District II
1301 W. Grand Ave., Artesia, NM 88210
Phone:(505) 748-1283 Fax:(505) 748-9720

Form C-101
Permit 46721

# State of New Mexico
# Energy, Minerals and Natural Resources
# Oil Conservation Division
# 1220 S. St Francis Dr.
# Santa Fe, NM 87505

Month - Year
MAR 29 2007
OCD - ARTESIA, NM

## APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

| 1. Operator Name and Address | 2. OGRID Number |
|---|---|
| RANGE OPERATING NEW MEXICO INC<br>777 MAIN STREET<br>FT WORTH , TX 76102 | 227588 |
| | 3. API Number<br>30-015-35510 |

| 4. Property Code | 5. Property Name | 6. Well No. |
|---|---|---|
| 300270 | SOUTH CULEBRA BLUFF 23 | 017 |

### 7. Surface Location

| UL - Lot | Section | Township | Range | Lot Idn | Feet From | N/S Line | Feet From | E/W Line | County |
|---|---|---|---|---|---|---|---|---|---|
| K | 23 | 23S | 28E | K | 2440 | S | 1500 | W | EDDY |

### 8. Pool Information

| | |
|---|---|
| LOVING;BRUSHY CANYON, EAST | 40350 |

### Additional Well Information

| 9. Work Type | 10. Well Type | 11. Cable/Rotary | 12. Lease Type | 13. Ground Level Elevation |
|---|---|---|---|---|
| New Well | I | Rotary | Private | 3002 |
| **14. Multiple** | **15. Proposed Depth** | **16. Formation** | **17. Contractor** | **18. Spud Date** |
| N | 6350 | Brushy Canyon | | 4/6/2007 |

| Depth to Ground water | Distance from nearest fresh water well | Distance to nearest surface water |
|---|---|---|
| 75 | | |

Pit: Liner: Synthetic ☐ mils thick Clay ☐ Pit Volume: bbls Drilling Method:
Closed Loop System ☒ Fresh Water ☒ Brine ☐ Diesel/Oil-based ☐ Gas/Air ☐

### 19. Proposed Casing and Cement Program

| Type | Hole Size | Casing Type | Casing Weight/ft | Setting Depth | Sacks of Cement | Estimated TOC |
|---|---|---|---|---|---|---|
| Surf | 12.25 | 8.625 | 24 | 300 | 350 | 0 |
| Prod | 7.875 | 5.5 | 15.5 | 6350 | 1670 | 0 |

### Casing/Cement Program: Additional Comments

### Proposed Blowout Prevention Program

| Type | Working Pressure | Test Pressure | Manufacturer |
|---|---|---|---|
| DoubleRam | 3000 | 3000 | Schaffer |

| | |
|---|---|
| I hereby certify that the information given above is true and complete to the best of my knowledge and belief.<br>**I further certify that the drilling pit will be constructed according to NMOCD guidelines ☒ a general permit ☐ or an (attached) alternative OCD-approved plan ☐.** | OIL CONSERVATION DIVISION |
| Printed Name: Electronically filed by Linda Stiles | Approved By: BRYAN G. ARRANT<br>Title: ~~DISTRICT II GEOLOGIST~~ |
| Title: Sr Engineering Tech | Approved Date: MAR 30 2007 Expiration Date: MAR 30 2008 |
| Email Address: lstiles@rangeresources.com | |
| Date: 3/26/2007 Phone: 817-810-1908 | |

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(505) 393-6161 Fax:(505) 393-0720
District II
1301 W. Grand Ave., Artesia, NM 88210
Phone:(505) 748-1283 Fax:(505) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

# State of New Mexico
# Energy, Minerals and Natural Resources
# Oil Conservation Division
# 1220 S. St Francis Dr.
# Santa Fe, NM 87505

Form C-102
Permit 46721

Month - Year
MAR 2 9 2007
OCD - ARTESIA, NM

## WELL LOCATION AND ACREAGE DEDICATION PLAT

| 1. API Number | 2. Pool Code | 3. Pool Name |
|---|---|---|
| | 40350 | LOVING;BRUSHY CANYON, EAST |

| 4. Property Code | 5. Property Name | 6. Well No. |
|---|---|---|
| 300270 | SOUTH CULEBRA BLUFF 23 | 017 |

| 7. OGRID No. | 8. Operator Name | 9. Elevation |
|---|---|---|
| 227588 | RANGE OPERATING NEW MEXICO INC | 3002 |

### 10. Surface Location

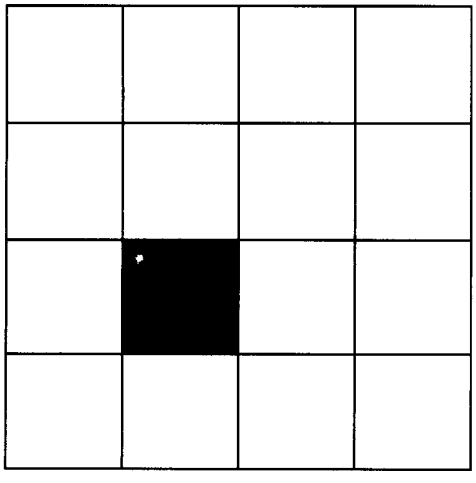
| UL - Lot | Section | Township | Range | Lot Idn | Feet From | N/S Line | Feet From | E/W Line | County |
|---|---|---|---|---|---|---|---|---|---|
| K | 23 | 23S | 28E | K | 2440 | S | 1500 | W | EDDY |

### 11. Bottom Hole Location If Different From Surface

| UL - Lot | Section | Township | Range | Lot Idn | Feet From | N/S Line | Feet From | E/W Line | County |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

| 12. Dedicated Acres | 13. Joint or Infill | 14. Consolidation Code | 15. Order No. |
|---|---|---|---|
| 40.00 | | | |

**NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION**



### OPERATOR CERTIFICATION

*I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location(s) or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.*

E-Signed By: Cindi C. Goodin
Title: Sr. Engineering Tech
Date: 3-26-2007

### SURVEYOR CERTIFICATION

*I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.*

Surveyed By: Gary Eidson
Date of Survey: 1/2/2007
Certificate Number: 12641

DISTRICT I
1625 N. FRENCH DR., HOBBS, NM 88240

DISTRICT II
1301 W. GRAND AVENUE, ARTESIA, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

# OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

Submit to Appropriate District Office
State Lease – 4 Copies
Fee Lease – 3 Copies

Form C-102
Revised October 12, 2005

Month - Year
MAR 29 2007
OCD - ARTESIA, NM

## WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

| API Number | Pool Code | Pool Name |
|---|---|---|
| | | |

| Property Code | Property Name | Well Number |
|---|---|---|
| | SCB 23 | 17 |
| **OGRID No.** | **Operator Name** | **Elevation** |
| | RANGE OPERATING NEW MEXICO, INC. | 3002' |

