12·6·93

# CHECKLIST for ADMINISTRATIVE INJECTION APPLICATIONS

Operator: PHILLIPS PETRO. CO. Well: RANGER WELL NO. 16

Contact: PAT CULPEPPER Title: ENG. Phone: 915·368·1542

DATE IN 11·24·93 RELEASE DATE 12·6·93 DATE OUT _____

Proposed Injection Application is for: ___ WATERFLOOD ___ Expansion ___ Initial

Original Order: R- _____ ___ Secondary Recovery ___ Pressure Maintenance

SENSITIVE AREAS X SALT WATER DISPOSAL

___WIPP ___ Capitan Reef ___ Commercial Operation

Data is complete for proposed well(s)? YES Additional Data _____

AREA of REVIEW WELLS

3 Total # of AOR 2 # of Plugged Wells

YES Tabulation Complete YES Schematics of P & A's

YES Cement Tops Adequate ___ AOR Repair Required

INJECTION INFORMATION

Injection Formation(s) BOURSE C + PENN

Source of Water " " " + DEVONIAN Compatible YES

PROOF OF NOTICE

YES Copy of Legal Notice YES Information Printed Correctly

N/A Correct Operators N/A Copies of Certified Mail Receipts

___ Objection Received ___ Set to Hearing _____ Date

NOTES: _____

APPLICATION QUALIFIES FOR ADMINISTRATIVE APPROVAL ___

COMMUNICATION WITH CONTACT PERSON:

1st Contact: ___ Telephoned ___ Letter _____ Date Nature of Discussion _____

2nd Contact: ___ Telephoned ___ Letter _____ Date Nature of Discussion _____

3rd Contact: ___ Telephoned ___ Letter _____ Date Nature of Discussion _____

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: ☐ Secondary Recovery ☒ Pressure Maintenance ☐ Disposal ☐ Storage
Application qualifies for administrative approval? ☐ yes ☐ no

II. Operator: Phillips Petroleum Company

Address: 4001 Penbrook, Odessa, TX 79762

Contact party: Pat Culpepper Phone: 915/368-1542

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? ☐ yes ☒ no
If yes, give the Division order number authorizing the project _____.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

* VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)

* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: K. E. Snow Title North Dist. Prod. Engr. Supvr.

Signature: Kevin E. Snow Date: 11/22/93

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal. _____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division district office.

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;

(3) the formation name and depth with expected maximum injection rates and pressures; and

(4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

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NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

PHILLIPS 66

# PHILLIPS PETROLEUM COMPANY
ODESSA E&P

PHILLIPS 66

## RANGER # 16

SEC. 23 T-12-S, R-35-E
CREATED BY: LEE SUMMERS

12S 34E

SEE ATTACHMENT 8

SEE ATTACHMENT 7

SEE ATTACHMENT 9

V. Area of Review - 1/2 mile radius.

Application for Authorization to Inject

PHILLIPS PETROLEUM COMPANY
RANGER WELL NO. 16

III. WELL DATA

A. 1. Name and Location: Ranger Well No. 16
(Formerly West Ranger Lake Unit Well No. 2)
1980' FSL & 1980' FWL
Section 26, T-12-S, R-34-E
Lea County, New Mexico

2. Casing

Surface: 13-3/8" OD, 54.5# J-55 set at 370'. (17-1/2" hole). Cemented with 400 sacks; TOC at surface (cement circulated).

Intermediate: 8-5/8" 32# J-55 set at 4200'. (11" hole). Cemented with 400 sacks. TOC at 3600' (Temperature Survey).

Production: 5-1/2" 17# J-55 to 20# N-80 set at 12816'. (7-7/8" hole). Cemented with 750 sacks. TOC at 6800' (Temperature Survey)

Openhole: 4-11/16" openhole from 12,816'-12,863'.

