastic mat,occ dol-DOL rich cmt,pred ool LS GRNST-w/inbd LS PKST,rr ANHY xl,rr scat CHT frag,v rr micxl DOL PKST incl,g intxl-fr ool-rr alg POR,g dull-bri yel FLOR,g brn-rr blk STN,g mod fast-fast CUT"

6840.00 6850.00 "LS AA,incr oolicastic LS PKST,scat DOL PKST AA,rr scat CHT frag,POR-FLOR-STN-CUT AA"

6850.00 6860.00 "ABNT CVGS P-FR SPL"
"LS pred ltbrn,occ brn,mot ip,micxl-vfxl,gran,micsuc-suc ip,oolicastic ip,arg,occ sl alg,v rr mic fos,dol-occ DOL rich cmt,sl anhy,occ micxl dol LS PKST incl,rr CHT frag,fr-g intxl-ool POR,fr ltbrn-tr mbrn STN,fr-g mod fast-fast CUT"

6860.00 6870.00 "DECR CVGS FR-G SPL"
"LS AA,scat DOL PKST aa,v rr scat CHT frag,POR-FLOR-STN-CUT AA"

6870.00 6880.00 "LS AA,v rr DOL PKST, occ scat bf CHT frag,POR-FLOR-STN-CUT AA"

6880.00 6900.00 "LS lt-mbrn-brn,micxl-vfxl,gran-micsuc,decr oolicastic mat,occ dol-DOL rich cmt,pred ool LS GRNST-w/inbd LS PKST,rr ANHY xl,rr scat CHT frag,v rr micxl DOL PKST incl,g intxl-fr ool-rr alg POR,g dull-bri yel FLOR,g brn-rr blk STN,g mod fast-fast CUT"

6900.00 6910.00 "LS AA,scat DOL PKST aa,v rr scat CHT frag,POR-FLOR-STN-CUT AA"

6909.00 6920.00 "LS ltbrn-mot,micxl-vfxl,gran-micsuc,decr oolicastic,incr dol-DOL rich cmt,pred ool LS GRNST-w/scat LS PKST,rr ANHY xl,rr CHT frag,incr& grdg to micxl-vfxl DOL GRNST incl,g intxl-fr ool-rr alg POR,g dull-bri yel FLOR,g brn-rr blk STN,g mod fast-fast CUT"

6920.00 6930.00 "DOL mbrn-brn,occ mot,micxl-vfxl,gran-suc,v sl alg,lmy,w/scat intbd ltbrn oolicastic LS GRNST,v rr LS & DOL PKST incl,v sl chty,rr mic fos,DOL & LS has fr-g intxl-tr alg-ool POR,fr-g dull-bri yel FLOR,g ltbrn-v rr blk STN,g mod fast-fast stmg CUT"

6930.00 6940.00 "DOL GRNST AA,decr LS GRNST-PKST,v sl alg,DOL POR-FLOR-STN-CUT AA,decr LS POR-FLOR-STN-CUT"

6940.00 6950.00 "DOL GRNST AA,lmy ip,w/occ LS rich cmt-v rr LS PKST incl,tr trnsl-clr-bf CHT frag,POR-FLOR-STN-CUT AA"

6950.00 6960.00 "DOL m-dkbrn,occ brn,micxl-vfxl,gran-suc,rthy ip,v sl alg,occ LS rich cmt,scat clr-trnsl CHT frag,tr sl dol crpsl-micxl LS PKST-v sl ool,rr mic fos,tr-fr intxl-alg-rrr ool POR,tr-fr dull-bri yel FLOR,fr lt-mbrn-rr blk STN,fr mod fast-fast stmg CUT"

6960.00 6970.00 "DOL AA,w/incr intbd crn-wh-tan crpxl,v sl ool LS PKST,scat CHT frag,decr intxl-alg-oolicastic POR,tr-fr dull-bri yel FLOR,tr lt-dkbrn STN,n-v rr blk dd o STN,tr mod fast-fast CUT"

6970.00 6980.00 "LS crm-tan,occ wh,crpxl,v rr micxl,plty ip,tr clr-trnsl CHT frag,rthy ip,rr mic fos,w/intbd DOL GRNST AA,rr-tr intxl POR,tr dull yel FLOR,tr lt-dkbrn STN,tr of g mod fast stmg CUT"

FORMATION TOPS

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 NW UPPER 1-B HORIZONTAL LATERAL LEG #2

FORMATION NAME		SAMPLES	SAMPLES	DATUM
		MEASURED DEPTH	TRUE VERTICAL DEPTH	KB:4760
LOWER ISMAY		5452'	5450'	-690'
GOTHIC SHALE		5479'	5473'	-713'
DESERT CREEK		5494'	5486'	-726'
DC 1-A		5498'	5488'	-728'
DC 1-B		5556'	5520'	-760'

GEOLOGICAL SUMMARY

AND

ZONES OF INTEREST

The Mobil Exploration and Production U.S. Inc., Ratherford Unit #13-41 Horizontal Leg #2, Section 13, T41S, R23E, was a re-entry of the Mobil Ratherford Unit #13-41, and was sidetracked in a northwesterly direction from 5413' measured depth, 5413' true vertical depth, on April 12, 1997. Leg #2 reached a measured depth of 6980', true vertical depth of 5510' at total depth, horizontal displacement of 1550' and true vertical plane 107 degrees, on April 17, 1997. The lateral was drilled with no problems. Since this well used an oil-water emulsion for drilling fluid, the background gases noted on the accompanying mud log remained moderately high, as well as the samples being contaminated to a certain extent with oil from the drilling fluid and from the lateral section of the well, which made a minor amount of oil while being drilled.

The primary objective of the Ratherford Unit #13-41 Horizontal Lateral Leg #2 was the upper 1-B Porosity Bench, to identify and define the porosity benches, their effective porosity, staining and reservoir properties in the Desert Creek Member of the Upper Paradox Formation.

The Lower Ismay, Gothic Shale, the transition zone at the top of the Desert Creek, and the 1-A zone were encountered while drilling Leg #2. Kick off point for this lateral was in the lower 1/3 of the Upper Ismay Member. The base of the Upper Ismay was very poorly represented in the samples due to the abundance of Permian Cutler shale in the first several samples. The Upper Ismay seen in the samples was predominately white to cream, occasionally tan, cryptocrystalline to microcrystalline, chalky, cherty, fossiliferous limestone, occasionally grading to or having interbedded very thin, very argillaceous, brown to gray brown, microcrystalline to microsucrosic dolomite. The dolomite graded into the very thin, carbonaceous, dolomitic shale of the Hovenweep.

The top of the Lower Ismay was picked at 5451' measured depth, 5450' true vertical depth, at the base of the very thin Hovenweep shale. The Lower Ismay was a cream to tan, some light gray brown to dark brown, cryptocrystalline to microcrystalline, chalky to clean, slightly limy dolomite, which was occasionally anhydritic, with some anhydrite filled fractures, slightly cherty, occasionally marly to very marly, and had a trace of scattered micro fossils. This dolomite had no to rare intercrystalline to rare fractured porosity, with no to very rare spotty dull yellow fluorescence, none to very rare light brown stain, and only a trace of very poor slow diffuse cut. There were very thin interbedded limestones, which were white to cream, occasionally tan, cryptocrystalline, occasionally microcrystalline, dolomitic, anhydritic, argillaceous, slightly silty to very silty, very tight, with no visible porosity, fluorescence, stain or cut. In the base of the Lower Ismay, the dolomites and limestone became increasingly argillaceous and graded into the Gothic Shale. These basal dolomites and very thin limestones had no to very rare intercrystalline porosity, spotty dull fluorescence, very rare stain, and only a poor very slow cut.

The top of the Gothic Shale is at 5479' measured depth, 5473' true vertical depth. The Gothic Shale was predominantly dark gray to black, silty, carbonaceous, brittle to firm, subblocky to blocky to platy, calcareous to slightly dolomitic and slightly micaceous. The top of the Gothic was gradational from the very thin interbedding of very argillaceous, carbonaceous limestone and very argillaceous, limy dolomite, with the dolomite grading into very dolomitic, carbonaceous shale. The top of the Gothic was picked predominantly by the decrease in penetration rate and the increased percentage of shale in the samples.

Between the Gothic Shale and Desert Creek Porosity Members is a transitional zone, which appears to be gradational. The top of the Desert Creek is commonly picked at the Gothic Shale to transition zone facies change, which in this well occurred at a measured depth of 5494' and a true vertical depth of 5486'. In this well the zone was predominantly a very limy and very silty dolomite; which was gray to gray brown, cryptocrystalline to microcrystalline, with some dolomitic marlstone, very slightly sandy, with thinly interbedded limestone which was cream to light gray brown, cryptocrystalline to rarely microcrystalline, slightly dolomitic and occasionally silty to very silty and sandy in part. The dolomites and limestones were predominately tight with very rare intercrystalline porosity that showed some anhydrite fillings. These dolomites and limestones had no to very poor fluorescence stain and cut. The dolomite and limestone graded into and had cyclic deposits of marlstones, and very rare dolomitic to slightly calcareous, black, carbonaceous mudstones. .

The top of the Desert Creek 1-A zone was picked at 5498' measured depth, 5988' true vertical depth. The pick is base on the increase in rate of penetration and sample interpretation. The top was picked in this lateral mainly based on the first consistent drilling break below the Desert Creek the tight silty limes and dolomites of the transition zone and the first occurrence of a light brown to brown, microcrystalline to very finely crystalline to microsucrosic, oolicastic limestone packstone with occasionally slightly algal, oolicastic limestone grainstones, with some interbedded limy, argillaceous, occasionally very slightly algal dolomite grainstone and packstone near the top and base of the zone. The dolomites were predominately tight with very rare streaks of intercrystalline to algal porosity, some chert fragments, and no to a trace of fluorescence, stains and cut. The limestones had fair oolicastic to occasionally intercrystalline to very a trace of algal porosity, rare to fair dull yellow fluorescence, spotty brown stain and a slow diffuse to moderately fast streaming cut.

The 1-B zone was picked at a measured depth of 5556', 5520' true vertical depth in tight interbedded tan to light brown, occasionally cream limestone and dolomite packstones. These limestones and dolomites had very rare microfossils, rare scattered dark brown to dark gray brown chert fragments and were very slightly anhydritic. The packstones had very poor intercrystalline porosity, and very poor sample shows.

As the curve was being completed in the 1-B zone the limestones became cleaner and increasingly granular and oolicastic. While drilling curve through the section, it appeared that the 1-B porosity bench appeared to be defined by the interval 5557' measured depth, 5420.5' true vertical depth to a 5692' measured depth, 5525' true vertical depth. The top of the porosity Bench was marked by gradational facies change. A drilling break from 3 minutes per foot to 1 minute per foot was noted from a measured depth of 5557', 5520.5' true vertical depth, to 5567' measured depth, 5523' true vertical depth, in the top 2 1/2 feet of the best porosity in the 1-B zone. The drilling break was in an oolicastic limestone grainstone, which had very thin interbedded oolicastic limestone packstones and very dolomite rich cement. The base of the porosity zone was not encountered while landing the curve.

At a measured depth of 5592', 5525' true vertical depth, with a horizontal displacement of 164' in the slightly algal, oolicastic limestone and limestone grainstones and very thin dolomite grainstones and packstones just below the best porosity of the 1-B porosity horizon, a trip was made to change from curve bottom hole assembly to the lateral assembly and pick up the MWD tool. When drilling was resumed in the 1-B lateral, the well bore wanted to drop in angle as if follow a porosity streak and was allowed to drop. After drilling 76' the drill rate dropped from an average of 2 minutes per foot to 3 minutes per foot as the base of the porosity zone was encountered and the well bore was turned upwards to reacquire the best porosity of the 1-B porosity zone. The best porosity of the 1-B zone was again acquired at a measured depth of 5956', 5522' true vertical depth, a horizontal displacement of 529' and approximately 3' above the target line for the 1-B zone. The interval from a measured depth of 5592', 5525' true vertical depth, with a horizontal displacement of 164' to a measured depth of 5968', 5522' true vertical depth, and a horizontal displacement of 529'; was predominately a tan to brown, occasionally cream to medium brown, cryptocrystalline to

microcrystalline, with a trace of very finely crystalline to granular, some oolicastic to slightly algal limestone packstones and rare scattered grainstones, with a dolomite rich cement. Interbedded with the limestones, were scattered light brown, slightly limy dolomite packstones and varying amounts of translucent to brown chert fragments. When the lateral reached a horizontal displacement of 529', the porosity was again encountered and the lithology became predominately oolicastic to very slightly algal limestone packstones and grainstones, with a very dolomite rich cement and very thin limy dolomite packstones and rare grainstones, with scattered chert fragments. An increase in the background gas was noted when the porosity zone was again encountered and increased as the lateral was continued.

From a measured depth of 5968', to a measured depth of 6283', 5513' true vertical depth, 854' horizontal displacement, as the 1-B zone was drilled upwards at a slight angle. The porosity was in a light brown to brown, occasionally dark brown, cryptocrystalline to very fine crystalline, microsucrosic to granular, oolicastic to very slightly algal limestone grainstones with thin oolicastic packstones. The limestones had very rare micro fossils, had scattered traces of anhydrite crystals to rare inclusions, rare scattered limy dolomite packstones fragments to inclusions and a dolomite rich cement, scattered chert fragments, predominately good oolitic to oolicastic porosity, rare traces of algal material, light to dark brown stain and very rare black oil stain residue* in the porosities. An increase in tighter limestone packstones was noted from a measured depth of 6216', 5514.7' true vertical depth, to a measured depth of 6226', 5514.5' true vertical depth, and horizontal displacements of 787' to 797' respectively, as the well bore bumped the top of the porosity zone. Through this interval the fluorescence was fair, the staining was moderate and cuts ranging from slow to good moderately fast to slow steady streaming.

At a measured depth of 6283', 5513' true vertical depth, and a horizontal displacement of 854', the well bore was oriented downward, due to the zone dipping downward toward the 12-34 well. The limestones from 6283' measured depth to 6405' measured depth, 5517' true vertical depth with 978' horizontal displacement, an increase in tighter slightly oolitic to oolicastic limestones packstones were encountered as the top of the porosity zone was approached. Through this interval a decrease in penetration was noted. The limestones encountered were predominately tan to brown to light brown, occasionally cream to medium brown, cryptocrystalline to microcrystalline, occasionally very finely crystalline to microsucrosic, occasionally oolicastic to very slightly algal, with slightly dolomite rich cement, occasionally thin limestone grainstones, with increasing scattered dolomite packstone fragments to inclusions and cementing, and an increase in chert fragments. The slightly oolicastic to algal limestones packstones and scattered grainstones had trace to fair oolicastic to slightly intercrystalline to rare algal porosity, trace to fair dull to rare bright yellow fluorescence, a fair brown stain, scattered black dead oil stain and a fair to good moderately fast to fast streaming cut.

The well was continued downward at a shallow angle to move away from the top of the zone from 6405' to 6835' measured depth, 5512' true vertical depth, with a horizontal displacement of 1508'. Through this interval the lithology remained brown to light brown, occasionally tan, cryptocrystalline to microcrystalline, occasionally microsucrosic to very finely crystalline, some granular, oolicastic to very slightly algal limestone grainstones with scattered amounts of limestone packstone and rare oolitic to microsucrosic dolomite packstones and very rare grainstones, rare micro fossils, and with varying amounts of dolomite rich cement. The limestones had fair to good oolicastic to fair intercrystalline to rare algal porosity, fair to good dull to bright yellow fluorescence, fair to brown stain, rare scattered black dead oil stain and predominately a good moderately fast to fast streaming cut.

As the lateral approached termination from a measured depth of 6835', 5512' true vertical depth, with a horizontal displacement of 1508' to the total depth of 6980', 5510.6' true vertical depth, and a horizontal displacement of 1550', an increase in brown to medium brown, micro to very finely crystalline, microsucrosic to sucrosic, limy, algal dolomite grainstones, with fair to good intercrystalline to occasionally algal porosity, a fair dull yellow fluorescence, a fair brown stain and a

fair to good moderately fast streaming cut was noted. Through this interval the limestones were predominately a tighter limestone packstone, occasionally platy, with only minor amounts of intercrystalline to oolicastic porosity, and the sample shows in the limestone becoming very poor.

At a total measured depth of 6980', true vertical depth 5510.6' and a horizontal displacement of 1550' the lateral was terminated. The lateral was terminated in a tight, very slightly oolitic limestone packstone and interbedded thin, slightly algal dolomite grainstone with scattered cherts.

In tracking the well bore through the 1-B bench, there were several facies changes with in the limestones. The changes noted in the limestones were as the well bore approached the top and base of the 1-B zone they changed from oolicastic limestone grainstone to slightly oolitic limestone packstone. A vertical change was noted from an oolicastic limestone grainstone to a slightly algal dolomite grainstone and very slightly oolitic, tight limestone packstone was noted as the top of the 1-B zone was penetrated near the termination of the lateral. The 1-B zone was projected to thicken and trend upward as the lateral continued toward the RU #12-34 well. In tracking the top and base of the zone, it appears that the dip trended upwards at an angle greater than the projected 90.2 angle until reaching a horizontal displacement of 1380', at this point the zone began to dip downward toward the 1-B zone of the RU #12-34.

Predominant facies changes were associated with the rock classification with in the limestones and were associated with the depositional environment, as the environment of deposition changed vertically when approaching the top or base of the 1-B zone. Through out the 1-B zone, the porous oolicastic to slightly algal limestone grainstones encountered were continuous, with the effective or better porosity and maximum background gas, being associated with this limestone facies, which had fair to good oolicastic, and some intercrystalline to algal porosities, and the absence of any major anhydrite plugging. The limestone and dolomite packstones encountered had porosities which were predominately tighter and with very poorer visible permabilities. The limestones noted from a horizontal displacement of approximately 240' to 529' and from 865' to 977' had poorer visible porosities.

From the top of the 1-B porosity bench to a total measured depth of 6980', the limestone lithology was rather consistent, ranging from light brown to medium brown, rare dark brown, micro to very fine crystalline, oolicastic, and occasionally microsucrosic to granular, with scattered, tighter limestone and dolomite packstones and some anhydrite matrixes. The limestones had fair to good oolitic to oolicastic porosity, with a fair amount of intercrystalline and traces algal porosities and a good constant dull to bright yellow fluorescence, with slight decreases when noticeable amounts of tight limestone and dolomite packstone were present. The staining in the limestones ranged from trace to good light brown to traces of black dead oil stain and the associated cuts being trace to good moderately fast to fast streaming, with only occasional slow cuts. The porosity, fluorescence, staining and cuts in the slightly oolitic to very slightly algal limestone and dolomite packstones encountered were rare to a slight trace, and were rather inconsistent through out the lateral in the 1-B zone. Near termination, as the well bore penetrated the top of 1-B zone, the dolomite grainstones were encountered had fair intercrystalline to rare algal porosities, with a trace to fair dull yellow fluorescence, a fair brown stain and a trace to fair streaming cut. The sample shows were affected in part due to the presence of the oil emulsion in the drilling fluid used through out the curve and lateral sections, along with the minor amount of oil made while drilling the lateral section.

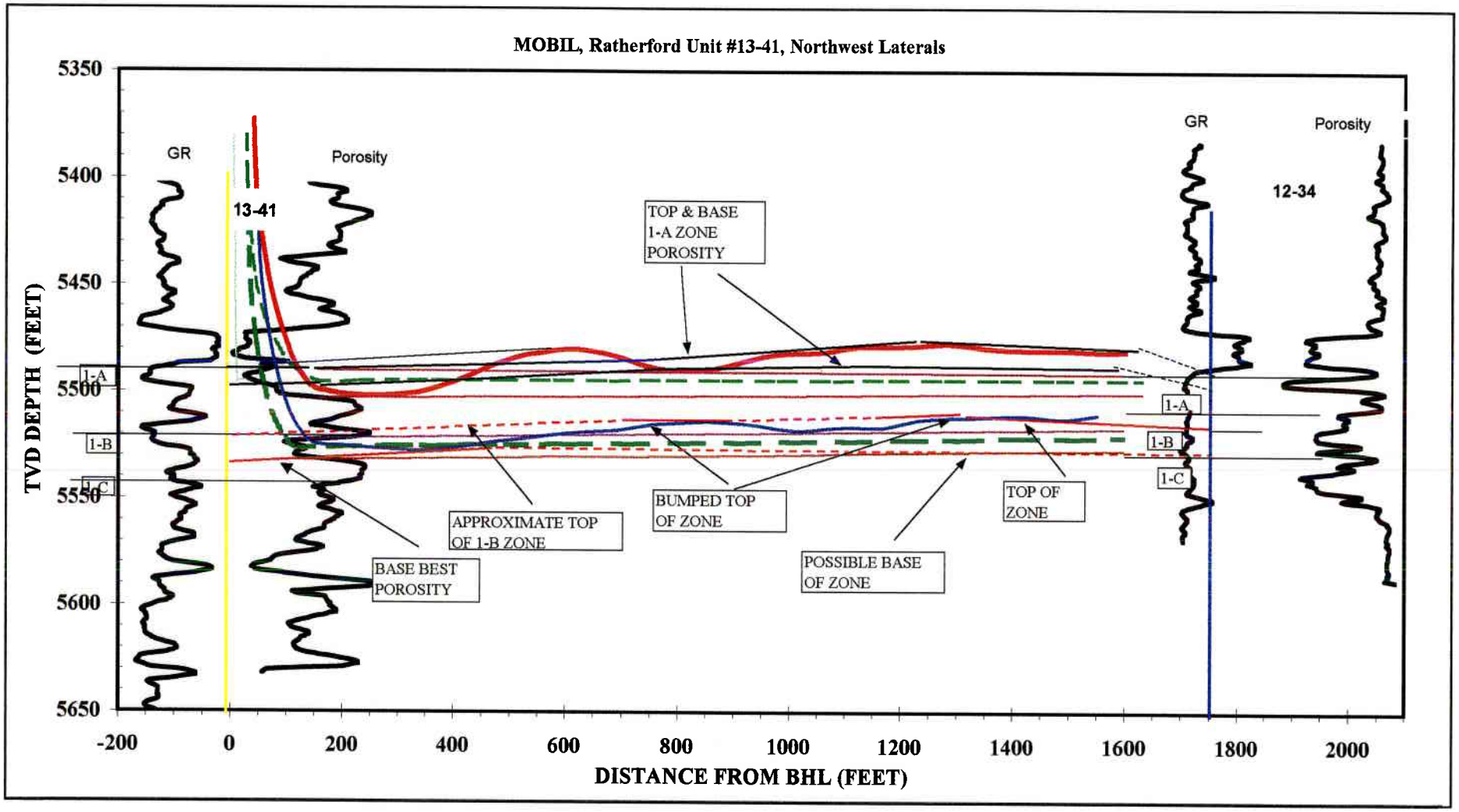
The conclusion drawn from the northwesterly 1-B porosity bench in Lateral Leg 2, is that in this area the limestone porosity, was enhanced by the presence of the oolicastic material and traces of algal material, as evidenced by the high gas shows encountered in the these porosities. Also, having and effect on the porosity, were the cryptocrystalline to microcrystalline limestone and dolomite packstones which were thinly interbedded in the oolicastic limestones, which in turn graded vertically into dolomitic limestone packstone. Staining was predominately fair to moderate good, with some black dead oil staining was trapped in the oolicastic and algal matrix. The lateral used the a proposed

projected target line as a reference point through the bench, drilling however followed the line of best porosity which was above the target line beginning at a horizontal displacement of approximately 500'. This lateral was drilled to completion entirely in the 1-B zone. From 500' to termination the lateral was drilled above the target line, anywhere from 10.5' to 6' above the line.

While drilling, the lateral the high background gas was due in part to the oil emulsion used in the drilling fluid, which was indicated by the significant amounts of heavies noted on the chromatograph (C_3 through C_5), and as the lateral was continued the well did make minor amount of oil, causing very high background gases through out most of the lateral. This lateral can be interpreted to have good reservoir qualities through out the lateral. It appears that the porosities are well enough developed to enhance the overall performance of the zone.

*The black residual staining has been called by Dr. Dave Eby & others as "bitchimum" and is also known as "dead oil" ("dd o stn" on mud logs). This staining is associated with the movement of oil over long periods of time and is a good indicator of producable hydrocarbons when associated with productive porosities, but can also be found in porosities that have been filled by anhydrites and other material at later dates.

ROCKY MOUNTAIN GEO-ENGINEERING CORP. 2450 INDUSTRIAL BLVD, GRAND JUNCTION, CO 81505 (970) 243-3044



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MOBIL

RATHERFORD UNIT #13-41
HORIZONTAL LATERAL LEG #3
UPPER 1-A
POROSITY BENCH DESERT CREEK
SECTION 13, T41S, R23E
SAN JUAN, UTAH

GEOLOGY REPORT
by
DAVE MEADE
ROCKY MOUNTAIN GEO-ENGINEERING CORP.
GRAND JUNCTION, COLORADO
(970) 243-3044

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WELL SUMMARY

OPERATOR:	MOBIL EXPLORATION & PRODUCTION U.S. INC.
NAME:	RATHERFORD UNIT #13-41 SE UPPER HORIZONTAL LATERAL LEG #3 IN 1-A UPPER POROSITY BENCH, DESERT CREEK
LOCATION:	SECTION 13, T41S, R23E
COUNTY/STATE:	SAN JUAN, UTAH
ELEVATION:	KB:4748' GL:4760'
SPUD DATE:	4/12/97
COMPLETION DATE:	4/17/97
DRILLING ENGINEER:	LEWIS SIMMON
WELLSITE GEOLOGY:	DAVE MEADE / MARVIN ROANHORSE
MUDLOGGING:	
ENGINEERS	DAVE MEADE / MARVIN ROANHORSE / KEN SCHWARTZ
CONTRACTOR:	BIG "A" RIG 25
TOOLPUSHER:	J. DEES
HOLE SIZE:	4 3/4"
CASING RECORD:	SIDETRACK IN WINDOW AT 5393' MEASURED DEPTH
DRILLING MUD:	M-I
ENGINEER:	DANNE BEASON
MUD TYPE:	OIL EMULSION / POLYMER SWEEPS
DIRECTIONAL DRILLING CO:	SPEERY-SUN
ELECTICAL LOGGING:	NA
TOTAL DEPTH:	6620' MEASURED DEPTH TVD-5512.06'
STATUS:	TOH & PREPARE TO SET WHIPSTOCK #4

DRILLING CHRONOLOGY
RATHERFORD UNIT #13-41
SE UPPER 1-A HORIZONTAL LATERAL LEG # 3

DATE	DEPTH	DAILY	ACTIVITY
4/18/97	6980'	9'	TOH-LAY DOWN WHIPSTOCK & LATCH ASSEMBLY-MAKE UP NEW WHIPSTOCK & EXTENTION & STARTER MILL-TIH & ORIENT-CIR. 10# BRINE-THRU CHOKE-TIH-SET WHIPSTOCK @ 5431-CIR 10# BRINE THRU CHOKE-MILLW/STARTER MILL 5386'-5388'-CIRC.-TOH-LAY DOWN STARTER MILL-PICK UP WINDOW MILL & WATER MELLEON MILL-TIH-CIR.-MILL WINDOW FROM 5386'-5395'-DRLG FORMATION 5393-5395'-PUMP SWEEPS-LAY DOWN 10 JTS DRL PIPE-TOH
4/19/97	5395'	23'	TOH -LAY DOWN MILLS-MAKE UP BIT & CURVE ASSEMBLY-TIH W/ BHA-RIG UP WIRELINE & RUN GYRO-TIME DRLG 5395'-5399'-CONTROL DRLG 5399'-5411'-DRLG 5411'-5418'-PULL GYRO-CIR BTMS UP-RUN IN STEERING TOOL & SET WET CONN.
4/20/97	5411'	264'	SET WET CONN.-DIR DRLG & SURVEYS-CIR BTMS UP @ 5557'-PULL TO WET CONN.-PULL STEERING TOOLCIR 10# BRINE-LAY DOWN 42 JTS DRL PIPE-TOH-LAY DOWN CURVE ASSEMBLY-PICK UP LATERAL BHA & BIT-TIH-CIR. OUT THRU CHOKE-DIR DRLG & SURVEYS
4/21/97	5675'	769'	DIRL DRLG & SURVEYS
4/22/97	6444'	176'	DIR DRLG & SURVEYS-CIR. SPLS @ 6620'-CIR SWEEPS-TOH-LAY DOWN LATERAL ASSEMBLY-PICK UP RETRIEVEING HOOK -TIH-CIR OUT GAS & OIL-TIH

DAILY ACTIVITY

Operator: MOBIL
Well Name: RATHERFORD UNIT #13-41 SE UPPER 1-A HORIZONTAL LATERAL LEG #3

DATE	DEPTH	DAILY	DATE	DEPTH	DAILY
4/18/97	6980'	9'			
4/19/97	5395'	23'			
4/20/97	5411'	264'			
4/21/97	5675'	769'			
4/22/97	6444'	176'			
TD	6620'				

BIT RECORD

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 SE UPPER 1-A HORIZONTAL LATERAL LEG #3

RUN	SIZE	MAKE	TYPE	IN/OUT	FTG	HRS	FT/HR
#1	4 3/4"	WTHRFRD	MILL	5386'/ 5395'	11'	N/A	N/A
#2(RR) BIT	4 3/4"	HTC	STR-20	5395'/ 5557'	162'	20	8.1
#3 BIT	4 3/4"	HTC	STR-30	5557'/ 6620'	1,063'	43.5	24.4

Customer ... : Mobil
Platform ... : RATERFORD UNIT
Slot/Well .. : A/13-41,3A1

MEASURED DEPTH	ANGLE DEG	IRECTIO DEG	TVD	NORTH IN FEET	GS	EAST IN FEET	GS	VERTICA SECTION	DOG LEG
5386	0.32	5.13	5385.32	52.81	N	10.61	W	-23.52	0
5395	2.7	69.5	5394.32	52.91	N	10.41	W	-23.35	28.64
5405	9	70.2	5404.26	53.26	N	9.45	W	-22.51	63
5415	15.5	70.9	5414.03	53.96	N	7.45	W	-20.75	65.02
5425	22	71.6	5423.49	54.99	N	4.41	W	-18.06	65.04
5435	27.1	72.3	5432.58	56.28	N	0.46	W	-14.56	51.08
5445	31.2	79.1	5441.32	57.46	N	4.26	E	-10.29	52.65
5455	35.7	84.7	5449.66	58.22	N	9.71	E	-5.2	54.53
5465	41.3	88.2	5457.48	58.59	N	15.92	E	0.72	60.07
5475	47.5	91.1	5464.63	58.62	N	22.91	E	7.48	65.22
5485	53.3	94	5471	58.27	N	30.6	E	15.01	62.14
5495	57.6	97.5	5476.67	57.44	N	38.79	E	23.15	51.76
5505	61.7	101.1	5481.72	56.04	N	47.31	E	31.74	51.43
5515	67	103.5	5486.05	54.12	N	56.11	E	40.74	57.24
5525	73.3	104.4	5489.44	51.85	N	65.23	E	50.14	63.57
5535	78.9	105.5	5491.85	49.35	N	74.61	E	59.85	57.01
5545	84.7	109.1	5493.27	46.4	N	84.05	E	69.73	68.06
5557	89	109.9	5493.93	42.4	N	95.34	E	81.66	36.45
5579.3	89	108	5494.32	35.16	N	116.43	E	103.89	8.52
5611.14	89.3	109.7	5494.79	24.88	N	146.56	E	135.63	5.42
5643	88	110.9	5495.54	13.83	N	176.43	E	167.32	5.55
5674.9	88.2	112.7	5496.6	1.99	N	206.03	E	198.95	5.67
5706.71	87.2	113.4	5497.88	10.46	S	235.28	E	230.38	3.84
5738.52	86	113.7	5499.76	23.14	S	264.38	E	261.74	3.89
5770.25	91.5	115.5	5500.46	36.34	S	293.21	E	292.96	18.24
5802.05	91.5	115.7	5499.62	50.08	S	321.88	E	324.16	0.63
5833.8	87.5	113.4	5499.9	63.27	S	350.75	E	355.41	14.53
5865.52	90.4	111.1	5500.48	75.27	S	380.1	E	386.83	11.67
5897.35	87.6	108.1	5501.04	85.95	S	410.08	E	418.53	12.89
5929.21	90.6	109.9	5501.54	96.32	S	440.19	E	450.28	10.98
5961.01	91.2	110.7	5501.04	107.35	S	470.01	E	481.91	3.14
5992.77	91.2	108.8	5500.37	118.08	S	499.9	E	513.53	5.98
6024.54	89.1	107.2	5500.29	127.89	S	530.11	E	545.24	8.31
6056.39	90.5	106.5	5500.4	137.12	S	560.59	E	577.07	4.91
6088.12	88.9	105.6	5500.57	145.9	S	591.08	E	608.78	5.79
6119.89	89.6	105.3	5500.98	154.36	S	621.7	E	640.54	2.4
6151.62	90.6	105.1	5500.93	162.68	S	652.32	E	672.27	3.21
6183.41	89.2	105.1	5500.98	170.96	S	683.01	E	704.06	4.4

Customer ... : Mobil
Platform ... : RATERFORD UNIT
Slot/Well .. : A/13-41,3A1

MEASURED DEPTH	ANGLE DEG	IRECTIO DEG	TVD	NORTHIN FEET	GS	EASTIN FEET	GS	VERTICA SECTION	DOG LEG
6215.21	91.7	105.3	5500.73	179.3	S	713.7	E	735.85	7.89
6246.97	91.8	105.3	5499.77	187.67	S	744.32	E	767.6	0.31
6278.73	90.8	105.8	5499.04	196.19	S	774.91	E	799.34	3.52
6310.48	89.8	105.8	5498.88	204.83	S	805.46	E	831.08	3.15
6342.23	84.5	104.6	5500.46	213.14	S	836.05	E	862.78	17.11
6373.18	84	103.7	5503.56	220.67	S	865.9	E	893.57	3.31
6404.15	85.3	103.9	5506.45	228.02	S	895.85	E	924.41	4.25
6436.01	86.6	104.6	5508.7	235.85	S	926.65	E	956.18	4.63
6467.82	86.4	104.9	5510.64	243.93	S	957.35	E	987.93	1.13
6498.88	87.3	105.1	5512.34	251.96	S	987.31	E	1018.95	2.97
6530.68	88.9	105.6	5513.4	260.37	S	1017.96	E	1050.72	5.27
6562.6	90.8	106.7	5513.48	269.25	S	1048.62	E	1082.63	6.88
6588	91.6	106.9	5512.95	276.59	S	1072.93	E	1108	3.25
6620	91.6	106.9	5512.06	285.89	S	1103.53	E	1139.96	0

MUD REPORT

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 SE UPPER 1-A HORIZONTAL LATERAL LEG #3

DATE	DEPTH	WT	VIS	PLS	YLD	GEL	pH	WL	CK	CHL	CA	SD	OIL	WTR
4/18/97	5388'	9.6	26	--	--	--	10.5	40.2	<1/32	140000	400	--	2%	92%
4/19/97	5398'	9.0	27	--	--	--	11.8	N/A	<1/32	100000	400	--	7%	93%
4/20/97	5557'	9.0	27	--	--	--	11.8	N/A	<1/32	99000	380	--	8%	92%
4/21/97	5657'	9.0	27	--	--	--	11.7	N/A	<1/32	96000	380	--	8%	92%
4/22/97	6617'	9.0	27	--	--	--	12.0	N/A	<1/32	96000	420	--	7%	93%

SAMPLE DESCRIPTIONS

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 SE UPPER 1-A HORIZONTAL LATERAL LEG #3

DEPTH	LITHOLOGY

5230.00 5240.00 "LS tan-crm-off wh,occ ltgybrn-dkbrngy,crpxl-micxl,rthy,cln,dns,sl chky,tr scat trnsl-mlky-brn CHT,rr trnsl xln ANHY,tr scat CMT,tt-vrr intxl POR,rr scat v dull yel FLOR,n-tr ltbrn STN.no CUT"

5240.00 5250.00 "LS AA/CHT & CMT,incr m-ltgybrn,brn/occ dkbrnblk-blk strk,bcmg shy-arg,brit,occ grdg to shy-arg DOL,v sl-sl chky,tt-rr intxl POR,n-vrr scat v dull yel FLOR,n-rr ltbrn STN,no CUT"

5250.00 5260.00 "LS crm-tan,occ ltgy-gybrn,crpxl-micxl,occ micsuc,dol,chk-cln,v sl slty,w/scat dkbrn CHT frag,occ gybrn micxl shy DOL incl,tt-v rr intxl POR,spty dull-bri yel FLOR,n-v rr vis STN,tr slow-mod fast CUT,thn carb SH ptgs"

5260.00 5270.00 "LS AA,w/decr DOL AA,scat CHT frag,occ v thn blk carb SH lams"

5270.00 5280.00 "LS tan-brn,occ crm-gybrn,rr wh,crpxl-micxl,rr micsuc,v dol,rthy-chk,occ cln,v rr mic fos,scat CHT frag,tt-tr intxl POR,tr spty dull yel FLOR,n-v rr vis STN,tr slow-mod fast CUT,v rr v thn blk carb SH ptgs,w/intbd thn,gybrn,micxl,rthy,lmy DOL,tt-vrr F-S-C"

5280.00 5290.00 "LS AA,incr DOL AA,w/brn-dkbrn CHT frag,POR-FLOR-STN-CUT AA"

5290.00 5300.00 "LS & DOL AA,incr dol MRLST,strky POR-FLOR-STN,tr fr mod fast CUT,incr gybrn CHT frag,scat carb SH ptgs,w/trnsl-clr xl ANHY"

5300.00 5310.00 "DOL ltgy-dkbrn,dkgybrn,crpxl-micxl,micsuc ip,slty,lmy ip,grdg to dol MRLST,rr intxl POR,spty yel FLOR,n-v rr ltbrn STN,tr slow-mod fast CUT,w/tan-ltgybrn,cprxl,arg LS,tt,scat dkgybrn-dk brn CHT frag,v thn ANHY,occ blk carb SH"

5310.00 5320.00 "DOL AA,scat CHT frag,tr LS incl,scat blk carb SH,POR-FLOR-STN-CUT AA"

5320.00 5330.00 "LS & DOL AA,incr dol MRLST,POR-FLOR-STN AA,tr fr mod fast CUT,scat CHT frag,scat carb SH ptgs,w/trnsl-clr xl ANHY"

5340.00 5350.00 "SH dkbrnblk-blk,sbblky-sbplty,frm-sft,occ brit,carb,v sl-sl mica,mrly-occ sl slty,calc-sl calc,sooty"

5349.00 5357.00 "LS crm-tan,occ wh,crpxl-micxl,dol,rr ANHY xl-incl,v rr CHT frag,w/thn intbd ltbrn,micxl,crpxl ip,lmy DOL,scat blk carb SH,rr intxl POR,tr spty dull yel FLOR,n-v rr vis STN,p slow-mod fast CUT in DOL"

5360.00 5370.00 "SH pred cvgs,dkgybrn,blk,sbblky,rthy-v sl slty,carb,dol-sl calc,sooty,mica,w/v thn tan crpxldns LS & ltgybrn-brn,micxl,rthy,sl lmy,arg tt DOL"

5370.00 5380.00 "LS,inr bcmg slty,tt,NFSOC,incr DOL PKST,bcmg v slty ip,w/abnt blk carb SH cvgs,AA"

DEPTH	LITHOLOGY

5380.00 5390.00 "DOL crm-tan,micxl,occ crpxl,v rthy-v slty,arg,grdg to v dol SLTST,tt-tr intxl POR,rr-tr dull yel FLOR,v rr ltbrn STN,n-v rr slow dif CUT,w/thn blk carb SH,scat v slty tt dol LS,v rr dkbrn CHT frag"

5390.00 5400.00 "DOL crm-tan,mgybrn,micxl-vfxl,rthy,v slty,v sl lmy,w/v rr scat CHT frag,occ thn intbd tt LS & blk carb SH,tr-fr dull yel flor,rr-tr intxl POR,n-v rr ltbrn STN,p slow dif-slow stmg CUT"

5400.00 5410.00 "DOL AA,tr intxl POR,tr-fr dull yel FLOR,v rr spty ltbrn-blk STN,tr slow dif-v rr slow stmg CUT,w/v rr intbd SH & LS AA,v rr trnsl CHT frag"

5410.00 5420.00 "DOL AA,v arg-v slty,v rr lt-dkbrn,micxl-vfxl,micsuc DOL GRNST,v rr xl ANHY incl,rr-tr intxl POR,tr-mfr dull-bri yel FLOR,n-v rr vis STN,slow-rr slow stmg CUT,w/decr LS & SH AA,v rr scat ltgy-trnsl CHT frag"
5410.00 5420.00 "DOL AA,v arg-v slty,v rr lt-dkbrn,micxl-vfxl,micsuc DOL GRNST,v rr xl ANHY incl,rr-tr intxl POR,tr-mfr dull-bri yel FLOR,n-v rr vis STN,slow-rr slow stmg CUT,w/decr LS & SH AA,v rr scat ltgy-trnsl CHT frag"

5430.00 5440.00 "DOL ltgy-gy,occ tan-ltbrn,micxl-vfxl,gran,occ crpxl DOL PKST incl,pred DOL GRNST,sl slty,LS rich cmt ip,occ grdg to dol LS GRNST,scat CHT frag,tr intxl POR,fr dull yel FLOR,spty ltbrn-v rr blk STN,rr slow stmg-fr slow dif CUT"

5440.00 5450.00 "DOL AA,decr ltbrn,incr slty-arg,decr POR-FLOR-STN-CUT,v rr LS frag "

5450.00 5460.00 "DOL pred ltgy-occ ltgybrn,rr brn,micxl-vfxl,v slty-v arg,v rr mica,grdg to v dol SLTST ip,w/scat tt crpxl chk dns ltgy-brn dol LS frag,scat tr intxl POR,tr-fr dull yel FLOR,n-v p vis brn STN,p slow dif-sl ow stmg CUT"

5460.00 5470.00 "DOL AA,w/scat tan crpxl-slty LS AA,POR-FLOR-STN-CUT AA"

5470.00 5480.00 "DOL AA,slty-v slty,v rr mica,grdg to dol SLTST,LS frag AA,decr POR-FLOR-STN-CUT"

5480.00 5490.00 "DOL AA,incr ltbrn-brn DOL GRNST,scat ltbrn anhy dol LS PKST frag,sl incr DOL POR-FLOR-STN-CUT"

5490.00 5500.00 "DOL AA,POR-FLOR-STN-CUT AA,incr ltgy-gy crpxl-micxl,occ vfxl,gran-v slty,dol LS-sl anhy,arg,v sl mica,grdg to v lmy SLTST ip,rr intxl POR,n-v rr spty bri yel FLOR,n vis STN,v p slow dif CUT"

5500.00 5510.00 "LS AA,incr LS GRNST-PKST,v slty,dol,POR-FLOR-STN-CUT AA,occ grdg to v slty DOL GRNST-PKST,w/LS rich cmt,scat ltbrn CHT frag,rr-tr intxl POR,n vis STN,n-v p slow dif CUT"

5510.00 5520.00 " LS & DOL AA,v p POR-FLOR-STN-CUT"

5520.00 5530.00 "DOL ltgy-gy,occ ltbrn-brn,crpxl-vfxl,gran ip,v slty,sl anhy,occ LS rich cmt,rr scat CHT frag,incr DOL PKST,tt-tr intxl POR,tr spty dull yel FLOR,n-v rr vis STN,n-v p slow dif CUT,w/scat slty LS GRNST & PKST,tt"

5530.00 5540.00 "DOL AA,incr ltbrn DOL PKST,sl incr LS rich cmt,rr CHT frag,occ ltgy-tan crpxl-micxl,chk,slty,dol,sl anhy LS,tt-vrr intxl POR,n-v rr vis FLOR,n vis STN,n-v p slow dif CUT"

DEPTH	LITHOLOGY

5540.00 5550.00 "DOL tan,occ ltbrn-ltgy-crm,crpxl-micxl,occ vfxl-micsuc,pred DOL PKST,w/v rr scat DOL GRNST,sl slty ip,incr LS rich cmt,w/thn intbd tan crpxl dol LS PKST frag,w/rr-tr intxl POR,tr dull yel FLOR,tr slow stmg-slow dif CUT in DOL"

5550.00 5560.00 "DOL AA,incr ltbrn & ltgy-crm plty frag,sl-v sl chky,tr tan CHT frag,POR-FLOR-STN-CUT AA"

5560.00 5570.00 "DOL brn,ltbrn-tan,agl,micsuc-gran,vfxl-crpxl,DOL GRNST/thin intbd PCKST,tr plty chky dol frag,tr trnsl xln ANHY & bf CHT frag,tr mic fos & CRIN,fr-g intxl/tr agl POR,g-fr even dull-mod bri yel FLOR,g brn-tr dkbrn/rr blk dd o STN,g dif/tr slow strmg CUT"

5570.00 5580.00 "DOL AA,POR-FLOR-STN-CUT AA"

5580.00 5590.00 "DOL AA,gran-micsuc-agl,pred DOL GRNST,tr-rr scat PCKST frag,rr tan-crm LS frag,tr CRIN & mic fos,tr ANHY AA,fr-g intxl/agl POR,fr-g even dull-mod bri yel FLOR,g ltbrn/scat brn-dkbrn STN,rr blk dd o STN,g dif/v slow strmg CUT"

5590.00 5600.00 "DOL GRNST AA/scat tr PCKST,g-fr intxl/tr agl POR,g even mod bri yel FLOR,g ltbrn/tr brn STN,g mod fast strmg CUT "