### Surface Location

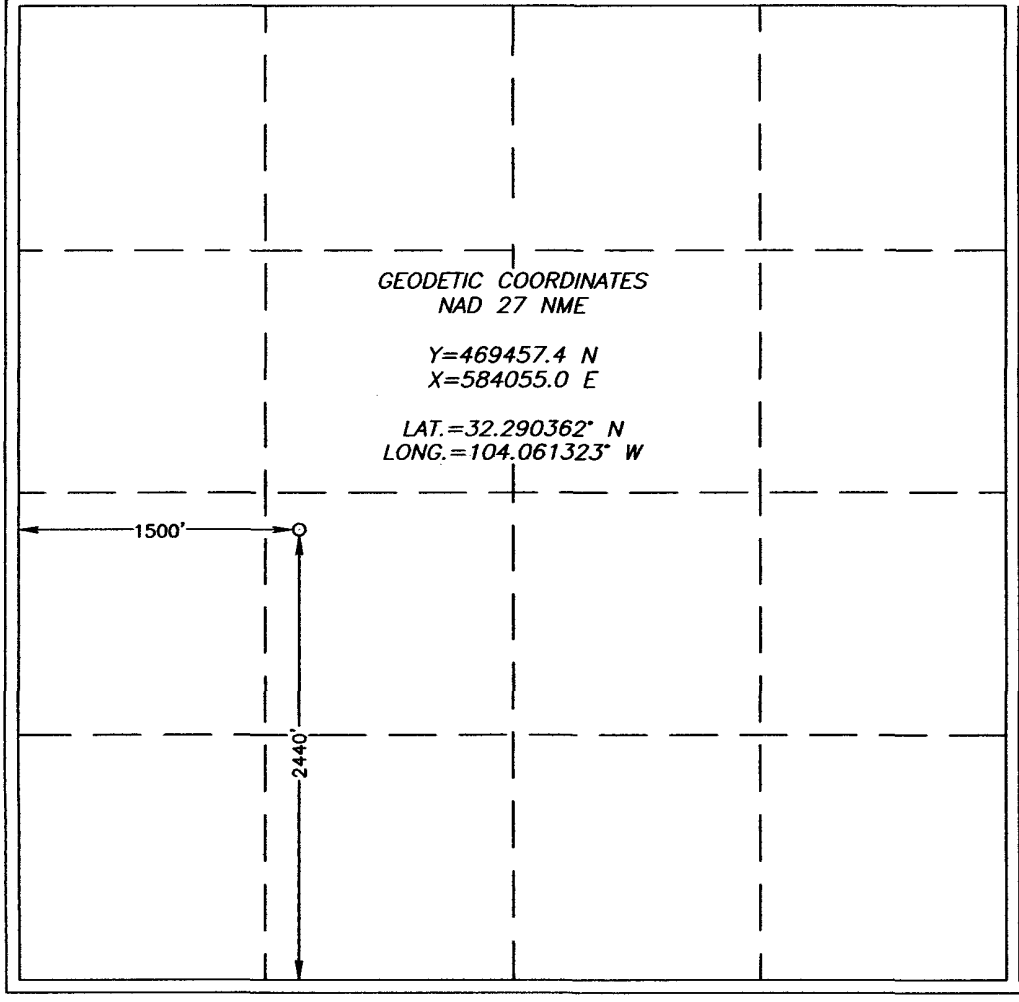
| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| K | 23 | 23–S | 28–E | | 2440 | SOUTH | 1500 | WEST | EDDY |

### Bottom Hole Location If Different From Surface

| UL or lot No. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

| Dedicated Acres | Joint or Infill | Consolidation Code | Order No. |
|---|---|---|---|
| | | | |

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION




### OPERATOR CERTIFICATION

*I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.*

William F. Frey 1/29/07
Signature Date

William F. Frey
Printed Name

### SURVEYOR CERTIFICATION

*I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.*

JANUARY 2, 2007
Date Surveyed AR

Signature & Seal of Professional Surveyor

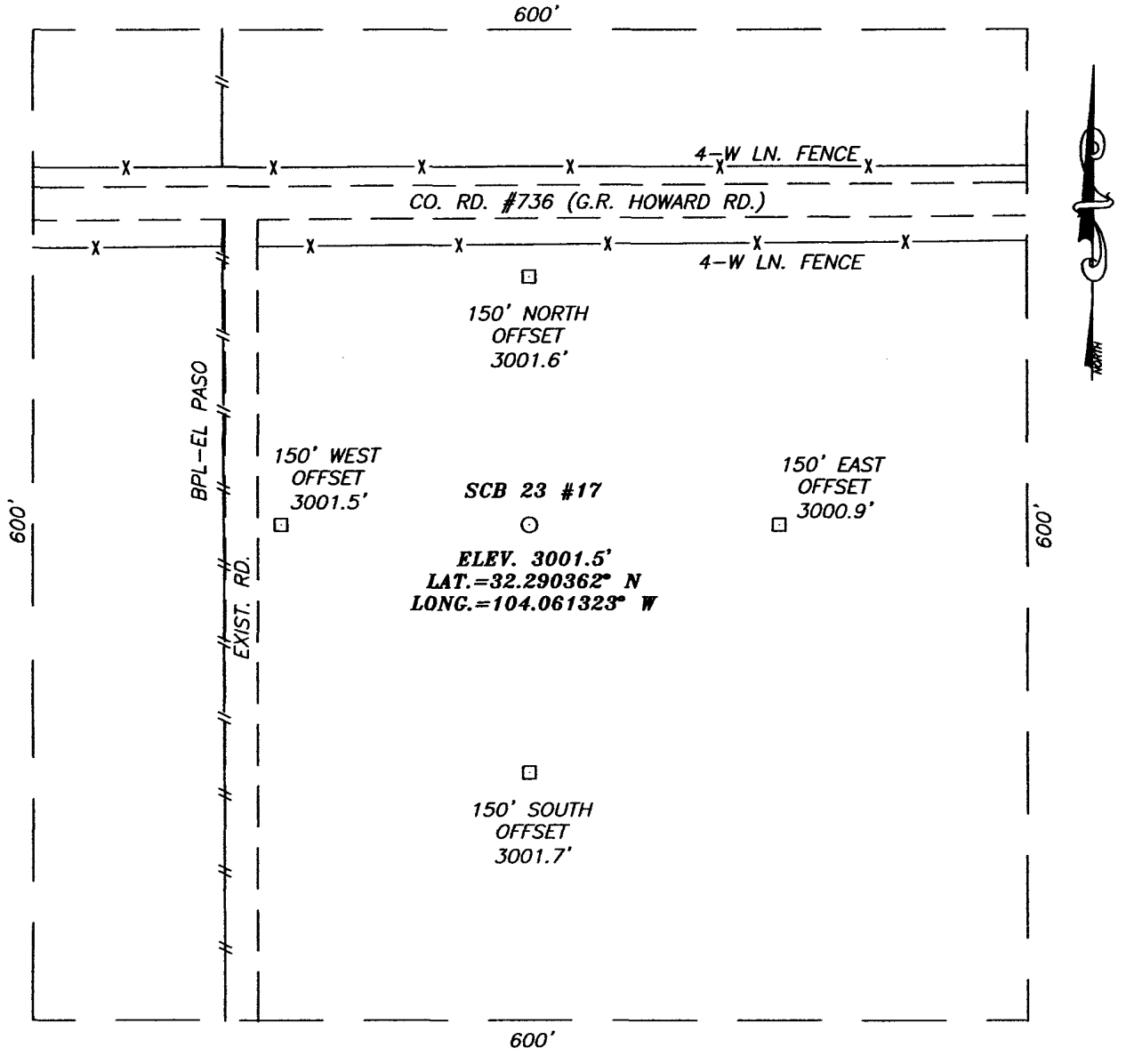
Gary L. Eidson 1/10/07

06.11.1398

Certificate No. GARY EIDSON 12641

# SECTION 23, TOWNSHIP 23 SOUTH, RANGE 28 EAST, N.M.P.M.,

EDDY COUNTY, NEW MEXICO




DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF CO. RD. #740 (DONALDSON FARM RD.) AND CO. RD. #736 (G.R. HOWARD RD.), GO EAST ON CO. RD. #746 APPROX. 0.3 MILES. THIS LOCATION IS APPROX. 195 FEET SOUTH.

