

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK  
 DRILL  DEEPEN  PLUG BACK

b. TYPE OF WELL  
 OIL WELL  GAS WELL  OTHER   
 SINGLE ZONE  MULTIPLE ZONE

2. NAME OF OPERATOR  
Energy Reserves Group, Inc.

3. ADDRESS OF OPERATOR  
Box 3280 Casper, Wyoming 82602

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)\*  
 At surface  
 At proposed prod. zone 1904' FNL 2112' FWL **SE NW**

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE\*  
Approx. 18 Miles South East of Jensen, Utah

15. DISTANCE FROM PROPOSED\* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any) 548'

16. NO. OF ACRES IN LEASE 1280'

17. NO. OF ACRES ASSIGNED TO THIS WELL 40

18. DISTANCE FROM PROPOSED LOCATION\* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT. 1300'

19. PROPOSED DEPTH 5700' Green River

20. ROTARY OR CABLE TOOLS Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.)  
5136' GR (ungraded)

22. APPROX. DATE WORK WILL START\*  
February 1981

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
12 1/2"	8 5/8"	24#	500'	Cement to surface
7 7/8"	5 1/2"	14#	5,700'	Sufficient to protect Green River Formation

APPROVED BY THE DIVISION  
 OF OIL, GAS, AND MINING  
 DATE: 3-13-81  
 BY: W.J. Minder

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24. SIGNED Walter J. Minder (Blue Flant - (307) 265-7331) TITLE Field Services Adm. DATE 2-9-81

(This space for Federal or State office use)

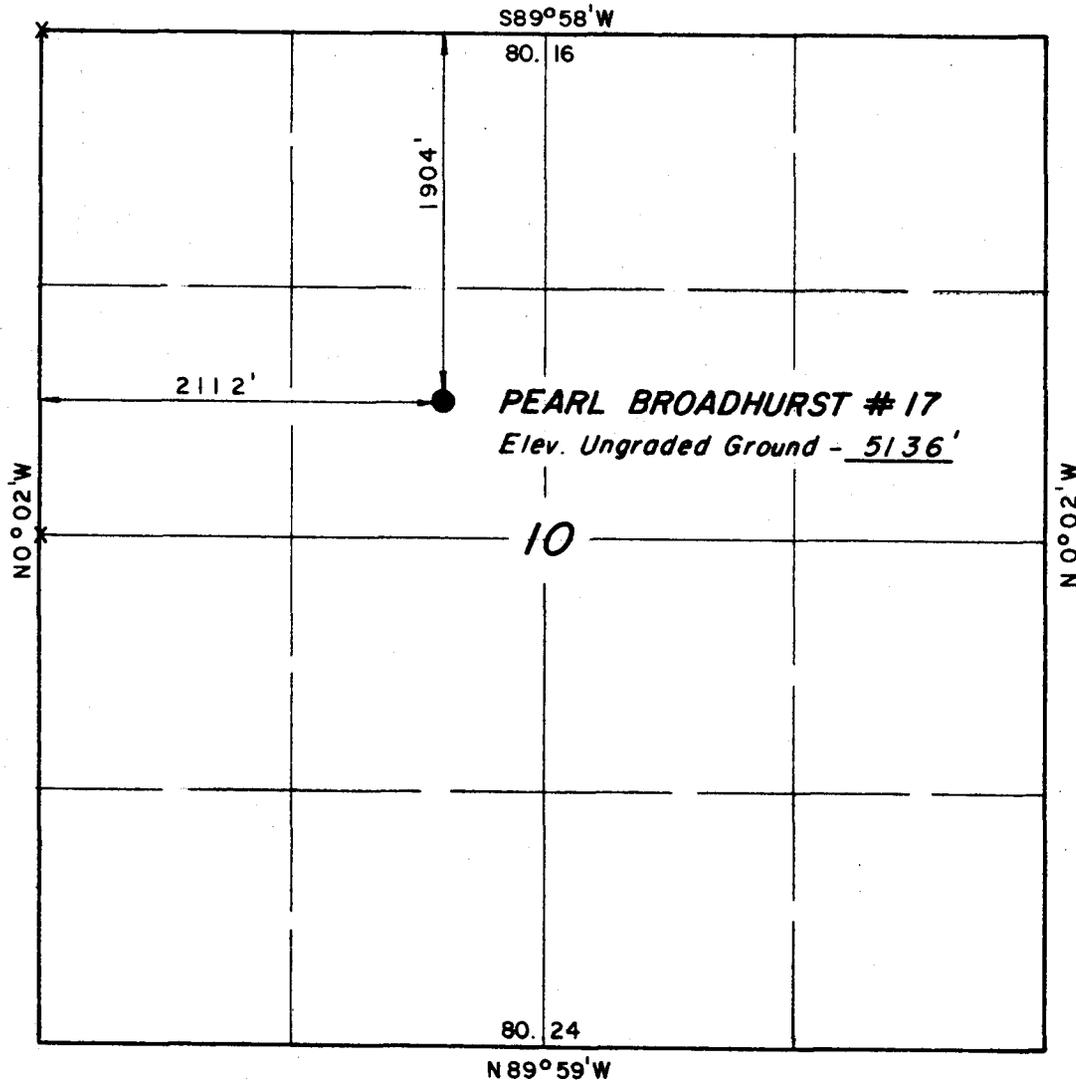
PERMIT NO. \_\_\_\_\_ APPROVAL DATE \_\_\_\_\_

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

T 7 S , R 2 3 E , S . L . B . & M .

PROJECT  
**ENERGY RESERVES GROUP**

Well location, *PEARL BROADHURST*  
# 17, located as shown in the SE 1/4  
NW 1/4 Section 10, T7S, R23E,  
S.L.B.&M. Uintah County, Utah.



CERTIFICATE

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.

*Steve Stewart*

REGISTERED LAND SURVEYOR  
REGISTRATION NO 3154  
STATE OF UTAH

**UINTAH ENGINEERING & LAND SURVEYING**  
P.O. BOX Q - 85 SOUTH - 200 EAST  
VERNAL, UTAH - 84078

SCALE	1" = 1000'	DATE	2/1/81
PARTY	MS KH MH RP	REFERENCES	GLO Plat
WEATHER	Clear / Cool	FILE	ENERGY RESERVES GRP.

X = Section Corners Located

ENERGY RESERVES GROUP

PROPOSED LOCATION  
PEARL BROADHURST #17



TOPO. MAP "A"

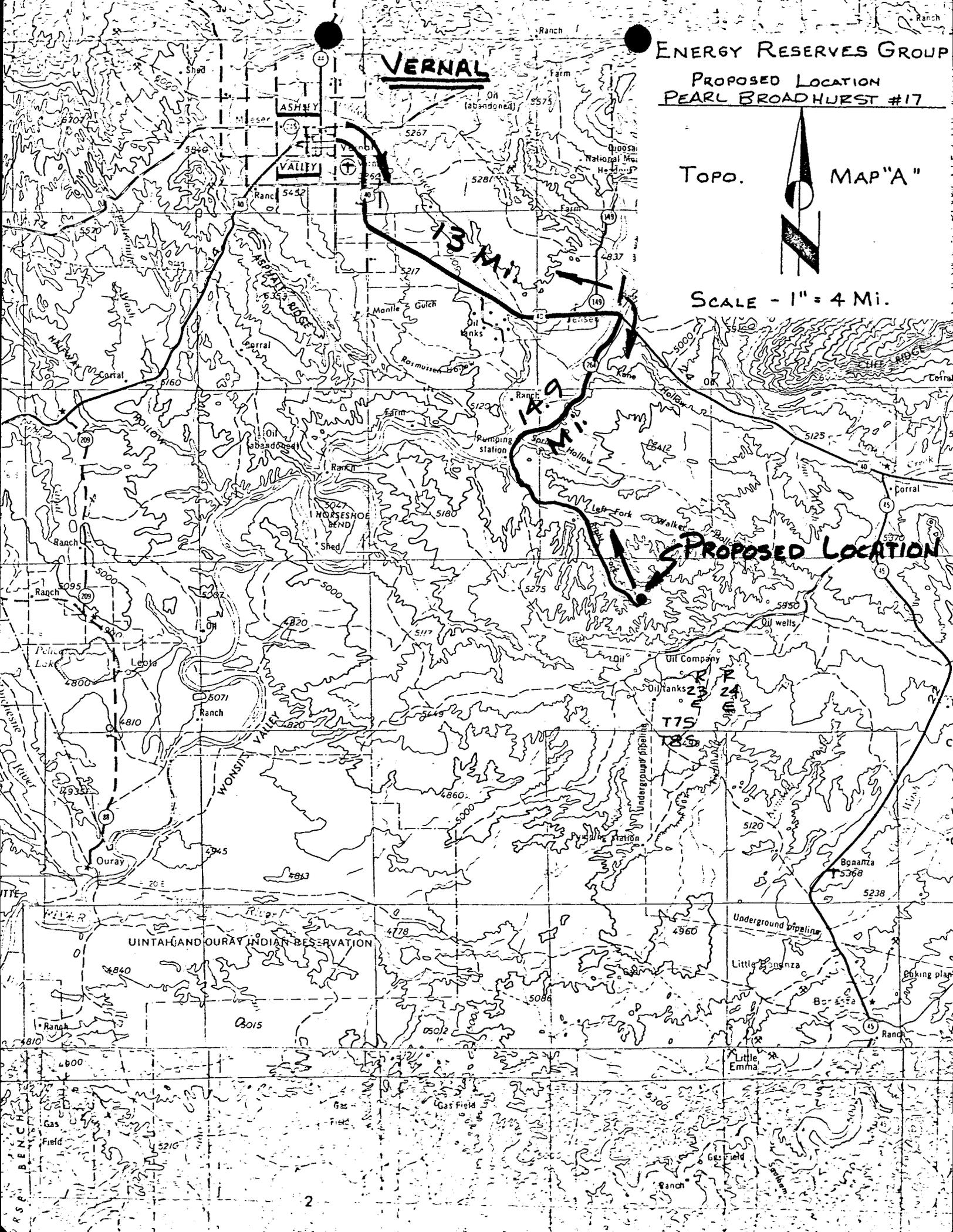
SCALE - 1" = 4 Mi.

**VERNAL**

13 Mi.

14.9 Mi.

**PROPOSED LOCATION**



UINTAH AND OURAY INDIAN RESERVATION

BENCH  
FIELD

TEN POINT PROGRAM

1) SURFACE FORMATION: Uintah

2 & 3) ESTIMATED TOPS:

Green River	2,950'	
Green River "G"	4,470'	
Green River "H"	4,775'	
Green River "I"	5,020'	
Green River "J"	5,300'	Oil & Gas
Green River "K"	5,450'	
T.D	5,700'	

4) CASING PROGRAM:

8 5/8", K-55, 24#, New Casing, ST&C  
5 1/2", K-55, 14#, New Casing, ST&C

5) PRESSURE CONTROL EQUIPMENT: (See attached schematic diagram) BOP's and choke manifold will be installed and pressure tested before drilling out under surface casing and then will be checked daily as to mechanical operating condition. Ram type preventors and related pressure control equipment will be pressure tested to rated working pressure of the stack assembly or to 70% of the minimum internal yield pressure of the casing. Annular type preventors will be tested to 50% of their rated working pressure. BOP's will be pressure tested at least once every 30 days.

6) MUD PROGRAM:

Fresh water base gel mud will be used during the entire drilling operation.  
Mud Weight 9.5 ppg. VIS 50-55, Water loss, PH 9.5

Sufficient mud materials to maintain mud properties, control lost circulation and to contain blowout will be available at wellsite.

7) AUXILLIARY EQUIPMENT:

- a. Kelly cocks
- b. Bit floats will be available
- c. Mud monitoring will be visual unless otherwise specified
- d. A full opening valve with drill pipe thread will be available on the rig floor

8) LOGGING: DIL, SGR, CN-D

CORING: None

TESTING: None

STIMULATION: 60,000 gallons of gelled water with 100,000# sand. All applicable state & federal regulations concerning equipment placement will be adhered to.

9) ABNORMAL PRESSURE: None

ESTIMATED BOTTOMHOLE PRESSURE: 2200 PSI

10) ANTICIPATED STARTING DATE: Feb. 1981

DURATION OF OPERATION: 30 days

LEASE: Pearl Broadhurst No. 17

Lease No. U-02651-A

LOCATION: SE $\frac{1}{4}$  NW $\frac{1}{4}$  Sec. 10

DATE: 2-9-81

SURFACE USE AND OPERATIONS PLAN

1. Existing roads

A. Proposed well site & access road staked - See attached topo map

B. Route and distance from nearest town: Proceed South from Jensen, Utah along Utah State Hwy 264, 8.6 miles to the junction of this Hwy. and an existing improved road to the South East. Proceed along this road for approx. 6 miles to the junction of the proposed access road.

C. Access roads to location: Color coded.

D. Exploratory well: Not applicable.

E. Development well: For all existing roads within a one mile radius See Map.

F. Plans for improvement and/or maintenance:

Existing roads are currently maintained by Energy Reserves Group, Inc.

2. Planned access roads. See Map.

1. Width: 18' crowned running surface - 32' with ditches

2. Maximum grade: 3%

3. Turnouts: None

4. Drainage design: Road to be ditched on both sides to provide drainage

5. Location and size of culverts: None

Major cuts and fills: None

6. Surface Materials: Gravel - will be obtained from a private source.

7. Gates: None

Cattleguards: None

Fence cuts: None

8. Center-line road flagging: The route of the new access road is flagged as shown on Map.

3. Location of existing wells

1. Water wells: None

2. Abandoned wells: Well No. 3 SW $\frac{1}{4}$  NE $\frac{1}{4}$  - Sec. 9

3. Temporarily Abandoned Wells: Well No. 5 SW $\frac{1}{4}$  SW $\frac{1}{4}$ , Sec. 10

4. Disposal wells: None

5. Drilling wells: Wells 11, 12, 13, 14, 15, 16 & 17

6. Producing wells: Wells 1, 2, 4, 5, 7, 8, 9 & 10

7. Shut-in wells: None

8. Injection wells: None

9. Monitoring or observation wells: None

4. Location of existing and/or proposed facilities owned and/or controlled by Energy Reserves Group, Inc.

A. Existing facilities:

1. Tank batteries: Located @ wells #1, #2, #4, #6 between #8 & #9
2. Production facilities: See Above
3. Oil gathering lines: From well #7 to #6 - from well #8 & #9 to battery site in SE $\frac{1}{4}$  NW $\frac{1}{4}$  - from well #10 to #6
4. Gas gathering lines: Each well has a gas gathering line
5. Injection lines: From Red Wash Field to well No. 3
6. Disposal lines: None

B. New production facilities:

1. Proposed tank battery: The tank battery for this well will be located just South of the well & provides storage for well 8 & 9
2. Dimensions of facilities: N/A
3. Construction methods and materials: Area to be used will be leveled with dozer, materials used for foundation will consist of crushed rock and native materials.
4. Protective measures and devices: Pits will be fenced and flagged to protect livestock, wildlife and waterfowl.

C. Plans for rehabilitation of disturbed area: All disturbed areas not needed for operation will be contoured to match existing terrain and reseeded with the seed mixture recommended by the surface owner.

5. Location and type of water supply

- A. Location: Near well No. 3 SW $\frac{1}{4}$  NE $\frac{1}{4}$ , Sec. 9  
Supply: Pipeline
- B. Method of transportation: Water will be hauled by tank trucks using existing roads.
- C. Water wells to be drilled: None

6. Source of construction materials

- A. Location: (tank battery) private sources
- B. From Federal or Indian lands: None
- C. Additional materials: None

D. Access roads on Federal or Indian lands: As shown on attached map

7. Methods of handling waste disposal

- 1 & 2. Cuttings and drilling fluids: Deposited during drilling operations will be put in reserve pits.
3. Produced fluids: Tanks will be used for storage of produced fluids during testing.
4. Sewage: Sewage will be contained in a portable latrine or bored hole and a suitable chemical will be used to decompose waste materials.
5. Garbage and other waste materials: Garbage and other waste materials will be put in burn pit and all flammable materials will be burned. Burn pits will be enclosed with small mesh wire to prevent littering.

6. Proper clean-up of well-site: Upon completion of drilling all trash and litter will be picked up and placed in the burn pit which will be buried. The reserve pits will be fenced on three sides during drilling and the fourth side will be fenced when drilling is completed. They will remain fenced until dry at which time they will be backfilled.

8. Ancillary facilities

1. None planned.

9. Wellsite layout

1. Cuts and fills: See Diagram.
2. Location of pits and stockpiles: For location of mud tanks, reserve, burn and trash pits, pipe racks, living facilities and soil materials stockpiles, See Diagram.
3. Pad orientation: For rig orientation parking areas and access roads, see Diagram.
4. Lining of pits: No plans to line reserve pits at this time.
5. O.S.H.A. requirements: Area needed to conduct the fracturing operations in a safe manner and in accordance with O.S.H.A. standards will be within the areas already disturbed.

10. Plans for restoration of surface

1. Backfilling, leveling, contouring, and waste disposal: Topsoil will be stripped from the location and stockpiled for use after completion of contouring at which time it will be redistributed on the location. Backfilling of the reserve pits will be done as soon as the pits are dry. Contouring of the location will be done, in the event of a dry hole, to restore the surface to as near its original condition as possible. In the event of production those portions of the pad not needed for operations will be contoured in such a manner as to support vegetation and blend into the surrounding topography as much as possible. Waste disposal will begin immediately after completion of drilling. All trash and litter will be picked up, placed in the burn pit and buried.
2. Revegetation and rehabilitation: Revegetation of the location and access roads (those not left for landowner use) will begin with reseeding which will be done in the Spring or Fall of the year with the seed mixture specified by the appropriate agency or landowner. Rehabilitation of the location and access road will include contouring, replacement of topsoil and reseeding as discussed above.
3. Prior to rig release: The pits will be fenced on four sides to protect livestock and wildlife. Fence will remain until pits are backfilled.
4. Oil on pit will be removed or overhead flagging will be installed for the protection of waterfowl.
5. Timetable of rehabilitation operations: Commencement of rehabilitation work will be upon completion of drilling. Completion of rehabilitation work will depend on weather conditions and time required for pits to dry.

11. Other information used

1. Topography, soil characteristics, geologic features, flora and fauna:

The Topography of the General Area - (See Topography Map "A")

The area is a large basin formed by the Uintah Mountains to the North and the Book Cliff Mountains to the South.

The basin floor is interlaced with numerous canyons and ridges formed by the non-perennial streams of the area. The sides of these canyons are steep and ledges formed in sandstone ledges, conglomerate deposits, and shale are common in this area.

The geologic structures of the area that are visible are of the Uintah formation (Eocene Epoch) Tertiary Period in the upper elevations and the cobblestone and younger deposits from the Quaternary Period.

Outcrops of sandstone ledges, conglomerate deposits and shale are common in this area.

The topsoils in the area range from a light brownish-gray sandy clay (SM-ML) type soil with poorly graded gravels to a clayey (OL) soil.

The majority of the numerous washes and draws in the area are of a non-perennial nature flowing during the early spring run-off and heavy rain storms of long duration which are rare as the normal annual rainfall in the area is only 8".

Due to the low precipitation average, climatic conditions and the marginal types of soils, the vegetation that is found in the area are common of the semi-arid regions and consists of areas of sagebrush, rabbitbrush, some grasses and cacti as the primary flora. This is also true of the lower elevations.

The fauna of the area is sparse and consists predominantly of the mule deer, pronghorn antelope, coyotes, rabbits, and varieties of small ground squirrels and other types of rodents. The area is used by man for the primary purpose of grazing domestic sheep and cattle.

The birds of the area are raptors, finches, ground sparrows, magpies, crows and jays.

2. Surface-use and ownership:

3. Proximity of water, occupied dwellings, archeological, historical or cultural sites:

The Green River is located approximately 15 miles to the West of the location site.

There are no occupied dwellings or other facilities of this nature in the general area.

There are no visible archaeological, historical, or cultural sites within any reasonable proximity of the proposed location site.

12. Lessee or operator's field representative

ENERGY RESERVES GROUP, INC.  
P.O. BOX 3280  
CASPER, WYOMING 82602

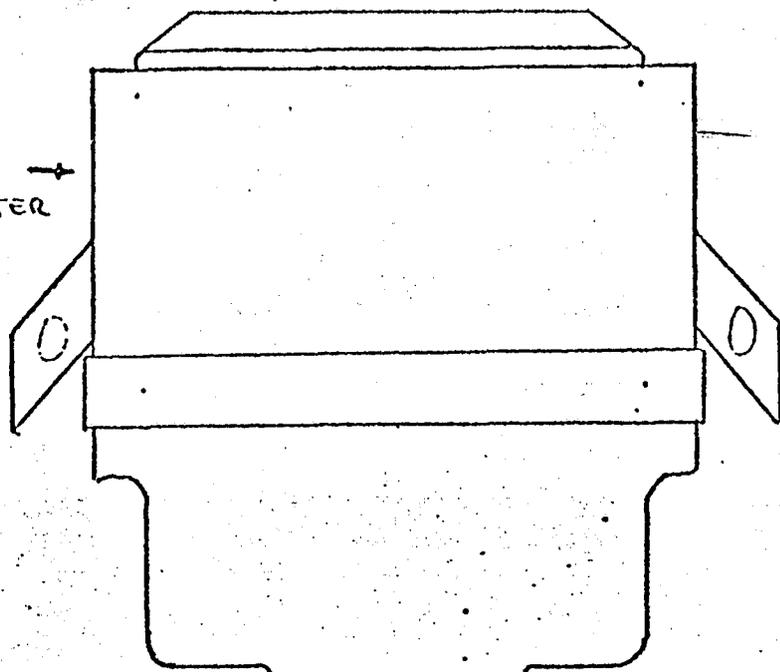
Phone No. 307-265-7331 (office)

13. Certification

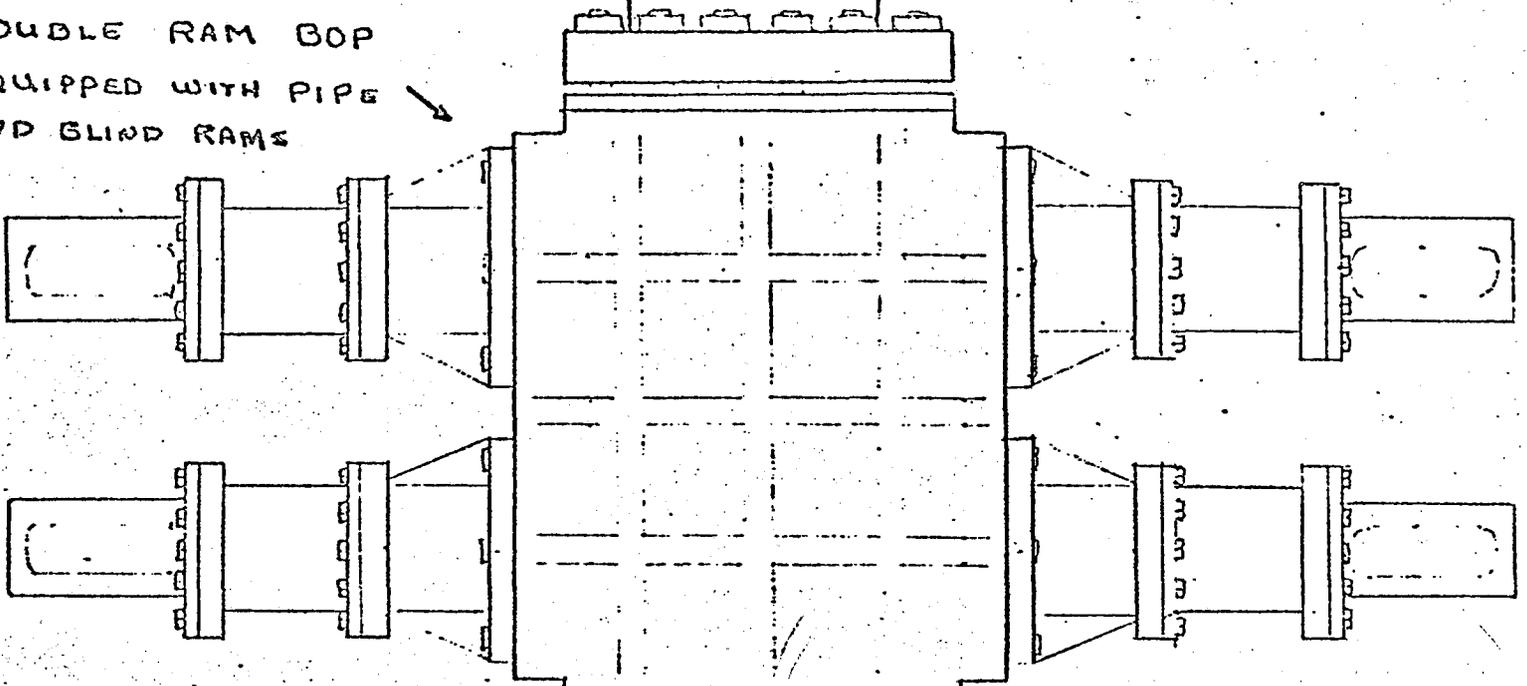
I hereby certify that I, or persons under my direct supervision have inspected the proposed drillsite and access route; that I am familiar with the conditions which presently exist; that the statements made in this plan are, to the best of my knowledge true and correct; and, that the work associated with the operations proposed herein will be performed by Energy Reserves Group, Inc. and its contractos and subcontractors in conformity with this plan and the terms and conditions under which it is approved.



5" SERIES 900  
3AG TYPE PREVENTER

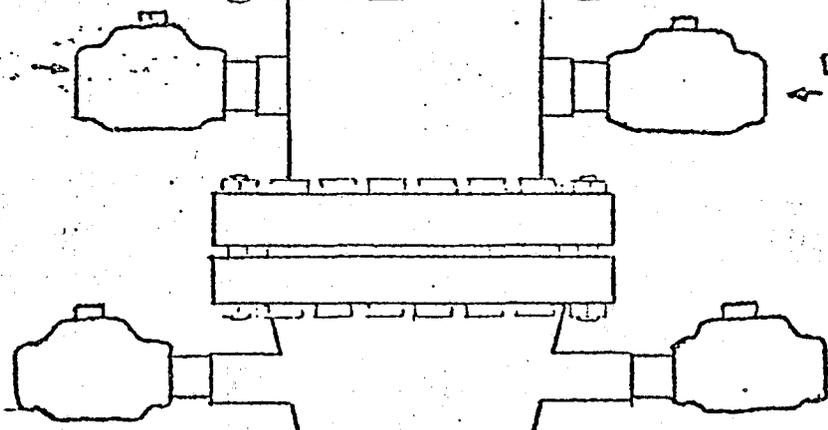


10" SERIES 900  
DOUBLE RAM BOP  
EQUIPPED WITH PIPE  
AND BLIND RAMS

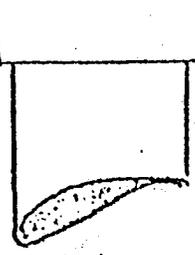


KILL LINE

BLEED OFF LINE



Surface Casing



United States Department of the Interior  
 Geological Survey  
 2000 Administration Bldg.  
 1745 West 1700 South  
 Salt Lake City, Utah 84104

NEPA CATEGORICAL EXCLUSION REVIEW

PROJECT IDENTIFICATION

Operator Energy Reserves Group, Inc.  
 Project Type Oil Well Drilling  
 Project Location 2104' FNL 2112' FWL Section 10, T. 7S, R. 23E  
 Well No. Broadhurst #17 Lease No. U-02651-A  
 Date Project Submitted February 11, 1981

FIELD INSPECTION

Date February 18, 1981

Field Inspection  
 Participants

<u>Greg Darlington</u>	<u>USGS, Vernal</u>
<u>Cory Bodman</u>	<u>BLM, Vernal</u>
<u>Bill Fiant</u>	<u>Energy Reserves Group</u>
<u>Ray Radke</u>	<u>Energy Reserves Group</u>
<u>Earl Cady</u>	<u>Ross Construction</u>
<u>Leonard Heeney</u>	<u>Ross Construction</u>

Related Environmental Documents: Unit Resource Analysis, Bonanza Planning  
Unit, BLM, Vernal

I have reviewed the proposal in accordance with the categorical exclusion review guidelines. This proposal would not involve any significant effects and, therefore, does not represent an exception to the categorical exclusions.

February 26, 1981  
 Date Prepared

Gregory Darlington  
 Environmental Scientist

I concur  
3/2/81  
 Date

E. W. [Signature]  
 District Supervisor

PROPOSED ACTION:

Energy Reserves Group, Inc. proposes to drill the Broadhurst #17 well, a 5700' oil test of the Green River Formation. About 50' of new access road is involved for the new location. The pad and wellsite were moved 200' south, then rotated 90°. (The reserve pits would be on the west side instead of the south side of the pad.) The drainage crossing the pad would be diverted around the pad. The pad would be about 135' by 300' and the pits would be 80' by 150'. A short flowline of about 400' would connect this well to a nearby tank battery.

RECOMMENDED APPROVAL CONDITIONS:

Drilling should be permitted provided the operator agrees to incorporate the following additional measures into the drilling plans:

1. BLM Stipulations
2. Lease Stipulations

CATEGORICAL EXCLUSION REVIEW INFORMATION SOURCE

Criteria 516 DM 2.3.A	Federal/State Agency			Local and private correspondence (date)	Previous NEPA	Other studies and reports	Staff expertise	Onsite inspection (date)	Other
	Corre- spondence (date)	Phone check (date)	Meeting (date)						
1. Public health and safety							1,2,3,6	2-18-81	
2. Unique charac- teristics							1,2,3,6	2-18	
3. Environmentally controversial							1,2,3,6	2-18	
4. Uncertain and unknown risks							1,2,3,6	2-18	
5. Establishes precedents							1,2,3,6	2-18	
6. Cumulatively significant							1,2,3,6	2-18	
7. National Register historic places							<del>1,2,3,6</del>	2-18	
8. Endangered/ threatened species							1,6	2-18	
9. Violate Federal, State, local, tribal law							1,2,3,6	2-18	

FIELD NOTES SHEET

Date of Field Inspection: February 18, 1981

Well No.: Broadhurst 17

Lease No.: V-02651A

Approve Location: No - Changed @ Request of operator

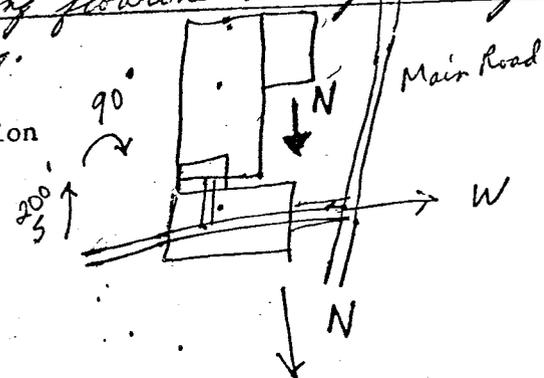
Approve Access Road: ✓ No new access required

Modify Location or Access Road: Moved 200 feet South of Original Location

for: 1. Geological Reasons 2. Better situate the pad and shorter required flowline 3. To better avoid an existing flowline during drilling. 4. More room for pad 275 long → 300 ft long.