3. Tubing: 2-7/8" OD, 6.5# J-55 and L-80 set at 8950'. (Duoline fiberglass insert)

4. Packer: Elder Sur-Lok Retrievable Packer set at 8950'.

B. 1. Formation: Bough-C (Ranger Lake Bough Field) and Pennsylvanian (Ranger Lake Penn Field)

2. Interval: 9902'-11450' perforated selectively

3. Original Intent: Well was drilled for gas production

4. Perforated Interval: See Schematic - Attachment 1

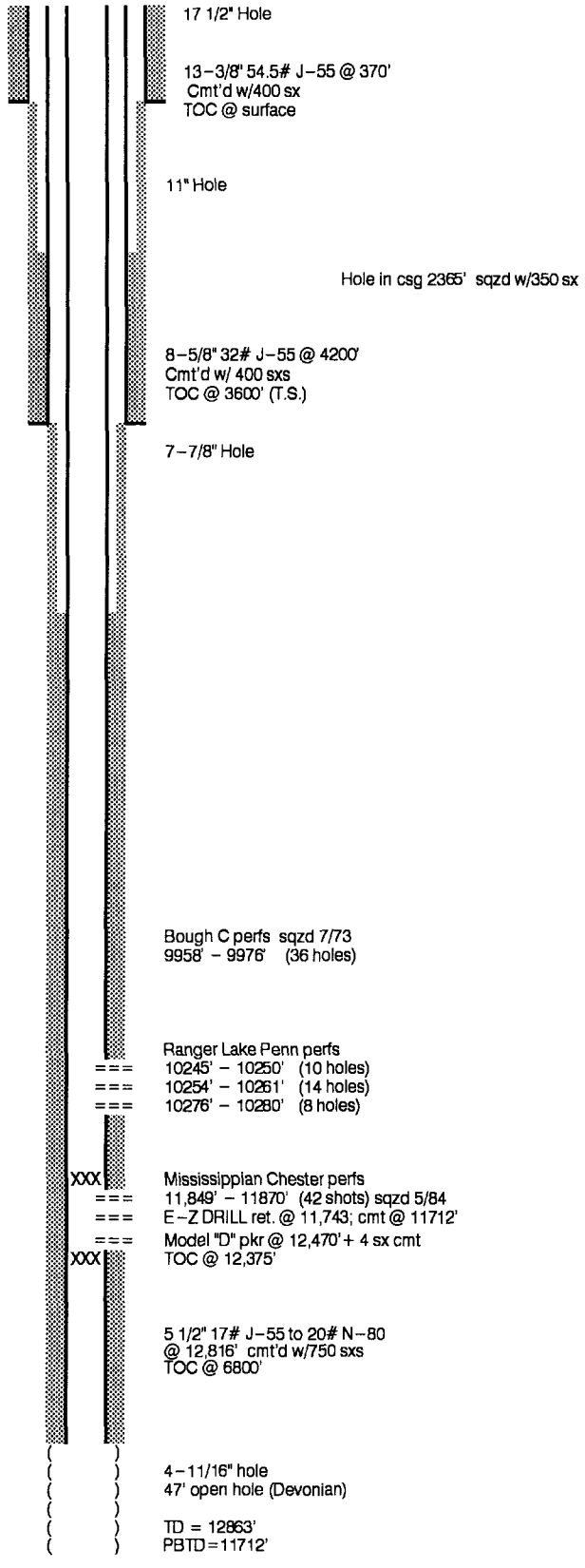
5. Productive Zones: The next higher oil or gas zone from the Ranger Lake Penn is the Abo at approximately 9100'. The Abo has not been found to be commercial within this area. The next oil or gas zone below the Ranger Lakes Penn interval is the Devonian at approximately 12,800' below the surface.