5600.00 5610.00 "DOL ltbrn,occ brn,tan,micsuc-gran,crpxl-vfxl,DOL GRNST/rr thin intbd PCKST,cln,v sl chky,tr trnsl-mlky CHT incl,rr trnsl xln ANHY frag-incl,rr CRIN fos,g-fr intxl/agl POR,g even mod bri yel FLOR,tr-fr ltbrn-brn STN,g mod fast CUT"

5610.00 5620.00 "DOL AA,occ LS rich cmt,tr ltbrn-crm DOL PKST,POR-FLOR-STN-CUT AA"

5620.00 5630.00 "DOL pred ltbrn-brn DOL GRNST,w/scat trnsl-spec wh-trnsl CHT frag,occ DOL PKST,POR-FLOR-STN-CUT AA"

5630.00 5640.00 "DOL ltbrn-brn,micxl-vfxl,gran,micsuc-suc,sl alg,rr ANHY xl-incl,pred DOL GRNST,occ tan crpxl DOL PKST,rr Crin fos,scat trnsl-wh occ mot CHT frag,fr-g intxl-alg POR,g dull yel FLOR,fr-g ltbrn-brn STN,fr-g slow-mod fast stmg CUT"

5640.00 5650.00 "DOL ltbrn-brn,micxl-vfxl,gran,micsuc-suc,sl alg,rr ANHY xl-incl,pred DOL GRNST,occ tan crpxl DOL PKST,rr Crin fos,scat trnsl-wh occ mot CHT frag,fr-g intxl-alg POR,g dull yel FLOR,fr-g ltbrn-brn STN,fr-g slow-mod fast stmg CUT"

5650.00 5660.00 "DOL ltbrn,occ brn,tan,micsuc-gran,agl,occ vfxl-crpxl,DOL GRNST,rr-tr scat PCKST,tr trnsl-clr xln ANHY,rr-tr bf-tan scat CHT,g-fr intxl/occ agl POR,g even mod bri-dull yel FLOR,g ltbrn/scat brn STN,rr pp blk dd o STN,g mod fast-fast strmg CUT"

5660.00 5670.00 "DOL AA/decr CHT AA,POR-FLOR-STN-CUT AA"

5670.00 5680.00 "DOL AA,DOL GRNST,rr scat PCKST,tr scat ltgy-wh CHT,tr trnsl-clr xln ANHY frag-rr incl,rr CRIN fos,g intxl-agl POR,g even mod bri-dull yel FLOR,fr-g ltbrn-brn STN,rr blk dd o STN,g blooming CUT"

5680.00 5690.00 "DOL AA,vfxl-gran,micsuc-suc,sl alg,rr ANHY AA,pred DOL GRNST,rr-tr tan crpxl DOL PKST,rr scat trnsl-wh CHT frag,fr-g intxl-alg POR,g even mod bri-dull yel FLOR,fr-g ltbrn-brn STN,g blooming-fast strmg CUT"

DEPTH	LITHOLOGY

5690.00 5700.00 "DOL AA,DOL GRNST,POR-FLOR-STN-CUT AA"

5700.00 5710.00 "DOL pred brn-ltbrn DOL GRNST,vrr ltgy-wh-trnsl CHT-sil frag/tr sil cmt,g intxl-tr agl POR,g even mod bri-dull yel FLOR,g-fr brn STN,g fast-mod fast strmg CUT"

5710.00 5720.00 "DOL brn-ltbrn,vfxl-gran-micsuc,alg-sl suc,vrr ANHY AA,DOL GRNST,vrr scat trnsl-wh CHT frag,fr-g intxl-alg POR,g even mod bri-dull yel FLOR,fr-g ltbrn-brn STN,g fast-mod fast strmg CUT"

5720.00 5730.00 "DOL AA,DOL GRNST,POR-FLOR-STN-CUT AA"

5730.00 5740.00 "DOL AA,DOL GRNST,vrr scat PCKST,tr scat ltgy-wh CHT,tr trnsl-clr xln ANHY frag-rr incl,rr CRIN fos,g intxl-agl POR,g even mod bri-dull yel FLOR,fr-g ltbrn-brn STN,rr blk dd o STN,g blooming CUT"

5740.00 5750.00 "DOL brn-ltbrn,occ tan,micsuc-gran,agl,occ vfxl-crpxl,DOL GRNST,rr trnsl-clr xln ANHY,tr-rr wh-tan scat CHT,g-fr intxl/occ agl POR,g even mod bri-dull yel FLOR,g ltbrn/scat brn STN,g mod fast-fast strmg CUT"

5750.00 5760.00 "DOL AA,DOL GRNST,POR-FLOR-STN-CUT AA"

5760.00 5770.00 "DOL GRNST AA/vrr scat crpxl PCKST,g-fr intxl/tr agl POR,g even mod bri-dull yel FLOR,g brn STN,g mod fast strmg CUT "

5770.00 5780.00 "DOL brn,occ ltbrn,tan,micsuc-gran,agl,occ vfxl-crpxl,DOL GRNST,rr scat crpxl PCKST,rr trnsl-clr xln ANHY,tr-rr wh-tan scat CHT,g-fr intxl/occ agl POR,g even mod bri-dull yel FLOR,g brn STN,g blooming-fast strmg CUT"

5780.00 5790.00 "DOL AA,DOL GRNST,POR-FLOR-STN AA,g mod fast strmg CUT"

5790.00 5800.00 "DOL GRNST AA/incr scat tan-bf crpxl PCKST,tr trnsl-clr ANHY frag,tr CRIN fos,rr trnsl-wh CHT,g-fr intxl/tr agl POR,g even mod bri-dull yel FLOR,g brn STN,g mod fast strmg CUT "

5800.00 5810.00 "DOL ltbrn-brn,micsuc-gran,micxl-vfxl,sl alg,pred DOL GRNST,tr tan crpxl DOL PKST,tr scat trnsl-wh occ mot CHT frag,tr trnsl xln ANHY frag & incl,fr-g intxl/tr alg POR,g mod bri yel FLOR,fr-g ltbrn-brn STN,g dif/slow stmg CUT"

5810.00 5820.00 "DOL AA,pred DOL GRNST/tr scat-intbd tan crpxl PCKST,tr scat ltgy-trnsl-wh CHT frag,fr-g intxl/tr agl POR,FLOR-STN-CUT AA"

5820.00 5840.00 "DOL ltbrn-brn,occ tan-crm,micsuc-micxl-gran,agl-crpxl,occ crpxl,pred GRNST/tr scat PCKST,trnsl-wh CHT frag,rr AHNY AA,rr CRIN fos,fr-g intxl/tr agl POR,g even mod bri-dull yel FLOR,g ltbrn-brn STN,g mod fast strmg CUT"

5840.00 5850.00 "DOL AA,micsuc-micxl-gran,agl-crpxl,occ crpxl,pred GRNST/tr scat PCKST,tr CHT frag AA,rr AHNY AA,rr CRIN fos,POR-FLOR-STN AA,g dif/tr slow strmg CUT"

5850.00 5860.00 "DOL brn-ltbrn,occ tan,micsuc-gran,agl-vfxl,occ crpxl,GRNST,tr scat PCKST frag-occ intbd/GRNST,tr CHT AA,rr ANHY AA,fr-g intxl/rr agl POR,g even dull-mod bri yel FLOR,g brn/rr blk dd o STN,g dif/mod fast strmg CUT"

DEPTH	LITHOLOGY

5860.00 5870.00 "DOL pred brn,occ ltbrn-tan,AA,pred GRNST/PCKST AA,POR-FLOR-STN-CUT AA"

5870.00 5880.00 "DOL brn-ltbrn,occ tan,micsuc-gran,agl-micxl-crpxl,occ crpxl,pred GRNST/scat PCKST,tr CHT frag & incl AA,tr CRIN fos,rr AHNY AA,fr-g intxl/tr agl POR,FLOR AA,g brn-ltbrn STN,g dif-slow strmg CUT"

5880.00 5890.00 "DOL AA,DOL GRNST/scat PCKST frag-occ intbd GRNST,tr CRIN fos,tr CHT AA,rr ANHY AA,fr-g intxl/tr agl POR,g even dull/tr mod bri yel FLOR,g brn-ltbrn STN,g dif-slow strmg CUT"

5890.00 5900.00 "DOL pred brn,occ ltbrn-tan,AA,pred GRNST/PCKST AA,POR-FLOR-STN-AA,g-fr mod fast-fast strmg CUT"

5900.00 5910.00 "DOL brn,micsuc-gran,micxl-suc,agl-vfxl,occ suc,DOL GRNST,rr scat crpxl PCKST,tr trnsl-clr anhy frag-occ incl,g-fr intxl-agl POR,g even dull-mod bri yel FLOR,g brn/tr scat pp blk dd o STN,"

5910.00 5920.00 "DOL GRNST AA,incr agl,rr ANHY AA,g-fr intxl-agl,g even dull-mod bri yel FLOR,g brn/blk dd o STN,g blooming/fast strmg CUT"

5920.00 5940.00 "DOL brn,occ ltbrn,tan,micsuc-gran,micxl-vfxl-agl,occ crpxl,GRNST,tr intbd PCKST/occ scat frag,tr trnsl xln ANHY incl & frag,rr scat crm crpxl LS frag,fr-g intxl POR,g even dull-mod bri yel FLOR,g brn/scat blk dd o STN,g mod fast-fast strmg CUT"

5940.00 5950.00 "DOL AA,DOL GRNST,POR-FLOR-STN-CUT AA"

5950.00 5970.00 "DOL brn,rr ltbrn,tan,micsuc-gran,micxl-vfxl-agl,occ crpxl,GRNST,rthy,sl slty,rr intbd PCKST/occ scat frag,rr trnsl xln ANHY incl & frag,fr-g intxl/occ agl POR,g even dull-mod bri yel FLOR,g brn/scat blk dd o STN,g fast-blooming strmg CUT"

5970.00 5980.00 "DOL AA,DOL GRNST,rr intbd GRNST,rr CRIN fos,rr CHT AA,rr ANHY AA,fr-g intxl/tr agl POR,g even dull-mod bri yel FLOR,g brn/scat blk dd o STN,g blooming-mod fast strmg CUT"

5980.00 5990.00 "DOL GRNST AA,rr ANHY AA,g-fr intxl/tr agl POR,g even dull-mod bri yel FLOR,g brn/ scat blk dd o STN,g blooming/fast strmg CUT"

5990.00 6000.00 "DOL brn,occ ltbrn,micsuc-micxl,vfxl-crpxl,occ sl agl,GRNST,rr intbd PCKST,rr trnsl-clr xln ANHY,rr CHT AA,g-fr intxl/rr agl POR,g even dull-mod bri yel FLOR,g brn/occ scat blk dd o STN,g blooming-fast strmg CUT"

6000.00 6010.00 "DOL GRNST AA,tr ANHY incl AA,rr CHT AA,POR-FLOR-STN AA,g mod fast -fast strmg CUT"

6010.00 6020.00 "DOL brn-mbrn,occ dkbrn,micxl-vfxl,gran,micsuc-suc,alg,w/scat ANHY incl-POR fl,tr ltbrn-brn DOL PKST,pred DOL GRNST,fr-g intxl-alg POR,mod g dull yel FLOR,g brn STN,occ blk dd o STN,fr-g mod fast-fast stmg CUT"

6020.00 6030.00 "DOL pred DOL GRNST AA,sl incr ANHY,POR-FLOR-STN-CUT AA"

6030.00 6040.00 "DOL AA,sl incr ANHY cmt,incr alg,POR-FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

6040.00 6050.00 "DOL brn-mbrn,occ dkbrn,micxl-vfxl,gran,micsuc-suc,alg,tr ltbrn-brn DOL PKST,pred DOL GRNST,occ scat ANHY xl-incl-rr POR fl,fr-g intxl-alg POR,mod g dull yel FLOR,g brn STN,occ blk dd o STN,fr-g mod fast-fast stmg CUT"

6050.00 6060.00 "DOL AA,scat tr DOL PKST w/tr intxl POR-FLOR-STN-CUT,pred DOL GRNST w/fr-g alg-intxl POR,mod g dull yel FLOR,fr-g brn STN,occ scat blk dd o STN,fr-g mod fast-fast stmg CUT"

6060.00 6070.00 "DOL AA,POR-FLOR-STN-CUT AA"

6070.00 6080.00 "DOL brn-mbrn,occ dkbrn,micxl-vfxl,gran,micsuc-suc,alg,tr ltbrn-brn DOL PKST,pred DOL GRNST,occ scat ANHY xl-incl-rr POR fl,fr-g intxl-alg POR,mod g dull yel FLOR,g brn STN,occ blk dd o STN,fr-g mod fast-fast stmg CUT"

6080.00 6090.00 "DOL AA,POR-FLOR-STN-CUT AA"

6090.00 6100.00 "DOL AA,sl incr ANHY cmt,incr alg,POR-FLOR-STN-CUT AA"

6100.00 6120.00 "DOL brn-mbrn,occ dkbrn,micxl-vfxl,gran,micsuc-suc,alg,tr ltbrn-brn DOL PKST,pred DOL GRNST,occ scat ANHY xl-incl-rr POR fl,v rr scat trnsl CHT FRAG,fr-g intxl-alg POR,mod g dull yel FLOR,g brn STN,occ blk dd o STN,fr-g mod fast-fast stmg CUT"

6110.00 6120.00 "DOL AA, decr ANHY xl-incl,v rr DOL PKST,POR-FLOR-STN-CUT AA"

6120.00 6130.00 "DOL ltbrn-brn,rr dkbrn,micxl-vfxl,gran,suc,alg,pred DOL GRNST,rr ANHY incl-xl,v rr trnsl CHT frag,scat tr DOL PKST,fr-g intxl-alg POR,fr-g dull yel FLOR,fr-g lt brn STN,g mod fast-fast stmg CUT"

6130.00 6140.00 "DOL AA,sl incr alg POR,n-v rr CHT frag,POR-FLOR-STN-CUT AA"

6140.00 6150.00 "DOL AA,sl incr ANHY xl-incl,incr CHT,POR-FLOR-STN-CUT AA"

6150.00 6160.00 "DOL brn-mbrn,occ dkbrn,micxl-vfxl,gran,micsuc-suc,alg,tr ltbrn-brn DOL PKST,pred DOL GRNST,occ scat ANHY xl-incl-rr POR fl,v rr scat trnsl CHT FRAG,fr-g intxl-alg POR,mod g dull yel FLOR,g brn STN,n-v rr blk dd o STN,fr-g mod fast-fast stmg CUT"

6160.00 6170.00 "DOL AA,n-v rr CHT frag,incr blk dd o STN,POR-FLOR-STN-CUT AA"

6170.00 6180.00 "DOL AA,pred v alg DOL GRNST,v rr ANHY xl-incl,abnt blk dd o STN,POR-FLOR-STN-CUT AA"

6180.00 6190.00 "DOL AA,sl incr DOL PKST,decr blk dd o STN,fr-g intxl-fr alg POR,fr-g dull yel FLOR,fr-g ltbrn STN,rr blk dd o STN,fr-g mod fast-fast stmg mlky CUT"

6190.00 6200.00 "DOL ltbrn-brn,micxl-vfxl,gran,suc ip,alg,pred DOL GRNST,occ DOL PKST,scat ANHY xl-incl,v rr styl,POR-FLOR-STN-CUT AA"

6200.00 6210.00 "DOL ltbrn-brn,occ dkbrn,micxl-vfxl,gran,micsuc-suc,pred DOL GRNST,alg ip,v rr scat ANHY xl-incl-rr cmt,occ scat DOL PKST,tr-g intxl-fr alg POR,fr-mod g dull yel FLOR,fr-g ltbrn STN,rr spty blk dd o STN,fr-g mod fast-fast stmg CUT"

6210.00 6220.00 "DOL AA,sl incr alg,decr DOL PKST,POR-FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

6220.00 6230.00 "DOL AA,rr Crin fos,POR-FLOR-STN-CUT AA"

6230.00 6240.00 "DOL brn-ltbrn,occ mbrn,micxl-vfxl,gran,micsuc-suc,alg,tr ltbrn-brn DOL PKST,pred DOL GRNST,tr ANHY xl-incl-rr POR fl,v rr scat trnsl CHT FRAG,fr-g intxl-alg POR,mod g dull yel FLOR,g brn STN,n-v rr blk dd o STN,fr-g mod fast-fast stmg CUT"

6240.00 6250.00 "DOL AA,rr Crin fos,POR-FLOR-STN-CUT AA"

6250.00 6260.00 "DOL brn-ltbrn,occ mbrn,micxl-vfxl,gran,micsuc-suc,alg,rr ltbrn DOL PKST,pred DOL GRNST,rr ANHY xl-incl-rr POR fl,v rr scat trnsl CHT FRAG,occ Crin-Cor fos,fr-g intxl-alg POR,mod g dull yel FLOR,g brn STN,n-v rr blk dd o STN,fr-g mod fast-fast stmg CUT"

6260.00 6270.00 "DOL AA,sl incr Crin fos & DOL PKST,POR-FLOR-STN-CUT AA"

6270.00 6280.00 "DOL AA,sl incr alg,decr DOL PKST,POR-FLOR-STN-CUT AA"

6280.00 6290.00 "DOL AA,POR-FLOR-STN-CUT AA,v rr scat wh-trnsl mot CHT FRAG,w/v rr crm-tan,crpxl LS PKST frag,NFSOC"

6290.00 6300.00 "DOL lt-mbrn,micxl-vfxl,gran-suc,occ tr tan DOL PKST,pred alg DOL GRNST,rr ANHY xl-incl,occ LS rich cmt,tr Crin fos,rr mot CHT frag,fr-g intxl-fr alg POR,fr-mod g dull yel FLOR,fr-g ltbrn STN,n-v rr spty blk dd o STN,fr-g mod fast-fast stmg CUT"

6300.00 6310.00 "DOL AA,incr LS rich cmt-v rr scat LS PKST frag,scat wh-mot CHT frag,w/rr DOL PKST frag,POR-FLOR-STN-CUT AA"

6310.00 6320.00 "DOL AA,pred DOL GRNSTN,occ LS rich cmt,POR-FLOR-STN-CUT AA"

6320.00 6330.00 "DOL,AA,w/incr DOL PKST,scat tan-crm crpxl sl dol LS PKST frag,scat Crin fos,tr-fr intxl-alg POR,fr dull yel FLOR,tr-fr ltbrn STN,fr-g mod fast-fast stmg CUT"

6330.00 6350.00 "DOL ltbrn-brn,occ tan,crpxl-vfxl,gran-micsuc ip,occ suc,DOL GRNST w/thn intbd DOL PKST & LS PKST,alg ip,scat Crin fos,occ trnsl-wh CHT frag,fr-g intxl-tr alg POR,tr-fr dull yel FLOR,tr-fr ltbrn STN,fr mod fast-fast stmg CUT"

6350.00 6360.00 "DOL AA,w/occ crm-tan crpxl dol LS PKST incl,tr intbd DOL PKST,rr CHT frag,scat Crin fos,POR-FLOR-STN-CUT AA "

6360.00 6370.00 "DOL AA,w/incr dol LS PKST incl,tr intbd DOL PKST,rr CHT frag,scat Crin fos,decr POR-FLOR-STN-CUT AA "

6370.00 6380.00 "DOL ltbrn-tan,brn-mbrn,crpxl-vfxl,occ gran-suc,sl alg,pred intbd DOL GRNST-PK,w/tr thn wh-crm-tan,crpxl,dol LS PKST,incr Crin fos,scat CHT frag,sl anhy,tt-fr intxl-rr alg POR,tr-fr dull yel FLOR,tr brn-m brn STN,tr of fr slow-mod fast stmg CUT"

6380.00 6390.00 "INTBD DOL & LS AA,POR-FLOR-STN-CUT AA"

6390.00 6400.00 "DOL brn-mbrn,occ ltbrn,micxl-vfxl,occ crpxl,rthy-v sl slty,alg,scat wh CHT frag,occ ltbrn DOL PKST incl,v rr intbd wh-tan LS PKST,scat Crin fos,tt-fr intxl-tr alg POR,tr-fr dull yel FLOR,rr-tr ltbrn-dkbrn STN,tr of fr-g slow-mod fast stmg CUT"

DEPTH	LITHOLOGY

6400.00 6410.00 "INTBD DOL & LS AA,POR-FLOR-STN-CUT AA"

6410.00 6420.00 "DOL ltbrn-tan,brn-mbrn,crpxl-vfxl,occ gran-suc,sl alg,pred intbd DOL GRNST-PK,w/tr thn wh-crm-tan,crpxl,dol LS PKST,tr Crin fos,incr scat CHT frag,sl anhy,tt-fr intxl-rr alg POR,tr-fr dull yel FLOR,tr brn-m brn STN,tr-fr dif-slow stmg CUT"

6420.00 6430.00 "DOL AA,w/decr dol LS PKST incl,incr intbd DOL PKST,scat CHT frag,scat CRIN fos,POR-FLOR-STN-CUT AA "

6440.00 6460.00 "DOL ltbrn,tan,occ mbrn-dkbrn,crm,vfxl-micsuc-micxl,crpxl,DOL GRNST/intbd crpxl PCKST,rr-tr scat tan-crm crpxl LS,cln,dns,v sl chky,tr scat CHT,tr-rr xln ANHY,fr-tr intxl POR,fr even dull yel FLOR,fr-g ltbrn/rr brn STN,g dif/tr slow strmg CUT"

6460.00 6470.00 "DOL AA,w/sl decr DOL PKST frag & rr incl,vrr LS PKST,scat CHT frag,scat CRIN fos,tr trnsl-clr-wh xln ANHY,POR-FLOR-STN-CUT AA "

6470.00 6480.00 "DOL ltbrn-tan-crm,occ wh-trnsl,m-brn,micxl-micsuc,crpxl-vfxl,pred GRNST/scat PCKST frag-rr incl,occ sl lmy-calc,ANHY & CHT AA,POR-FLOR-STN-CUT AA"

6480.00 6490.00 "DOL AA,pred GRNST w/sl incr crpxl PCKST frag-tr intbd incl,tr scat bf-wh CHT frag,tr trnsl-wh-clr ANHY,tr CRIN fos,cln,fr intxl POR,g even dull yel FLOR,g ltbrn-rr mbrn STN,g slow-mod fast strmg CUT"

6490.00 6500.00 "DOL ltbrn-tan,brn,occ crm-wh,micxl-crpxl.micsuc-vfxl,pred GRNST w/ scat crpxl PCKST frag-occ intbd in GRNST,occ sl calc,tr CRIN fos,tr scat trnsl-wh CHT frag,rr trnsl-clr-wh ANHY,cln,dns,tr intxl/vrr agl POR,fr-g even dull yel FLOR,STN-CUT AA"

6500.00 6510.00 "DOL AA,GRNST/scat PCKST,ANHY & CHT AA,rr CRIN fos,POR-FLOR-STN-CUT AA"

6510.00 6530.00 "DOL ltbrn-tan-crm,micxl-crpxl-micsuc,vfxl-gran,GRNST/scat crpxl PCKST frag-incl,occ grdg to dol LS ip,cln,rr bf-mlky-trnsl CHT frag-incl,tr trnsl-wh ANHY,fr-tr intxl POR,g even dull-mod bri yel FLOR,g ltbrn STN,g fast strmg CUT"

6530.00 6540.00 "DOL AA,pred GRNST/scat crpxl PCKST frag-incl,occ grdg to dol LS ip,cln,tr CHT fragAA,rr trnsl-wh ANHY,fr-g intxl/rr vug POR,g even dull-mod bri yel FLOR,g ltbrn STN,g blooming/tr fast strmg CUT"

6540.00 6550.00 "DOL ltbrn-tan-crm,occ brn,micxl-crpxl,micsuc-vfxl,gran,pred GRNST/tr calc cmt,scat PCKST frag-incl sl lmy-calc crpxl,occ grdg to dol LS ip,cln,rr bf-mlky-trnsl CHT frag-incl, rr trnsl xln ANHY,fr-tr intxl POR,g even dull-mod bri yel FLOR,g blooming CUT"

6550.00 6570.00 "DOL AA,pred GRNST w/sl lmy-calc crpxl PCKST frag & rr intbd incl,tr scat wh-trnsl-bf CHT frag,rr trnsl-clr xln ANHY,tr CRIN fos,cln,fr-tr intxl POR,g even dull yel FLOR,g ltbrn-mbrn STN,g-fr dif-v slow strmg CUT"

6570.00 6580.00 "DOL - GRNST AA,w/scat PKST frag-incl,scat CHT frag & ANHY AA,rr CRIN fos,POR-FLOR-STN AA,fr-g mod fast strmg CUT "

DEPTH	LITHOLOGY

6580.00 6600.00 "DOL ltbrn-tan-crm,micsuc-micxl,crpxl-vfxl,gran,pred GRNST/rr calc cmt,scat PCKST frag sl lmy-calc crpxl,occ grdg to dol LS ip,tr scat CRIN fos,incrCHT frag AA,rr ANHY,fr intxl/rr agl POR,g even dull-mod bri yel FLOR,g ltbrn STN,fr-g dif/slow strmg CUT"

6600.00 6610.00 "DOL ltbrn-tan,brn,occ crm,micxl-micsuc-vfxl,crpxl-vfxl,GRNST/rr lmy cmt,scat sl lmy-calc crpxl PCKST,scat wh-trnsl-occ dkbrn CHT frag,tr trnsl-clr xln ANHY,fr-g intxl/tr agl POR,g even dull/tr spty mod bri yel FLOR,g ltbrn-brn STN,g dif-slow strmg CUT"

6610.00 6630.00 "DOL mbrn-brn-ltbrn,occ tan-crm,micsuc-gran-micxl,suc-crpxl,sl agl,DOL GRNST/decr-occ crpxl PCKST,scat mlky-wh-trnsl CHT frag,rr ANHY AA,occ sl slty,g intxl-tr agl POR,g even dull yel FLOR,g dk brn/tr blk dd o STN,g fast strmg-blooming CUT"

6630.00 6640.00 "DOL AA,decr agl,pred GRNST/sl incr of sl lmy-calc crpxl PCKST,scat CHT AA,rr trnsl-clr xln ANHY,g intxl/rr agl POR,g even dull-mod dull yel FLOR,g brn-ltbrn/tr blk dd o STN,fr-g blooming/mod fast strmg CUT"

6640.00 6660.00 "DOL GRNST AA/scat PCKST AA occ intbd in GRNST,scat CHT AA,rr trnsl-clr xln ANHY,g-fr intxl/rr agl POR,fr-g even dull yel FLOR,g ltbrn-brn/rr blk dd o STN,fr-g slow strmg CUT"

FORMATION TOPS

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 SE UPPER 1-A HORIZONTAL LATERAL LEG #3

FORMATION NAME		SAMPLES MEASURED DEPTH	SAMPLES TRUE VERTICAL DEPTH	DATUM KB:4760
LOWER ISMAY		5457'	5451'	-691
GOTHIC SHALE		5488'	5472'	-712
DESERT CREEK		5515'	5486'	-726
DC 1-A		5532'	5491'	-731

GEOLOGICAL SUMMARY

AND

ZONES OF INTEREST

The Mobil Exploration and Production U.S. Inc., Ratherford Unit #13-41 Horizontal LEG #3, Section 13, T41S, R23E, was a re-entry of the Mobil Ratherford Unit #13-41, and was sidetracked in a southeasterly direction from 5395' measured depth, 5395' true vertical depth, on April 18, 1997. Leg #3 reached a measured depth of 6620', true vertical depth of 5512' at total depth, horizontal displacement of 1140' and true vertical plane 107 degrees, on April 22, 1997. The lateral was drilled with no significant problems. Since this well used live oil in an emulation while drilling, and the lateral section made a minor amount of oil, the background gases noted on the accompanying mud log were high through out the drilling, and the samples showed a minor amount of oil contamination through out the well.

The primary objective of the Ratherford Unit #13-41 Horizontal Lateral LEG #3 was the upper 1-A Porosity Bench, to identify and define the porosity bench, its effective porosity, staining and reservoir properties in the 1-A zone of the Desert Creek Member of the Upper Paradox Formation.

The Lower Ismay, Gothic Shale, and the transition zone at the top of the Desert Creek were encountered while drilling LEG #3. Kick off point for this lateral was in the lower 1/3 of the Upper Ismay Member. The base of the Upper Ismay was predominately light gray to cream to tan, occasionally brown, cryptocrystalline to microcrystalline, chalky, cherty, fossiliferous limestone, occasionally limestone grainstone. It grading to and had interbedded very argillaceous, brown to gray brown, microcrystalline to microsucrosic dolomite; thin black, carbonaceous, slightly calcareous to dolomitic shale, and scattered brown to black to translucent chert fragments. There was no to very rare visible porosity in the Upper Ismay, with no sample shows or gas increases. The dolomites at the base of the Upper Ismay graded into the very thin, carbonaceous, dolomitic shale of the Hovenweep.

The top of the Lower Ismay was picked at 5457' measured depth, 5451' true vertical depth, at the base of the very thin Hovenweep shale. The Lower Ismay was a predominately a light gray to light gray brown, occasionally dark gray to brown, cryptocrystalline to microcrystalline, some microsucrosic to granular, slightly silty to clean, slightly limy to anhydritic, slightly cherty dolomite with a trace of scattered micro fossils, no to a trace of scattered intercrystalline porosity, with a trace of spotty dull to bright yellow fluorescence, none to very rare light brown stain, and only a trace of very poor slow diffuse cut. The dolomite had very thin interbedded limestones which were light gray to gray brown, occasionally white to brown to dark brown, cryptocrystalline to microcrystalline, earthy to chalky, some clean, cherty, anhydritic, with no to very rare intercrystalline, and to very rare dull yellow fluorescence, but no visible stain or cut. A thin translucent, crystalline anhydrite, which had very thin streaks of black carbonaceous shales and gray brown, microcrystalline dolomite, was noted near the base of the Lower Ismay. Interbedded in the basal 5' of the Lower Ismay were light to medium gray to gray brown, clean to very argillaceous dolomites that were cryptocrystalline to microcrystalline, with some very thin mottled gray to gray brown, cryptocrystalline to microcrystalline limestone streaks, very cherty, and clean to argillaceous. The dolomite increased with depth and graded into the Gothic Shale. These very thin dolomites had a rare trace of intercrystalline porosity with scattered dull yellow fluorescence, no visible stain, and only very poor slow diffuse to residual ring cut.

The top of the Gothic Shale is at 5488' measured depth, 5472' true vertical depth. The Gothic Shale was predominantly dark gray to black, silty, carbonaceous, brittle to firm, subblocky to blocky to platy, calcareous to slightly dolomitic and slightly micaceous. The top of the Gothic was gradational from the very thin interbedding of very argillaceous, carbonaceous limestone and very argillaceous, limy dolomite, with the dolomite grading into very dolomitic, carbonaceous shale. The top of the Gothic was picked predominantly by the decrease in penetration rate and the increased percentage of shale in the samples.

Between the Gothic Shale and Desert Creek Porosity Members is a transitional zone, which appears to be gradational. The top of the Desert Creek is commonly picked at the Gothic Shale to transition zone facies change, which in this well occurred at a measured depth of 5515' and a true vertical depth of 5486'. In this well the zone was predominantly a very silty, dolomitic limestone; which was cream to tan, some gray to white, cryptocrystalline to microcrystalline, argillaceous, with very rare intercrystalline porosity, but only very spotty dull mineral fluorescence, and visible stain or cut. There were thin gray brown to dark brown dolomites, which were very argillaceous, microcrystalline and slightly silty, with had no visible porosity. The limestones graded into and had cyclic deposits of very thin dolomite packstones and dolomitic to slightly calcareous, black, carbonaceous mudstones. The porosities ranged from none to very poor intergranular, with traces of calcite to anhydrite fillings. The thin dolomites had no visible staining, fluorescence or cut.

The top of the Desert Creek 1-A zone was picked at 5532' measured depth, 5491' true vertical depth. The pick was base on the increase in rate of penetration and sample interpretation. The top was picked in this lateral was based on the first oolicastic limestone packstone porosity below the Desert Creek top and thinly interbedded limy dolomite packstone near the top of the zone. The limestone was predominately oolitic with streaks of intercrystalline to very rare algal porosity , some scattered chert fragments, and a trace to fair fluorescence, brown stain and a moderately fast cut. The thin dolomites had no visible porosity, fluorescence, stain or cut.

As the curve was being completed in the 1-A zone the oolicastic limestone became cleaner and increasingly granular. While drilling curve through the section, it appeared that the 1-A porosity bench was possibly defined by the interval 5534' measured depth, 5492' true vertical depth to a true vertical depth of 5500' true vertical depth. The top of the porosity Bench was marked by facies change, which was somewhat sharp since the drill rate increased rather rapidly. The base of the porosity zone was determined from electric logs, as it was not encountered while landing the curve.

At a measured depth of 5557', 5494' true vertical depth, with a horizontal displacement of 81' in the oolicastic limestones, packstones and very thin grainstones of the 1-A porosity horizon, a trip was made to change the bottom hole assemblies and pick up the MWD tool. While drilling the 1-A lateral to a horizontal displacement of approximately 250', the well bore was drilled at a very shallow downwards angle in a light brown to brown, white to cream, oolicastic, cryptocrystalline to microcrystalline, occasionally sucrosic to granular limestone. The limestone was very slightly anhydritic to scattered anhydrite inclusions and had very rare thin brown, microcrystalline to microsucrosic, dolomites. These limestones had fair good oolicastic to a trace of intercrystalline porosity, fair to good dull to bright yellow fluorescence, fair brown stain with a trace of black dead oil stain* and fair to good moderately fast to fast streaming cut. The thin dolomites were predominately tight, with no to very rare porosity, fluorescence, stain, or cut.

From a measured depth of 5750', 5500' measured depth, with a horizontal displacement of 250', to a measured depth of 6046', 5500' measured depth, 541' horizontal displacement, the lateral was drilled at a shallow upward angle. The limestones of the porosity zone were a tan to brown to cream, cryptocrystalline to very fine crystalline, occasionally granular, oolicastic limestone packstones, and some grainstones, with occasionally dolomite rich cement. The limestones were very slightly anhydritic with traces of scattered translucent to light brown chert fragments. Anhydrite crystals to rare inclusions, rare scattered cryptocrystalline limestone fragments to inclusions and

occasionally slightly limy cement, scattered chert fragment, rare micro fossils, very rare algal material, traces of scattered dark brown stain and very rare black oil stain residue* in the intercrystalline and oolicastic matrix. The limestone had predominantly fair to good oolitic to traces of intercrystalline and very rare algal porosity, with rare anhydrite and very rare dolomitic limestone mud filling and cement in the intercrystalline and oolicastic porosity. Through this interval the fluorescence was fair to good, the staining was moderate to fair and cuts ranging from moderate to good moderately fast to fast steady streaming. A slight decrease in penetration rate was noted at 6046' measured depth, 5500' true vertical depth, with a horizontal displacement of 541'. An increase in tighter limestone packstone was noted in the samples. The increase in packstone was due to a vertical facies change as the well bore encountered the top of the best porosity zone and neared the upper limit of the zone. The facies change encountered was from the very oolicastic limestone packstones and thin grainstones, to the tighter light brown to brown, very cherty limestone packstones at the top of the best porosity in the zone. After a series of slides and rotates to turn the bore hole toward the horizontal, and to move away from the upper limit of the best porosity, the lithology again returning to predominately oolicastic limestone packstones and scattered grainstones.

As the well bore was continued horizontally around a true vertical depth of 5500', from a measured depth of 6046', with a horizontal displacement of 541' to 6261' measured depth, with a horizontal displacement of 759', the top of the 1-A porosity zone was encountered several times. The lithology was predominately light brown, occasionally medium brown and white, cryptocrystalline to microcrystalline, occasionally very finely crystalline to granular to microsucrosic, oolicastic, very rarely algal limestone packstone to occasionally limestone grainstone, with increasing amounts of anhydrite crystals to inclusions and chert fragments. As the top was bumped there was a noticeable increase in tighter limestone packstone. The oolicastic limestone had fair to good oolitic to traces of intercrystalline porosity, fair dull to bright yellow fluorescence, a fair brown stain, scattered black dead oil stain and a fair to good moderately fast to fast streaming cut.

From a measured depth of 6261' to a measured depth of 6335', 5498.5' true vertical depth, with a horizontal displacement of 855', the top of porosity zone was penetrated. The oolicastic limestone porosity decreased as the lithology changed vertically to a much lighter, tighter limestone packstone, with an increase in anhydrite inclusions and marked decrease in porosity, stain and cut. Due to the presence of oil in the mud system, and the well producing oil, no significant decrease in fluorescence was noted. During this interval the well was turned away from the top of the zone at a measured depth of 6315', 5498.6' true vertical depth, with a horizontal displacement of 836', and was oriented downward at a shallow angle. At a measured depth of 6335' the best porosity of the 1-A zone was reentered and the penetration rate increased and the oolicastic to intercrystalline porosity, staining and cuts increased.

At a measured depth of 6408', 5507' true vertical depth and a horizontal displacement of 928', a vertical facies change was noted, as the base of the 1-A porosity zone was penetrated. The well bore had turned downward at a much greater angle than was anticipated and even with an attempt to slow the drop rate, the well bore dropped just over 8' in vertical section in 90'. The base of the zone predominately a tight cream to tan to white, cryptocrystalline to microcrystalline, anhydritic to cherty limestone packstone with streaks of oolicastic to intercrystalline porosity, with decreasing amounts of fluorescence, stain and cut. The well bore was oriented upward to try to regain the porosity zone.

As the well bore was continued at a very shallow upward angle, from a measured depth of 6406' to its total measured depth of 6620', 5512' true vertical, and a horizontal displacement of 1140', the lithology was an increasingly tight, light brown to tan, cream to white, cryptocrystalline to occasionally microcrystalline, anhydritic, very cherty, limestone packstones and very rare, very thin, tight, scattered dolomite packstones. The dolomites were brown to dark brown, microcrystalline, very slightly limy and very argillaceous. The limestone porosity decreased rapidly as the lateral continued and the amount of chert noted in the samples increased.

At a total measured depth of 6620', true vertical depth 5512' and a horizontal displacement of 1140', the lateral was terminated. The lateral was terminated in a very tight, very cherty, limestone packstone with an abundant amount of clear to translucent chert.

In tracking the well bore through the 1-A bench, there were facies changes with in the limestone. The changes noted were vertical, as the well bore approached the top and base of the 1-A zone. The 1-A zone was projected to dip downward as the lateral continued toward the RU# 18-11 well. In tracking the top and base of the zone, it appears that the zone was approximately horizontal to a very shallow upward dip to a horizontal displacement of 831', after which it was projected to dip downward toward the 18-11 well.

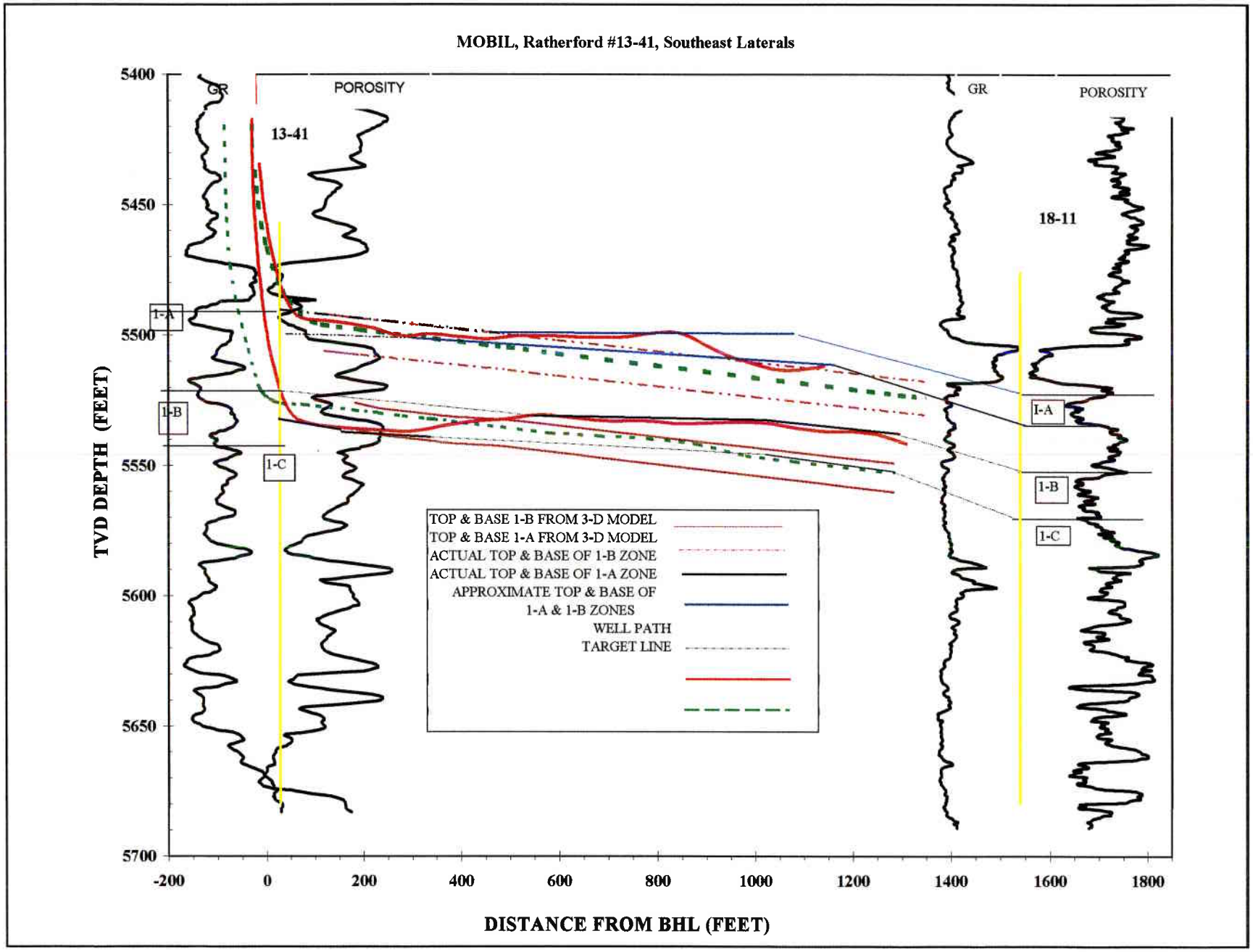
Predominant facies changes were associated with the rock classification with in the limestones and occasionally the depositional environment, as the environment of deposition changed when encountering the top or base of the 1-A zone. With the classification changes, the porous limestone encountered were of primary deposition and were continuous through out the 1-A zone penetrated, with the effective or the better porosity being associated with the oolicastic limestone packstone and thin grainstone facies which had fair to good, intercrystalline to algal porosities, and the absence of any major anhydrite plugging. The limestone packstone at and near the top and base of the 1-A zone had porosities, which were predominately tighter and with poorer permabilities. The limestone packstones noted from a horizontal displacement of 1928' to 1140' had no to very poor porosities.

From the top of the 1-A porosity bench to a total measured depth of 6406', the limestone lithology was consistent, ranging from light brown to medium brown, micro to cryptocrystalline, some very finely crystalline, occasionally microsucrosic to granular, with scattered, tighter dolomite packstone and some anhydrite matrixes. The limestones had fair to good oolicastic to a trace of intercrystalline and very rare algal porosities and a good constant dull to bright yellow fluorescence, with noticeable decreases when noticeable amounts of tighter limestone packstone was present. The staining in the limestone ranged from trace to good light brown to traces of black dead oil stain and the associated cuts being trace to good moderately fast to fast streaming cuts. From 6406' to 6620' measured depths the tight limestones had no to very poor intercrystalline to very rare scattered algal porosity, no to very rare, spotty fluorescence, with very poor, very spotty black dead oil to light brown oil staining with no to very poor slow diffuse cut. The sample shows were affected in part due to the oil & water emulsion used as the drilling fluid through out the curve and lateral sections and the oil encountered while drilling the lateral.

The conclusion drawn from the northwesterly 1-A porosity bench in Lateral Leg 3, is that in this area the limestone porosities were enhanced by presence of the oolicastic material porosity and the lack of anhydrite filling and cement. Also, having and effect on the porosity, was the dolomite cement. Staining was fair to good and there were significant sections where staining was very good, with some black dead oil staining trapped in the intercrystalline porosity and the oolicasts, and along the anhydrite to limestone contact surfaces. The lateral used the a proposed projected target line as a reference point through the bench, with the well bore following the line of best porosity which was above the target line beginning at a horizontal displacement of 324'.

While drilling the lateral, the high background gas was due in part to the oil and water emulsion used as the drilling fluid, which masked in part the oil encountered in the 1-A porosity zone, which was indicated by the significant amounts of heavies noted on the chromatograph (C_3 through C_5). This lateral can be interpreted to have good reservoir qualities through most of the lateral. It appears that the porosities are well enough developed to enhance the overall performance of the zone.

*The black residual staining has been called by Dr. Dave Eby & others as "bitchimum" and is also known as "dead oil" ("dd o stn" on mud logs). This staining is associated with the movement of oil over long periods of time and is a good indicator of producable hydrocarbons when associated with productive porosities, but can also be found in porosities that have been filled by anhydrites and other material at later dates.