Evaluation of Criteria for Categorical Exclusion

1. Public Health and Safety
2. Unique Characteristics
3. Environmentally Controversial Items
4. Uncertain and Unknown Risks
5. Establishes Precedents
6. Cumulatively Significant
7. National Register Historic Places
8. Endangered/Threatened Species
9. Violate Federal, State, Local, or Tribal Laws

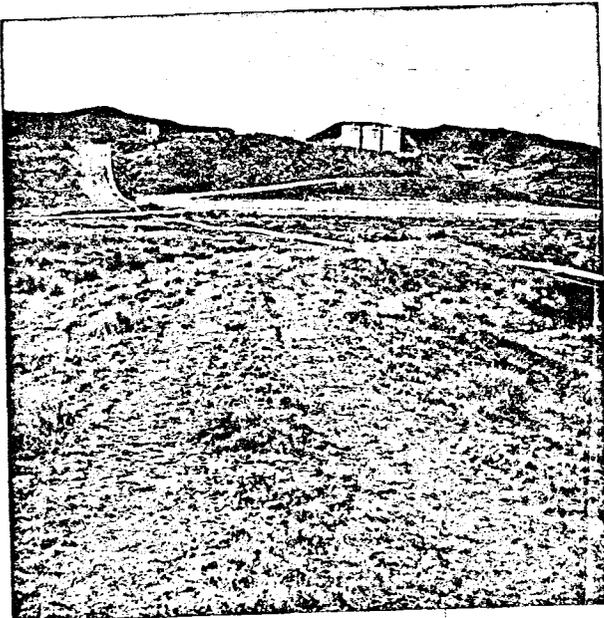


If this project is not eligible for Categorical Exclusion circle the numbers of the above criteria requiring the preparation of an EA.

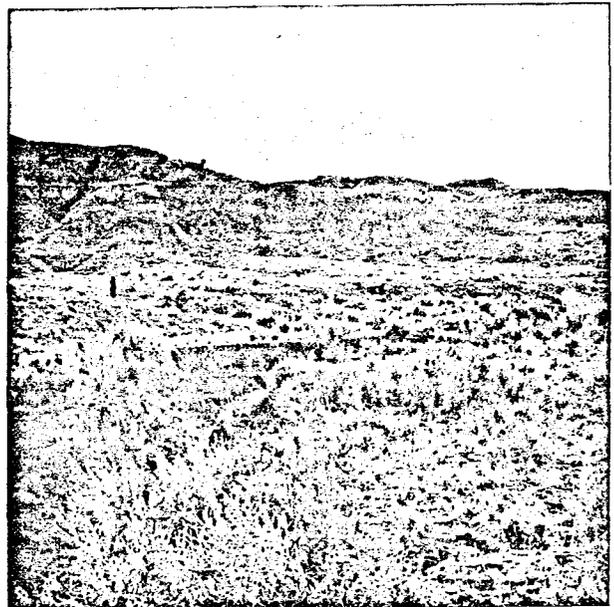
Comments and special conditions of approval discussed at onsite: (include local topography) I got confused as to my directions. The new location looks like the old only with respect to the road to a different well. See drawing. Location is close to a tank battery and pipeline. Drawing on this sheet is close to ~~scale~~ scale depiction of distance to tank battery and Old location in black, New in red.

CATEGORICAL EXCLUSION REVIEW COMMON REFERENCE LEGEND

1. Surface Management Agency Input
2. Reviews Reports, or information received from Geological Survey (Conservation Division, Geological Division, Water Resource Division, Topographic Division)
3. Lease Stipulations/Terms
4. Application Permit to Drill
5. Operator Correspondence
6. Field Observation
7. Private Rehabilitation Agreement
8. USGS conditions of approval.



Looking South From the West Side of Broadhurst #17



East View of Proposed Relocation of Broadhurst #17

Greg

FROM: : DISTRICT GEOLOGIST, SALT LAKE CITY, UTAH

TO : DISTRICT ENGINEER, O&amp;G, SALT LAKE CITY, UTAH

SUBJECT: APD MINERAL EVALUATION REPORT

LEASE NO. U-02651-AOPERATOR: Energy Reserves GroupWELL NO. 17LOCATION: C. SE 1/4 NW 1/4 sec. 10, T. 7S., R. 23E, SLMUintah County, Utah

## 1. Stratigraphy:

Uintah	surface
Green River	2950'
Green River "G"	4470'
Green River "H"	4775'
Green River "I"	5020'
Green River "J"	5300'
Green River "K"	5450'
<u>TD</u>	<u>5700'</u>

## 2. Fresh Water:

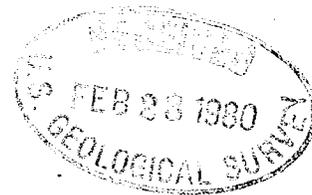
Fresh water is possible in the Uintah

## 3. Leasable Minerals:

Oil shale in the Green River. The Mahogany should occur at ~4500'. Saline minerals may occur in an 800' rock interval immediately above the Mahogany.

## 4. Additional Logs Needed:

Adequate



## 5. Potential Geologic Hazards:

None expected

## 6. References and Remarks:

Signature:

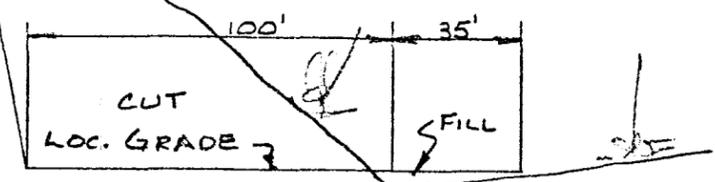
Gregory W. Wood

Date:

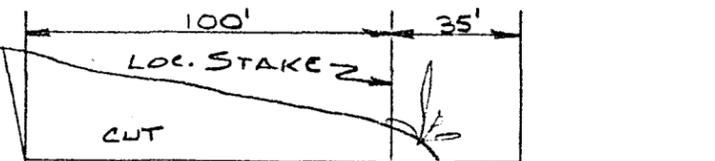
2-14-81

# ENERGY RESERVES GROUP

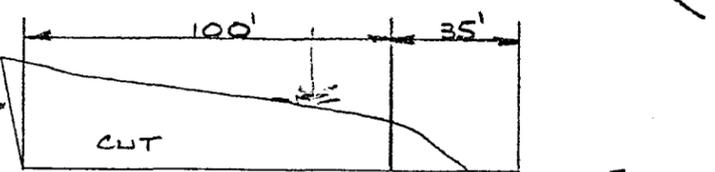
PEARL BROADHURST #17



STA. 0+00

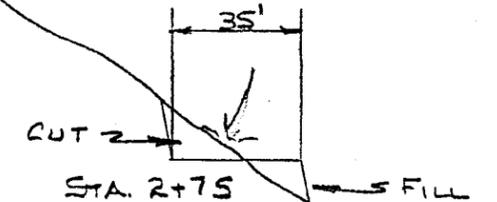


STA. 1+25



STA. 1+50

EXISTING GROUND



STA. 2+75

C  
R  
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S  
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C  
T  
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N  
S

1" = 10'  
SCALES  
1" = 50'

APPROX. YARDAGES

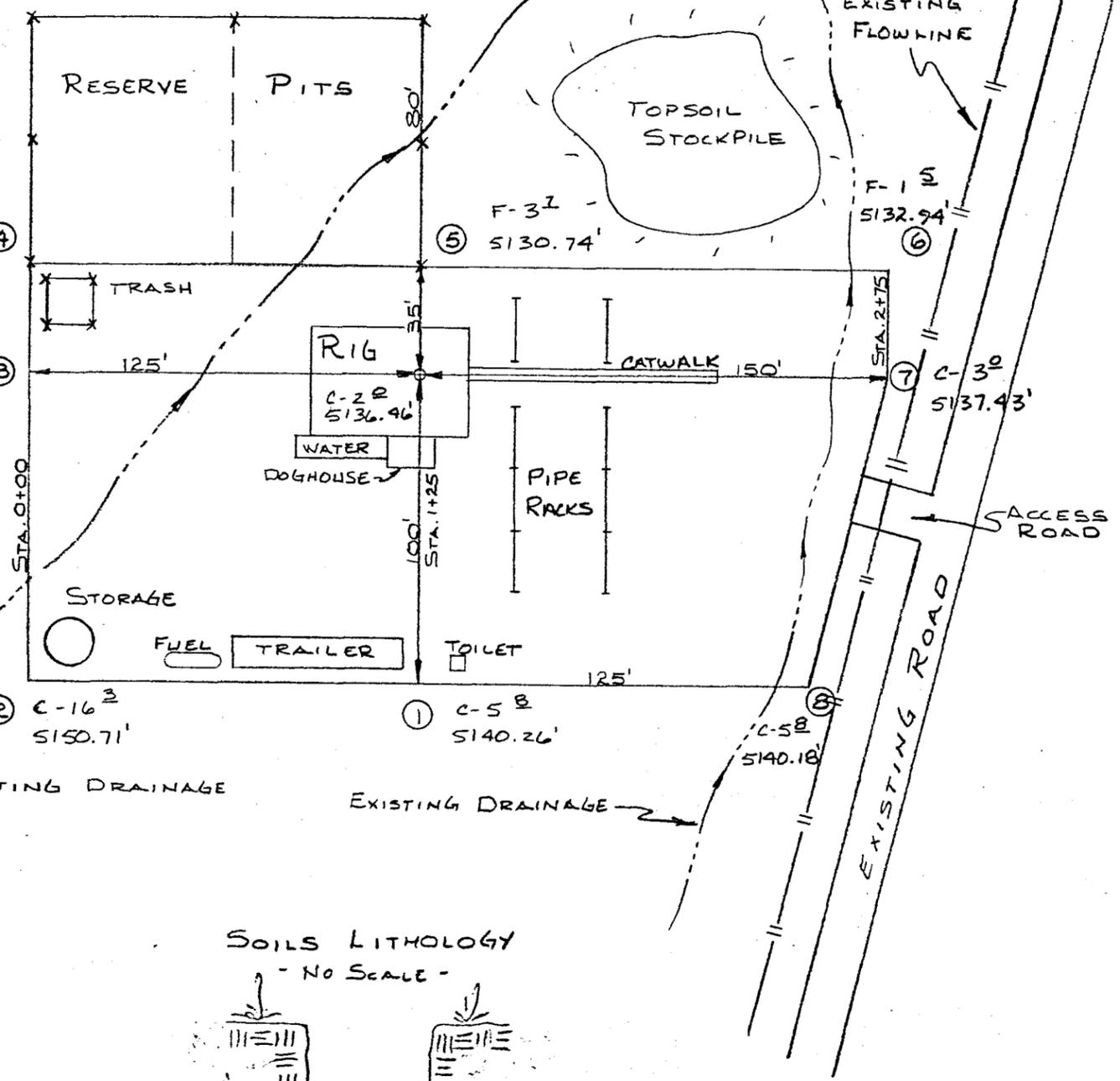
CU. YDS. CUT - 3812  
CU. YDS. FILL - 194



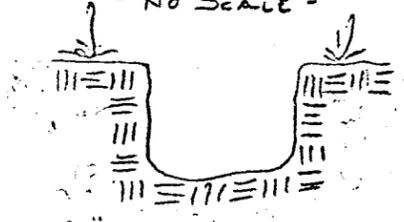
WIND EAST

REROUTE DRAINAGE

SCALE: 1" = 50'



SOILS LITHOLOGY  
- NO SCALE -



LIGHT BROWN SANDY CLAY

\*\* FILE NOTATIONS \*\*

DATE: Feb. 23, 1981  
OPERATOR: Energy Reserves Group, Inc.  
WELL NO: Broadhurst #17  
Location: Sec. 10 T. 7S R. 23E County: Wintah

File Prepared:  Entered on N.I.D:   
Card Indexed:  Completion Sheet:

API Number 43-047-30905

CHECKED BY:

Petroleum Engineer: M.S. Munder 3-13-81  
As an Oil well

Director: \_\_\_\_\_

Administrative Aide: C-3 spacing - check loc ok on Bndry #9 & proposed #17 only @ 832' apart.  
ok on bndrys.

(OW-1072'  
FNL 4  
2159'  
FWL)

APPROVAL LETTER:

Bond Required:  Survey Plat Required:

Order No. \_\_\_\_\_ O.K. Rule C-3

Rule C-3(c), Topographic Exception - company owns or controls acreage within a 660' radius of proposed site

Lease Designation Fecl. Plotted on Map

Approval Letter Written

Hot Line  P.I.

March 23, 1981

Energy Reserves Group, Inc.  
Box 3280  
Capper, Wyoming 82602

Re: Well No. Broadhurst #17  
Sec. 10, T. 7S, R. 23E, SE NW,  
Uintah County, Utah

Insofar as this office is concerned, approval to drill the above referred to oil well is hereby granted in accordance with Rule C-3, General Rules and Regulations and Rules of Practice and Procedure. Please be advised that this well is approved to be completed as an oil well only.

Should you determine that it will be necessary to plug and abandon this well, you are hereby requested to immediately notify the following:

MICHAEL T. MINDER - Petroleum Engineer  
Office: 533-5771  
Home: 876-3001

Enclosed please find Form OGC-8-X, which is to be completed whether or not water sands (aquifers) are encountered during drilling. Your cooperation in completing this form will be appreciated.

Further, it is requested that this Division be notified within 24 hours after drilling operations commence, and that the drilling contractor and rig number be identified.

The API number assigned to this well is 43-047-30905.

Sincerely,

DIVISION OF OIL, GAS, AND MINING



Michael T. Minder  
Petroleum Engineer

MTM/ko  
cc: USGS

**DUPLICATE**  
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

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

Form approved  
Budget Bureau No. 42-R1425.

**APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK**

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

2. NAME OF OPERATOR  
Energy Reserves Group, Inc.

3. ADDRESS OF OPERATOR  
Box 3280 Casper, Wyoming 82602

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

At proposed prod. zone 2104' 1904' FNL      2112' FWL

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE\*  
Approx. 18 Miles South East of Jensen, Utah

15. DISTANCE FROM PROPOSED\* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any)      548'

18. DISTANCE FROM PROPOSED LOCATION\* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.      1300'

21. ELEVATIONS (Show whether DF, RT, GR, etc.)  
 5136' GR (ungraded)

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH
12 1/2"	8 5/8"	24#	500' ±
7 7/8"	5 1/2"	14#	5,700'

5. LEASE DESIGNATION AND SERIAL NO.  
U-02651-A  
 6. IF INDIAN, ALLOTTEE OR TRIBE NAME  
 7. UNIT AGREEMENT NAME  
 8. FARM OR LEASE NAME  
Broadhurst  
 9. WELL NO.  
17  
 10. FIELD AND POOL, OR WILDCAT  
Walker Hollow  
 11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA  
Section 10, T7S-R23E  
 12. COUNTY OR PARISH  
Uintah  
 13. STATE  
Utah

16. NO. OF ACRES IN LEASE      1280'  
 17. NO. OF ACRES ASSIGNED TO THIS WELL      40  
 19. PROPOSED DEPTH      5700'  
 20. ROTARY OR CABLE TOOLS  
Rotary

22. APPROX. DATE WORK WILL START\*  
February 1981

**RECEIVED**  
 MAR 25 1981

DIVISION OF  
 OIL, GAS & MINING

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24. SIGNED Walter J. [Signature]      TITLE Field Services Adm.      DATE 2-9-81

(This space for Federal or State office use)

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

APPROVED BY W.P. [Signature]      TITLE FOR E. W. GUYNN DISTRICT ENGINEER      DATE MAR 24 1981

CONDITIONS OF APPROVAL, IF ANY:

CONDITIONS OF APPROVAL ATTACHED  
 TO OPERATOR'S COPY

NOTICE OF APPROVAL

FLARING OR VENTING OF  
 GAS IS SUBJECT TO NTL 4-A  
 DATED 1/1/80

Stack Oil & Gas



# United States Department of the Interior

IN REPLY REFER TO

T & R

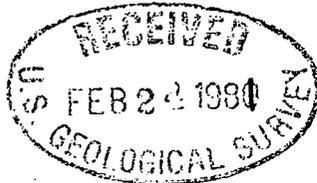
U-802

BUREAU OF LAND MANAGEMENT  
VERNAL DISTRICT OFFICE  
170 South 500 East  
Vernal, Utah 84078

February 20, 1981

Ed Guynn, District Engineer  
USGS, Conservation Division  
2000 Administration Building  
1745 West 1700 South  
Salt Lake City, Utah 84104

Re: Energy Reserve Group, Inc.  
Walker Hollow Unit  
Well #14 Sec 9, T7S, R23E  
Well #15 Sec 9, T7S, R23E  
Well #16 Sec 10, T7S, R23E  
Well #17 Sec 10, T7S, R23E  
Uintah County, Utah  
U-02651-A



Dear Mr. Guynn:

A joint examination was made on February 18, 1981, of the above referenced well site locations and proposed access roads. We feel that the surface use and operating plans are adequate with the following stipulations:

1. Construction and maintenance of roads, rehabilitation of disturbed areas, and construction of pipeline routes, shall be in accordance with surface use standards as set forth in the brochure, "Surface Operating Standards for Oil and Gas Exploration and Development,"
2. Traveling off access road rights-of-way will not be allowed. The maximum width of access road (both existing and planned) will be 30 feet total disturbed area, except where backslopes and fills require additional area. Turnouts will not be required.
3. The BLM must be contacted at least 24 hours prior to any construction activities.
4. The BLM will be contacted at least 24 hours prior to any rehabilitation activities. The operator may be informed of any additional needed seeding and restoration requirements.
5. Burn pits will be constructed. There will be no burning or burying of trash or garbage at the well sites. Refuse must be contained and hauled to an approved disposal site.

Continued . . .



6. The reserve pits will be fenced on three sides during drilling and on the fourth upon removal of the rig.

Site Specific  
Well #14

1. The reserve pits demensions were changed from 80 feet by 150 feet to 100 feet by 150 feet.
2. The top 6-8 inches of topsoil will be collected and stockpiled between reference points #1 and #2.
3. We have no objection to the proposed flowline route provided no blading of the route occurs.
4. We have no objection to the proposed tank battery location that will service this well provided the top 2-4 inches of top soil is gathered and stockpiled adjacent to the location.
  - a. That the water pit is fenced on all sides.
  - b. That the company follow stipulations #2 in construction of the proposed turn around road.

Well #15

1. The top 2-4 inches of topsoil will be gathered and stockpiled between reference point #2 and #3.
2. The proposed flowline will be laid on the surface adjacent to the existing road. The only surface disturbance allowed will be where the flowline is buried where it crosses roads.

Well #16

1. The top 3-5 inches of top soil will be gathered and stockpiled at reference points #1 and #2.
2. The reserve pits demensions were changed from 80 feet by 150 feet to 50 feet by 250 feet.
3. The proposed flowline route will not be bladed. A bulldozer may be used to assist trucks in steep terrain, drag pipeline into position and for the construction of ford type crossings on drainages which cannot otherwise be crossed. Construction of drainage crossing is the only type surface disturbance authorized.

Continued . . .

Well #17

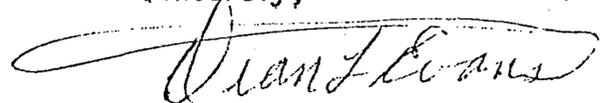
1. This location was moved 200 feet to the south and rotated 90°.
2. The top 6-8 inches of topsoil will be gathered and stockpiled between reference corners #2 and #3.
3. We have no objection to the installation of the proposed flowline provided the only surface disturbance is where the line is buried under existing roads.

All the proposed locations, access routes, and flowline routes were surveyed for cultural resources and none were found.

The proposed activities do not jeopardize listed, threatened, or endangered flora/fauna or their habitats.

The BLM representative will be Cory Bodman, 789-1362.

Sincerely,



Dean L. Evans  
Area Manager  
Bookcliffs Resource Area

cc: USGS, Vernal

NOTICE OF SPUD

P

Caller: Ross Gillespi

Phone: 307 265-7331

Well Number: Broad Hurst #17

Location: Sec 10, T5, R3E SE NW

County: Uinta State: Utah

Lease Number: U-02651-A

Lease Expiration Date: \_\_\_\_\_

Unit Name (If Applicable): \_\_\_\_\_

Date & Time Spudded: 6-7-81 4:15 p.m.

Dry Hole Spudder Rotary

Details of Spud (Hole, Casing, Cement, etc.) \_\_\_\_\_

Rotary Rig Name & Number: MGE Rig 105

Approximate Date Rotary Moves In: 6-4-81

FOLLOW WITH SUNDRY NOTICE

Call Received By: Rachelle

Date: June 8, 1981

DIVISION  
OIL & GAS

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

**SUNDRY NOTICES AND REPORTS ON WELLS**

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well  gas well  other

2. NAME OF OPERATOR  
Energy Reserves Group, Inc.

3. ADDRESS OF OPERATOR  
P.O. Box 3280 - Casper, Wyoming 82602

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)  
AT SURFACE: 2,104' FNL & 2,112' FWL (SE/NW)  
AT TOP PROD. INTERVAL:  
AT TOTAL DEPTH:

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

5. LEASE  
U-02651-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME  
USA Pearl Broadhurst

9. WELL NO.  
17

10. FIELD OR WILDCAT NAME  
Walker Hollow

11. SEC., T., R., M. OR BLK. AND SURVEY OR AREA  
Sec. 10-T7S-R23E

12. COUNTY OR PARISH  
Uintah

13. STATE  
Utah

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD)  
G.L. Elev. 5,136'; K.B. 5,149'

REQUEST FOR APPROVAL TO:                      SUBSEQUENT REPORT OF:

TEST WATER SHUT-OFF

FRACTURE TREAT

SHOOT OR ACIDIZE

REPAIR WELL

PULL OR ALTER CASING

MULTIPLE COMPLETE

CHANGE ZONES

ABANDON\*

(other)

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

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)\*

The above referenced well was spudded @ 4:15 PM 6-7-81.

Drl'd 12-1/4" hole to 507'. Ran 12 jts 8-5/8" O.D., 24#, K-55, R-3, ST&C new casing set @ 507'. Cemented w/360 sx of Class "G" cement w/2% CaCl<sub>2</sub> & 1/4# Flocele/sx. Plug down @ 2:30 PM 6-8-81. Good cement returns

N.U. & pressure tested BOPE to 1200 psi--held o.k.

6-9-81: Drlg 7-7/8" hole @ 770'.

DIVISION OF  
OIL, GAS & MINING

Subsurface Safety Valve: Manu. and Type \_\_\_\_\_ Set @ \_\_\_\_\_ Ft.

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

SIGNED Rose C. Gillespie TITLE Drlg Supt - RMD DATE 6-9-81

(This space for Federal or State office use)

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

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

**SUNDRY NOTICES AND REPORTS ON WELLS**

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well  gas well  other

2. NAME OF OPERATOR  
Energy Reserves Group, Inc.

3. ADDRESS OF OPERATOR  
P.O. Box 3280 - Casper, Wyoming 82602

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)  
AT SURFACE: 2,104' FNL & 2,112' FWL (SE/NW)  
AT TOP PROD. INTERVAL:  
AT TOTAL DEPTH:

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

REQUEST FOR APPROVAL TO:	SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF <input type="checkbox"/>	<input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	<input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	<input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	<input type="checkbox"/>
PULL OR ALTER CASING <input type="checkbox"/>	<input type="checkbox"/>
MULTIPLE COMPLETE <input type="checkbox"/>	<input type="checkbox"/>
CHANGE ZONES <input type="checkbox"/>	<input type="checkbox"/>
ABANDON* <input type="checkbox"/>	<input type="checkbox"/>
(other) <u>Top of Cement</u> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

5. LEASE U-02651-A	
6. IF INDIAN, ALLOTTEE OR TRIBE NAME	
7. UNIT AGREEMENT NAME	
8. FARM OR LEASE NAME USA Pearl Broadhurst	
9. WELL NO. 17	
10. FIELD OR WILDCAT NAME Walker Hollow	
11. SEC., T., R., M. OR BLK. AND SURVEY OR AREA Sec. 10-T7S R23E	
12. COUNTY OR PARISH Uintah	13. STATE Utah
14. API NO.	
15. ELEVATIONS (SHOW DF, KDB, AND WD) 5,149' (GRD + 13')	

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

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)\*

On August 27, 1981, a Cement Bond Log indicated the top of cement to be at ± 1,900' K.B. on the subject well.

**RECEIVED**  
SEP 17 1981

DIVISION OF  
OIL, GAS & MINING

Subsurface Safety Valve: Manu. and Type \_\_\_\_\_ Set @ \_\_\_\_\_ Ft.

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

SIGNED Bobby Patrick TITLE Prod. Engr- RMD DATE 9-11-81

(This space for Federal or State office use)

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

FORM OGC-8-X

FILE IN QUADRUPLICATE

RECEIVED  
JUN 2 1964

STATE OF UTAH  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL & GAS CONSERVATION  
1588 West North Temple  
Salt Lake City, Utah 84116

DIVISION OF  
OIL, GAS & MINING

REPORT OF WATER ENCOUNTERED DURING DRILLING

Well Name & Number U.S.A. Pearl Broadhurst #17

Operator Energy Reserves Group, Inc. Address P.O. Box 3280 - Casper, WY 82602- 307-265-733

Contractor MGF Drilling Company Address P.O. Box 940 -Mills, WY 82644 - 307-234-7389

Location SE 1/4 NW 1/4 Sec. 10 T. 7 N R. 23 Uintah County, Utah  
Ⓢ W

Water Sands:

<u>Depth</u>		<u>Volume</u>	<u>Quality</u>
From	To	Flow Rate or Head	Fresh or Salty
1. (During drilling operations no water flows were encountered. The drilling was			
2. essentially water from surface to ± 2,540' and chemical/gel mud system from ±			
3. 2,540' to T.D., with mud weights ranging from 8.8 to 9.2 ppg).			
4.			
5.			

(Continue on reverse side if necessary)

Formation Tops:

Uintah @ surface  
Green River ± 2,885'

Remarks:

- NOTE:
- (a) Upon diminishing supply forms, please inform this office.
  - (b) Report on this form as provided for in Rule C-20, General Rules and Regulations and Rules of Practice and Procedure, (See Back of form).
  - (c) If a water analysis has been made of the above reported zone, please forward a copy along with this form.

LITHOLOGY

- 3,200 - 3,260 LIMESTONE (10-30%) - crm gy-gybrn, frm-hd, vf-micxln, micrite, occ slty, sl-mod arg, n-vp intxln  $\emptyset$ , NSOFC.  
SHALE (45-60%) - gy gn rdbrn orng yelbrn, sft-frm, sbfis-sbblky, occ slty-sl sdy, calc, NSOFC.  
SILTSTONE (20-40%) - gy gybrn, frm-hd, arg-occ sdy, sl calc n  $\emptyset$ , NSOFC.  
SANDSTONE (tr-10%) - wh gy, frm-hd, vf gr w srt, occ fri, occ arg-slty, sl-mod calc, occ p-fr intgr  $\emptyset$ , NSOFC.  
PYR (tr) - hd, mas.
- 3,260 - 3,280 SILTSTONE (70%) - gy gybrn-brn, frm-hd, arg occ sdy, sl calc, occ sil, occ tt, gen n  $\emptyset$ , NSOFC.  
SHALE (20%) - var col, sft-frm, sbblky-sbfis, calc, NSOFC.  
LIMESTONE (10%) - gy gybrn crm occ wh, frm-hd, vf-micxln, micrite, occ slty, sl-mod arg, n-vp  $\emptyset$ , NSOFC.
- 3,280 - 3,300 SANDSTONE (20%) - gy gybrn lt-m brn, frm-hd, vf-f gr, sbang, w srt, occ arg-slty, occ fri, sl-mod calc, gen fr-exc  $\emptyset$ , sme fr-exc lt-m brn dif o stn/wk flor, stng stmg-milky dif cut.  
SILTSTONE (60%) - lt-m gy gybrn brn, frm-hd, arg-occ sdy, sl-calc, occ sil, occ tt, gen n  $\emptyset$ , tr dd o stn/NFOC.  
LIMESTONE (tr) - micrite, gen a/a.
- 3,300 - 3,340 LIMESTONE (10-20%) - crm gy gybrn, frm-hd, micxln, micrite, sl-mod arg-occ sl slty, n-vp intxln  $\emptyset$ , NSOFC.  
SANDSTONE (tr) - wh gy lt brn crm, frm-hd, vf-f gr cons sbang-sbrd mod w srt, fr-exc  $\emptyset$ , occ dd o stn, NFOC, gen NSOFC.  
SILTSTONE (40-60%) - gy brn gybrn tan crm, frm-hd, arg, occ sdy, sl-mod calc, occ sil, occ tt, gen n-vp  $\emptyset$ , gen NSOFC.  
SHALE (30-40%) - var col, sft-frm, sbblky, sl slty-sl sdy sl-mod calc, NSOFC.
- 3,340 - 3,360 SILTSTONE (80%) - gy gybrn m-dk brn, frm-hd, arg, v occ sdy, occ sl calc, occ sil, occ tt/n  $\emptyset$ , fr-exc dd o stn, NFOC.  
SHALE (20%) - gygn gy rdbrn orng yel-yelbrn, sft-frm, sbblky, calc, NSOFC.
- 3,360 - 3,400 SANDSTONE (tr-10%) - tan lt brn, frm, vf gr w srt, arg-slty, sl calc, occ fri, sme fr-exc  $\emptyset$ , fr-exc lt brn dif o stn/wk gn flor, stng stmg-milky dif yelgn cut.  
SILTSTONE (60-70%) - gy gybrn crm lt-dk brn, frm-hd, arg, occ sdy, sl-mod calc, sme sil, sme tt, gen n-p  $\emptyset$ , sme lt-dk brn dd o stn, occ lt brn o stn/wk flor, v wk resd cut.  
SHALE (10-30%) - var col, sft-frm, sbblky-sbfis, occ slty sl sdy, gen calc, NSOFC.

LITHOLOGY (Cont.)