ATTACHMENT 1

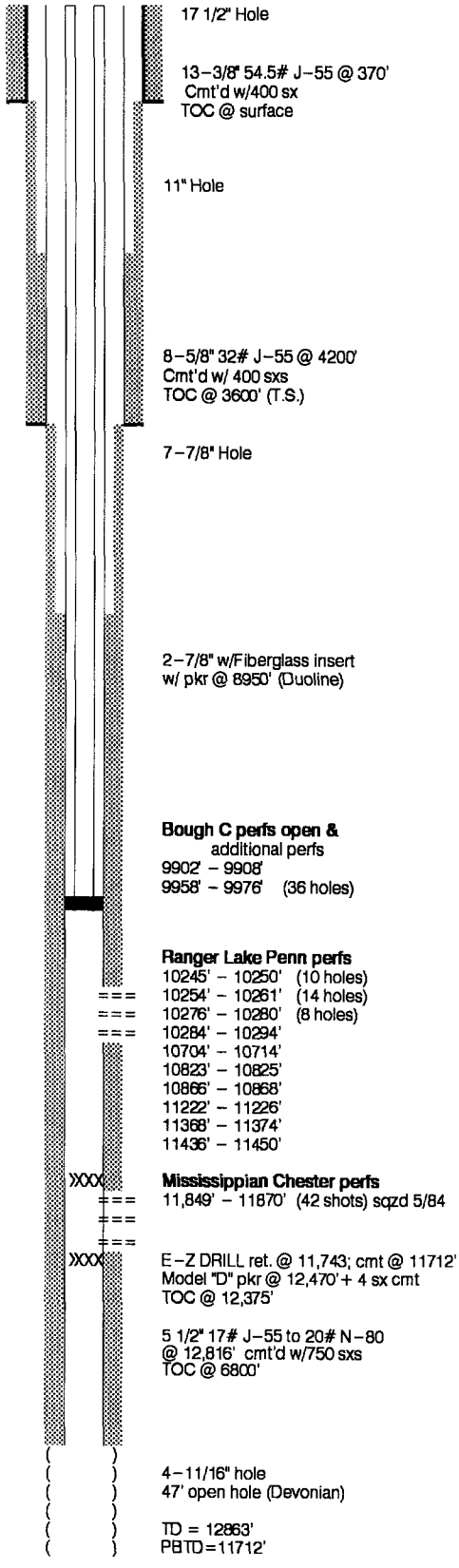
# Phillips Petroleum Company

**RANGER #16**

**EXISTING PRODUCING WELLBORE**




**PLANNED DISPOSAL WELLBORE**



ATTACHMENT 2

WELL SERVICE APPROVAL
PHILLIPS PETROLEUM COMPANY--PERMIAN BASIN REGION

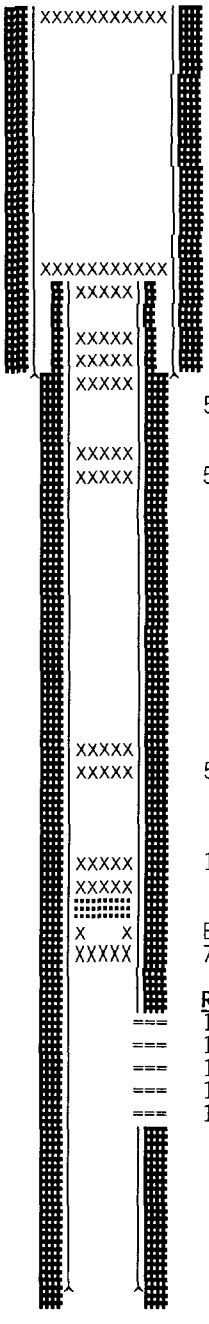
RKB @ 4160 '
CHF @ '
GL @ 4147 '

Date October 26, 1993

Area NORTH Subarea LOVINGTON
Lease & Well No. RANGER #11 (Ranger Lake Unit Tr. 2 #11)
Legal Description 1978' FNL & 1978' FWL SEC. 26, T12S, R34E
LEA COUNTY State: NEW MEXICO
Field RANGER LAKE - Penn
Status: P&A'D 1-26-77 BCPD BWPD MMCFD
Tbg: of " OD, #/ft, Gr.

Packer: Packer Type:
Date Drilled/Completed: 11-18-59
Hole/Casing Condition:
Stimulation History:

Proposal:



10 sx cement at surface

12-1/4" hole

5-1/2" casing pulled at 1150'. Spotted 50 sx cement plug from 1100'-1200'

8-5/8" 24# J-55 @ 1999'
Cmt'd w/707 sxs
TOC @ surface (circ.)

7-7/8" Hole

50 sx plug. Cement from 1535'-2050'.

50 sx plug. Cement from 2350'-2875'.

50 sx plug. Cement from 7000'-7500'.