MOBIL, Ratherford #13-41, Southeast Laterals
GR
POROSITY
13-41
GR
POROSITY
18-11
1-A
1-B
1-C
I-A
1-B
1-C
TVD DEPTH (FEET)
5400
5450
5500
5550
5600
5650
5700
-200
0
200
400
600
800
1000
1200
1400
1600
1800
DISTANCE FROM BHL (FEET)
TOP & BASE 1-B FROM 3-D MODEL
TOP & BASE 1-A FROM 3-D MODEL
ACTUAL TOP & BASE OF 1-B ZONE
ACTUAL TOP & BASE OF 1-A ZONE
APPROXIMATE TOP & BASE OF 1-A & 1-B ZONES
WELL PATH
TARGET LINE

RECEIVED
MAY 06 1997
DIV. OF OIL, GAS & MINING

MOBIL

RATHERFORD UNIT #13-41
HORIZONTAL LATERAL LEG #4
UPPER 1-A
POROSITY BENCH DESERT CREEK
SECTION 13, T41S, R23E
SAN JUAN, UTAH

GEOLOGY REPORT
by
DAVE MEADE
ROCKY MOUNTAIN GEO-ENGINEERING CORP.
GRAND JUNCTION, COLORADO
(970) 243-3044

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WELL SUMMARY

OPERATOR:	MOBIL EXPLORATION & PRODUCTION U.S. INC.
NAME:	RATHERFORD UNIT #13-41 NW UPPER HORIZONTAL LATERAL LEG #4 IN 1-A UPPER POROSITY BENCH, DESERT CREEK
LOCATION:	SECTION 13, T41S, R23E
COUNTY/STATE:	SAN JUAN, UTAH
ELEVATION:	KB:4748' GL:4760'
SPUD DATE:	4/18/97
COMPLETION DATE:	4/29/97
DRILLING ENGINEER:	LEWIS SIMMON/BENNY BRIGGS
WELLSITE GEOLOGY:	DAVE MEADE / MARVIN ROANHORSE
MUDLOGGING: ENGINEERS	DAVE MEADE / MARVIN ROANHORSE
CONTRACTOR:	BIG "A" RIG 25
TOOLPUSHER:	J. DEES
HOLE SIZE:	4 3/4"
CASING RECORD:	SIDETRACK IN WINDOW AT 5382' MEASURED DEPTH
DRILLING MUD:	M-I
ENGINEER:	DANNE BEASON
MUD TYPE:	OIL & WATER EMULSION / POLYMER SWEEPS
DIRECTIONAL DRILLING CO:	SPEERY-SUN
ELECTICAL LOGGING:	NA
TOTAL DEPTH:	7011' MEASURED DEPTH TVD- 5481.10'
STATUS:	TOH & LAY DOWN TOOLS - PREPARE TO MOVE RIG

DRILLING CHRONOLOGY
RATHERFORD UNIT #13-41
NW UPPER 1-A HORIZONTAL LATERAL LEG # 4

DATE	DEPTH	DAILY	ACTIVITY
4/23/97	6620'	6'	TIH W/12 JTS DP-HOOK INTO & RELEASE WHIPSTOCK-CIR & DISPLACE HOLE W/10# BRINE-TOH-LAY DOWN WHIPSTOCK & LATCH ASSEMBLY-MAKE UP NEW WHIPSTOCK & EXTENTION-ORIENT TO 309 DEG-TIH-SET WHIPSTOCK-CIR OUT & SPOT 52 BBLS 10# BRINE-TOH W/SETTINE ASSEMBLY-PICK UP STARTER MILL-TIH-MILL 5374'-5376'-CIR. & SPOT 50BBLS 10# BRINE-TOH-LAY DOWN STARTER MILL-PICK UP WINDOW MILL & WATER MELLEON MILL-TIH-CIR.-MILL WINDOW FROM 5374'-5380'
4/24/97	5380'	67'	MILL 5380' TO 5382'-CIR OUT SWEEPS & SPOT 10# BRINE-TOH -LAY DOWN MILLS-PICK UP BIT & CURVE ASSEMBLY- TIH-TAG UP @ 5382'-BREAK CIR-RIG UP WIRELINE & RUN GYRO-TIME DRLG 5382'-5385'-CONTROL DRLG 5385'-5397'-GYRO QUIT-PULL GYRO & INSPECT-DIR DRLG & SURVEYS-5397'-5411'-PULL GYRO-CIR BTMS UP-RUN IN STEERING TOOL & SET WET CONN.-DIR DRLG & SURVEYS
4/25/97	5447'	140'	DIR DRLG & SURVEYS-CIR BTMS UP @ 5568'-PULL TO WET CONN.-PULL STEERING TOOL-CIR 10# BRINE-LAY DOWN 42 JTS DRL PIPE-TOH-LAY DOWN CURVE ASSEMBLY-PICK UP LATERAL BHA & BIT-TIH-CIR. OUT THRU CHOKE-DIR DRLG & SURVEYS
4/26/97	5587'	360'	DIRL DRLG & SURVEYS
4/27/97	5947'	288'	DIR DRLG & SURVEYS
4/28/97	6235	655'	DIR DRLG & SURVEYS-WORK PIPE TO KILL ANGLE-TIME DRLG 6310' TO 6320'-CONTROL DRLG 6320' TO 6343'-DIR DRLG & SURVEYS-WORK PIPE TO KILL ANGLE-DIR DRLG & SURVEY
4/29/97	6890	121'	DIR DRLG & SURVEYS-CIR SPLS @ 7011'-PUMP SWEEPS-LAY DOWN 7 JTS DRL PIPE-TOH TO WINDOW-SPOT BRINE WATER @ WINDOW-TOH-LAY DOWN LATERAL ASSEMBLY-PICK UP RETRIEVING HOOK-TIH LATCH IN TO WHIPSTOCK-SHEAR OFF & TOH-LAYING DOWN DRL PIPE & COLLARS-LAY DOWN WHIPSTOCK-PREPARE TO MOVE RIG

DAILY ACTIVITY

Operator: MOBIL
Well Name: RATHERFORD UNIT #13-41 NW UPPER 1-A HORIZONTAL LATERAL LEG #4

DATE	DEPTH	DAILY	DATE	DEPTH	DAILY
4/23/97	6620'	6'			
4/24/97	5380'	67'			
4/25/97	5447'	140'			
4/26/97	5587'	360'			
4/27/97	5947'	288'			
4/28/97	6235'	655'			
4/29/97	6890'	121'			
TD	7011'				

BIT RECORD

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 NW UPPER 1-A HORIZONTAL LATERAL LEG #4

RUN	SIZE	MAKE	TYPE	IN/OUT	FTG	HRS	FT/HR
#1	4 3/4"	WTHRFRD	MILL	5374'/ 5382'	8'	N/A	N/A
#2(RR) BIT	4 3/4"	STC	MF-3P	5382'/ 5568'	186'	18	10.3
#3 BIT	4 3/4"	HTC	STR-30	5568'/ 7011'	1,443'	74	19.5

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATERFORD UNIT
Slot/Well .. : A /13-41, 4A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
5374.00	0.33	5.37	5373.32	52.74 N	10.61 W	41.44	0.00
5382.00	3.50	295.00	5381.31	52.87 N	10.83 W	41.69	42.54
5392.00	9.10	295.80	5391.25	53.34 N	11.82 W	42.75	56.01
5402.00	14.30	296.60	5401.04	54.24 N	13.64 W	44.73	52.02
5412.00	19.70	297.40	5410.60	55.57 N	16.24 W	47.59	54.05
5422.00	25.20	298.80	5419.84	57.37 N	19.60 W	51.34	55.26
5432.00	30.40	306.90	5428.68	59.92 N	23.50 W	55.97	64.17
5442.00	34.60	309.90	5437.12	63.26 N	27.70 W	61.34	44.98
5452.00	37.60	313.00	5445.20	67.16 N	32.11 W	67.22	35.11
5462.00	40.30	309.20	5452.97	71.29 N	36.85 W	73.50	36.04
5472.00	44.90	307.90	5460.33	75.50 N	42.14 W	80.27	46.83
5482.00	49.60	307.50	5467.12	79.99 N	47.95 W	87.61	47.09
5492.00	51.70	306.10	5473.46	84.62 N	54.15 W	95.33	23.63
5502.00	54.60	307.10	5479.46	89.39 N	60.57 W	103.33	30.08
5512.00	59.40	308.10	5484.90	94.51 N	67.21 W	111.71	48.73
5522.00	64.20	308.80	5489.62	99.99 N	74.11 W	120.52	48.39
5532.00	69.90	309.50	5493.52	105.80 N	81.25 W	129.72	57.36
5542.00	75.80	310.40	5496.47	111.94 N	88.57 W	139.27	59.62
5552.00	81.70	311.70	5498.42	118.38 N	95.96 W	149.07	60.36
5562.00	85.90	311.90	5499.50	125.00 N	103.37 W	159.00	42.05
5568.00	86.90	311.20	5499.88	128.97 N	107.85 W	164.98	20.33
5579.25	87.00	310.40	5500.47	136.31 N	116.35 W	176.21	7.16
5611.08	88.70	308.50	5501.67	156.52 N	140.91 W	208.01	8.01
5642.95	89.90	308.50	5502.06	176.36 N	165.85 W	239.88	3.77
5674.85	90.20	307.60	5502.03	196.02 N	190.97 W	271.77	2.97
5706.65	91.20	307.40	5501.64	215.38 N	216.20 W	303.56	3.21
5738.48	92.20	307.40	5500.70	234.70 N	241.47 W	335.36	3.14
5770.22	95.10	307.30	5498.68	253.92 N	266.65 W	367.02	9.14
5802.04	95.40	307.30	5495.77	273.12 N	291.86 W	398.69	0.94
5833.80	96.80	307.10	5492.39	292.21 N	317.01 W	430.26	4.45
5865.51	96.70	307.10	5488.66	311.21 N	342.13 W	461.73	0.32
5897.35	94.30	306.20	5485.61	330.12 N	367.55 W	493.40	8.05
5929.20	93.20	305.90	5483.53	348.83 N	393.25 W	525.14	3.58
5961.00	92.60	306.00	5481.92	367.47 N	418.96 W	556.85	1.91
5992.75	92.50	305.90	5480.51	386.09 N	444.64 W	588.52	0.45
6024.50	88.60	306.00	5480.20	404.73 N	470.33 W	620.22	12.29
6056.33	87.00	306.40	5481.42	423.51 N	496.00 W	651.99	5.18
6088.07	86.60	306.60	5483.20	442.36 N	521.47 W	683.65	1.41

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATERFORD UNIT
Slot/Well .. : A /13-41, 4A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
6119.84	84.80	306.20	5485.58	461.16 N	546.97 W	715.29	5.80
6151.57	85.60	306.40	5488.23	479.88 N	572.45 W	746.88	2.60
6183.36	89.10	307.30	5489.70	498.92 N	597.86 W	778.61	11.37
6215.14	89.90	307.40	5489.98	518.20 N	623.12 W	810.37	2.54
6246.90	90.50	307.60	5489.87	537.54 N	648.32 W	842.12	1.99
6278.66	93.40	308.10	5488.79	557.01 N	673.38 W	873.85	9.27
6310.40	94.40	308.50	5486.63	576.64 N	698.23 W	905.52	3.39
6342.15	93.50	310.20	5484.44	596.72 N	722.72 W	937.19	6.05
6373.10	92.30	312.20	5482.88	617.08 N	745.98 W	968.07	7.53
6404.07	90.20	313.60	5482.20	638.15 N	768.66 W	998.96	8.15
6435.92	90.60	315.90	5481.98	660.57 N	791.28 W	1030.65	7.33
6467.74	91.70	319.60	5481.34	684.12 N	812.66 W	1062.09	12.13
6498.80	93.30	322.20	5479.99	708.20 N	832.23 W	1092.45	9.82
6530.62	90.70	321.70	5478.88	733.24 N	851.83 W	1123.44	8.32
6562.53	89.50	320.80	5478.82	758.12 N	871.80 W	1154.62	4.70
6594.25	90.50	318.70	5478.82	782.33 N	892.29 W	1185.78	7.33
6626.02	90.40	316.90	5478.57	805.86 N	913.63 W	1217.17	5.67
6657.87	91.70	314.80	5477.99	828.71 N	935.81 W	1248.79	7.75
6688.93	90.00	312.70	5477.52	850.18 N	958.25 W	1279.73	8.70
6720.62	87.80	310.40	5478.13	871.20 N	981.95 W	1311.38	10.04
6752.52	87.50	308.10	5479.44	891.36 N	1006.63 W	1343.25	7.27
6783.49	90.10	306.20	5480.09	910.06 N	1031.31 W	1374.20	10.40
6815.36	89.50	304.10	5480.20	928.40 N	1057.37 W	1405.99	6.85
6847.08	89.70	302.20	5480.42	945.75 N	1083.92 W	1437.55	6.02
6878.82	90.30	300.60	5480.42	962.29 N	1111.01 W	1469.01	5.38
6910.65	89.30	302.70	5480.53	978.99 N	1138.11 W	1500.57	7.31
6942.53	88.90	305.00	5481.04	996.74 N	1164.58 W	1532.32	7.32
6974.28	90.20	307.10	5481.28	1015.42 N	1190.25 W	1564.02	7.78
6979.00	90.30	307.40	5481.26	1018.28 N	1194.00 W	1568.74	6.70
7011.00	90.30	309.50	5481.10	1038.18 N	1219.06 W	1600.74	6.56

THE DOGLEG SEVERITY IS IN DEGREES PER 100.00 FEET.
N/E COORDINATE VALUES GIVEN RELATIVE TO WELL SYSTEM REFERENCE POINT.
TVD COORDINATE VALUES GIVEN RELATIVE TO WELL HEAD.
THE VERTICAL SECTION ORIGIN IS 0.00 N 0.00 E.
THE VERTICAL SECTION WAS COMPUTED ALONG 309.00 (TRUE).
CALCULATION METHOD: MINIMUM CURVATURE.

TIE-ON 5374 - GYRO 5382 - S/T SURVEYS 5392-5542
INTERPOLATED AZI 5392-5402 - SLIGHT AZ INTERFERENCE
5412-5422 - MWD 5552-6979 - BIT PROJECTION 7011

MUD REPORT

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 NW UPPER 1-A HORIZONTAL LATERAL LEG #4

DATE	DEPTH	WT	VIS	PLS	YLD	GEL	pH	WL	CK	CHL	CA	SD	OIL	WTR
4/23/97	5381'	9.1+	27	–	–	–	11.6	N/A	<1/32	110000	420	–	8%	92%
4/24/97	5382'	9.2	27	–	–	–	11.0	N/A	<1/32	111000	420	–	7%	93%
4/25/97	5511'	9.2	27	–	–	–	11.5	N/A	<1/32	110000	420	–	6%	94%
4/26/97	5707'	9.2+	27	–	–	–	11.6	N/A	<1/32	110000	440	–	6%	94%
4/27/97	6042'	9.2	27	–	–	–	12.0	N/A	<1/32	110000	420	–	5%	95%
4/28/97	6252'	9.2	27	–	–	–	11.8	N/A	<1/32	110000	440	–	5%	95%
4/29/97	7011'	9.1+	27	–	–	–	11.0	N/A	<1/32	110000	800	–	5%	95%

SAMPLE DESCRIPTIONS

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 NW UPPER 1-A HORIZONTAL LATERAL LEG #4

DEPTH	LITHOLOGY

5382.00 5390.00 "LS crm-tan,ltbrn,ltbrngy,occ ltgy,brn,crpxl-micxl,rthy,shy,sl chk,v sl slty,occ sl dol,tr trnsl xln ANHY incl,pred tt/tr inxl-r agl POR,no-tr scat spty mod bri yel FLOR,tr ltbrn STN,fr dif/res ring CUT"

5390.00 5400.00 "LS AA/scat dkbrn CHT frag & dkbrn-brnblk sl carb-sl dol SH,POR AA,no-rr mod bri yel FLOR,STN-CUT AA"

5400.00 5410.00 "DOL dkbrn-brnblk,crpxl-micxl,rthy,shy-arg,occ sl slty ip,sl calc-lmy ip,grdg to dol SH,NFSOC"

5410.00 5420.00 "LS brn,tan,occ ltgy-gybrn,crpxl-micxl,rthy,shy,occ sl arg-slty ip,occ mot/dkbrn-brnblk slty strk,tt-tr intxl POR,no-vrr scat dull orngyel FLOR,tr ltbrn STN,p-fr dif CUT"

5420.00 5430.00 "DOL dkbrn-brnblk,dk-mbrngy,occ ltgybrn,micxl-micsuc-crpxl,rthy,sl-v slty ip,tr blk slty carb strk,calc-sl lmy ip,sl shy-arg,occ grdg to dol SH,tt-tr intxl POR,NFSOC"

5430.00 5440.00 "LS AA/scat dkbrn CHT frag & dkbrn-brnblk sl carb-sl dol SH,POR AA,no-rr mod bri yel FLOR,STN-CUT AA"

5440.00 5450.00 "DOL dkbrn-brnblk,dk-mbrngy,occ ltgybrn,crpxl-micxl-micsuc,rthy,sl shy,occ sl slty ip,calc-sl lmy ip,occ sl arg,vrr dism PYR,grdg to dol SH,tt-tr intxl POR,NFSOC"

5450.00 5460.00 "LS ltgy,m-ltgybrn,brn,occ mot/dkbrn-brnblk strk,micxl-micsuc,crpxl,rthy,slty-sl arg,tr sl sdy strk/occ chk fl,sl dol ip,tt-tr intxl POR,no-vrr scat dull orngyel FLOR,tr ltbrn STN,p-fr dif CUT"

5460.00 5470.00 "DOL ltgybrn-ltgy,mbrngy,micxl-micsuc,occ crpxl,rthy,slty/occ sdy strk,cln-sl chk,sl mrly-arg ip,tr calc cmt-fl,tr intbd dkbrn CHT,sl anhy,tt-tr intxl POR,tr scat dull orngyel FLOR,tr ltbrn/rr brn STN,p dif CUT"

5470.00 5480.00 "DOL AA,pred tt,n-v rr intxl POR,n-v rr fnt dull yel FLOR,n vis STN,n-v rr resid ring CUT,w/scat dkbrn CHT frag,scat ANHY incl,occ ltbrn-crm-ltgy,crpxl,dol,tt,arg LS,NFSOC & occ blk carb dol-calc SH"

5480.00 5490.00 "DOL-CHT-LS AA,incr blk-dkgybrn,sbplty,carb,sl calc-v dol,sl slty,mica ip SH"

5490.00 5510.00 "SH blk,dkgybrn-dkgy ip,sbblky-plty,rthy,mica,slty ip,sl calc-dol,carb-sooty,w/v thn arg-sl mrly DOL AA,& v arg sl slty tt LS AA,v rr scat brn-smky gy CHT frag"

5510.00 5520.00 "SH AA,W/DOL tan-crm-gybrn-brn,crpxl-micxl,rthy,slty,v lmy,tr ANHY incl-xl,n-v rr intxl POR,v rr dull yel FLOR,NSOC & thn intbd tan-wh-crm,crpxl-micxl,v slty,sl dol tt LS,NFSOC"

5520.00 5530.00 "LS crm-tan-brn,occ wh,crpxl-vfxl,gran-micsuc ip,sl ooc,intbd ooc LS GRNST & PKST,v sl anhy,occ chty,v sl dol-occ DOL rich cmt,occ thn dkbrn DOL PKST incl,tr-fr intxl-ooc POR,tr dull-bri yel FLOR,tr ltbrn STN,tr-fr slow-mod fast stmg CUT"

DEPTH	LITHOLOGY

5530.00 5540.00 "LS AA,incr ooc mat,pred ooc LS GRNST,occ ooc LS PKST,fr-g intxl-ooc POR,tr dull-bri yel FLOR,fr-g ltbrn STN,tr slow-mod fast stmg CUT,tr scat ltbrn-trnsl CHTfrag,DOL AA"

5540.00 5550.00 "LS tan-wh,crpxl-micxl,pred tt LS PKST,tr mic fos,rr-tr FLOR-STN-CUT"

5550.00 5568.00 "LS crm-wh,tan,occ ltbrn,crpxl-micxl,sl vfxl-gran,v rr ooc mat,pred tt sl anhy LS PKST,v rr mic fos,chty-tr trnsl-bf CHT frag,v rr micxl-crpxl,lmy,arg,tt DOL PKST,n-v rr intxl-ooc POR,n-v rr spty dull yel FLOR,v rr spty ltbrn STN,n-v p slow dif CUT"

5568.00 5580.00 "LS pred AA/vcol DOL,LS,SH cvgs"

5580.00 5590.00 "LS wh-crm,occ tan,ltbrn,crpxl-micxl,vfxl,occ micsuc-gran,cln,anhy/tr trnsl xln ANHY incl,LS PCKST/chk-mrly prtgs,tt-rr intxl & vrr ooc POR,tr scat dull-occ spty mod bri yel FLOR,rr-tr ltbrn STN,fr dif/rr slow strmg CUT"

5590.00 5600.00 "LS AA,pred LS PCKST/intbd chk-mrly prtgs,POR-FLOR-STN-CUT AA"

5600.00 5610.00 "LS wh-crm-tan,occ ltbrn,crpxl-micxl,vfxl,occ micsuc-gran,cln,anhy AA,LS PCKST/chk-mrly prtgs,occ v sl dol ip,tt-rr intxl & vrr ooc POR,no-tr scat dull/rr spty mod bri yel FLOR,tr ltbrn STN,fr dif/tr slow strmg CUT"

5610.00 5620.00 "LS AA/incr ltbrn-tan crpxl LS PCKST,occ sl dol ip,POR-FLOR-STN-CUT AA"

5620.00 5630.00 "LS wh-crm-tan,crpxl-micxl,vfxl-gran,cln,anhy/rr trnsl xln ANHY incl,LS PCKST/chk-mrly prtgs,tt-rr intxl POR,tr scat dull-rr spty mod bri yel FLOR,no-tr ltbrn STN,fr dif/rr slow strmg CUT"

5630.00 5640.00 "LS AA,LS PCKST/decr chk-mrly prtgs,bcmg incr tanocc sl dol ip,POR-FLOR-STN-CUT AA"

5640.00 5650.00 "LS crm-wh-tan,crpxl-micxl,vfxl-gran,cln,sl anhy/rr trnsl xln ANHY incl,LS PCKST/chk-mrly prtg,POR-FLOR-STN-CUT AA"

5650.00 5660.00 "LS tan,ltgybrn-crm-wh,occ ltgy,ltbrn-brn,crpxl-micxl-vfxl,occ micsu,ool-ooc,gran,cln,sl anhy,LS PCKST/chk-mrly prtg,rr blk-dkgybrn sl slty SH prtg,rr ool & mic fos,tt-tr intxl/rr ooc POR,FLOR-STN-CUT AA"

5660.00 5670.00 "LS crm-tan,occ wh,crpxl-micxl,occ micsuc,anhy,pred LS PKST w/v rr LS GRNST incl,w/occ scat CHT frag,tt-v rr intxl POR,n-v rr spty dull-bri yel FLOR,n-v rr spty STN,n-v p slow dif CUT"

5670.00 5680.00 "LS AA,v rr ooc-intxl POR,FLOR-STN-CUT AA"

5680.00 5690.00 "LS crm-tan,occ wh,cprxl-miclx LS PKST,v rr stks GRNST,anhy,v sl dol,scat trnsl-bf CHT frag,occ Crin fos,tt-v rr intxl POR,n-v rr dull yel FLOR,n vis stn,n-v p slow dif CUT"

5690.00 5700.00 "LS AA,intbd sl anhy-chty LS PKST,w/occ micsuc LS GRNST,v rr intxl POR,FLOR-STN-CUT AA"

5700.00 5710.00 "LS AA,incr plty wh crpxl PKST,scat trnsl-bf CHT frag,POR-FLOR-STN-CUT AA,occ v rr ltbrn micxl lmy arg DOL frag"

DEPTH	LITHOLOGY

5710.00 5730.00 "LS crm-wh-tan,crpxl,v rr micxl,v rr gran-micsuc,rr mic fos,chty-scat CHT frag,anhy-v rr ANHY xl,dol ip,tt-v rr intxl POR,n-v rr dull yel FLOR,n-v rr spty ltbrn STN,n-v rr slow dif-resid ring CUT"

5730.00 5740.00 "LS AA,scat CHT frag,occ micsuc DOL GRNST,FLOR-STN-CUT AA"

5740.00 5750.00 "LS crm-wh-tan,crpxl,v rr micxl,v rr gran-micsuc,rr mic fos,chty-scat CHT frag,anhy-v rr ANHY xl,dol ip,pred tt plty LS PKST,v rr intbd LS GRNST,tt-v rr intxl POR,n-v rr dull yel FLOR,n-v rr spty ltbrn STN,n-v rr slow dif-resid ring CUT"

5750.00 5760.00 "LS AA,decr plty,incr ANHY xl-incl,POR-FLOR-STN-CUT AA"

5760.00 5770.00 "LS tan-crm,occ wh,crpxl-micxl,rr misuc,plty ip,intbd LS PKST & LS GRNST,anhy-occ ANHY xl,scat trnsl-bf CHT frag,rr mic fos,tt-tr intxl POR,n-v rr spty dull yel FLOR,n-v rr spty ltbrn STN,v p slow dif-resid ring CUT"

5770.00 5780.00 "LS AA,bcmg pred tan-crm LS GRNST,tr intxl POR,tr dull-bri yel FLOR,n-rr ltbrn STN,rr-tr slow dif CUT,rr lmy micxl DOL GRNST,n-v rr intxl POR,NFSOC"

5780.00 5790.00 "LS AA,chty-tr trnsl-bf CHT,tr dull yel FLOR,rr-tr ltbrn STN,tr slow dif-slow stmg CUT"

5790.00 5810.00 "LS crm-tan,occ ltbrn,wh ip,crpxl-micxl,occ micsuc-vfxl,plty-chk ip,occ chty-scat trnsl-clr CHT frag,v sl dol,occ ANHY xl-incl,v rr mic fos,sl alg,rr tt ool,tt-fr intxl-v rr alg POR,tr-fr dull-bri yel FLOR,tr ltbrn-v rr blk STN,n-tr slow dif-slow stmg CUT"

5810.00 5820.00 "LS crm-tan,occ wh,crpxl,v rr micxl,plty,pred LS PKST,v rr ool,anhy-scat ANHY xl-incl,CHT frag,dol-v rr micxl DOL frag,tt-v rr intxl POR,v rr spty FLOR-STN,n-v p slow dif CUT"

5820.00 5830.00 "LS crm-tan,ltbrn,crpxl-vfxl,micsuc-gran ip,incr ooc LS GRNST,tr-fr intxl-ool POR,tr-fr dull-bri yel FLOR,tr ltbrn-v rr blk STN,tr-fr slow dif-mod fast stmg CUT"

5830.00 5850.00 "LS crm-tan-ltbrn,occ wh,crpxl-vfxl,micsuc-gran,pred sl anhy ooc LS GRNST,occ LS PKST,rr mic fos,fr-g intxl-ool POR,tr-fr dull-bri yel FLOR,tr-fr ltbrn-tr blk STN,tr-fr slow-mod fast stmg CUT"

5850.00 5860.00 "LS tan-ltbrn-crm,occ wh,brn,crpxl-micxl,vfxl-micsuc,gran-ooc,ooc LS GRNST/scat PCKST,sl anhy,tr cht,tr mic fos,fr intxl/occ ooc POR,g scat even mod bri-dull yel FLOR,fr ltbrn-tr brn/occ blk dd o STN,g fast strmg CUT"

5860.00 5870.00 "LS AA,pred sl anhy ooc LS GRNST/occ scat PCKST,sl chty,g intxl/incr ooc POR,g-fr dull-mod bri/scat bri yel FLOR,g-fr ltbrn-brn/occ blk dd o STN,CUT AA"

5870.00 5890.00 "LS tan-ltbrn,crm-wh,occ brn,micxl-micsuc,ooc-gran-crpxl,ooc LS GRNST,rr PCKST,tr trnsl xln ANHY frag-incl,occ v chk-mrly,tr wh-bf CHT,rr micr fos,g intxl-ooc POR,g even mod bri-dull/scat bri yel FLOR,fr-g ltbrn-brn/tr
blk dd o STN,g mod fast strmg CUT"

5890.00 5900.00 "LS tan-ltbrn,occ crm-off wh,ooc,micxl-gran-vfxl,occ crpxl,ooc LS GRNST,tr scat trnsl xln ANHY,tr bf CHT,v sl chk-mrly,g ooc-intxl POR,g spty-even mod bri-bri yel FLOR,g ltbrn-brn/tr blk dd o STN,g mod fast-fast strmg CUT"

5900.00 5910.00 "LS AA,pred ooc LS GRNST/tr intbd CHT AA,POR-FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

5910.00 5920.00 "LS AA.pred ooc LS GRNST/tr crpxl PCKST,incr bf CHT frag/rr ool fos incl,sl chky-mrly,tr ANHY AA,g ooc-intxl POR,g-fr even dull/spty mod bri-bri yel FLOR,g-fr ltbrn-brn/tr blk dd o STN,g mod fast strmg CUT"

5920.00 5930.00 "LS AA,ooc LS GRNST,tr PCKST AA,ANHY & CHT AA,POR-FLOR-STN-CUT AA"

5930.00 5940.00 "LS AA,micxl-ooc-vfxl,crpxl,ooc LS GRNST/scat PCKST,rr ANHY & CHT AA,v sl chk-mrly,g intxl-ooc POR,fr-g scat spty dull-mod bri yel FLOR,g ltbrn-brn/tr blk dd o STN,g dif/mod fast strmg CUT"

5940.00 5960.00 "LS tan-ltbrn,occ crm-off wh,brn-dkbrn,ltgybrn,micxl-ooc-gran,vfxl-crpxl,pred LS GRNST occ ooc-rr slty ip,incr scat crpxl PCKST,tr plty chky frag & calc carb SH,vrr PYR,fr-g intxl-ooc POR,fr scat spty mod bri yel FLOR,fr STN AA,fr-g dif/slow strmg CUT"

5960.00 5970.00 "LS tan-gy,ltbrn,crpxl,arg,slty,sl dol,grdg to v slty arg LS GRNST,rr intxl POR,n-v rr dull yel FLOR,n-v rr brn STN,n-v p slow dif CUT,v rr ltbrn crpxl arg DOL PKST,w/intbd ltgy slty sl calc CLYST & ltgy-tan sl calc-dol arg SLTST"

5970.00 5980.00 "LS tan-brn,occ ltgybrn,crpxl-micxl,v rr micsuc-gran,sl anhy,chty,slty-arg ip,occ DOL,v rr intxl POR,NFSOC,thn ltbrn-brn micxl lmy DOL incl arg,tt,NFSOC,scat CHT frag,thn ltgy calc CLYST-slty"

5980.00 5990.00 "LS AA,incr brn crpxl LS PKST,occ vrr ltbrn-tan LS GRNST,v sl dol,chty,tt-v rr intxl POR,NFSOC,rr DOL incl,scat CHT frag,v rr CLYST ptgs"

5990.00 6000.00 "LS AA,sl incr LS GRNST,rr-tr intxl POR,n-v rr FLOR-STN-CUT,decr DOL-CLYST,CHT AA"

6000.00 6010.00 "LS brn-tan,crpxl-micxl,occ vfxl,pred sl dol LS PKST-tr LS GRNST,incr ltbrn-brn CHT frag,decr DOL,v rr intxl POR,NFSOC"

6010.00 6020.00 "INTBD LS crm-tan-brn,crpxl-micxl,occ micsuc,chty,dol,sl arg,anhy ip,tt-tr intxl POR,NFSOC,& DOL brn-mbrn,crpxl,calc,chty,occ v sl anhy,tt,NFSOC,scat brn CHT frag"

6020.00 6030.00 "INTBD LS & DOL AA,POR-FLOR-STN-CUT AA,incr brn CHT frag"

6030.00 6040.00 "LS-DOL-CHT AA"

6040.00 6050.00 "LS tan-brn-mbrn,crpxl-micxl,v rr micsuc,dol,pred LS PKST w/scat LS GRNST,tt-tr intxl POR,n-v rr dull yel FLOR,n-v rr spty brn STN,n-v p slow resid ring CUT,w/intbd DOL brn-dkbrn,crpxl,sl arg,lmy,chty,tt,NFSOC,scat dkbrn-brn CHT frag"

6050.00 6060.00 "LS AA,pred dns,cln,dol-v dol brn LS PKST,incr dns,tt,dkbrn lmy DOL PKST,NFSOC,scat brn-ltbrn CHT frag"

6060.00 6070.00 "DOL brn-dkbrn,crpxl,dns,sl lmy,v rr mic fos,chty,pred DOL PKST,bcmg DOL WKST,tt,NFSOC,LS tan-brn,v rr wh,crpxl,v rr micxl,anhy,rthy,dol,v rr mic fos,tt,NFSOC"

6070.00 6080.00 "DOL AA,occ bcmg DOL WKST,LS AA,bcmg wh-tan,w/rr ANHY xl-stks,v rr frac POR,n-v rr fnt dull yel FLOR,occ fnt dull orng mnrl FLOR,vv rr spty blk dd o STN,n-v rr v p dif CUT"

DEPTH	LITHOLOGY

6080.00 6090.00 "DOL AA,lmy,pred tt DOL PKST-rr DOL WKST,NFSOC,incr LS PKST AA,occ micsuc anhy sl fos,LS GRSTN,tt-v rr intxl POR,v rr FLOR-STN AA,v rr-rr spty slow dif-resid ring CUT"

6090.00 6110.00 "LS crm-tan,occ wh,crpxl-micxl,micsuc ip,occ plty tt sl dol LS PKST,incr LS GRNST,bcmg sl oolcastic,chty ip-scat bf-trnsl CHT frag,tr intxl-rr ool POR,tr dull yel FLOR,rr-tr spty ltbrn STN,tr slow dif-mod fast stmg CUT,w/thn DOL AA"

6110.00 6120.00 "LS crm-tan,occ wh,crpxl-vfxl,occ micsuc-grn,plty ip,pred ooc LS GRNST,occ plty LS PKST,scat bf-trnsl CHT frag,rr DOL PKST incl,tr-g intxl-tr ool POR,tr-fr dull-bri yel FLOR,tr ltbrn STN,fr slow-mod fast stmg CUT"

6120.00 6130.00 "LS AA,pred ooc LS GRNST,intr POR-FLOR-STN-CUT,scat CHT frag,tr DOL PKST cvgs"

6130.00 6140.00 "LS tan-crm-ltbrn,wh ip,crpxl-vfxl,gran-micsuc,oolicastic,occ DOL rich cmt,scat CHT frag,occ plty LS PKST incl,fr-g intxl-tr ool POR,tr-fr dull-bri yel FLOR,tr-fr ltbrn STN,v rr spty blk dd o STN,tr-fr slow-mod fast stmg CUT"

6139.00 6150.00 "LS AA,incr POR-FLOR-STN-CUT,scat CHT frag"

6150.00 6160.00 "LS tan-crm-ltbrn,AA,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr ltbrn-v rr blk STN,fr-g slow-mod fast stmg CUT"

6160.00 6170.00 "LS AA,crpxl-micxl-gran,vfxl-occ ooc,pred LS PCKST/intbd chky plty prtgs,rr scat ooc GRNST,tr intbd bf CHT/rr dkbrn crpxl DOL,tt-tr intxl POR,fr even dull yel FLOR,fr STN AA,fr-g dif CUT"

6170.00 6180.00 "LS AA,LS PCKST/scat ooc GRNST,incr dkbrn crpxl sl calc DOL,POR AA,fr scat dull yel FLOR-STN-CUT AA"

6180.00 6190.00 "LS AA,pred LS PCKST/incr intbd chky plty prtgs,tr intbd bf CHT,tr dkbrn crpxl DOL,POR-FLOR-STN-CUT AA"

6190.00 6210.00 "LS tan-ltbrn,crm-wh,micxl-vfxl-gran,ooc-crpxl,pred LS PCKST/intbd-scat plty chky frag,occ ooc GRNST,scat-intbd dkbrn crpxl calc DOL,tr bf CHT & xln ANHY,fr intxl/occ ooc POR,fr scat dull-mod bri yel FLOR,g ltbrn-brn STN,g-fr dif/tr slow strmg CUT "

6210.00 6220.00 "DOL dkbrn-brnblk,crpxl,occ micsuc,DOL PCKST/rr sl slty strk,rthy,dns,occ sl-v calc-lmy,arg-v sl shy ip,grdg to dol LS,tt-rr intxl POR,NFSOC"

6220.00 6230.00 "LS AA,pred LS PCKST,scat ooc GRNST/scat DOL AA,tr mic fos,tt-tr intxl/occ ooc POR,fr-tr scat spty mod bri-dull yel FLOR,STN-CUT AA "

6230.00 6240.00 "LS crm-wh-ltbrn,crpxl-micxl-vfxl,occ ooc,LS PCKST/chky plty frag,tr ooc GRNST,sl anhy-chty,tr mic fos,w/DOL AA,tt-tr intxl/tr ooc POR,fr even dull/tr scat mod bri yel FLOR,fr-tr ltbrn-brn STN,fr dif/tr slow strmg CUT"

6240.00 6250.00 "LS crm-wh,occ tan-ltbrn,crpxl-vfxl,micxl-gran,cln,chky-mrly,occ arg ip,sl anhy & chty,tt-tr intxl POR,fr even dull/rr scat mod bri yel FLOR,no-vrr ltbrn STN,vp dif CUT"

6250.00 6260.00 "LS AA,POR-FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

6260.00 6270.00 "LS crm-wh-ltbrn,crpxl-micxl-vfxl,LS PCKST/chky plty frag,rr ooc GRNST,sl anhy-chty,tr mic fos,tr blk SH strk & DOL AA,tt-tr intxl/rr ooc POR,fr even dull/tr scat mod bri yel FLOR,tr ltbrn/rr brn STN,p dif CUT"

6270.00 6290.00 "LS crm-wh-ltbrn,crpxl-micxl-vfxl,occ ooc,LS PCKST/chky plty frag,tr ooc GRNST,sl anhy-chty,tr mic fos,w/DOL & SH AA,tt-tr intxl/tr ooc POR,fr even dull/tr scat mod bri yel FLOR,fr-tr ltbrn-brn STN,fr dif/tr slow strmg CUT"

6290.00 6310.00 "LS crn-tan,ltbrn,occ wh,crpxl-vfxl,gran-micsuc,pred ooc-sl alg LS GRNST,occ dol-DOL rich cmt,scat trnsl-bf CHT frag,tr wh plty LS PKST,fr-g intxl-ool-rr alg POR,fr-g dull-bri yel FLOR,fr ltbrn-rr blk STN,fr-g mod fast-fast stmg CUT"

6310.00 6320.00 "LS crm-tan,ltbrn,crpxl-micxl,occ vfxl-gran,micsuc ip,pred oolicastic LS GRNST,v sl alg,occ ooc LS PKST incl,chty-scat trnsl-bf CHT frag,tr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr ltbrn-rr blk STN,fr-g mod fast-fast CUT"

6320.00 6330.00 "LS AA,decr LS PKST,POR-FLOR-STN-CUT AA"

6330.00 6340.00 "LS AA,decr CHT frag,POR-FLOR-STN-CUT AA"

6340.00 6350.00 "LS AA,incr trnsl-bf CHT frag,incr ool-occ alg POR,FLOR-STN-CUT AA"

6350.00 6370.00 "LS crm-tan,ltbrn,crpxl-micxl,occ vfxl-gran,micsuc ip,pred oolicastic LS GRNST,v sl alg,occ ooc LS PKST incl,sl chty-scat rrnsl-bf CHT frag,tr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr ltbrn-rr blk STN,fr-g mod fast-fast CUT"

6370.00 6380.00 "LS AA,incr trnsl-bf CHT frag,incr ool-occ alg POR,FLOR-STN-CUT AA"

6380.00 6390.00 "LS tan-brn,occ crm-mbrn,crpxl-vfxl,micsuc-gran ip,oolicastic,sl alg,pred ool LS GRNST,sl dol-occ DOL rich cmt,anhy-tr ANHY xl-incl,scat CHT frag,v rr mic fos,fr-g intxl-ool-rr alg POR,fr-g dull-bri yel FLOR,fr-g ltbrn STN,occ blk dd o STN,g mod fast CUT"

6390.00 6400.00 "LS AA,sl incr trnsl-bf CHT frag,incr ool-occ alg POR,FLOR-STN-CUT AA"

6400.00 6410.00 "LS AA,POR-FLOR-CUT AA,fr-g ltbrn STN,tr blk dd o STN"

6410.00 6430.00 "LS crm-tan-brn,occ mbrn-wh,micxl-vfxl,gran-micsuc,occ crpxl,pred oolicastic-v rr alg LS GRNST,v sl dol,rr trnsl-bf CHT frag,scat ANHY xl-incl,fr-g intxl-ool-rr alg POR,fr-g dull-bri yel FLOR,fr-g ltbrn-v rr blk STN,fr-g mod fast-fast stmg CUT"

6430.00 6440.00 "LS AA,sl incr oolicastic LS PKST,POR-FLOR-STN-CUT AA"

6440.00 6450.00 "LS AA,scat trnsl-bf CHT frag,POR-FLOR-CUT AA,incr dkbrn-blk STN"

6450.00 6460.00 6447.14 0 "LS crm-tan-brn,occ mbrn-wh,micxl-vfxl,gran-micsuc,occ crpxl,pred oolicastic-v rr alg LS GRNST,v sl dol,rr trnsl-bf CHT frag,scat ANHY xl-incl,fr-g intxl-ool-rr alg POR,fr-g dull-bri yel FLOR,fr-g ltbrn-v rr blk STN,fr-g mod fast-fast stmg CUT"

6460.00 6470.00 "LS AA,scat trnsl-bf CHT frag,POR-FLOR-CUT AA,incr dkbrn-blk STN"

DEPTH	LITHOLOGY

6470.00 6480.00 "LS crm-tan-brn,occ mbrn-wh,crpxl-vfxl,occ gran-micsuc,pred oolicastic-v sl alg LS PKST,occ ool LS GRNST.v sl dol,tr trnsl-bf CHT frag,rr ANHY xl-incl,fr-g ool-tr intxl-rr alg POR,fr-g dull-bri yel FLOR,fr-g ltbrn-tr blk STN,fr-g mod fast-fast stmg CUT"

6480.00 6490.00 "LS AA,decr alg mat-CHT frag,POR-FLOR-STN AA,decr alg POR"

6490.00 6500.00 "LS AA,incr v oolicastic LS PKST,POR-FLOR-CUT AA,incr dkbrn STN,incr blk dd o STN"

6500.00 6520.00 "LS crm-tan-brn,occ mbrn-wh,crpxl-vfxl,occ gran-micsuc,pred oolicastic-v sl alg LS PKST,rr ool LS GRNST.v sl dol,tr trnsl-bf CHT frag,rr ANHY xl-incl,fr-g ool-tr intxl-rr alg POR,fr-g dull-bri yel FLOR,fr-g ltbrn-tr blk STN,fr-g mod fast-fast stmg CUT"

6520.00 6530.00 "LS AA,v oolicastic LS PKST,POR-FLOR-CUT AA,incr dkbrn STN,incr blk dd o STN"

6530.00 6540.00 "LS tan-ltbrn-crm,occ mbrn,crpxl-vfxl,micsuc-gran ip,occ ool LS GRNST-pred v ool LS PKST,scat CHT frag,occ ANHY xl-incl,v rr alg mat,fr-g ool-tr intxl-v rr alg POR,fr-g dull-bri yel FLOR,g brn-tr blk STN,fr-g mod fast-fast stmg CUT"

6540.00 6550.00 "LS AA,occ DOL rich cmt,scat wh-bf CHT frag,POR-FLOR-STN-CUT AA"

6550.00 6560.00 "LS crm-tan-brn,occ mbrn-wh,crpxl-vfxl,occ gran-micsuc,pred oolicastic-v sl alg LS PKST,rr ool LS GRNST.v sl dol,tr trnsl-bf CHT frag,rr ANHY xl-incl,fr-g ool-tr intxl-rr alg POR,fr-g dull-bri yel FLOR,fr-g ltbrn-tr blk STN,fr-g mod fast-fast stmg CUT"

6560.00 6570.00 "LS AA,scat trnsl-bf CHT frag,POR-FLOR-CUT AA,incr dkbrn-blk STN"

6570.00 6580.00 "LS AA,POR-FLOR-CUT AA,fr-g ltbrn STN,tr blk dd o STN"

6580.00 6590.00 "LS AA,sl incr trnsl-bf CHT frag,incr ool-occ alg POR,FLOR-STN-CUT AA"

6590.00 6600.00 "LS tan-ltbrn-brn,occ crm,mbrn-wh,crpxl-vfxl,occ gran-micsuc,pred oolicastic-v sl alg LS PKST,rr ool LS GRNST.tr trnsl-bf CHT frag,rr ANHY xl-incl,fr-g ool-tr intxl-rr alg POR,fr-g dull-bri yel FLOR,fr-g ltbrn-tr blk STN,fr-g mod fast-fast stmg CUT"

6600.00 6610.00 "LS AA,POR-FLOR-CUT AA,fr-g ltbrn STN,tr blk dd o STN"

6610.00 6620.00 "LS AA,sl incr trnsl-bf CHT frag,incr ool-occ alg POR,FLOR-STN-CUT AA"

6620.00 6630.00 "LS tan-ltbrn-crm,occ mbrn,crpxl-vfxl,micsuc-gran ip,occ ool LS GRNST-pred v ool LS PKST,scat CHT frag,occ ANHY xl-incl,v rr alg mat,fr-g ool-tr intxl-v rr alg POR,fr-g dull-bri yel FLOR,g brn-tr blk STN,fr-g mod fast-fast stmg
CUT"

6630.00 6640.00 "LS AA,POR-FLOR-CUT AA,fr-g ltbrn STN,tr blk dd o STN"

6640.00 6650.00 "LS AA,sl incr trnsl-bf CHT frag,incr ool-occ alg POR,FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

6650.00 6660.00 "LS crm-tan-brn,occ mbrn-wh,crpxl-ooc,occ gran-micsuc,pred oolicastic-v sl alg LS PKST,occ ool LS GRNST.v-sl dol,rr trnsl-bf CHT frag,rr ANHY xl-incl,fr-g ool-tr intxl-rr alg POR,fr-g dull-bri yel FLOR,fr-g ltbrn/blk STN,fr-g mod fast-fast stmg CUT"