- 3,400 - 3,440 SILTSTONE (60-70%) - lt-dk brn gybrn m gy, frm-hd, arg-occ sdy, sl calc, sme sil, gen n-p Ø, sme fr dd brn o stn, NFOC.  
LIMESTONE (10%) - crm tan lt-m brn, frm-hd, micxln, micrite, arg occ slty, gen n-vp intxln Ø, occ dd o stn/NFOC.  
SHALE (20-30%) - gy gn rdbrn orng yel tan, sft-frm, sbblky, occ slty-sl sdy, calc, NSOFC.
- 3,440 - 3,460 SANDSTONE (tr-10%) - lt brn gy, frm-hd, vf-f gr mod w srt, arg-slty, sl calc, fr-exc intgr Ø, fr lt brn dif o stn/dul yel dif flor, stng stmg-milky dif cut.  
SHALE (20%) - var col, sbblky, calc, occ tar str, gen NSOFC.  
SILTSTONE (70%) - gy gybrn lt-m brn, frm-hd, arg-occ sdy, sl calc, n Ø, fr dd o stn/NFOC.
- 3,460 - 3,500 SHALE (50%) - orng rdbrn yel gn gy gybrn, sft-frm, occ slty-sl sdy, calc, gen NSOFC.  
SANDSTONE (tr-10%) - lt brn gy, frm-hd, vf gr arg occ slty, sl calc, fr-exc Ø, gen cvgs.  
LIMESTONE (10%) - crm tan, sft-frm, micxln, micrite, arg, occ dd lt brn o stn, NFOC.  
SILTSTONE (30-40%) - gy gybrn crm lt-m brn, frm-hd, gen a/a.
- 3,500 - 3,540 SANDSTONE (10%) - lt-dk brn tan, frm-hd, vf-f gr cons sbrd w srt, occ arg-slty, sl calc, gen fri, gen fr-exc Ø, sme exc lt-dk brn dif-ptchy o stn/n-dul gn-yelgn flor, stng stmg-stng-wk milky dif cut.  
SILTSTONE (40-50%) - gy brn gybrn tan, frm-hd, arg-occ sdy, sl calc, sme sil, gen tt/n Ø, sme fr-exc dd o stn/NFOC.  
SHALE (30-40%) - var col, sft-frm, sbblky-sbfis, occ slty-sl sdy, calc, NSOFC.
- 3,540 - 3,560 SANDSTONE (tr) - cvgs, exc dk brn o stn, f gr, exc Ø.  
SILTSTONE (60%) - gy brn gybrn tan, frm-hd, arg-occ sdy, sl calc, sme sil, occ tt/n Ø, sme fr dd o stn, NFOC.  
SHALE (40%) - var col, sft-frm, sbblky, calc, NSOFC.
- 3,560 - 3,600 LIMESTONE (tr-10%) - crm tan lt brn, frm-hd, crp-micxln, micrite, arg-sl slty, n intxln Ø, NSOFC.  
SILTSTONE (40-50%) - gy gybrn brn, frm-hd gen a/a, occ dd o stn/NFOC, gen NSOFC.  
SHALE (40-60%) - gy gn orng rdbrn brn tan yel, sft-frm, sbblky-sbfis, gen calc, occ slty-sl sdy, NSOFC.

LITHOLOGY (Cont.)

- 3,600 - 3,620 SANDSTONE (tr-10%) - lt gy lt brn, frm-hd, slty-arg, occ fri, sme fr-exc  $\emptyset$ , occ lt brn o stn/wk cut, sme dd o stn/NFOC.  
SHALE (60%) - var col, sft-frm, fis-sbblky, calc, occ slty-sdy, NSOFC.  
SILTSTONE (30%) - gy brn gybrn occ var col, frm-hd, arg-sdy, sl calc, occ sil, occ tt, gen n-p  $\emptyset$ , NSOFC.  
LIMESTONE (tr) - gy gybrn tan, frm-hd, micrite, arg-occ slty, n intxln  $\emptyset$ , NSOFC.
- 3,620 - 3,700 SANDSTONE (40-70%) - lt brn-lt gy, frm-hd, vf-f gr cons sbang-sbrd w srt, occ arg-slty, sl calc, gen sil cmt, fr-g  $\emptyset$ , lt-dk brn dif o stn/wk gn flor, stng stm-g-flash-milky dif cut.  
SILTSTONE (20-30%) - gy gybrn lt-dk brn, frm-hd, arg-sme vf sd, sl-mod calc, occ sil, gen n-p  $\emptyset$ , sme fr brn o stn/NF, wk resd cut, gen dd o stn.  
SHALE (10-40%) - gn gy orng rdbrn tan yel brn, sft-frm, sbblky-sbfis, occ slty-sdy, calc, NSOFC.  
LIMESTONE (tr) - crm tan lt brn-gybrn, frm-hd, micxln, occ crpxln, micrite, arg-occ sl slty, n intxln  $\emptyset$ , occ tr dd o stn, gen NSOFC.
- 3,700 - 3,720 SANDSTONE (50%) - wh lt gy occ lt brn, vf-f gr cons w srt, arg-slty, sl calc, gen fri, fr-exc  $\emptyset$ , NSOFC, occ fr-exc brn dd o stn, occ m gr uncons, rd, frstd.  
SHALE (40%) - var col, sft-frm, sbblky, occ slty-sl sdy, calc, NSOFC.  
SILTSTONE (tr-10%) - crm tan lt brn lt gybrn, frm-hd, arg-sl sdy, n  $\emptyset$ , NSOFC.  
LIMESTONE (tr) - crm tan, frm-hd, micrite, arg, n  $\emptyset$ , NSOFC.
- 3,720 - 3,760 SANDSTONE (tr-10%) - lt gy wh occ lt brn, frm-hd, vf-f gr w srt, arg-slty, sl calc, gen fri/fr-exc  $\emptyset$ , gen NSOFC, occ cvgs/lt-m brn o stn.  
SHALE (40-60%) - var col, sft-frm, sbblky-sbfis, occ slty-sl sdy, sl-mod calc, NSOFC.  
LIMESTONE (tr-10%) - crm tan gy gybrn, frm-hd, micxln, micrite, arg, n intxln  $\emptyset$ , NSOFC.  
SILTSTONE (20-40%) - gy gybrn brn crm, frm-hd, arg, occ sl sdy, sl-mod calc, n  $\emptyset$ , NSOFC.  
PYR (tr) - gol, hd, mas.
- 3,760 - 3,780 SANDSTONE (30-40%) - wh lt gy, frm-hd, vf-f gr cons sbang w srt, sl arg-sl slty, gen fri/fr-exc  $\emptyset$ , cln, NSOFC, occ m gr uncons ang-rd occ frstd.  
SILTSTONE (15%) - crm lt-m gy-gybrn, frm-hd, arg-occ sdy, sl-mod calc, occ sil, occ tt, sme p  $\emptyset$ , NSOFC.  
SHALE (40-50%) - gy brn gn yel orng rdbrn crm var col, sft-frm, sbblky occ sbfis, occ slty-sl sdy, calc, NSOFC.

LITHOLOGY (Cont.)

- 3,780 - 3,800 SANDSTONE (90%) - clr wh lt gy, hd, f-m gr uncons sbang-rd, NSOFC, occ vf gr cons w srt, NSOFC.  
SHALE (tr-10%) - var col, gen a/a.  
SILTSTONE (tr) - crm gy gybrn, frm-hd, arg occ sdy, gen a/a.
- 3,800 - 3,820 SANDSTONE (60%) - lt gy clr wh occ lt brn, frm-hd, vf-f gr cons w srt, sl arg-sl slty, gen cln, gen fri/exc  $\emptyset$ , gen NSOFC, occ lt brn o stn/NF, occ stng cut.  
SHALE (35%) - gy gn yel orng rdbrn brn crm, sft-frm, sbblky-sbfis, occ slty-sdy, calc, NSOFC.  
SILTSTONE (tr) - crm lt brn gy gybrn, frm-hd, arg, occ sl sdy, n-p  $\emptyset$ , NSOFC.
- 3,820 - 3,840 SANDSTONE (20%) - lt gy lt brn clr, vf-f gr cons w srt, sl arg, occ sl slty, gen fri, gen cln, fr-exc  $\emptyset$ , lt brn-lt gy dd o stn, NFOC, occ m gr uncons, occ frstd.  
SILTSTONE (30%) - gy gybrn crm brn, frm-hd, arg occ sdy, sl-mod calc, n-vp  $\emptyset$ , occ d o stn, gen NSOFC.  
SHALE (50%) - gy brn crm yel orng gn, sft-frm, sbblky, occ slty-sl sdy, calc, NSOFC.
- 3,840 - 3,860 SANDSTONE (50%) - wh lt gy clr frstd, vf-f gr cons sbrd-rd w srt, sl arg-sl slty, gen fri, gen sil cmt, fr-exc  $\emptyset$ , cln/NSOFC.  
SILTSTONE (20%) - lt gy lt brn crm gybrn, frm-hd, arg occ sdy, sl-mod calc, occ sil, occ tt, gen n-vp  $\emptyset$ , NSOFC.  
SHALE (30%) - var col, sft-frm, sbblky, occ slty-sdy, calc, NSOFC.
- 3,860 - 3,900 SHALE (50-60%) - var col, sft gen a/a, occ sbfis.  
SANDSTONE (tr) - lt gy lt brn, vf-f gr cons w srt, arg-slty, gen fri/exc  $\emptyset$ , tr dd o stn, NFOC.  
SILTSTONE (25-35%) - gy gybrn lt-m brn crm tan, frm-hd, arg occ sdy, sl calc, occ sil, occ tt, gen NSOFC, tr dd o stn.  
LIMESTONE (tr-10%) - crm brn tan gy gybrn, frm-hd, crp-micxln, micrite, arg occ sl slty, n  $\emptyset$ , NSOFC.
- 3,900 - 3,940 SANDSTONE (50%) - wh lt gy clr frstd occ lt brn, frm-hd, vf-f gr cons sbang-sbrd mod w srt, occ arg-slty, gen fr-exc  $\emptyset$ , occ sil cmt, occ tt, sme lt-m brn dif o stn/wk dif-ptchy flor, wk stng cut, sme cln/NSOFC.  
SHALE (30%) - rdbrn gn gy mot yel brn, sft-frm, sbblky-sbfis, occ slty-sl sdy, calc, NSOFC.  
SILTSTONE (20%) - gy brn crm var col, sft-frm, arg-occ sdy, occ calc, occ sil, gen n  $\emptyset$ , NSOFC.

LITHOLOGY (Cont.)

- 3,940 - 4,020 SANDSTONE (tr-10%) - wh lt gy clr, occ frstd, occ lt brn, frm-hd, vf-f gr w srt, occ arg-slty, sme fri/exc  $\emptyset$ , occ sil, sl calc, occ dd o stn/NFOC, gen NSOFC.  
SHALE (50-60%) - orng, yel gn gy brn var col, sft-frm, sbblky-sbfis, occ slty-sl sdy, sl-mod calc, NSOFC.  
SILTSTONE (25-40%) - crm tan lt brn gy gybrn, sft-hd, arg-occ v sdy, sl-mod calc, gen n-p  $\emptyset$ , occ sil, occ tt/n  $\emptyset$ , NSOFC.
- 4,020 - 4,040 SANDSTONE (10-20%) - wh clr lt gy, occ frstd, occ lt-m brn, frm-hd, vf-f gr cons sbang-sbrd mod w srt, occ arg-slty, sme calc cmt sme sil cmt, gen fr-exc  $\emptyset$ , occ fri, gen cln/NSOFC, occ lt-m brn dif o stn/n-dul flor wk cut.  
SHALE (60%) - var col, sft-frm, sbfis-sbblky, occ slty-sdy, calc, NSOFC.  
SILTSTONE (20-30%) - crm tan gy brn mot, sft-hd, arg-occ sdy, sl-mod calc, occ sil, gen n-p  $\emptyset$ , occ tr dd o stn/NFOC.
- 4,040 - 4,100 SANDSTONE (tr-10%) - wh lt gy clr frstd, frm-hd, vf-f gr cons w srt, exc  $\emptyset$ , cln/NSOFC, occ m gr uncons sbang.  
SHALE (60-70%) - var col, sft-frm, gen a/a.  
SILTSTONE (20-35%) - crm tan gy brn mot, sft-hd, arg-occ sme vf sd, sl-mod calc, occ sil cmt, n  $\emptyset$ , NSOFC.
- 4,100 - 4,140 SANDSTONE (40-60%) - wh lt gy, clr occ frstd, occ lt-m brn, frm-hd, vf-f gr cons w srt, sme arg-slty, gen fri/exc  $\emptyset$ , gen cln/NSOFC.  
SILTSTONE (10-25%) - crm, tan gybrn mot, sft-hd, arg-occ sdy, occ calc, occ sil, NSOFC.  
SHALE (15-40%) - var col, sft-frm, sbblky, occ sbfis, occ slty-sl sdy, calc, NSOFC.
- 4,140 - 4,200 SHALE (55-65%) - gy gn yel brn orng crm rdbrn var col, sft-frm, sbblky-sbfis, occ fis, occ slty-v sdy, calc, NSOFC.  
SILTSTONE (35-40%) - gybrn crm tan mot, sft-hd, arg-occ sdy, sl-mod calc, occ sil/n  $\emptyset$ , gen n-p  $\emptyset$ , NSOFC.  
SANDSTONE (tr-10%) - wh lt gy clr occ frstd occ lt brn cvgs, frm-hd, gen a/a.
- 4,200 - 4,220 SANDSTONE (40%) - clr frstd wh lt gy, frm-hd, vf-f gr, cons sbang-sbrd w srt, sl arg-sl slty, gen fri/exc  $\emptyset$ , occ sil cmt, sl calc, gen cln/NSOFC, occ f-m gr uncons, rd-sbrd.  
SILTSTONE (25%) - var col, sft-hd, arg, occ v sdy, occ calc, sme sil, n  $\emptyset$ , NSOFC.  
SHALE (35%) - gn gy var col, sft-frm, sbblky, calc, occ slty-sdy, NSOFC.

LITHOLOGY (Cont.)

- 4,220 - 4,240 SILTSTONE (30%) - gy brn rdbrn crm tan, sft-hd, arg-occ sme vf sd, sl-mod calc, occ sil, n Ø, NSOFC.  
SANDSTONE (10%) - wh clr lt gy, hd, f gr cons w srt, gen fri, exc Ø, NSOFC.  
SHALE (60%) - gy gn brn yel orng crm tan rdbrn, sft-frm, sbblky-sbfis, calc, NSOFC.
- 4,240 - 4,260 SANDSTONE (10-20%) - clr wh lt gy frstd, frm-hd, vf-f gr cons w srt, n-sl arg-sl slty, sl calc, occ sil cmt, fr-exc Ø, sme fri, gen cln, NSOFC.  
SILTSTONE (40%) - lt-m gy brn gybrn crm tan, sft-hd, arg-occ v sdy, sl-mod calc, gen n-vp Ø, NSOFC.  
SHALE (40-50%) - gy brn rdbrn orng yel crm var col, sft-frm, sbblky, occ slty-sl sdy, calc, NSOFC.
- 4,260 - 4,280 PYR (tr) - gol, hd, mas.  
SANDSTONE (20%) - clr lt gy wh occ frstd, gen vf-f gr cons sbang-sbrd w srt, sl arg, sl calc, NSOFC.  
SHALE (50%) - var col, sbblky-sbfis, gen a/a.  
SILTSTONE (30%) - crm tan gy occ lt-m brn gy gn var col, sft-frm, arg-occ sdy, sl-mod calc, n Ø, NSOFC.
- 4,280 - 4,300 SANDSTONE (tr-10%) - lt gy, lt gybrn wh clr, gen vf-f gr cons w srt, sl arg-sl slty, gen fri/exc Ø, sl calc, sme lt gy-lt brngy dif dd o stn, NFOC, gen cln, NSOFC.  
SHALE (60%) - var col, sbblky-sbfis, occ slty-sl sdy, occ v calc, NSOFC.  
SILTSTONE (30%) - brn rdbrn gy gn gybrn crm, sft-frm, arg-occ sdy, sl-mod calc, n-vp Ø, NSOFC.
- 4,300 - 4,310 SANDSTONE (20%) - lt-m brn gy-gybrn, frm-hd, vf-f gr cons sbang mod w srt, gen fri/exc Ø, exc lt-m brn dif o stn/dul yelgn flor, stng stmg-flash-milky dif blgn cut.  
SILTSTONE (20%) - var col, sft-frm, arg-sdy, occ calc, occ sil, gen n Ø, NSOFC.  
SHALE (60%) - var col, sft-frm, sbblky-sbfis, occ slty sdy, sl-mod calc, NSOFC.
- 4,310 - 4,320 SANDSTONE (tr) - wh lt gy occ lt brn, frm-hd, arg-slty, vf-f gr cons w srt/sme calc cmt, gen exc Ø, occ fri, occ dd o stn, gen NSOFC.  
SILTSTONE (40%) - crm gy brn mot gn orng, sft-frm, arg-occ v sdy, occ calc, gen n-vp Ø, NSOFC.  
SHALE (55%) - gy brn rdbrn yel crm orng gn tan, sft-frm, sbblky-sbfis, occ slty-sdy, occ calc, NSOFC.
- 4,320 - 4,330 SANDSTONE (20%) - m-dk brn, vf-f gr cons w srt, occ arg-slty, sl calc, gen fri/exc Ø, exc o stn/dul yel flor, stng stmg-milky dif cut.  
SILTSTONE (35%) - crm gy var col, sft-frm, arg-occ v sdy, gen n-p Ø, occ dd o stn, gen cln, NSOFC.  
SHALE (45%) - var col, sft-frm, sbblky-sbfis, occ slty-sl sdy, sl-mod calc, NSOFC.

LITHOLOGY (Cont.)

- 4,330 - 4,340 SANDSTONE (25-30%) - lt-dk brn, frm-hd, vf-f gr cons w srt, gen fri/exc  $\emptyset$ , exc lt-dk brn dif o stn, wk-n flor, stng stmg-milky dif blgn cut.  
SILTSTONE (30-40%) - gy brn rdbrn, sft-frm, arg-occ v sdy, sl-occ mod calc, gen n  $\emptyset$ , occ dd o stn, gen NSOFC.  
SHALE (30-40%) - var col, sbblky, gen a/a.
- 4,340 - 4,350 SHALE (70%) - gy brn gn yel crm tan rdbrn occ orng, sft-frm, sbblky-fis occ splty, slty-sl sdy, calc, NSOFC.  
SILTSTONE (25%) - gy rdbrn brn gn var col, sft-frm, arg-occ calc, n  $\emptyset$ , NSOFC.  
SANDSTONE (tr) - wh lt gy vf-f gr cons w srt, fr-exc  $\emptyset$ , cln, NSOFC.
- 4,350 - 4,360 SANDSTONE (30%) - lt gy lt brn clr, frm-hd, vf-f gr cons w srt, fr-exc  $\emptyset$ , gen fri, sme lt gy dif o stn, n-wk flor, wk stmg cut.  
SILTSTONE (20%) - gy brn var col, mot, sft-frm, arg-occ sdy, sl-mod calc, n  $\emptyset$ , NSOFC.  
SHALE (50%) - var col, sft-frm, sbblky-fis, occ slty-sl sdy, calc, NSOFC.
- 4,360 - 4,390 SANDSTONE (10-30%) - wh lt gy lt brn clr frstd, frm-hd, vf-f gr sbrd mod w srt, occ arg-slty, sl calc, gen fri, exc  $\emptyset$ , occ lt gy-lt brn dd o stn, n-wk flor, v wk cut.  
LIMESTONE (tr) - wh, micrite, n arg, n  $\emptyset$ , NSOFC.  
SILTSTONE (20-30%) - gy brn crm wh mot var col, sft-hd, arg-occ sdy, occ calc, occ sil, n  $\emptyset$ , NSOFC.  
SHALE (40-60%) - gy brn yel crm orng var col, sft-frm, sbblky-fis, occ splty, calc, n  $\emptyset$ , NSOFC.
- 4,390 - 4,400 SANDSTONE (20%) - lt gy lt brn wh clr, vf-f gr cons, gen w srt, occ arg-slty, occ sl-mod calc cmt, gen fri, exc  $\emptyset$ , occ lt gy lt brn dif o stn, dul gn flor, v wk cut.  
SILTSTONE (30%) - gen a/a, occ dd o stn-tar str, NFOC.  
SHALE (50%) - gy gn brn crm tan yel rdbrn orng, sft-frm, sbblky-sbfis, occ slty-sl sdy, calc, NSOFC.
- 4,400 - 4,420 SHALE (70%) - brn crm tan yel orng gn rdbrn gy mot, sft-frm, sbblky-sbfis, occ slty-sdy, gen calc, NSOFC.  
SILTSTONE (25%) - gy brn gn mot, var col, sft-frm, arg-occ v sdy, occ calc, n  $\emptyset$ , NSOFC.  
SANDSTONE (tr) - lt gy wh clr, frm-hd, vf-f gr cons w srt, occ arg-slty, sme calc cmt, occ fri, fr  $\emptyset$ , NSOFC.
- 4,420 - 4,440 SANDSTONE (10-20%) - lt-dk brn gy-gybrn, frm-hd, vf-f gr cons sbang w srt, occ arg-slty, occ calc, gen fri, exc  $\emptyset$ , exc lt-dk brn dif o stn, wk ptchy flor, stng stmg-dif cut.  
SILTSTONE (20-30%) - lt gy brn crm tan var col, sft-frm, arg-occ v sdy, sl-mod calc, gen n-vp  $\emptyset$ , occ dd o stn, NFOC.  
SHALE (60%) - var col, sbblky-sbfis, gen a/a, NSOFC.

LITHOLOGY (Cont.)

- 4,440 - 4,460 SANDSTONE (tr-10%) - wh lt gy-lt brn, vf gr cons w srt, gen cvgs.  
SILTSTONE (40%) - gy brn gn orng yel mot, var col, sft-frm, arg-occ sme vf sd, occ mod calc, gen n-vp  $\emptyset$ , NSOFC.  
SHALE (50-60%) - var col, sft-frm, sbblky, occ slty-sdy, gen calc, NSOFC.
- 4,460 - 4,520 SANDSTONE (10-20%) - wh lt gy clr occ lt brn, vf-f gr cons mod w srt, arg-occ slty, gen fri, exc  $\emptyset$ , gen cln, NSOFC.  
SHALE (50-60%) - var col, sft-frm, sbblky-fis occ splty, gen NSOFC.  
SILTSTONE (20-30%) - var col, sft-frm, arg-occ sdy, sl-occ calc, NSOFC.
- 4,520 - 4,560 SANDSTONE (30-40%) - lt gy clr occ wh occ frstd, frm-hd, vf-f gr cons sbang mod w srt, arg-slty, gen fri, exc  $\emptyset$ , gen NSOFC, occ tar str.  
PYR (tr) - gol, hd, mas.  
SILTSTONE (25-40%) - gn gy crm yel brn orng mot, var col, sft-hd, arg-occ v sdy, occ calc, occ sme sil cmt, occ tt, gen n-vp  $\emptyset$ , NSOFC.  
SHALE (20-50%) - var col, sbblky-sbfis, occ slty, NSOFC.
- 4,560 - 4,580 SANDSTONE (40-50%) - lt gy wh clr occ frstd, frm-hd, vf-f gr cons w srt, arg-slty, occ calc, gen fri, fr-exc  $\emptyset$ , NSOFC.  
SILTSTONE (20-30%) - gy gn orng rdbrn crm, sft-hd, arg-occ sme vf sd, occ calc, gen n-vp  $\emptyset$ , NSOFC.  
SHALE (20-40%) - gy yel crm brn gn orng, sft-frm, sbblky-occ fis, occ slty-sdy, gen calc, NSOFC.
- 4,580 - 4,600 SANDSTONE (20-30%) - clr lt gy, frm-hd, vf-f gr cons w srt, arg-slty, gen fri, exc  $\emptyset$ , occ lt gy o stn, dul flor, v wk cut gen cln, NSOFC.  
SILTSTONE (30-40%) - var col gy brn crm, sft-frm, arg-occ v sdy, occ calc, n  $\emptyset$ , NSOFC.  
SHALE (30-50%) - gn gy yel orng rdbrn sft-frm, sbllky-fis, occ slty-sdy, gen calc, NSOFC.
- 4,600 - 4,640 SHALE (40-60%) - var col, sft-frm, occ fis-sbblky, occ slty-sl sdy, gen calc, NSOFC.  
SILTSTONE (45-55%) - gy brn crm tan var col, sft-hd, arg-occ v sdy, sl-mod calc, n  $\emptyset$ , NSOFC, occ grdg to vf SS.  
LIMESTONE (tr) - brn crm, hd, micxln, micrite, occ arg, n  $\emptyset$ , NSOFC.
- 4,640 - 4,680 SANDSTONE (10-20%) - wh lt gy lt brn occ clr-frstd, vf-f gr cons sbrd w srt, n-sl arg-slty, occ sl calc, exc  $\emptyset$ , gen fri, sme lt gy-lt brn dd o stn, wk flor, wk stmg cut.  
SILTSTONE (30-40%) - gy brn crm mot, sft-hd, arg-occ v sdy, occ calc, gen tt, n  $\emptyset$ , tr dd o stn, NFOC.  
SHALE (40-60%) - gn gy yel orng brn var col, sft-frm, occ slty-sdy, NSOFC.

LITHOLOGY (Cont.)

- 4,680 - 4,690 SANDSTONE (tr-10%) - lt gy clr lt brn, frm-hd, vf-f gr cons w srt, occ arg-slty, gen fri, exc  $\emptyset$ , sme fr-exc lt brn-gy o stn, occ bri yel flor, stng stmg cut.  
SILTSTONE (40-50%) - gy brn-rdbrn gn var col, arg-occ v sdy, n  $\emptyset$ , NSOFC.  
SHALE (50%) - gn gy yel orng brn, sft-frm, sbblky-sbfis, occ slty-sdy, gen calc, NSOFC.
- 4,690 - 4,700 SANDSTONE (40%) - lt brn-gy-gybrn, frm-hd, occ arg-slty, gen exc  $\emptyset$ , lt brn dif o stn, bri yelgn flor, wk-stng stmg cut.  
SILTSTONE (20-30%) - a/a.  
SHALE (30-40%) - a/a.
- 4,700 - 4,710 SANDSTONE (20%) - lt brn-lt gy, frm-hd, vf-f gr cons w srt, occ arg-slty, gen fri, exc  $\emptyset$ , lt brn-gy o stn, bri yelgn flor, stng stmg-milky dif cut.  
SILTSTONE (30%) - var col, sft-hd, arg-occ v sdy, sl calc, occ sil, tt, n  $\emptyset$ , NSOFC.  
SHALE (50%) - gy yel var brn gn orng mot, sft-frm, occ slty-sdy, calc, NSOFC.
- 4,710 - 4,720 SHALE (40%) - var col, sbblky-fis, occ slty-sdy, gen calc, NSOFC.  
SILTSTONE (50%) - gn gy brn crm, sft-frm, arg-occ v sdy, sl-mod calc, n  $\emptyset$ , NSOFC.  
SANDSTONE (tr-10%) - lt brn-lt gy, frm-hd, gen cvgs a/a.
- 4,720 - 4,740 SANDSTONE (10-20%) - lt gy lt brn clr, frm-hd, occ arg-slty, gen fri, exc  $\emptyset$ , fr-g lt brn dif o stn, bri yel flor, wk-mod stng stmg cut.  
SILTSTONE (20-30%) - gy brn crm var col, sft-frm, arg-occ v sdy, sl calc, n  $\emptyset$ , NSOFC.  
SHALE (50-70%) - var col, sft-frm, sbblky, occ fis, occ slty-sdy, sl-mod calc, NSOFC.
- 4,740 - 4,760 SANDSTONE (20-25%) - lt-m gy, occ gybrn-lt brn, frm-hd, vf-f gr cons sbang mod-w srt, occ arg-slty, occ sil, n  $\emptyset$ , sme fr-g  $\emptyset$ , occ fr lt gy-lt brn o stn, dul flor, wk cut, gen NSOFC.  
SILTSTONE (40-50%) - gy brn gn rdbrn crm, arg-occ sme vf sd, occ sil, gen n  $\emptyset$ , NSOFC.  
SHALE (25-40%) - var col, sbblky-fis, occ slty, NSOFC.
- 4,760 - 4,800 SANDSTONE (tr-15%) - wh clr lt gy, frm-hd, vf-f gr w srt, gen fri, exc  $\emptyset$ , sme occ tt, NSOFC.  
SHALE (40-50%) - var col, sbblky-fis, occ slty occ v sdy, gen calc, NSOFC.  
SILTSTONE (35-55%) - brn gy crm tan, gen a/a.
- 4,800 - 4,820 SANDSTONE (10-15%) - lt gy clr frstd, frm-hd, vf-f gr cons gen w srt, n-sl arg-sl slty, gen fri, exc  $\emptyset$ , NSOFC.  
SILTSTONE (30-40%) - gn gy rdbrn crm mot, sft-hd, arg-occ v sdy, occ sil, gen n-p  $\emptyset$ , NSOFC.  
SHALE (45-60%) - var col, sft-frm, sbblky-fis, occ slty-sdy, occ calc, NSOFC.

LITHOLOGY (Cont.)

- 4,820 - 4,840 SANDSTONE (10-30%) - wh clr frstd lt gy, frm-hd, vf-f gr cons w srt, gen m-c gr uncons sbang-rd, qtztc, NSOFC.  
SILTSTONE (20-40%) - var col, arg-occ sme vf sd, n Ø, NSOFC.  
SHALE (25-40%) - gn gy yel orng rdbrn crm tan, sft-frm, sbblky-occ fis, occ calc, NSOFC.
- 4,840 - 4,880 SANDSTONE (60-80%) - wh clr frstd lt gy, w srt, gen m-c gr uncons ang-sbrd, qtztc, NSOFC.  
SILTSTONE (10%) - gybrn crm mot, sft-frm, arg-occ v sdy, occ calc, occ sil, tt, n Ø, NSOFC.  
SHALE (10-30%) - var col, sft-frm, gen a/a.
- 4,880 - 4,890 PYR (tr) - gol, hd, mas.  
SANDSTONE (30%) - wh lt gy sme lt brn, frm-hd, vf-f gr cons sbang w srt, occ arg-slty, gen fri, fr-exc Ø, gen NSOFC, occ lt brn dif o stn, wk flor, wk cut.  
SILTSTONE (30%) - gy brn gn crm tan, sft-frm, arg-occ v sdy, occ calc, n Ø, NSOFC.  
SHALE (40%) - gy brn gn yel orng crm, sft-frm, sbblky-fis, gen calc, NSOFC.
- 4,890 - 4,910 SANDSTONE (10-20%) - wh lt gy clr occ lt brn, gen a/a.  
SILTSTONE (40%) - var col, sft-frm, arg-occ v sdy, occ calc, n Ø, NSOFC.  
SHALE (40-50%) - var col, sbblky-fis, occ calc, occ slty-sdy, NSOFC.  
LIMESTONE (tr) - gy brn mot, frm-hd, micxln ool, oomicrite arg, n intxln Ø, NSOFC.
- 4,910 - 4,950 SANDSTONE (tr-10%) - wh clr lt gy, frm-hd, vf-f gr cons ang-sbang w srt, occ sil cmt, gen fri/exc Ø, NSOFC, occ m gr uncons sbang.  
SHALE (40-60%) - gn gy brn mot var col, sft-frm, sbblky-fis, occ slty-sdy, gen calc, NSOFC.  
SILTSTONE (30%) - var col, sft-frm, gen a/a.
- 4,950 - 4,960 SANDSTONE (50%) - clr lt gy wh, frm-hd, vf-f gr cons w srt, cln, gen fri/fr Ø, occ sil cmt, NSOFC, m gr uncons, ang-sbrd, occ frstd.  
SILTSTONE (20%) - gy brn gn yel rdbrn, sft-frm, arg-occ sdy, occ calc, n Ø, NSOFC.  
SHALE (30%) - var col, sft-frm, sbblky-occ fis, gen calc, NSOFC.
- 4,960 - 5,000 SANDSTONE (tr-10%) - clr frstd lt gy, frm-hd, vf-f gr cons sbrd w srt, gen fri/fr-exc Ø, occ sil cmt occ sl calc, NSOFC.  
SILTSTONE (40-50%) - gy brn mot crm gn yel, sft-frm, arg-occ v sdy, occ sl calc, occ sil cmt, gen NSOFC.  
SHALE (40-55%) - gy gn yel orng brn var col, sft-frm, sbblky-occ fis occ splty, occ slty-sdy, gen calc, NSOFC.