100 0 100 200 Feet

Scale:1"=100'

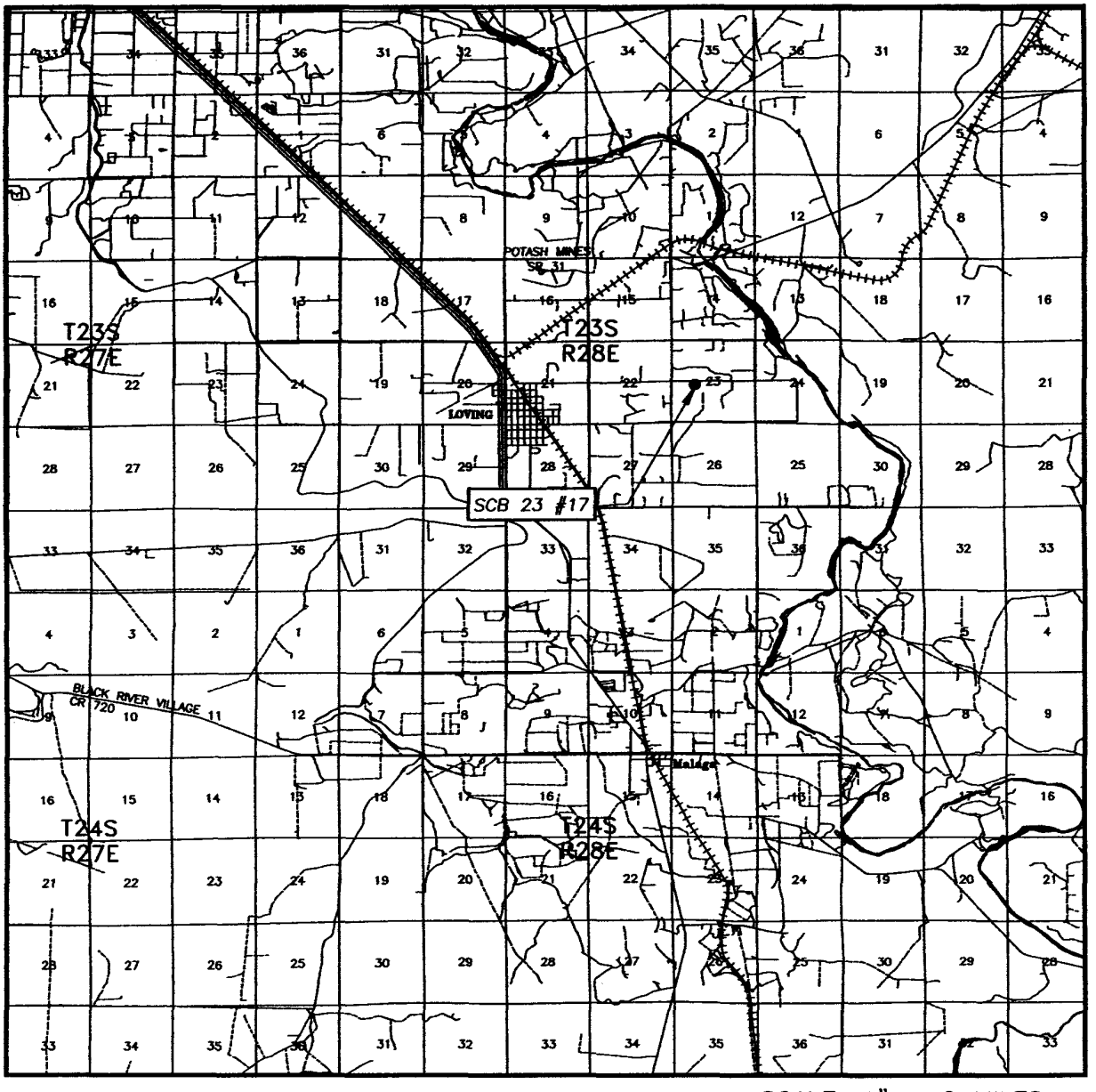
## RANGE OPERATING NEW MEXICO, INC.

SCB 23 #17
LOCATED 2440 FEET FROM THE SOUTH LINE
AND 1500 FEET FROM THE WEST LINE OF SECTION 23,
TOWNSHIP 23 SOUTH, RANGE 28 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.

| | | | |
|---|---|---|---|
| Survey Date: 01/02/07 | Sheet 1 of 1 Sheets | | |
| W.O. Number: 06.11.1398 | Dr By: AR | | Rev 1:N/A |
| Date: 01/05/07 | Disk: CD#6 | 06111398 | Scale:1"=100' |


PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(505) 393-3117

# *VICINITY MAP*




SCALE: 1" = 2 MILES

SEC. 23 TWP. 23-S RGE. 28-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 2440' FSL & 1500' FWL

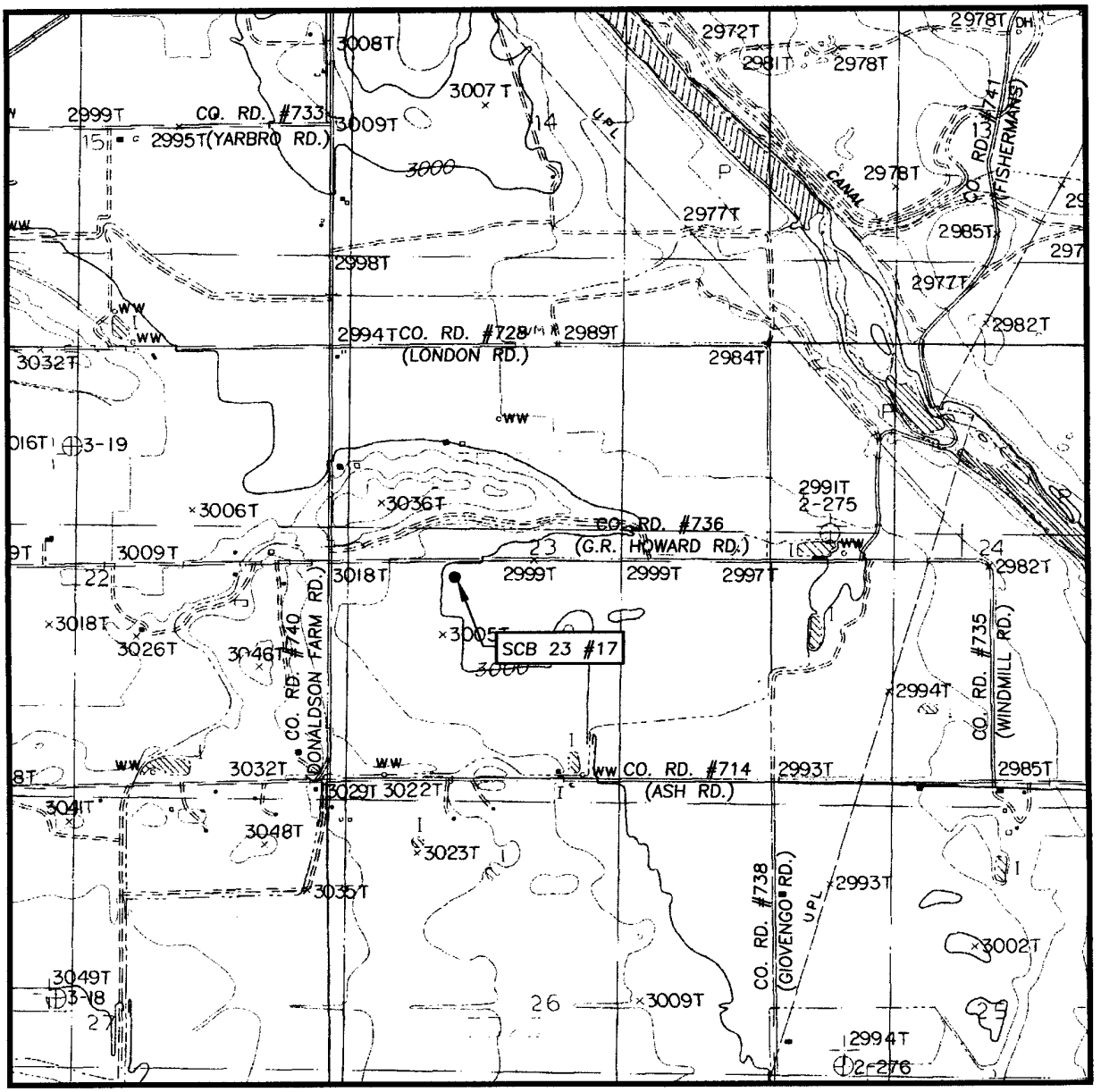
ELEVATION 3002'