100 sx hulls and 50 sx cement above packer. -Tagged TOC at 9950'

Baker Model "D" pkr @ 10220'
75 sx cmt below pkr

Ranger Lake Penn perfs
10274-10284' EL (20 holes)
10300-10326' EL (52 holes)
10308-10311' EL (18 holes super-bullet)
10340-10352' EL (24 holes)
10344-10347' EL (18 holes super-bullet)

5-1/2" 14# J-55 to 17# N-80
@ 10,359' Cmt'd w/1262 sx
TOC @ surface (circ.)

TD = 10,360'
PBTD = 0'

APPLICATION FOR AUTHORIZATION TO INJECT

PHILLIPS PETROLEUM COMPANY
RANGER #16

## VI. WELLS WITHIN THE AREA OF INTEREST (RADIUS OF INVESTIGATION = 1/2 MILE)

| Operator | Well Name | Location | Date Completed (DEPTH FT) | Well Type | Surface Casing Size (in) | Surface Casing Depth (ft) | Surface Casing Cement (sx) | Intermediate Casing Size (in) | Intermediate Casing Depth (ft) | Intermediate Casing Cement (sx) | Production Casing Size (in) | Production Casing Depth (ft) | Production Casing Cement (sx) | TOC (ft) | Initial Completion (zone) | Current Completion (zone) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phillips Petroleum Co. | Ranger #7 | 1980' FSL & 660' FWL Sec 26, T-12-S, R-34-E Lea County, NM | 8 October 1959 (10365) | oil | 13-3/8 | 351 | 375 | 8-5/8 | 4211 | 811 | 5-1/2 | 10363 | 700 | 4000 TS | 10212-10313 (Penn) | 9941-10313 (Bough-C/Penn) | |
| | Ranger #11 (Ranger Lake Unit Tract 2 #11) | 1978' FNL & 1978' FWL Sec 26, T-12-S, R-34-E Lea County, NM | 18 November 1959 (10360) | oil | | | | 8-5/8 | 1999 | 705 | 5-1/2 | 10359 | 1262 | surface circ | 10274-10352 (Penn) | plugged | Attachment 2 |
| | Ranger #12 (Ranger Lake Unit Tract 2 #12) | 660' FSL & 1830' FWL Sec 26, T-12-S, R-34-E Lea County, NM | 23 March 1960 (10350) | oil | | | | 8-5/8 | 2000 | 705 | 5-1/2 | 10348 | 1490 | 750 TS | 10228-10316 (Penn) | plugged | Attachment 3 |

TOC- c - calculated w/ a 50% safety factor
-circ- cement circulated
-TS- temperature survey

ATTACHMENT 3

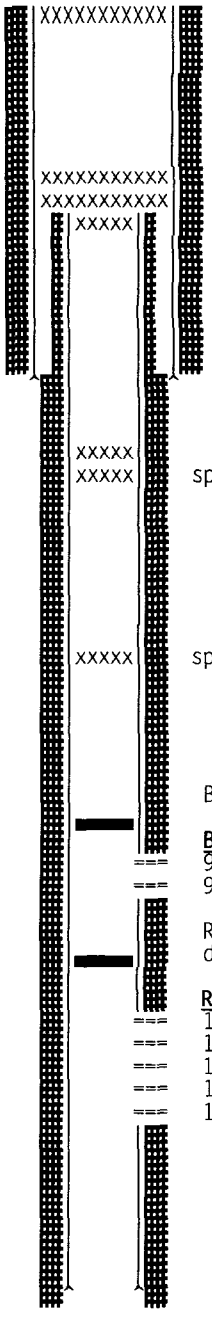
WELL SERVICE APPROVAL
PHILLIPS PETROLEUM COMPANY--PERMIAN BASIN REGION

RKB @ 4159 '
CHF @ _____ '
GL @ 4147 '

Category Code: THREE
Date October 26, 1993
Area NORTH Subarea LOVINGTON
Lease & Well No. RANGER #12 (Ranger Lake Unit Tr. 2 #12)
Legal Description 660' FSL & 1830' FWL SEC. 26, T12S, R34E
LEA COUNTY State: NEW MEXICO
Field RANGER LAKE
Status: P&A'D 8-28-80 _____BCPD _____BWPD _____MMCFD
Tbg: _____ of _____" OD, _____#/ft, Gr. _____

Packer: _____ Packer Type: _____
Date Drilled/Completed: 3-23-60
Hole/Casing Condition: _____
Stimulation History: _____

Proposal: _____



XXXXXXXXXXX

12-1/4" hole
35 sx cement plug
100' to surface

spotted 100 sx cmt
1488-1775'

XXXXXXXXXXX
XXXXXXXXXXX
XXXXX

Pulled 1725' of 5-1/2" csg

8-5/8" 24# J-55 @ 2000'
Cmt'd w/705 sxs
TOC @ surface (circ.)