6660.00 6670.00 "LS AA,POR-FLOR-CUT AA,fr-g ltbrn STN/incr blk dd o STN"

6670.00 6680.00 "LS AA,ooc-crpxl-micxl,occ gran-micsuc,pred oolicastic-tr scat alg LS PKST,occ ool LS GRNST,v-sl dol,rr trnsl-bf CHT frag,rr ANHY incl,fr-g ool-tr intxl-rr alg POR,fr-g mod bri-bri yel FLOR,g ltbrn-brn/blk STN,fr-g mod fast-fast stmg CUT"

6680.00 6690.00 "LS AA,POR AA-g-fr even mod bri-bri yel FLOR,g brn-ltbrn/blk dd o STN,g mod fast strmg-blooming CUT"

6690.00 6700.00 "LS AA,oolicastic LS PKST-GRNST,POR-FLOR-STN-CUT AA"

6700.00 6710.00 "LS tan-ltbrn-crm,occ mbrn,ooc-crpxl-vfxl,gran ip,occ ool LS GRNST-pred v ool LS PKST,scat CHT frag,rr ANHY incl,g ool-tr intxl POR,fr-g even dull/spty bri yel FLOR,g brn/blk STN,fr-g mod fast-fast stmg CUT"

6710.00 6730.00 "LS tan-ltbrn-crm,occ mbrn,crpxl-vfxl,micsuc-gran ip,occ ool LS GRNST-pred v ool LS PKST,scat CHT frag,rr ANHY xl-incl,v rr alg mat,fr-g ool-tr intxl-v rr alg POR,fr-g even mod bri-bri yel FLOR,g ltbrn brn/blk STN,g mod fast-fast stmg CUT"

6730.00 6740.00 "LS AA,sl incr trnsl-bf CHT frag,incr ool-occ alg POR,FLOR-STN-CUT AA"

6740.00 6750.00 "LS tan-ltbrn-crm,occ mbrn,crpxl-ooc-vfxl,micsuc-gran,occ ool LS GRNST-pred v ool LS PKST,incr scat CHT frag-incl,rr ANHY xl-incl,v rr alg mat,fr-g ool-tr intxl-v rr alg POR,g even dull/spty bri yel FLOR,g ltbrn-brn/blk STN,g mod fast-fast stmg CUT"

6750.00 6760.00 "LS AA,v oolicastic LS PKST,POR-FLOR-STN-CUT AA"

6760.00 6770.00 "LS AA,oolicastic LS PKST-GRNST,POR-FLOR-STN-CUT AA"

6770.00 6780.00 "LS AA,ooc-crpxl-micxl,occ gran-micsuc,pred oolicastic-rr scat alg LS PKST,occ ool LS GRNST,v sl dol,tr trnsl-bf CHT frag,rr ANHY incl,g ool-tr intxl-rr alg POR,g even mod bri-bri yel FLOR,g ltbrn-brn/blk STN,g mod fast-fast stmg CUT"

6780.00 6790.00 "LS AA,sl incr trnsl-bf CHT frag,incr ool-occ alg POR,FLOR-STN-CUT AA"

6790.00 6800.00 "LS AA,POR AA,g even mod bri-bri yel FLOR,g ltbrn-brn/blk dd o STN,g mod fast strmg-blooming CUT"

6800.00 6820.00 "LS tan,ltbrn-crm,occ mbrn,wh,crpxl-ooc-vfxl,gran,pred oolicastic-v sl alg LS PKST,tr ool LS GRNST.v sl dol,tr trnsl-bf CHT frag,rr ANHY xl-incl,g-fr ool-tr intxl POR,g even dull-bri yel FLOR,fr-g ltbrn/tr brn & blk STN,g blooming/fast stmg CUT"

6820.00 6830.00 "LS AA,pred v oolicastic LS PKST/tr scat ooc GRNST,POR-FLOR-STN-CUT AA"

DEPTH	LITHOLOGY

6830.00 6840.00 "LS AA,ooc-crpxl-micxl,occ gran-micsuc,pred oolicastic-tr scat alg LS PKST,occ ool LS GRNST,v-sl dol,tr trnsl-bf CHT frag,rr ANHY incl,g ool-tr intxl-rr alg POR,g even mod bri-bri yel FLOR,g ltbrn-brn/blk STN,g blooming-mod fast stmg CUT"

6840.00 6850.00 "LS AA/incr trnsl-bf CHT frag,POR-FLOR-STN-CUT AA"

6850.00 6870.00 "LS tan-ltbrn-crm,occ mbrn,crpxl-ooc-vfxl,micsuc-gran ip,occ ool LS GRNST-pred v ool LS PKST,scat CHT frag,rr ANHY xl incl,v rr alg mat,g ool-tr intxl-v rr alg POR,g even mod bri-bri yel FLOR,g brn-ltbrn/blk STN,g mod fast strmg-blooming CUT"

6870.00 6880.00 "LS AA,ooc-crpxl-micxl,occ gran-micsuc,pred oolicastic-rr scat alg LS PKST,occ ool LS GRNST,v sl dol,tr trnsl-bf CHT frag,rr ANHY incl,g ool-tr intxl-rr alg POR,FLOR-STN-CUT AA"

6880.00 6890.00 "LS AA,pred v oolicastic LS PKST/tr scat ooc GRNST,incr bf-tan CHT,FLOR-STN-CUT AA"

6890.00 6900.00 "LS tan-crm-ltbrn,occ brn,ooc-crpxl-vfxl,micsuc-gran ip,occ ool LS GRNST-pred v ool LS PKST,scat CHT frag,rr ANHY xl-incl,v rr alg mat,g ool/tr intxl-v rr alg POR,g even dull/scat bri yel FLOR,g ltbrn-brn/tr blk STN,g mod fast strmg-blooming CUT"

6900.00 6910.00 "LS AA,pred v oolicastic LS PKST/tr scat ooc GRNST,incr bf-tan CHT,FLOR-STN-CUT AA"

6910.00 6920.00 "LS AA,POR AA,g even mod bri-bri yel FLOR,g ltbrn-brn/blk dd o STN,g mod fast strmg-blooming CUT"

6920.00 6930.00 "LS tan-ltbrn-crm,occ brn,ooc-crpxl-vfxl,micsuc-gran ip,occ ool LS GRNST-pred v ool LS PKST,incr bf CHT incl-frag,rr ANHY xl-incl,v rr alg mat,g ool/tr intxl-v rr alg POR,g even dull-bri yel FLOR,g ltbrn-brn/tr blk STN,g blooming-mod fast CUT"

6930.00 6940.00 "LS AA,pred v oolicastic LS PKST/tr scat ooc GRNST,incr bf-tan CHT,FLOR-STN-CUT AA"

6940.00 6950.00 "LS AA,sl incr tan-bf CHT incl-frag,POR-FLOR AA,STN AA/sl incr blk dd o STN-CUT AA"

6950.00 6960.00 "LS AA,pred v oolicastic LS PKST/tr scat ooc GRNST,bf-tan CHT incl,FLOR-STN-CUT AA"

6960.00 6980.00 "LS tan-ltbrn-crm,occ mbrn,crpxl-ooc-vfxl,micsuc-gran ip,occ ool LS GRNST-pred v ool LS PKST,v rr bf-tan CHT incl,v rr ANHY xl-incl,g ool-tr intxl-v rr alg POR,g even dull-bri yel FLOR,g ltbrn-brn/blk STN,fr-g mod fast-fast stmg CUT"

6980.00 6990.00 "LS AA,ooc-crpxl-vfxl,micsuc-gran ip,occ ool LS GRNST-pred v ool LS PKST,incr bf CHT incl-tr frag,rr ANHY xl-incl,g ool/tr intxl POR,g even dull-bri yel FLOR,g ltbrn-brn/blk STN,g blooming-mod fast strmg CUT"

6990.00 7000.00 "LS AA,pred v oolicastic LS PKST/rr scat ooc GRNST,v rr bf-tan CHT incl,FLOR-STN-CUT AA"

7000.00 7011.00 "LS AA,ooc-crpxl-vfxl,micsuc-gran ip,tr ool LS GRNST-pred v ool LS PKST-v sl dol ip,tr bf CHT incl,vrr ANHY incl,g ool/tr intxl POR,g even dull-bri yel FLOR,g ltbrn-brn/blk STN,g blooming-mod fast CUT"

FORMATION TOPS

OPERATOR: MOBIL
WELL NAME: RATHERFORD UNIT #13-41 NW UPPER 1-A HORIZONTAL LATERAL LEG #4

FORMATION NAME		SAMPLES MEASURED DEPTH	SAMPLES TRUE VERTICAL DEPTH	DATUM KB:4760
LOWER ISMAY		5458'	5451'	-691
GOTHIC SHALE		5487'	5472'	-712
DESERT CREEK		5517'	5486'	-726
DC 1-A		5520'	5491'	-731

GEOLOGICAL SUMMARY

AND

ZONES OF INTEREST

The Mobil Exploration and Production U.S. Inc., Ratherford Unit #13-41 Horizontal Leg #4, Section 13, T41S, R23E, was a re-entry of the Mobil Ratherford Unit #13-41, and was sidetracked in a northwesterly direction from 5382' measured depth, 5382' true vertical depth, on April 23, 1997. Leg #4 reached a measured depth of 7011', true vertical depth of 5499.88' at total depth, with a horizontal displacement of 1601' and true vertical plane 309 degrees, on April 29, 1997. The lateral was drilled with no significant problems. Since this well used live oil in an emulation while drilling, and the lateral section made a minor amount of oil, the background gases noted on the accompanying mud log were moderately high through out the drilling, and the samples showed a minor amount of oil contamination through out the well.

The primary objective of the Ratherford Unit #13-41 Horizontal Lateral Leg #4 was the upper 1-A Porosity Bench. Also to identify and define the porosity bench, the effective porosity, staining and reservoir properties in the 1-A zone of the Desert Creek Member of the Upper Paradox Formation.

The Lower Ismay, Gothic Shale, and the transition zone at the top of the Desert Creek were encountered while drilling Leg #4. Kick off point for this lateral was in the lower 1/3 of the Upper Ismay Member. The base of the Upper Ismay was interbedded light gray to cream to tan, occasionally brown, cryptocrystalline to microcrystalline, chalky, cherty, fossiliferous limestone, occasionally limestone grainstone, grading to and very argillaceous, brown to gray brown, microcrystalline to microsucrosic dolomite; very thin black, carbonaceous, slightly calcareous to dolomitic shale, and scattered brown to black to translucent chert fragments. There was no to very rare visible porosity in the Upper Ismay, with no sample shows or gas increases. The dolomites at the base of the Upper Ismay graded into the very thin, carbonaceous, dolomitic shale of the Hovenweep.

The top of the Lower Ismay was picked at 5458' measured depth, 5451' true vertical depth, at the base of the very thin Hovenweep shale. The Lower Ismay was a predominately a light gray to light gray brown, occasionally dark gray to brown, cryptocrystalline to microcrystalline, some microsucrosic to granular, slightly silty to clean, slightly limy to anhydritic, slightly cherty dolomite with a trace of scattered micro fossils, no to a trace of scattered intercrystalline porosity, with a trace of spotty dull to bright yellow fluorescence, none to very rare light brown stain, and only a trace of very poor slow diffuse cut. Interbedded in the dolomites were light gray to gray brown, occasionally white to brown to dark brown, thin limestones which were cryptocrystalline to microcrystalline, earthy to chalky, some clean, cherty, anhydritic, with no visible porosity, and no fluorescence, stain or cut. Also noted were thin, scattered translucent, crystalline anhydrites, near the base of the Lower Ismay. In the basal Lower Ismay were light to medium gray to gray brown, clean to very argillaceous dolomites that were cryptocrystalline to microcrystalline, with some very thin mottled gray to gray brown, cryptocrystalline to microcrystalline limestone streaks, very cherty, and clean to argillaceous, which graded into the Gothic Shale. These very thin dolomites had a rare trace of intercrystalline porosity with scattered dull yellow fluorescence, no visible stain, and only very poor slow diffuse to residual ring cut.

The top of the Gothic Shale is at 5487' measured depth, 5472' true vertical depth. The Gothic Shale was predominantly dark gray to black, silty, carbonaceous, brittle to firm, subblocky to blocky to platy, calcareous to slightly dolomitic and slightly micaceous. The top of the Gothic was gradational from the very thin interbedding of very argillaceous, carbonaceous limestone and very argillaceous, limy dolomite, with the dolomite grading into very dolomitic, carbonaceous shale. The top of the Gothic was picked predominantly by the decrease in penetration rate and the increased percentage of shale in the samples.

Between the Gothic Shale and Desert Creek Porosity Members is a transitional zone, which appears to be gradational. The top of the Desert Creek is commonly picked at the Gothic Shale to transition zone facies change, which in this well occurred at a measured depth of 5517' and a true vertical depth of 5486'. In this well the zone was predominantly a very silty, dolomitic limestone; which was cream to tan, some gray to white to brown to dark brown, cryptocrystalline to microcrystalline, argillaceous, with very rare intercrystalline porosity, but only very spotty dull mineral fluorescence, and visible stain or cut. There were thin gray brown to dark brown dolomites, which were very limy, argillaceous, microcrystalline and slightly silty, with had no visible porosity and no visible staining, fluorescence or cut. The limestones graded into and had cyclic deposits of very thin dolomite packstones and dolomitic to slightly calcareous, light to medium gray, silty claystones. The limestones graded into the porosity of the 1-A zone.

The top of the Desert Creek 1-A zone was picked at 5520' measured depth, 5490' true vertical depth. The pick was base on the increase in rate of penetration and sample interpretation. The top was picked in this lateral was based on the first oolicastic limestone packstone porosity below the Desert Creek top and thinly interbedded limy dolomite packstone near the top of the zone. The limestone was predominately oolitic with streaks of intercrystalline to very rare algal porosity, some scattered chert fragments, and a trace to fair fluorescence, brown stain and a moderately fast cut. The thin dolomites had no visible porosity, fluorescence, stain or cut.

As the curve was being completed in the 1-A zone the oolicastic limestone became cleaner and increasingly granular. While drilling curve through the section, it appeared that the 1-A porosity bench was possibly defined by the interval 5520' measured depth, 5489' true vertical depth to a measured depth of 5542', 5496.5' true vertical depth. The top of the porosity Bench was marked by facies change, which was somewhat sharp since the drill rate increased rather rapidly. The base of the porosity zone was picked at the decrease in penetration and a facies change to a dense, cream to white limestone packstone, while landing the curve.

At a measured depth of 5568', 5500' true vertical depth, with a horizontal displacement of 165' in the tight limestone packstones of the lower 1-A horizon, a trip was made to change the bottom hole assemblies and pick up the MWD tool. Upon resumption of drilling in the 1-A lateral, the well bore was drilled at an upwards angle in the white to cream, occasionally light brown, cryptocrystalline, very rarely microsucrosic to very rare scattered oolitic, slightly anhydritic, occasionally cherty limestone packstone. The limestone had very rare thin brown, microcrystalline to microsucrosic, dolomites. These limestones had no to very rare streaks of intercrystalline porosity, with rare, scattered dull yellow fluorescence, no visible stain and a poor residual ring cut. The thin dolomites were predominately tight, with no visible porosity, fluorescence, stain, or cut. This lithology continued to a measured depth of 5824', 5493' true vertical depth, with a horizontal displacement of 420', with a slow increase in porosity, fluorescence, stain and cut noted as the well continued upwards at a true vertical depth 5498'.

At measured depth of 5824', 5493' measured depth, to a measured depth of 5906', 5484' measured depth, with a horizontal displacement 502', the lateral penetrated the oolicastic porosity of the 1-A zone. The 1-A zone was drilled at a upward angle of 95 degrees. The limestones of the porosity zone were a tan to brown to cream, cryptocrystalline to very fine crystalline, occasionally granular, oolicastic limestone packstones, and some grainstones, with occasionally dolomite rich

cement. The limestones were very slightly anhydritic with traces of scattered translucent to light brown chert fragments. Anhydrite crystals to rare inclusions, rare scattered cryptocrystalline limestone fragments to inclusions and occasionally slightly limy cement, scattered chert fragment, rare micro fossils, very rare algal material, traces of scattered dark brown stain and very rare black oil stain residue* in the intercrystalline and oolicastic matrix. The limestone had predominantly fair to good oolitic to traces of intercrystalline and very rare algal porosity, with rare anhydrite and very rare dolomitic limestone mud filling and cement in the intercrystalline and oolicastic porosity. Through this interval the fluorescence was fair to good, the staining was moderate to fair and cuts ranging from moderate to good moderately fast to fast steady streaming. A slight decrease in penetration rate was noted at 5906' measured depth, 5484' true vertical depth, with a horizontal displacement of 541'. An increase in tighter limestone packstone was noted in the samples. The increase in packstone was due to a vertical facies change as the well bore encountered and penetrated the top of the best porosity zone. The porosity zone at a horizontal displacement of 461' appeared to be approximately 11' thick.

The facies change encountered at a measured depth of 5906' was from the very oolicastic limestone packstones and thin grainstones, to the tighter cream to white, tan to light brown to dark brown, dolomitic, occasionally cherty limestone packstones, above the top of the best porosity in the 1-A zone. These limestones had very thin interbedded light gray, calcareous claystone, and dense dolomite packstones. After a series of slides and rotates to turn the bore hole downward, to move away from the transition zone of the Desert Creek, the porosity zone of the 1-A was again encountered at a measured depth of 6109', 5484' true vertical depth with the lithology returning to predominately and oolicastic limestone packstone and grainstone, at a horizontal displacement of 705'.

As the well bore was continued downward at an 86 degree angle from a true vertical depth of 5484' to 5489', at 6164' measured depth, with a horizontal displacement of 760', the porosity zone of the 1-A zone was again drilled. The lithology returned to the oolicasitc limestones and grainstone of the best porosity. These limestone were predominately light brown, cream to white, cryptocrystalline to microcrystalline, occasionally very finely crystalline to granular to microsucrosic, oolicastic, very rarely algal, with scattered anhydrite crystals to inclusions and chert fragments. The oolicastic limestone had fair to good oolitic to traces of intercrystalline porosity, fair dull to bright yellow fluorescence, a fair brown stain, scattered black dead oil stain and a fair to good moderately fast to fast streaming cut. At this point of the zone, the porosity zone appeared to be approximately 4' to 5' thick.

From a measured depth of 6164' to a measured depth of 6283', 5487' true vertical depth, with a horizontal displacement of 880', the tighter limestones below the 1-A porosity zone was again drilled. The oolicastic limestone porosity decreased rapidly as the lithology changed vertically to a much lighter, tighter limestone packstone, with an increase in anhydrite inclusions and marked decrease in porosity, stain and cut. Due to the presence of oil in the mud system, and the well producing oil, a slow decrease in fluorescence was noted. Through this interval the well was turned upward to try to require the porosity zone. The limestones encountered were cream to tan to white, occasionally light brown, cryptocrystalline to microcrystalline, dense, slightly cherty, very slightly dolomitic, with only scattered thin intercrystalline porosities and very poor sample shows. During this interval, some dark brown to brown, cryptocrystalline, tight, argillaceous dolomites were noted. As the well was continued upward the base of the 1-A porosity zone was again encountered at a measured depth of 6283', 5487' true vertical depth, with a horizontal displacement of 880', and the penetration rate increased and the oolicastic to intercrystalline porosity, staining and cuts was again the predominate lithology.

At the measured depth of 6283', the vertical facies change was noted, as the base of the 1-A porosity zone was penetrated. The well was circulated and the drill pipe was worked to kill the sharp increase in upward angle noted as the porosity was penetrated. At increase from 93.4 degrees to an angle of 94.4 was noted. The tool face was turned downward and 10' of time drilling, followed by 23' of controlled drilling was done in an attempt to slow the rate of climb.

As the well bore was continued and slowly turned downward and then oriented approximately horizontal, from a measured depth of 6283' to its total measured depth of 7011', 5481' true vertical, and a horizontal displacement of 1601', the lithology was an oolicastic, light brown to tan, cream to white, cryptocrystalline to very finely crystalline, microsucrosic, slightly anhydritic, very slightly cherty, limestone packstones and grainstones. The limestones had good visible porosity, fair to good dull to bright yellow fluorescence, fair light brown stain, with scattered black dead oil stain and a fair to good moderately fast to fast streaming cut noted in the samples.

At a total measured depth of 7011', true vertical depth 5481', and a horizontal displacement of 1601', the lateral was terminated. The lateral was terminated at approximately 13' above the center of the proposed target line, in a very oolicastic limestone packstone and grainstone.

In tracking the well bore through the 1-A bench, there were several facies changes with in the limestones. The changes noted were vertical, as the well bore approached the top and base of the 1-A zone. The 1-A zone was projected to dip very slightly upward as the lateral continued toward the RU# 12-34 well. In tracking the top and base of the zone, it appears that the zone trended upward at a slightly steeper angle than was projected to its termination, after which it probably dipped downward toward the 12-34 well.

Predominant facies changes were associated with the vertical changes with in the limestones and occasionally the depositional environment, as the environment of deposition changed when encountering the top or base of the 1-A zone. With the classification changes, the oolicastic limestones encountered were of varying thickness and were continuous through out the 1-A zone penetrated. The effective or the better porosity was associated with the oolicastic limestone packstone and grainstone facies which had fair to good, intercrystalline to algal porosities, and the absence of any major anhydrite plugging. The limestone packstone at the top and base of the 1-A zone had little or no porosity and much poorer permabilities. The limestone packstones noted from horizontal displacements of 140' to 420', 502' to 705', and 760' to 880' had no to very poor porosities.

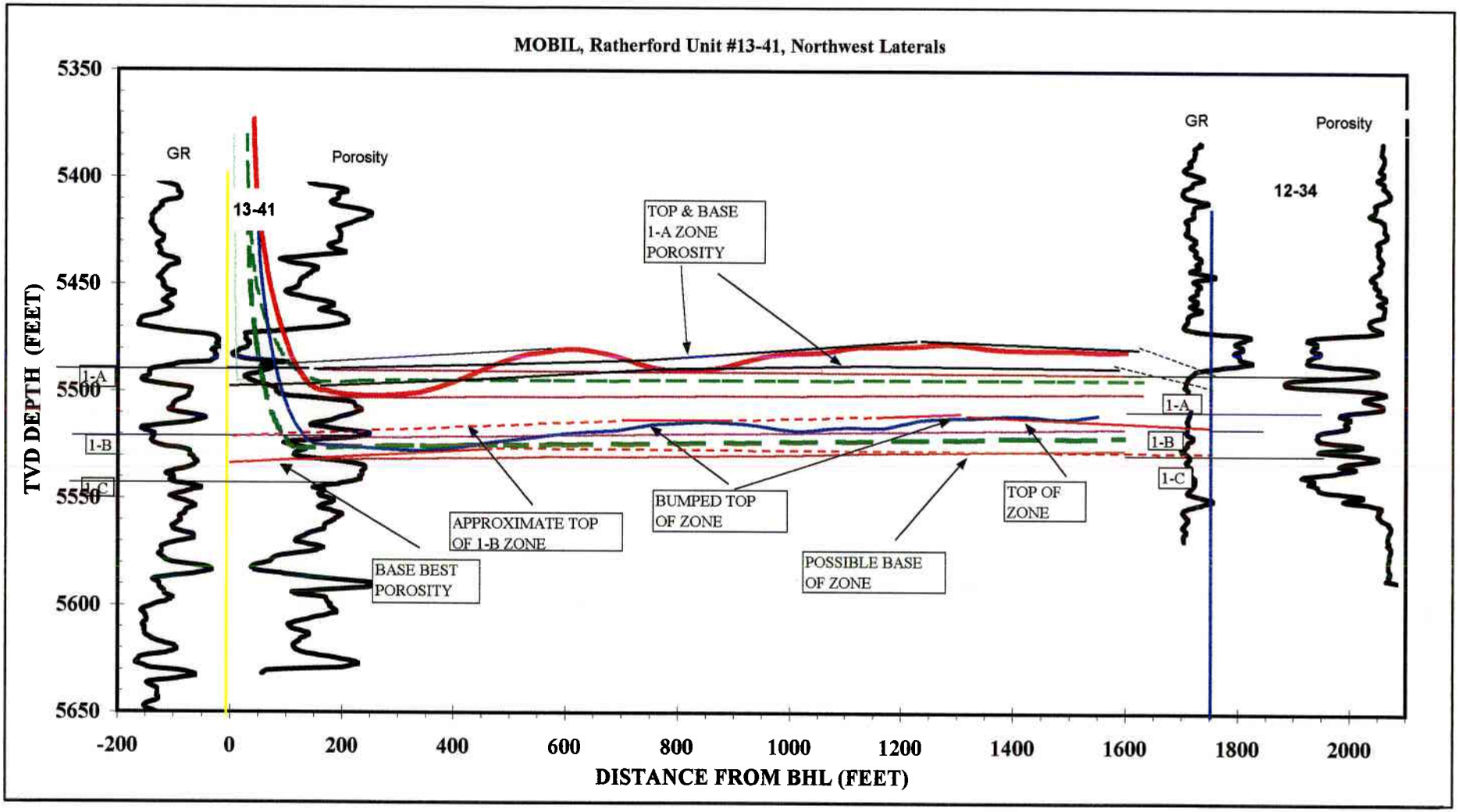
From the top of the 1-A porosity bench to a total measured depth of 7011', the limestone lithology of best porosity appeared to be consistent, ranging from light brown to medium brown, cryptocrystalline to very finely crystalline, occasionally microsucrosic to granular, with scattered, tighter limestone packstone and some anhydrite matrixes. The limestones had fair to good oolicastic to a trace of intercrystalline and very rare algal porosities and a good constant dull to bright yellow fluorescence, with noticeable decreases when noticeable amounts of tighter limestone packstone was present. The staining in the limestone ranged from trace to good light brown to traces of black dead oil stain and the associated cuts being trace to good moderately fast to fast streaming cuts. Above and below the porosity zone, the tight limestones had no to very poor intercrystalline to very rare scattered oolicastic porosity, no to very rare, spotty fluorescence, with very poor oil staining with no to very poor slow diffuse cut. The sample shows were affected in part due to the oil & water emulsion used as the drilling fluid through out the curve and lateral sections, along with the oil encountered while drilling the lateral.

The conclusion drawn from the northwesterly 1-A porosity bench in Lateral Leg 4, is that in this area the limestone porosities were enhanced by presence of the oolicastic material porosity and the lack of anhydrite filling and cement. Also, having and effect on the porosity, was the minor amount of dolomite cement. Staining was fair to good and there were significant sections where staining was very good, with some black dead oil staining trapped in the intercrystalline porosity and the oolicasts, and along the anhydrite to limestone contact surfaces. The lateral used the a proposed projected target line as a reference point through the bench, with the well bore following the line of best porosity which was above the target line beginning at a horizontal displacement of 420'.

While drilling the lateral, the high background gas was due in part to the oil and water emulsion used as the drilling fluid, which masked in part the oil encountered in the 1-A porosity zone, which was indicated by the significant amounts of heavies noted on the chromatograph (C_3 through C_5). This lateral can be interpreted to have good reservoir qualities through out. It appears that the porosities are well enough developed to enhance the overall performance of the zone.

*The black residual staining has been called by Dr. Dave Eby & others as "bitchimum" and is also known as "dead oil" ("dd o stn" on mud logs). This staining is associated with the movement of oil over long periods of time and is a good indicator of producable hydrocarbons when associated with productive porosities, but can also be found in porosities that have been filled by anhydrites and other material at later dates.

ROCKY MOUNTAIN GEO-ENGINEERING CORP. 2450 INDUSTRIAL BLVD. GRAND JUNCTION, CO 81505 (970) 243-3044



Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: 14-20-603-247A
6. If Indian, Allottee or Tribe Name: NAVAJO TRIBAL
7. If Unit or CA, Agreement Designation: RATHERFORD UNIT
8. Well Name and No.: 13-41
9. API Well No.: 43-037-15856
10. Field and Pool, or exploratory Area: GREATER ANETH
11. County or Parish, State: SAN JUAN UT

1. Type of Well: [X] Oil Well [ ] Gas Well [ ] Other SIDETRACK
2. Name of Operator: Mobil Exploration & Producing U.S. Inc. as Agent for Mobil Producing TX & NM Inc.
3. Address and Telephone No.: P.O. Box 633, Midland, TX 79702 915-688-2585
4. Location of Well (Footage, Sec., T., R., M., or Survey Description): 660' FNL, 660' FEL SEC.13, T41S, R23E

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[ ] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
[X] Subsequent Report	[ ] Recompletion	[ ] New Construction
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
	[ ] Altering Casing	[ ] Conversion to Injection
	[X] Other SIDETRACK	[ ] Dispose Water

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

13. 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.)*

LATERAL #1 433' SOUTH & 1234' EAST FROM SURFACE SPOT ZONE 1b
LATERAL #2 1184'NORTH & 1038' WEST FROM SURFACE SPOT ZONE 1b
LATERAL #3 286' SOUTH & 1104' EAST FROM SURFACE SPOT ZONE 1a
LATERAL #4 1038'NORTH & 1219' WEST FROM SURFACE SPOT ZONE 1a

SEE ATTACHMENTS

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

Signed Shirley Houchins Title ENV. & REG. TECHNICIAN Date 06-00-97

(This space for Federal or State office use)

Approved by _____ Title _____ Date _____
Conditions of approval, if any:

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.

* See Instruction on Reverse Side

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

ENTITY ACTION FORM - FORM 6

OPERATOR MOBIL PRODUCING TX & NM, INC.

ADDRESS P. O. BOX 633
MIDLAND, TEXAS 79702

OPERATOR ACCT. NO. N

ACTION CODE	CURRENT ENTITY NO.	NEW ENTITY NO.	API NUMBER	WELL NAME	WELL LOCATION QQ	SC	TP	RG	COUNTY	SPUD DATE	EFFECTIVE DATE
			42-037-15856	RATHERFORD		13	41S	23E	SAN JUAN	4-5-97	
WELL 1 COMMENTS:											
WELL 2 COMMENTS:											
WELL 3 COMMENTS:											
WELL 4 COMMENTS:											
WELL 5 COMMENTS:											

ACTION CODES (See instructions on back of form)
- A - Establish new entity for new well (single well only)
- B - Add new well to existing entity (group or unit well)
- C - Re-assign well from one existing entity to another existing entity
- D - Re-assign well from one existing entity to a new entity
- E - Other (explain in comments section)

NOTE: Use COMMENT section to explain why each Action Code was selected.

(3/89)

Shirley Houchins
Signature SHIRLEY HOUCHINS
ENV. & REG. TECHNICIAN 5-21-97
Title Date
Phone No. 915) 688-2585

ATTACHMENT - FORM 3160-5
RATHERFORD UNIT #13-41
14-20-603-247A
NAVAJO TRIBAL
SAN JUAN, UTAH

03-29-97	MIRU NWI RIG #36. SPOT PUMP & TANK. POOH & LD RODS . LOCATE FLANGE TO NU BOP TO BASH ROSS WELLHEAD. SDFN & SUNDAY.
03-31-97	BLAST STUCK DONUT FRE W/PRIMER CORD. POOH & STAND BACK 178 JTS. 2 7/8" TBG. & TAC. RU BASIN WL, RUN GR/CCL LOG F/5450-5200'. RD BASIN. RIH W/BIT & SCRAPER. NOTIFIED WAYNE TOWNSEND @ BLM ON MONDAY 3-31-97 @ 1:00 PM OF SCHEDULED W/O OPERATIONS ON WELL.
04-01-97	SHUT IN CASING PRESURE @ 7:30 WAS 0 PSI. RIG UP BASIN PRIMER CORD. BLOW DONUT FREE. NIPPLE UP BOPE. POH W/ 2 7/8" TBG. & TBG ANCHOR. RIG UP BASIN LOGGING UT. RIH TO 5400' LOG F/5400-5200'. POH RDMO. RIH W/BIT TO 5430. SDFN.
04-02-97	SIP @ 7:30 WAS 0 PSI. RIH TO 5361' RU TO PUMP TRUCK. LOAD HOLE, CIRC. POH W'/BIT & SCRAPER. MAKE UP 5.5", 14# TS BRIDGE PLUG W/RET. HEAD. RIH TO 5410' & SET. RIG UP TO RIG PUMP. LOAD HOLE W/FRESH WATER. COULD NOT TEST CSG. POH W/2 7/8" TB. & RETV. HEAD FOR BRIDGE PLUG. MAKE UP 5.5" 14# PKR. RIH TO 2527'. TEST DOWN TBG. TO ABOVE PKR. LEAKED. TEST CSG. WHILE POH TO FIND CSG LEAK. LOCATE CSG. LEAD F/2084' TOP TO 2147' POH W/PKR & LAY DOWN. DROP 10 GAL OF WET SAND ON TOP OF BRIDGE PLUG. SWIFN.

CALLED MELVIN CAPITAN WITH NAVAJO EPA @ 17:09, 04-01-97
CALLED JIM THOMPSON OF UTAH OIL & GAS @ 17:15, 04-01-97
CALLED BLM @ 17:20 ON 04-01-97.

INFORMED ALL OF ABOVE OF INPENDING INTENT TO SQUEEZE CASING LEAK:

04-03-97	SHUT IN CSG. PRESS @ 7:30 WAS 0 PSI. RIH W/5.5" CMT RETAINER TO 2018'. SET RETAINER. TEST PUMP & LINES. TEST TBG TO 1000 PSI. OK. SQUEEZE CSG. LEAK F/2084-2147' W/75 SKS CLASS 'G' CMT. + 50/50 POZ LITE + 2% GEL +4% DISPERSANT + 1% CACL2 + 1% DEFOAMER.. TBG. PRESSURE TO 350 PSI. CSG PRESS TO 350 PSI. REVERSE OUT. POH. SIFN.
04-04-97	SHUT IN CSG. PRESS @ 7:30 WAS 0 PSI. RIH W/BIT & DRLG COLLARS & TBG. TO 2018'. DRLG OUT CMT RET. & CMT TO 2094'. SIFN.
04-05-97	SIP @ 7:30 WAS 0 PSI. RU & DRLG OUT CMT. F/2049-2140'. TEST TO 500 PSI. LOST 120 PSI IN 5 MIN. RIH TO 5300' POH & LAY DOWN TBG. DIG OUT CELLAR. CUT OFF 8.625" CSG. NIPPLE UP CSG. HEAD & TBG. HANGE. SIFN.
04-06-97	OPEN HOLE F/5489-5624' RIG DOWN & MOVE OFF MONTEZUMA WELL SERVICE RIG #36. FINAL WORKOVER REPORT

DRILLING

04-05-97	MIRU NWI RIG #25, NOTIFIED JIM THOMPSON W/STATE OF UTAH @ 4:30, 4-4-97 ABOUT STARTING DRILLING OPERATIONS.
04-06-97	FINISH RIGGING UP ROTARY TOOLS, RIH W/BIT, TAG SAND @ 5392'. POH W/BIT.
04-07-97	RUN W/RET. TOOL, POH W/RBP , RUN JUNK BASKET, SET WHIPSTOCK PKR @ 5431'. RIH W/ORIENT SUB, FOUND PKR KEYWAY @ 86 DEG. GTF, POH W/ORIENT SUB. FINAL REPORT FOR RE-ENTRY.
04-08-97	RIH W/WHIPSTOCK PKR. SET @ 5431'., MILL WINDOW W/STARTER MILL F/5418-5425'. POH W/STARTER MILL MILL FORMATION F/5425-5427. POH W/MILLS. RIH W/CURVE DRILLING ASSM.

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04-09-97	LATERAL #1A1: FINISH RIH W/CURVE DRILLING ASSEMBLEY, DRILL CURVE F/5427-5590' TMD 5532' TVD.
04-10-97	POH W/CURVE DRILLING ASSM. RIH W/LATERAL DRILLING ASSEMBLEY. SLIDE & ROTATE DRILL LATERAL #1A1 IN 1b ZONE F/5590-5860'.
04-11-97	LATERAL #1A1, ROTATE DRILL F/5860-6824' TD. FINAL REPORT LATERAL #1A1. POH W/LATERAL DRILLING ASSM.
04-12-97	RIH W/WEATERFORD SUPERHOOK, POH W/WHIPSTOCK. RIH W/TIW LATCH ASSM. CUT WINDOW F/5406-5410'. LATERAL #2A1.
04-13-97	MILL WINDOW F/5410-5413, POH W/MILLS. FINAL REPORT WINDOW LATERAL #2A1.
04-14-97	RIH W/GYRO, TIME DRILL CURVE, LATERAL 2A1, F/5413-20, CONTROL DRILL F/5420-5436', POH W/GRYO, RIH W/STEERING TOOL, SLIDE DRILL CURVE 2A1 F/5436-5592 MD. LANDED @ 5525.52 TVD.
04-15-97	LATERAL #2A1, CONTINUE DRILL AHEAD, SLIDE & ROTATE F/5592-5783'.
04-16-97	LATERAL #2A1 SLIDE & ROTATE DRILL F/5783-6296'.
04-17-97	LATERAL #2A1 FINISH DRILLING TO 6980' MD , 5511'TVD, POOH LD DIRECTIONAL TOOLS & PU RET. TOOL FOR RETRIEVABLE WHIPSTOCK..
04-18-97	POOH TO TOP OF CURVE & DISPLACE TO 10#, POOH PU HOOK F/WHIPSTOCK, TIH & RET. WS, CIRC BOTTOMS UP, POOH LD WS. RIH SET RETRIEVABLE WHIPSTOCK ORIENTED @ 121 DEG. FINISH TIH /RETRIEVABLE WS SET TOP OF WINDOW @ 5386' & BOTTOM @ 5393'., CUT START SECTION 5386-88' POOH START MILL, PU WINDOW MILL ASSM , TIH W/SAME.
04-19-97	FIHINSH TIH W/MILL ASSM & MILL WINDOW FORMATION F/5386-5393', DRILLED 2' OF FORMATION, PUMP SWEEP & CIRC. POOH LAY DOWN MILLS . LATERAL #3A1. RIH W/CURVE DRILL ASSM, RU GYRO DATA, RUN GYRO, TIME DRILL CURVE F/5395-5405'..
04-20-97	FINISH DRILLING CURVE LATERAL #3A1 TO 5557'. POOH FOR LATERAL DRILLING ASSM.
04-21-97	TIH W/LATERAL DRILL ASSM , SLIDE & ROTATE LATERAL #3 IN ZONE A F/5557-6250'.
04-22-97	DRILLING AHEAD ON LATERAL #3, 6250-6620'. TD LATERAL #3
04-23-97	TIH W/WHIPSTOCK ASSM & SET W/WS ORIENTED AT 309 DEG, WINDOW CUT F/5374-5376'.
04-24-97	POOH W/STARTING MILL, PU WATERMELON & WINDOW MILL ASSM & TIH W/SAME MILL WINDOW F/5376-5381' & CUT NEW FORMATION TO 5382'. POOH F/CURVE DRILLING ASSEMBLY.
04-24-97	PU CURVE DRILLING ASSM, RIH W/GYRO & ORIENT MOTOR, TIME DRILL LATERAL #4 F/5382-5393'.
04-25-97	DRILL CURVE W/GYRO TO 5410', CONTINUE / LAND CURVE @ 5568', 91 DEG, 310 AZ, 5499' TVD. RDMO GYRO,.
04-26-97	RIH W/LATERAL DRILLING ASSM. DRILL LATERAL #4 F/5568-5824'.
04-27-97	SLIDE & ROTATE F/5824-6088'.
04-28-97	SLIDE & ROTATE F/5824-6467'.
04-29-97	SLIDE DRILLED LATERAL 4A1 F/6467-7011' TD, WELL @ 90 DEG. 309 DEG AZ, TVD 5481, 1600' VS. FINAL REPORT FOR LATERAL 4A1. RELEASE DRILLING RIG.

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COMPLETION:

04-30-97	MIRU NAVAJO WEST, SPOT EQUIP. READY TO LOG IN AM, SDFN.
05-01-97	MIRU SCHLUMBERGER, RUN CBL F/4600' SURFACE W/200 PSI ON CSG. RDMO PU MTN STATES TENSION PKR, RIH & TEST BOP OK 100 LOW & 500 HIG. ISOLATE CASING LEAK W/PKR F/2103-2507'. POOH W/PKR, POUR SAND DOWN HOLE ON RBP, SDFN.
05-02-97	RIH W/TBG TO 2550'. CIRC CLEAN. MIRU DOWELL, SPOT 650' PLUG OF 14.5 PPG CMT @ 2550' POOH TO 1900', REVERSE OUT CMT TO PIT. POOH W/2 STDS, PRESSURE UP ON BACKSIDE TO 500 PSI. PRESSURE HELD. SIFN W/500 PSI ON CSG.
05-03-97	POOH & STD BACK TBG. PU BIT, RUH W/TBG. TAG CMT @ 1908'. RU POWER SEIVEL, DRILL DOWN W JTS, CMT GREEN, RETURNS BALLING UP. CIRC WELL CLEAN. SWIFN. CONT WOC OVERNIGHT.
05-04-97	CONTINUE DRILL OUT CMT. RETURNS SOFT, DRILL DEEPER. TEST SQUEEZE EVERY 2-3 JTS. ALL OK TO 500 PSI. DRILL OUT CMT TO 2564' PU 1 EXTRA JT TO CLEAN OUT STRINGERS. CIRC CLEAN TO PIT.
05-05-97	TEST SQUEEZE ON CHART, LOSE 120# IN 35 MIN. WAIT ON ORDERS, CIRC WELL CLEAN W/FW. OBTAIN VERBAL APPROVAL F/WAYNE TOWNSEND @ BLM @ 10:55 AM., TO PROCEED W/COMPLETION OPERATIONS. CIRC SAND OFF RBP, POOH & LD DC'S, NU HYDRIL, RIH W/RETRIEVING TOOL, TAG RBP, CIRC BW. SDFN
05-06-97	POOH W/RET BRIDGE PLUG. RIH W/PKR, RU DOWELL COIL TUBING UNIT, PREP TO ACIDIZE.
05-07-97	START IN HOLE W/COIL TBG. CHAIN TO INJECTOR HEAD BROKE & SPLIT COIL TBG. ND INJ HD. CUT COIL TBG , POOH, SD WO/DOWELL.
05-11-97	MIRU DOWELL COILED TBG. UNIT. RIG UP PUMP TRUCKS & TEST COILED TBG TO 3000 PSI. OK SIFN.
05-12-97	RIH W/1.5" COILED TBG. TO 7011'. SPOT ACID TO END OF COIL TBG. ACIDIZE LATERAL #4A1 FROM 7011-5610' W/30,000 GAL. 15% HCL ACID. SWI. POH/RIG DOWN COILED TBG UNIT. FLOW WELL TO TEST TANK. RECV. 442 BBLS OF FLUID. SIFN.
05-13-97	SHUT IN CSG. PRESS @ 7:30 WAS 1000 PSI. OPEN TO TEST TANK ON FULL OPEN CHOKE. PRESS. F/1000 PSI TO 550 PSI. BULL HEAD TBG. W/10 LBS BRINE. PRESS TO 450 PSI. FLOW 10 LBS BRINE TO TEST TANK. OPEN TO PROD. LINE.
05-14-97	FLOWING TBG. PRESSURE @ 7:30 WAS 200 PSI. SWI RELEASE PKR. PICK-UP & RIH W/RETV., TOOL FOR WHIPSTOCK. RETV. WHIPSTOCK, POH & LAY DOWN WHIPSTOCK. RIH W/RETV. WHIPSTOCK SET @ 5386'. POH TO 5200'. SIFN.
05-15-97	SHUT IN PRESS @ 7:30 WAS 50 PSI, POH W/WHIPSTOCK & SETTING TOOLS. RIH W/PH6 TAIL PIPE PKR, & TBG. CIRC. SET PACKER & TEST TO 500 PSI, MIRU DOWELL COILED TBG. UNIT, RIG UP PUMP TRUCKS, SIFN.
05-16-97	SHUT IN TBG. PRESS. @ 3:00 WAS 170 PSI. RIH W/COILED TBG TO 6620', ACIDIZE LATERAL #3A1 DOWN COILED TBG F/5610-6610' W/21,000 GALS OF 15% HCL ACID. POH RIG DOWN COILED TBG UNIT. FLOW WELL TO TEST TANK. FLOW DOWN LINE.
05-17-97	LATERAL #2 -- SITP @ 7:30 WAS 200 PSI. RIG UP & RELEASE PKR. @ 5240', PICK UP RET. TOOLS FOR RETV. WHIPSTOCK . RIH TO 5386' LATCH ONTO WHIPSTOCK, SHEAR FREE. POH. LAY DOWN 20' EXT. PICK UP RETV. WHIPSTOCK FOR LATERAL #2A1. RIH TO 5476' SET WHIPSTOCK, POH TO 5200'. SIFN.