OPERATOR RANGE OPERATING NEW MEXICO, INC.

LEASE SCB 23


PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(505) 393-3117

# LOCATION VERIFICATION MAP




SCALE: 1" = 2000'

CONTOUR INTERVAL:
LOVING, N.M. – 10'

SEC. 23 TWP. 23-S RGE. 28-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 2440' FSL & 1500' FWL

ELEVATION 3002'

OPERATOR RANGE OPERATING NEW MEXICO, INC.

LEASE SCB 23

U.S.G.S. TOPOGRAPHIC MAP
LOVING, N.M.


PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(505) 393-3117

STATE OF NEW MEXICO
ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

CASE NO. 13705
ORDER NO. R-12601

APPLICATION OF RANGE OPERATING NEW MEXICO, INC. FOR APPROVAL OF ITS EAST LOVING DELAWARE LEASEHOLD PILOT WATERFLOOD PROJECT INCLUDING SIX INJECTION WELLS TO BE LOCATED AT UNORTHODOX WELL LOCATIONS AND QUALIFICATION OF THE PROJECT AREA FOR THE RECOVERED OIL TAX RATE PURSUANT TO THE ENHANCED OIL RECOVERY ACT, EDDY COUNTY, NEW MEXICO.

## ORDER OF THE DIVISION

**BY THE DIVISION:**

This case came on for hearing at 8:15 a.m. on May 11, June 8 and July 6, 2006, at Santa Fe, New Mexico, before Examiners David R. Catanach, William V. Jones, and Richard Ezeanyim, respectively.

NOW, on this 26th day of July, 2006, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner,

**FINDS THAT:**

(1) Due public notice has been given, and the Division has jurisdiction of this case and its subject matter.

(2) The applicant, Range Operating New Mexico, Inc. ("applicant" or "Range"), seeks authority to institute a leasehold pilot waterflood project within the following-described area by the injection of produced water into the Brushy Canyon interval of the Delaware formation, East Loving-Brushy Canyon Pool, through six proposed injection wells located at locations considered unorthodox for producing wells in Section 23, Township 23 South, Range 28 East, NMPM, Eddy County, New Mexico:

**TOWNSHIP 23 SOUTH, RANGE 28 EAST, NMPM**
Section 23: N/2, N/2 S/2

(3) The proposed injection wells are either existing wells (South Culebra Bluff "23" Well No. 15), or wells to be drilled (South Culebra Bluff "23" Wells No. 17, 18, 19, 20 and 21) at the following-described locations in Section 23. According to applicant's evidence, the South Culebra Bluff "23" Wells No. 18 and 19 will be directionally drilled in order to accommodate the request of the surface owners:

| Well Name & Number | Well Location |
|---|---|
| South Culebra Bluff "23" Well No. 15 | 1430' FNL & 1150' FEL (Unit H) |
| South Culebra Bluff "23" Well No. 17 | 2440' FSL & 1500' FWL (Unit K) |
| South Culebra Bluff "23" Well No. 18 | 1815' FNL & 1200' FWL (Unit E) **Surface**<br>1000' FNL & 1300 FWL (Unit D) **BHL** |
| South Culebra Bluff "23" Well No. 19 | 1950' FNL & 2470' FWL (Unit F) **Surface**<br>1300' FNL & 2620' FEL (Unit B) **BHL** |
| South Culebra Bluff "23" Well No. 20 | 2520' FSL & 2460' FEL (Unit J) |
| South Culebra Bluff "23" Well No. 21 | 2531' FSL & 1252' FEL (Unit I) |

(4) This case was originally heard on May 11 and June 8, 2006 and was subsequently taken under advisement. Subsequent to the hearing, it was determined that the publication notice was published in the wrong county, and that the advertisement for the case contained errors. The case was reopened and heard on July 6, 2006 to correct these deficiencies.

(5) On May 4, 2006, the Division received an objection to the application from the Martin Law Firm on behalf of John Draper Brantley, Jr., Claibourne M. Power, Merland, Inc., Will Matthew Brantley and Johnny Reid (collectively "Brantley"). These parties own a mineral or surface interest within the proposed project area.

(6) Range testified that a stipulated agreement was reached with Brantley prior to the hearing. In accordance with that agreement, Range requested that the following provision be incorporated into this order:

"Range, as the operator of the East Loving Delaware Pilot Leasehold Waterflood Project, upon the written request of John Draper Brantley, Jr., or Claibourne M. Power, or Will Matthew Brantley, or Merland, Inc. or Johnny Reid (or their heirs, successors or assigns) shall obtain a water analysis for each of the following water sources, but not more frequently than once every two years and provide a copy to the Division and to each of the parties:

i) SCB Water Well No. 1, located approximately 3500 feet from the East line and 1300 feet from the North line of Section 23, Township 23 South, Range 28 East, NMPM, Eddy County, New Mexico;

ii) SCB Water Well No. 2 located approximately 1320 feet from the East line and 720 feet from the North line of Section 23, Township 23 South, Range 28 East, NMPM, Eddy County, New Mexico; and

iii) SCB Water Well No. 3 located approximately 850 feet from the West line and 2600 feet from the North line of Section 23, Township 23 South, Range 28 East, NMPM, Eddy County, New Mexico."

(7) The proposed pilot waterflood project is fully contained within the East Loving-Brushy Canyon Pool.