LITHOLOGY (Cont.)

- 5,000 - 5,040 SILTSTONE (30-40%) - var col, sft-frm, arg-occ sdy, occ sl calc, occ sil cmt, gen NSOFC, tr dd o stn.  
SANDSTONE (10%) - clr lt gy lt brn, frm-hd, vf-f gr cons sbang-sbrd w srt, occ v arg-slty, NSOFC, occ m-c gr uncons.  
SHALE (40-60%) - var col, sbblky-occ fis, sme slty-sl sdy, gen calc, NSOFC.
- 5,040 - 5,100 SANDSTONE (10-20%) - clr lt gy lt brn, frm-hd, vf-f gr cons sbang-sbrd w srt, occ v arg-slty, occ m-c gr uncons, occ lt-dk brn-lt gy o stn, wk-mod gn flor, sme stng cut, gen dd o stn.  
SILTSTONE (20-30%) - gy brn crm gn rdbrn mot, sft-frm, arg-occ v sdy, occ calc, sme sil cmt, gen n Ø, sme dd o stn, NFOC.  
SHALE (50-70%) - var col, sft-frm, sbblky-fis, gen calc, NSOFC.
- 5,100 - 5,180 SANDSTONE (10-20%) - wh lt gy-lt brn clr, frm-hd, vf-f gr cons sbrd w srt, sl-mod calc, occ fri, exc Ø, occ sil cmt, n Ø, n-sl arg, occ lt gy-lt brn dd o stn, NFOC.  
SILTSTONE (20-40%) - gy gn brn yel rdbrn mot, sft-frm, arg-occ v sdy, occ sil/n Ø, gen n-vp Ø, occ calc, gen NSOFC.  
SHALE (40-70%) - var col, sft-frm, sbblky-occ fis, occ slty-sme sd, sl-mod calc, NSOFC.
- 5,180 - 5,200 SANDSTONE (10-20%) - lt gy clr, frm-hd, vf-f gr cons, sbang-mod w srt, occ arg-slty, occ sl calc, gen fri, exc Ø, occ dd o stn, NF, v wk cut.  
SILTSTONE (40-50%) - gy lt-dk brn, var col, sft-hd, arg-occ sdy, occ calc, sme sil cmt, gen n Ø, occ dd o stn, NFOC.  
SHALE (30-50%) - var col mot, sft-frm, sbblky-fis, occ splty, occ slty-sl sdy, gen calc, occ tar str, NFOC.
- 5,200 - 5,210 SANDSTONE (20-30%) - clr wh lt gy occ frstd, vf-f gr cons w srt, occ arg-slty, occ sl calc, gen fri, exc Ø, NSOFC.  
SILTSTONE (40%) - gy gn rdbrn brn mot, var col, sft-hd, arg-occ sdy, gen sl calc, occ sil cmt, n Ø, NSOFC.  
SHALE (30-40%) - var col, sft-frm, gen a/a.
- 5,210 - 5,230 SANDSTONE (10%) - wh lt gy clr, frm-hd, vf-f gr cons sbang gen w srt, occ arg-slty, occ sl calc, gen fri, exc Ø, NSOFC.  
SILTSTONE (30%) - crm tan gybrn-gy brn gn rdbrn, sft-hd, arg-v sdy, occ sl-mod calc, n Ø, NSOFC.  
SHALE (60%) - gn rdbrn crm yel gy brn, sft-frm, sbblky-fis, gen calc, NSOFC.

LITHOLOGY (Cont.)

- 5,230 - 5,250 SANDSTONE (tr-20%) - wh clr lt gy occ lt brn, vf-f gr cons gen fri/exc  $\emptyset$ , occ lt gy-lt brn dd o stn/NF, wk cut.  
SHALE (40-60%) - var col, sft-occ frm, sbblky-fis occ splty, gen calc, NSOFC.  
SILTSTONE (30-40%) - gy crm gn brn orng, sft-frm, arg-occ v sdy, occ calc, gen n  $\emptyset$ , NSOFC.
- 5,250 - 5,270 SANDSTONE (10%) - lt gy occ lt brn clr frstd, frm-hd, vf-f gr cons sbang-sbrd, occ sl calc, sme slty-arg, gen fri/exc  $\emptyset$ , occ lt gy-lt brn dif o stn/sme bri yel flor, occ stng stmg-wk dif cut, occ m-c gr uncons ang-sbang.  
SILTSTONE (30%) - var col, gy brn crm, arg-sdy, occ calc, sme sil cmt, gen n  $\emptyset$ , occ dd o stn/NFOC.  
SHALE (60%) - gy gn brn crm yel rdbrn, sft-frm, sbblky-fis, gen calc, NSOFC.
- 5,270 - 5,300 SANDSTONE (tr) - lt gy clr occ lt brn, frm-hd, vf-f gr cons, gen fri/exc  $\emptyset$ , occ sme cvgs/lt gy-lt brn dif o stn, gen NSOFC.  
SHALE (50-60%) - var col, sbblky-fis, occ slty, gen calc, NSOFC.  
SILTSTONE (35-45%) - gy brn var col, sft-hd, arg-occ sdy, occ sl calc, occ sme sil cmt, n  $\emptyset$ , NSOFC.
- 5,300 - 5,320 SANDSTONE (10-20%) - wh lt gy clr frstd, frm-hd, vf-f gr cons w srt, occ arg-slty, gen fri/exc  $\emptyset$ , occ sil cmt, NSOFC.  
SILTSTONE (30-40%) - gy crm brn rdbrn occ gn, sft-frm, arg-sdy, occ calc, n  $\emptyset$ , NSOFC.  
SHALE (40-60%) - var col, sbblky-fis occ splty, occ slty-sl sdy, gen calc, NSOFC.
- 5,320 - 5,330 SANDSTONE (25%) - lt brn lt gy clr, frm-hd, vf-f gr cons ang-sbang mod w srt, occ arg-slty, sl calc, gen exc  $\emptyset$ , fri, fr-exc lt brn dif o stn/dul-bri yel flor, stng stmg yelgn cut, occ m gr uncons sbrd frstd.  
SILTSTONE (30%) - gy brn crm mot, arg-sdy, occ calc, occ sil cmt, gen n  $\emptyset$ , NSOFC.  
SHALE (45%) - orng rdbrn brn tan crm yel gn gy mot, sft-frm, sbblky-fis, occ splty, gen calc, NSOFC.
- 5,330 - 5,340 SANDSTONE (tr-10%) - lt brn, vf-f gr cons, exc  $\emptyset$ , lt brn o stn/dul flor, wk dif-occ stng stmg cut.  
SILTSTONE (30%) - gy brn crm gn mot, sft-frm, arg-sdy, occ calc occ sil cmt, n  $\emptyset$ , NSOFC.  
SHALE (60-65%) - var col, sbblky-fis, gen calc, a/a.
- 5,340 - 5,350 SHALE (80%) - gn gy brn crm var col, sft-frm, fis-sbblky occ splty, occ slty-sdy, gen calc, NSOFC.  
SILTSTONE (20%) - var col, sft-frm, arg-sl sdy, occ calc, occ sil, n  $\emptyset$ , NSOFC.

LITHOLOGY (Cont.)

- 5,350 - 5,360 SANDSTONE (35%) - lt gy lt brn occ clr, frm-hd, vf-f gr cons gen w srt, occ arg-slty, occ calc cmt, gen fri/exc  $\emptyset$ , fr-vg lt brn dif o stn/dul gn flor, wk cut.  
SILTSTONE (25%) - lt brn crm tan gy occ gn rdbrn, sft-frm, arg-slty, occ calc, gen n  $\emptyset$ , NSOFC.  
SHALE (40%) - var col, sft-frm, sbblky-occ sbfis, occ slty-sdy, gen calc, NSOFC.
- 5,360 - 5,370 SANDSTONE (30-40%) - lt gy lt gybrn lt brn, frm-hd, vf-f gr cons w srt, arg-slty, occ calc cmt, gen fri/exc  $\emptyset$ , fr lt gy-lt gybrn ptchy-dif o stn/wk gn flor, v wk cut, occ m gr uncons.  
SHALE (40%) - var col, sft-frm, sbblky-sbfis occ splty, gen calc, NSOFC.  
SILTSTONE (20-30%) - gy crm brn gn rdbrn mot, sft-frm, arg-occ sdy, occ calc, NSOFC.
- 5,370 - 5,380 SHALE (70%) - gn brn yel gy rdbrn crm mot, sft-frm, sbblky-sbfis, gen calc, occ slty-sl sdy, NSOFC.  
SILTSTONE (30%) - var col, sft-frm, arg-occ sdy, occ calc, n  $\emptyset$ , NSOFC.
- 5,380 - 5,420 SHALE (60-70%) - var col, sft-frm, sbblky-sbfis occ splty, occ slty-sl sdy, gen calc, NSOFC.  
SILTSTONE (30-40%) - var col, sft-frm, arg-occ sdy, gen a/a.
- 5,420 - 5,460 SANDSTONE (10-20%) - wh lt gy clr, frm-hd, vf-f gr cons w srt, gen cln, occ sl calc, gen fri/exc  $\emptyset$ , NSOFC.  
SILTSTONE (35%) - gy gybrn rdbrn crm occ gn, sft-frm, arg-occ sdy, occ calc, n  $\emptyset$ , NSOFC.  
SHALE (45-55%) - gn rdbrn crm yel gy brn, sft-frm, sbblky-sbfis, occ splty, gen calc, NSOFC.
- 5,460 - 5,487 SHALE (60-70%) - gy gn rdbrn crm var col, sft-frm, sbfis-fis occ splty, gen calc, occ slty-sl sdy, NSOFC.  
SILTSTONE (30-40%) - var col mot, sft-frm, arg-sdy, occ calc, n  $\emptyset$ , NSOFC.

LITHOLOGY

- 3,000-3,040 SANDSTONE (20-40%) - wh, lt gy, sft-hd, f-vf gr cons gen w srt, sme calc mtx, sme mod w comp, sl-mod arg-slty, p Ø, NSOFC.  
SILTSTONE (10%) - lt-m gy, crm tan, frm-hd, arg-occ sme vf sd, n-sl calc, occ sil, n Ø, NSOFC.  
SHALE (50-70%) - gy, gn, rdbrn, orng, yel, crm, brn mot, sft-frm, sbblky-occ sl slty-sl sdy, gen calc, NSOFC.
- 3,040-3,060 SILTSTONE (60%) - gy, gybrn, dk brn, frm-hd, arg-occ sl sdy, n-sl calc, n-vp Ø, fr-g dd o stn, NFOC.  
SHALE (40%) - gy, gn, brn, orng, tan, crm, yel, rdbrn, mot, sft-frm, sbblky, sl slty-occ sl sdy, gen calc, NSOFC.
- 3,060-3,080 SANDSTONE (60%) - clr lt gy, crm, wh, frm-hd, f gr, cons, sbang-sbrd, v w srt, occ sl calc cmt, exc Ø, gen cln, NSOFC.  
SILTSTONE (20%) - gy, brn, gybrn, frm-hd, arg-occ sl sdy, n-sl calc, occ sil, n Ø, occ tr dd o stn, NFOC.  
SHALE (20%) - var col, sft-frm, sbblky, sl slty-sl sdy, gen calc, NSOFC.
- 3,080-3,100 SANDSTONE (30%) - clr, lt brn, tan, crm, lt gy, occ wh, frm-hd, f gr cons w srt, occ calc cmt, occ sl arg-sl slty, occ calc cmt, exc Ø, NSOFC.  
SHALE (60%) - gy, yel, brn, orng, gn, crm, var col, sft-frm, sbblky, occ v slty-sl sdy, gen calc, NSOFC.  
SILTSTONE (10%) - gy, brn, gybrn, frm-hd, arg, n-sl calc, n Ø, occ tr dd o stn, NFOC.
- 3,100-3,120 SILTSTONE (50%) - gy, gybrn, m-dk brn, frm-hd, arg, n-sl calc, occ v sil, n Ø, fr dd o stn, NFOC.  
SHALE (50%) - var col, sft, gen a/a.
- 3,120-3,160 SANDSTONE (90%) - clr wh lt gy crm, frm-hd, vf gr cons gen p srt p comp, sl-mod arg-slty, n-vp Ø, occ resd o stn/wk flor when cut, mod-stng stmg cut.  
SHALE (10%) - gy orng yel gn brn rdbrn mot, sft-frm, sbblky sl slty-sl sdy, gen calc, NSOFC.
- 3,160-3,180 SANDSTONE (50%) - clr crm tan lt gy occ wh, frm-hd, f-vf gr cons sbang gen w srt, sl-mod arg-slty, occ sl calc, exc Ø, occ resd o stn/wk blgn flor when cut, mod stng stmg cut.  
SHALE (50%) - var col mot, sft-frm, sbblky, occ mod slty-sl sdy, gen calc, NSOFC.
- 3,180-3,200 LIMESTONE (95%) - crm lt tan, sft-frm, micxln, micrite, n-sl arg, occ sl slty, n Ø, NSOFC.  
SHALE (5%) - var col, a/a.

LITHOLOGY (Cont.)

- 3,200-3,260 LIMESTONE (40-50%) - crm lt tan lt brn, frm-hd, micxln, micrite, n-sl arg occ sl slty, n Ø, NSOFC.  
SILTSTONE (10-20%) - gy gybrn lt-m brn crm tan, frm-hd, arg-occ sl sdy, n-sl calc, n Ø, NSOFC.  
SHALE (35-50%) - gy brn gn yel orng rdbrn occ mot, sft-frm, sbblky-occ sbfis, occ slty-sl sdy, gen calc, n Ø, NSOFC.
- 3,260-3,300 SHALE (70-80%) - gy gybrn m-dk brn orng rdbrn occ gygn, sft-hd, blk-ly-sbblky, occ slty-sl sdy, sl-v calc, occ sil, n Ø, sme fr dd o stn, NFOC.  
SILTSTONE (20-30%) - m-dk brn gybrn, frm-hd, arg-sdy, sl-mod calc, sme v sil, gen n Ø, sme fr dd o stn/NFOC.
- 3,300-3,360 SILTSTONE (40-60%) - m brn gybrn m gy, frm-hd, arg-occ sl sdy, sl-mod calc, occ sil, gen n-vp Ø, NSOFC.  
SHALE (40-60%) - orng rdbrn gy gn yel tan, sft-frm, sbblky, occ sbfis, gen calc, NSOFC.
- 3,360-3,400 LIMESTONE (10%) - m-dk gy brn, frm-hd, vf-micxln, micrite, v arg, occ sl slty, n-vp intxln Ø, NSOFC.  
SILTSTONE (70-80%) - gy gybrn dk brn, frm-hd, arg-v occ sl sdy, sl-mod calc, n Ø, NSOFC.  
SHALE (10-20%) - var col, sft-frm, sbblky occ sbfis, occ slty-v sdy, gen calc, NSOFC.
- 3,400-3,440 LIMESTONE (10%) - crm lt-m brn, sft-hd, vf-micxln, micrite, arg-sl slty, n dol, n intxln Ø, NSOFC.  
SANDSTONE (10%) - crm tan lt brn, vf gr cons w comp, arg-slty, sl-mod calc, p Ø, NSOFC.  
SILTSTONE (60-70%) - m-dk brn gybrn m gy, frm-hd, arg-occ sl sdy, sl-mod calc, n Ø, NSOFC.  
SHALE (10-20%) - var col, sbblky-sbfis, occ slty-sl sdy, gen calc, NSOFC.
- 3,440-3,460 SANDSTONE (Tr-10%) - lt brn tan, frm-hd, vf-f gr cons gen w srt, arg-slty, sl calc, fr Ø, fr lt-m brn o stn/flor. when cut, wk stmg cut, gen dd o stn.  
SILTSTONE (80%) - m-dk brn dk gybrn, frm-hd, arg-occ sl sdy, sl-mod calc, n Ø, exc dk brn dd o stn/NFOC.  
SHALE (10-15%) - gy gn rdbrn orng brn yel tan crm, sft-frm, sbblky-occ splty, occ sl slty-sl sdy, gen calc, NSOFC.
- 3,460-3,480 SHALE (25%) - dk gy-blk, sft-frm, sbblky-sbfis, n slty, n sdy, sl calc, exc dk brn-blk dd o stn/NFOC.  
SILTSTONE (75%) - dk gy-dk brn gybrn, frm-hd, arg-occ sl sdy, n-sl calc, n-vp Ø, exc dk dd o stn/NFOC, occ grdg to slty vf SS.
- 3,480-3,500 SANDSTONE (30%) - clr wh lt-dk gy occ frstd, frm-hd, f-vf gr cons sbrd gen w srt, arg-slty, sl calc, fr-exc Ø, sme exc lt-dk gy dd o stn/NFOC, sme f-m gr uncons.

LITHOLOGY (Cont.)

- 3,480-3,500 SILTSTONE (25%) - gy gybrn, frm-hd, arg-occ sl sdy, sl  
(Cont.) calc, n Ø, exc dd o stn/NFOC.  
SHALE (45%) - orng rdbrn gy gn brn yel, sft-frm, sbblky-  
occ sbfis, gen calc, NSOFC.
- 3,500-3,540 SANDSTONE (10-15%) - lt-dk brn crm tan, frm-hd, f gr cons  
gen w srt, n-sl arg-sl slty, sl calc, fr-exc lt-dk brn o  
stn/flor when cut, mod stng milky blgn stmg cut.  
SILTSTONE (40-60%) - lt-dk brn m gy gybrn, frm-hd, arg-  
occ sl sdy, n-sl calc, n Ø, fr-exc brn dd o stn/NFOC.  
SHALE (30-50%) - var col, sft-frm, a/a.
- 3,540-3,560 SANDSTONE (60%) - lt brn tan, sft-frm, occ hd, vf gr cons  
gen w srt, slty-sl arg, sme fr Ø, lt brn dif o stn/wk dul  
flor, wk-mod stmg-wk dif cut.  
SILTSTONE (30%) - lt-dk brn gy gybrn tan, frm-hd, arg,  
occ sl sdy, sl calc, n Ø, NSOFC.  
SHALE (10%) - gy gn orng rdbrn yel, frm-hd, arg-occ sl  
sdy, gen calc, NSOFC.
- 3,560-3,580 SANDSTONE (10%) - lt brn tan crm, vf gr cons gen w srt,  
arg-slty, n-sl calc, sme fr Ø, fr lt brn o stn/flor when  
cut, wk cut.  
SILTSTONE (30%) - gy gybrn crm tan brn, gen a/a.  
SHALE (60%) - var col, sft-frm, sbblky, occ sbfis, gen  
calc, NSOFC.
- 3,580-3,600 SANDSTONE (98%) - clr lt brn tan occ frstd, frm-hd, f-vf  
gr cons gen w srt, occ sl arg-sl slty, sme fr-g Ø, lt  
brn dd o stn/NF, v wk cut, f-c gr uncons sbang-rd p srt.
- 3,600-3,620 SANDSTONE (10%) - lt brn tan crm, frm-hd, vf gr cons gen  
w srt, arg-slty, sme fr lt brn dd o stn/flor when cut, v wk  
cut.  
SILTSTONE (60%) - lt brn tan crm lt gy, sft-hd, arg-occ  
sdy, sl-mod calc, n Ø, NSOFC.  
SHALE (30%) - var col, sft-frm, sbblky-occ splty, gen  
calc, NSOFC.
- 3,620-3,640 SANDSTONE (Tr-10%) - lt brn tan crm, gen as above.  
SHALE (60%) - gy gn brn rdbrn yel crm tan, sft-frm, sbblky,  
occ sl slty-sl sdy, gen calc, NSOFC.  
SILTSTONE (30%) - brn crm tan gybrn, frm-hd, arg-v occ  
sl sdy, n-sl calc, n Ø, NSOFC.  
LIMESTONE (Tr) - crm, sft-frm, micxln, micrite, sl arg,  
n Ø, NSOFC.
- 3,640-3,660 SILTSTONE (60%) - gybrn brn crm gy, frm-hd, arg-occ sl sdy,  
sl calc, n Ø, NSOFC.  
SANDSTONE (35%) - lt brn crm tan, frm-hd, vf gr cons gen  
w srt, arg-sl slty, fr Ø, lt tan dd o stn/NFOC, gen NSOFC.  
LIMESTONE (Tr) - crm tan lt brn, frm, micxln, micrite,  
sl arg, n-p intxln Ø, NSOFC.

LITHOLOGY (Cont.)

- 3,660-3,700 SANDSTONE (40-60%) - clr occ frstd, wh lt gy crm tan lt-m brn, frm-hd, sme vf gr cons gen w srt, arg, p  $\emptyset$ , occ dd o stn/NFOC, gen f-c gr uncons sbang-rd p srt.  
SILTSTONE (10-30%) - lt-dk brn gybrn crm, frm-hd, arg-occ v sdy, sl-occ mod calc, occ sil, gen n-vp  $\emptyset$ , g-exc dd o stn/NFOC.  
LIMESTONE (Tr-10%) - crm tan, frm, micxln, micrite, arg, n-vp intxln  $\emptyset$ , NSOFC.  
SHALE (20-40%) - gn gy orng yel crm lt brn var col occ mot, sft-frm, sbblky-occ fis, gen calc, occ slty-sl sdy, NSOFC.
- 3,700-3,780 SANDSTONE (60-80%) - wh clr occ frstd lt gy lt brn-tan occ crm occ lt gybrn, frm-hd, sme f-vf gr cons sbang-sbrd, gen w srt, fri/fr-exc  $\emptyset$ , occ sl-mod arg, occ slty, n-sl calc, occ lt brn-lt gy dif o stn/wk flor, wk-mod stmg cut, much dd o stn, sme cln/NSOFC, sme f-m gr uncons ang-rd p srt.  
SILTSTONE (10-20%) - crm lt brn-tan occ gybrn, frm-hd, arg-occ sl sdy, gen sl calc, n-vp  $\emptyset$ , occ dk brn dd o stn/NFOC.  
SHALE (20-30%) - var col mot, sft-frm, sbblky-fis occ splty, gen calc, occ v slty-sl sdy, NSOFC.
- 3,780-3,800 SANDSTONE (20%) - clr lt gy frstd, frm-hd, gen f-m gr uncons sbang-rd mod w srt, cln, NSOFC.  
LIMESTONE (Tr) - crm tan, frm, micxln, micrite, sl-mod arg, n  $\emptyset$ , NSOFC.  
SILTSTONE (20%) - crm-brn, frm-hd, arg-occ sl sdy, n-sl calc, sil, n  $\emptyset$ , occ dk dd o stn/NFOC.  
SHALE (55%) - gy gn orng rdbn brn tan yel sme mot, sft-frm sbblky-sbfis, gen calc, occ slty-sl sdy, NSOFC.
- 3,800-3,820 SANDSTONE (70%) - clr wh lt gy frstd, frm-hd, f gr cons sbang w srt, n-sl arg-sl slty, sl calc, v fri, gen cln/NSOFC.  
LIMESTONE (10%) - wh, micxln, micrite, n arg, n  $\emptyset$ , NSOFC.  
SILTSTONE (Tr) - lt-m brn, frm-hd, occ sil, n  $\emptyset$ , gen NSOFC.  
SHALE (15-20%) - var col, sft-frm, sbblky, gen calc, occ slty-sl sdy, NSOFC.
- 3,820-3,840 SANDSTONE (40%) - clr wh lt gy frstd, frm-hd, f gr cons sbang, w srt, gen w comp, sme v fri, occ sil cmt, n-sl arg-sl slty, fr-exc  $\emptyset$ , NSOFC.  
LIMESTONE (20%) - wh m brn, sft-hd, micxln, micrite, sme arg, n-vp intxln  $\emptyset$ , NSOFC.  
SILTSTONE (20%) - m-dk brn, frm-hd, arg-occ sl sdy, sme v sil, sl-mod calc, n  $\emptyset$ , NSOFC.  
SHALE (20%) - var col occ mot, sft-frm, a/a.

LITHOLOGY (Cont.)

- 3,840-3,860 SILTSTONE (50%) - dk-m brn m-dk gy gybrn, frm-hd, arg-v sl sdy, sl-mod calc, occ v sil, n-vp  $\emptyset$ , occ dk dd o stn/NFOC, grdg to SH.  
SHALE (45%) - dk gy occ blk dk gybrn brn occ var col, sft-frm, sl-mod calc, occ v slty-sl sdy, tr dk dd o stn/NFOC.  
SANDSTONE (Tr) - wh clr frstd lt gy, frm-hd, f gr cons gen w comp, occ sil cmt, fr-exc  $\emptyset$ , NSOFC.
- 3,860-3,880 SANDSTONE (20%) - clr wh lt gy tan-lt brn occ frstd, frm-hd, f gr cons gen w srt gen w comp, n-sl fri, occ sil-qtztc p-occ g intgr  $\emptyset$ , lt-m brn dd o stn/flor when cut, gen fr-n cut.  
SILTSTONE (30%) - dk brn dk gybrn gy blk, frm-hd, arg-occ sl sdy, sl-mod calc, sme sil, n-vp  $\emptyset$ , sme fr dd o stn/NFOC.  
LIMESTONE (Tr) - crm lt-m brn, frm, micxln, micrite, arg-occ sl slty, n-vp intxln  $\emptyset$ , NSOFC.  
SHALE (45%) - blk gy gn orng crm rdbrn yel brn, sft-frm, sl-mod calc, occ sl slty-sl sdy, occ dd o stn/NFOC, gen NSOFC.
- 3,880-3,900 SANDSTONE (60%) - lt gy, frm-hd, f-vf gr cons gen w srt, w comp, fri, sl arg-sl slty, sl calc, fr-g  $\emptyset$ , NSOFC.  
SHALE (15%) - var col, sft-frm, sbblky, gen calc, occ slty-sl sdy, NSOFC.  
SILTSTONE (15%) - gy brn gybrn occ blk, frm-hd, arg-occ v sl sdy, sl-mod calc, n  $\emptyset$ , NSOFC.  
LIMESTONE (10%) - wh sme tan-lt brn, sft-frm, micxln, micrite, sme arg, n-vp intxln  $\emptyset$ , NSOFC.
- 3,900-3,940 SHALE (50%) - gy gn brn orng rdbrn crm yel mot, sft-frm, sbblky-occ sbfis, gen calc, occ v slty-v sdy, NSOFC.  
SILTSTONE (20%) - gy crm brn gybrn, sft-hd, v arg-sl sdy, sl-mod calc, occ sil, gen n-vp  $\emptyset$ , occ tr dd o stn/NFOC.  
LIMESTONE (10-20%) - wh crm lt brn, sft-frm, vf-micxln, micrite, sme mod arg-occ sl slty, n-vp intxln  $\emptyset$ , NSOFC.  
SANDSTONE (10-20%) - clr lt brn lt-gy occ wh sme frstd, sft-hd, f-vf gr cons, gen w srt, sme v fri, occ v arg-slty mtx, occ g-exc  $\emptyset$ , occ lt brn dif o stn/wk cut, gen NSOFC.  
PYRITE (Tr) - gol, hd, mas.
- 3,940-4,000 SANDSTONE (10-20%) - wh clr occ frstd sme tan lt brn, sft-hd, f-vf gr cons gen w srt, sme/v arg mtx, gen fri, sme fr-vg  $\emptyset$ , gen cln/NSOFC.  
SILTSTONE (20-30%) - brn gy gybrn tan occ crm, sft-hd, arg-occ v sdy, sl-v calc, occ sil, occ tr dk dd o stn, gen NSOFC.  
SHALE (50-70%) - var col mot, sft-frm, occ slty-v sdy, gen calc, a/a.  
PYRITE (Tr) - gol, hd, mas-xln.
- 4,000-4,020 SANDSTONE (10%) - clr wh lt gy lt brn tan, sft-hd, f-vf gr cons gen w srt, sme v arg-slty, m tx, gen fri, sme p-fr  $\emptyset$ , gen cln/NSOFC.

LITHOLOGY (Cont.)

- 4,000-4,020 (Cont.) SHALE (55%) - orng yel rdbrn gy gn brn occ blk, sft-frm, sbblky-sbfis, gen calc, occ slty-sl sdy, NSOFC.  
SILTSTONE (35%) - m-dk gy m-dk brn gybrn occ tan-lt brn, frm-hd, arg-occ sl sdy, sl calc, occ sil, n  $\emptyset$ , v occ tr dd o stn/NFOC.  
CHERT (Tr) - smky, v hd.
- 4,020-4,060 SANDSTONE (20%) - clr lt gy occ frstd, frm-hd, f-vf gr cons gen w srt, w comp, sl arg-sl slty, sme fri, occ sil cmt, n-sl calc, gen cln/NSOFC, occ sme m-c gr uncons sb ang-rd mod w srt.  
LIMESTONE (10%) - crm tan lt-m brn, frm-hd, vf-micxln, micrite, sl-mod arg, n intxln  $\emptyset$ , NSOFC.  
SILTSTONE (30%) - m-dk gy m-dk brn gybrn, frm-hd, arg-occ v sl sdy, sl-occ mod calc, n  $\emptyset$ , NSOFC.  
SHALE (40%) - var col mot, sft-frm, sbblky, gen calc, occ slty-sl sdy, NSOFC.
- 4,060-4,100 SANDSTONE (10%) - clr lt gy, occ frstd, occ lt brn, frm-hd, f-vf gr cons gen w srt, sl arg-sl slty, gen fri, sme fr-exc  $\emptyset$ , v occ tr lt brn dif o stn/wk cut, gen cln/NSOFC.  
SILTSTONE (30-40%) - gy brn gybrn, occ lt brn, frm-hd, gen a/a.  
SHALE (50-60%) - gy gn brn rdbrn orng tan yel mot, sft-frm, sbblky-sbfis, gen calc, occ slty-sl sdy, NSOFC.
- 4,100-4,150 SANDSTONE (10-20%) - clr wh occ frstd lt gy, sft-frm, f-vf gr cons gen w srt, w comp gen calc cmt, occ arg-slty, occ fr  $\emptyset$ , gen cln/NSOFC, occ tr dd o stn/NF, v wk cut.  
LIMESTONE (Tr-20%) - wh crm tan, sft-frm, vf-micxln, micrite, occ mod arg-sl slty, n intxln  $\emptyset$ , NSOFC.  
SILTSTONE (20-30%) - tan lt-m brn, frm-hd, arg-occ sdy, sl-mod calc, n  $\emptyset$ , occ tr dd o stn, gen NSOFC.  
SHALE (30-50%) - gy brn gn yel orng rdbrn tan, sft-frm, sbblky-fis occ splty, sme slty-v sdy, gen calc, NSOFC.  
PYRITE (Tr) - gol, v hd, xln-mas.
- 4,150-4,160 SANDSTONE (40%) - wh clr lt gy occ frstd, frm-hd, f-vf gr cons ang-sbang w srt, gen w comp, fri, n-sl arg-sl slty, n-sl calc, fr-vg  $\emptyset$ , NSOFC.  
LIMESTONE (10%) - wh, micrite, n arg, n  $\emptyset$ , NSOFC.  
SILTSTONE (10%) - gy brn gybrn, frm-hd, arg-occ sl sdy, sl-mod calc, occ sil, n  $\emptyset$ , NSOFC.  
SHALE (40%) - gy gn brn rdbrn tan yel orng, sft-frm, sbblky-sbfis occ splty, occ slty-sl sdy, gen calc, NSOFC.
- 4,160-4,170 SANDSTONE (30%) - clr lt gy occ frstd occ wh, frm-hd, f-vf gr cons sbang gen v w srt w comp, n-sl arg-sl slty, fr-exc  $\emptyset$ , cln/NSOFC.  
SILTSTONE (10%) - m-dk gy, m-dk brn gybrn, frm-hd, arg-sl sdy, sl-mod calc, n  $\emptyset$ , NSOFC.  
SHALE (60%) - var col mot, sft-frm, sbblky-fis occ splty, gen calc, occ slty-sl sdy, NSOFC.