7-7/8" Hole

XXXXX
XXXXX

spot 100 sx cmt @ 2800'

XXXXX

spot 50 sx cmt at 6800'

Bridgeplug at 9930' with 3 sx cement on top

Bough-C perfs
=== 9952-9957' (12 holes)
=== 9960-9962' ( 6 holes)

RBP @ 10000 (unable to retrieve)
dumped 3 sx cmt on RBP

Ranger Lake Penn perfs
=== 10228-10231' EL ( 6 holes)
=== 10233-10242' EL (18 holes)
=== 10261-10267' EL (12 holes)
=== 10276-10294' EL (36 holes)
=== 10309-10316' EL (14 holes)

5-1/2" 14# J-55 to 17# N-80
@ 10,348' Cmt'd w/1490 sx
TOC @ 750'

TD = 10,350'
PBTD = 0'

**Application for Authorization to Inject**

**PHILLIPS PETROLEUM COMPANY**
**RANGER WELL NO. 16**

VII. PROPOSED INJECTION OPERATIONS

| | | |
|---|---|---|
| 1. Rates: | average: | 500 BWPD |
| | maximum: | 2000 BWPD |
| 2. System: | closed | |
| 3. Pressures: | average: | 500 psi |
| | maximum: | 1980 psi |
| 4. Fluid: | Produced water analysis from the Phillips Ranger Well No. 20 (Devonian formation- Attachment 4), Ranger Well No. 7 (Bough-C/Penn commingled downhole- Attachment 5), and the Ranger Penn production battery (Includes 2 Penn wells plus the No. 7- Attachment 6). | |
| 5. Injection Zone: | The Bough-C and Penn are productive within one mile. | |

VIII. GEOLOGICAL DATA

| | | |
|---|---|---|
| A. | Injection Zone: | The Ranger Lake Pennsylvanian interval is characterized by shoaling-upward carbonate cycles. These cycles are mainly limestone grainstones composed of bioclasts and oolite material. Porosities average 5-10% with primary interparticle, biomoldic and oomoldic as the most common porosity types. The Ranger Lake Penn interval is approximately 700' to 1000' thick at a depth of 9900'-10900' from the surface. |
| B. | Fresh Water Sources: | The depth to an underground aquifer is the Ogallala at 300' from surface. |

ATTACHMENT 4

Champion Technologies, Inc.

GP.O.BOX 2187
HOBBS, N.M. 88240

PHONE: (505) 393-7726

# WATER ANALYSIS REPORT

Report for: Randall Smith
cc: Pat Culpepper
cc: Scott Malone
cc:
Company: Phillips
Address:
Service Engineer: Kenny Kearney

Date sampled: 9-20-93
Date reported: 10-5-93
Lease or well # : Ranger #20
County: State:
Formation: Devonian
Depth:
Submitted by: Kenny Kearney

| CHEMICAL COMPOSITION : | mg/L | meq/L |
|---|---|---|
| Chloride (Cl) | 31000 | 874 |
| Iron (Fe) (total) | 108.0 | |
| Total hardness | 5900 | |
| Calcium (Ca) | 1363 | 68 |
| Magnesium (Mg) | 607 | 49 |
| Bicarbonates (HCO3) | 817 | 13 |
| Carbonates (CO3) | n/a | |
| Sulfates (SO4) | 1218 | 25 |
| Hydrogen sulfide (H2S) | 119 | |
| Carbon dioxide (CO2) | 79 | |
| Sodium (Na) | 18318 | 796 |
| Total dissolved solids | 53325 | |
| Barium (Ba) | n/a | |
| Strontium (Sr) | n/a | |

| | |
|---|---|
| Specific Gravity | 1.038 |
| Density (#/gal.) | 8.650 |
| pH | 6.960 |
| IONIC STRENGTH | 0.98 |