(8) The applicant presented geologic evidence that demonstrates that:

(a) within the project area, there are six distinct producing intervals within the Brushy Canyon formation;

(b) initial waterflood operations will be limited to the two lowermost intervals within the Brushy Canyon formation due to the fact that the upper producing intervals are generally characterized by poor reservoir quality, including low permeability and high water saturations;

(c) the two lowermost intervals within the Brushy Canyon formation are laterally continuous within the project area, and appear to be suitable for waterflood operations; and

(d) injection operations may be vertically expanded in the future to encompass additional producing intervals in the Brushy Canyon formation depending on the success of pilot waterflood operations.

(9) The applicant presented engineering evidence that demonstrates that:

(a) a five-spot injection pattern containing six (6) injection wells and thirteen (13) producing wells will be initially utilized within the project area;

(b) waterflood operations within the two lowermost intervals in the Brushy Canyon formation should result in the recovery of an additional 900,000 barrels of oil. If the project is expanded to ultimately include all of the producing intervals within the Brushy Canyon, additional recovery from all zones is estimated to be approximately 1.9 million barrels of oil; and

(c) production during waterflood operations will be allocated on a lease-basis.

(10) The wells within the project area are in an advanced state of depletion.

(11) Range estimates that it will cost approximately $5.415 million dollars to implement waterflood operations within the proposed project area.

(12) Approval of the subject pilot waterflood project should result in the recovery of additional oil and gas reserves from the project area that may otherwise not be recovered, thereby preventing waste, and will not violate correlative rights.

(13) The applicant further seeks to qualify the pilot waterflood project as an "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery Act" (NMSA 1978 Sections 7-29A-1 through 7-29A-5).

(14) The evidence presented demonstrates that:

(a) the application for approval of the proposed secondary recovery project has not been prematurely filed either for economic or technical reasons;

(b) the area affected by the proposed project has been so depleted by primary operations that it is prudent to apply secondary recovery techniques to maximize the ultimate recovery of crude oil from the pool; and

(c) the proposed secondary recovery project meets all the criteria for certification by the Division as a qualified "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery Act" (NMSA 1978 Sections 7-29A-1 through 7-29A-5).

(15) The approved project area should initially comprise the N/2 and the N/2 S/2 of Section 23; however, the "project area" and/or the producing wells eligible for the enhanced oil recovery (EOR) tax rate may be contracted and reduced based upon the evidence presented by the applicant in its demonstration of a positive production response.

(16) To be eligible for the EOR tax rate, the operator should advise the Division of the date water injection commences within the secondary recovery project. At that time, the Division will certify the project to the New Mexico Taxation and Revenue Department.

(17) At such time as a positive production response occurs, and within five years from

the date the project was certified to the New Mexico Taxation and Revenue Department, the applicant must apply to the Division for certification of a positive production response. This application shall identify the area benefiting from enhanced oil recovery operations and the specific wells eligible for the EOR tax rate. The Division may review the application administratively or set it for hearing. Based upon the evidence presented, the Division will certify to the New Mexico Taxation and Revenue Department those wells that are eligible for the EOR tax rate.

**IT IS THEREFORE ORDERED THAT:**

(1) Range Operating New Mexico, Inc., is hereby authorized to institute a pilot waterflood project within the following-described area by the injection of water into the Brushy Canyon interval of the Delaware formation, East Loving-Brushy Canyon Pool, Eddy County, New Mexico, through six initial injection wells shown on Exhibit "A" attached to this order located in Section 23, Township 23 South, Range 28 East, NMPM:

Township 23 South, Range 28 East, NMPM
Section 23: N2, N/2 S/2

(2) The operator shall take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

(3) Injection into each of the wells shown on Exhibit "A" shall be accomplished through 2 7/8-inch internally plastic-lined tubing installed in a packer located within 100 feet of the uppermost injection perforations. The casing-tubing annulus in each well shall be filled with an inert fluid and a gauge or approved leak-detection device shall be attached to the annulus in order to determine leakage in the casing, tubing, or packer.

(4) The injection wells or pressurization system shall be equipped with a pressure control device or acceptable substitute that will limit the surface injection pressure to no more than 0.2 psi per foot of depth to the uppermost injection perforation, all as shown on Exhibit A.

(5) The Division Director may administratively authorize a pressure limitation in excess of the above upon a showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata.

(6) Prior to commencing injection operations, the casing in each well shall be pressure tested throughout the interval from the surface down to the proposed packer setting depth to assure the integrity of such casing.

(7) The operator shall give advance notice to the supervisor of the Division's Artesia District Office of the date and time injection equipment will be installed and the mechanical integrity pressure tests conducted on the injection wells so that these operations may be witnessed.

(8) The operator shall immediately notify the supervisor of the Division's Artesia District Office of the failure of the tubing, casing or packer in any of the injection wells or the leakage of water, oil or gas from or around any producing or plugged and abandoned well within the project area, and shall promptly take all steps necessary to correct such failure or leakage.

(9) The waterflood project is hereby designated the East Loving Delaware Leasehold Waterflood Project, and the applicant shall conduct injection operations in accordance with Division Rules No. 701 through 708, and shall submit monthly reports in accordance with Division Rules No. 706 and 1115.

(10) The injection authority granted herein for each well shown on Exhibit "A" shall terminate one year after the date of this order if the operator has not commenced injection operations into the wells; provided, however, the Division, upon written request by the operator, may grant an extension for good cause.

(11) The East Loving Delaware Leasehold Waterflood Project is hereby certified as an "Enhanced Oil Recovery Project." The project area shall initially comprise the area described in Ordering Paragraph No. (1), provided however, the project area and/or the producing wells eligible for the enhanced oil recovery (EOR) tax rate may be contracted and reduced based upon the evidence presented by the applicant in its demonstration of a positive production response.

(12) To be eligible for the EOR tax rate, the operator shall advise the Division of the date and time water injection commences within the secondary recovery project. At that time, the Division will certify the project to the New Mexico Taxation and Revenue Department.

(13) At such time as a positive production response occurs, and within five years from the date the project was certified to the New Mexico Taxation and Revenue Department, the applicant must apply to the Division for certification of a positive production response. This application shall identify the area benefiting from enhanced oil recovery operations and the specific wells eligible for the EOR tax rate. The Division may review the application administratively or set it for hearing. Based upon the evidence presented, the Division will certify to the New Mexico Taxation and Revenue Department those wells that are eligible for the EOR tax rate.

(14) As requested by the applicant, the following provision is hereby incorporated into this order:

> "Range, as the operator of the East Loving Delaware Pilot Leasehold Waterflood Project, upon the written request of John Draper Brantley, Jr., or Claibourne M. Power, or Will Matthew Brantley, or Merland, Inc. or Johnny Reid (or their heirs, successors or assigns) shall obtain a water analysis for each of the following water sources, but not more frequently than once every two years and provide a copy to the Division and to each of the parties:

i) SCB Water Well No. 1, located approximately 3500 feet from the East line and 1300 feet from the North line of Section 23, Township 23 South, Range 28 East, NMPM, Eddy County, New Mexico;

ii) SCB Water Well No. 2 located approximately 1320 feet from the East line and 720 feet from the North line of Section 23, Township 23 South, Range 28 East, NMPM, Eddy County, New Mexico; and

iii) SCB Water Well No. 3 located approximately 850 feet from the West line and 2600 feet from the North line of Section 23, Township 23 South, Range 28 East, NMPM, Eddy County, New Mexico."