LITHOLOGY (Cont.)

- 4,170-4,190 SANDSTONE (10%) - wh clr occ frstd lt gy, frm-hd, f-vf gr cons ang-sbrd w srt, w comp, sme calc cmt, n-sl slty-sl arg, sme fr-exc  $\emptyset$ , NSOFC.  
SILTSTONE (20-30%) - brn rdbrn gy gybrn, frm-hd, arg-occ sme vf sd, sl-mod calc, n  $\emptyset$ , NSOFC.  
SHALE (60-70%) - var col, sbblky-sbfis, gen a/a.
- 4,190-4,200 SANDSTONE (30%) - clr lt gy occ wh occ frstd, frm-hd, f-vf gr cons gen w srt, w comp, sme fr calc cmt, sl arg-sl slty, fr-vg  $\emptyset$ , NSOFC.  
SILTSTONE (25%) - brn gybrn m-dk gy, occ lam, frm-hd, arg-occ v sl sdy, sl-mod calc, n  $\emptyset$ , sme resd brn-dk gy dd o stn/NF, wk cut.  
SHALE (45%) - orng rdbrn brn gy gn yel occ tan, sft-frm, sbblky-sbfis occ splty, occ slty, occ sdy, gen calc, occ str dd o stn/NFOC.
- 4,200-4,220 SANDSTONE (20-40%) - clr lt gy occ frstd, frm-hd, f gr cons sbang w srt, w comp, fri, n-sl calc, n-sl slty-sl arg, fr-exc  $\emptyset$ , sme p lt gy dif o stn/wk dul gol flor, v wk dif-resd cut.  
SILTSTONE (10-20%) - gy brn tan gy brn, sft-hd, arg-occ v sdy, sl-mod calc, occ sil, gen n-vp  $\emptyset$ , tr resd dd o stn/NFOC.  
SHALE (40-70%) - var col mot, sft-frm, sbblky-sbfis occ splty, gen calc, occ slty-v sdy, occ tr resd dd o stn/NFOC.  
PYRITE (Tr) - gol, v hd, mas-occ xln/imbd sd.
- 4,220-4,240 SANDSTONE (20-40%) - clr, lt gy occ wh occ frstd, frm-hd, f-vf gr cons sbang-sbrd w srt, fri, w comp occ sme calc cmt, n-sl arg-sl slty, sme fr-exc  $\emptyset$ , NSOFC.  
LIMESTONE (10%) - wh, sft, micxln, micrite, occ sl arg, occ mica, cln/NSOFC.  
SILTSTONE (10-20%) - gy tan brn gybrn, sft-hd, gen a/a.  
SHALE (30-60%) - gy brn gn yel tan orng rdbrn mot, sft-frm, sbblky-sbfis occ splty, gen calc, occ slty-sl sdy, occ tr resd dd o stn/NFOC.
- 4,240-4,270 SANDSTONE (Tr-10%) - clr frm-hd, f gr cons w srt gen w comp, n-sl arg-sl slty, n-sl calc, fr-exc  $\emptyset$ , cln/NSOFC.  
LIMESTONE (Tr) - wh, crm tan, sft-frm, vf-micxln, micrite, occ arg-sl slty, n-vp intxln  $\emptyset$ , NSOFC.  
SILTSTONE (10-30%) - brn tan gybrn gy, frm-hd, arg-sme vf sd, sl-mod calc, n-vp  $\emptyset$ , NSOFC.  
SHALE (55-80%) - var col, sft-frm, sbblky-sbfis, gen calc, occ slty-sme vf sd, occ tr resd dd o stn/NFOC, gen NSOFC.
- 4,270-4,330 SANDSTONE (20-30%) - clr lt gy occ frstd, frm-hd, f-vf gr cons w srt, w comp, n-sl calc, occ sl sil cmt, n-sl slty-sl arg, fr-g  $\emptyset$ , occ resd lt brn o stn/NF, wk cut, gen cln/NSOFC.

LITHOLOGY (Cont.)

- 4,270- 4,330 SILTSTONE (20-30%) - gy brn tan gybrn, frm-hd, arg-occ v  
(Cont.) sl sdy, sl-mod calc, n-vp Ø, NSOFC.  
SHALE (40-60%) - gy gn rdbrn orng yel tan mot, sft-frm,  
sbblky-sbfis occ splty, gen calc, occ sl slty-sl sdy,  
NSOFC.
- 4,330-4,340 SANDSTONE (45%) - lt brn lt gybrn, occ clr occ frstd,  
frm-hd, f-vf gr cons mod p srt, n-v sl calc, mod-v arg-  
v slty, fr-v occ g Ø, lt brn-lt gybrn dif o stn/dul yel  
flor - flor when cut, mod-stng stmg cut.  
SILTSTONE (20%) - lt-m brn gybrn-gy, frm-hd, arg-occ sl  
sdy, sl calc, n Ø, fr dd o stn/NFOC.  
SHALE (35%) - var col mot, sft-frm, sbblky, gen calc, occ  
v slty-sl sdy, NSOFC.
- 4,340-4,350 SANDSTONE (65%) - lt gy lt brn, frm-hd, f-vf gr cons sbang-  
sbrd w srt, w comp, occ calc cmt, sl slty-sl arg, fr-exc  
Ø, fr-g lt gy-lt brn dif-ptchy o stn/dul yel gn flor, mod  
wk stmg cut.  
LIMESTONE (20%) - crm tan, frm, micxln, micrite, n-sl arg,  
n intxln Ø, NSOFC.  
SILTSTONE (Tr) - gy brn gybrn tan, frm-hd, arg, occ v sl  
sdy, sl calc, n Ø, tr dd o stn, gen cln/NSOFC.  
SHALE (10%) - gen gn occ rdbrn brn tan, sft-frm, sbblky,  
gen calc occ slty-sl sdy, NSOFC.
- 4,350-4,360 SANDSTONE (30%) - lt brn lt gy occ mot occ frstd, f-vf gr  
cons p srt, w comp, n-sl calc, mod slty-arg, n-p Ø, occ  
tr lt brn-lt gy dif-ptchy o stn/wk flor, gen v wk-n cut,  
gen dd o stn, sme NSOFC.  
SILTSTONE (20%) - gy brn gybrn occ crm-tan, frm-hd, arg-  
occ sme vf sd, sl-mod calc, n Ø, v occ tr dd o stn/NFOC.  
SHALE (50%) - gy gn orng brn rdbrn yel tan, sft-frm, sbblky  
gen calc, occ v slty-v sdy, NSOFC.
- 4,360-4,370 SHALE (50%) - var col mot, sft-frm, gen a/a.  
SILTSTONE (45%) - gy brn tan gybrn, frm-hd, arg-occ sl  
sdy, sl-mod calc, occ sil, n Ø, NSOFC.  
SANDSTONE (tr) - clr lt gy, frm-hd, f-vf gr cons w srt,  
w comp occ calc cmt, occ sl slty-sl arg, fr Ø, NSOFC.
- 4,370-4,380 SANDSTONE (65%) - clr lt gy, frm-hd, f-vf gr cons sbang  
w srt, n-sl slty-sl arg, mod calc, v occ sil cmt, fr-vg  
Ø, gen cln/NSOFC, sme lt gy reds dd o stn/NF, v wk cut.  
SILTSTONE (10%) - brn gy gybrn occ rdbrn, frm-hd, arg-sl  
sdy, sl-mod calc, n Ø, NSOFC.  
SHALE (25%) - gy gn rdbrn orng brn yel tan mot, sft-frm,  
sbblky-occ fis, gen calc, occ v slty-sl sdy, NSOFC.
- 4,380-4,390 SANDSTONE (20%) - clr lt gy occ lt brn, frm-hd, f-vf gr  
cons sbang gen w srt, n-sl slty-sl arg, fri, fr-exc Ø, occ  
lt brn dif-ptchy o stn/dul gol flor, mod-stng cut, gen cln/  
NSOFC.

LITHOLOGY (Cont.)

- 4,380-4,390 SILTSTONE (20%) - lt-m gy gybrn occ brn, sft-frm, arg-occ  
(Cont.) sme vf sd, sl-mod calc, n  $\emptyset$ , NSOFC.  
SHALE (60%) - gn orng rdbrn gybrn yel occ tan, sft-frm,  
sbblky-occ fis, gen calc, occ slty-sdy, NSOFC.
- 4,390-4,410 SILTSTONE (35%) - lt m gy crm brn tan, sft-frm, arg-occ sdy,  
sl-mod calc, n  $\emptyset$ , NSOFC.  
SHALE (60%) - var col mot, sft-frm, sbblky-sbfis, gen calc,  
occ slty-sdy, NSOFC.  
SANDSTONE (Tr) - clr, frm-hd, f gr cons w srt, occ sil,  
gen fri, fr-vg  $\emptyset$ , n-sl slty-sl arg, NSOFC.
- 4,410-4,420 SANDSTONE (20%) - clr lt gy v lt brn, frm-hd, f gr cons w  
srt, w comp, fri, n-sl slty-sl arg, fr-g  $\emptyset$ , occ lt gy-  
v lt brn dd o stn/NFOC.  
SILTSTONE (25%) - gy brn gybrn occ tan, sft-frm, v arg-  
occ sl sdy, sl-mod calc, NSOFC.  
SHALE (55%) - gn gy brn rdbrn yel orng sme mot, sft-frm,  
sbblky-sbfis, gen calc, occ slty-sl sdy, NSOFC.
- 4,420-4,440 SANDSTONE (30-40%) - clr, lt gy occ frstd, frm-hd, m-f  
gr cons mod w srt, w comp, occ sil, v sl-mod slty-mod arg,  
occ fr-g  $\emptyset$ , gen cln/NSOFC.  
SHALE (50%) - var col, sft-frm, gen a/a.  
SILTSTONE (10-20%) - gy gybrn brn occ tan, frm, arg-occ  
sl sdy, sl-mod calc, n  $\emptyset$ , NSOFC.
- 4,440-4,460 SANDSTONE (10%) - clr tan crm lt gy, sft-hd, f-vf gr cons,  
fri, arg-slty, sme fr-g calc cmt, gen p-fr  $\emptyset$ , sme lt dd o  
stn/NFOC, occ cln/NSOFC, occ m gr uncons.  
SHALE (70%) - gn gy rdbrn brn tan yel, sft-frm, sbblky-  
sbfis, occ slty-sdy, gen calc, NSOFC.  
SILTSTONE (15%) - gy brn tan gybrn, frm-hd, arg-occ sdy,  
sl calc, occ sil, gen n-vp  $\emptyset$ , occ tr dk dd o stn/NFOC.  
LIMESTONE (Tr) - wh, micxln, micrite, n arg, n  $\emptyset$ , NSOFC.
- 4,460-4,470 SILTSTONE (25%) - lt-m brn gybrn occ gy, frm-hd, arg-  
occ sl sdy, sl-mod calc, occ sil, tt, n  $\emptyset$ , v occ tr dd o  
stn, gen NSOFC.  
SHALE (75%) - gy gn orng rdbrn brn crm tan, sft-frm, sbblky  
occ slty-sl sdy, gen calc, NSOFC.
- 4,470-4,490 LIMESTONE (20%) - crm tan, frm, micxln, micrite, occ ool/  
micxln mtx, n-sl arg, n-vp  $\emptyset$ , occ tr dd o stn/NFOC, gen  
NSOFC, dul mnl flor.  
SANDSTONE (Tr) - clr lt brn tan, frm-hd, f-vf gr cons fri,  
sl-mod slty-arg, fr-vg  $\emptyset$ , NSOFC.  
SHALE (65%) - gn gy rdbrn brn orng yel tan, sft-frm, sbblky  
occ sbfis, gen calc, occ slty-sl sdy, NSOFC.  
SILTSTONE (10%) - crm tan brn occ gybrn, sft-frm, arg-sl  
sdy, sl-mod calc, n  $\emptyset$ , NSOFC.

LITHOLOGY (Cont.)

- 4,490-4,500 SANDSTONE (20%) - wh lt gy clr, frm-hd, f-vf gr cons gen w srt, fri, g calc cmt, n-sl slty-sl arg, fr-vg  $\emptyset$ , cln/NSOFC.  
LIMESTONE (15%) - tan wh, sft-frm, micxln, micrite, n-occ sl arg, n  $\emptyset$ , NSOFC, dul mnl flor.  
SILTSTONE (10%) - tan crm lt brn occ gy-gybrn, sft-hd, v arg-occ sme vf sd, sl-mod calc, n  $\emptyset$ , NSOFC.  
SHALE (55%) - var col mot, sft-frm, sbblky, gen calc, occ slty-sl sdy, NSOFC.
- 4,500-4,560 SANDSTONE (10%) - lt gy clr, frm-hd, f-vf gr cons gen w srt w comp, n-sl arg-sl slty, gen fri, occ sl calc, fr-exc  $\emptyset$ , gen cln/NSOFC.  
SILTSTONE (20-30%) - lt-m gy gybrn brn occ tan, arg-sl sdy, sl-mod calc, n  $\emptyset$ , gen NSOFC.  
SHALE (50-60%) - gn gy brn rdbrn occ orng yel tan, sft-frm, sbblky-sbfis, sme slty-v sdy, NSOFC.  
LIMESTONE (Tr-10%) - wh crm, sft, micxln, micrite, occ ool/micxln mtx, cln, NSOFC.
- 4,560-4,600 SANDSTONE (10-15%) - clr lt gy occ v lt tan, frm-hd, f-vf gr cons gen w srt, fri, n-sl calc, n-sl slty-sl arg, fr-vg  $\emptyset$ , occ lt dd o stn, gen cln/NSOFC.  
SILTSTONE (10-20%) - gy brn gybrn tan, frm-hd, arg-occ sl sdy, sl-mod calc, n  $\emptyset$ , occ tr dd o stn, gen NSOFC.  
LIMESTONE (Tr) - wh, micrite, n arg, n  $\emptyset$ , NSOFC.  
SHALE (60-75%) - var col, sft-frm, sbblky-sbfis, occ slty-occ sdy, gen calc, NSOFC.
- 4,600-4,620 SANDSTONE (80%) - gy lt crm, frm-hd, f-vf gr cons, gen w srt w comp, occ sil, n-sl calc, fr-g  $\emptyset$ , g-exc lt gy dif-brn ptchy o stn/mod yel gn flor, stng stmg-mod dif cut.  
SILTSTONE (Tr-10%) - gy gybrn tan-crm, frm-hd, arg-occ sl sdy, sl-mod calc, occ sil, n  $\emptyset$ , occ tr dd o stn.  
SHALE (10-15%) - var col, sft-frm, gen a/a.
- 4,620-4,640 SANDSTONE (10-15%) - gy clr lt-m brn, frm-hd, f-vf gr cons, w comp, n-sl calc, sl-mod slty-arg, fr-vg  $\emptyset$ , fr-g lt gy dif-lt-m brn ptchy o stn/mod yelgn flor, wk-mod stmg cut.  
PYRITE (Tr) - gol, v hd, mas.  
SILTSTONE (20%) - m brn gybrn gy occ crm, frm-hd, arg-occ sdy, sl-mod calc, occ sil, n  $\emptyset$ , occ tr dd o stn.  
SHALE (60-65%) - gn rdbrn brn gy tan yel mot, sft-frm, sbblky-occ fis, gen calc, occ slty-v sdy, NSOFC.
- 4,640-4,650 SANDSTONE (25%) - lt gy clr lt brn crm, sft-hd, f-vf gr cons sbang gen w srt w comp, gen fri, occ calc cmt, mod slty-mod arg, fr-exc  $\emptyset$ , sme g-vg lt gy dif-lt brn ptchy o stn/mod flor, wk-mod stmg cut.  
SILTSTONE (15%) - brn gybrn gy, frm-hd, arg-sl sdy, sl-mod calc, n  $\emptyset$ , v occ tr dd o stn/NSOFC, gen NSOFC.  
SHALE (60%) - gn gy rdbrn brn tan yel occ mot, sft-frm, sbblky-fis, occ splty, gen calc, occ slty-v sdy, NSOFC.

LITHOLOGY (Cont.)

- 4,650-4,680 SHALE (70-80%) - var col mot, sft frm, sbblky-sbfis occ fis-splty, gen calc, occ slty-sl sdy, NSOFC.  
SANDSTONE (Tr-10%) - clr lt gy wh, frm-hd, f-vf gr cons, gen w srt, mod comp, n-sl slty-sl arg, fr-exc  $\emptyset$ , occ lt gy-lt brn dif o stn/wk cut, gen NSOFC.  
SILTSTONE (10-20%) - brn gy brn, gen a/a.
- 4,680-4,690 SANDSTONE (40%) - clr brn, frm-hd, f gr cons ang-sbrd vw srt, v fri, n-sl calc, sl arg-sl slty, fr-exc  $\emptyset$ , exc lt brn dif o stn/bri gn flor, stng milky stmg cut.  
LIMESTONE (30%) - crm tan, frm-hd, ool/micxln mtx, sl-mod arg, p-fr intxln  $\emptyset$ , exc lt brn dif o stn/bri gn flor, stng stmg cut.  
SILTSTONE (Tr) - gy brn brn, frm-hd, arg-sl sdy, n  $\emptyset$ , fr dd brn o stn/NFOC.  
SHALE (25%) - gn gy rdbrn crm yel tan, sft frm, sbblky-fis occ splty, gen calc, occ slty-sl sdy, NSOFC.
- 4,690-4,700 SANDSTONE (25%) - brn gy, clr, frm-hd, f-vf gr cons gen w srt, fri, w comp, sl-mod calc, v slty-v arg, fr-g  $\emptyset$ , lt m brn dif-ptchy o stn/dul flor, mod-stng milky stmg cut.  
SILTSTONE (40%) - brn gy gybrn crm, sft-hd, arg-occ sdy, sl-mod calc, occ sil, gen n-vp  $\emptyset$ , occ fr dd brn o stn/NFOC, occ cln/NSOFC.  
SHALE (35%) - var col mot, sft frm, sbblky-occ fis, gen a/a
- 4,700-4,720 SANDSTONE (Tr-10%) - lt gy clr occ lt brn, frm-hd, f-vf gr cons sbang gen w srt, occ sil, gen fri, sl slty-sl arg, n-occ exc  $\emptyset$ , v occ lt brn dif o stn/bri flor, slow-mod stmg cut, gen NSOFC.  
LIMESTONE (10%) - crm tan gy gybrn, frm, crp-micxln, micrit arg-sl slty, n-vp intxln  $\emptyset$ , NSOFC.  
SILTSTONE (60-75%) -gn gy rdbrn orng tan yel brn, sft frm, sbblky-sbfis, occ slty-sl sdy, gen calc, NSOFC.
- 4,720-4,730 SANDSTONE (20%) - lt brn lt gy, frm-hd, f-vf gr cons gen w srt, frm, sl slty-sl arg, fr-exc  $\emptyset$ , lt brn dif-ptchy o stn/bri gn flor, v wk dif cut.  
SILTSTONE (30%) - m-dk brn gy gybrn occ tan, frm-hd, arg-occ sl sdy, sl-mod calc, occ sil, n  $\emptyset$ , occ fr dk dd o stn/NFOC.
- 4,730-4,760 SANDSTONE (Tr-10%) - clr occ lt brn, frm-hd, f-vf gr cons mod w srt, v fri, n-sl arg-sl slty, sl calc, p-occ exc  $\emptyset$ , sme lt dd o stn/dul flor, n-v wk cut, occ cln/NSOFC.  
LIMESTONE (Tr-10%) - crm lt brn tan occ wh, sft frm, micxln, micrite, occ ools, sl-mod arg, n-vp intxln  $\emptyset$ , NSOFC.  
SILTSTONE (10-30%) - gy brn tan gybrn, frm-hd, arg-occ sdy, sl-mod calc, n  $\emptyset$ , v occ tr dd o stn, gen NSOFC.  
SHALE (50-80%) - var col occ mot, sft frm, sbblky-occ fis occ splty, sl-mod slty-sl sdy, gen calc, NSOFC.

LITHOLOGY (Cont.)

- 4,760-4,780 PYRITE (Tr) - gol mot/blk, v hd, mas-xln.  
LIMESTONE (10-15%) - crm tan gy brn occ gy, frm-hd, micxln, micrite, sl-mod arg, n-vp intxln  $\emptyset$ , NSOFC.  
SANDSTONE (Tr-10%) - clr wh occ lt brn, frm-hd, f-vf gr cons gen w srt, mod-v fri, sl-occ mod calc, fr-vg-occ exc  $\emptyset$ , occ lt dif stn/dul flor, wk cut, gen cln/NSOFC.  
SILTSTONE (20-30%) - brn tan gybrn gy, frm-hd, arg-occ sl sdy, sl-mod calc, n  $\emptyset$ , NSOFC.  
SHALE (40-60%) - var col sme mot, sbblky-occ splty, gen a/a
- 4,780-4,800 SHALE (60-80%) - gn gy rdbrn orng tan brn yel mot, sft-frm, sbblky-fis occ splty, gen calc, occ slty-sl sdy, NSOFC.  
SANDSTONE (Tr) - gen clr occ ptchy lt brn, frm-hd, m-f gr cons gen w srt, sl slty-sl arg, v fri, sl calc, exc  $\emptyset$ , NSOFC.  
SILTSTONE (15-35%) - brn gybrn gy, frm-hd, gen as above.
- 4,800-4,830 SANDSTONE (10-15%) - lt gy wh clr, frm-hd, f-vf g cons mod srt, occ sil, sme fri, p-occ exc  $\emptyset$ , sl arg-sl slty, gen cln/NSOFC.  
SHALE (50-60%) - gn gy rdbrn yel crm brn occ mot, sft-frm, sbblky-sbfis occ splty, gen calc, NSOFC.  
LIMESTONE (Tr) - crm tan, frm, micrite, sl-mod arg, n intxln  $\emptyset$ , NSOFC.  
SILTSTONE (20-35%) - m-dk brn crm tan gy gybrn, frm-hd, arg-sl sdy, sl-mod calc, occ sil, n-vp  $\emptyset$ , v occ tr dd o stn/NFOC, gen NSOFC.
- 4,830-4,840 SANDSTONE (Tr) - clr lt gy, f-vf gr cons w srt w comp, sl calc, gen cln/NSOFC.  
SILTSTONE (45%) - dk brn dk-m gy gybrn occ tan, frm-hd, arg-occ sdy, sl-mod calc, sme sil, n-vp  $\emptyset$ , NSOFC.  
SHALE (50%) - var col mot, sft-frm, sbblky-occ fis, gen calc, occ slty-v sdy, NSOFC.
- 4,840-4,860 SANDSTONE (10-15%) - clr lt gy occ crm, sft-hd, f-vf gr cons, w srt, occ calc mtx, sl-mod arg-slty, g  $\emptyset$ , gen cln/NSOFC.  
SILTSTONE (10-20%) - dk gy brn dk brn gy, frm-hd, arg-occ sl sdy, sl-mod calc, occ sil, n  $\emptyset$ , NSOFC.  
SHALE (65-80%) - gy gn rdbrn brn tan yel mot, sft-frm, sbblky-sbfis, gen calc, occ slty-sdy, NSOFC.
- 4,860-4,880 SANDSTONE (30-40%) - clr lt gy lt gybrn, frm-hd, f gr cons sbang v w srt w comp, n-sl arg-sl slty, n calc, fr-exc  $\emptyset$ , NSOFC, sme m-c gr ang-sbang, frstd.  
SILTSTONE (10-25%) - gy brn gybrn occ tan, frm-hd, arg-occ sl sdy, sl calc, occ sl sil, gen n-vp  $\emptyset$ /NSOFC.  
SHALE (35-60%) - var col mot, sft-frm, fis-sbblky sme splty, occ slty-sl sdy, gen calc, NSOFC.

LITHOLOGY (Cont.)

- 4,880-4,910 LIMESTONE (Tr) - crm tan gy, sft-frm, micxln, micrite, mod arg, n sdy, vp-p intxln  $\emptyset$ , NSOFC.  
SILTSTONE (30-40%) - gy brn gybrn tan, frm-hd, arg-occ sl sdy, sl-occ mod calc, n  $\emptyset$ , NSOFC.  
SHALE (55-65%) - gn gy orng brn rdbrn tan yel mot, sft-frm, sbblky-fis occ splty, gen calc, occ slty-sdy, NSOFC.
- 4,910-4,960 SANDSTONE (Tr-10%) - clr wh lt gy occ lt brn-tan, sft-hd, f-vf gr cons sbang gen w srt, w comp, occ fri, occ vg calc cmt, occ sil, gen tt-occ fr  $\emptyset$ , gen cln/NSOFC, v occ lt gy-lt brn dd o stn/n-v dul flor, n-v wk cut.  
LIMESTONE (Tr-10%) - crm tan wh, sft-frm, micxln, micrite, occ ools, n-mod arg, n-vp intxln  $\emptyset$ , NSOFC.  
SILTSTONE (30-40%) - gy brn gybrn tan, sft-hd, arg-occ v sdy, occ sil, sl-mod calc, n-vp  $\emptyset$ , NSOFC.  
SHALE (40-60%) - gy gn rdbrn brn orng tan yel mot, sft-frm, sbblky-fis occ splty, gen calc, sl-mod slty-mod sdy, NSOFC.
- 4,960-4,980 SANDSTONE (10-20%) - lt gy lt brn clr occ frstd, frm-hd, f-vf gr cons w srt mod w comp, occ fri, sl calc, sl-mod arg mod slty, fr-exc  $\emptyset$ , sme lt brn-lt gy dif o stn/bri flor, wk-mod stng stng cut, sme cln/NSOFC, sme m-vc uncons ang-sbrd p srt.  
LIMESTONE (10-15%) - crm tan wh, sft-frm, micxln, micrite, n-mod arg, n intxln  $\emptyset$ , NSOFC.  
SILTSTONE (10-20%) - gy brn gybrn tan, sft-hd, arg-occ sdy, sl-mod calc, n  $\emptyset$ , NSOFC.  
SHALE (35-70%) - var col mot, sft-frm, sbblky-fis, occ slty-sdy, occ xln PYR incl, gen calc, NSOFC.
- 4,980-5,000 SANDSTONE (Tr) - cln wh lt gy occ lt brn, frm-hd, f-vf gr cons p-mod w srt, occ vw comp-sil, sl-mod calc, gen tt/NSOFC, occ fr  $\emptyset$ /lt dd o stn.  
SILTSTONE (10-30%) - gy brn gybrn occ tan, sft-hd, arg-occ sl sdy, sl-mod calc, occ sil, gen n  $\emptyset$ , NSOFC.  
SHALE (65-85%) - gn gy brn rdbrn orng yel crm tan, sft-frm, gen a/a.
- 5,000-5,020 SANDSTONE (20-30%) - clr lt gy, sft-hd, f-vf gr cons mod w srt, gen w comp, occ g calc cmt, mod arg-slty, fr intgr  $\emptyset$ , NSOFC.  
SILTSTONE (10-30%) - m-dk gy, gybrn brn, frm-hd, arg-occ sdy, sl-mod calc, occ sil, n  $\emptyset$ , NSOFC.  
SHALE (40-70%) - var col mot, sft-frm, sbblky-sbfis, occ splty, gen calc, occ slty-mod sdy, NSOFC.
- 5,020-5,100 SANDSTONE (Tr-10%) - clr lt gy, frm-hd, f-vf gr cons gen w srt, sme vw comp, p-occ exc  $\emptyset$ , NSOFC.  
LIMESTONE (Tr) - crm wh, sft-frm, micrite, n-mod arg, n  $\emptyset$ , NSOFC.  
SILTSTONE (20-30%) - m-dk gy gybrn sme brn, sft-hd, arg-occ sdy, sl-mod calc, occ sil, n-vp  $\emptyset$ , NSOFC.  
SHALE (55-70%) - gn gy brn orng-rdbrn tan yel crm, sft-frm, sbblky-fis occ splty, sme v slty-mod sdy, gen calc, NSOFC.

LITHOLOGY (Cont.)

- 5,100-5,120 SANDSTONE (10-20%) - clr lt gy occ wh, frm-hd, f-vf gr cons mod w srt, arg-sltly, p-occ fr  $\emptyset$ , sl calc, p-occ fr  $\emptyset$ , NSOFC.  
SILTSTONE (30-40%) - m-dk gy gybrn occ brn, frm-hd, arg-sl sdy, sl-mod calc, occ sil, n  $\emptyset$ , NSOFC.  
SHALE (40-60%) - var col sme mot, sft-frm, sbblky-fis, occ splty, gen calc, occ slty-sdy, NSOFC.
- 5,120-5,200 SANDSTONE (Tr-10%) - clr, hd, f gr cons sbang gen w srt, w comp, n-sl arg-sl slty, n-p  $\emptyset$ , NSOFC.  
LIMESTONE (Tr) - wh crm, micxln, micrite, sl-v arg, n intxln  $\emptyset$ , NSOFC.  
SILTSTONE (20-40%) - gy brn gybrn, gen a/a.  
SHALE (45-70%) - var col, sft-frm, sbblky-fis occ splty, occ slty-sl sdy, gen calc, NSOFC.
- 5,200-5,220 LIMESTONE (10%) - tan lt brn crm, frm-hd, micxln, micrite, arg, n dol, n-vp intxln  $\emptyset$ , NSOFC.  
SILTSTONE (30%) - m-dk gy brn gy brn, frm-hd, arg-occ sl sdy, sl-mod calc, n-vp  $\emptyset$ , gen NSOFC, occ dk ddo stn/NFOC.  
SANDSTONE (20%) - clr lt gy occ lt brn, sft-hd, f-vf gr cons sbang gen w srt, occ v arg-sltly, gen fri, occ vg calc cmt, occ sil, gen tt/p  $\emptyset$ , NSOFC.  
SHALE (40%) - gn gy brn rdbrn orng yel tan mot, sft-frm, sbblky-sbfis occ splty, gen calc, occ slty-mod sdy, NSOFC.
- 5,220-5,230 SANDSTONE (10%) - clr lt gy lt brn crm, frm-hd, f-vf gr cons gen w srt, occ sil-qtztc, occ mod slty-v arg, p-occ fr  $\emptyset$ , occ v lt brn dif o stn/bri yel flor, wk cut.  
SILTSTONE (35%) - m-dk gy gybrn lt-m brn, frm-hd, arg-sl sdy, sl-mod calc, sme sil, n-vp  $\emptyset$ , occ dk dd o stn/NFOC.  
LIMESTONE (Tr) - crm lt brn tan, frm-hd, micrite, sl-mod arg, n-vp intxln  $\emptyset$ , NSOFC.  
SHALE (50%) - gy gn orng rdbrn brn tan yel mot, sft-frm, sbblky-fis, occ splty, gen calc, NSOFC.
- 5,230-5,250 SANDSTONE (10%) - lt brn lt gy occ clr, frm-hd, f gr cons, sbang w srt, sl-mod slty-mod arg, fri, fr-exc  $\emptyset$ , lt brn dif o stn/bri yel flor, mod-stng stmg cut.  
LIMESTONE (Tr) - crm tan wh, sft-frm, micxln, micrite, n-mod arg, n dol, n-vp intxln  $\emptyset$ , NSOFC.  
SILTSTONE (20%) - gy m gy brn occ brn, frm-hd, v arg-sl sdy, sl-mod calc, n-vp  $\emptyset$ , gen NSOFC, occ dd o stn.  
SHALE (65%) - var col mot, sbblky-fis occ splty, gen calc, sl-mod slty-mod sdy, NSOFC.
- 5,250-5,270 SANDSTONE (Tr) - lt brn lt gy clr, frm-hd, f-vf gr cons, gen w srt, occ slty-arg, fri, occ mod calc, fr-g  $\emptyset$ , sme lt brn-lt gy dif o stn/wk-mod flor, wk-mod stmg cut.  
SILTSTONE (20-30%) - gy gybrn, frm-hd, arg-mod sdy, sl-mod calc, occ sil, n-p  $\emptyset$ , gen NSOFC, v occ dd o stn/NFOC.  
SHALE (65-75%) - gn gy brn orng tan yel mot, sft-frm, sbblky-fis occ splty, gen calc, occ slty-sl sdy, NSOFC.