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05-18-97	SITP @ 7:30 WAS 0 PSI. POH W/2 7/8" TBG & RETV. TOOL FOR WHIPSTOCK. RIH W/PH6 TAIL PIPE, PKR. & TBG. TO 5585'. END OF TAIL PIPE & PKR @ 5240'. TEST PKR TO 500 PSI. RIG UP COILED TBG UT. SIFN.
05-19-97	ACIDIZE LATERAL #2A1 F/5620-6980' W/28,000 GALS 15% HCL ACID. POOH W/CT, FLOW WELL TO TEST TANK, ISIP @ 1630 PSI, FLOW TO TANK @ 500 PSI. TURN WELL DOWN FLOWLINES ON FLOWIN @ 400 PSI.
05-20-97	WELL FLOWING 300 PSI DOWN FLOWLINE. POOH W/TBG, PKR, & PH6. PU RETRIEVING TOOL, RIH & LATCH ONTO WHIPSTOCK, POOH. REORIENT WHIPSTOCK FOR LATERAL #1A1 @ 111 DEG. RIH & SET, SDFN.
05-21-97	POOH W/WHIPSTOCK SETTING TOOL. PU PKR, RIH W/PH6, PKR & TBG. SET PKR @ 5248', EOT @ 5590'. READY TO ACIDIZE LATERAL #1A1.
05-22-97	RU COILED TBG UT. & EQUIPMENT. SITP 30 PSI. TEST LINES OK TO 2500 PSI. RIH W/CT TO 6824'. ACIDIZE LATERAL #1A1 F/5620-6824' W/602 BBLS 15% HCL ACID. MAX BACKSIDE PRESSURE @ 1674 PSI. ISIP 1363 PSI. TURN DN FLOWLINE.
05-23-97	WELL FLOWING @ 300 PSI DOWN FLOWLINE. UNSET PKR, POOH W/TBG, PKR & PH6. PU RETRIEVING HEAD, RIH, SHEAR WHIPSTOCK OUT OF PKR. RIH W/TBG FOR KILL STRING.
05-24-97	PU & RIH W/ESP PUMP. RIH W/ 2 7/8 PROD TBG, SET PUMP @ 5263'. ND BOP, NU WELLHEAD, RU FLOWLINE . KICK ON ESP, FLOW 1ST 150 BBL TO TANK TO CLEAN UP MUD, TURN DOWN FLOWLINE.

Final Print
Schlumberger

CEMENT BOND LOG WITH GAMMA RAY & CCL.

COMPANY MOBIL OIL INC.

WELL RATHERFORD UNIT 13-41

FIELD GREATER ANETH

COUNTY SAN JUAN STATE UTAH

County SAN JUAN
Field GRE TER ANETH
Location 660 VL & 660 FEL
Well RAT ERFORD UNIT 13-41
Company MO LE OIL INC.

Locatio

API Serial No.	Sect.	Twp.	Range
N/A	13	41 S	23 E

Permanent Datum	GL	Elev. 4748	Elev.K.B. 4760
Log Measured From	KB	12' above Perm. Datum	D.F. 4758
Drilling Measured From	KB		G.L. 4748

Date	0-1-97	Casing Fluid	WATER		
Run No.	ONE	Fluid Level	SURF.		
Depth-Driller	4662	Max. Rec. Temp.			
Depth-Logger	4600	Est. Cement Top			
Btm. Log Interval	4600	Unit / District	130	4314	
Top Log Interval	SURF.	Recorded By	GEORGE REID		
Open Hole Size		Witnessed By	NANCY GARDNER		

CASING REC.	Size	Wt/Ft	Grade	Type Joint	Top	Bottom
Surface String						
Prot. String						
Prod. String	5 1/2	14 LB			SURF	TD
Liner						

PRIMARY CEMENTING DATA

STRING	Surface	Protection	Production	Liner
Vol. of Cement				
Type of Cement				
Additive				
Retarder				

S

BILLY HANCOCK.
RRELATED TO SWS P.A.L. LOGGED 6-17-97.
ASS RAN UNDER 200 PSI.
SET OF CBL TOOLS USED.
DEPTH NEAR BOTTON BUT DRIFTS OFF
LE. CHECK CORRELATION BEFORE PERFORATING!

YOU FOR USING SCHLUMBERGER'S
STREAK SERVICES!

sperry-sun
DRILLING SERVICES

END OF WELL REPORT
for
MOBIL E&P Services, Inc.
Well: Ratherford Unit 13-41 (4 Leg ML)
Location: San Juan County, UTAH

96 Inverness Drive East, Suite O • Englewood, Colorado 80112 • (303) 649-9309 • Fax (303) 649-9727
A Dresser Industries, Inc. Company

sperry-sun
DRILLING SERVICES
A DRESSER INDUSTRIES, INC. COMPANY

Mobil
San Juan County
Utah
Sec.13-T41S-R23E
Ratherford Unit 13-41 - Leg #1

SURVEY REPORT

12 May, 1997

Survey Ref: svy1673

Sperry-Sun Drilling Services

Survey Report for Ratherford Unit 13-41

Mobil
San Juan County

Utah
Sec.13-T41S-R23E

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Gyro Survey							
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
200.00	0.340	158.730	200.00	0.55 S	0.22 E	0.40	0.170
400.00	0.210	195.620	400.00	1.46 S	0.33 E	0.83	0.107
600.00	0.350	242.190	599.99	2.10 S	0.31 W	0.46	0.128
800.00	0.590	248.940	799.99	2.75 S	1.81 W	-0.70	0.123
1000.00	0.980	281.300	999.97	2.79 S	4.45 W	-3.15	0.288
1200.00	1.090	284.980	1199.94	1.96 S	7.96 W	-6.73	0.064
1400.00	1.250	305.790	1399.90	0.19 S	11.57 W	-10.73	0.225
1600.00	1.320	310.000	1599.85	2.56 N	15.10 W	-15.02	0.059
1800.00	1.270	308.410	1799.79	5.42 N	18.60 W	-19.31	0.031
2000.00	1.070	294.390	1999.75	7.57 N	22.04 W	-23.29	0.174
2200.00	0.950	293.230	2199.72	8.99 N	25.27 W	-26.81	0.061
2400.00	0.380	15.610	2399.71	10.29 N	26.61 W	-28.53	0.488
2600.00	0.890	46.200	2599.70	12.00 N	25.31 W	-27.93	0.298
2800.00	1.260	26.760	2799.66	15.04 N	23.20 W	-27.05	0.257
3000.00	1.260	25.350	2999.62	18.99 N	21.27 W	-26.66	0.016
3200.00	1.300	24.530	3199.57	23.04 N	19.39 W	-26.36	0.022
3400.00	1.160	24.860	3399.52	26.94 N	17.59 W	-26.08	0.070
3600.00	1.080	28.780	3599.48	30.43 N	15.83 W	-25.69	0.055
3800.00	0.870	21.090	3799.45	33.50 N	14.38 W	-25.43	0.123
4000.00	0.940	15.960	3999.43	36.49 N	13.38 W	-25.57	0.054
4200.00	0.890	6.430	4199.40	39.62 N	12.76 W	-26.11	0.080
4400.00	0.770	12.940	4399.38	42.47 N	12.28 W	-26.69	0.076
4600.00	0.750	17.470	4599.36	45.03 N	11.59 W	-26.96	0.032
4800.00	0.690	5.470	4799.35	47.47 N	11.08 W	-27.36	0.081
5000.00	0.560	2.550	4999.34	49.65 N	10.92 W	-27.99	0.067
5200.00	0.500	7.590	5199.33	51.49 N	10.76 W	-28.50	0.038
Leg #1							
5400.00	0.310	4.840	5399.32	52.89 N	10.60 W	-28.85	0.095
5418.00	0.300	353.000	5417.32	52.99 N	10.60 W	-28.89	0.354
5427.00	3.100	99.000	5426.32	52.98 N	10.37 W	-28.66	35.508
5437.00	7.900	100.100	5436.27	52.81 N	9.42 W	-27.72	48.009
5447.00	13.200	101.200	5446.10	52.47 N	7.63 W	-25.92	53.036
5457.00	18.100	102.300	5455.72	51.92 N	4.99 W	-23.26	49.088
5467.00	23.200	103.400	5465.08	51.13 N	1.55 W	-19.77	51.145
5477.00	27.400	109.300	5474.12	49.91 N	2.54 E	-15.51	48.941
5487.00	31.600	111.300	5482.82	48.20 N	7.16 E	-10.59	43.134
5497.00	36.200	111.800	5491.12	46.15 N	12.34 E	-5.02	46.084

Continued...

Sperry-Sun Drilling Services

Survey Report for Ratherford Unit 13-41

Mobil
San Juan County

Utah
Sec.13-T41S-R23E

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5507.00	41.200	112.000	5498.92	43.82 N	18.14 E	1.23	50.016
5517.00	46.700	111.900	5506.12	41.22 N	24.57 E	8.17	55.004
5527.00	52.400	111.600	5512.60	38.41 N	31.64 E	15.78	57.046
5537.00	58.200	111.200	5518.29	35.41 N	39.29 E	23.99	58.093
5547.00	64.100	111.200	5523.11	32.24 N	47.45 E	32.75	59.000
5557.00	69.900	112.000	5527.02	28.85 N	56.01 E	41.95	58.465
5567.00	76.000	112.900	5529.95	25.20 N	64.84 E	51.50	61.603
5577.00	82.500	115.400	5531.81	21.18 N	73.80 E	61.30	69.480
5590.00	86.600	114.300	5533.05	15.75 N	85.54 E	74.21	32.643
5618.97	87.900	112.200	5534.44	4.33 N	112.12 E	103.13	8.518
5650.81	88.900	108.800	5535.33	6.82 S	141.93 E	134.95	11.127
5682.66	89.300	108.600	5535.83	17.03 S	172.10 E	166.77	1.404
5714.46	89.600	109.300	5536.13	27.35 S	202.17 E	198.55	2.395
5746.21	89.100	108.300	5536.49	37.59 S	232.22 E	230.27	3.521
5777.96	89.400	108.600	5536.91	47.63 S	262.34 E	261.99	1.336
5809.82	90.000	110.000	5537.08	58.16 S	292.41 E	293.83	4.781
5841.55	92.500	112.300	5536.38	69.61 S	321.99 E	325.55	10.705
5873.30	92.300	112.100	5535.05	81.59 S	351.36 E	357.26	0.890
5905.06	91.200	110.700	5534.08	93.17 S	380.92 E	389.01	5.604
5936.85	91.500	111.800	5533.34	104.69 S	410.54 E	420.79	3.586
5968.65	90.500	111.800	5532.78	116.50 S	440.06 E	452.58	3.145
6000.43	90.700	112.800	5532.45	128.56 S	469.46 E	484.35	3.209
6032.21	91.800	113.900	5531.75	141.15 S	498.63 E	516.09	4.894
6063.96	91.800	113.400	5530.76	153.88 S	527.70 E	547.79	1.574
6095.71	88.200	112.000	5530.76	166.13 S	556.98 E	579.52	12.166
6126.66	89.200	112.500	5531.46	177.85 S	585.62 E	610.46	3.612
6157.62	88.500	111.800	5532.08	189.52 S	614.29 E	641.40	3.197
6189.47	89.000	112.500	5532.78	201.52 S	643.78 E	673.24	2.700
6221.27	89.900	112.800	5533.08	213.77 S	673.13 E	705.02	2.983
6252.32	90.600	113.900	5532.95	226.08 S	701.63 E	736.05	4.199
6284.14	89.700	113.700	5532.86	238.92 S	730.74 E	767.83	2.897
6316.04	88.500	113.200	5533.36	251.61 S	760.01 E	799.70	4.075
6347.76	89.200	113.700	5534.00	264.23 S	789.10 E	831.38	2.712
6379.52	90.600	113.200	5534.06	276.87 S	818.24 E	863.11	4.681
6411.35	90.400	113.000	5533.78	289.36 S	847.51 E	894.92	0.889
6442.52	90.200	113.000	5533.61	301.53 S	876.20 E	926.07	0.642
6474.23	90.100	112.800	5533.53	313.87 S	905.42 E	957.76	0.705
6506.10	90.400	113.700	5533.39	326.45 S	934.70 E	989.60	2.977
6537.96	88.300	111.600	5533.75	338.72 S	964.09 E	1021.45	9.321
6569.78	88.000	111.300	5534.78	350.35 S	993.69 E	1053.25	1.333
6601.42	88.700	110.400	5535.69	361.61 S	1023.25 E	1084.87	3.603
6633.30	88.600	109.700	5536.44	372.53 S	1053.19 E	1116.74	2.217
6665.04	89.300	109.300	5537.02	383.13 S	1083.10 E	1148.46	2.540
6696.82	90.400	109.700	5537.11	393.74 S	1113.06 E	1180.23	3.683
6727.78	89.400	108.600	5537.16	403.89 S	1142.31 E	1211.18	4.802

Continued...

Sperry-Sun Drilling Services

Survey Report for Ratherford Unit 13-41

Mobil **Utah**
San Juan County **Sec.13-T41S-R23E**

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6759.54	87.800	107.600	5537.94	413.76 S	1172.48 E	1242.88	5.940
6791.00	86.400	107.000	5539.53	423.10 S	1202.48 E	1274.24	4.841
6824.00	86.400	107.000	5541.60	432.73 S	1233.98 E	1307.09	0.000

All data is in feet unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Structure. Northings and Eastings are relative to Structure.

The Dogleg Severity is in Degrees per 100ft.
Vertical Section is from Well and calculated along an Azimuth of 111.000° (True).
Coordinate System is UT-S. Grid Convergence at Surface is -4.170°.

Based Upon Minimum Curvature type calculations, at a Measured Depth of 6824.00ft.,
The Bottom Hole Displacement is 1307.65ft., in the Direction of 109.325° (True).

sperry-sun
DRILLING SERVICES
A DRESSER INDUSTRIES, INC. COMPANY

Mobil
San Juan County
Utah
Sec.13-T41S-R23E
Ratherford Unit 13-41 - Leg #2

SURVEY REPORT

12 May, 1997

Survey Ref: svy1675

Sperry-Sun Drilling Services

Survey Report for Ratherford Unit 13-41

Mobil
San Juan County

Utah
Sec.13-T41S-R23E

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Gyro Survey							
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
200.00	0.340	158.730	200.00	0.55 S	0.22 E	-0.56	0.170
400.00	0.210	195.620	400.00	1.46 S	0.33 E	-1.32	0.107
600.00	0.350	242.190	599.99	2.10 S	0.31 W	-1.38	0.128
800.00	0.590	248.940	799.99	2.75 S	1.81 W	-0.89	0.123
1000.00	0.980	281.300	999.97	2.79 S	4.45 W	0.81	0.288
1200.00	1.090	284.980	1199.94	1.96 S	7.96 W	3.74	0.064
1400.00	1.250	305.790	1399.90	0.19 S	11.57 W	7.44	0.225
1600.00	1.320	310.000	1599.85	2.56 N	15.10 W	11.84	0.059
1800.00	1.270	308.410	1799.79	5.42 N	18.60 W	16.30	0.031
2000.00	1.070	294.390	1999.75	7.57 N	22.04 W	20.17	0.174
2200.00	0.950	293.230	2199.72	8.99 N	25.27 W	23.36	0.061
2400.00	0.380	15.610	2399.71	10.29 N	26.61 W	25.22	0.488
2600.00	0.890	46.200	2599.70	12.00 N	25.31 W	25.66	0.298
2800.00	1.260	26.760	2799.66	15.04 N	23.20 W	26.57	0.257
3000.00	1.260	25.350	2999.62	18.99 N	21.27 W	28.29	0.016
3200.00	1.300	24.530	3199.57	23.04 N	19.39 W	30.11	0.022
3400.00	1.160	24.860	3399.52	26.94 N	17.59 W	31.88	0.070
3600.00	1.080	28.780	3599.48	30.43 N	15.83 W	33.36	0.055
3800.00	0.870	21.090	3799.45	33.50 N	14.38 W	34.72	0.123
4000.00	0.940	15.960	3999.43	36.49 N	13.38 W	36.32	0.054
4200.00	0.890	6.430	4199.40	39.62 N	12.76 W	38.27	0.080
4400.00	0.770	12.940	4399.38	42.47 N	12.28 W	40.11	0.076
4600.00	0.750	17.470	4599.36	45.03 N	11.59 W	41.59	0.032
4800.00	0.690	5.470	4799.35	47.47 N	11.08 W	43.10	0.081
5000.00	0.560	2.550	4999.34	49.65 N	10.92 W	44.64	0.067
5200.00	0.500	7.590	5199.33	51.49 N	10.76 W	45.92	0.038
Leg #2							
5406.00	0.307	0.751	5405.32	52.93 N	10.60 W	46.90	0.096
5413.00	3.700	329.900	5412.32	53.14 N	10.71 W	47.14	49.139
5423.00	8.300	328.200	5422.26	54.03 N	11.26 W	48.17	46.029
5433.00	13.100	326.500	5432.08	55.59 N	12.26 W	50.00	48.099
5443.00	17.800	324.800	5441.72	57.79 N	13.77 W	52.65	47.213
5453.00	22.500	323.200	5451.10	60.57 N	15.80 W	56.08	47.318
5463.00	27.200	321.500	5460.18	63.89 N	18.37 W	60.27	47.535
5473.00	31.800	319.800	5468.88	67.70 N	21.49 W	65.19	46.751
5483.00	36.000	320.200	5477.17	71.97 N	25.08 W	70.77	42.059
5493.00	40.100	321.200	5485.05	76.74 N	28.98 W	76.93	41.460

Continued...

Sperry-Sun Drilling Services

Survey Report for Ratherford Unit 13-41

Mobil
San Juan County

Utah
Sec.13-T41S-R23E

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5503.00	44.800	322.000	5492.42	82.03 N	33.17 W	83.67	47.308
5513.00	50.000	322.400	5499.19	87.84 N	37.68 W	91.02	52.083
5523.00	54.800	322.200	5505.29	94.11 N	42.52 W	98.92	48.026
5533.00	60.000	322.100	5510.68	100.76 N	47.69 W	107.33	52.007
5543.00	65.300	321.800	5515.27	107.75 N	53.16 W	116.20	53.067
5553.00	70.400	321.800	5519.04	115.03 N	58.89 W	125.45	51.000
5563.00	75.600	321.600	5521.96	122.53 N	64.81 W	135.00	52.035
5570.00	79.400	321.400	5523.48	127.88 N	69.07 W	141.82	54.357
5580.00	86.000	322.300	5524.75	135.67 N	75.19 W	151.72	66.600
5592.00	89.500	322.000	5525.22	145.14 N	82.55 W	163.69	29.273
5610.13	90.000	320.300	5525.30	159.26 N	93.92 W	181.81	9.774
5642.02	88.700	317.400	5525.66	183.27 N	114.90 W	213.69	9.965
5673.92	88.600	316.900	5526.41	206.65 N	136.59 W	245.57	1.598
5705.74	89.200	317.800	5527.02	230.05 N	158.14 W	277.37	3.399
5737.57	89.200	318.200	5527.46	253.70 N	179.44 W	309.19	1.257
5769.30	90.300	318.500	5527.60	277.41 N	200.53 W	340.92	3.593
5801.12	91.500	318.200	5527.10	301.18 N	221.67 W	372.73	3.887
5832.88	91.700	318.500	5526.22	324.90 N	242.77 W	404.48	1.135
5864.60	92.500	318.900	5525.05	348.72 N	263.69 W	436.18	2.819
5896.45	92.100	319.200	5523.78	372.75 N	284.55 W	468.00	1.569
5928.33	91.200	319.700	5522.86	396.97 N	305.26 W	499.87	3.229
5960.15	92.300	320.800	5521.89	421.42 N	325.60 W	531.66	4.888
5991.91	91.900	322.000	5520.72	446.22 N	345.40 W	563.37	3.980
6023.68	91.700	322.600	5519.72	471.35 N	364.82 W	595.07	1.990
6055.53	91.100	323.100	5518.95	496.73 N	384.05 W	626.84	2.452
6087.25	90.200	321.900	5518.59	521.89 N	403.36 W	658.50	4.729
6119.01	91.900	321.300	5518.00	546.77 N	423.08 W	690.22	5.676
6150.73	92.900	320.300	5516.68	571.33 N	443.11 W	721.90	4.456
6182.50	92.100	320.600	5515.29	595.81 N	463.32 W	753.63	2.689
6214.29	90.000	319.700	5514.71	620.21 N	483.68 W	785.40	7.187
6246.04	91.800	321.000	5514.21	644.65 N	503.94 W	817.14	6.993
6277.80	89.200	320.300	5513.93	669.20 N	524.08 W	848.88	8.478
6309.54	89.400	319.400	5514.32	693.46 N	544.54 W	880.61	2.905
6341.30	88.800	319.700	5514.82	717.63 N	565.14 W	912.37	2.112
6372.28	87.500	319.400	5515.82	741.19 N	585.23 W	943.33	4.306
6403.28	87.300	318.200	5517.23	764.49 N	605.63 W	974.30	3.920
6435.15	89.800	318.500	5518.03	788.30 N	626.80 W	1006.15	7.901
6467.03	91.100	318.200	5517.78	812.12 N	647.99 W	1038.03	4.185
6498.11	92.000	319.600	5516.94	835.53 N	668.41 W	1069.10	5.354
6529.95	90.100	319.200	5516.36	859.70 N	689.13 W	1100.93	6.098
6561.87	89.000	317.500	5516.61	883.55 N	710.34 W	1132.84	6.343
6593.60	91.100	317.300	5516.58	906.90 N	731.81 W	1164.56	6.648
6625.38	94.700	316.800	5514.97	930.13 N	753.43 W	1196.27	11.436
6657.24	91.800	317.100	5513.17	953.37 N	775.15 W	1228.06	9.151
6688.41	91.000	316.800	5512.40	976.14 N	796.42 W	1259.20	2.741

Continued...

Sperry-Sun Drilling Services

Survey Report for Ratherford Unit 13-41

Mobil **Utah**
San Juan County **Sec.13-T41S-R23E**

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6720.14	90.400	317.300	5512.02	999.36 N	818.04 W	1290.91	2.461
6751.78	89.900	317.100	5511.93	1022.58 N	839.53 W	1322.53	1.702
6783.68	91.400	316.400	5511.57	1045.81 N	861.39 W	1354.41	5.189
6815.58	90.400	315.300	5511.07	1068.70 N	883.60 W	1386.25	4.660
6847.41	89.500	315.000	5511.10	1091.26 N	906.05 W	1418.01	2.980
6879.15	88.000	313.800	5511.79	1113.46 N	928.72 W	1449.64	6.051
6911.02	89.400	313.800	5512.51	1135.52 N	951.72 W	1481.37	4.393
6942.77	92.200	315.500	5512.07	1157.82 N	974.30 W	1513.02	10.317
6980.00	92.200	315.500	5510.64	1184.36 N	1000.38 W	1550.15	0.000

All data is in feet unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Structure. Northings and Eastings are relative to Structure.

The Dogleg Severity is in Degrees per 100ft.
Vertical Section is from Well and calculated along an Azimuth of 319.000° (True).
Coordinate System is UT-S. Grid Convergence at Surface is -4.170°.

Based Upon Minimum Curvature type calculations, at a Measured Depth of 6980.00ft.,
The Bottom Hole Displacement is 1550.31ft., in the Direction of 319.814° (True).

sperry-sun
DRILLING SERVICES
A DRESSER INDUSTRIES, INC. COMPANY

Mobil
San Juan County
Utah
Sec.13-T41S-R23E
Ratherford Unit 13-41 - Leg #3

SURVEY REPORT

12 May, 1997

Survey Ref: svy1677

Sperry-Sun Drilling Services

Survey Report for Ratherford Unit 13-41

Mobil
San Juan County

Utah
Sec.13-T41S-R23E

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Gyro Survey							
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
200.00	0.340	158.730	200.00	0.55 S	0.22 E	0.35	0.170
400.00	0.210	195.620	400.00	1.46 S	0.33 E	0.69	0.107
600.00	0.350	242.190	599.99	2.10 S	0.31 W	0.23	0.128
800.00	0.590	248.940	799.99	2.75 S	1.81 W	-1.06	0.123
1000.00	0.980	281.300	999.97	2.79 S	4.45 W	-3.61	0.288
1200.00	1.090	284.980	1199.94	1.96 S	7.96 W	-7.22	0.064
1400.00	1.250	305.790	1399.90	0.19 S	11.57 W	-11.15	0.225
1600.00	1.320	310.000	1599.85	2.56 N	15.10 W	-15.26	0.059
1800.00	1.270	308.410	1799.79	5.42 N	18.60 W	-19.37	0.031
2000.00	1.070	294.390	1999.75	7.57 N	22.04 W	-23.24	0.174
2200.00	0.950	293.230	2199.72	8.99 N	25.27 W	-26.71	0.061
2400.00	0.380	15.610	2399.71	10.29 N	26.61 W	-28.34	0.488
2600.00	0.890	46.200	2599.70	12.00 N	25.31 W	-27.51	0.298
2800.00	1.260	26.760	2799.66	15.04 N	23.20 W	-26.23	0.257
3000.00	1.260	25.350	2999.62	18.99 N	21.27 W	-25.35	0.016
3200.00	1.300	24.530	3199.57	23.04 N	19.39 W	-24.54	0.022
3400.00	1.160	24.860	3399.52	26.94 N	17.59 W	-23.79	0.070
3600.00	1.080	28.780	3599.48	30.43 N	15.83 W	-22.96	0.055
3800.00	0.870	21.090	3799.45	33.50 N	14.38 W	-22.32	0.123
4000.00	0.940	15.960	3999.43	36.49 N	13.38 W	-22.11	0.054
4200.00	0.890	6.430	4199.40	39.62 N	12.76 W	-22.28	0.080
4400.00	0.770	12.940	4399.38	42.47 N	12.28 W	-22.54	0.076
4600.00	0.750	17.470	4599.36	45.03 N	11.59 W	-22.51	0.032
4800.00	0.690	5.470	4799.35	47.47 N	11.08 W	-22.63	0.081
5000.00	0.560	2.550	4999.34	49.65 N	10.92 W	-23.02	0.067
5200.00	0.500	7.590	5199.33	51.49 N	10.76 W	-23.33	0.038
Leg #3							
5386.00	0.323	5.138	5385.32	52.82 N	10.61 W	-23.51	0.095
5395.00	2.700	69.500	5394.32	52.92 N	10.41 W	-23.34	28.629
5405.00	9.000	70.200	5404.26	53.26 N	9.45 W	-22.50	63.003
5415.00	15.500	70.900	5414.03	53.97 N	7.45 W	-20.74	65.016
5425.00	22.000	71.600	5423.49	55.00 N	4.41 W	-18.06	65.038
5435.00	27.100	72.300	5432.59	56.28 N	0.46 W	-14.55	51.082
5445.00	31.200	79.100	5441.32	57.47 N	4.26 E	-10.28	52.651
5455.00	35.700	84.700	5449.66	58.23 N	9.71 E	-5.20	54.529
5465.00	41.300	88.200	5457.49	58.60 N	15.92 E	0.72	60.070
5475.00	47.500	91.100	5464.63	58.63 N	22.91 E	7.48	65.223

Continued...

Sperry-Sun Drilling Services

Survey Report for Ratherford Unit 13-41

Mobil **Utah**
San Juan County **Sec.13-T41S-R23E**

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5485.00	53.300	94.000	5471.00	58.28 N	30.60 E	15.02	62.145
5495.00	57.600	97.500	5476.67	57.45 N	38.80 E	23.15	51.759
5505.00	61.700	101.100	5481.73	56.05 N	47.31 E	31.74	51.432
5515.00	67.000	103.500	5486.05	54.13 N	56.11 E	40.75	57.241
5525.00	73.300	104.400	5489.45	51.86 N	65.23 E	50.15	63.565
5535.00	78.900	105.500	5491.85	49.35 N	74.61 E	59.85	57.008
5545.00	84.700	109.100	5493.27	46.41 N	84.05 E	69.73	68.062
5557.00	89.000	109.900	5493.93	42.41 N	95.34 E	81.66	36.446
5579.30	89.000	108.000	5494.32	35.17 N	116.43 E	103.89	8.519
5611.14	89.300	109.700	5494.80	24.89 N	146.56 E	135.64	5.421
5643.00	88.000	110.900	5495.55	13.84 N	176.43 E	167.33	5.552
5674.90	88.200	112.700	5496.60	2.00 N	206.03 E	198.95	5.674
5706.71	87.200	113.400	5497.88	10.45 S	235.28 E	230.38	3.836
5738.52	86.000	113.700	5499.77	23.14 S	264.39 E	261.74	3.888
5770.25	91.500	115.500	5500.46	36.34 S	293.22 E	292.96	18.237
5802.05	91.500	115.700	5499.63	50.07 S	321.88 E	324.16	0.629
5833.80	87.500	113.400	5499.90	63.26 S	350.76 E	355.41	14.532
5865.52	90.400	111.100	5500.48	75.27 S	380.10 E	386.83	11.668
5897.35	87.600	108.100	5501.04	85.94 S	410.08 E	418.53	12.891
5929.21	90.600	109.900	5501.54	96.31 S	440.19 E	450.28	10.980
5961.01	91.200	110.700	5501.04	107.34 S	470.01 E	481.91	3.144
5992.77	91.200	108.800	5500.38	118.07 S	499.90 E	513.53	5.981
6024.54	89.100	107.200	5500.29	127.89 S	530.11 E	545.24	8.310
6056.39	90.500	106.500	5500.40	137.12 S	560.59 E	577.06	4.914
6088.12	88.900	105.600	5500.57	145.89 S	591.08 E	608.78	5.785
6119.89	89.600	105.300	5500.99	154.35 S	621.70 E	640.54	2.397
6151.62	90.600	105.100	5500.93	162.67 S	652.32 E	672.27	3.214
6183.41	89.200	105.100	5500.99	170.95 S	683.01 E	704.06	4.404
6215.21	91.700	105.300	5500.74	179.29 S	713.70 E	735.85	7.887
6246.97	91.800	105.300	5499.77	187.67 S	744.32 E	767.60	0.315
6278.73	90.800	105.800	5499.05	196.18 S	774.91 E	799.34	3.520
6310.48	89.800	105.800	5498.88	204.82 S	805.46 E	831.08	3.150
6342.23	84.500	104.600	5500.46	213.13 S	836.05 E	862.78	17.114
6373.18	84.000	103.700	5503.56	220.66 S	865.91 E	893.57	3.314
6404.15	85.300	103.900	5506.45	228.02 S	895.85 E	924.41	4.247
6436.01	86.600	104.600	5508.70	235.84 S	926.65 E	956.18	4.632
6467.82	86.400	104.900	5510.64	243.92 S	957.36 E	987.93	1.132
6498.88	87.300	105.100	5512.35	251.95 S	987.31 E	1018.95	2.968
6530.68	88.900	105.600	5513.40	260.36 S	1017.96 E	1050.72	5.271
6562.60	90.800	106.700	5513.48	269.24 S	1048.62 E	1082.63	6.878
6588.00	91.600	106.900	5512.95	276.58 S	1072.93 E	1108.00	3.247
6620.00	91.600	106.900	5512.06	285.88 S	1103.53 E	1139.96	0.000

Continued...

Sperry-Sun Drilling Services

Survey Report for Ratherford Unit 13-41

Mobil **Utah**
San Juan County **Sec.13-T41S-R23E**

All data is in feet unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Structure. Northings and Eastings are relative to Structure.

The Dogleg Severity is in Degrees per 100ft.
Vertical Section is from Well and calculated along an Azimuth of 104.520° (True).
Coordinate System is UT-S. Grid Convergence at Surface is -4.170°.

Based Upon Minimum Curvature type calculations, at a Measured Depth of 6620.00ft.,
The Bottom Hole Displacement is 1139.96ft., in the Direction of 104.524° (True).

sperry-sun
DRILLING SERVICES
A DRESSER INDUSTRIES, INC. COMPANY

Mobil
San Juan County
Utah
Sec.13-T41S-R23E
Ratherford Unit 13-41 - Leg #4

SURVEY REPORT

12 May, 1997

Survey Ref: svy1679

Sperry-Sun Drilling Services

Survey Report for Ratherford Unit 13-41

Mobil **Utah**
San Juan County **Sec.13-T41S-R23E**

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Gyro Survey							
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
200.00	0.340	158.730	200.00	0.55 S	0.22 E	-0.52	0.170
400.00	0.210	195.620	400.00	1.46 S	0.33 E	-1.18	0.107
600.00	0.350	242.190	599.99	2.10 S	0.31 W	-1.08	0.128
800.00	0.590	248.940	799.99	2.75 S	1.81 W	-0.33	0.123
1000.00	0.980	281.300	999.97	2.79 S	4.45 W	1.70	0.288
1200.00	1.090	284.980	1199.94	1.96 S	7.96 W	4.95	0.064
1400.00	1.250	305.790	1399.90	0.19 S	11.57 W	8.87	0.225
1600.00	1.320	310.000	1599.85	2.56 N	15.10 W	13.35	0.059
1800.00	1.270	308.410	1799.79	5.42 N	18.60 W	17.87	0.031
2000.00	1.070	294.390	1999.75	7.57 N	22.04 W	21.89	0.174
2200.00	0.950	293.230	2199.72	8.99 N	25.27 W	25.30	0.061
2400.00	0.380	15.610	2399.71	10.29 N	26.61 W	27.16	0.488
2600.00	0.890	46.200	2599.70	12.00 N	25.31 W	27.22	0.298
2800.00	1.260	26.760	2799.66	15.04 N	23.20 W	27.50	0.257
3000.00	1.260	25.350	2999.62	18.99 N	21.27 W	28.48	0.016
3200.00	1.300	24.530	3199.57	23.04 N	19.39 W	29.57	0.022
3400.00	1.160	24.860	3399.52	26.94 N	17.59 W	30.63	0.070
3600.00	1.080	28.780	3599.48	30.43 N	15.83 W	31.46	0.055
3800.00	0.870	21.090	3799.45	33.50 N	14.38 W	32.26	0.123
4000.00	0.940	15.960	3999.43	36.49 N	13.38 W	33.37	0.054
4200.00	0.890	6.430	4199.40	39.62 N	12.76 W	34.85	0.080
4400.00	0.770	12.940	4399.38	42.47 N	12.28 W	36.27	0.076
4600.00	0.750	17.470	4599.36	45.03 N	11.59 W	37.34	0.032
4800.00	0.690	5.470	4799.35	47.47 N	11.08 W	38.49	0.081
5000.00	0.560	2.550	4999.34	49.65 N	10.92 W	39.73	0.067
5200.00	0.500	7.590	5199.33	51.49 N	10.76 W	40.77	0.038
Leg #4							
5374.00	0.335	5.374	5373.32	52.75 N	10.62 W	41.45	0.095
5382.00	3.500	295.000	5381.32	52.88 N	10.84 W	41.70	42.528
5392.00	9.100	295.800	5391.25	53.35 N	11.82 W	42.76	56.006
5402.00	14.300	296.600	5401.04	54.25 N	13.64 W	44.74	52.024
5412.00	19.700	297.400	5410.60	55.58 N	16.24 W	47.60	54.049
5422.00	25.200	298.800	5419.84	57.38 N	19.61 W	51.35	55.256
5432.00	30.400	306.900	5428.69	59.93 N	23.50 W	55.98	64.169
5442.00	34.600	309.900	5437.12	63.27 N	27.71 W	61.35	44.976
5452.00	37.600	313.000	5445.20	67.17 N	32.12 W	67.23	35.115
5462.00	40.300	309.200	5452.98	71.30 N	36.86 W	73.51	36.041

Continued...

Sperry-Sun Drilling Services

Survey Report for Ratherford Unit 13-41

Mobil **Utah**
San Juan County **Sec.13-T41S-R23E**

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5472.00	44.900	307.900	5460.33	75.51 N	42.15 W	80.28	46.832
5482.00	49.600	307.500	5467.12	80.00 N	47.96 W	87.62	47.092
5492.00	51.700	306.100	5473.46	84.63 N	54.15 W	95.34	23.625
5502.00	54.600	307.100	5479.46	89.40 N	60.57 W	103.34	30.083
5512.00	59.400	308.100	5484.90	94.52 N	67.21 W	111.72	48.726
5522.00	64.200	308.800	5489.63	100.00 N	74.11 W	120.53	48.394
5532.00	69.900	309.500	5493.52	105.81 N	81.25 W	129.73	57.363
5542.00	75.800	310.400	5496.47	111.95 N	88.57 W	139.28	59.623
5552.00	81.700	311.700	5498.42	118.38 N	95.96 W	149.08	60.361
5562.00	85.900	311.900	5499.50	125.01 N	103.37 W	159.01	42.047
5568.00	86.900	311.200	5499.88	128.98 N	107.86 W	164.99	20.331
5579.25	87.000	310.400	5500.48	136.32 N	116.36 W	176.22	7.156
5611.08	88.700	308.500	5501.67	156.53 N	140.92 W	208.02	8.006
5642.95	89.900	308.500	5502.06	176.37 N	165.86 W	239.89	3.765
5674.85	90.200	307.600	5502.03	196.03 N	190.98 W	271.78	2.974
5706.65	91.200	307.400	5501.64	215.39 N	216.20 W	303.57	3.207
5738.48	92.200	307.400	5500.70	234.71 N	241.48 W	335.37	3.142
5770.22	95.100	307.300	5498.68	253.93 N	266.66 W	367.03	9.142
5802.04	95.400	307.300	5495.77	273.13 N	291.86 W	398.70	0.943
5833.80	96.800	307.100	5492.39	292.22 N	317.02 W	430.27	4.452
5865.51	96.700	307.100	5488.67	311.21 N	342.13 W	461.74	0.315
5897.35	94.300	306.200	5485.61	330.13 N	367.56 W	493.41	8.046
5929.20	93.200	305.900	5483.53	348.83 N	393.25 W	525.14	3.579
5961.00	92.600	306.000	5481.92	367.48 N	418.96 W	556.86	1.913
5992.75	92.500	305.900	5480.51	386.10 N	444.64 W	588.53	0.445
6024.50	88.600	306.000	5480.21	404.74 N	470.34 W	620.23	12.287
6056.33	87.000	306.400	5481.43	423.52 N	496.00 W	652.00	5.181
6088.07	86.600	306.600	5483.20	442.37 N	521.48 W	683.66	1.409
6119.84	84.800	306.200	5485.58	461.17 N	546.98 W	715.30	5.803
6151.57	85.600	306.400	5488.24	479.89 N	572.46 W	746.89	2.598
6183.36	89.100	307.300	5489.71	498.93 N	597.87 W	778.62	11.367
6215.14	89.900	307.400	5489.98	518.21 N	623.13 W	810.38	2.537
6246.90	90.500	307.600	5489.87	537.54 N	648.32 W	842.13	1.991
6278.66	93.400	308.100	5488.79	557.02 N	673.39 W	873.86	9.265
6310.40	94.400	308.500	5486.63	576.64 N	698.24 W	905.52	3.392
6342.15	93.500	310.200	5484.45	596.73 N	722.73 W	937.20	6.047
6373.10	92.300	312.200	5482.88	617.09 N	745.98 W	968.08	7.529
6404.07	90.200	313.600	5482.20	638.16 N	768.66 W	998.97	8.149
6435.92	90.600	315.900	5481.98	660.58 N	791.28 W	1030.66	7.330
6467.74	91.700	319.600	5481.34	684.13 N	812.67 W	1062.10	12.128
6498.80	93.300	322.200	5479.99	708.20 N	832.24 W	1092.46	9.822
6530.62	90.700	321.700	5478.88	733.24 N	851.83 W	1123.44	8.320
6562.53	89.500	320.800	5478.82	758.13 N	871.81 W	1154.63	4.701
6594.25	90.500	318.700	5478.82	782.34 N	892.30 W	1185.79	7.333
6626.02	90.400	316.900	5478.57	805.87 N	913.64 W	1217.18	5.674

Continued...

Sperry-Sun Drilling Services

Survey Report for Ratherford Unit 13-41

Mobil **Utah**
San Juan County **Sec.13-T41S-R23E**

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6657.87	91.700	314.800	5477.99	828.72 N	935.82 W	1248.80	7.753
6688.93	90.000	312.700	5477.53	850.19 N	958.25 W	1279.74	8.698
6720.62	87.800	310.400	5478.14	871.21 N	981.96 W	1311.39	10.042
6752.52	87.500	308.100	5479.44	891.37 N	1006.64 W	1343.26	7.265
6783.49	90.100	306.200	5480.09	910.07 N	1031.32 W	1374.21	10.397
6815.36	89.500	304.100	5480.20	928.41 N	1057.37 W	1406.00	6.853
6847.08	89.700	302.200	5480.43	945.76 N	1083.93 W	1437.56	6.023
6878.82	90.300	300.600	5480.43	962.29 N	1111.02 W	1469.01	5.384
6910.65	89.300	302.700	5480.54	978.99 N	1138.11 W	1500.58	7.307
6942.53	88.900	305.000	5481.04	996.75 N	1164.58 W	1532.33	7.322
6974.28	90.200	307.100	5481.29	1015.43 N	1190.25 W	1564.03	7.779
6979.00	90.300	307.400	5481.27	1018.29 N	1194.01 W	1568.75	6.699
7011.00	90.300	309.500	5481.10	1038.19 N	1219.07 W	1600.74	6.562

All data is in feet unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Structure. Northings and Eastings are relative to Structure.

The Dogleg Severity is in Degrees per 100ft.
Vertical Section is from Well and calculated along an Azimuth of 309.000° (True).
Coordinate System is UT-S. Grid Convergence at Surface is -4.170°.

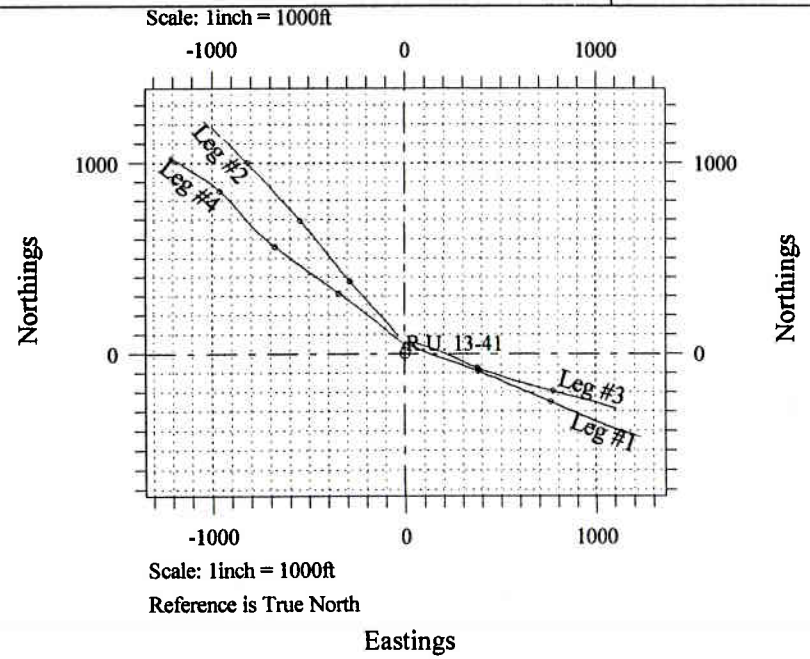
Based Upon Minimum Curvature type calculations, at a Measured Depth of 7011.00ft.,
The Bottom Hole Displacement is 1601.24ft., in the Direction of 310.418° (True).

sperry-sun DRILLING SERVICES

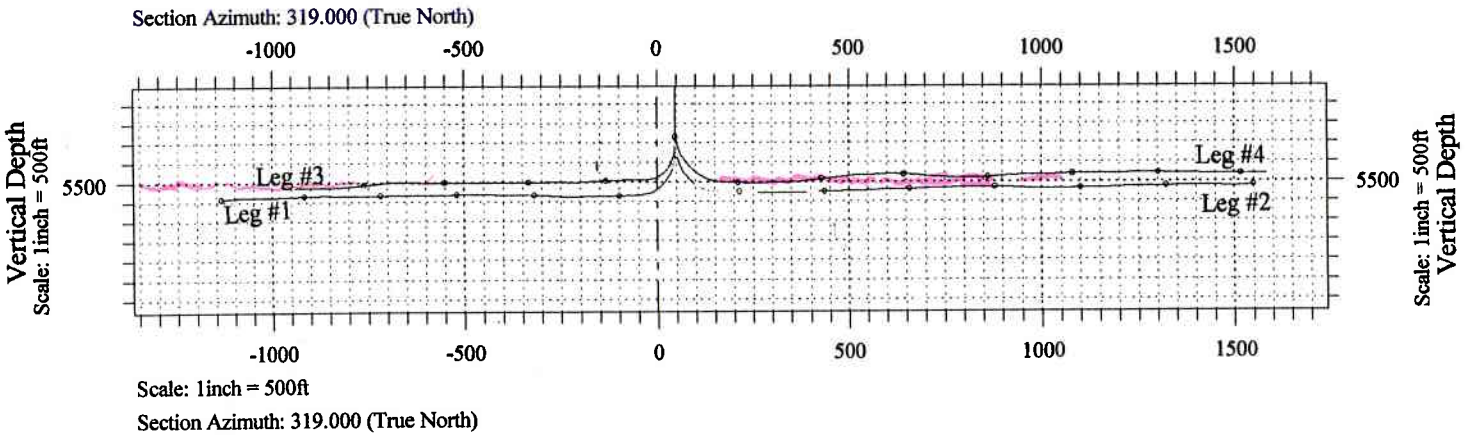
Well: Ratherford Unit 13-41

DrillQuest™

Customer: Mobil
Folder: Mobil
Field: San Juan County
Project: Utah
Structure: Sec.13-T41S-R23E
Well: Ratherford Unit 13-41



Vertical Section



Vertical Section

Prepared:	Checked:	Approved:

Form 3160-4
(July 1992)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN DUPLICATE (See other instructions on reverse side)

FORM APPROVED
OMB NO. 1004-0137
Expires: February 28, 1995

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

5. LEASE DESIGNATION AND SERIAL NO.: 14-20-603-247A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: NAVAJO TRIBAL

7. UNIT AGREEMENT NAME: RATHERFORD UNIT

8. FARM OR LEASE NAME, WELL NO.: RATHERFORD 13-41

9. API WELL NO.: 43-037-15856

10. FIELD AND POOL, OR WILDCAT: GREATER ANETH

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: SEC. 13, T41S, R23E

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

b. TYPE OF COMPLETION: NEW WELL [ ] WORK OVER [ ] DEEP-EN [ ] PLUG BACK [ ] DIFF. RESVR. [ ] Other SIDETRACK

2. NAME OF OPERATOR: Mobil Exploration & Producing U.S. Inc. as Agent for Mobil Producing TX & NM Inc.

3. ADDRESS AND TELEPHONE NO.: P.O. Box 633, Midland, TX 79702 (915) 688-2585

4. LOCATION OF WELL (*Report location clearly and in accordance with any State requirements*)*
At surface: 660' FNL & 660' FEL
At top prod. interval reported below: *#37 THIS FORM
At total depth: @#37 THIS FORM

14. PERMIT NO. / DATE ISSUED

12. COUNTY OR PARISH: SAN JUAN

13. STATE: UTAH

15. DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMPL. (*Ready to prod.*)	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	19. ELEV. CASINGHEAD
4-05-97	4-29-97	5-24-97	4748' GR, 4760' KB	

20. TOTAL DEPTH, MD & TVD	21. PLUG, BACK T.D., MD & TVD	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
**#37	**#37	NO	→	X	

24. PRODUCING INTERVAL(S), OF THIS COMPLETION - TOP, BOTTOM, NAME (MD AND TVD)*: **#37

25. WAS DIRECTIONAL SURVEY MADE: YES

26. TYPE ELECTRIC AND OTHER LOGS RUN: SD/DSN DLL 3-10-94
MUD LOGS 1EGS 1,2,3&4 5-6-97

27. WAS WELL CORED: NO

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

CASING SIZE/GRADE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	TOP OF CEMENT, CEMENTING RECORD	AMOUNT PULLED
8 5/8"	24#	1238'	11"	400 SXS - SURFACE	
5 1/2"	14#	5489'	7 7/8"	TOC @ 4169'	

29. LINER RECORD

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

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2 7/8"		

RECEIVED
JUN 16 1997
DIV. OF OIL, GAS & MINING

31. PERFORATION RECORD (*Interval, size and number*)

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

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
5610-7011'	LAT. #4A1/ACIDIZE W/30000
	GALS 15% HCL ACID.
5610-6610'	LAT. #3A1/ACIDIZE W/21000
***#37	GALS 15% HCL ACID

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (*Flowing, gas lift, pumping - size and type of pump*)	WELL STATUS (*Producing or shut-in*)
	2 1/2" X 2" X 24' PUMP	PRODUCING

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD	OIL - BBL.	GAS - MCF.	WATER - BBL.	GAS - OIL RATIO
6-07-97	24		→	524	443	530	845

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

34. DISPOSITION OF GAS (*Sold, used for fuel, vented, etc.*)

TEST WITNESSED BY

35. LIST OF ATTACHMENTS
DIRECTIONAL SURVEY REPORT

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

SIGNED Shirley Houchins TITLE ENV. & REG. TECHNICIAN DATE 06-00-97

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

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 jurisdicton.