(15) Jurisdiction is hereby retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

SEAL

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MARK E. FESMIRE, P.E.
Director

**Exhibit "A"**
**Case No. 13705**
**Division Order No. R-12601**
**East Loving Delaware Leasehold Waterflood Project**
**Approved Injection Wells (All in Section 23, Township 23 South, Range 28 East, NMPM)**

| Well Name & Number | API Number | Well Location | Injection Interval | Packer Depth | Maximum Surface Injection Pressure |
|---|---|---|---|---|---|
| South Culebra Bluff "23" No. 15 | 30-015-33783 | 1430' FNL & 1150' FEL (Unit H) | 5,724'-6,234' | 5,624' | 1145 PSIG |
| South Culebra Bluff "23" No. 17 | N/A | 2440' FSL & 1500' FWL (Unit K) | 5,680'-6,205' | 5,580' | 1136 PSIG |
| South Culebra Bluff "23' No. 18 | N/A | 1815' FNL & 1200' FWL (Unit E) **Surface** 1000' FNL & 1300' FWL (Unit D) **BHL** | 5,695'-6,215' | 5,595' | 1139 PSIG |
| South Culebra Bluff "23" No. 19 | N/A | 1950' FNL & 2470' FWL (Unit F) **Surface** 1300' FNL & 2620' FEL (Unit B) **BHL** | 5,720'-6,235' | 5,620' | 1144 PSIG |
| South Culebra Bluff "23" No. 20 | N/A | 2520' FSL & 2460' FEL (Unit J) | 5,710'-6,225' | 5,610' | 1142 PSIG |
| South Culebra Bluff "23" No. 21 | N/A | 2531' FSL & 1252' FEL (Unit I) | 5,725'-6,235' | 5,625' | 1145 PSIG |

RANGE RESOURCES


March 23, 2007

New Mexico Oil Conservation Division
1301 West Grand Avenue
Artesia, New Mexico 88210

RE: H2S Contingency Plan

Dear Mr. Arrant:

Range Operating New Mexico Inc. has conducted a review to determine if an H2S Contingency Plan is required for the referenced wells listed below. We are able to conclude that any potential hazardous volume would be minimal. H2S concentrations of wells in these areas from surface to total depth are low enough; therefore we do not believe that an H2S Contingency Plan will be necessary.

| | | |
|---|---|---|
| South Culebra Bluff 23 #17 | 1500' FWL & 2440' FSL | Section 23 T23S R28E |
| South Culebra Bluff 23 #18 | 1052' FWL & 1883' FNL | Section 23 T23S R28E |
| | 1300' FWL & 1000' FNL | |
| South Culebra Bluff 23 #19 | 2470' FWL & 1950' FNL | Section 23 T23S R28E |
| | 2620' FEL & 1300' FNL | |
| South Culebra Bluff 23 #20 | 2460' FEL & 2460' FSL | Section 23 T23S R28E |
| South Culebra Bluff 23 #21 | 1160' FEL & 2460' FSL | Section 23 T23S R28E |

Please advise if you have a different opinion or need further information.

Sincerely,

Linda C. Stiles
Operations Department

/lcs

**Range Resources Corporation**
777 Main Street Suite 800 Fort Worth, Texas 76102 Tel: (817) 870-2601 Fax: (817) 870-2316

**RANGE** RESOURCES

LOVING EAST AREA-SE NM

**SCB 23 No 17 (INJECTION)**
**Eddy Co., New Mexico**
**50% WI**
**(Chesapeake Partner 50% WI)**

Locations Calls: **1500' FWL & 2440' FSL** **SL**

GL: **3002**
Est. KB: **3012**

**Sec 23, T 23 S, R 28 E, N.M.P.M.**

Surface Conditions: **No special notations**

Classification: **Injection**

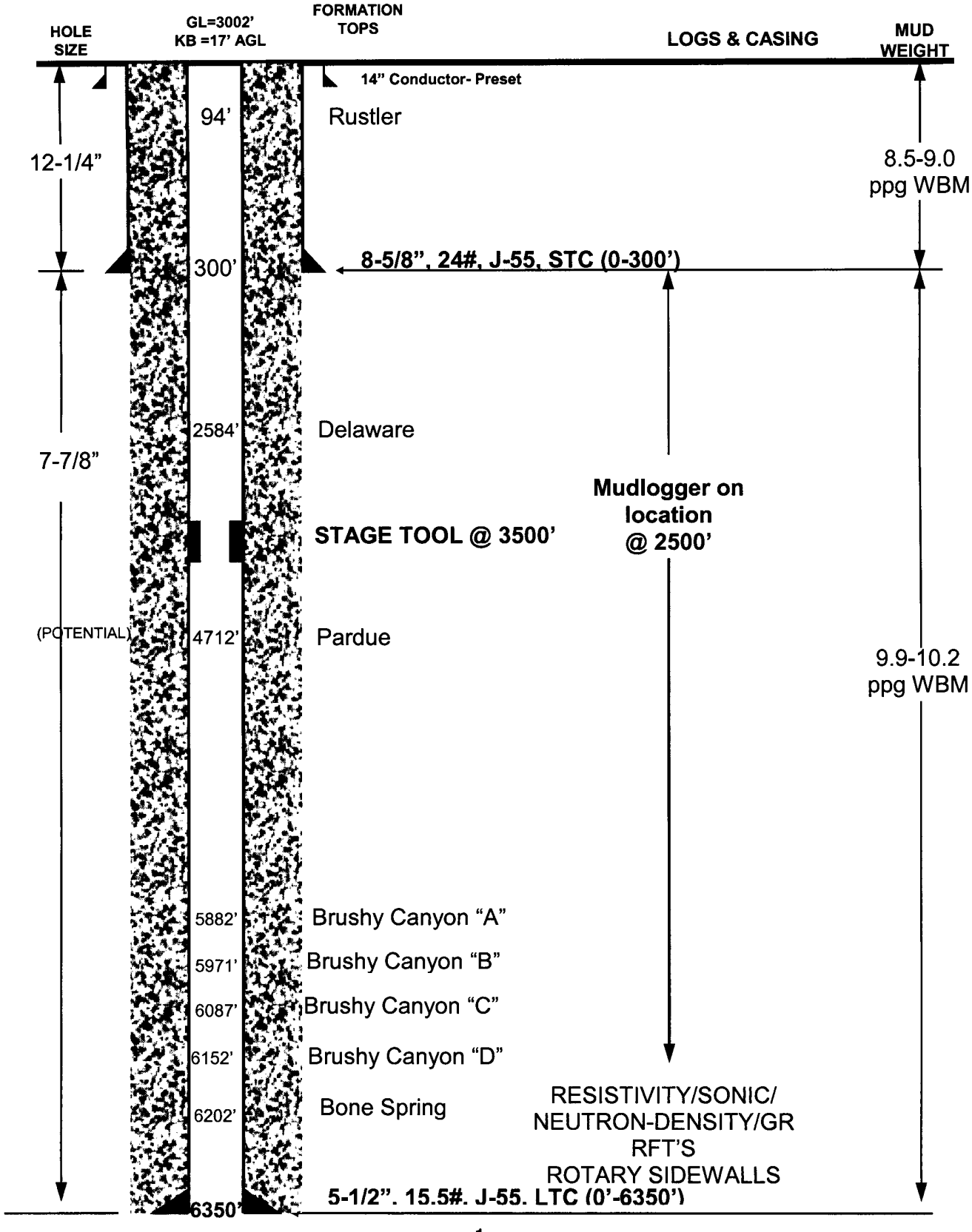
Objective: **Primary: Brushy Canyon C & D**