LITHOLOGY (Cont.)

- 5,270-5,280 SANDSTONE (10%) - lt brn lt gy occ cln, frm-hd, f gr cons sbang w srt, sl-mod arg-sl slty, fri, sl calc, fr-exc Ø, g lt brn dif o stn/bri yel flor, mod-stng stmg cut.  
SILTSTONE (30%) - gy gybrn frm-hd, arg-mod sdy, gen a/a.  
SHALE (60%) - var col, sft-frm, sbblky-fis occ splty, gen calc, sl-mod slty-sl sdy, NSOFC.
- 5,280-5,290 SANDSTONE (Tr) - clr lt gy, sft-hd, f-vf gr gen w srt, sme v fri, sme fr calc cmt, n-sl arg-sl slty, p-occ g Ø, gen cln/NSOFC.  
SILTSTONE (35%) - gy gybrn, frm-hd, arg-sl sdy, sl-mod calc, occ sil, n-vp Ø, NSOFC.  
SHALE (60%) - gn gy brn rdbrn orng tan yel occ mot, sft-frm, sbblky-fis occ splty, sl-mod slty-sl sdy, gen calc, NSOFC.
- 5,290-5,300 SANDSTONE (20%) - lt gy clr lt brn, frm-hd, f-vf gr cons gen w srt, gen mod w comp, fri, sl slty-sl arg, n-sl calc, fr-exc Ø, fr-g lt gy-lt brn dif o stn/bri yel flor, wk-mod stmg cut.  
SILTSTONE (40%) - gy gybrn, sft-frm, arg-mod sdy, sl-mod calc, n Ø, v occ lt dd o stn/NFOC.  
SHALE (40%) - var col, sbblky-splty, gen calc, gen a/a.
- 5,300-5,320 SANDSTONE (10%) - lt brn occ lt gy occ clr, frm-hd, f gr cons sbang w srt, p comp, v fri, sl slty-sl arg, sl calc, fr-exc Ø, exc lt brn dif o stn/bri yel flor, mod-stng stmg blgn flor cut.  
LIMESTONE (Tr-10%) - crm tan lt brn, frm, micxln, micrite, sl-mod arg, n dol, n-p intxln Ø, gen NSOFC, occ tr dd o stn/NFOC.  
SILTSTONE (20-30%) - gy gybrn dk-m brn, frm-hd, arg-occ sdy, sl-mod calc, n Ø, sme dk dd o stn/NFOC, occ NSOFC.  
SHALE (50-65%) - gn gy orng rdbrn brn tan yel crm mot, sft-frm, sbblky-fis occ splty, gen calc, occ tr dd o stn/NFOC.
- 5,320-5,330 SANDSTONE (10%) - lt gy lt brn, frm-hd, f-vf gr cons, mod w srt, arg-slty, sl-mod calc, fr-vg Ø, exc lt brn dif o stn/v occ bri yel flor, gen NF, v wk cut.  
SILTSTONE (25%) - dk brn gybrn gy, sft-hd, arg-occ mod sdy, sl-mod calc, n Ø, sme dk dd o stn/NFOC, sme NSOFC.  
SHALE (65%) - m-dk gy gygn orng-yel brn tan, sft-frm, sbblky, gen calc, sl slty-sl sdy, NSOFC.
- 5,330-5,340 SANDSTONE (20%) - lt gy lt brn, frm-hd, f-vf gr cons mod w srt, v fri, sl calc, sl slty-sl arg, fr-exc Ø, exc lt brn dif-ptchy o stn/bri yel flor, stng stmg-dif milky blue flor cut.  
SILTSTONE (20%) - lt-m gy occ gybrn, sft-frm, arg-occ sl sdy, sl-mod calc, n-p Ø, occ fr dd o stn/NFOC, gen NSOFC.  
SHALE (60%) - lt m gy gygn gn orng lt brn tan yel mot, sft-frm, sbblky-sbfis, occ slty-mod sdy, gen calc, NSOFC.

LITHOLOGY (Cont.)

- 5,340-5,350 SANDSTONE (Tr) - lt brn, f gr cons, fri, sl arg-sl slty, exc  $\emptyset$ , exc lt brn dif o stn/bri yel flor, stng stmg cut.  
SILTSTONE (30%) - gy brn gybrn, frm-hd, arg-sme vf sd, sl-mod calc, occ sil, n  $\emptyset$ , NSOFC.  
SHALE (65%) - var col mot, sft-frm, sbblky-sbfis, gen a/a.
- 5,350-5,360 SANDSTONE (20%) - clr lt gy lt brn, frm-hd, m-f gr cons mod w srt, n-sl slty-sl arg, n-sl calc, fr-exc  $\emptyset$ , fr-vg lt brn dif-ptchy o stn/bri yel flor, mod-stng stmg dif milky blgn flor cut.  
SILTSTONE (20%) - gy gybrn, sft-frm, arg-sl sdy, sl-mod calc, n  $\emptyset$ , occ dd o stn/NFOC.  
SHALE (60%) - var col mot, sft-frm, sbblky-fis occ splty, gen calc, occ slty-sl sdy, NSOFC.
- 5,360-5,402 SANDSTONE (10-30%) - lt brn occ lt gy, f-vf gr cons gen w srt, gen w comp, sl arg-sl slty, fr-exc  $\emptyset$ , exc lt brn dif o stn/dul-bri yel flor, slo stmg-resd cut.  
SILTSTONE (10-20%) - m gy gybrn, sft-frm, arg-occ mod sdy, sl-mod calc, n  $\emptyset$ , v occ dd o stn/NFOC, gen NSOFC.  
SHALE (50-80%) - gygn gy yel crm tan orng rdbrn mot, sft-frm, sbblky-fis occ splty, gen calc, occ slty-sme vf sd, NSOFC.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE

(See other instructions on reverse side)

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

6

WELL COMPLETION OR RECOMPLETION REPORT AND LOG \*

5. LEASE DESIGNATION AND SERIAL NO.  
U-02651-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME  
USA Pearl Broadhurst

9. WELL NO.  
17

10. FIELD AND POOL, OR WILDCAT  
Walker Hollow

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA  
Sec. 10-T7S-R23E

12. COUNTY OR PARISH  
Uintah

13. STATE  
Utah

14. PERMIT NO. \_\_\_\_\_ DATE ISSUED \_\_\_\_\_

**RECEIVED**  
DIVISION OF OIL, GAS & MINING

15. DATE SPUNDED 6-7-81 16. DATE T.D. REACHED 6-21-81 17. DATE COMPL. (Ready to prod.) 9-14-81 18. ELEVATIONS (DF, RKB, RT, GR, ETC.)\* 5,149' (GRD + 13')

19. ELEV. CASINGHEAD \_\_\_\_\_

20. TOTAL DEPTH, MD & TVD 5,402' K.B. 21. PLUG, BACK T.D., MD & TVD 5,360' K.B. 22. IF MULTIPLE COMPL., HOW MANY\* NA 23. INTERVALS DRILLED BY 0-TD ROTARY TOOLS CABLE TOOLS

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)\*  
Green River "J" Zone - 5,213'-5,224'  
Green River "K" Zone - 5,283'-5,325'

25. WAS DIRECTIONAL SURVEY MADE NO

26. TYPE ELECTRIC AND OTHER LOGS RUN  
Compensated Neutron/Formation Density, Dual Induction, & Acoustilog

27. WAS WELL CORED NO

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

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8-5/8"	24#	507' KB	12-1/4"	360 sx "G" w/2% CaCl <sub>2</sub> & 1/4# Flocele/sx.	-0-
5-1/2"	14#	5,402' KB	7-7/8"	435 sx "G" w/3% D-79 & 10# D-42 (Kolite) OVER	-0-

29. LINER RECORD

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

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2-7/8"	5,277' KB	

31. PERFORATION RECORD (Interval, size and number)

Green River "J" 5,213'-5,224'  
Green River "K" 5,283'-5,325' (14 holes)

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

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
5,213'-5,325'	BD w/750 gal Western 7 1/2% "Spearhead Acid" plus additives & ball sealers.

33.\* PRODUCTION

DATE FIRST PRODUCTION 9-14-81 PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump) Pumping 2-1/2" x 1-3/4" x 14' Rod Pump WELL STATUS (Producing or shut-in) Producing

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
9-24-81	24	-----	→	54	NA	1	NA

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
--	-----	→	54	NA	1	±29.0°

34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.)  
VENTED DURING TEST

TEST WITNESSED BY  
RIP DOUGLAS

35. LIST OF ATTACHMENTS  
SAMPLE DESCRIPTION ATTACHED.

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

SIGNED Garie Lape TITLE Production Tech - RMD DATE 10-1-81

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

# INSTRUCTIONS

**General:** This form is designed for submitting a complete and correct well completion report and log on all types of lands and leases to either a Federal agency or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office. See instructions on items 22 and 24, and 33, below regarding separate reports for separate completions.

If not filed prior to the time this summary record is submitted, copies of all currently available logs (drillers, geologists, sample and core analysis, all types electric, etc.), formation and pressure tests, and directional surveys, should be attached hereto, to the extent required by applicable Federal and/or State laws and regulations. All attachments should be listed on this form, see item 35.

**Item 4:** If there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.

**Item 18:** Indicate which elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments. **Items 22 and 24:** If this well is completed for separate production from more than one interval zone (multiple completion), so state in item 22, and in item 24 show the producing interval, or intervals, top(s), bottom(s) and name(s) (if any) for only the interval reported in item 33. Submit a separate report (page) on this form, adequately identified, for each additional interval to be separately produced, showing the additional data pertinent to such interval.

**Item 29: "Sacks Cement":** Attached supplemental records for this well should show the details of any multiple stage cementing and the location of the cementing tool. **Item 33:** Submit a separate completion report on this form for each interval to be separately produced. (See instruction for items 22 and 24 above.)

FORMATION	TOP	BOTTOM	DESCRIPTION, CONTENTS, ETC.	NAME	MEAS. DEPTH	TRUE VERT. DEPTH
<b>37. SUMMARY OF POROUS ZONES:</b> 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						
No DST's			Cementing 5-1/2" - 400 sx 50-50 Pozmix w/ 2% Gel; 0.75% D-60 & 1/4# Flocele/sx.	LOG TOPS		
				Uintah Green River "G" "H" "I" "J" "K" Driller T.D. Logger T.D.	Surface 2,766' 4,294' 4,565' 4,789' 5,082' 5,252' 5,402' 5,394'	
<b>38. GEOLOGIC MARKERS</b>						

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

SUBMIT IN TRIP  
(Other instruction re-  
verse side)

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

6

**SUNDRY NOTICES AND REPORTS ON WELLS**

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

**APR 12 1985**

**DIVISION OF OIL  
GAS & MINING**

1. OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/>		7. UNIT AGREEMENT NAME	
2. NAME OF OPERATOR Energy Reserves Group, Inc.		8. FARM OR LEASE NAME USA Pearl Broadhurst	
3. ADDRESS OF OPERATOR P. O. Box 3280 Casper, Wyoming 82602		9. WELL NO. 17	
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface 2104' FNL & 2112' FWL (SE/NW)		10. FIELD AND POOL, OR WILDCAT Walker Hollow Field	
14. PERMIT NO.		12. COUNTY OR PARISH Uintah	
15. ELEVATIONS (Show whether DF, RT, GR, etc.) KB 5162' (GRD + 13')		13. STATE Utah	

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

NOTICE OF INTENTION TO:

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

SUBSEQUENT REPORT OF:

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

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

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)\*

The workover on the subject well was completed as follows from March 26 to April 1, 1985:

1. MI RUSU. Pulled pump and rods. Release tubing anchor. Installed BOPE. TOOH w/2-7/8" tubing.
2. PU 5-1/2" casing scraper and TIH to 5360'. TOOH.
3. Reperforated the following Green River intervals w/3 JSPF: 5322'-26', 5315'-18', 5288'-92', 5282'-85' & 5212'-26'. Perforated the following Green River intervals w/3 JSPF: 4685'-89', 4677'-79' & 4597'-05'.
4. PU casing scraper and TIH to 5360'. TOOH.
5. Acidized each 1 ft. perforated interval w/1 bbl of 15% HCl acid plus additives using Baker Service Tools "SAP" tool.
6. TOOH. TIH & TOOH laying down tubing.
7. PU and TIH w/coated tubing and tubing anchor. ND BOPE. Set tubing anchor.
8. TIH w/pump and rods. Started well pumping.
9. RD MOSU.

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

SIGNED Bobby Patrick TITLE Petroleum Engineer DATE 4-8-85  
Bobby Patrick  
 (This space for Federal or State office use)

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

\*See Instructions on Reverse Side

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

SUBMIT IN 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

2. NAME OF OPERATOR **Energy Reserves Group, Inc.**

3. ADDRESS OF OPERATOR **P. O. Box 3280 Casper, Wyoming 82602**

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

14. PERMIT NO. \_\_\_\_\_ 15. ELEVATIONS (Show whether DF, RT, GR, etc.) \_\_\_\_\_

RECEIVED

JUN 03 1985

DIVISION OF OIL  
GAS & MINING

5. LEASE DESIGNATION AND SERIAL NO. **U-02651-A**

6. IF INDIAN, ALLOTTEE OR TRIBE NAME \_\_\_\_\_

7. UNIT AGREEMENT NAME \_\_\_\_\_

8. FARM OR LEASE NAME **USA Pearl Broadhurst**

9. WELL NO. \_\_\_\_\_

10. FIELD AND POOL, OR WILDCAT **Walker Hollow Field**

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA **Section 9 T1S-R1E**

12. COUNTY OR PARISH **Uintah** 13. STATE **Utah**

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

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

(Other) **Consolidate Tank Batteries**

(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.)\*

Energy Reserves Group, Inc. is proposing to consolidate the five existing tank batteries to one central tank battery to be located at the USA Pearl Broadhurst #1 present tank battery site. The location of the central tank battery site and the additional flowlines are shown on the attached topo map. All of the additional flowlines required will be in existing pipeline routes and will be insulated surface lines, so there should not be any additional surface disturbances. The entire lease has already had archaeological clearance. The present #1 Broadhurst Tank Battery already has the required tank storage, additional heater treaters will have to be moved to the present #1 battery.

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

SIGNED Bobby Patrick TITLE Petroleum Engineer DATE 5-31-85

Bobby Patrick  
(This space for Federal or State office use)

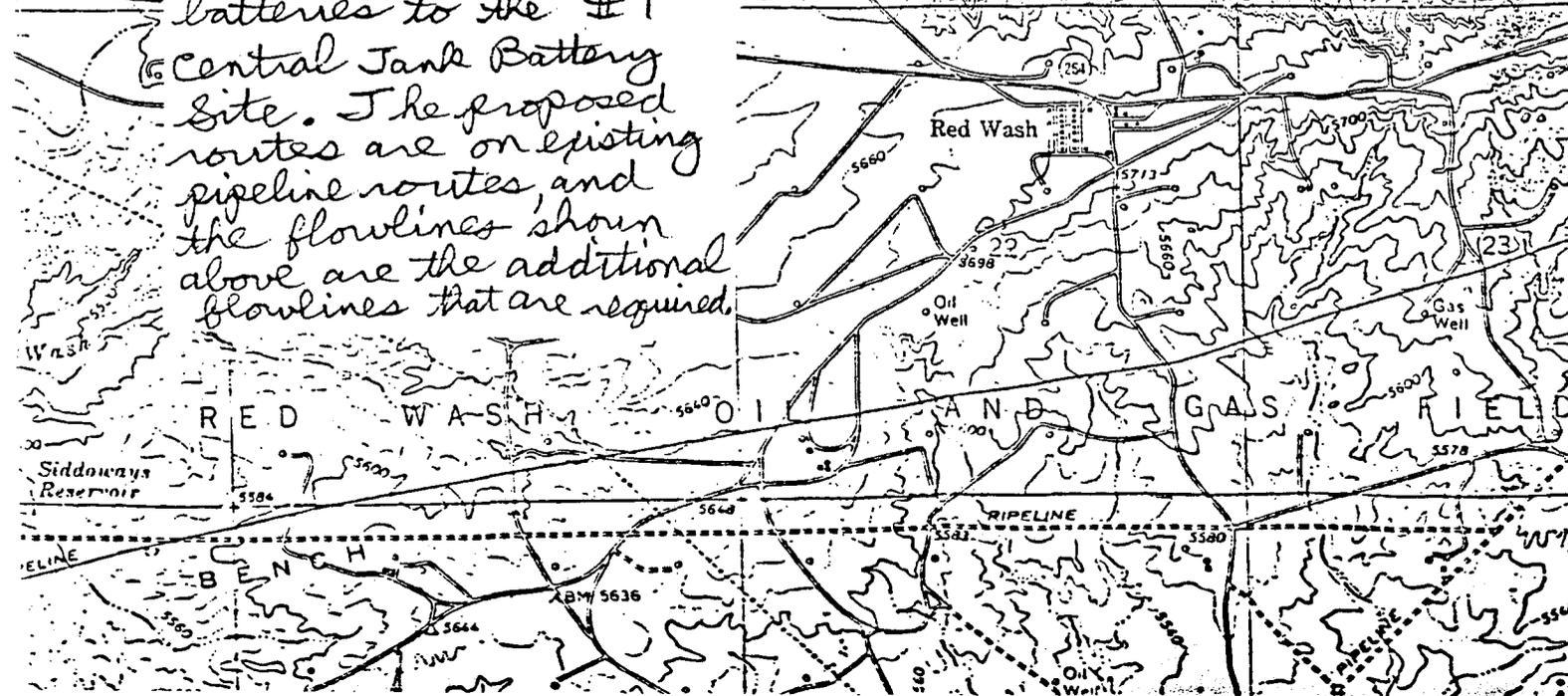
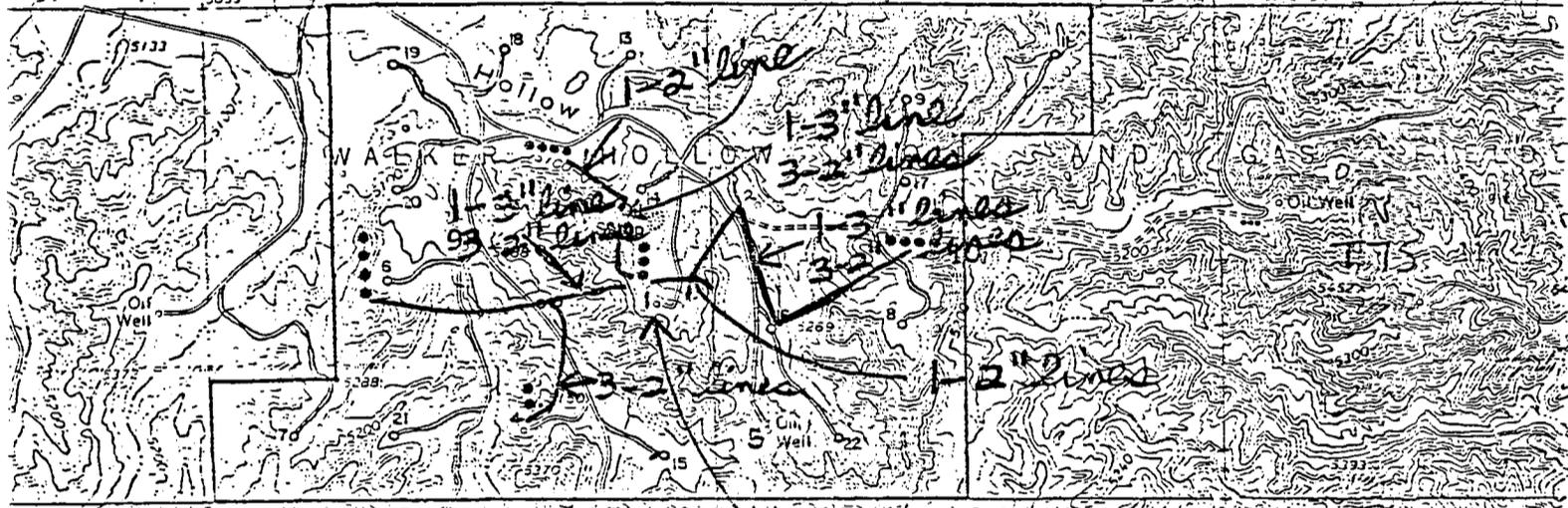
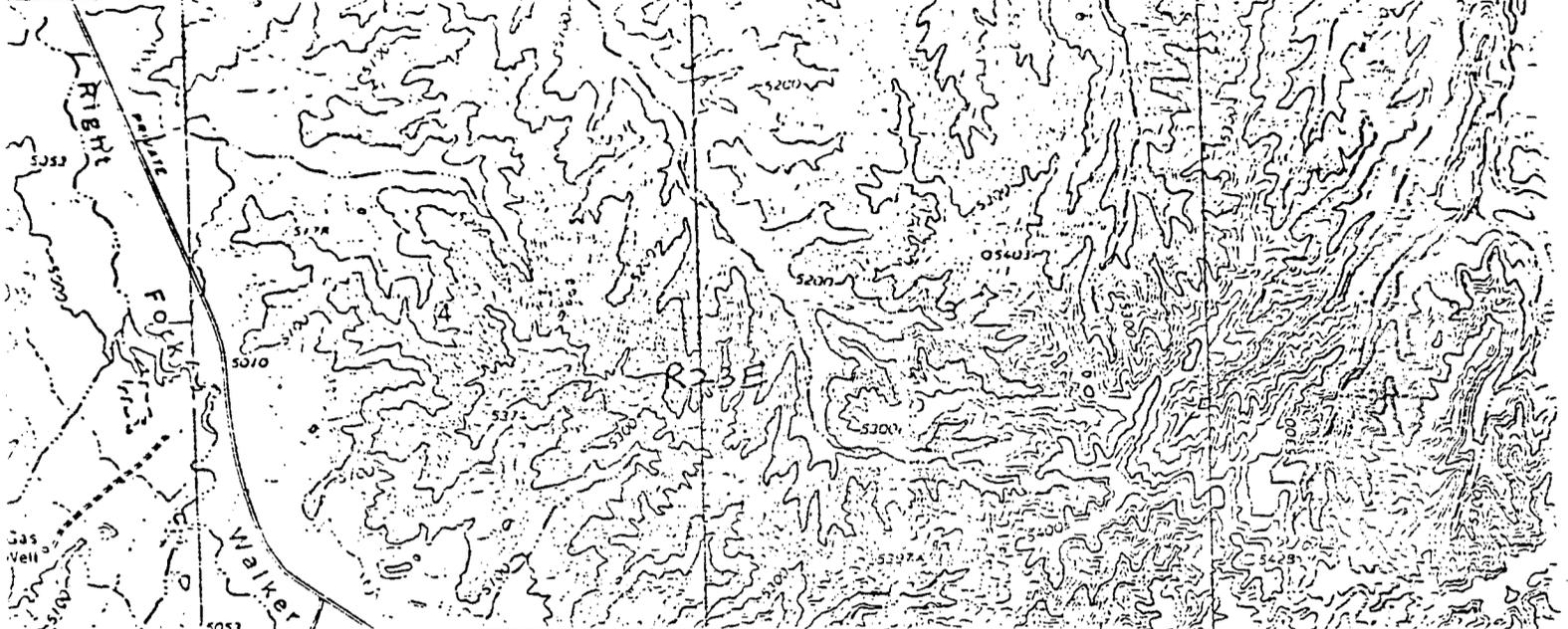
APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_

CONDITIONS OF APPROVAL, IF ANY: \_\_\_\_\_

\*See Instructions on Reverse Side

Energy Reserves Group  
 USA Pearl Broadhurst Lease  
 Walker Hollow Field  
 Uintah Co., Utah

35 MI TO UTAH 258 20' 142 143 4164 IV SE (JENSEN) 144 145 17'30"



The flowline routes shown above are the proposed routes from the existing batteries to the #1 Central Tank Battery Site. The proposed routes are on existing pipeline routes, and the flowlines shown above are the additional flowlines that are required.

913 North Foster Road  
Post Office Box 3280  
Casper, Wyoming 82602  
Telephone (307) 265-7331  
Fax (307) 266-1999

RECEIVED

OCT 24 1985

DIVISION OF OIL  
GAS & MINING



September 17, 1985

Division of Oil, Gas, and Mining  
3 Triad Center, Suite 350  
Salt Lake City, UT 84180-1203

*Broadhurst #17  
75.232.10 Uintah Co.*

Re: Corporate name change, ENERGY RESERVES GROUP, INC.

Gentlemen:

By authority of the enclosed copies and affidavit, please change your records to reflect the change of the name of ENERGY RESERVES GROUP, INC., to BHP Petroleum (Americas) Inc. for all former ERG operations in Utah.

Affected leases and numbers are as follows:

USA Pan American  
Federal Lease #81-06579  
(Utah entity #00220)

USA Pearl Broadhurst  
Federal Lease #U-02651-A  
(Utah entity #00225)

Roosevelt Unit - Wasatch  
Federal Lease #I-109-IND-5248 and I-109-IND-5242  
(Utah entity #00221)

If further information is needed, please contact me at the letterhead address or telephone number.

Thank you for your assistance.

BHP Petroleum (Americas) Inc.

A handwritten signature in cursive script that reads 'Dale Belden'.

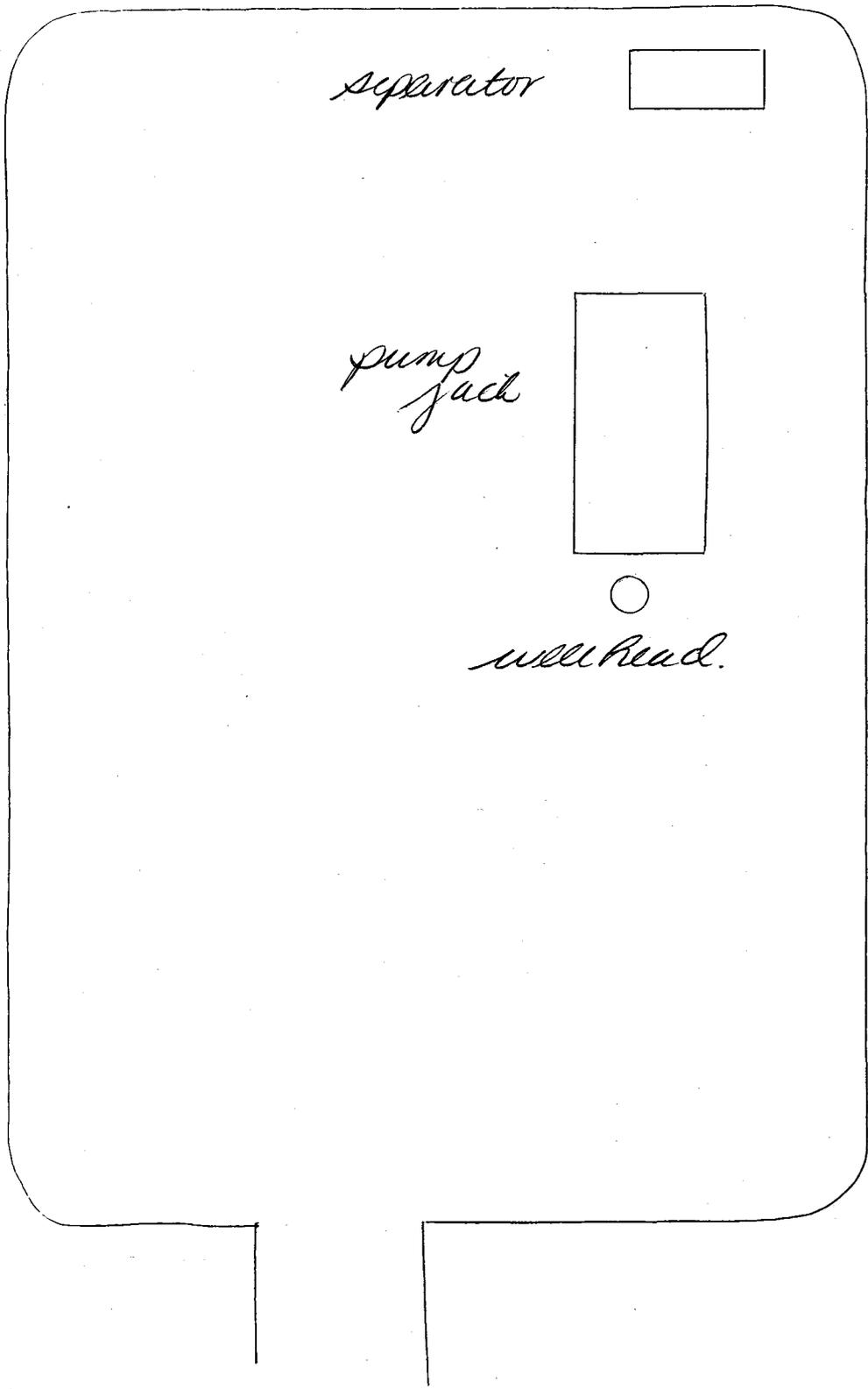
Dale Belden  
District Clerk  
Rocky Mountain District

DB/mz

Enclosure

OCT 25 1985

N



42-382 50 SHEETS 5 SQUARE  
 42-383 100 SHEETS 5 SQUARE  
 42-384 200 SHEETS 5 SQUARE  
 42-385 300 SHEETS 5 SQUARE  
 MADE IN U.S.A.  
 NATIONAL

# GENERAL ATLANTIC

RESOURCES, INC.

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

June 14, 1993

RECEIVED

JUN 17 1993

State of Utah  
Oil & Gas Conservation Commission  
Three Triad Center, Suite 350  
355 West North Temple  
Salt Lake City, Utah 84180-1203

DIVISION OF  
OIL, GAS & MINING

RE: Change of Operator  
Sundry Notices and  
Reports on Wells

Gentlemen:

By Assignment dated April 30, 1993, effective January 1, 1993, General Atlantic Resources, Inc. ("GARI") purchased the interests of BHP Petroleum (Americas) Inc., Hamilton Brothers Oil Company, Hamilton Brothers Exploration Company and The Norwegian Oil Corporation (DNP-U.S.) collectively ("BHP"), in the properties referenced on the enclosed forms. BHP was the designated operator of said properties, resigning effective May 1, 1993. GARI has been acting as the operator in the interim while balloting was being conducted to determine the successor operator.