Stiff-Davis (CaCO3) Stability Index :
SI = pH - pCa - pAlk - K

SI @ 86 F = +0.34
104 F = +0.57
122 F = +0.83
140 F = +1.12
158 F = +1.44

This water is 3130 mg/l (-64.44%) under ITS CALCULATED CaSO4 saturation value at 82 F.
SATURATION= 4857 mg/L PRESENT= 1727 mg/L

REPORTED BY MOSES G. JIMENEZ
LAB TECHNICIAN

ATTACHMENT 5

Champion Technologies, Inc.

GP.O.BOX 2187
HOBBS, N.M. 88240

PHONE: (505) 393-7726

# WATER ANALYSIS REPORT

Report for: Randall Smith
cc: Pat Culpepper
cc: Scott Malone
cc:
Company: Phillips
Address:
Service Engineer: Kenny Kearney

Date sampled: 9-20-93
Date reported: 10-5-93
Lease or well # : Ranger #7
County: State:
Formation:
Depth:
Submitted by: Kenny Kearney

| CHEMICAL COMPOSITION : | mg/L | meq/L |
|---|---|---|
| Chloride (Cl) | 45000 | 1269 |
| Iron (Fe) (total) | 0.0 | |
| Total hardness | 14300 | |
| Calcium (Ca) | 3528 | 176 |
| Magnesium (Mg) | 1336 | 107 |
| Bicarbonates (HCO3) | 170 | 3 |
| Carbonates (CO3) | n/a | |
| Sulfates (SO4) | 1153 | 24 |
| Hydrogen sulfide (H2S) | 30 | |
| Carbon dioxide (CO2) | 79 | |
| Sodium (Na) | 23294 | 1013 |
| Total dissolved solids | 74483 | |
| Barium (Ba) | n/a | |
| Strontium (Sr) | n/a | |

| | |
|---|---|
| Specific Gravity | 1.053 |
| Density (#/gal.) | 8.775 |
| pH | 6.600 |
| IONIC STRENGTH | 1.45 |

Stiff-Davis (CaCO3) Stability Index :
SI = pH - pCa - pAlk - K

SI @ 86 F = -0.31
104 F = -0.08
122 F = +0.18
140 F = +0.47
158 F = +0.79

This water is 1930 mg/l (-54.15%) under ITS CALCULATED CaSO4 saturation value at 82 F.
SATURATION= 3564 mg/L PRESENT= 1634 mg/L

REPORTED BY MOSES G. JIMENEZ
LAB TECHNICIAN

ATTACHMENT 6

Champion Technologies, Inc.

GP.O.BOX 2187
HOBBS, N.M. 88240

PHONE: (505) 393-7726

# WATER ANALYSIS REPORT

Report for: Randall Smith
cc: Pat Culpepper
cc: Scott Malone
cc:
Company: Phillips
Address:
Service Engineer: Kenny Kearney

Date sampled: 9-20-93
Date reported: 10-5-93
Lease or well # : Ranger Lease
County: State:
Formation: Penn
Depth:
Submitted by: Kenny Kearney

| CHEMICAL COMPOSITION : | mg/L | meq/L |
|---|---|---|
| Chloride (Cl) | 52000 | 1467 |
| Iron (Fe) (total) | 0.0 | |
| Total hardness | 14500 | |
| Calcium (Ca) | 3248 | 162 |
| Magnesium (Mg) | 1555 | 125 |
| Bicarbonates (HCO3) | 195 | 3 |
| Carbonates (CO3) | n/a | |
| Sulfates (SO4) | 1185 | 25 |
| Hydrogen sulfide (H2S) | 34 | |
| Carbon dioxide (CO2) | 74 | |
| Sodium (Na) | 27779 | 1208 |
| Total dissolved solids | 85963 | |
| Barium (Ba) | n/a | |
| Strontium (Sr) | n/a | |

| | |
|---|---|
| Specific Gravity | 1.061 |
| Density (#/gal.) | 8.842 |
| pH | 6.500 |
| IONIC STRENGTH | 1.65 |