37. SUMMARY OF POROUS ZONES: (Show all important zones of porosity and contents thereof; cored intervals; and all drill-stem, tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures, and recoveries):

FORMATION	TOP	BOTTOM	DESCRIPTION, CONTENTS, ETC.
* #4		LAT 1A1	433' F SOUTH & 1234' F EAST (1307.9 LENGTH)
		LAT 2A1	1184' F NORTH & 1038' F WEST (1550 LENGTH)
		LAT 3A1	286' F SOUTH & 1104' F EAST (1140 LENGTH)
		LAT 4A1	1038' F NORTH & 1219' F WEST (1600 LENGTH)
** # 20 & 24		LAT #1A1	(5533-5542' TVD)(5590-6824' TMD)
		LAT #2A1	(5526-5511' TVD)(5592-6980' TMD)
		LAT #3A1	(5494-5512' TVD)(5557-6620' TMD)
		LAT #4A1	(5499-5481' TVD)(5568-7011' TMD)
*** #37	5620	6980'	LAT #2A1: ACIDIZE W/28000 GALS 15% HCL ACID.
	5620'	6824'	LAT #1A1: ACIDIZE W/25284 GALS 15% HCL ACID.

38. GEOLOGIC MARKERS

NAME	TOP	
	MEAS. DEPTH	TRUE VERT. DEPTH

U.S. GOVERNMENT PRINTING OFFICE: 1992-774-672

ExxonMobil Production Comp
U.S. West
P.O. Box 4358
Houston, Texas 77210-4358

June 27, 2001

ExxonMobil
Production

Mr. Jim Thompson
State of Utah, Division of Oil, Gas and Mining
1549 West North Temple
Suite 1210
Salt Lake City, UT 84114-5801

Change of Name – Mobil Oil Corporation to
ExxonMobil Oil Corporation

Dear Mr. Thompson

Effective June 1, 2001, Mobil Oil Corporation (MOC) changed its name to ExxonMobil Oil Corporation (EMOC). This was a name change only; EMOC is the same corporation as Mobil Oil Corporation, but with a new name. No facility or other asset was transferred from one corporation to another by virtue of the name change. Specifically, EMOC will remain the owner and operator of its existing exploration and production oil and gas properties and facilities, as well as relevant permits.

There is no change to the name of Exxon Mobil Corporation, the ultimate shareholder of EMOC.

Please note the change of name of MOC to ExxonMobil Oil Corporation in your records pertaining to any MOC permits.

The Federal Identification Number for MOC (13-5401570) will remain the same for EMOC.

A copy of the Certification, Bond Rider and a list of wells are attached.

If you have any questions please feel free to call Joel Talavera at 713-431-1010

Very truly yours,

Charlotte H. Harper

Charlotte H. Harper
Permitting Supervisor

ExxonMobil Production Company
a division of Exxon Mobil Corporation,
acting for ExxonMobil Oil Corporation

RECEIVED
JUN 29 2001
DIVISION OF
OIL, GAS AND MINING

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
Navajo Area Office
NAVAJO REGION
P.O. Box 1060
Gallup, New Mexico 87305-1060

IN REPLY REFER TO:

RRES/543

AUG 30 2001

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Charlotte H. Harper, Permitting Supervisor
Exxon Mobil Production Company
U. S. West
P. O. Box 4358
Houston, TX 77210-4358

Dear Ms. Harper:

This is to acknowledge receipt of your company's name change from Mobil Oil Corporation to ExxonMobil Oil Corporation effective June 1, 2001. The receipt of documents includes the Name Change Certification, current listing of Officers and Directors, Listing of Leases, Financial Statement, filing fees of $75.00 and a copy of the Rider for Bond Number 8027 31 97. There are no other changes.

Please note that we will provide copies of these documents to other concerned parties. If you need further assistance, you may contact Ms. Bertha Spencer, Realty Specialist, at (928) 871-5938.

Sincerely,

DENNIS DENETSONE

Regional Realty Officer

cc: BLM, Farmington Field Office w/enclosures
Navajo Nation Minerals Office, Attn: Mr. Akhtar Zaman, Director/w enclosures

MINERAL RESOURCES
ADM 1
NATV AM MIN COORD
SOLID MIN TEAM
PETRO MGMT TEAM 2
O & G INSPECT TEAM
ALL TEAM LEADERS
LAND RESOURCES
ENVIRONMENT
FILES

ExxonMobil Production Company
U.S. West
P.O. Box 4358
Houston, Texas 77210-4358

PB 7/12/2001 SN 543 file

June 27, 2001

ExxonMobil Production

Certified Mail
Return Receipt Requested

RECEIVED #477 JUL 9 - 2001 Navajo Region Office RES - Minerals Section

Ms. Genni Denetsone
United States Department of the Interior
Bureau of Indian Affairs, Navajo Region
Real Estate Services
P. O. Box 1060
Gallup, New Mexico 87305-1060
Mail Code 543

Change of Name –
Mobil Oil Corporation to
ExxonMobil Oil Corporation

Dear Ms. Denetsone:

Effective June 1, 2001, Mobil Oil Corporation (MOC) changed its name to ExxonMobil Oil Corporation (EMOC). This was a name change only; EMOC is the same corporation as Mobil Oil Corporation, but with a new name. No facility or other asset was transferred from one corporation to another by virtue of the name change. Specifically, EMOC will remain the owner and operator of its existing exploration and production oil and gas properties and facilities, as well as relevant permits.

There is no change to the name of Exxon Mobil Corporation, the ultimate shareholder of EMOC.

Please note the change of name of MOC to ExxonMobil Oil Corporation in your records pertaining to any MOC permits.

The Federal Identification Number for MOC (13-5401570) will remain the same for EMOC.

Attached is the Name Change Certification, Current listing of Officers and Directors, Filing Fee of $75/-, Listing of Leases, Financial Statement and a copy of the Rider for Bond number 8027 31 97. The original Bond Rider has been sent to Ms. Barbar Davis at your Washington Office.

If you have any questions , please contact Alex Correa at (713) 431-1012.

Very truly yours,

Charlotte H. Harper

Charlotte H. Harper
Permitting Supervisor

Attachments

RECEIVED JUL 05 2001 NAVAJO REGION OFFICE BRANCH OF REAL ESTATE SERVICES

ExxonMobil Production Company
a division of Exxon Mobil Corporation,
acting for ExxonMobil Oil Corporation

NOTE: Check forwarded to Ella Jessie

Bureau of Indian Affairs
Navajo Region Office
Attn: RRES - Mineral and Mining Section
P.O. Box 1060
Gallup, New Mexico 87305-1060

Gentlemen:

The current listing of officers and director of ExxonMobil Oil Corporation (Name of Corporation), of New York (State) is as follows:

OFFICERS

President	F.A. Risch	Address 5959 Las Colinas Blvd. Irving, TX 75039
Vice President	K.T. Koonce	Address 800 Bell Street Houston, TX 77002
Secretary	F.L. Reid	Address 5959 Las Colinas Blvd. Irving, TX 75039
Treasure	B.A. Maher	Address 5959 Las Colinas Blvd. Irving, TX 75039

DIRECTORS

Name	D.D. Humphreys	Address 5959 Las Colinas Blvd. Irving, TX 75039
Name	P.A. Hanson	Address 5959 Las Colinas Blvd. Irving, TX 75039
Name	T.P. Townsend	Address 5959 Las Colinas Blvd. Irving, TX 75039
Name	B.A. Maher	Address 5959 Las Colinas Blvd. Irving, TX 75039
Name	F.A. Risch	Address 5959 Las Colinas Blvd. Irving, TX 75039

Sincerely,

Alex Correa

This is to certify that the above information pertaining to ExxonMobil Oil Corporation (Corporation) is trust and correct as evidenced by the records and accounts covering business for the State of Utah and in the custody of Corporation Service Company (Agent), Phone: 1 (800)927-9800, whose business address is One Utah Center, 201 South Main Street, Salt Lake City, Utah 84111-2218

(CORPORATE SEAL)

Signature

AGENT AND ATTORNEY IN FACT
Title

SAL

CERTIFICATION

I, the undersigned Assistant Secretary of ExxonMobil Oil Corporation. (formerly Mobil Oil Corporation), a corporation organized and existing under the laws of the State of New York, United States of America, DO HEREBY CERTIFY, That, the following is a true and exact copy of the resolutions adopted by the Board of Directors on May 22, 2001:

CHANGE OF COMPANY NAME

WHEREAS, the undersigned Directors of the Corporation deem it to be in the best interest of the Corporation to amend the Certificate of Incorporation of the Corporation to change the name and principal office of the Corporation:

NOW THEREFORE BE IT RESOLVED, That Article 1st relating to the corporate name is hereby amended to read as follows:

"1st The corporate name of said Company shall be,

ExxonMobil Oil Corporation",

FURTHER RESOLVED, That the amendment of the Corporation's Certificate of Incorporation referred to in the preceding resolutions be submitted to the sole shareholder of the Corporation entitled to vote thereon for its approval and, if such shareholder gives its written consent, pursuant to Section 803 of the Business Corporation Law of the State of New York, approving such amendment, the proper officers of the Corporation be, and they hereby are, authorized to execute in the name of the Corporation the Certificate of Amendment of Certificate of Incorporation, in the form attached hereto;

FURTHER RESOLVED, That the proper officers of the Corporation be and they hereby are authorized and directed to deliver, file and record in its behalf, the Certificate of Amendment of Certificate of Incorporation, and to take such action as may be deemed necessary or advisable to confirm and make effective in all respects the change of this Company's name to EXXONMOBIL OIL CORPORATION.

WITNESS, my hand and the seal of the Corporation at Irving, Texas, this 8th day of June, 2001.

S. A. Millican
Assistant Secretary

COUNTY OF DALLAS)
STATE OF TEXAS)
UNITED STATES OF AMERICA)
Sworn to and subscribed before me at Irving, Texas, U. S. A. on this the 8th day of June, 2001.

Janice M. Phillips
Notary Public

LISTING OF LEASES OF MOBIL OIL CORPORATION

	Lease Number
1)	14-20-0603-6504
2)	14-20-0603-6505
3)	14-20-0603-6506
4)	14-20-0603-6508
5)	14-20-0603-6509
6)	14-20-0603-6510
7)	14-20-0603-7171
8)	14-20-0603-7172A
9)	14-20-600-3530
10)	14-20-603-359
11)	14-20-603-368
12)	14-20-603-370
13)	14-20-603-370A
14)	14-20-603-372
15)	14-20-603-372A
16)	14-20-603-4495
17)	14-20-603-5447
18)	14-20-603-5448
19)	14-20-603-5449
20)	14-20-603-5450
21)	14-20-603-5451

6/1/01

CHUBB GROUP OF INSURANCE COMPANIES

[illegible] South, Suite [illegible], Houston, Texas [illegible]
[illegible] (713) 297-4600 • Facsimile: (713) 297-4759

NW Bond

FEDERAL INSURANCE COMPANY RIDER
to be attached to and form a part of

BOND NO **8027 31 97**
wherein
Mobil Oil Corporation and Mobil Exploration and Producing U.S., Inc. is named as Principal and

FEDERAL INSURANCE COMPANY AS SURETY,

in favor of United States of America, Department of the Interior Bureau of Indian Affairs

in the amount of **$150,000.00**
bond date: 11/01/65

IT IS HEREBY UNDERSTOOD AND AGREED THAT effective **June 1, 2001** the name of the Principal is changed

FROM: **Mobil Oil Corporation and Mobil Exploration and Producing U.S., Inc.**

TO : **ExxonMobil Oil Corporation**

All other terms and conditions of this Bond are unchanged.

Signed, sealed and dated this 12th of June, 2001.

ExxonMobil Oil Corporation

By :

FEDERAL INSURANCE COMPANY

By: Mary Pierson
Mary Pierson, Attorney-in-fact

Chubb Surety

POWER OF ATTORNEY

Federal Insurance Company
Vigilant Insurance Company
Pacific Indemnity Company

Attn.: Surety Department
15 Mountain View Road
Warren, NJ 07059

Know All by These Presents, That **FEDERAL INSURANCE COMPANY,** an Indiana corporation, **VIGILANT INSURANCE COMPANY,** a New York corporation, and **PACIFIC INDEMNITY COMPANY,** a Wisconsin corporation, do each hereby constitute and appoint

Mary Pierson, Philana Berros, and Jody E. Specht of Houston, Texas---------- R.F. Bobo,

each as their true and lawful Attorney-in-Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than bail bonds) given or executed in the course of business, and any instruments amending or altering the same, and consents to the modification or alteration of any instrument referred to in said bonds or obligations.

In Witness Whereof, said **FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY,** and **PACIFIC INDEMNITY COMPANY** have each executed and attested these presents and affixed their corporate seals on this 10th day of May, 2001.

Kenneth C. Wendel, Assistant Secretary

Frank E. Robertson, Vice President

STATE OF NEW JERSEY
County of Somerset } ss.

On this 10th day of May, 2001, before me, a Notary Public of New Jersey, personally came Kenneth C. Wendel, to me known to be Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY, the companies which executed the foregoing Power of Attorney, and the said Kenneth C. Wendel being by me duly sworn, did depose and say that he is Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY and knows the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of the By-Laws of said Companies; and that he signed said Power of Attorney as Assistant Secretary of said Companies by like authority; and that he is acquainted with Frank E. Robertson, and knows him to be Vice President of said Companies; and that the signature of Frank E. Robertson, subscribed to said Power of Attorney is in the genuine handwriting of Frank E. Robertson, and that he saw the same affixed thereto subscribed by authority of said Kenneth C. Wendel in deponent's presence.

Notarial Seal

KAREN A. PRICE NOTARY PUBLIC NEW JERSEY

Notary Public State of New Jersey
No. 2231647
Commission Expires Oct. 28, 2004

Karen A. Price
Notary Public

CERTIFICATION

Extract from the By-Laws of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY:

"All powers of attorney for and on behalf of the Company may and shall be executed in the name and on behalf of the Company, either by the Chairman or the President or a Vice President or an Assistant Vice President, jointly with the Secretary or an Assistant Secretary, under their respective designations. The signature of such officers may be engraved, printed or lithographed. The signature of each of the following officers: Chairman, President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary and the seal of the Company may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such power of attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached."

I, Kenneth C. Wendel, Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY (the "Companies") do hereby certify that

(i) the foregoing extract of the By-Laws of the Companies is true and correct,
(ii) the Companies are duly licensed and authorized to transact surety business in all 50 of the United States of America and the District of Columbia and are authorized by the U. S. Treasury Department; further, Federal and Vigilant are licensed in Puerto Rico and the U. S. Virgin Islands, and Federal is licensed in American Samoa, Guam, and each of the Provinces of Canada except Prince Edward Island; and
(iii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Warren, NJ this 12th day of June, 2001.

FEDERAL INSURANCE COMPANY · INDIANA ·

PACIFIC INDEMNITY COMPANY INCORPORATED JAN. 14, 1775 WISCONSIN

VIGILANT INSURANCE COMPANY NEW YORK

Kenneth C. Wendel, Assistant Secretary

IN THE EVENT YOU WISH TO NOTIFY US OF A CLAIM, VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT ADDRESS LISTED ABOVE, OR BY
Telephone (908) 903-3485 Fax (908) 903-3656 e-mail: surety@chubb.com

F010601000187

CSC 45

CERTIFICATE OF AMENDMENT
OF
CERTIFICATE OF INCORPORATION
OF
MOBIL OIL CORPORATION

(Under Section 805 of the Business Corporation Law)

Pursuant to the provisions of Section 805 of the Business Corporation Law, the undersigned President and Secretary, respectively, of Mobil Oil Corporation hereby certify:

FIRST: That the name of the corporation is MOBIL OIL CORPORATION and that said corporation was incorporated under the name of Standard Oil Company of New York.

SECOND: That the Certificate of Incorporation of the corporation was filed by the Department of State, Albany, New York, on the 10th day of August, 1882.

THIRD: That the amendments to the Certificate of Incorporation effected by this Certificate are as follows:

(a) Article 1st of the Certificate of Incorporation, relating to the corporate name, is hereby amended to read as follows:

"1st The corporate name of said Company shall be,

ExxonMobil Oil Corporation",

(b) Article 7th of the Certificate of Incorporation, relating to the office of the corporation is hereby amended to read as follows:

The office of the corporation within the State of New York is to be located in the County of Albany. The Company shall have offices at such other places as the Board of Directors may from time to time determine.

FOURTH: That the amendments to the Certificate of Incorporation were authorized by the Board of Directors followed by the holder of all outstanding shares entitled to vote on amendments to the Certificate of Incorporation by written consent of the sole shareholder dated May 22, 2001.

IN WITNESS WHEREOF, this Certificate has been signed this 22nd Day of May, 2001.

F. A. Risch, President

STATE OF TEXAS)
COUNTY OF DALLAS)

F. L. REID, being duly sworn, deposes and says that he is the Secretary of MOBIL OIL CORPORATION, the corporation mentioned and described in the foregoing instrument; that he has read and signed the same and that the statements contained therein are true.

F. L. REID, Secretary

SUBSCRIBED AND SWORN TO before me, the undersigned authority, on this the 22nd day of May, 2001.

[SEAL]

NOTARY PUBLIC, STATE OF TEXAS

JANICE M. PHILLIPS
MY COMMISSION EXPIRES
May 16, 2002

CSC
CSC

5184334741

06/01 '01 09:01 NO.411 02/02
06/01 '01 09:06 NO.155 04/04

F010601000187

CSC 45

CERTIFICATE OF AMENDMENT

OF

MOBIL OIL CORPORATION

Under Section 805 of the Business Corporation Law

SAC

100 cc

STATE OF NEW YORK
DEPARTMENT OF STATE
FILED JUN 01 2001
TAX $
BY: SAC
NY | Albany

Filed by: EXXONMOBIL CORPORATION
(Name)

5959 Las Colinas Blvd.
(Mailing address)

Irving, TX 75039-2298
(City, State and Zip code)

Cust Ref # 165578MPT

RECEIVED
JUL 05 2001
DIVISION OF CORPORATIONS AND REAL ESTATE SERVICES

010601000195

State of New York }
Department of State } *ss:*

I hereby certify that the annexed copy has been compared with the original document in the custody of the Secretary of State and that the same is a true copy of said original.

Witness my hand and seal of the Department of State on JUN 01 2001

Special Deputy Secretary of State

DOS-1266 (7/00)

Division of Oil, Gas and Mining

OPERATOR CHANGE WORKSHEET

ROUTING
1. GLH
2. CDW ✓
3. FILE

Change of Operator (Well Sold) — Designation of Agent

X **Operator Name Change** — Merger

The operator of the well(s) listed below has changed, effective: **06-01-2001**

FROM: (Old Operator):	**TO:** (New Operator):
MOBIL EXPLORATION & PRODUCTION	EXXONMOBIL OIL CORPORATION
Address: P O BOX DRAWER "G"	Address: U S WEST P O BOX 4358
CORTEZ, CO 81321	HOUSTON, TX 77210-4358
Phone: 1-(970)-564-5212	Phone: 1-(713)-431-1010
Account No. N7370	Account No. N1855

CA No. **Unit:** **RATHERFORD**

WELL(S)

NAME	SEC TWN RNG	API NO	ENTITY NO	LEASE TYPE	WELL TYPE	WELL STATUS
RATHERFORD UNIT 1-34	01-41S-23E	43-037-16385	6280	INDIAN	OW	P
RATHERFORD UNIT 1-14	01-41S-23E	43-037-31162	6280	INDIAN	OW	P
RATHERFORD 11-41	11-41S-23E	43-037-31544	6280	INDIAN	OW	P
RATHERFORD UNIT 11-43	11-41S-23E	43-037-31622	6280	INDIAN	OW	P
12-14	12-41S-23E	43-037-15844	6280	INDIAN	OW	P
RATHERFORD UNIT 12-23 (MULTI-LEG)	12-41S-23E	43-037-15846	6280	INDIAN	OW	P
RATHERFORD UNIT 12-34	12-41S-23E	43-037-31126	6280	INDIAN	OW	P
RATHERFORD UNIT 12-12	12-41S-23E	43-037-31190	6280	INDIAN	OW	P
RATHERFORD UNIT 12-21	12-41S-23E	43-037-31201	6280	INDIAN	OW	P
RATHERFORD UNIT 12-43	12-41S-23E	43-037-31202	6280	INDIAN	OW	P
RATHERFORD UNIT 12-32	12-41S-23E	43-037-31203	6280	INDIAN	OW	P
RATHERFORD UNIT 13-41	13-41S-23E	43-037-15856	6280	INDIAN	OW	P
N DESERT CR 32-13 (13-32)	13-41S-23E	43-037-16406	6280	INDIAN	OW	S
RATHERFORD UNIT 13-12	13-41S-23E	43-037-31127	6280	INDIAN	OW	P
RATHERFORD UNIT 13-21	13-41S-23E	43-037-31128	6280	INDIAN	OW	P
RATHERFORD UNIT 13-23	13-41S-23E	43-037-31129	6280	INDIAN	OW	P
RATHERFORD UNIT 13-34 (RE-ENTRY)	13-41S-23E	43-037-31130	6280	INDIAN	OW	P
RATHERFORD UNIT 13-43	13-41S-23E	43-037-31131	6280	INDIAN	OW	P
RATHERFORD UNIT 13-14	13-41S-23E	43-037-31589	6280	INDIAN	OW	P
14-32	14-41S-23E	43-037-15858	6280	INDIAN	OW	P

OPERATOR CHANGES DOCUMENTATION

Enter date after each listed item is completed

1. (R649-8-10) Sundry or legal documentation was received from the **FORMER** operator on: 06/29/2001
2. (R649-8-10) Sundry or legal documentation was received from the **NEW** operator on: 06/29/2001
3. The new company has been checked through the **Department of Commerce, Division of Corporations Database on:** 04/09/2002
4. Is the new operator registered in the State of Utah: YES Business Number: 579865-0143
5. If **NO**, the operator was contacted contacted on: N/A

6. **Federal and Indian Lease Wells:** The BLM and or the BIA has approved the merger, name change, or operator change for all wells listed on Federal or Indian leases on: BIA-06/01/01

7. **Federal and Indian Units:**
The BLM or BIA has approved the successor of unit operator for wells listed on: 06/01/2001

8. **Federal and Indian Communization Agreements ("CA"):**
The BLM or BIA has approved the operator for all wells listed within a CA on: N/A

9. **Underground Injection Control ("UIC")** The Division has approved UIC Form 5, **Transfer of Authority to Inject,** for the enhanced/secondary recovery unit/project for the water disposal well(s) listed on: N/A

DATA ENTRY:

1. Changes entered in the **Oil and Gas Database on:** 04/12/2002
2. Changes have been entered on the **Monthly Operator Change Spread Sheet on:** 04/12/2002
3. Bond information entered in RBDMS on: N/A
4. Fee wells attached to bond in RBDMS on: N/A

STATE WELL(S) BOND VERIFICATION:

1. State well(s) covered by Bond Number: N/A

FEDERAL WELL(S) BOND VERIFICATION:

1. Federal well(s) covered by Bond Number: N/A

INDIAN WELL(S) BOND VERIFICATION:

1. Indian well(s) covered by Bond Number: 80273197

FEE WELL(S) BOND VERIFICATION:

1. (R649-3-1) The **NEW** operator of any fee well(s) listed covered by Bond Number N/A
2. The **FORMER** operator has requested a release of liability from their bond on: N/A
The Division sent response by letter on: N/A

LEASE INTEREST OWNER NOTIFICATION:

3. (R649-2-10) The **FORMER** operator of the fee wells has been contacted and informed by a letter from the Division of their responsibility to notify all interest owners of this change on: N/A

COMMENTS:

Form 3160-5
(April 2004)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: March 31, 2007

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE- Other instructions on reverse side.

5. Lease Serial No.
1420603247A

6. If Indian, Allottee or Tribe Name
SHIP ROCK

7. If Unit or CA/Agreement, Name and/or No.
UTU68931A

1. Type of Well
☑ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
RATHERFORD 13-41

2. Name of Operator **EXXONMOBIL OIL CORPORATION**

9. API Well No.
43-037-15856-01-S1

3a. Address
P. O. BOX 4358 HOUSTON, TX 77210-4358

3b. Phone No. *(include area code)*
281-654-1913

10. Field and Pool, or Exploratory Area
GREATER ANETH

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
SEC 13 T41S R23E NENE 660 FNL 660 FEL

11. County or Parish, State
SAN JUAN COUNTY, UT

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☐ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☑ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☑ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other _____
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

10/5/04 MIRU WSU, spot equipment, RU hardlines, bled csg off, flow back 10 bbls tbg, tbg flowing, pump 20 bbls produce water, SISD lightning. SION

10/6/04 BJSA, bled off well, tbg flowing, csg dead, pump 15 bbls 14# KWF down tbg, well dead, POOH LD 68 1", 80 7/8, 62 3/4 T-66 rods, SION

10/7/04 BJSA, well dead, NDWH, NUBOP, test BOP to 1000# held good, release TAC, felt like TAC release, POOH LD 22 jts, SB 90 jts, 113 jts total, found tbg parted at 113th body break corrosion. Swap out trailers, PU RIH w/ 74 jts KS. SION

10/8/04 BJSA, bled well down, slight blew, well dead, POOH, PU overshot, PU RIH W/ 38 jts, tagged fill, PU 1 jts w/ swivel, washover get over fish, latch up, MIRU WL, test BOP and lubricator, RIH w/freepoint tagged at 3533', POOH LD freepoint, PU 1 1/4 sinkerbar, RIH still wouldn't pass 3533', POOH LD tools, RD WI, tried to release TAC, POOH SB 114 jts, LD part of fish and 2 more jts, found bad collars and tbg body, didn't proper slips, elevator, RIH w/ 24 jts KS, SISD.

10/9/04 No Activity, SISD weekend (10/10/04)

SEE ATTACHMENT

14. I hereby certify that the foregoing is true and correct
Name *(Printed/Typed)* **JACQUELINE P. DAVIS**

Title **SUPPORT STAFF OFFICE ASSISTANT**

Signature Jacqueline P. Davis

Date **12/16/2004**

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by _____ Title _____ Date _____

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make 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.

(Instructions on page 2)

RECEIVED
DEC 17 2004
DIV. OF OIL, GAS & MINING

ATTACHMENT TO FORM 3160-5
EXXONMOBIL OIL CORPORATION
RATHERFORD UNIT 13-41
API# 43-037-15856-01-S1

10/11/04 BJSA, POOH, PU another overshot, RIH latch onto fish, POOH SB WS, LD 51 jts, TAC and 5 jts still in the hole, RIH w/ overshot latch back on, POOH w/ small piece of tbg. RIH w/ KS SION.

10/12/04 BJSA, bled well down, slight blow, POOH w/ KS, PU overshot short catch extension, RIH w/ 169 jts, latch onto fish, POOH drag to 53 jts, got stuck, work it free, last fish, ran back in, latch back on, POOH w/ 150 jts, stuck w/ 19 jts in the hole, work it free, POOH LD TAC, 6 jts below, PU RIH w/ bit and scraper, w/ 169 jts, PU 2 jts, POOH SB 20 stds, SION.

10/13/04 BSJA, bled well down, POOH LD bit and scraper, PU RIH w/ RBP, set at 5276', pump circ 120 bbls fresh water, POOH SB 10 jts, dump 3 sxs sand on top RBP, pump 20 bbls behind, SION, high wind.

10/14/04 BSJA, well dead, POOH SB WS RIH w/ 12 jts from derrick old production string, POOH LD, PU RIH w/ packer, set 2055' test good to surface, leak off below, test at 2551', test good below, Leak off to surface, POOH SB 10 jts. SION.

10/15/04 BJSA, well dead, narrow csg leak between 2489' to 2540', test to get rate, pressure right up. POOH drag packer back out, found a lot of red bed formation on packer, POOH SB 10 jts, SISD. Schedule BJ Service for Monday AM for csg squeeze.

10/16/04 No Activity, weekend (10/17/04).

10/18/04 BJSA, RIH w/ 10 jts, MIRU B J Service. Safety mtg, test line to 2000#, pump 1 bbl to fill hole, establish rate .5 BPM 1000#, pump 3 bbls, bled off, start cement, pump 10.5 bbls 50 sxs class H, 15.6#, 1.18 yield, w/ CD-32. POOH SB tbg, pump 6 bbls to fill hole, squeeze 2 1/4 bbls at 1000#, SISD, left 950# on well, RD MO BJ Service. WOC

10/19/04 Monthly Safety mtg, BJSA, RIH tagged cmt at 2293' PU swivel DOC to 2448', test good, circ clean. POOH LD 1 jt. SION

10/20/04 BJSA, well dead, continue to DO to 2500', circ clean, test to 500# for 30 min, test good, POOH SB WS, LD 6 DC, PU retrieving head RBP, SION

10/21/04 BJSA, well dead, tagged fill at 5114', wash down to 5300' w/ 10# brine, latch on to RBP, release RBP, had 700# below RBP, set RBP, latch out, WO KWF. Circ 120 bbls 14# KWF. SION.

10/22/04 BJSA, well dead, latch back on, release RBP, POOH LD 169 jts WS, LD RBP, PU BHA, BP, MA<4' perf sub, SN, 1 jt IPC, 5 jts, TAC, 161 jts, NDBOP, set TAC 18K tension, NUWH, circ out 80 bbls KWF, sent well down flowline, SISD.

10/23/04 No Activity weekend (10/24/04)

10/25/04 BJSA, well flowing, pump 30 bbls 10# brine down tbg, still flowing. WO on heavier KWF, pump 30 bbls 11.6 Cacl, tbg dead, PU GA, 2" pump, 62 3/4 T-66 rods, PU polish rod. SION (found some corroded 7/8 rods, line out crew to load up 82 new 7/8 rods).

10/26/04 BJSA, bled tbg down, PU 82 nes 7/8 T-66 rods, 67 used 1", seated pump, space pump, hang well on, repump flowline. SION.

10/27/04 RD clean location, MO. Final report. Turn well to production.

Division of Oil, Gas and Mining

OPERATOR CHANGE WORKSHEET

ROUTING
1. DJJ
2. CDW

X Change of Operator (Well Sold) Operator Name Change/Merger

The operator of the well(s) listed below has changed, effective: **6/1/2006**

FROM: (Old Operator):	**TO:** (New Operator):
N1855-ExxonMobil Oil Corporation PO Box 4358 Houston, TX 77210-4358	N2700-Resolute Natural Resources Company 1675 Broadway, Suite 1950 Denver, CO 80202
Phone: 1 (281) 654-1936	Phone: 1 (303) 534-4600

CA No. **Unit:** **RATHERFORD**

OPERATOR CHANGES DOCUMENTATION

Enter date after each listed item is completed

1. (R649-8-10) Sundry or legal documentation was received from the **FORMER** operator on: 4/21/2006
2. (R649-8-10) Sundry or legal documentation was received from the **NEW** operator on: 4/24/2006
3. The new company was checked on the **Department of Commerce, Division of Corporations Database on:** 6/7/2006
4. Is the new operator registered in the State of Utah: YES Business Number: 5733505-0143
5. If **NO**, the operator was contacted contacted on:

6a. (R649-9-2)Waste Management Plan has been received on: requested

6b. Inspections of LA PA state/fee well sites complete on: n/a

6c. Reports current for Production/Disposition & Sundries on: ok

7. **Federal and Indian Lease Wells:** The BLM and or the BIA has approved the merger, name change, or operator change for all wells listed on Federal or Indian leases on: BLM n/a BIA not yet
8. **Federal and Indian Units:**
   The BLM or BIA has approved the successor of unit operator for wells listed on: not yet
9. **Federal and Indian Communization Agreements ("CA"):**
   The BLM or BIA has approved the operator for all wells listed within a CA on: n/a
10. **Underground Injection Control ("UIC")** The Division has approved UIC Form 5, **Transfer of Authority to Inject,** for the enhanced/secondary recovery unit/project for the water disposal well(s) listed on: 6/12/2006

DATA ENTRY:

1. Changes entered in the **Oil and Gas Database on:** 6/22/2006
2. Changes have been entered on the **Monthly Operator Change Spread Sheet on:** 6/22/2006
3. Bond information entered in RBDMS on: n/a
4. Fee/State wells attached to bond in RBDMS on: n/a
5. Injection Projects to new operator in RBDMS on: 6/22/2006
6. Receipt of Acceptance of Drilling Procedures for APD/New on: n/a

BOND VERIFICATION:

1. Federal well(s) covered by Bond Number: n/a
2. Indian well(s) covered by Bond Number: PA002769
3. (R649-3-1) The **NEW** operator of any fee well(s) listed covered by Bond Number n/a

a. The **FORMER** operator has requested a release of liability from their bond on: n/a
The Division sent response by letter on: n/a

LEASE INTEREST OWNER NOTIFICATION:

4. (R649-2-10) The **FORMER** operator of the fee wells has been contacted and informed by a letter from the Division of their responsibility to notify all interest owners of this change on: n/a

COMMENTS:

FORM 9

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

5. LEASE DESIGNATION AND SERIAL NUMBER: See attached list
6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Navajo Tribe
7. UNIT or CA AGREEMENT NAME: Ratherford Unit
8. WELL NAME and NUMBER: See attached list
9. API NUMBER: Attached
10. FIELD AND POOL, OR WILDCAT: Greater Aneth

1. TYPE OF WELL: OIL WELL ☐ GAS WELL ☐ OTHER Unit Agreement

2. NAME OF OPERATOR: Resolute Natural Resources Company N2700

3. ADDRESS OF OPERATOR: 1675 Broadway, Suite 1950 CITY Denver STATE CO ZIP 80202 PHONE NUMBER: (303) 534-4600

4. LOCATION OF WELL
FOOTAGES AT SURFACE: See attached list COUNTY: San Juan
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
☐ NOTICE OF INTENT (Submit in Duplicate)	☐ ACIDIZE	☐ DEEPEN	☐ REPERFORATE CURRENT FORMATION
Approximate date work will start:	☐ ALTER CASING	☐ FRACTURE TREAT	☐ SIDETRACK TO REPAIR WELL
	☐ CASING REPAIR	☐ NEW CONSTRUCTION	☐ TEMPORARILY ABANDON
	☐ CHANGE TO PREVIOUS PLANS	☑ OPERATOR CHANGE	☐ TUBING REPAIR
	☐ CHANGE TUBING	☐ PLUG AND ABANDON	☐ VENT OR FLARE
☑ SUBSEQUENT REPORT (Submit Original Form Only)	☐ CHANGE WELL NAME	☐ PLUG BACK	☐ WATER DISPOSAL
Date of work completion:	☐ CHANGE WELL STATUS	☐ PRODUCTION (START/RESUME)	☐ WATER SHUT-OFF
	☐ COMMINGLE PRODUCING FORMATIONS	☐ RECLAMATION OF WELL SITE	☐ OTHER:
	☐ CONVERT WELL TYPE	☐ RECOMPLETE - DIFFERENT FORMATION	

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

Effective June 1, 2006 Exxon Mobil Oil Corporation resigns as operator of the Ratherford Unit. Also effective June 1, 2006 Resolute Natural Resources Company is designated as successor operator of the Ratherford Unit.

A list of affected producing and water source wells is attached. A separate of affected injection wells is being submitted with UIC Form 5, Transfer of Authority to Inject.

As of the effective date, bond coverage for the affected wells will transfer to BIA Bond # PA002769.

NAME (PLEASE PRINT) Dwight E Mallory TITLE Regulatory Coordinator
SIGNATURE Dwt E Mallory DATE 4/20/2006

(This space for State use only)

APPROVED 6/27/06
Earlene Russell
Division of Oil, Gas and Mining
Earlene Russell, Engineering Technician

RECEIVED
APR 24 2006
DIV. OF OIL, GAS & MINING

(5/2000) (See Instructions on Reverse Side)

FORM 9

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

5. LEASE DESIGNATION AND SERIAL NUMBER:

SUNDRY NOTICES AND REPORTS ON WELLS

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Ship Rock

7. UNIT or CA AGREEMENT NAME: UTU68931A

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

1. TYPE OF WELL: OIL WELL ☑ GAS WELL ☐ OTHER

8. WELL NAME and NUMBER: Ratherford

2. NAME OF OPERATOR: ExxonMobil Oil Corporation N1855

9. API NUMBER: attached

3. ADDRESS OF OPERATOR: P.O. Box 4358 CITY Houston STATE TX ZIP 77210-4358 PHONE NUMBER: (281) 654-1936

10. FIELD AND POOL, OR WILDCAT: Aneth

4. LOCATION OF WELL

FOOTAGES AT SURFACE:

COUNTY: San Juan

QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN:

STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
☑ NOTICE OF INTENT (Submit in Duplicate)	☐ ACIDIZE	☐ DEEPEN	☐ REPERFORATE CURRENT FORMATION
Approximate date work will start: 6/1/2006	☐ ALTER CASING	☐ FRACTURE TREAT	☐ SIDETRACK TO REPAIR WELL
	☐ CASING REPAIR	☐ NEW CONSTRUCTION	☐ TEMPORARILY ABANDON
	☐ CHANGE TO PREVIOUS PLANS	☑ OPERATOR CHANGE	☐ TUBING REPAIR
	☐ CHANGE TUBING	☐ PLUG AND ABANDON	☐ VENT OR FLARE
☐ SUBSEQUENT REPORT (Submit Original Form Only)	☐ CHANGE WELL NAME	☐ PLUG BACK	☐ WATER DISPOSAL
Date of work completion:	☐ CHANGE WELL STATUS	☐ PRODUCTION (START/RESUME)	☐ WATER SHUT-OFF
	☐ COMMINGLE PRODUCING FORMATIONS	☐ RECLAMATION OF WELL SITE	☐ OTHER:
	☐ CONVERT WELL TYPE	☐ RECOMPLETE - DIFFERENT FORMATION	

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

ExxonMobil Oil Corporation is transferring operatorship of Greater Aneth field, Ratherford lease to Resolute Natural Resources Company. All change of operator notices should be made effective as of 7:00 AM MST on June 1, 2006.

Attached please find a listing of producers and water source wells included in the transfer.