GARI has been named successor operator. Enclosed are executed forms for your review and approval reflecting this change. In the event you have questions or concerns relative to this transfer of operatorship, please contact Jim Lee Wolfe, Vice President of Operations or the undersigned at the letterhead address and/or call (303) 573-5100. Thank you for your timely attention in this matter.

Very truly yours,

GENERAL ATLANTIC RESOURCES, INC.

  
Lynn D. Becker, CPL  
Landman

Enclosures



STATE OF UTAH  
DIVISION OF OIL, GAS AND MINING

5. LEASE DESIGNATION & SERIAL NO.

SEE BELOW

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.)

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

SEE BELOW

8. FARM OR LEASE NAME

9. WELL NO.

SEE ATTACHED

10. FIELD AND POOL, OR WILDCAT

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

1. OIL WELL  GAS WELL  OTHER

2. NAME OF OPERATOR

BHP Petroleum (Americas) Inc. (PREVIOUS OPERATOR)

3. ADDRESS OF OPERATOR

5847 San Felipe, Suite 3600, Houston, Texas 77057

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

See also space 17 below.)

At surface Sections 9,10,13,18,19,20,21,23,25,26,27,28

At proposed prod. zone

14. API NO.

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

12. COUNTY

13. STATE

Uintah

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)

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.)

APPROX. DATE WORK WILL START \_\_\_\_\_

DATE OF COMPLETION 5/01/93

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.

EFFECTIVE DATE: January 1, 1993.

NEW OPERATOR: General Atlantic Resources, Inc.

ADDRESS: 410 17th Street, Suite 1400, Denver, Colorado 80202

LEASE: USA Pearl Broadhurst  
USA Pan American  
Roosevelt Unit Wasatch

LEASE #: UTU02651A  
UTSL065759  
892000886A

RECEIVED

JUN 17 1993

DIVISION OF OIL GAS & MINING

Attached is a list of the wells which make up the above leases along with their respective API numbers. This method of ownership change was suggested by Lisha Romero, Division of Oil, Gas and Mining, Salt Lake City, Utah.

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

SIGNED

*Carl Kolbe*

TITLE

*Regulatory Off. Rep.*

DATE

*4/27/93*

(This space for Federal or State office use)

APPROVED BY \_\_\_\_\_

TITLE \_\_\_\_\_

DATE \_\_\_\_\_

CONDITIONS OF APPROVAL, IF ANY:

<u>LEASE</u>	<u>WELL#</u>	<u>API NUMBER</u>
USA Pearl Broadhurst	1 — Sec 9 T7S R22E	43-047-15692
" " "	2 — 10	43-047-15693
" " "	4 — 9	43-047-15694
" " "	5 — 10	43-047-15695
" " "	6 — 9	43-047-30705
" " "	7 — 9	43-047-30730
" " "	8 — 10	43-047-30696
" " "	9 — 10	43-047-30787
" " "	10 — 9	43-047-30839
" " "	11 — 11	43-047-30840
" " "	12 — 10	43-047-30841
" " "	13 — 9	43-047-30842
" " "	14 — 9	43-047-30904
" " "	15 — 9	43-047-30901
" " "	16 — 10	43-047-30903
" " "	17 — 10	43-047-30905
" " "	18 — 9	43-047-30939
" " "	19 — 9	43-047-30940
" " "	20 — 9	43-047-30941
" " "	21 — 9	43-047-30942
" " "	22 — 10	43-047-31025
USA Pan American	1 Sec 23 T55 R 22E	43-047-15682
" " "	2 — 26	43-047-15683
" " "	3 — 26	43-047-15684
" " "	4 — 22	43-047-15685
" " "	5 — 26	43-047-15686
" " "	6 — 26	43-047-15687
" " "	7 — 25	43-047-15688
" " "	8 — 22	43-047-15689
" " "	9 — 27	43-047-15690
" " "	10 — 22	43-047-15691
Roosevelt Unit Wasatch	5W — Sec 20 T1S 1E	43-047-31254
" " "	6 — 20	43-047-31366
" " "	7 — 19	43-047-31402
" " "	9W — 28	43-047-31445
" " "	10W — 21	43-047-31446
" " "	C11 — 18	43-047-31500
" " "	Mary 278 13	43-047-31845

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 well or reservoir.  
Use "APPLICATION FOR PERMIT—" for such proposals

RECEIVED  
SEP 20 1993

SUBMIT IN TRIPLICATE

SEP 20 1993

5. Lease Designation and Serial No.

USA U-02651-A

6. If Indian, Allottee or Tribe Name

7. If Unit or CA, Agreement Designation

8. Well Name and No. 17 (see at Pearl Broadhurst exhibit)

9. API Well No. 43-647-30905 (see att. exhibit A)

10. Field and Pool, or Expiratory Area

11. County or Parish, State

Uintah County, Utah

1. Type of Well

Oil Well  Gas Well  Other

DIVISION OF

OIL, GAS & MINING

2. Name of Operator

General Atlantic Resources, Inc.

3. Address and Telephone No.

410 17th Street, Suite 1400, Denver, Colorado 80202 (303) 573-5100

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

(See attached exhibit A)  
Sections 9 and 10, Township 7 South-Range 23 East

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

TYPE OF SUBMISSION

- Notice of Intent
- Subsequent Report
- Final Abandonment Notice

TYPE OF ACTION

- Abandonment
- Recompletion
- Plugging Back
- Casing Repair
- Altering Casing
- Other change of operator

- Change of Plans
- New Construction
- Non-Routine Fracturing
- Water Shut-Off
- Conversion to Injection
- Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form 1)

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.)

On May 1, 1993 General Atlantic Resources, Inc. took over operations of the referenced well from BHP Petroleum (Americas) Inc.

Bond coverage pursuant to 43 CFR 3104 for lease activities is being provided by General Atlantic Resources, Inc. under their nationwide bond, BLM bond number C01023. They will be responsible for compliance under the lease terms and conditions for that portion of the lease associated with this notice.

VEENAL DIST.  
ENG. 224 8-18-93  
GEOLOG. \_\_\_\_\_  
E.S. \_\_\_\_\_  
PET. \_\_\_\_\_  
A.M. \_\_\_\_\_

SEP 20 1993

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

Lynn D. Becker  
Landman

Date August 20, 1993

Signed

Title

Date

(This space for Federal or State office use)

Approved by \_\_\_\_\_  
Conditions of approval, if any:

Title

ASSISTANT DISTRICT  
MANAGER MINERALS

Date

SEP 10 1993

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.

Routing:

1	<input checked="" type="checkbox"/> EC/GIL
2	<input checked="" type="checkbox"/> DTS/ST-SJ
3	<input checked="" type="checkbox"/> VLC 8-FILE
4	<input checked="" type="checkbox"/> RTE
5	<input checked="" type="checkbox"/> LEB
6	<input type="checkbox"/> 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.

- Change of Operator (well sold)                       Designation of Agent  
 Designation of Operator                                       Operator Name Change Only

The operator of the well(s) listed below has changed (EFFECTIVE DATE: 5-1-93)

TO (new operator) <u>GENERAL ATLANTIC RES INC</u>	FROM (former operator) <u>BHP PETROLEUM/AMERICAS INC</u>
(address) <u>410 17TH ST #1400</u>	(address) <u>5847 SAN FELIPE #3600</u>
<u>DENVER, CO 80202</u>	<u>HOUSTON, TX 77057</u>
<u>LYNN BECKER, LANDMAN</u>	<u>CARL KOLBE (713)780-5301</u>
phone ( <u>303</u> ) <u>573-5100</u>	phone ( <u>713</u> ) <u>780-5245</u>
account no. <u>N 0910</u>	account no. <u>N0390</u>

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

Name: <u>BROADHURST #16/GRRV</u>	API: <u>43-047-30903</u>	Entity: <u>225</u>	Sec <u>10</u> Twp <u>7S</u> Rng <u>23E</u>	Lease Type: <u>U02651A</u>
Name: <u>BROADHURST #17/GRRV</u>	API: <u>43-047-30905</u>	Entity: <u>225</u>	Sec <u>10</u> Twp <u>7S</u> Rng <u>23E</u>	Lease Type: <u>"</u>
Name: <u>BROADHURST #18/GRRV</u>	API: <u>43-047-30939</u>	Entity: <u>225</u>	Sec <u>9</u> Twp <u>7S</u> Rng <u>23E</u>	Lease Type: <u>"</u>
Name: <u>PEARL BH #19/GRRV</u>	API: <u>43-047-30940</u>	Entity: <u>225</u>	Sec <u>9</u> Twp <u>7S</u> Rng <u>23E</u>	Lease Type: <u>"</u>
Name: <u>BROADHURST #20/GRRV</u>	API: <u>43-047-30941</u>	Entity: <u>225</u>	Sec <u>9</u> Twp <u>7S</u> Rng <u>23E</u>	Lease Type: <u>"</u>
Name: <u>BROADHURST #21/GRRV</u>	API: <u>43-047-30942</u>	Entity: <u>225</u>	Sec <u>9</u> Twp <u>7S</u> Rng <u>23E</u>	Lease Type: <u>"</u>
Name: <u>PEARL BH #22/GRRV</u>	API: <u>43-047-31025</u>	Entity: <u>225</u>	Sec <u>10</u> Twp <u>7S</u> Rng <u>23E</u>	Lease Type: <u>"</u>

**OPERATOR CHANGE DOCUMENTATION**

- See 1. (Rule R615-8-10) Sundry or other legal documentation has been received from former operator (Attach to this form). *(Rec'd 6-17-93)*
- See 2. (Rule R615-8-10) Sundry or other legal documentation has been received from new operator (Attach to this form). *(Rec'd 6-17-93)*
- See 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: # 92898.
- See 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.
- See 5. Changes have been entered in the Oil and Gas Information System (Wang/IBM) for each well listed above. *(9-28-93)*
- See 6. Cardex file has been updated for each well listed above. *(9-28-93)*
- See 7. Well file labels have been updated for each well listed above. *(9-28-93)*
- See 8. Changes have been included on the monthly "Operator, Address, and Account Changes" memo for distribution to State Lands and the Tax Commission. *(9-28-93)*
- See 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.

**ENTITY REVIEW**

- 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).
- 2. State Lands and the Tax Commission have been notified through normal procedures of entity changes.

**BOND VERIFICATION (Fee wells only)**

- 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**

- 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.
- 2. Copies of documents have been sent to State Lands for changes involving State leases.

**MICROFILMING**

- 1. All attachments to this form have been microfilmed. Date: 10-12 1993.

**FILED**

- 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**

930920 Btm/Manual Approved 9-10-93. (Lease 117112651-A Only) Other leases/wells will be handled on separate change.

**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:

APRIL LAHNUM  
 GENERAL ATLANTIC RES INC  
 410 17TH ST STE 1400  
 DENVER CO 80202

UTAH ACCOUNT NUMBER: N0910

REPORT PERIOD (MONTH/YEAR): 12 / 94

AMENDED REPORT  (Highlight Changes)

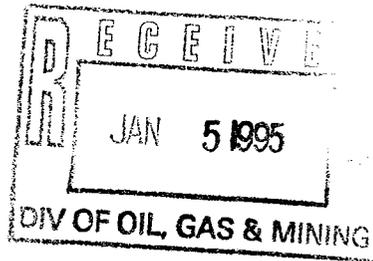
Well Name			Producing Zone	Well Status	Days Oper	Production Volumes		
API Number	Entity	Location				OIL(BBL)	GAS(MCF)	WATER(BBL)
✓	BROADHURST #17							
4304730905	00225	07S 23E 10	GRRV			u02051-A		
✓	BROADHURST #18							
4304730939	00225	07S 23E 9	GRRV			"		
✓	PEARL BROADHURST 19							
4304730940	00225	07S 23E 9	GRRV			"		
✓	BROADHURST #20							
4304730941	00225	07S 23E 9	GRRV			"		
✓	BROADHURST #21							
4304730942	00225	07S 23E 9	GRRV			"		
✓	PEARL BROADHURST 22							
04731025	00225	07S 23E 10	GRRV			"		
	USA PPL Bhdwst #2							
43-047-15693	00225	7S 23E 10	GRRV - W/W			"		
	USA PEARL BROADHURST 5							
43-047-15695	09141	7S 23E 10	WSTC - W/W			"		
	"		GRRV - TAZ					
<b>TOTALS</b>								

COMMENTS: \_\_\_\_\_

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

Name and Signature: \_\_\_\_\_ Telephone Number: \_\_\_\_\_

UMC Petroleum Corporation



January 23, 1995

State of Utah  
Division of Oil, Gas and Mining  
3 Triad Center, #350  
Salt Lake City, Utah 84180-1203

Re: Change of Operator

Gentlemen,

On November 15, 1994, General Atlantic Resources, Inc. merged into UMC Petroleum Corporation. Enclosed please find a copy of the certificate of merger as well as State of Utah Form 9 with an attachment listing all wells and their locations.

UMC Petroleum Corporation will be operating these wells effective January 1, 1995. If there are any questions or you require additional information, please contact the undersigned at (303) 573-4732.

Sincerely,

UMC PETROLEUM CORPORATION

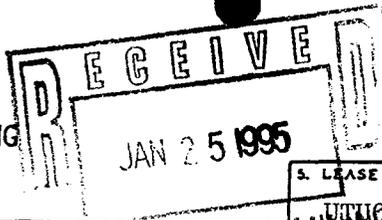
A handwritten signature in cursive script, appearing to read "April J.M. Lahnum".

April J.M. Lahnum  
Production Technician

ajml

{LETTERS/utah}

STATE OF UTAH  
DIVISION OF OIL, GAS AND MINING



5. LEASE DESIGNATION & SERIAL NO.  
UTM02651A

SUNDRY NOTICES AND REPORTS ON WELLS - OIL, GAS & MINING

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

1. OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/>		7. UNIT AGREEMENT NAME	
2. NAME OF OPERATOR UMC Petroleum Corporation		8. FARM OR LEASE NAME USA Pearl Broadhurst	
3. ADDRESS OF OPERATOR 410 17th Street, Suite 1400, Denver, CO 80202		9. WELL NO. (see attached exhibit A)	
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements. See also space 17 below.) At surface (see attached exhibit A) At proposed prod. zone Sections 9 and 10, T7S, R23E		10. FIELD AND POOL, OR WILDCAT Green River	
14. API NO. (see att. exhibit A)		11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA Sec 9 & 10, T7S, R23E	
15. ELEVATIONS (Show whether DF, RT, GR, etc.)		12. COUNTY Uintah	13. STATE UT

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

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	FULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) <u>Change of Operator</u> <input checked="" type="checkbox"/>	
(Other) <input type="checkbox"/>		(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	
APPROX. DATE WORK WILL START _____		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.

On November 15, 1994, General Atlantic Resources, Inc. merged into UMC Petroleum Corporation. (See enclosed certificate of merger.)

UMC Petroleum Corporation will begin operating the referenced lease on January 1, 1995.

Bond coverage for lease activities is being provided by UMC Petroleum Corporation under their nationwide bond, BLM bond number B01843.

18. I hereby certify that the foregoing is true and correct  
 SIGNED April J.M. Lahnum TITLE Production Technician DATE January 20, 1995

(This space for Federal or State office use)  
 APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_  
 CONDITIONS OF APPROVAL, IF ANY:

GENERAL ATLANTIC RESOURCES, INC. - Well Location Report  
 Report Date: 01-18-1995 - Page 1  
 Reporting Field WALKER HOLLOW

EXHIBIT "A"

Utah Production	PRAMS I.D.	Company Identification #	State I.D.#	API Number	Lease Name/Number	Formation	Qtr/Qtr	Sec.	Twp.	Rge	County	Operator
<u>WALKER HOLLOW Field</u>												
PEARL BROADHURST #1	PEARL1	UT-017-01-001	00225	43-047-15692-00	UTU02651A	GREEN RIVER	NESE	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #10	PEARL10	UT-017-01-009	00225	43-047-30839-00	UTU02651A	GREEN RIVER	NWSW	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #11	PEARL11	UT-017-01-010	00225	43-047-30840-00	UTU02651A	GREEN RIVER	NWNE	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #12	PEARL12	UT-017-01-011	00225	43-047-30841-00	UTU02651A	GREEN RIVER	NWNW	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #13	PEARL13	UT-017-01-012	00225	43-047-30842-00	UTU02651A	GREEN RIVER	NENE	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #14	PEARL14	UT-017-01-013	00225	43-047-30904-00	UTU02651A	GREEN RIVER	SENE	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #15	PEARL15	UT-017-01-014	00225	43-047-30901-00	UTU02651A	GREEN RIVER	SESE	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #16	PEARL16	UT-017-01-015	00225	43-047-30903-00	UTU02651A	GREEN RIVER	NWSW	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #17	PEARL17	UT-017-01-016	00225	43-047-30905-00	UTU02651A	GREEN RIVER	SENE	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #18	PEARL18	UT-017-01-017	00225	43-047-30939-00	UTU02651A	GREEN RIVER	NWNE	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #19	PEARL19	UT-017-01-018	00225	43-047-30940-00	UTU02651A	GREEN RIVER	NWNE	9	7S	23E	UINTAH	GARI-BHP
✓ PEARL BROADHURST #2 (wtw)	PEARL2	UT-017-01-002	00225	43-047-15693-00	UTU02651A	GREEN RIVER	SWNW	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #20	PEARL20	UT-017-01-019	00225	43-047-30941-00	UTU02651A	GREEN RIVER	SESW	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #21	PEARL21	UT-017-01-020	00225	43-047-30942-00	UTU02651A	GREEN RIVER	SESW	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #22	PEARL22	UT-017-01-021	00225	43-047-31025-00	UTU02651A	GREEN RIVER	SESW	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #4	PEARL4	UT-017-01-003	00225	43-047-15694-00	UTU02651A	GREEN RIVER	SWSE	9	7S	23E	UINTAH	GARI-BHP
✓ PEARL BROADHURST #5 (wtw)	PEARL5A	UT-017-01-004	00225	43-047-15695-00	UTU02651A	GREEN RIVER	SWSW	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #6	PEARL6	UT-017-01-005	00225	43-047-30705-00	UTU02651A	GREEN RIVER	NESW	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #7	PEARL7	UT-017-01-006	00225	43-047-30730-00	UTU02651A	GREEN RIVER	SWSW	9	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #8	PEARL8	UT-017-01-007	00225	43-047-30696-00	UTU02651A	GREEN RIVER	NESW	10	7S	23E	UINTAH	GARI-BHP
PEARL BROADHURST #9	PEARL9	UT-017-01-008	00225	43-047-30787-00	UTU02651A	GREEN RIVER	NENW	10	7S	23E	UINTAH	GARI-BHP

*State of Delaware*  
*Office of the Secretary of State* PAGE 1

---

I, EDWARD J. FREEL, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF MERGER, WHICH MERGES:

"GENERAL ATLANTIC RESOURCES, INC.", A DELAWARE CORPORATION, WITH AND INTO "UMC PETROLEUM CORPORATION" UNDER THE NAME OF "UMC PETROLEUM CORPORATION", A CORPORATION ORGANIZED AND EXISTING UNDER THE LAWS OF THE STATE OF DELAWARE, AS RECEIVED AND FILED IN THIS OFFICE THE FIFTEENTH DAY OF NOVEMBER, A.D. 1994, AT 11:10 O'CLOCK A.M.



A handwritten signature in cursive script, reading "Edward J. Freel".

*Edward J. Freel, Secretary of State*

AUTHENTICATION:

DATE: 7306080

11-17-94

2257442 8100M

944221473

**CERTIFICATE OF MERGER**

**OF**

**GENERAL ATLANTIC RESOURCES, INC.,  
A DELAWARE CORPORATION**

**AND**

**UMC PETROLEUM CORPORATION,  
A DELAWARE CORPORATION**

UMC Petroleum Corporation, a Delaware corporation, certifies that:

1. Constituent Corporations. The constituent business corporations participating in the merger herein certified are:

(a) General Atlantic Resources, Inc., which is incorporated under the laws of the State of Delaware; and

(b) UMC Petroleum Corporation, which is incorporated under the laws of the State of Delaware.

2. Approval of Agreement and Plan of Merger. An Agreement and Plan of Merger dated as of August 9, 1994 ("Agreement and Plan of Merger"), has been approved, adopted, certified, executed and acknowledged by each of the aforesaid constituent corporations in accordance with the provisions of Section 251 of the General Corporation Law of the State of Delaware.

3. Surviving Corporation. The surviving corporation (the "Surviving Corporation") in the merger herein certified is UMC Petroleum Corporation, a Delaware corporation.

4. Certificate of Incorporation. The certificate of incorporation of UMC Petroleum Corporation, a Delaware corporation, shall be the certificate of incorporation of the Surviving Corporation, except that Article 4 thereof is hereby amended and restated in its entirety as follows:

1. Authorized Shares. The total authorized capital stock of the corporation shall consist of Common Stock. The aggregate number of shares of Common Stock that the corporation shall have authority to issue is three thousand (3,000) with the par value of one cent (\$.01) per share.

5. Agreement and Plan of Merger on File. The executed Agreement and Plan of Merger is on file at the principal place of business of the Surviving Corporation, the address

of which as of the date hereof is as follows:

1201 Louisiana Street  
Suite 1400  
Houston, Texas 77002

6. Copies of Agreement and Plan of Merger. A copy of the Agreement and Plan of Merger will be furnished by the Surviving Corporation, on request and without cost, to any stockholder of any of the aforesaid constituent corporations.

IN WITNESS WHEREOF, the undersigned has executed this Certificate of Merger on behalf of UMC Petroleum Corporation on this 15th day of November, 1994.

UMC PETROLEUM CORPORATION, a Delaware corporation

By:  
Name:  
Title:

  
John B. Brock  
President and Chief Executive Officer

Attest:

By:  
Name:  
Title:

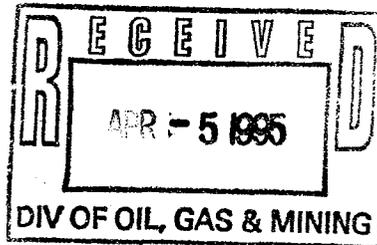
  
Marya Ingram  
Corporate Secretary

# United States Department of the Interior

## BUREAU OF LAND MANAGEMENT

Utah State Office  
P.O. Box 45155  
Salt Lake City, Utah 84145-0155

IN REPLY REFER TO:  
3100  
U-02651A et al  
(UT-923)



MAR 24 1995

### NOTICE

UMC Petroleum Corporation	:	Oil and Gas
1201 Louisiana, Suite 1400	:	U-02651A, U-51411,
Houston, Texas 77002-5603	:	U-55626, U-58530

### Merger Recognized

Acceptable evidence has been filed in this office concerning the merger of General Atlantic Resources, Inc. into UMC Petroleum Corporation with UMC Petroleum Corporation being the surviving entity.

For our purposes, the merger is recognized effective November 15, 1994.

The oil and gas lease files identified above have been noted as to the merger. We are notifying the Minerals Management Service and all applicable Bureau of Land Management offices of the change by a copy of this notice.

A rider to UMC's bond (BLM Bond No. NM1773) assuming the liability accrued under General's bond (BLM Bond No. CO1023) was accepted effective March 7, 1995, the date the rider was filed.

/s/ ROBERT LOPEZ

Chief, Branch of Mineral  
Leasing Adjudication

bc: Vernal District Office  
Moab District Office  
MMS—Data Management Division, MS 3113, P.O. Box 5860, Denver, CO 80217  
UT-922 (Teresa Thompson)  
Lisha Cordova, State of Utah, Division of Oil, Gas, and Mining, 3 Triad Center,  
Suite 350, Salt Lake City, Utah 84189-1204

DOGMT

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

1. Type of Well  
 Oil Well    Gas Well    Other

2. Name of Operator  
 UMC Petroleum Corporation

3. Address and Telephone No.  
 410 17th Street, Suite 1400, Denver, CO 80202 (303) 573-5100

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)  
 (see attachment)

RECEIVED  
MAR 23 1995

5. Lease Designation and Serial No.  
 UTU02651A

6. If Indian, Allottee or Tribe Name

7. If Unit or CA, Agreement Designation

8. Well Name and No.  
 Pearl Broadhurst

9. API Well No.  
 (see attachment)

10. Field and Pool, or Exploratory Area  
 Walker Hollow

11. County or Parish, State  
 Uintah, UT

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

TYPE OF SUBMISSION	TYPE OF ACTION
<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Abandonment
<input checked="" type="checkbox"/> Subsequent Report	<input type="checkbox"/> Recompletion
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Plugging Back
	<input type="checkbox"/> Casing Repair
	<input type="checkbox"/> Altering Casing
	<input checked="" type="checkbox"/> Other <u>Change of Operator</u>
	<input type="checkbox"/> Change of Plans
	<input type="checkbox"/> New Construction
	<input type="checkbox"/> Non-Routine Fracturing
	<input type="checkbox"/> Water Shut-Off
	<input type="checkbox"/> Conversion to Injection
	<input type="checkbox"/> Dispose Water

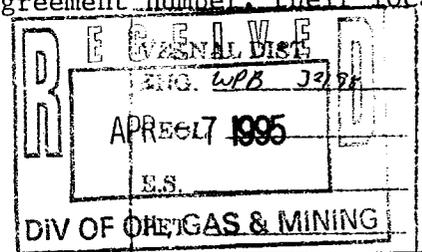
(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

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.)\*

On November 15, 1994, General Atlantic Resources, Inc. merged with UMC Petroleum Corporation (See enclosed certificate of merger.)

Bond coverage pursuant to 43 CFR 3104 for lease activities is being provided by UMC Petroleum Corporation under their nationwide bond, B01843. They will be responsible for compliance under the lease terms and conditions for that portion of the lease associated with this notice.

Attachment lists all wells associated with the referenced agreement number, their location, and API well numbers.



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

Signed April J.M. Lahnum Title Production Technician Date March 15, 1995

(This space for Federal or State officials use)  
**NOTED**

Approved by \_\_\_\_\_ Title \_\_\_\_\_ Date APR 06 1995

Conditions of approval, if any:

State I.D.#	API Number	Lease Name/Number	Formation	Qtr/Qtr	Sec.	Twp.	Rge	County
Utah Production								
<u>WALKER HOLLOW Field</u>								
PEARL BROADHURST #1	00225	43-047-15692-00	UTU02651A	GREEN RIVER	NESE	9	7S	23E UINTAH
PEARL BROADHURST #10	00225	43-047-30839-00	UTU02651A	GREEN RIVER	NWSW	9	7S	23E UINTAH
PEARL BROADHURST #11	00225	43-047-30840-00	UTU02651A	GREEN RIVER	NWNE	10	7S	23E UINTAH
PEARL BROADHURST #12	00225	43-047-30841-00	UTU02651A	GREEN RIVER	NWNW	10	7S	23E UINTAH
PEARL BROADHURST #13	00225	43-047-30842-00	UTU02651A	GREEN RIVER	NENE	9	7S	23E UINTAH
PEARL BROADHURST #14	00225	43-047-30904-00	UTU02651A	GREEN RIVER	SENE	9	7S	23E UINTAH
PEARL BROADHURST #15	00225	43-047-30901-00	UTU02651A	GREEN RIVER	SESE	9	7S	23E UINTAH
PEARL BROADHURST #16	00225	43-047-30903-00	UTU02651A	GREEN RIVER	NWSW	10	7S	23E UINTAH
PEARL BROADHURST #17	00225	43-047-30905-00	UTU02651A	GREEN RIVER	SENE	10	7S	23E UINTAH
PEARL BROADHURST #18	00225	43-047-30939-00	UTU02651A	GREEN RIVER	NWNE	9	7S	23E UINTAH
PEARL BROADHURST #19	00225	43-047-30940-00	UTU02651A	GREEN RIVER	NWNE	9	7S	23E UINTAH
PEARL BROADHURST #2	00225	43-047-15693-00	UTU02651A	GREEN RIVER	SWNW	10	7S	23E UINTAH
PEARL BROADHURST #20	00225	43-047-30941-00	UTU02651A	GREEN RIVER	SESW	9	7S	23E UINTAH
PEARL BROADHURST #21	00225	43-047-30942-00	UTU02651A	GREEN RIVER	SESW	9	7S	23E UINTAH
PEARL BROADHURST #22	00225	43-047-31025-00	UTU02651A	GREEN RIVER	SESW	10	7S	23E UINTAH
PEARL BROADHURST #4	00225	43-047-15694-00	UTU02651A	GREEN RIVER	SWSE	9	7S	23E UINTAH
PEARL BROADHURST #5	00225	43-047-15695-00	UTU02651A	GREEN RIVER	SWSW	10	7S	23E UINTAH
PEARL BROADHURST #6	00225	43-047-30705-00	UTU02651A	GREEN RIVER	NESW	9	7S	23E UINTAH
PEARL BROADHURST #7	00225	43-047-30730-00	UTU02651A	GREEN RIVER	SWSW	9	7S	23E UINTAH
PEARL BROADHURST #8	00225	43-047-30696-00	UTU02651A	GREEN RIVER	NESW	10	7S	23E UINTAH
PEARL BROADHURST #9	00225	43-047-30787-00	UTU02651A	GREEN RIVER	NENW	10	7S	23E UINTAH

Division of Oil, Gas and Mining  
**OPERATOR CHANGE WORKSHEET**

Routing:

1-DEC-7-GIL	✓
2-LWP 7-SJ	✓
3-DW 8-PL	✓
4-VLC 9-FILE	✓
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 (MERGER)     Designation of Agent  
 Designation of Operator     Operator Name Change Only

The operator of the well(s) listed below has changed (EFFECTIVE DATE: 11-15-94)

TO (new operator)	<u>UMC PETROLEUM CORPORATION</u>	FROM (former operator)	<u>GENERAL ATLANTIC RES INC</u>
(address)	<u>410 17TH ST STE 1400</u>	(address)	<u>410 17TH ST STE 1400</u>
	<u>DENVER CO 80202</u>		<u>DENVER CO 80202</u>
	<u>APRIL LAHNUM (915)683-3003</u>		<u>APRIL LAHNUM</u>
	phone <u>(303) 573-5100</u>		phone <u>(303) 573-5100</u>
	account no. <u>N9215</u>		account no. <u>N 0910</u>

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

Name: <u>**SEE ATTACHED**</u>	API: <u>4304730905</u>	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____

**OPERATOR CHANGE DOCUMENTATION**

1. (Rule R615-8-10) Sundry or other legal documentation has been received from former operator (Attach to this form). *(Rec'd 1-25-95)*
2. (Rule R615-8-10) Sundry or other legal documentation has been received from new operator (Attach to this form). *(Rec'd 1-25-95)*
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: #152682. *(# 6/91)*
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.
5. Changes have been entered in the Oil and Gas Information System (Wang/IBM) for each well listed above. *(4-6-95)*
6. Cardex file has been updated for each well listed above. *4-18-95*
7. Well file labels have been updated for each well listed above. *4-18-95*
8. Changes have been included on the monthly "Operator, Address, and Account Changes" memo for distribution to State Lands and the Tax Commission. *(4-6-95)*
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.