Stiff-Davis (CaCO3) Stability Index :
SI = pH - pCa - pAlk - K

SI @ 86 F = -0.37
104 F = -0.14
122 F = +0.12
140 F = +0.41
158 F = +0.73

This water is 2334 mg/l (-58.15%) under ITS CALCULATED CaSO4 saturation value at 82 F.
SATURATION= 4014 mg/L PRESENT= 1680 mg/L

REPORTED BY MOSES G. JIMENEZ
LAB TECHNICIAN

Application for Authorization to Inject

PHILLIPS PETROLEUM COMPANY
RANGER WELL NO. 16

## IX. PROPOSED STIMULATION PROGRAM

The Bough-C will be perforated from 9902'-9908' and from 9956'-9978'. The Penn will be perforated from 10284'-11450' (selectively- new perforations). The current Penn perforations (10245'-10280') will remain open. The entire interval will be acidized with approximately 3000 gallons 15% NeFe HCl.

## X. LOGGING DATA

Well logs were filed after the well was drilled in 1968.

## XI. FRESH WATER ANALYSIS

Fresh Water Well Locations- See map of radius of investigation.

Fresh Water Analysis- See Attachments 7, 8 and 9.

## XII. AFFIRMATIVE STATEMENT

All available geological and engineering data has been examined and no evidence of open faults or any other hydrological connection between the injection zone and underground source of drinking water was found.

ATTACHMENT 7

Champion Technologies, Inc.

GP.O.BOX 2187
HOBBS, N.M. 88240

PHONE: (505) 393-7726

# W A T E R  A N A L Y S I S  R E P O R T

| | | | |
|---|---|---|---|
| Report for: | Randall Smith | Date sampled: | 9-20-93 |
| cc: | Pat Culpepper | Date reported: | 10-5-93 |
| cc: | Scott Malone | Lease or well # : | Ranger House Sub |
| cc: | | County: | State: |
| Company: | Phillips | Formation: | |
| Address: | | Depth: | |
| Service Engineer: | Kenny Kearney | Submitted by: | Kenny Kearney |

| CHEMICAL COMPOSITION : | mg/L | meq/L |
|---|---|---|
| Chloride (Cl) | 400 | 11 |
| Iron (Fe) (total) | 0.0 | |
| Total hardness | 630 | |
| Calcium (Ca) | 252 | 13 |
| Magnesium (Mg) | 0 | 0 |
| Bicarbonates (HCO3) | 268 | 4 |
| Carbonates (CO3) | n/a | |
| Sulfates (SO4) | 454 | 9 |
| Hydrogen sulfide (H2S) | n/a | |
| Carbon dioxide (CO2) | n/a | |
| Sodium (Na) | 288 | 13 |
| Total dissolved solids | 1663 | |
| Barium (Ba) | n/a | |
| Strontium (Sr) | n/a | |

| | |
|---|---|
| Specific Gravity | 1.001 |
| Density (#/gal.) | 8.342 |
| pH | 7.100 |
| IONIC STRENGTH | 0.04 |

Stiff-Davis (CaCO3) Stability Index :

SI = pH - pCa - pAlk - K

SI @ 86 F = +0.48
104 F = +0.70
122 F = +0.93
140 F = +1.17
158 F = +1.42

This water is 1773 mg/l (-76.06%) under ITS CALCULATED CaSO4 saturation value at 82 F.
SATURATION= 2331 mg/L PRESENT= 558 mg/L

REPORTED BY MOSES G. JIMENEZ
LAB TECHNICIAN

ATTACHMENT 8

Champion Technologies, Inc.