NAME (PLEASE PRINT) Laurie Kilbride TITLE Permitting Supervisor

SIGNATURE Laurie B. Kilbride DATE 4/19/2006

(This space for State use only) APPROVED 6/27/06
Earlene Russell
Division of Oil, Gas and Mining
Earlene Russell, Engineering Technician

RECEIVED
APR 21 2006
DIV. OF OIL, GAS & MINING

(See Instructions on Reverse Side)

(5/2000)

Ratherford Unit - Producer Well List

minus P&A's

Lease	Number	API #	Status	Lease #	Location					
					Sec	T	R	QTR/QTR	NSFoot	EWFoot
Ratherford	01-14	430373116200S1	Producing	1420603246A	1	41S	23E	SWSW	0660FSL	0660FWL
Ratherford	01-34	430371638501S1	SI	1420603246A	1	41S	23E	SWSE	1133FSL	1980FEL
Ratherford	11-41	430373154400S1	Producing	1420603246A	11	41S	23E	NENE	0860FNL	0350FEL
Ratherford	11-43	430373162201S1	Producing	1420603246A	11	41S	23E	NESE	1980FSL	0660FEL
Ratherford	12-12	430373119000S1	Producing	1420603246A	12	41S	23E	SWNW	1850FNL	0660FWL
Ratherford	12-14	430371584400S1	SI	1420603246A	12	41S	23E	SWSW	0660FSL	4622FEL
Ratherford	12-21	430373120100S1	Producing	1420603246A	12	41S	23E	NENW	0660FNL	1980FWL
Ratherford	12-23	430371584601S1	Producing	1420603246A	12	41S	23E	NESW	1958FSL	3300FEL
Ratherford	12-32	430373120300S1	Producing	1420603246A	12	41S	23E	SWNE	1820FNL	1820FEL
Ratherford	12-34	430373112600S1	Producing	1420603246A	12	41S	23E	SWSE	0675FSL	1905FEL
Ratherford	12-43	430373120200S1	SI	1420603246A	12	41S	23E	NESE	2100FSL	0660FEL
Ratherford	13-12	430373112701S1	Producing	1420603247A	13	41S	23E	SWNW	1705FNL	0640FWL
Ratherford	13-14	430373158900S1	Producing	1420603247A	13	41S	23E	SWSW	0660FSL	0660FWL
Ratherford	13-21	430373112801S1	SI	1420603247A	13	41S	23E	NENW	0660FNL	1920FWL
Ratherford	13-23	430373112900S1	Producing	1420603247A	13	41S	23E	NESW	1980FSL	1930FWL
Ratherford	13-34	430373113001S1	Producing	1420603247A	13	41S	23E	SWSE	0660FSL	1980FEL
Ratherford	13-41	430371585601S1	Producing	1420603247A	13	41S	23E	NENE	660FNL	660FEL
Ratherford	13-43	430373113100S1	Producing	1420603247A	13	41S	23E	NESE	1700FSL	0960FEL
Ratherford	14-32	430371585801S1	Producing	1420603247A	14	41S	23E	SWNE	2130FNL	1830FEL
Ratherford	14-41	430373162300S1	Producing	1420603247A	14	41S	23E	NENE	0521FNL	0810FEL
Ratherford	24-32	430373159300S1	Producing	1420603247A	24	41S	23E	SWNE	2121FNL	1846FEL
Ratherford	24-41	430373113200S1	Producing	1420603247A	24	41S	23E	NENE	0660FNL	0710FEL
Ratherford	17-11	430373116900S1	Producing	1420603353	17	41S	24E	NWNW	1075FNL	0800FWL
Ratherford	17-13	430373113301S1	Producing	1420603353	17	41S	24E	NWSW	2100FSL	0660FWL
Ratherford	17-22	430373117001S1	Producing	1420603353	17	41S	24E	SENW	1882FNL	1910FWL
Ratherford	17-24	430373104400S1	Producing	1420603353	17	41S	24E	SESW	0720FSL	1980FWL
Ratherford	17-31	430373117800S1	Producing	1420603353	17	41S	24E	NWNE	0500FNL	1980FEL
Ratherford	17-33	430373113400S1	Producing	1420603353	17	41S	24E	NWSE	1980FSL	1845FEL
Ratherford	17-42	430373117700S1	Producing	1420603353	17	41S	24E	SENE	1980FNL	0660FEL
Ratherford	17-44	430371573201S1	Producing	1420603353	17	41S	24E	SESE	0660FSL	0660FEL
Ratherford	18-11	430371573300S1	SI	1420603353	18	41S	24E	NWNW	0720FNL	0730FWL
Ratherford	18-13	430371573401S1	Producing	1420603353	18	41S	24E	NWSW	1980FSL	0500FWL
Ratherford	18-22	430373123600S1	Producing	1420603353	18	41S	24E	SENW	2200FNL	2210FWL
Ratherford	18-24	430373107900S1	Producing	1420603353	18	41S	24E	SESW	0760FSL	1980FWL
Ratherford	18-31	430373118101S1	Producing	1420603353	18	41S	24E	NWNE	0795FNL	2090FEL
Ratherford	18-33	430373113501S1	Producing	1420603353	18	41S	24E	NWSE	1870FSL	1980FEL
Ratherford	18-42	430373118200S1	Producing	1420603353	18	41S	24E	SENE	2120FNL	0745FEL
Ratherford	18-44	430373104500S1	SI	1420603353	18	41S	24E	SESE	0660FSL	0660FEL
Ratherford	19-11	430373108000S1	Producing	1420603353	19	41S	24E	NWNW	0660FNL	0660FWL
Ratherford	19-13	430373171900S1	Producing	1420603353	19	41S	24E	NWSW	1980FSL	0660FWL
Ratherford	19-22	430373104601S1	Producing	1420603353	19	41S	24E	SENW	1840FNL	1980FWL
Ratherford	19-24	430373175401S1	Producing	1420603353	19	41S	24E	SESW	0600FSL	1980FWL
Ratherford	19-31	430373104701S1	Producing	1420603353	19	41S	24E	NWNE	510FNL	1980FEL
Ratherford	19-33	430373104800S1	Producing	1420603353	19	41S	24E	NWSE	1980FSL	1980FEL
Ratherford	19-42	430373091600S1	Producing	1420603353	19	41S	24E	SENE	1880FNL	0660FEL
Ratherford	19-44	430373108100S1	Producing	1420603353	19	41S	24E	SESE	0660FSL	0660FEL
Ratherford	19-97	430373159600S1	Producing	1420603353	19	41S	24E	SENE	2562FNL	0030FEL
Ratherford	20-11	430373104900S1	Producing	1420603353	20	41S	24E	NWNW	0500FNL	0660FWL
Ratherford	20-13	430373091700S1	Producing	1420603353	20	41S	24E	NWSW	2140FSL	0500FWL
Ratherford	20-22	430373093000S1	Producing	1420603353	20	41S	24E	SENW	2020FNL	2090FWL
Ratherford	20-24	430373091800S1	Producing	1420603353	20	41S	24E	SESW	0820FSL	1820FWL

Ratherford Unit - Producer Well List

minus P&A's

Lease	Number	API #	Status	Lease #	Location					
					Sec	T	R	QTR/QTR	NSFoot	EWFoot
Ratherford	20-31	430373105001S1	Producing	1420603353	20	41S	24E	NWNE	0660FNL	1880FEL
Ratherford	20-33	430373093100S1	Producing	1420603353	20	41S	24E	NWSE	1910FSL	2140FEL
Ratherford	20-42	430373105100S1	Producing	1420603353	20	41S	24E	SENE	1980FNL	0660FEL
Ratherford	20-44	430373091501S1	Producing	1420603353	20	41S	24E	SESE	0620FSL	0760FEL
Ratherford	20-66	430373159201S1	Producing	1420603353	20	41S	24E	SWNW	1369FNL	1221FWL
Ratherford	20-68	430373159100S1	Producing	1420603353	20	41S	24E	NWSW	1615FSL	1276FWL
Ratherford	15-12	430371571501S1	Producing	1420603355	15	41S	24E	SWNW	1820FNL	0500FWL
Ratherford	15-22	430373044900S1	SI	1420603355	15	41S	24E	SENW	1980FNL	2050FWL
Ratherford	15-32	430371571700S1	Producing	1420603355	15	41S	24E	SWNE	1980FNL	1980FEL
Ratherford	15-33	430371571800S1	Producing	1420603355	15	41S	24E	NWSE	1650FSL	1980FEL
Ratherford	15-41	430371571900S1	TA	1420603355	15	41S	24E	NENE	0660FNL	0660FEL
Ratherford	15-42	430373044800S1	Producing	1420603355	15	41S	24E	SENE	2020FNL	0820FEL
Ratherford	16-13	430373116801S1	Producing	1420603355	16	41S	24E	NWSW	1980FSL	660FWL
Ratherford	16-32	430371572300S1	Producing	1420603355	16	41S	24E	SWNE	1980FNL	1980FEL
Ratherford	16-41	430371572500S1	Producing	1420603355	16	41S	24E	NENE	0660FNL	0660FEL
Ratherford	16-77	430373176800S1	Producing	1420603355	16	41S	24E	NESW	2587FSL	2410FWL
Ratherford	21-23	430371375400S1	Producing	1420603355	21	41S	24E	NESW	1740FSL	1740FWL
Ratherford	21-24	430373172001S1	SI	1420603355	21	41S	24E	SESW	487FSL	2064FWL
Ratherford	21-32	430371575500S1	SI	1420603355	21	41S	24E	SWNE	1880FNL	1980FEL
Ratherford	21-77	430373175801S1	SI	1420603355	21	41S	24E	NWSE	2511FSL	2446FEL
Ratherford	07-11	430373116300S1	Producing	1420603368	7	41S	24E	NWNW	0660FNL	0710FWL
Ratherford	07-13	430373116400S1	Producing	1420603368	7	41S	24E	NWSW	2110FSL	0740FWL
Ratherford	07-22	430373116500S1	Producing	1420603368	7	41S	24E	SENW	1980FNL	1980FWL
Ratherford	07-24	430373116600S1	Producing	1420603368	7	41S	24E	SESW	0880FSL	2414FWL
Ratherford	07-44	430373118900S1	SI	1420603368	7	41S	24E	SESE	0737FSL	0555FEL
Ratherford	08-12	430371599100S1	Producing	1420603368	8	41S	24E	SWNW	1909FNL	0520FWL
Ratherford	08-21	430371599300S1	Producing	1420603368	8	41S	24E	NENW	0616FNL	1911FWL
Ratherford	08-23	430371599400S1	Producing	1420603368	8	41S	24E	NESW	1920FSL	2055FWL
Ratherford	08-32	430371599500S1	Producing	1420603368	8	41S	24E	SWNE	1980FNL	1980FEL
Ratherford	08-34	430371599600S1	Producing	1420603368	8	41S	24E	SWSE	0660FSL	1980FEL
Ratherford	04-34	430371616400S1	Producing	14206034035	4	41S	24E	SWSE	0660FSL	1980FEL
Ratherford	11-14	430371616700S1	Producing	14206034037	11	41S	24E	SWSW	0660FSL	0660FWL
Ratherford	09-34	430371571100S1	SI	14206034043	9	41S	24E	SWSE	0660FSL	1980FEL
Ratherford	10-12	430371571200S1	Producing	14206034043	10	41S	24E	SWNW	1980FNL	0660FWL
Ratherford	10-14	430371571300S1	Producing	14206034043	10	41S	24E	SWSW	0510FSL	0710FWL
Ratherford	10-32	430371571400S1	TA	14206034043	10	41S	24E	SWNE	2080FNL	1910FEL
Ratherford	10-44	430373045100S1	TA	14206034043	10	41S	24E	SESE	0820FSL	0510FEL
Ratherford	29-11	430373105300S1	Producing	1420603407	29	41S	24E	NWNW	0770FNL	0585FWL
Ratherford	29-22	430373108200S1	Producing	1420603407	29	41S	24E	SENW	2130FNL	1370FWL
Ratherford	29-31	430373091401S1	Producing	1420603407	29	41S	24E	NWNE	0700FNL	2140FEL
Ratherford	29-33	430373093200S1	SI	1420603407	29	41S	24E	NWSE	1860FSL	1820FEL
Ratherford	29-34	430371534000S1	SI	1420603407	29	41S	24E	SWSE	0817FSL	2096FEL
Ratherford	29-42	430373093700S1	SI	1420603407	29	41S	24E	SENE	1850FNL	0660FEL
Ratherford	30-32	430371534200S1	Producing	1420603407	30	41S	24E	SWNE	1975FNL	2010FEL
Ratherford	28-11	430373044600S1	Producing	1420603409	28	41S	24E	NWNW	0520FNL	0620FWL

Ratherford Unit - Producer Well List

minus P&A's

Lease	Number	API #	Status	Lease #	Location					
					Sec	T	R	QTR/QTR	NSFoot	EWFoot
Ratherford	09-12	430371512600S1	Producing	14206035045	9	41S	24E	SWNW	1865FNL	0780FWL
Ratherford	09-14	430371512700S1	Producing	14206035046	9	41S	24E	SWSW	0695FSL	0695FWL
Ratherford	04-14	430371616300S1	Producing	14206035446	4	41S	24E	SWSW	0500FSL	0660FWL
Ratherford	03-12	430371562000S1	Producing	14206036506	3	41S	24E	SWNW	2140FNL	0660FWL

Water Source Wells (Feb 2006)

RU	S1	4303700001	Active
RU	S2	4303700002	Active
RU	S3	4303700003	Active
RU	S4	4303700004	Active
RU	S5	4303700005	Active
RU	S6	4303700006	Active
RU	S7	4303700007	Active
RU	S8	4303700008	Active
RU	S9	4303700009	Active
RU	S10	4303700010	Active
RU	S11	4303700011	Active
RU	S12	4303700012	Active
RU	S13	4303700013	Active
RU	S14	4303700014	Active
RU	S16	4303700016	Active
RU	S17	4303700017	Active

FEDERAL APPROVAL OF THIS ACTION IS NECESSARY

FORM 9

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS, AND MINING

5.LEASE DESIGNATION AND SERIAL NUMBER: 14-20-603-247A

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: NAVAJO

7.UNIT or CA AGREEMENT NAME: RATHERFORD

1. TYPE OF WELL Oil Well

8. WELL NAME and NUMBER: RATHERFORD 13-41

2. NAME OF OPERATOR: RESOLUTE NATURAL RESOURCES

9. API NUMBER: 43037158560000

3. ADDRESS OF OPERATOR: 1675 Boradway Ste 1950 , Denver, CO, 80202

PHONE NUMBER: 303 534-4600 Ext

9. FIELD and POOL or WILDCAT: GREATER ANETH

4. LOCATION OF WELL
FOOTAGES AT SURFACE: 0660 FNL 0660 FEL
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: NENE Section: 13 Township: 41.0S Range: 23.0E Meridian: S

COUNTY: SAN JUAN

STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
✓ NOTICE OF INTENT Approximate date work will start: 5/8/2013	☐ ACIDIZE	☐ ALTER CASING	☐ CASING REPAIR
	☐ CHANGE TO PREVIOUS PLANS	☐ CHANGE TUBING	☐ CHANGE WELL NAME
	☐ CHANGE WELL STATUS	☐ COMMINGLE PRODUCING FORMATIONS	☐ CONVERT WELL TYPE
☐ SUBSEQUENT REPORT Date of Work Completion:	☐ DEEPEN	☐ FRACTURE TREAT	☐ NEW CONSTRUCTION
	☐ OPERATOR CHANGE	☐ PLUG AND ABANDON	☐ PLUG BACK
	☐ PRODUCTION START OR RESUME	☐ RECLAMATION OF WELL SITE	☐ RECOMPLETE DIFFERENT FORMATION
☐ SPUD REPORT Date of Spud:	☐ REPERFORATE CURRENT FORMATION	☐ SIDETRACK TO REPAIR WELL	☐ TEMPORARY ABANDON
	☐ TUBING REPAIR	☐ VENT OR FLARE	☐ WATER DISPOSAL
☐ DRILLING REPORT Report Date:	☐ WATER SHUTOFF	☐ SI TA STATUS EXTENSION	☐ APD EXTENSION
	☐ WILDCAT WELL DETERMINATION	✓ OTHER	OTHER: rod repair/pump upsize

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

Resolute proposes to repair the rods in the RU #13-41, a quad lateral producer, which went down with rod failure on 4-21-13. In addition to repairing the failed rod string, it is planned to replace the 1-3/4" tubing pump in the well with a 2-1/4" tubing pump and replace the 912 pumping unit with a 1280 unit in order to lift more fluid and increase production. An existing wellbore diagram, proposed wellbore diagram, BOP stack diagram and water source wells are attached to this sundry.

Accepted by the Utah Division of Oil, Gas and Mining

Date: May 13, 2013

By: Dark K Quist

NAME (PLEASE PRINT)	PHONE NUMBER	TITLE
Sherry Glass	303 573-4886	Sr Regulatory Technician
SIGNATURE N/A		**DATE** 5/6/2013

RECEIVED: May. 06, 2013

Rod Repair, Downhole Pump & Pumping Unit Upgrades
Ratherford Unit 13-41
660' FNL & 660' FEL
Sec 13, T41S, R23E
San Juan County, Utah
API 43-037-15856
PRISM 0043011

Recompletion Procedure (Sundry – Notice of Intent)

1. MIRU WSU.
2. Pull & LD rods.
3. NU BOPE to pull tubing. Test BOPE.
4. Release TAC & tag for fill on bottom with extra joint(s).
5. Pull 2-3/8 tubing & 1-3/4" tubing pump.
6. Clean out to PBD if necessary, using nitrogen.
7. RIH w/new BHA on 2-3/8 tubing including MA joint on bottom, 2-1/4" tubing pump, 4 jts tubing, 4" TAC, and tubing to surface.
8. Land tubing with EOT at ~5420', TAC at ~5230'.
9. ND BOPE, NU WH.
10. RIH with rod string & on/off connector.
11. Latch pump plunger, long stroke the pump to check the pump action.
12. Make polish rod adjustment for correct pump spacing.
13. Check alignment of the new 1280 unit; hang well on & start the unit.
14. RDMOL.

RECEIVED: May. 06, 2013

15. Resume appropriate chemical treatment.

Job Scope – Repair parted rods, replace 1-3/4"downhole tubing pump with 2-1/4", Replace 912 pumping unit with 1280 unit for increased production. Chinle has been previously cemented.

1. Wellbore Diagrams –
    a) Existing Wellbore Diagram – Attachment No. 1
    b) Proposed Wellbore Diagram – Attachment No. 2

2. BOP Diagram and Equipment Description – Attachment No. 3

RECEIVED: May. 06, 2013

RATHERFORD UNIT # 13-41
GREATER ANETH FIELD
Surface Loc: 660' FNL & 660' FEL
SEC 13-T41S-R23E

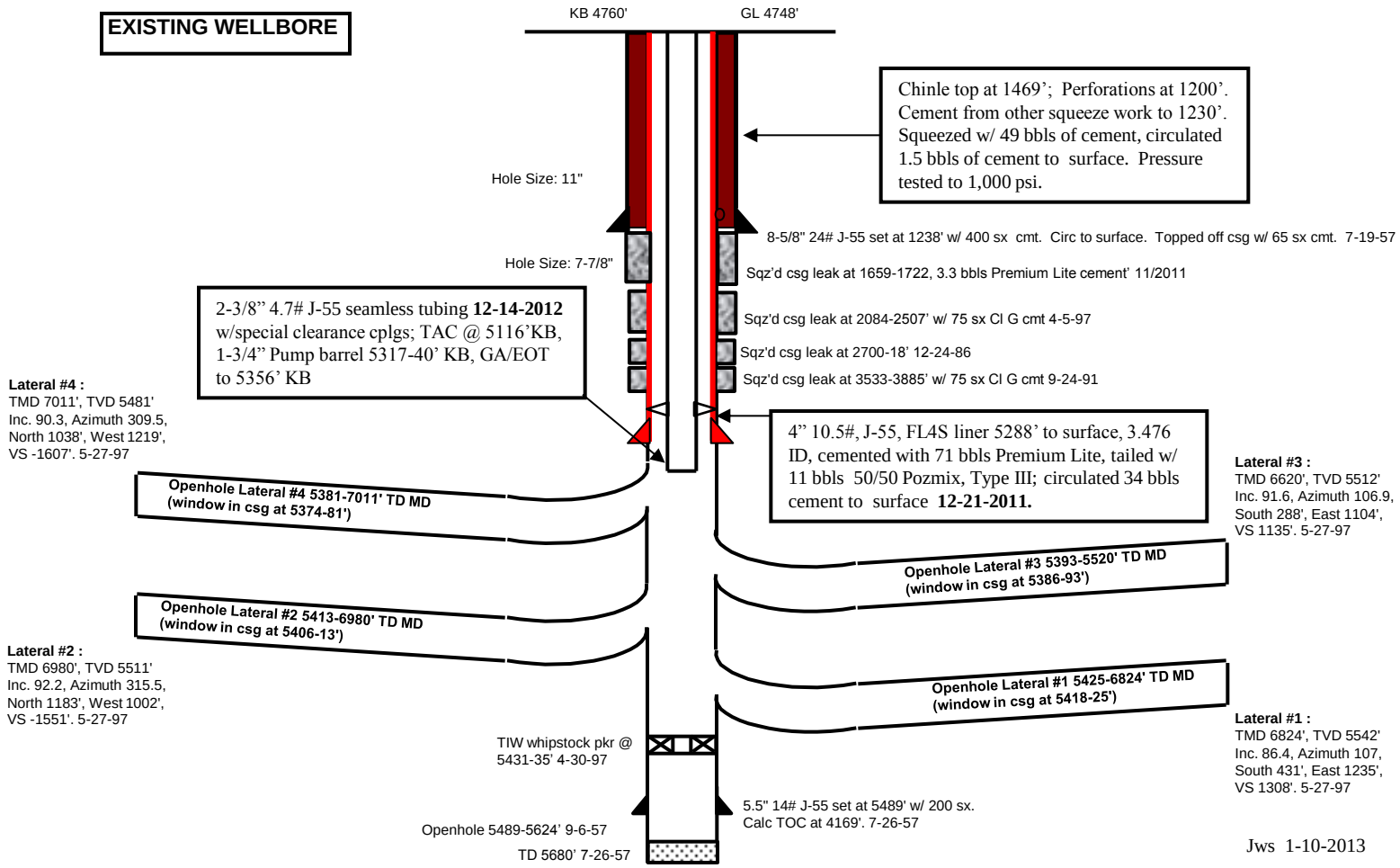
B.H. Location Lateral #1:
431' S & 1235' E of Surface Location

B.H. Location Lateral #2:
1183' N & 1002' W of Surface Location

B.H. Location Lateral #3:
288' S & 1104' E of Surface Location

B.H. Location Lateral #4:
1038' N & 1219' W of Surface Location

PRODUCER
SAN JUAN COUNTY, UTAH
API 43-037-15856
PRISM 0043011



Jws 1-10-2013

RATHERFORD UNIT # 13-41
GREATER ANETH FIELD
Surface Loc: 660' FNL & 660' FEL
SEC 13-T41S-R23E

B.H. Location Lateral #1:
431' S & 1235' E of Surface Location

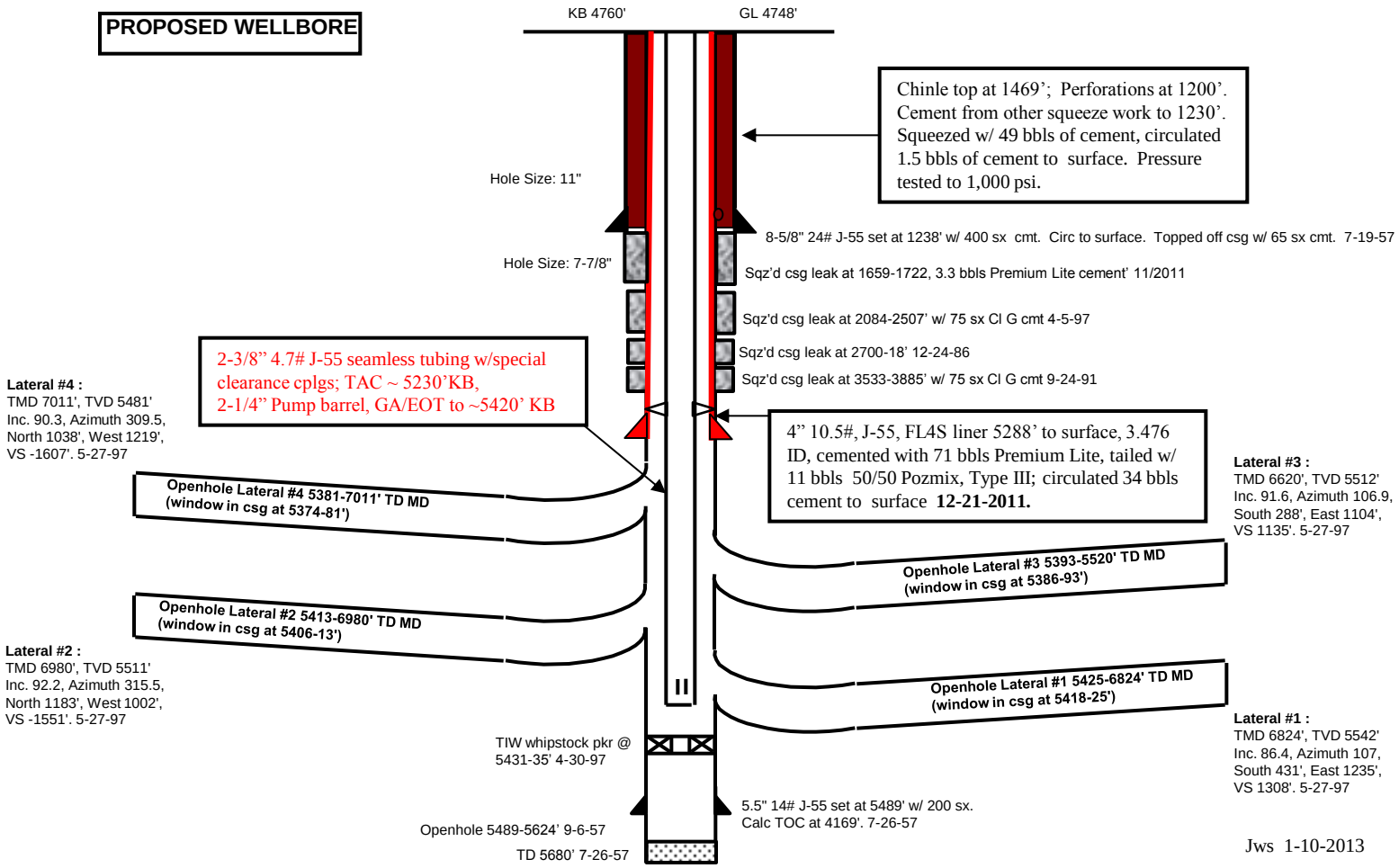
B.H. Location Lateral #2:
1183' N & 1002' W of Surface Location

B.H. Location Lateral #3:
288' S & 1104' E of Surface Location

B.H. Location Lateral #4:
1038' N & 1219' W of Surface Location

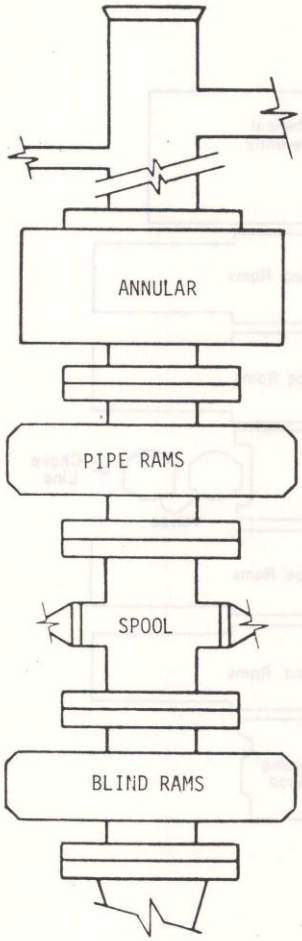
PRODUCER
SAN JUAN COUNTY, UTAH
API 43-037-15856
PRISM 0043011

PROPOSED WELLBORE



Jws 1-10-2013

Attachment No. 3



7-1/16 inch x 5000 psig with stainless steel trim for sour service operations

2-7/8 inch pipe rams, 7-1/16 inch x 5000 psig with stainless steel trim for sour service operations

7-1/16 inch x 5000 psig with stainless steel trim for sour service operations

TYPICAL WORKOVER BOP STACK

Figure 30

RECEIVED: May. 06, 2013

Well No.	DWP No.	WUP # 1996	WUP # 1997	Sec-Twp-Rg	GPS Coordinates		East (1995)	North (1995)	Appl #	Completed	Comments
McElmo											
1-PIT	PIT	95-529	97-223	18-41S-25E			658980	4121100			Abandoned
2	12-0715	95-530	97-201	17-41S-25E	37° 13.226' N	109° 12.242' N	659410	4120650	29718, A3777	9/14/61	
3	12-0716	95-531	97-202	17-41S-25E	37° 13.196' N	019° 12.187' N	659580	4120480	29718, A3777	10/3/61	
4	12-0717	95-532	97-203	17-41S-25E	37° 13.166' N	019° 12.142' N	659560	4120520	29718, A3777	10/17/61	
5	12-0718	95-533	97-204	17-41S-25E	37° 13.132' N	019° 12.098' N	659630	4120460	29718, A3777	10/19/61	
6	12-0719	95-534	97-205	17-41S-25E	37° 13.096' N	019° 12.053' N	659690	4120890	31023 A-3777	4/26/62	
7	12-0720	95-512	97-206	17-41S-25E	37° 13.055' N	019° 12.032' N	659725	4120325	31023 A-3777	4/30/62	
8	12-0721	95-513	97-207	17-41S-25E	37° 13.023' N	019° 12.986' N	659800	4120265	31023 A-3777	5/4/62	
9	12-0722	95-514	97-208	17-41S-25E	37° 13.010' N	109° 11.932' N	659880	4120230	31023 A-3777	5/8/62	
10	12-0723	95-515	97-209	17-41S-25E	37° 12.996' N	109° 11.866' N	659980	4120220	31023 A-3777	5/12/62	
11	12-0724	95-516	97-210	17-41S-25E	37° 12.993' N	109° 11.809' N	660060	4120210	29718 31023	11/28/62	
12	12-0725	95-517	97-211	17-41S-25E	37° 13.028' N	109° 11.768' N	660125	4120270	29718 A-3777	12/5/62	Not in Service, no pump
13	12-0726	95-518	97-212	18-41S-25E	37° 13.432' N	109° 12.415' N	659145	4121010	29178 31023	12/9/62	
14	12-0727	95-519	97-213	18-41S-25E	37° 13.436' N	109° 12.473' N	659045	4121010	A-31023	12/12/62	
15	12-0728	95-520	97-214	17-41S-25E	37° 13.404' N	109° 12.365' N	659230	4120950	A-31023	12/26/62	
16	12-0729	95-521	97-215	17-41S-25E	37° 13.361' N	109° 12.341' N	659265	4120870	A-31023	1/8/63	
17	12-0730	95-522	97-216	17-41S-25E	37° 13.312' N	109° 12.325' N	659285	4120785	A-31023	1/12/63	
18	12-0731	95-523	97-217	17-41S-25E	37° 13.027' N	109° 12.894' N	659940	4120270	29718, A3777	4/5/63	
19	12-0732	95-524	97-218	17-41S-25E	37° 13.002' N	109° 12.900' N	659925	4120230	29718, A3777	4/10/63	
20	12-0733	95-525	97-219	17-41S-25E	37° 13.062' N	109° 12.994' N	659780	4120335	29718, A3777	4/17/63	
21	12-0734	95-526	97-220	17-41S-25E	37° 13.013' N	109° 12.965' N	659835	4120240	29718,	4/19/63	
22	12-0735	95-527	97-221	17-41S-25E	37° 13.030' N	109° 12.016' N	659750	4120278	A3777, 29718	4/22/63	Community
O-24	12-0736	95-528	97-222	17-41S-25E	37° 13.475' N	109° 12.504' N	659815	4120300		3/14/64	former oil well MCU O-24, 13-3/8"surf., 8-5/8" prod. csgs 1200' deep, out of service since 1975, needs P&A

Well No.	DWP No	WUP # 1996	WUP # 1997	Sec-Twp-Rg	GPS Coordinates		East (1995)	North (1995)	Appl #	Completed	Comments
Ratherford											
1	09-0614	95-496	97-224	5-41S-24E	37° 15.333' N	109° 17.603' W	650740	4124380	32-773	11/21/61	
2	09-0615	95-497	97-225	5-41S-24E	37° 15.330' N	109° 17.865' W	650560	4124380	32-773	11/28/61	
3	09-0616	95-498	97-226	5-41S-24E	37° 15.332' N	109° 17.928' W	650380	4124380	32-733	12/2/61	
4	09-0617	95-499	97-227	5-41S-24E	37° 15.331' N	109° 17.900' W	650470	4124380	32-733	12/3/62	
5	09-0618	95-500	97-228	5-41S-24E	37° 15.335' N	109° 17.835' W	650650	4124380	32-733	12/11/62	
6	09-0619	95-501	97-229	5-41S-24E	37° 15.349' N	109° 17.776' W	650840	4124380	32-733	12/28/62	
7	09-0620	95-502	97-230	5-41S-24E	37° 15.353' N	109° 17.750' W	650900	4124380	32-733	12/15/62	
8	09-0621	95-503	97-231	5-41S-24E	37° 15.355' N	109° 17.720' W	651040	4124380	32-733	12/21/62	
9	09-0622	96-202	97-232	5-41S-24E	37° 15.360' N	109° 17.689' W	651120	4124400	32-733	12/27/62	
10	09-0623	95-504	97-233	5-41S-24E	37° 15.364' N	109° 17.656' W	651205	4124425	32-733	1/2/63	
11	09-0624	95-505	97-234	5-41S-24E	37° 15.365' N	109° 17.627' W	651290	4124430	32-733	1/5/63	
13	09-0625	95-506	97-235	5-41S-24E	37° 15.364' N	109° 17.545' W	651470	4124430	32-733	1/5/63	
14	09-0626	95-507	97-236	5-41S-24E	37° 15.367' N	109° 17.506' W	651560	4124430	32-733	1/16/63	
15	09-0627	95-508	97-237	5-41S-24E	37° 15.368' N	109° 17.464' W	651640	4124430	32-733	2/3/63	
16	09-0628	95-509	97-238	5-41S-24E	37° 15.373' N	109° 17.421' W	651760	4124460	32-733	2/4/63	
17	09-0629	95-510	97-239	5-41S-24E	37° 15.374' N	109° 17.381' W	651840	4124480	32-733	2/8/63	
14-33	09-0642	95-511	97-240	14-41S-24E	37° 15.389' N	109° 17.589' W	645850	4119050			Water well abandoned 09-01-1998. Cut & Capped

Summary		35	operated wells								
		2	not prod.	95-528	95-517						
		2	aband.	95-529	95-511						
		1	NTU	95-527							
		40	Total Wells in listed in RCMA-55-96, WUP 95-495 to 95-528 & 96-202								

Additional Unlisted Wells at Ratherford				Sec-Twp-Rg	GPS Coordinates				Appl #	Completed	Comments
19				5-41S-24E	37° 15.217' N	109° 16.769' W			32-773	4/22/64	In service
20				5-41S-24E	37° 15.220' N	109° 16.888' W			32-773	4/14/64	In Service
22				5-41S-24E	37° 15.219' N	109° 16.832' W			32-773		Operable, but has power problems
23				5-41S-24E	37° 15.228' N	109° 17.014' W			32273	4/20/64	Operable, but has power problems
		4	Additional unlisted wells								

FEDERAL APPROVAL OF THIS ACTION IS NECESSARY

FORM 9

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS, AND MINING

5.LEASE DESIGNATION AND SERIAL NUMBER: 14-20-603-247A

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: NAVAJO

7.UNIT or CA AGREEMENT NAME: RATHERFORD

1. TYPE OF WELL Oil Well

8. WELL NAME and NUMBER: RATHERFORD 13-41

2. NAME OF OPERATOR: RESOLUTE NATURAL RESOURCES

9. API NUMBER: 43037158560000

3. ADDRESS OF OPERATOR: 1675 Boradway Ste 1950 , Denver, CO, 80202

PHONE NUMBER: 303 534-4600 Ext

9. FIELD and POOL or WILDCAT: GREATER ANETH

4. LOCATION OF WELL
FOOTAGES AT SURFACE: 0660 FNL 0660 FEL
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: NENE Section: 13 Township: 41.0S Range: 23.0E Meridian: S

COUNTY: SAN JUAN

STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

- ✓ NOTICE OF INTENT — Approximate date work will start: 11/5/2013
- ☐ SUBSEQUENT REPORT — Date of Work Completion:
- ☐ SPUD REPORT — Date of Spud:
- ☐ DRILLING REPORT — Report Date:

TYPE OF ACTION

☐ ACIDIZE	☐ ALTER CASING	☐ CASING REPAIR
☐ CHANGE TO PREVIOUS PLANS	☐ CHANGE TUBING	☐ CHANGE WELL NAME
☐ CHANGE WELL STATUS	☐ COMMINGLE PRODUCING FORMATIONS	☐ CONVERT WELL TYPE
☐ DEEPEN	☐ FRACTURE TREAT	☐ NEW CONSTRUCTION
☐ OPERATOR CHANGE	☐ PLUG AND ABANDON	☐ PLUG BACK
☐ PRODUCTION START OR RESUME	☐ RECLAMATION OF WELL SITE	☐ RECOMPLETE DIFFERENT FORMATION
☐ REPERFORATE CURRENT FORMATION	☐ SIDETRACK TO REPAIR WELL	☐ TEMPORARY ABANDON
✓ TUBING REPAIR	☐ VENT OR FLARE	☐ WATER DISPOSAL
☐ WATER SHUTOFF	☐ SI TA STATUS EXTENSION	☐ APD EXTENSION
☐ WILDCAT WELL DETERMINATION	☐ OTHER	OTHER:

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

Resolute proposes to attempt to repair the rods in the subject well to enhance production. The proposed procedure, including work history, and well schematic are attached. Work is expected to commence on 11-5-13.

Accepted by the Utah Division of Oil, Gas and Mining

Date: November 05, 2013

By: Dark K Quist

NAME (PLEASE PRINT)	PHONE NUMBER	TITLE
Sherry Glass	303 573-4886	Sr Regulatory Technician

SIGNATURE	DATE
N/A	10/31/2013

RECEIVED: Oct. 31, 2013

RESOLUTE
NATURAL RESOURCES

RU 13-41
660' FNL, 660' FEL
NENE section 13-T41S-R23E
43-037-15856
Repair Parted Rods

Job Scope

Job Scope includes: Pull and inspect rods & on-off connector, PU TBIH with rods & new on-off connector.
(Acid planned? /N; Change of tubing size? /N; Paraffin expected? /N)

Work History

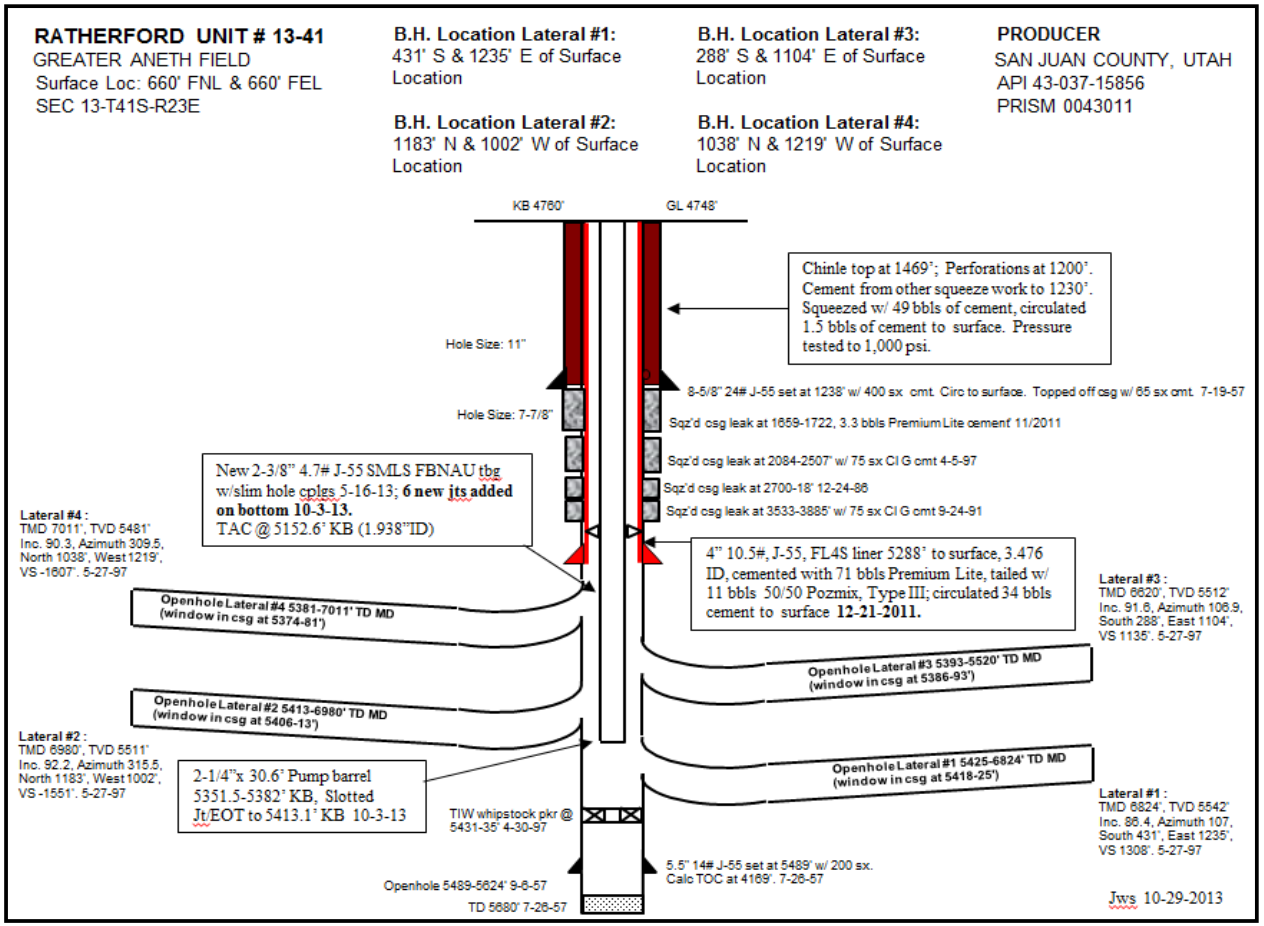
5-13-2013: Parted Rods - 7/8" rod box part at #12; LD all 3/4" rods, Pulled & LD all Tbg. PU new 2-1/4" Tbg barrel pump. Ran new 2-3/8" FBNAU Tbg. Ran new 7/8" T-66 rods w/ slim hole cplgs, all new rod boxes, Start up new 1280 Mark II pumping unit at 5 SPM.
8-26-2013: Tubing Repair - Pulled rods & tubing; LD bottom 81 x 7/8 rods; no tbg leak found except pump-out shear sub was sheared; N2 CO 57' of fill to 5431' PBD, Re-ran 2-1/4" x 30.6' pump barrel swapped end for end w/80 new joints 2-3/8 tubing on bottom.
10-1-2013: Rod Repair - PT'd tubing to 1000 psi - good test; Pulled rods, found on/off tool parted, Pulled tbg & pump barrel; Ran back new 2-1/4" pump barrel, re-ran tbg w/6 new joints on bottom; Ran back same T-66 rods w/80 new 7/8 on bottom plus new on/off tool. Reduced SPM from 5 to 4.

Procedure

Horsley Witten: No (Chinle previously isolated)

1. MIRU WSU, LOTO,
2. Pressure test tubing to 1000 psig.
3. Kill well as necessary.
4. POOH with rods and on-off tool. Stand back rods in derrick. Call and notify Bill Albert (970) 371-9682 to inspect rods. If unavailable, contact Tech Support (Virgil Holly (435) 444-0020, or Julius Claw (435) 444-0156. Replace rods &/or on-off tool per inspection results.
5. If tbg PT fails, ND WH, NU BOPE to pull tubing. If PT is good, go to step 14.
6. Release the TAC @ 5152.6' KB. Install a packer. Pressure test BOPE.
7. PU 1 extra joint & tag fill; Current EOT at 5414' KB, PBD at 5431' KB (had 57' of fill in August 2013).
8. TOOH with 2-3/8 tubing & 2-1/4 tbg barrel pump, standing back. Tear down & evaluate the pump.
9. Call & notify Bill Albert to inspect tubing. If unavailable, contact Virgil H. or Julius Claw.
10. If required, RIH w/3-3/4 bit & clean out to TIW @ 5431' KB using Global N2.
11. If tubing is replaced or select jts replaced, run new 2-3/8" J-55 seamless, FBNAU tbg w/slim hole cplgs.
12. TIH with mud anchor, tubing pump barrel & plunger, tubing, TAC, and tubing to surface.
13. NDBOP, NUWH.
14. RIH with 7/8" rods & new on-off connector. Contact Tech Support for pump and rod details.
15. Latch onto pump plunger, long stroke pump to test for good pumping action.
16. Leave enough polished rod for operators to correctly space pump as required;
    Use crane to replace pump unit head.
17. Notify the Area Production Supervisor Billison Rentz (970) 779-9273 that well is ready.
18. RDMOL. Hook up appropriate chemical treatment.

RECEIVED: Oct. 31, 2013



RECEIVED: Oct. 31, 2013

FORM 9

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS, AND MINING

5.LEASE DESIGNATION AND SERIAL NUMBER: 14-20-603-247A

SUNDRY NOTICES AND REPORTS ON WELLS

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6. IF INDIAN, ALLOTTEE OR TRIBE NAME: NAVAJO

7.UNIT or CA AGREEMENT NAME: RATHERFORD

1. TYPE OF WELL Oil Well

8. WELL NAME and NUMBER: RATHERFORD 13-41

2. NAME OF OPERATOR: RESOLUTE NATURAL RESOURCES

9. API NUMBER: 43037158560000

3. ADDRESS OF OPERATOR: 1675 Boradway Ste 1950 , Denver, CO, 80202

PHONE NUMBER: 303 534-4600 Ext

9. FIELD and POOL or WILDCAT: GREATER ANETH

4. LOCATION OF WELL
FOOTAGES AT SURFACE: 0660 FNL 0660 FEL
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: NENE Section: 13 Township: 41.0S Range: 23.0E Meridian: S

COUNTY: SAN JUAN

STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

- ☐ NOTICE OF INTENT — Approximate date work will start:
- ✓ SUBSEQUENT REPORT — Date of Work Completion: 11/27/2013
- ☐ SPUD REPORT — Date of Spud:
- ☐ DRILLING REPORT — Report Date:

TYPE OF ACTION

☐ ACIDIZE	☐ ALTER CASING	☐ CASING REPAIR
☐ CHANGE TO PREVIOUS PLANS	☐ CHANGE TUBING	☐ CHANGE WELL NAME
☐ CHANGE WELL STATUS	☐ COMMINGLE PRODUCING FORMATIONS	☐ CONVERT WELL TYPE
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☐ WATER SHUTOFF	☐ SI TA STATUS EXTENSION	☐ APD EXTENSION
☐ WILDCAT WELL DETERMINATION	☐ OTHER	OTHER:

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

Resolute completed tubing repairs to the subject well to enhance production on 11-27-13. The well was put back to production at that time. Daily activity summary, well bore schematic and tubing detail are attached.

Accepted by the Utah Division of Oil, Gas and Mining
FOR RECORD ONLY
December 02, 2013

NAME (PLEASE PRINT)	PHONE NUMBER	TITLE
Sherry Glass	303 573-4886	Sr Regulatory Technician

SIGNATURE	DATE
N/A	12/2/2013

RECEIVED: Dec. 02, 2013

RESOLUTE NATURAL RESOURCES

Daily Activity Summary

Well Name: Ratherford U 1341

API Number	Section	Township	Range	Field Name	County	State/Province
4303715856	13	41S	23E	Ratherford	San Juan	Utah

Ground Elevation (ft)	Casing Flange Elevation (ft)	KB-Ground Distance (ft)	KB-Casing Flange Distance (ft)	Regulatory Spud Date	Rig Release Date/Time
4,722.00		36.00		7/19/1957 00:00	5/27/1997 00:00

Job Category	Primary Job Type	AFE Number
Workover	Rod Repair	10013472

Start Date	End Date	Total AFE Amount (Cost)
11/6/2013		

Objective

Job Scope includes: Pull and inspect rods and on-off connector, PU TBIH with rods and new on-off connector.
.