| | ESTIMATED/PRE-DRILL | | | | ACTUAL/POST-DRILL | | | |
|---|---|---|---|---|---|---|---|---|
| | M.D. | Subsea | Net Phi | Avg. Phi | M.D. | Subsea | Net Phi | Avg. Phi |
| T/ Rustler: | 94 | 2918 | | | | | | |
| T/ Delaware Grp | 2584 | 428 | | | | | | |
| T/ Lwr Brushy Canyon "Pardue" | 4712 | -1700 | | | | | | |
| T/ Lwr Brushy Canyon "A" | 5882 | -2870 | | | | | | |
| T/ Lwr Brushy Canyon "B" | 5971 | -2959 | | | | | | |
| T/ Lwr Brushy Canyon "C" | 6087 | -3075 | | | | | | |
| T/ Lwr Brushy Canyon "D" | 6152 | -3140 | | | | | | |
| B/ Lwr Brushy Canyon "D" | 6202 | -3190 | | | | | | |
| (T/ Bone Spring) | | | | | | | | |
| 100 ft rathole | 6302 | -3290 | | | | | | |

Proposed Total Depth (TVD): **6350**
(B/Base of Brushy Canyon "D" + ~100 ft. rat hole)

**GEOLOGIST:** R. Hubnik

| | | |
|---|---|---|
| **WELL** | **: SCB #23-17 (INJECTION WELL)** | **AFE:** |
| **SL** | **: 2440' FSL & 1500' FWL, Sec 23-T23S-R28E** | **FIELD: East Loving** |
| **COUNTY** | **: EDDY COUNTY** | **OBJECTIVE TD: 6350'** |
| **STATE** | **: NEW MEXICO** | **PERMIT NO:** |



RANGE RESOURCES

**RANGE OPERATING NEW MEXICO, INC.**

# SCB #23-17

# Eddy County, NM

## Drilling Program

Prepared 3/16/07

**PROPOSED DEPTH:** 6350' MD / 6350' TVD
**GROUND ELEVATION:** **3002'**
**KB:** **17'**

**LOCATION:** 2440' FSL & 1500' FWL, Sec. 23-T23S-R28E, Eddy County, NM

**ANTICIPATED INJECTION FORMATION:** Brushy Canyon

**API NO:**

**GENERAL:**
Objective is to drill and complete the SCB 23-17, a water injection well in the Brushy Canyon 'C' and 'D' waterflood pilot in the northern half of Section 23 in the East Loving Field. The recommended injector has an estimated TD of 6350'.

**ESTIMATED FORMATION TOPS: (Log Depths)**

| | | ESTIMATED/PRE-DRILL | | | |
|---|---|---|---|---|---|
| | M.D. | Subsea | Net Phi | Avg. Phi |
| T/ Rustler: | 94 | 2918 | | |
| T/ Delaware Grp | 2584 | 428 | | |
| T/ Lwr Brushy Canyon "Pardue" | 4712 | -1700 | | |
| T/ Lwr Brushy Canyon "A" | 5882 | -2870 | | |
| T/ Lwr Brushy Canyon "B" | 5971 | -2959 | | |
| T/ Lwr Brushy Canyon "C" | 6087 | -3075 | | |
| T/ Lwr Brushy Canyon "D" | 6152 | -3140 | | |
| B/ Lwr Brushy Canyon "D" | 6202 | -3190 | | |
| (T/ Bone Spring) | | | | |
| 100 ft rathole | 6302 | -3290 | | |

## DETAILED DRILLING PROCEDURE

TIMES AND EVENTS THAT MUST BE NOTED ON DRILLING REPORT:

A. SPUD (date and time)
B. TD (each interval date and time)
C. Cement in place (date and time)
D. RIG RELEASE (date and time)

## BIT & HYDRAULICS PLAN

| Bit # | Size | Mfg. | Type | IADC | Jets | Out | Hrs | ROP | WOB | RPM | GPM | PSI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12.25 | SEC | FDS (RR) | 116 | 3-12's | 300 | 4 | 75 | 35-45 | 100 | 400 | 1000 |
| 2 | 7.875 | HTC | HX20CJ | 517 | 3-11's | 5200 | 116 | 42 | 45-50 | 70-100 | 330 | 1800 |
| 3 | 7.875 | HTC | HRS30C | 537 | 3-12's | 6350 | 33 | 35 | 50-55 | 60-65 | 300 | 1800 |
| | | | | | | | 153 | | | | | |

## BOTTOM HOLE ASSEMBLIES

BHA #1: (0-300') - Bit, 2-8" DC, 10-6.25" DC's

BHA #2: (300'-6350') - Bit, 30 jts of 4.5" HWDP

## USE OF RT TOOL

Two RT tools will be run, one 500' above the top of the collars and the other at 1500' above the top the first RT tool. These tools will be used throughout the 7-7/8" section.

## MUD PROGRAM

| INTERVAL | MUD WEIGHT | FUNNEL VIS. | API Fluid Loss |
|---|---|---|---|
| 0' - 300' | 8.4 – 9.0 | 36-45 | NC |
| 300'-6350' | 9.9 – 10.1 | 28-32 | NC |

1) Level and build an all-weather location and access road.

2) MIRU. Perform rig safety inspection and ensure that everything is in proper working order prior to spudding well. The well will be drilled with a closed loop mud system. RU rails and cuttings catch tanks and additional mud cleaning equipment.

3) Notify NMOCD of intent to spud, run casing and cement each 24 hours in advance 505-748-1283.

4) Spud well with 12.25" mill tooth bit. Drill to +/- 300' (Actual depth will be determined by the length of the casing). Circulate hole clean. Sweep and condition hole to run casing. Drop a TOTCO prior to POOH (must run 1st survey prior to 500' per NMOCD rules). Pull out of hole, lay down 12.25" BHA.

**NOTE:** Mud through this interval will be a native spud mud supplemented with Bentonite. Lime may be used to flocculate the mud and increase the yield point to clean the hole. Mix paper for seepage control. Utilize all solids control equipment to control drill solids. Run as fine of mesh shaker screens as possible. Use water to control mud weight and viscosity. Maintain mud weight at 8.4 – 9.0 ppg.

5) Rig up casing crew and run 8-5/8", 24.0#, J-55, ST&C ($15.50/ft) as follows:

1-8-5/8" Texas Pattern Shoe
1-8-5/8" Insert Float Collar
1-8-5/8" x 12-1/4" Centralizer 10' above shoe
1-8-5/8" x 12-1/4" Centralizer every other joint
1-8-5/8" Stop Ring

6) Circulate for at least bottoms up plus one casing volume with mud prior to cementing. Cement surface casing according to cement recommendation. NOTE: Have field bin, cement, and circulating equipment on location prior to casing job.

a) Review rates, pressures, displacement volumes and casing pressure rating with Service Company and rig personnel. All cement slurries are to be lab tested; both a pilot test and a test of the actual field blend. Report results, including 24 hour compressive strengths, to the office. **(See Cement Testing Requirements below).** Also keep two samples of each dry cement in the event that a problem is encountered while cementing. Discard this sample if all indications are positive.

b) Cement well as follows: Pump 20 bbl fresh water followed by **350** sxs class "C" with 2% CcCl2, ¼# celloseal mixed @ 14.8ppg & 1.32 ft3/ sx Tail, Displace with fresh water, Bump plug with w/ 500 psi over final pump pressure.

c) If cement is not circulated to surface, contact the office and the NMOCDC and prepare to run 1" and top out cement. Have 1" pipe on location for possible top-out.

d) If cement falls, fill 12.25" X 8-5/8" annulus with cement.