**ENTITY REVIEW**

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

**BOND VERIFICATION (Fee wells only)**

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**

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.
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: May 2 1995.

**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**

950131 Reg. LIC F5 (27 wells).

9502 Trust Leads Admin. "accepted merger".

950324 Btm/54 Appr. eff. 11-15-94.

## MONTHLY OIL AND GAS PRODUCTION REPORT

OPERATOR NAME AND ADDRESS:

LORETTA A MURPHY  
 UMC PETROLEUM CORPORATION  
 PO BOX 549  
 NEWCASTLE WY 82701-0549

UTAH ACCOUNT NUMBER: N9215

REPORT PERIOD (MONTH/YEAR): 6 / 98

AMENDED REPORT  (Highlight Changes)

Well Name			Producing Zone	Well Status	Days Oper	Production Volumes		
API Number	Entity	Location				OIL(BBL)	GAS(MCF)	WATER(BBL)
USA PEARL BROADHURST #1								
4304715692	00225	07S 23E 9	GRRV			U-02651-A		
USA PEARL BROADHURST #4								
4304715694	00225	07S 23E 9	GRRV			U-02651-A		
BROADHURST #8						"		
4304730696	00225	07S 23E 10	GRRV			"		
BROADHURST #6						"		
4304730705	00225	07S 23E 9	GRRV			"		
BROADHURST #7						"		
4304730730	00225	07S 23E 9	GRRV			"		
BROADHURST #9						U-02651		
4304730787	00225	07S 23E 10	GRRV			U-02651-A		
PEARL BROADHURST 10						U-02651-A		
4304730839	00225	07S 23E 9	GRRV			"		
PEARL BROADHURST 11						"		
4304730840	00225	07S 23E 10	GRRV			"		
PEARL BROADHURST #12						"		
4304730841	00225	07S 23E 10	GRRV			"		
PEARL BROADHURST #13						"		
4304730842	00225	07S 23E 9	GRRV			"		
BROADHURST #15						"		
4304730901	00225	07S 23E 9	GRRV			"		
BROADHURST #16						"		
4304730903	00225	07S 23E 10	GRRV			"		
BROADHURST #17						"		
4304730905	00225	07S 23E 10	GRRV			"		
<b>TOTALS</b>								

COMMENTS: \_\_\_\_\_

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

Date: \_\_\_\_\_

Name and Signature: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

# MONTHLY OIL AND GAS PRODUCTION REPORT

OPERATOR NAME AND ADDRESS:

LORETTA A MURPHY  
 UMC PETROLEUM CORPORATION  
 PO BOX 549  
 NEWCASTLE WY 82701-0549

UTAH ACCOUNT NUMBER: N9215

REPORT PERIOD (MONTH/YEAR): 6 / 98

AMENDED REPORT  (Highlight Changes)

Well Name			Producing Zone	Well Status	Days Oper	Production Volumes		
API Number	Entity	Location				OIL(BBL)	GAS(MCF)	WATER(BBL)
BROADHURST #18								
4304730939	00225	075 23E 9	GRRV			4-2651-A		
PEARL BROADHURST 19						"		
4304730940	00225	075 23E 9	GRRV			"		
BROADHURST #20						"		
4304730941	00225	075 23E 9	GRRV			"		
BROADHURST #21						"		
4304730942	00225	075 23E 9	GRRV			"		
PEARL BROADHURST 22						"		
4304731025	00225	075 23E 10	GRRV			"		
<b>TOTALS</b>								

COMMENTS: \_\_\_\_\_

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

Date: \_\_\_\_\_

Name and Signature: \_\_\_\_\_

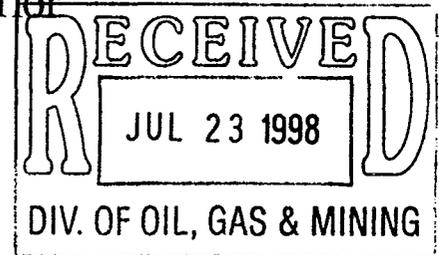
Telephone Number: \_\_\_\_\_



# United States Department of the Interior

## BUREAU OF LAND MANAGEMENT

Utah State Office  
P.O. Box 45155  
Salt Lake City, UT 84145-0155



In Reply Refer To:  
3100  
U-02651A et al  
(UT-932)

JUL 21 1998

### NOTICE

Ocean Energy, Inc.	:	Oil and Gas: U-02651A, U-
1201 Louisiana, Suite 1400	:	U-09712A, U-020691A, U-8894A,
Houston, TX 77002-5603	:	U-8895A, U-8897A, U-40401, U-64058
(713) 654-9110	:	

### Merger Recognized

Acceptable evidence has been filed in this office concerning the merger of UMC Petroleum Corporation into Ocean Energy, Inc. with Ocean Energy, Inc. being the surviving entity.

For our purposes, the merger is recognized effective May 15, 1998, the effective date set by the New Mexico State Office.

The oil and gas lease files identified above have been noted as to the merger. The list was compiled from your list of leases, and a list of leases obtained from our Automated Land and Mineral Record System (ALMRS). We have not abstracted the lease files to determine if the entity affected by the merger holds an interest in the leases identified nor have we attempted to identify leases where the entity is the operator on the ground maintaining no vested record title or operating rights interests. We are notifying the Minerals Management Service and all applicable Bureau of Land Management offices of the change by a copy of this notice. If additional documentation for changes of operator are required by our Field Offices, you will be contacted by them.

By recognition of the merger, the principal is automatically changed by operation of law from UMC Petroleum Corporation to Ocean Energy, Inc. on Bond No. BO1843 (BLM Bond No. NM1773). A rider amending the principal's name from UMC Petroleum Corporation to Ocean Energy, Inc. has been filed in the New Mexico State Office, examined, and found to be satisfactory.

**ROBERT LOPEZ**

Robert Lopez  
Group Leader,  
Minerals Adjudication Group

cc: Moab District Office  
Vernal Field Office  
MMS-Reference Data Branch, MS 3130, P.O. Box 5860, Denver, CO 80217  
State of Utah, DOGM, Attn: Lisha Cordova (Ste. 1210) P.O. Box 145801, SLC, UT 84114

**OPERATOR CHANGE WORKSHEET**

Routing	
1-IP <i>lee</i>	6-LEG <i>KR</i>
2-GL <i>lee</i>	7-KAS <i>lee</i>
3-DTS <i>lee</i>	8-SI <i>lee</i>
4-VLD <i>CDW</i>	9-FILE
5-IRB	

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       Operator Name Change Only

The operator of the well(s) listed below has changed, effective: 4-1-98 (MERGER)

TO: (new operator)	<u>OCEAN ENERGY INC</u>	FROM: (old operator)	<u>UMC PETROLEUM CORPORATION</u>
(address)	<u>PO BOX 549</u>	(address)	<u>PO BOX 549</u>
	<u>NEWCASTLE WY 82701-0549</u>		<u>NEWCASTLE WY 82701-0549</u>
	<u>Phone: (307) 746-4052</u>		<u>Phone: (307) 746-4052</u>
	<u>Account no. N3220 (7-31-98)</u>		<u>Account no. N9215</u>

WELL(S) attach additional page if needed:

Name: <b>**SEE ATTACHED**</b>	API: <u>43,047,30905</u>	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____

**OPERATOR CHANGE DOCUMENTATION**

- lee* 1. (r649-8-10) Sundry or other legal documentation has been received from the **FORMER** operator (attach to this form). *(rec'd 9-3-98)*
- lee* 2. (r649-8-10) Sundry or other legal documentation has been received from the **NEW** operator (Attach to this form). *(rec'd 9-3-98)*
- lee* 3. The **Department of Commerce** has been contacted if the new operator above is not currently operating any wells in Utah. Is the company registered with the state? *(yes/no)* \_\_\_\_\_ If yes, show company file number: Co209299. *(eff. 3-23-98)*
- lee* 4. **FOR INDIAN AND FEDERAL WELLS ONLY.** The BLM has been contacted regarding this change. Make note of BLM status in comments section of this form. BLM approval of **Federal** and **Indian** well operator changes should ordinarily take place prior to the division's approval, and before the completion of **steps 5 through 9** below.
- lee* 5. Changes have been entered in the **Oil and Gas Information System** (3270) for each well listed above. *(7-31-98) X UIC Quattro E. DBASE*
- Chd* 6. **Cardex** file has been updated for each well listed above. *(8-3-98)*
- Chd* 7. Well **file labels** have been updated for each well listed above. *(8-3-98)*
- lee* 8. Changes have been included on the monthly "Operator, Address, and Account Changes" **memo** for distribution to Trust Lands, Sovereign Lands, UGS, Tax Commission, etc. *(7-31-98)*
- lee* 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.

**ENTITY REVIEW**

- Lee 1. (r649-8-7) **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.
- Lee 2. Trust Lands, Sovereign Lands, Tax Commission, etc., have been **notified** through normal procedures of entity changes.

**BOND VERIFICATION - (FEE WELLS ONLY)**

- Lee 1. (r649-3-1) 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 operator's bond files.
- \_\_\_\_ 3. The **FORMER** operator has requested a release of liability from their bond (yes/no) \_\_\_\_, as of today's date \_\_\_\_\_. If yes, division response was made to this request by letter dated \_\_\_\_\_.

**LEASE INTEREST OWNER NOTIFICATION OF RESPONSIBILITY**

- Lee 1. Copies of documents have been sent on \_\_\_\_\_ to \_\_\_\_\_ at Trust Lands for changes involving State leases, in order to remind that agency of their responsibility to review for proper bonding.
- Lee 2. (r649-2-10) The former operator of any fee lease wells listed above has been contacted and informed by letter dated \_\_\_\_\_ 19 \_\_, of their responsibility to notify all interest owners of this change.

**FILMING**

- 1. All attachments to this form have been **microfilmed**. Today's date: 12.8.98.

**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** are now being filed in the Operator Change file.

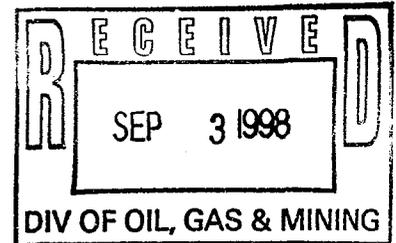
**COMMENTS**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



September 2, 1998

Lisha Cordova  
Utah Department of Natural Resources  
Division of Oil, Gas and Mining  
1594 West North Temple, Suite 1210  
Salt Lake City, Utah 84114-5801



RE: Merger of UMC Petroleum Corporation and Ocean Energy, Inc.  
Pearl Broadhurst #2, #4, #5 & #14.

Dear Ms. Cordova:

Effective April 1, 1998, UMC Petroleum Corporation merged with Ocean Energy, Inc. Effective June 30, 1998, all onshore wells were transferred to its wholly owned subsidiary, Ocean Energy Resources, Inc. Enclosed is the requested UIC Form 5's for the subject change of operation for the original merger and the subsequent re-organization in June 30 1998. All wells previously operated by UMC Petroleum in Utah are now operated by Ocean Energy Resources, Inc.

There has been no change in personnel with whom you are already familiar. Furthermore, the address for all notices, revenues and remittances, notifications and general correspondence remains the same:

Ocean Energy, Resources, Inc.  
410 17<sup>th</sup> Street, Suite 1400  
Denver, Colorado 80202

Please distribute this notice to any other applicable departments within your organization that should be aware of this change.

If you have any questions, please feel free to contact the undersigned at (303) 573-4721.

Sincerely,

Scott M. Webb  
Regulatory Coordinator

UNITED STATES OF AMERICA

State of

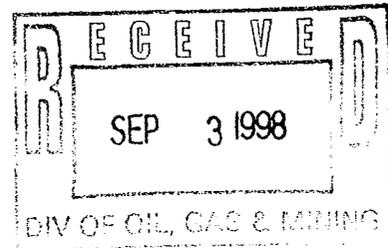


Louisiana

Box McKeithen

SECRETARY OF STATE

*As Secretary of State, of the State of Louisiana, I do hereby Certify that*  
the annexed and following is a True and Correct copy of a  
Merger as shown by comparison with document filed and  
recorded in this Office on March 27, 1998.



*In testimony whereof, I have hereunto set  
my hand and caused the Seal of my Office  
to be affixed at the City of Baton Rouge on,*

April 17 1998

*Box McKeithen*

CGR

*Secretary of State*



## CERTIFICATE OF MERGER

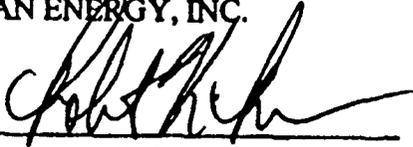
of  
UMC Petroleum Corporation, a Delaware corporation  
into  
Ocean Energy, Inc., a Louisiana corporation

Pursuant to Section 112 of the Louisiana Business Corporation Law (the "LBCL"), Ocean Energy, Inc., a Louisiana corporation ("OEI"), hereby adopts the following Certificate of Merger regarding the merger (the "Merger") of UMC Petroleum Corporation, a Delaware corporation ("UMCPC" and, together with OEI, the "Constituent Corporations"), with and into OEI, with OEI as the surviving corporation (the "Surviving Corporation").

1. Ocean Energy, Inc., a Louisiana corporation, and UMC Petroleum Corporation, a Delaware corporation, are the parties to the Merger.
2. The Agreement and Plan of Merger, dated March 27, 1998 (the "Merger Agreement"), has been approved, adopted, certified, executed and acknowledged by the Constituent Corporations in accordance with Section 112 of the LBCL.
3. The Merger is effective at 3:02 p.m., Central Standard Time, on March 27, 1998.
4. The name of the Surviving Corporation shall be Ocean Energy, Inc.
5. Article III of the Articles of Incorporation of Ocean Energy, Inc. is amended in connection with the Merger to increase the authorized capital of the Surviving Corporation and, as a result of the amendment, Article III shall be and read as follows: *The aggregate number of shares which the corporation shall have authority to issue is 3,000 shares without par value, all of which shares shall be of one class and shall be designated as Common Stock*. The Articles of Incorporation of the Surviving Corporation as amended by the amendment to Article III shall be its articles of incorporation.
6. The executed Merger Agreement is on file at the principal place of business of the Surviving Corporation, 1201 Louisiana, Suite 1400, Houston, Texas 77002.
7. A copy of the Merger Agreement will be furnished by the Surviving Corporation, on request and without cost, to any shareholder of UMC Petroleum Corporation or Ocean Energy, Inc., the parties to the Merger.

This Certificate of Merger is dated this 27th day of March, 1998.

OCEAN ENERGY, INC.

By: 

Name: Robert K. Reeves

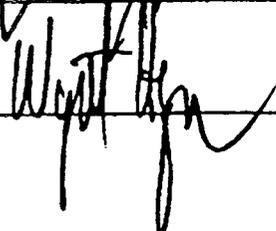
Title: Executive Vice President,  
General Counsel and Secretary

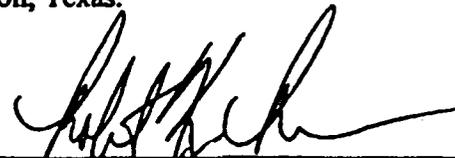
STATE OF TEXAS           §  
  §  
COUNTY OF HARRIS       §

BEFORE ME, the undersigned authority, personally came and appeared Robert K. Reeves, who being duly sworn, declared and acknowledged before me that he is the Executive Vice President, General Counsel and Secretary of Ocean Energy, Inc., a Louisiana corporation, and acknowledged to me that he was authorized to and executed the foregoing Certificate of Merger of UMC Petroleum Corporation into Ocean Energy, Inc. in such capacity for the purposes therein expressed, and as his, and said corporation's free act and deed.

IN WITNESS WHEREOF, the said appearer, witnesses and I, notary, have hereunto affixed our hands on this 27<sup>th</sup> day of March, 1998 at Houston, Texas.

WITNESS:

  
\_\_\_\_\_  
  
\_\_\_\_\_

  
\_\_\_\_\_  
Robert K. Reeves



Notary Public in and for  
the State of Texas

  
\_\_\_\_\_

State of Delaware  
Office of the Secretary of State

---

PAGE 1

I, EDWARD J. FREEL, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF MERGER, WHICH MERGES:

"UMC PETROLEUM CORPORATION", A DELAWARE CORPORATION,  
WITH AND INTO "OCEAN ENERGY, INC." UNDER THE NAME OF "OCEAN ENERGY, INC.", A CORPORATION ORGANIZED AND EXISTING UNDER THE LAWS OF THE STATE OF LOUISIANA, AS RECEIVED AND FILED IN THIS OFFICE THE TWENTY-SEVENTH DAY OF MARCH, A.D. 1998, AT 12:22 O'CLOCK P.M.



A handwritten signature in cursive script that reads "Edward J. Freel".

Edward J. Freel, Secretary of State

2257442 8100M

981130659

AUTHENTICATION: 9012828

DATE: 04-06-98

## CERTIFICATE OF MERGER

Merger of UMC Petroleum Corporation, a Delaware corporation  
With and Into  
Ocean Energy, Inc., a Louisiana corporation

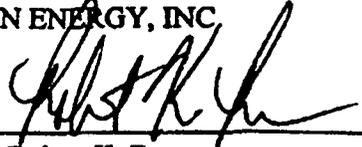
Pursuant to the Provisions of Section 252 of the Delaware General Corporation Law, the undersigned certifies as follows concerning the merger (the "Merger") of UMC Petroleum Corporation, a Delaware corporation, with and into Ocean Energy, Inc., a Louisiana corporation (together with UMC Petroleum Corporation, the "Constituent Corporations"), with Ocean Energy, Inc. as the surviving corporation (the "Surviving Corporation").

1. The Agreement and Plan of Merger, dated March 27, 1998 (the "Merger Agreement"), has been approved, adopted, certified, executed and acknowledged by the Constituent Corporations in accordance with Section 252 of the Delaware General Corporation Law.
2. The Merger contemplated in the Merger Agreement and this Certificate of Merger will be effective at 3:02 p.m., Central Standard Time, on March 27, 1998.
3. The name of the Surviving Corporation shall be Ocean Energy, Inc.
4. Article III of the Articles of Incorporation of Ocean Energy, Inc. is amended in connection with the Merger to increase the authorized capital of the Surviving Corporation and, as a result of the amendment, Article III shall be and read as follows: *The aggregate number of shares which the corporation shall have authority to issue is 3,000 shares without par value, all of which shares shall be of one class and shall be designated as Common Stock.* The Articles of Incorporation of the Surviving Corporation as amended by the amendment to Article III shall be its articles of incorporation.
5. The executed Merger Agreement is on file at the principal place of business of the Surviving Corporation, 1201 Louisiana, Suite 1400, Houston, Texas 77002.
6. A copy of the Merger Agreement will be furnished by the Surviving Corporation, on request and without cost, to any stockholder of UMC Petroleum Corporation or Ocean Energy, Inc.
7. The Surviving Corporation may be served with process in the State of Delaware in any proceeding for enforcement of any obligation of the Constituent Corporations, as well as for enforcement of any obligation of the Surviving Corporation arising from the Merger, including any suit or other proceeding to enforce the right of any stockholder as determined in appraisal proceedings pursuant to the provisions of Section 262 of the Delaware General Corporation Law, and the Surviving Corporation does hereby irrevocably appoint the Secretary of State of

Delaware as its agent to accept service of process in any such suit or other proceedings. The address to which a copy of such process shall be mailed by the Secretary of State of Delaware is c/o Ocean Energy, Inc., 1201 Louisiana, Suite 1400, Houston, Texas 77002, Attention: Secretary, until the Surviving Corporation shall have hereafter designated in writing to the Secretary of State of Delaware a different address for such purpose.

Dated this 27th day of March, 1998.

OCEAN ENERGY, INC.

By: 

Name: Robert K. Reeves

Title: Executive Vice President,  
General Counsel and Secretary

# MONTHLY OIL AND GAS PRODUCTION REPORT

OPERATOR NAME AND ADDRESS:

LORETTA A MURPHY  
OCEAN ENERGY INC  
PO BOX 549  
NEWCASTLE WY 82701-0549

UTAH ACCOUNT NUMBER: N3220

REPORT PERIOD (MONTH/YEAR): 12 / 98

AMENDED REPORT  (Highlight Changes)

Well Name	Producing Zone	Well Status	Days Oper	Production Volumes		
				OIL(BBL)	GAS(MCF)	WATER(BBL)
USA PEARL BROADHURST 1						
4304715692 00225 07S 23E 9	GRRV			U-02651-A		
USA PEARL BROADHURST 4						
4304715694 00225 07S 23E 9	GRRV			U-02651-A	* per Sunday W1W	
BROADHURST 8						
4304730696 00225 07S 23E 10	GRRV			U-02651-A		
BROADHURST 6						
4304730705 00225 07S 23E 9	GRRV			U-02651-A		
BROADHURST 7						
4304730730 00225 07S 23E 9	GRRV			U-02651-A		
BROADHURST 9						
4304730787 00225 07S 23E 10	GRRV			U-02651		
PEARL BROADHURST 10						
4304730839 00225 07S 23E 9	GRRV			U-02651-A		
PEARL BROADHURST 11						
4304730840 00225 07S 23E 10	GRRV			U-02651-A		
PEARL BROADHURST 12						
4304730841 00225 07S 23E 10	GRRV			U-02651-A		
PEARL BROADHURST 13						
4304730842 00225 07S 23E 9	GRRV			U-02651-A		
BROADHURST 15						
4304730901 00225 07S 23E 9	GRRV			U-02651-A		
BROADHURST 16						
4304730903 00225 07S 23E 10	GRRV			U-02651-A		
BROADHURST 17						
4304730905 00225 07S 23E 10	GRRV			U-02651-A		
<b>TOTALS</b>						

REMARKS:

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

Date: \_\_\_\_\_

Name and Signature: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

STATE OF UTAH  
DIVISION OF OIL, GAS AND MINING

5. LEASE DESIGNATION & SERIAL NO.  
U-025651-A

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.)

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

1. OIL WELL  GAS WELL  OTHER

7. UNIT AGREEMENT NAME

2. NAME OF OPERATOR  
Ocean Energy Resources, Inc.

8. FARM OR LEASE NAME  
USA Pearl Broadhurst

3. ADDRESS OF OPERATOR  
410 17th Street, Suite 1400, Denver, Colorado 80202

9. WELL NO.  
17

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.  
See also space 17 below.)  
At surface 2104' FNL & 2112' FWL SE NW  
At proposed prod. zone

10. FIELD AND POOL, OR WILDCAT  
Walker Hollow Field

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA  
10-7S-R23E

14. API NO.  
43,447,30905

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

12. COUNTY  
Uintah

13. STATE  
UT

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)

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.)

APPROX. DATE WORK WILL START \_\_\_\_\_

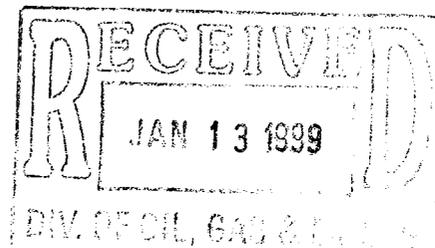
DATE OF COMPLETION \_\_\_\_\_

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.)

Change of Operator: Effective Date January 1, 1999.\* Must be accompanied by a cement verification report.

Former Operator: Ocean Energy, Resources, Inc. (303) 573-5100  
410 17th Street, Suite 1400  
Denver, Colorado 80202

New Operator: Citation Oil & Gas Corp. (281) 469-9664  
8223 Willow Place South  
Suite 250  
Houston, Texas 77070-5623



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

SIGNED [Signature] TITLE Regulatory Coordinitor DATE 1/6/99

(This space for Federal or State office use)

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

STATE OF UTAH  
DIVISION OF OIL, GAS AND MINING

5. LEASE DESIGNATION & SERIAL NO.  
U-025651-A

**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.)

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

1. OIL WELL  GAS WELL  OTHER

7. UNIT AGREEMENT NAME

2. NAME OF OPERATOR  
Citation Oil & Gas Corp.

8. FARM OR LEASE NAME  
USA Pearl Broadhurst

3. ADDRESS OF OPERATOR  
8223 Willow Place South, Suite 250, Houston, TX 77070-5623

9. WELL NO.  
17

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.  
See also space 17 below.)  
At surface 2104' FNL & 2112' FWL SE NW  
At proposed prod. zone

10. FIELD AND POOL, OR WILDCAT  
Walker Hollow Field

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA  
10-T7S-R23E

14. API NO.  
43-047-309105

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

12. COUNTY  
Uintah

13. STATE  
UT

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

NOTICE OF INTENTION TO:

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

APPROX. DATE WORK WILL START \_\_\_\_\_

SUBSEQUENT REPORT OF:

WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>
(Other) <u>Change Of Operator</u> <input checked="" type="checkbox"/>	
(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

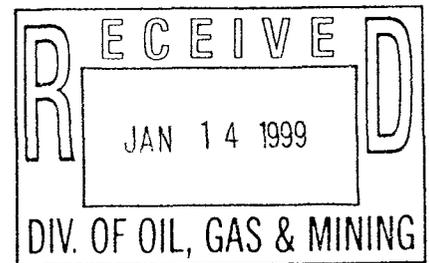
DATE OF COMPLETION \_\_\_\_\_

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.)

Change of Operator: Effective Date January 1, 1999.\* Must be accompanied by a cement verification report.

Former Operator: Ocean Energy, Resources, Inc. (303) 573-5100  
410 17th Street, Suite 1400  
Denver, Colorado 80202

New Operator: Citation Oil & Gas Corp. (281) 469-9664  
8223 Willow Place South  
Suite 250  
Houston, Texas 77070-5623



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

SIGNED

*Robert J. Land*

TITLE

Vice President Land

DATE

1-8-99

(This space for Federal or State office use)

APPROVED BY \_\_\_\_\_

TITLE \_\_\_\_\_

DATE \_\_\_\_\_

CONDITIONS OF APPROVAL, IF ANY:



## United States Department of the Interior

### BUREAU OF LAND MANAGEMENT Vernal Field Office

170 South 500 East Phone: (435) 781-4400  
Vernal, Utah 84078-2799 Fax: (435) 781-4410

IN REPLY REFER TO:

3160  
UT08300

February 17, 1999

Citation Oil & Gas Corporation  
Attn: Sharon Ward  
P O Box 690688  
Houston, TX 77269-0688

Re: USA Pearl Broadhust Wells 1, 2, 4, 5, 6, 7,  
8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19,  
20, 21, and 22  
Sec. 9 & 10, T7S, R23E  
Lease U-02651-A  
Uintah County, Utah

Dear Ms. Ward:

This correspondence is in regard to the self-certification statement submitted requesting a change in operator for the referenced well. After a review by this office, the change in operator request is approved. Effective immediately, Citation Oil & Gas Corporation is responsible for all operations performed on the referenced well. All liability will now fall under your bond, BLM Bond No. MT0630, for all operations conducted on the referenced well on the leased land.

If you have any other questions concerning this matter, please contact Margie Herrmann or Pat Sutton of this office at (435) 781-4492.

Sincerely,

Howard B. Cleavinger II  
Assistant Field Manager for

Minerals Resources

cc: Ocean Energy, Inc.  
Amoco Production Co.  
Utah Div. Oil, Gas & Mining

**From:** <Margie\_Herrmann@ut.blm.gov>  
**To:** <nrogm.krisbeck@state.ut.us>  
**Date:** Tue, Jun 1, 1999 11:18 AM  
**Subject:** Change of Operator

Here goes again! Let me know if you receive it.  
Thank you,  
Margie

# OPERATOR CHANGE WORKSHEET

Routing:	
1-KDR ✓	6-KAS ✓
2-GLH ✓	7-SJ
3-JRB ✓	8-FILE
4-CDW ✓	
5-KDR ✓	T

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       Operator Name Change Only

The operator of the well(s) listed below has changed, effective: 1-1-99

**TO:** (new operator) CITATION OIL & GAS CORP      **FROM:** (old operator) OCEAN ENERGY RESOURCES INC  
 (address) 8223 WILLOW PL. SOUTH STE 250      (address) 410 17TH STREET STE 1400  
HOUSTON, TX 77070-5623      DENVER, CO 80202

Phone: (281)469-9664  
Account no. N0265

Phone: (303)573-5100  
Account no. N3220

**WELL(S)** attach additional page if needed:

Name: <u>*SEE ATTACHED*</u>	API: <u>43-DA7-30905</u>	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____
Name: _____	API: _____	Entity: _____	S _____	T _____	R _____	Lease: _____

## OPERATOR CHANGE DOCUMENTATION

- KDR 1. (r649-8-10) Sundry or other legal documentation has been received from the **FORMER** operator (attach to this form). *(Rec'd 7.13.99)*
- KDR 2. (r649-8-10) Sundry or other legal documentation has been received from the **NEW** operator (Attach to this form). *(Rec'd 1.14.99)*
- N/A 3. The **Department of Commerce** has been contacted if the new operator above is not currently operating any wells in Utah. Is the company **registered with the state?** (yes/no) \_\_\_\_\_ If yes, show company file number: \_\_\_\_\_
- KDR 4. **FOR INDIAN AND FEDERAL WELLS ONLY.** The BLM has been contacted regarding this change. Make note of BLM status in comments section of this form. BLM approval of **Federal** and **Indian** well operator changes should ordinarily take place prior to the division's approval, and before the completion of **steps 5 through 9** below. *(Rec'd 6.1.99)*
- KDR 5. Changes have been entered in the **Oil and Gas Information System** (3270) for each well listed above. *(6.10.99)*
- KDR 6. Cardex file has been updated for each well listed above.
- DF 7. Well file labels have been updated for each well listed above. *(\*new filing system)*
- DF 8. Changes have been included on the monthly "Operator, Address, and Account Changes" memo for distribution to Trust Lands, Sovereign Lands, UGS, Tax Commission, etc. *6.10.99*
- DF 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.

**ENTITY REVIEW**

- CDP 1. (r649-8-7) Entity assignments have been reviewed for all wells listed above. Were entity changes made? (yes/no) (no) If entity assignments were changed, attach copies of Form 6, Entity Action Form.
- CDP 2. Trust Lands, Sovereign Lands, Tax Commission, etc., have been notified through normal procedures of entity changes.

**BOND VERIFICATION - (FEE WELLS ONLY)**

- N/A 1. (r649-3-1) 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 operator's bond files.
- + 3. The FORMER operator has requested a release of liability from their bond (yes/no) \_\_\_\_\_, as of today's date \_\_\_\_\_. If yes, division response was made to this request by letter dated \_\_\_\_\_.

**LEASE INTEREST OWNER NOTIFICATION OF RESPONSIBILITY**

- N/A 1. Copies of documents have been sent on \_\_\_\_\_ to \_\_\_\_\_ at Trust Lands for changes involving State leases, in order to remind that agency of their responsibility to review for proper bonding.
- + 2. (r649-2-10) The former operator of any fee lease wells listed above has been contacted and informed by letter dated \_\_\_\_\_ 19 \_\_\_\_, of their responsibility to notify all interest owners of this change.

**FILMING**

- ✓ 1. All attachments to this form have been microfilmed. Today's date: 8.3.99.

**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 are now being filed in the Operator Change file.

**COMMENTS**

990514 left message w/ marjie (BIM) regarding approval? 990601 rec'd e-mail approval from marjie (BIM)