Contractor	Rig Number	Rig on Report Date	Rig off report date
TOPPS	1	11/6/2013	

Report Number	Start Date	End Date	Summary
1	11/6/2013	11/6/2013	MIRU spot LO/TO loc. Fill out jsa, safety mtg. Spot in, RU WSU, safety equip, and hard lines. LD horse head, TOOH, hang rods. V.Holly inspected rods, decided to LD all rods. TIH, spot trailer, LD all rods.
2	11/7/2013	11/7/2013	got tbg peroforated NU BOP got BOP tested TOOH LD tbg pump TIH kill string
3	11/8/2013	11/8/2013	TIH with tbg to PBD @ 5,431' CO N2
4	11/11/2013	11/11/2013	TOOH stand back tbg, LD bottom 20 jts. PU MA, tbg pump. PU 20 new jts, TIH with tbg from derrick.
5	11/12/2013	11/12/2013	Pump and kill well. RD floor, ND BOP, set TAC. RU well head, PU rods with on/ off tools. PU new T-66 7/8" rods. Latch on, space pump, psi test. RD WSU, RD hard lines and safety equip.
6	11/13/2013	11/13/2013	Hang on horse head with crane truck. Had trouble with pump. RD MO, re-spot, RUWSU back in, try to unlatch off tbg pump.
7	11/14/2013	11/14/2013	unlatch off release tbg pump TOOH hang back rods CO to tbg equip, NU BOP RU floor test bop
8	11/15/2013	11/15/2013	get tbg perforated pump 10 down TOOH LD BHA spot in tbg trail inPU treating PKR PU tbg
9	11/16/2013	11/16/2013	finish up PU tbg set PKR @ 5220' acidizing well with 3000 gal of 15 % acid HCL flushed 150 FW @ 4 to 5 BBLS per min only seen about 630 psi while we pumping acid and 150 flush psi was onl 585 psi, SITP was 585 psi, 5 min SITP 560, 10 min SITP 517, 15 min SITP 517
10	11/18/2013	11/18/2013	Flow back well all day take solids and samples start off with dark water heavy solids it and clear up hardly any solids in it flow back 760 BBLS back
11	11/19/2013	11/19/2013	flow back180 BBLS returns were clean and hardly solids in it pump Scale inhibitor 55 gal, WLC821, 6 BBLS FW w/ 2 gal WAW3003 surfactant mixed in, 4 drums SCW 35 mixed in 31 BBLS FW, switched to rig pump displaced w/ 240 BBLLS PW @ 2 BPM , TSIP was 660 # psi
12	11/20/2013	11/20/2013	No rig action, 24 hrs SI for chemical treatment.
13	11/21/2013	11/21/2013	check psi blow well down release PKR flow well back returns had more solids in it went 2 drums of 15 % acid and displaced 80 BBLS PW
14	11/22/2013	11/22/2013	Take psi readings, flow back well. Pump 10# brine down tbg. TOOH, stand back tbg. LD pkr, PU slim hole nocks collar. TIH tag fill @ 5378'. TOOH put EOT @ 5206', back above the laterals. Secure well, flow back crew took over.
15	11/25/2013	11/25/2013	Pump tbg side, kill well. TIH, tag fill at 5378.68'. RU P/S, CO to 5431' with N2 and CO wellbore for 4 hrs.
16	11/26/2013	11/26/2013	LD 167 jts on trailer, load up all tag jts. PU BHA, TIH w/tbg from derrick.
17	11/27/2013	11/27/2013	pump & kill well RD floor ND BOP set TAC at 5,128 KB EOT is @ 5168.60 KB, PU plunger TIH 203 7/8 - T-66 rods new 1 1/2" X 36' polish rod psi tested good RD WSU MO crane truck install horse head V. Holly on location started unit on

Report Printed: 12/2/2013

RECEIVED: Dec. 02, 2013

Resolute

Well Name: Ratherford U 1341

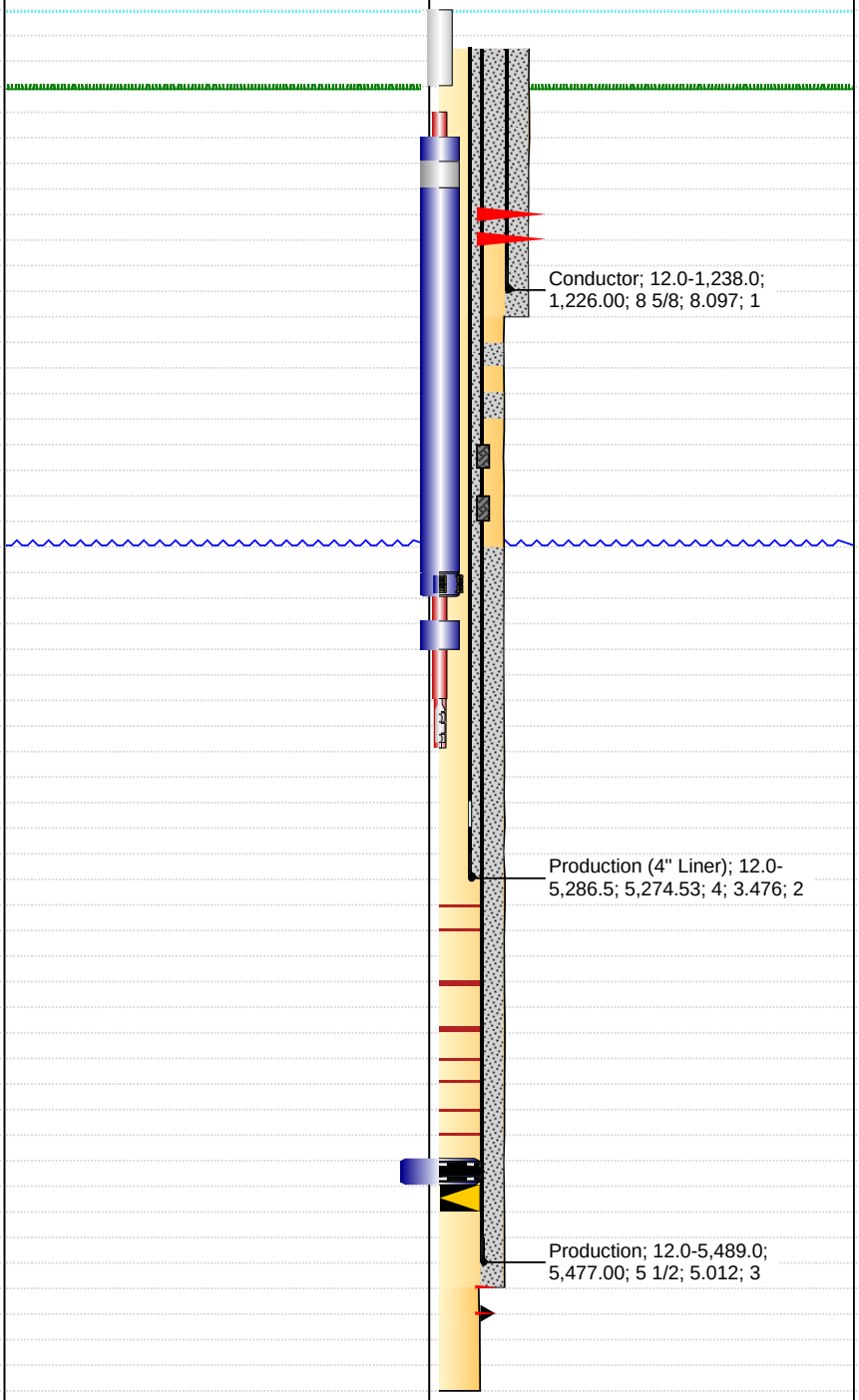
API Number	Section	Qtr/Qtr	TWN	RGE	Block	Reg Spud Dt/Tm	Field Name	State/Prov	WI (%)
4303715856	13	C NE NE	41S	23E		7/19/1957 00:00	Ratherford	Utah	58.60

Most Recent Job

Job Category	Primary Job Type	Secondary Job Type	Start Date	End Date
Workover	Rod Repair		11/6/2013	

TD: 7,011.0 Horizontal - Lateral 4, 12/2/2013 12:19:14 PM

Formations - Prog Depths	Vertical schematic (proposed)	Vertical schematic (actual)	Formations - Drilling Depths	Days vs Depth
				Pl Cum Days M…
				Cum Time Log (…



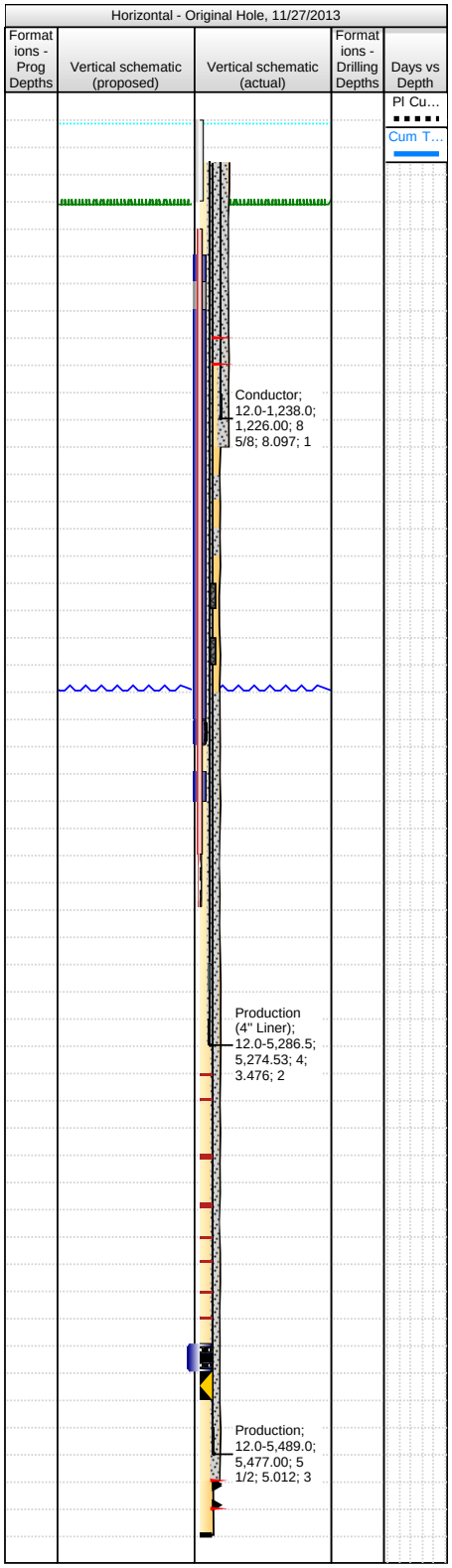
RECEIVED: Dec. 02, 2013

Resolute

Well Name: Ratherford U 1341

API Number	Section	Qtr/Qtr	TWN	RGE	Block	Reg Spud Dt/Tm	Field Name	State/Prov	WI (%)
4303715856	13	C NE NE	41S	23E		7/19/1957 00:00	Ratherford	Utah	58.60

Horizontal - Original Hole, 11/27/2013



Tubing

Tubing Description	Set Depth (ftKB)	Run Date	Pull Date
Tubing - Production	5,168.4	11/27/2013	

Comment

Item Des	Icon	OD (in)	Grade	Len (ft)	Top (ftKB)	Btm (ftKB)
KB	Tubing (blue)	2 3/8	J-55	12.00	111.0	123.0
Tubing	Tubing (blue)	2 3/8	J-55	0.00	123.0	123.0
Tubing Pup Joint	Tubing (grey)	2 3/8	J-55	20.32	123.0	143.3
Tubing	Tubing (blue)	2 3/8	J-55	4,882.92	143.3	5,026.2
Anchor/catcher	Tubing anchor 1	2 3/8	J-55	1.99	5,026.2	5,028.2
Tubing	Tubing anchor 1			32.07	5,028.2	5,060.3
Tubing	Tubing (blue)	2 3/8	J-55	31.89	5,060.3	5,092.2
Tubing Pup Joint	Tubing (grey)			4.03	5,092.2	5,096.2
Pump barrel	Pump barrel			31.02	5,096.2	5,127.2
Slotted Joint	Tubing - Slotted			41.16	5,127.2	5,168.4

Rod Strings

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Unknown	5,026.0	8/26/2003	10/7/2004

Comment

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		26.00		0.0	26.0
Rod(s)	Rod (red)	1	HS	1,700.00		26.0	1,726.0
Rod(s)	Rod (red)	7/8	HS	1,750.00		1,726.0	3,476.0
Rod(s)	Rod (red)	3/4	HS	1,550.00		3,476.0	5,026.0

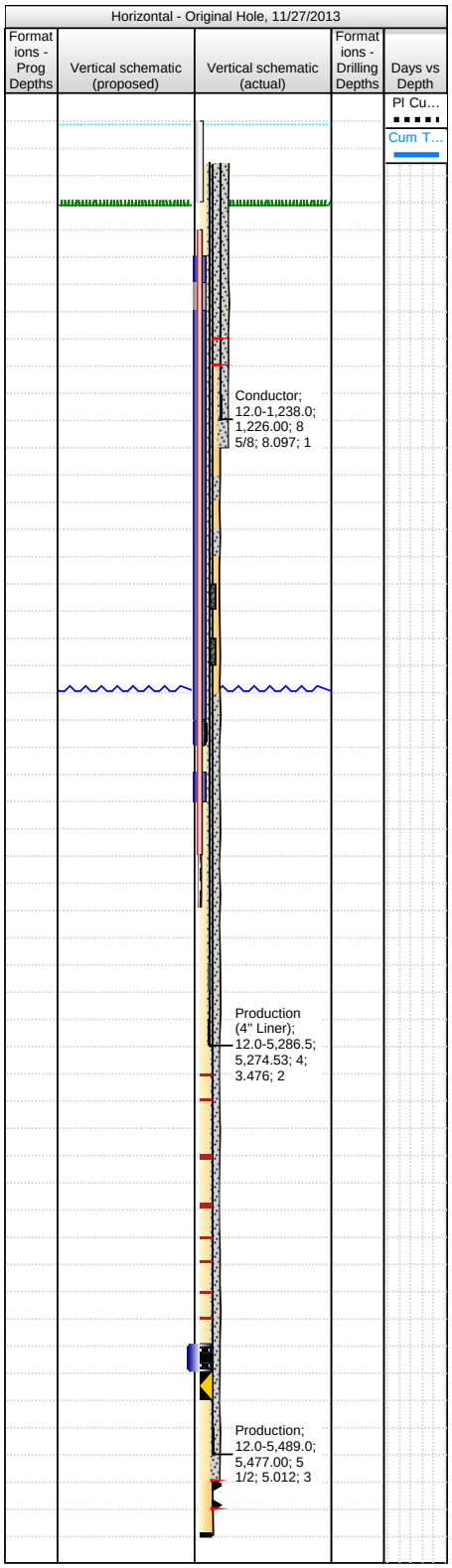
Printed: 12/2/2013

RECEIVED: Dec. 02, 2013

Resolute

Well Name: Ratherford U 1341

API Number	Section	Qtr/Qtr	TWN	RGE	Block	Reg Spud Dt/Tm	Field Name	State/Prov	WI (%)
4303715856	13	C NE NE	41S	23E		7/19/1957 00:00	Ratherford	Utah	58.60



Rod Strings

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Conventional Rod Pump String	5,326.0	10/25/2004	3/11/2008

Comment: Layed down

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		26.00		0.0	26.0
Pony Rod	Rod (green)	1		2.00		26.0	28.0
Rod(s)	Rod (red)	1	HS	1,650.00		28.0	1,678.0
Rod(s)	Rod (red)	7/8	HS	2,050.00		1,678.0	3,728.0
Rod(s)	Rod (red)	3/4	HS	1,550.00		3,728.0	5,278.0
Pony Rod	Rod guide	3/4		8.00		5,278.0	5,286.0
Rod Insert Pump Assembly	Rod pump	2		24.00		5,286.0	5,310.0
Gas Anchor	Gas anchor - strainer	1 1/4		16.00		5,310.0	5,326.0

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Rod	5,332.0	3/18/2008	9/17/2008

Comment: New S-87 rods. 3- guided 7/8 rods @ 2400ft.

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		26.00		0.0	26.0
Pony Rod	Rod (green)	1		2.00		26.0	28.0
Sucker Rod	Rod (red)	1		1,581.00		28.0	1,609.0
Sucker Rod	Rod (red)	7/8		1,525.00		1,609.0	3,134.0
Sucker Rod	Rod (red)	3/4		2,150.00		3,134.0	5,284.0
Pony Rod Stablizer Subs	Rod (green)	3/4		8.00		5,284.0	5,292.0
Rod Insert Pump# MCU W-07	Rod pump	2		24.00		5,292.0	5,316.0
Gas Anchor Dip Tube	Gas Anchor	1 1/4		16.00		5,316.0	5,332.0

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Rod	5,314.0	9/25/2008	10/28/2009

Comment:

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		26.00		0.0	26.0
Pony Rod	Rod (green)	1		8.00		26.0	34.0

RECEIVED: Dec. 02, 2013

Resolute

Well Name: Ratherford U 1341

API Number	Section	Qtr/Qtr	TWN	RGE	Block	Reg Spud Dt/Tm	Field Name	State/Prov	WI (%)
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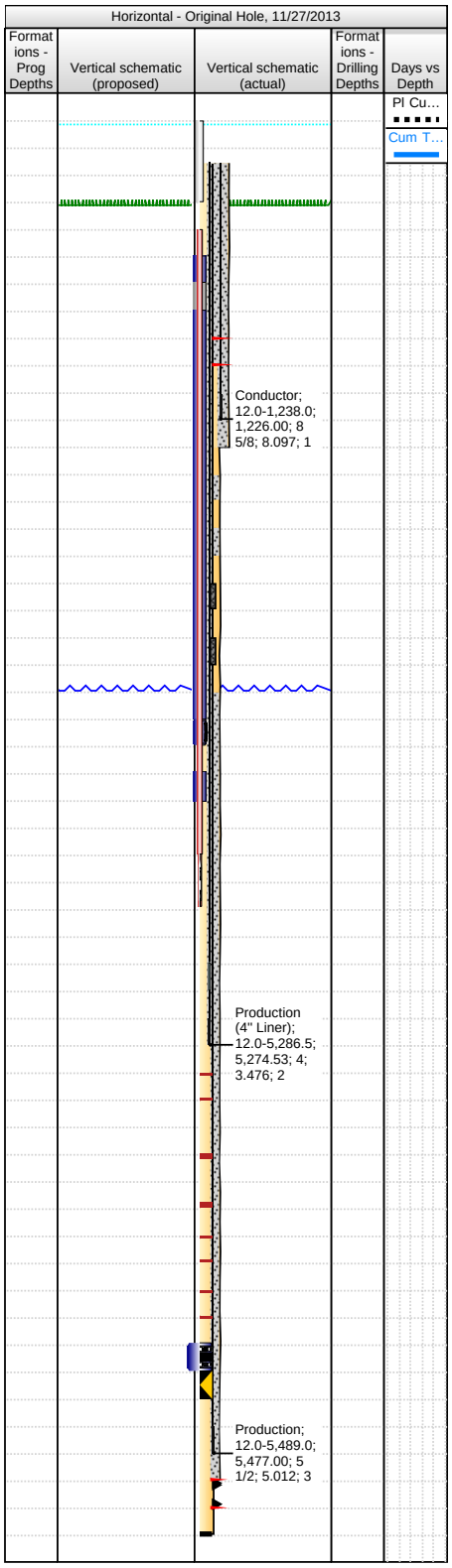


Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Pony Rod	Rod (green)	1		6.00		34.0	40.0
Sucker Rod	Rod (red)	7/8		2,300.00		40.0	2,340.0
Sucker Rod	Rod (red)	3/4		2,925.00		2,340.0	5,265.0
Pony Rod Stablizer Subs	Rod (green)	3/4		8.00		5,265.0	5,273.0
Rod Insert Pump# MCU W-07	Tubing plunger	2		25.00		5,273.0	5,298.0
Gas Anchor Dip Tube	Gas Anchor	1 1/4		16.00		5,298.0	5,314.0

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Rod	5,251.0	10/28/2009	11/15/2011

Comment

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		26.00		0.0	26.0
Sucker Rod	Rod (red)	7/8		2,275.00		26.0	2,301.0
Sucker Rod	Rod (red)	3/4		2,950.00		2,301.0	5,251.0

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Rod	5,301.5	5/2/2012	8/24/2012

Comment
New T66 rods w/On-Off Tool

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		26.00		0.0	26.0
Sucker Rod	Rod (red)	7/8		2,075.00		26.0	2,101.0
Sucker Rod	Rod (red)	3/4		3,200.00		2,101.0	5,301.0
		1.65		0.50		5,301.0	5,301.5

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Rod	5,323.0	8/27/2012	11/20/2012

Comment
new on/off tool

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		26.00		0.0	26.0
Pony Rod	Rod (green)	7/8		12.00		26.0	38.0
Sucker Rod	Rod (red)	7/8		2,050.00		38.0	2,088.0
Sucker Rod	Rod (red)	3/4		3,200.00		2,088.0	5,288.0
Rod Stabilizer	Rod Stabilizer	3/4		8.00		5,288.0	5,296.0
Tubing Pump	Rod Pump	1 3/4		27.00		5,296.0	5,323.0

Printed: 12/2/2013

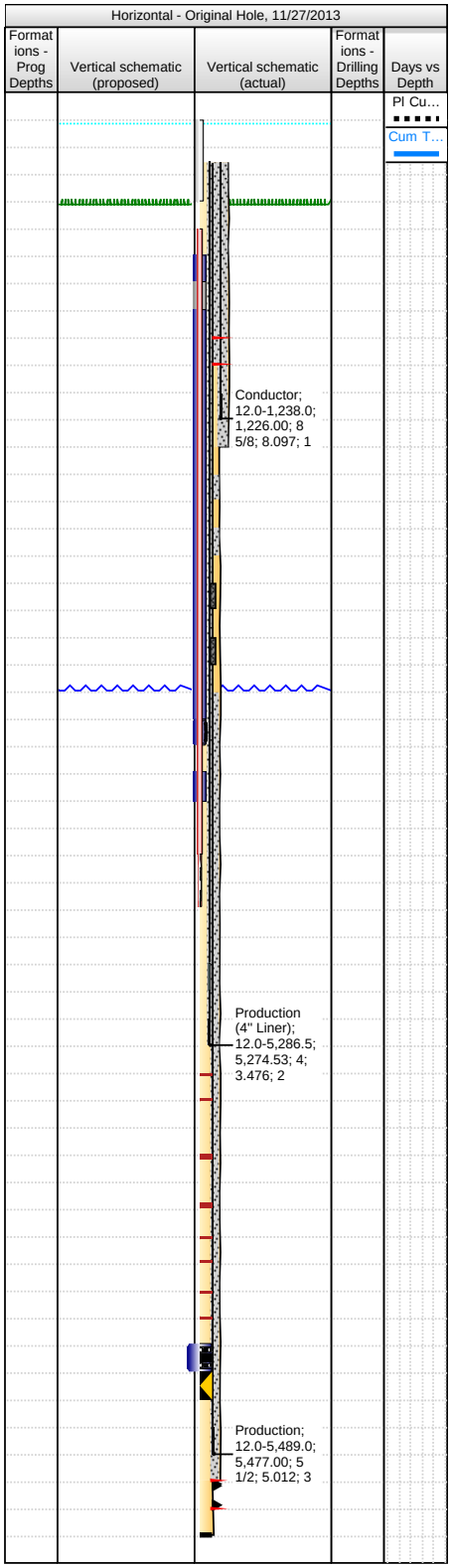
RECEIVED: Dec. 02, 2013

Resolute

Well Name: Ratherford U 1341

API Number	Section	Qtr/Qtr	TWN	RGE	Block	Reg Spud Dt/Tm	Field Name	State/Prov	WI (%)
4303715856	13	C NE NE	41S	23E		7/19/1957 00:00	Ratherford	Utah	58.60

Horizontal - Original Hole, 11/27/2013



Rod Strings

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Rod	5,297.0	11/20/2012	12/12/2012

Comment: parted on off tool

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		26.00		0.0	26.0
Pony Rod	Rod (green)	7/8		12.00		26.0	38.0
Sucker Rod	Rod (red)	7/8		2,050.00		38.0	2,088.0
Sucker Rod	Rod (red)	3/4		3,200.00		2,088.0	5,288.0
Rod Stabilizer	Rod Stabilizer	3/4		8.00		5,288.0	5,296.0
Tubing Pump	Rod Pump	1 3/4		1.00		5,296.0	5,297.0

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Rod	5,300.0	12/17/2012	2/7/2013

Comment: run 4' X 1-1/4" Plunger

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		26.00		0.0	26.0
Pony Rod	Rod (green)	7/8		12.00		26.0	38.0
Sucker Rod	Rod (red)	7/8		2,050.00		38.0	2,088.0
Sucker Rod	Rod (red)	3/4		3,200.00		2,088.0	5,288.0
Rod Stabilizer	Rod Stabilizer	2		8.00		5,288.0	5,296.0
Tubing Pump	Rod Pump	1 1/4		4.00		5,296.0	5,300.0

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Rod	5,300.0	2/8/2013	5/13/2013

Comment: 7/8 slm hle rod box break @ 310' on jt 12

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		26.00		0.0	26.0
Sucker Rod	Rod (red)	7/8	T66	12.00		26.0	38.0
Sucker Rod	Rod (red)	7/8	T66	2,050.00		38.0	2,088.0
Sucker Rod	Rod (red)	3/4	T66	3,200.00		2,088.0	5,288.0
Rod Stabilizer	Rod Stabilizer	3/4		8.00		5,288.0	5,296.0
Tubing Pump	Rod Pump	1 3/4		4.00		5,296.0	5,300.0

Printed: 12/2/2013

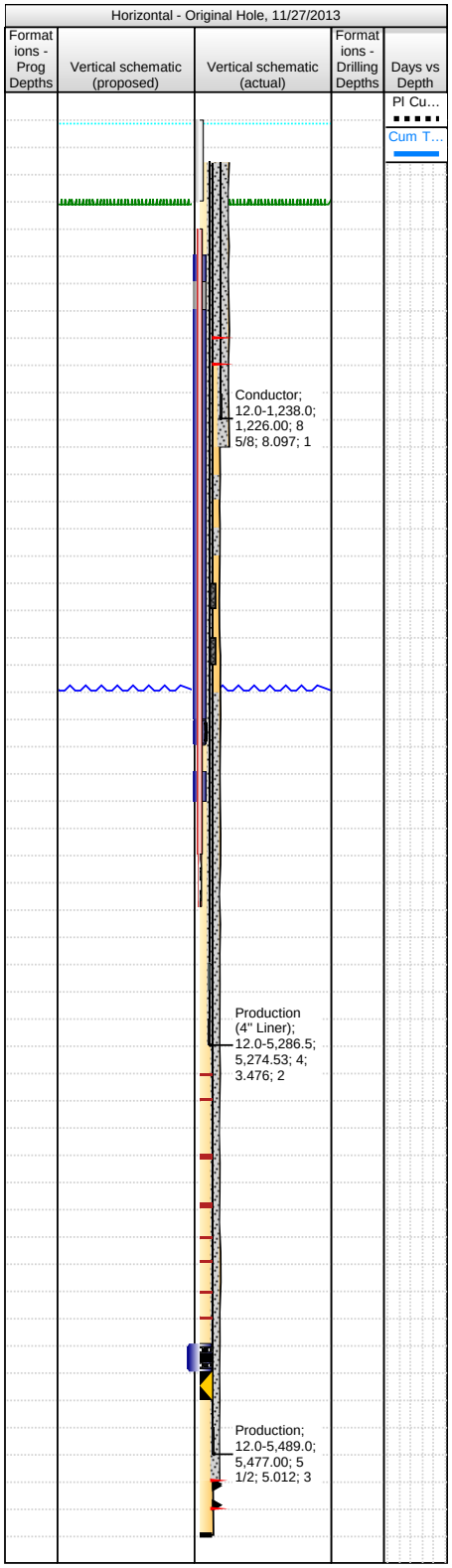
RECEIVED: Dec. 02, 2013

Resolute

Well Name: Ratherford U 1341

API Number	Section	Qtr/Qtr	TWN	RGE	Block	Reg Spud Dt/Tm	Field Name	State/Prov	WI (%)
4303715856	13	C NE NE	41S	23E		7/19/1957 00:00	Ratherford	Utah	58.60

Horizontal - Original Hole, 11/27/2013



Rod Strings

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Rod	5,387.0	5/17/2013	8/27/2013

Comment

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		36.00		0.0	36.0
Sucker Rod	Rod (red)	7/8	T-66	2,025.00		36.0	2,061.0
Sucker Rod	Rod (red)	7/8	T-66	3,325.00		2,061.0	5,386.0
Tubing Pump	Rod Pump	1 13/16		1.00		5,386.0	5,387.0

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Rod	5,362.0	9/3/2013	10/2/2013

Comment

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		36.00		0.0	36.0
Sucker Rod	Rod (red)	7/8		5,325.00		36.0	5,361.0
Rod Pump	Rod pump	7/8		1.00		5,361.0	5,362.0

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Rod	5,362.0	10/4/2013	11/6/2013

Comment

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		36.00		0.0	36.0
Sucker Rod	Rod (red)	7/8	T66	3,325.00		36.0	3,361.0
Sucker Rod	Rod (red)	7/8	T66	2,000.00		3,361.0	5,361.0
Sucker Rod	On off tool	7/8		1.00		5,361.0	5,362.0

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Rod	5,312.0	11/12/2013	11/13/2013

Comment

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		31.00		5.0	36.0
Sucker Rod	Rod (red)	7/8	HS	5,275.00		36.0	5,311.0
Coupling	Rod coupling			1.00		5,311.0	5,312.0

Rod Description	Set Depth (ftKB)	Run Date	Pull Date
Rod	5,127.6	11/27/2013	

Comment

Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Polished Rod	Polish rod	1 1/2		36.00		-1.4	34.6
Pony Rod	Rod (green)			14.00		34.6	48.6

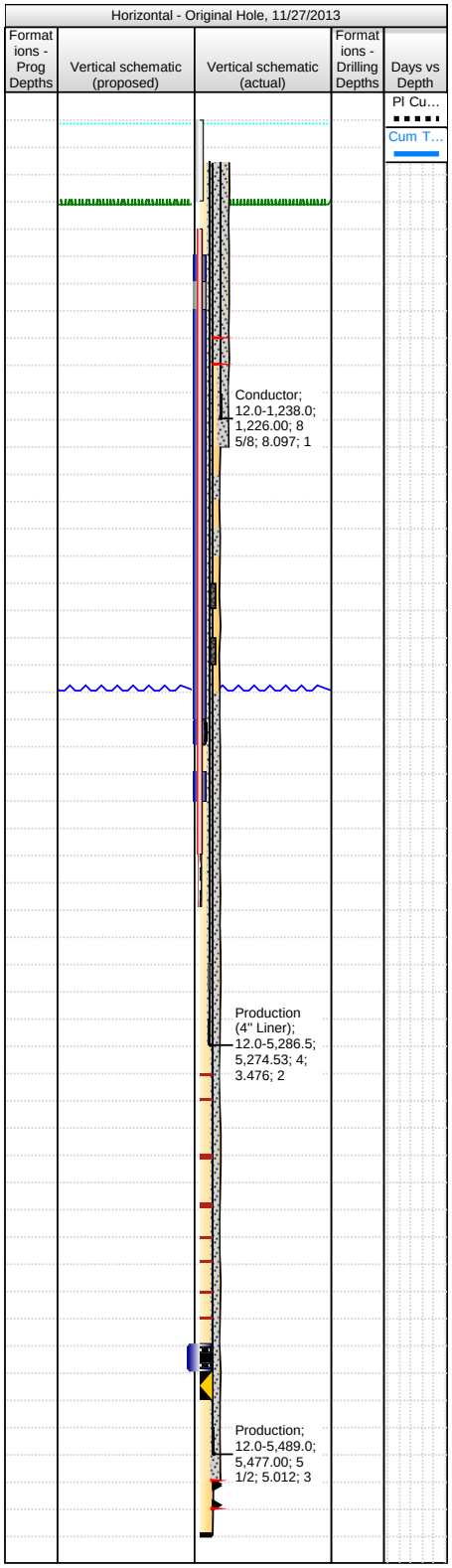
RECEIVED: Dec. 02, 2013

Resolute

Well Name: Ratherford U 1341

API Number	Section	Qtr/Qtr	TWN	RGE	Block	Reg Spud Dt/Tm	Field Name	State/Prov	WI (%)
4303715856	13	C NE NE	41S	23E		7/19/1957 00:00	Ratherford	Utah	58.60

Horizontal - Original Hole, 11/27/2013



Item Des	Icon	OD (in)	Grade	Len (ft)	Max Tensile (1000lbf)	Top (ftKB)	Btm (ftKB)
Sucker Rod	Rod (red)	7/8	SPCL APP	5,075.00		48.6	5,123.6
Tubing Pump	Rod Pump	3/4		4.00		5,123.6	5,127.6

Other Strings

String Description	Run Date	Set Depth (ftKB)

Other In Hole

Description	Icon	Bottom Depth (ftKB)	Run Date
Packer	Packer 1	5,435.0	4/7/1997
Milled casing section	Casing - milled section	5,427.0	4/7/1997
CIBP	Casing bridge plug	5,440.0	4/7/1997
Milled casing section	Casing - milled section	5,413.0	4/12/1997
Milled casing section	Casing - milled section	5,395.0	4/18/1997
Milled casing section	Casing - milled section	5,380.0	4/23/1997

RECEIVED: Dec. 02, 2013

FEDERAL APPROVAL OF THIS ACTION IS NECESSARY

FORM 9

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS, AND MINING

5.LEASE DESIGNATION AND SERIAL NUMBER: 14-20-603-247A

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: NAVAJO

7.UNIT or CA AGREEMENT NAME: RATHERFORD

1. TYPE OF WELL Oil Well

8. WELL NAME and NUMBER: RATHERFORD 13-41

2. NAME OF OPERATOR: RESOLUTE NATURAL RESOURCES

9. API NUMBER: 43037158560000

3. ADDRESS OF OPERATOR: 1700 Lincoln Street, Suite 2800 , Denver, CO, 80203 4535

PHONE NUMBER: 303 534-4600 Ext

9. FIELD and POOL or WILDCAT: GREATER ANETH

4. LOCATION OF WELL
FOOTAGES AT SURFACE: 0660 FNL 0660 FEL
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: NENE Section: 13 Township: 41.0S Range: 23.0E Meridian: S

COUNTY: SAN JUAN

STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
✓ NOTICE OF INTENT Approximate date work will start: 8/2/2014	☐ ACIDIZE	☐ ALTER CASING	☐ CASING REPAIR
	☐ CHANGE TO PREVIOUS PLANS	☐ CHANGE TUBING	☐ CHANGE WELL NAME
	☐ CHANGE WELL STATUS	☐ COMMINGLE PRODUCING FORMATIONS	☐ CONVERT WELL TYPE
☐ SUBSEQUENT REPORT Date of Work Completion:	☐ DEEPEN	☐ FRACTURE TREAT	☐ NEW CONSTRUCTION
	☐ OPERATOR CHANGE	☐ PLUG AND ABANDON	☐ PLUG BACK
	☐ PRODUCTION START OR RESUME	☐ RECLAMATION OF WELL SITE	☐ RECOMPLETE DIFFERENT FORMATION
☐ SPUD REPORT Date of Spud:	☐ REPERFORATE CURRENT FORMATION	☐ SIDETRACK TO REPAIR WELL	☐ TEMPORARY ABANDON
	☐ TUBING REPAIR	☐ VENT OR FLARE	☐ WATER DISPOSAL
☐ DRILLING REPORT Report Date:	☐ WATER SHUTOFF	☐ SI TA STATUS EXTENSION	☐ APD EXTENSION
	☐ WILDCAT WELL DETERMINATION	✓ OTHER	OTHER: Pump Repair

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

Resolute Natural Resources respectfully submits this sundry as notice of a pump repair on the above well. Attached are the procedures and schematic.

Accepted by the Utah Division of Oil, Gas and Mining
Date: July 31, 2014
By: Dark K Quist

NAME (PLEASE PRINT)	PHONE NUMBER	TITLE
Erin Joseph	303 573-4886	Sr. Regulatory Analyst

SIGNATURE	DATE
N/A	7/28/2014

RECEIVED: Jul. 28, 2014

RESOLUTE
NATURAL RESOURCES

RU 13-41 Pump Repair

Procedure

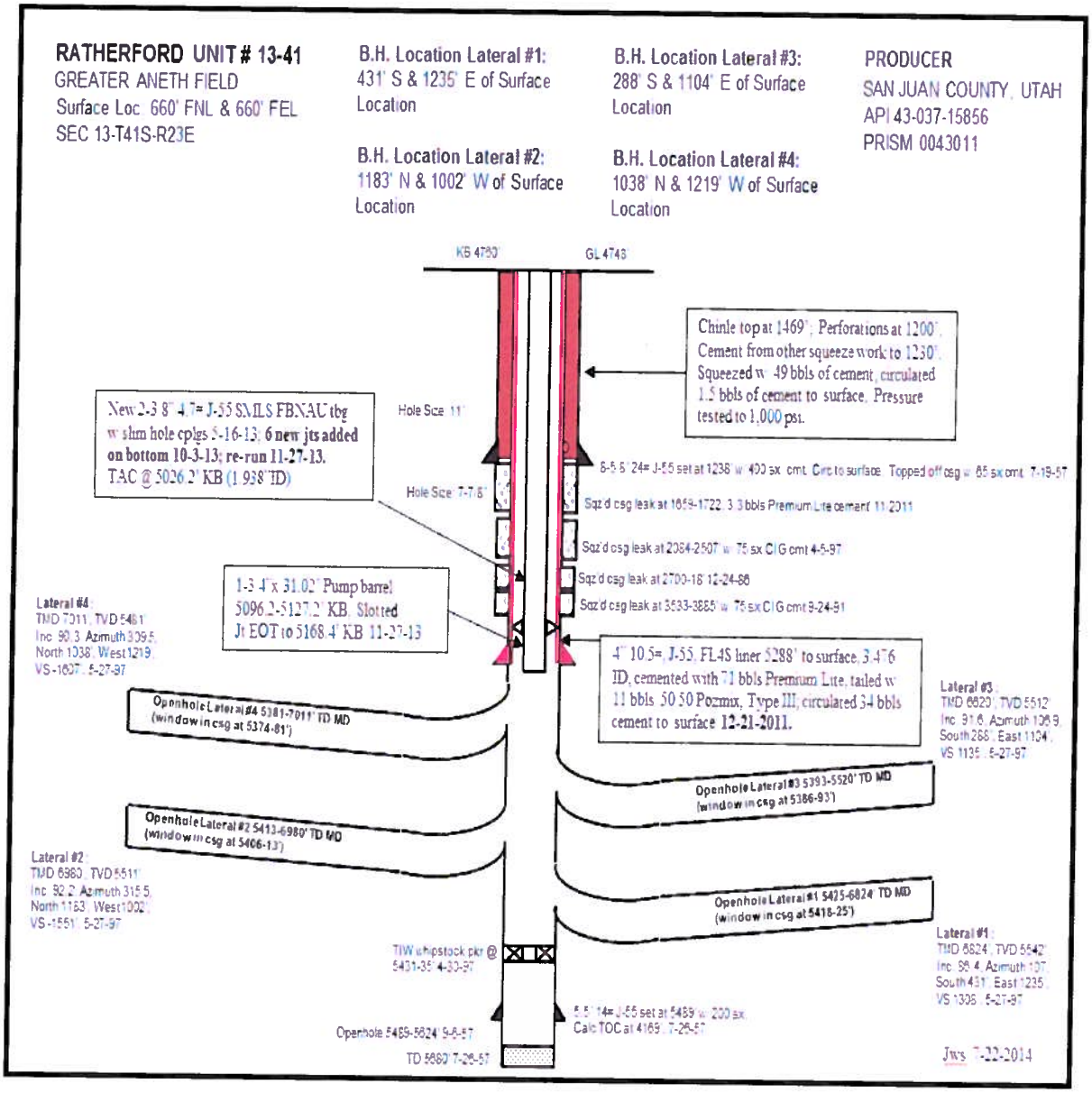
Horsley Witten: No (Chinle previously isolated)

1. MIRU WSU, LOTO,
2. Pressure test tubing to 1000 psig.
3. Kill well as necessary.
4. POOH with rods and 1-3/4" pump plunger. Stand back rods in derrick. Call and notify Bill Albert (970) 371-9682 to inspect rods. If unavailable, contact Tech Support (Virgil Holly (435) 444-0020, or Nate Dee (435) 444-0345. Replace rods per inspection results.
5. ND WH, NU BOPE to pull tubing.
6. Release the TAC @ 5026.2' KB. Install a packer. Pressure test BOPE.
7. PU 9 extra joints & tag for fill; Current EOT at 5168.4' KB, PBD at 5431' KB (had 57' of fill in August 2013, 53' in Nov 2013).
8. TOOH with 2-3/8 tubing & bha, standing back. Tear down & evaluate the pump for solids, etc.
9. Call & notify Bill Albert to inspect tubing. If unavailable, contact Virgil H. or Nate Dee.
10. If required, RIH w/3-3/4 bit & clean out to TIW @ 5431' KB using Global N2.
11. If tubing is replaced or select jts replaced, run new 2-3/8" J-55 seamless, FBNAU tbg w/slim hole cplgs.
12. TIH with 41' slotted jt, 2" tubing pump barrel*, 2 jts tubing, TAC, and tubing to surface.

12.5. Land tubing with EOT at ~5168' as before, and TAC at ~5020-30'.

13. NDBOP, NUWH.
14. RIH with 7/8" rods & 2" plunger*. Plan on 0.007" clearance plunger, as before.
15. PT the tubing, long stroke pump to test for good pumping action.
16. Leave enough polished rod for operators to correctly space pump as required; Use crane to replace pump unit head.
17. Notify the Area Production Supervisor Alfred Redhouse (435) 619-7227 that well is ready.
18. RDMOL. Hook up appropriate chemical treatment.

* Subject to change pending inspection of plunger, pump barrel, etc.


RATHERFORD UNIT # 13-41
GREATER ANETH FIELD
Surface Loc 660' FNL & 660' FEL
SEC 13-T41S-R23E
B.H. Location Lateral #1:
431' S & 1235' E of Surface Location
B.H. Location Lateral #2:
1183' N & 1002' W of Surface Location
B.H. Location Lateral #3:
288' S & 1104' E of Surface Location
B.H. Location Lateral #4:
1038' N & 1219' W of Surface Location
PRODUCER
SAN JUAN COUNTY, UTAH
API 43-037-15856
PRISM 0043011
KB 4750'
GL 4743'
Chinle top at 1469'; Perforations at 1200'. Cement from other squeeze work to 1230'. Squeezed w 49 bbls of cement, circulated 1.5 bbls of cement to surface. Pressure tested to 1,000 psi.
New 2-3/8" 4.7# J-55 SMLS FBNAU tbg w/ slim hole cplgs 5-16-13; 6 new jts added on bottom 10-3-13; re-run 11-27-13. TAC @ 5026.2' KB (1.938" ID)
Hole Size 11"
Hole Size 7-7/8"
8-5/8" 24# J-55 set at 1238' w/ 400 sx cmt. Circ to surface. Topped off csg w/ 65 sx cmt. 7-19-57
Sqz'd csg leak at 1659-1722. 3.3 bbls Premium Lite cement 11/2011
Sqz'd csg leak at 2084-2507' w/ 75 sx Cl G cmt 4-5-97
Sqz'd csg leak at 2700-18' 12-24-86
Sqz'd csg leak at 3533-3885' w/ 75 sx Cl G cmt 9-24-91
1-3/4" x 31.02' Pump barrel 5096.2-5127.2' KB. Slotted Jt EOT to 5168.4' KB 11-27-13
4" 10.5#, J-55, FL4S liner 5288' to surface, 3.476 ID, cemented with 71 bbls Premium Lite, tailed w 11 bbls 50/50 Pozmix, Type III, circulated 34 bbls cement to surface 12-21-2011.
Lateral #4:
TMD 7011', TVD 5461'
Inc. 90.3, Azimuth 309.5,
North 1038', West 1219',
VS -1607', 5-27-97
Openhole Lateral #4 5381-7011' TD MD (window in csg at 5374-81')
Lateral #3:
TMD 6820', TVD 5512'
Inc. 91.6, Azimuth 106.9,
South 288', East 1104',
VS 1135', 5-27-97
Openhole Lateral #3 5393-5520' TD MD (window in csg at 5386-93')
Openhole Lateral #2 5413-6980' TD MD (window in csg at 5406-13')
Lateral #2:
TMD 6980', TVD 5511'
Inc. 92.2, Azimuth 315.5,
North 1183', West 1002',
VS -1551', 5-27-97
Openhole Lateral #1 5425-6824' TD MD (window in csg at 5418-25')
Lateral #1:
TMD 6824', TVD 5542'
Inc. 88.4, Azimuth 107,
South 431', East 1235',
VS 1306', 5-27-97
TIW whipstock pkr @ 5431-35' 4-30-97
5-5/8" 14# J-55 set at 5489' w/ 200 sx. Calc TOC at 4169', 7-26-57
Openhole 5489-6824' 5-6-57
TD 6980' 7-26-57
Jws 7-22-2014

FORM 9

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS, AND MINING

5.LEASE DESIGNATION AND SERIAL NUMBER: 14-20-603-247A

SUNDRY NOTICES AND REPORTS ON WELLS

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6. IF INDIAN, ALLOTTEE OR TRIBE NAME: NAVAJO

7.UNIT or CA AGREEMENT NAME: RATHERFORD

1. TYPE OF WELL Oil Well

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2. NAME OF OPERATOR: RESOLUTE NATURAL RESOURCES

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PHONE NUMBER: 303 534-4600 Ext

9. FIELD and POOL or WILDCAT: GREATER ANETH

4. LOCATION OF WELL
FOOTAGES AT SURFACE: 0660 FNL 0660 FEL
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: NENE Section: 13 Township: 41.0S Range: 23.0E Meridian: S

COUNTY: SAN JUAN

STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

- ☐ NOTICE OF INTENT — Approximate date work will start:
- ✓ SUBSEQUENT REPORT — Date of Work Completion: 9/9/2014
- ☐ SPUD REPORT — Date of Spud:
- ☐ DRILLING REPORT — Report Date:

TYPE OF ACTION

☐ ACIDIZE	☐ ALTER CASING	☐ CASING REPAIR
☐ CHANGE TO PREVIOUS PLANS	☐ CHANGE TUBING	☐ CHANGE WELL NAME
☐ CHANGE WELL STATUS	☐ COMMINGLE PRODUCING FORMATIONS	☐ CONVERT WELL TYPE
☐ DEEPEN	☐ FRACTURE TREAT	☐ NEW CONSTRUCTION
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☐ TUBING REPAIR	☐ VENT OR FLARE	☐ WATER DISPOSAL
☐ WATER SHUTOFF	☐ SI TA STATUS EXTENSION	☐ APD EXTENSION
☐ WILDCAT WELL DETERMINATION	✓ OTHER	OTHER: Pump Repair

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

Resolute Natural Resources respectfully submits this sundry as notice that the pump repair on the above well was completed on 9/9/14 according to previously submitted procedures.

Accepted by the Utah Division of Oil, Gas and Mining
FOR RECORD ONLY
September 25, 2014

NAME (PLEASE PRINT)	PHONE NUMBER	TITLE
Erin Joseph	303 573-4886	Sr. Regulatory Analyst

SIGNATURE	DATE
N/A	9/23/2014

RECEIVED: Sep. 23, 2014