7) Release pressure and check for flow back. Set casing on bottom. If float is holding, base nipple up of wellhead and BOP on the surface cement samples. Well must stand at least 8 hours total before any testing of casing is performed per NMOCD.

8) After Cementing casing, run a slip-on, weld-on casing head and test head to 1000 psi. Test BOP blind Rams & choke manifold 250# low & 3000# high. Pick up Bit #2 (7-7/8") & BHA , trip in hole, test BOP pipe rams 250# low & 3000#. Pressure test casing to 1000 psi for 30 minutes prior to drilling out shoe. Clearly report this test information of the daily drilling report.

**MUD NOTES: See Mud Program for details**

After cementing 8-5/8" casing circ pit with brine water. Mix paper for seepage control. Utilize pre-hydrated Gel/Lime sweeps for flushing the hole. Run all available solids control equipment to control weight. Add brine water as needed to maintain volume. Add LCM to system only as needed. Use batch LCM treatment if losses occur and maintain as needed.

9) Drill ahead with brine water in 7-7/8" hole taking deviation surveys every ±500' or nearest bit run per NMOCD rules. Use

sweeps as needed to clean hole. Drill to +/-6350; exact TD will be determined by the length of the casing. Sweep and condition hole in preparation for logging. Spot a 50 bbl, 40-42 visc pill prior to POOH for logs. Strap out of hole.

10) RU Wire line Truck and Tools. Log well as instructed by RB Operating. Rotary sidewall cores may be required along with RFTs.

11) Make a conditioning trip prior to running casing. Trip into hole with BHA and drill pipe, break circulation at 2400'. Ream last two stands to bottom. Circulate and condition hole. Maintain viscosity of 38. TOH laying down 4-1/2" drill pipe and drill collars. Clear floor and prepare to run casing.

12) Rig up casing crew and run 5-1/2" 15.5#, J-55, LT&C **($9.75/ft)** as follows:
    a) Float shoe (thread-lock)
    b) 2 jts. 5-1/2", 15.5#, J-55, LT&C casing (thread-lock)
    c) Float collar (thread-lock)
    d) 5-1/2", 15.5#, J-55, LT&C Casing to 3500'.
    e) Cement Stage Tool @ 3500'
    f) 5-1/2", 15.5#, J-55, LT&C Casing to surface

    The two bottom joints of 5-1/2" casing and the float shoe and float collar should be thread-locked (do not weld pipe). Run 1 centralizer 5' above shoe with limit clamp, one on the next collar, one just below the float collar with limit clamp and one per joint up to 4500'.

13) Circulate mud for at least bottoms up plus one casing volume prior to cementing.

14) Cement the production casing as follows. Re-figure cement volumes on a basis of: caliper + 20% + 50 sx. Precede Cement with 20 bbl fresh water, 500 gals superflush, 20 bbl fresh water

**Stage One:**

Slurry: PVL Cement + 0.3% D-167 + 0.2% D-65 +0.1% D-13 +0.2% D46 + 4#/sk D-24 + 1#/sk D-44

Slurry Weight: 13.0 ppg Slurry Yield: 1.41 cuft/sk Water: 6.83 gals/sk

**Stage Two:**

Slurry: 65/35 (Class C/POZ) + 6% D-20 + 5% D-44 + 0.3% S-1 + 4#/sk D-24 + 0.25#/sk

Slurry Weight: 12.4 ppg Slurry Yield: 2.21 cuft/sk Water: 12.11 gals/sk

Review rates, pressures, displacement volumes and casing pressure rating with Service Company and rig personnel. All cement slurries are to be lab tested; both a pilot test and a test of the actual field blend. Report results, including 24 hour compressive strengths, to the office. **(See Cement Testing Requirements below).** Also keep two samples of each dry cement.

a) Have additional water storage on location as necessary for mixing cement. Have water analyzed by cementing company for compatibility with cement and chemicals.

b) Reciprocate pipe during 1st Stage job. Take special care to move pipe very slowly on the down stroke. Pump spacer and cement at 7-8 BPM. When the last cement has been pumped, maintain rate at 7-8 BPM. Displace with fresh water. When reaching displacement to shoe joint minus 10 bbls slow pump rate to 2 barrels per minute or less prior to bumping plug. Bleed off pressure and check for backflow. If negative, remove the cap and drop the opening bomb for the second stage job. Wait 30 minutes then attempt to open stage tool.

Circulate a minimum of 2 hours prior to pumping second stage job.

c) Cement second stage. Bump plug with 500 psi over final displacement pressure and hold pressure for 15 minutes.

d) If cement does not circulate notify NMOCD office.

15) Release pressure and check for flow back. If floats are holding, continue to make preparations to hang 5-1/2" casing one foot off bottom. If floats do not hold, wait 12 hours on cement.

16) Set 5-1/2" slips in "A" section with full string weight. Nipple down BOP, Nipple up well head.

17) Install cap. Clean mud pits and release rig.

| | | | | |
|---|---|---|---|---|
| Don Robinson | Drillingg Manager | 469-450-2281 | 972-317-8345 | 817-509-1506 |
| | | | | |
| George Allen Teer | VP of Operations | (817) 723-1107 | (817) 491-3740 | (817) 870-2601 |
| | | | | |
| Andrew Tullis | District Engineer | | | (817) 870-2601 |
| | | | | |
| Rennie Hubnik | Chief Geologist | 817-907-8272 | (817) 430-4861 | 817-810-1982 |
| | | | | |
| Linda Stiles | Regulatory Tech | ( 817) 291-4618 | | 817-509-1505 |

817-810-1982

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|---|---|---|---|
| **TBD** | Rig Company | | (432)-425-4498 |
| | | | |
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| | | | |
| **Suttles Logging, Inc.** – Midland, TX | Mudlogging | Sam Samford | 432-687-3148 |
| **Schlumberger**-Artesia, NM | Cementing Service | Lynn Northcutt | (505)-748-1392<br>cell 505-365-7510 |
| **Nova Mud, Inc**- Hobbs, NM | Drlg Mud | Dale Welch | (800) 530-8786 |
| **National** – Hobbs, NM | Well Heads | | (505) 393-9928 |
| **Master Tubulars** – Midland, TX | Casing & Tubing | Randy Martin | (800) 682-8996 |
| **TFH** –Hobbs, NM | Dirt Contractor | | (505) 397-3270 |
| **Weatherford** –Artesia, NM | Float Equipment | | |
| | | | |
| **Halliburton Logging** –Hobbs, NM | Open Hole Logs | Michael Escriva<br>Tommy Johnson | (505) 392-7543 |
| **Allen's Casing Crew** -Hobbs, TX | Csg Crew | | |
| **Riverside**- Carlsbad, TX | Water - | | (505) 885-6663 |
| **National** –Hobbs, NM | General Supplies | | (505) 393-9928 |
| **TFH** –Hobbs, NM | Fork Lift | | (505) 397-3270 |
| | Trailer, sewage, water | | |
| **Abbot Brothers** | Conductor setting | | |
| **RTO Sales & Lease** | Satellite Internet | | 432-550-5678 |