GP.O.BOX 2187
HOBBS, N.M. 88240

PHONE: (505) 393-7726

# W A T E R  A N A L Y S I S  R E P O R T

Report for: Randall Smith
cc: Pat Culpepper
cc: Scott Malone
cc:
Company: Phillips
Address:
Service Engineer: Kenny Kearney

Date sampled: 9-20-93
Date reported: 10-5-93
Lease or well # : S.Ranger Horse Past.
County: State:
Formation: FW Well
Depth:
Submitted by: Kenny Kearney

| CHEMICAL COMPOSITION : | mg/L | meq/L |
|---|---|---|
| Chloride (Cl) | 89 | 3 |
| Iron (Fe) (total) | 0.0 | |
| Total hardness | 120 | |
| Calcium (Ca) | 32 | 2 |
| Magnesium (Mg) | 9 | 1 |
| Bicarbonates (HCO3) | 73 | 1 |
| Carbonates (CO3) | n/a | |
| Sulfates (SO4) | 0 | 0 |
| Hydrogen sulfide (H2S) | n/a | |
| Carbon dioxide (CO2) | n/a | |
| Sodium (Na) | 31 | 1 |
| Total dissolved solids | 236 | |
| Barium (Ba) | n/a | |
| Strontium (Sr) | n/a | |

| | |
|---|---|
| Specific Gravity | 1.000 |
| Density (#/gal.) | 8.334 |
| pH | 8.010 |
| IONIC STRENGTH | 0.00 |

Stiff-Davis (CaCO3) Stability Index :
SI = pH - pCa - pAlk - K

SI @ 86 F = +0.55
104 F = +0.77
122 F = +1.00
140 F = +1.23
158 F = +1.48

This water is 2382 mg/l (%-100.00%) under ITS CALCULATED CaSO4 saturation value at 82 F.
SATURATION= 2382 mg/L PRESENT= 0 mg/L

REPORTED BY MOSES G. JIMENEZ
LAB TECHNICIAN

ATTACHMENT 9

Champion Technologies, Inc.

GP.O.BOX 2187
HOBBS, N.M. 88240

PHONE: (505) 393-7726

# WATER ANALYSIS REPORT

Report for: Randall Smith
cc: Pat Culpepper
cc: Scott Malone
cc:
Company: Phillips
Address:
Service Engineer: Kenny Kearney

Date sampled: 9-20-93
Date reported: 10-5-93
Lease or well # : E.Horse Pasture
County: State:
Formation: Windmill
Depth:
Submitted by: Kenny Kearney

| CHEMICAL COMPOSITION : | mg/L | meq/L |
|---|---|---|
| Chloride (Cl) | 100 | 3 |
| Iron (Fe) (total) | 0.0 | |
| Total hardness | 420 | |
| Calcium (Ca) | 100 | 5 |
| Magnesium (Mg) | 41 | 3 |
| Bicarbonates (HCO3) | 231 | 4 |
| Carbonates (CO3) | n/a | |
| Sulfates (SO4) | 152 | 3 |
| Hydrogen sulfide (H2S) | n/a | |
| Carbon dioxide (CO2) | n/a | |
| Sodium (Na) | 33 | 1 |
| Total dissolved solids | 659 | |
| Barium (Ba) | n/a | |
| Strontium (Sr) | n/a | |

| | |
|---|---|
| Specific Gravity | 1.000 |
| Density (#/gal.) | 8.334 |
| pH | 7.120 |
| IONIC STRENGTH | 0.02 |

Stiff-Davis (CaCO3) Stability Index :
SI = pH - pCa - pAlk - K

SI @ 86 F = +0.32
104 F = +0.54
122 F = +0.76
140 F = +1.00
158 F = +1.25

This water is 2306 mg/l (-96.61%) under ITS CALCULATED CaSO4 saturation value at 82 F.
SATURATION= 2387 mg/L PRESENT= 81 mg/L

REPORTED BY MOSES G. JIMENEZ
LAB TECHNICIAN

AFFIDAVIT OF PUBLICATION

State of New Mexico,
County of Lea.

I, Kathi Bearden

General Manager

of the Hobbs Daily News-Sun, a daily newspaper published at Hobbs, New Mexico, do solemnly swear that the clipping attached hereto was published once a week in the regular and entire issue of said paper, and not a supplement thereof for a period.

of _____

one weeks.
Beginning with the issue dated

October 29 , 19 93
and ending with the issue dated

October 29 , 19 93

Kathi Bearden
General Manager
Sworn and subscribed to before

me this 29 day of
October , 19 93
Charlene Perrin
Notary Public.

My Commission expires
March 15, 1997
(Seal)

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937, and payment of fees for said publication has been made.

**LEGAL NOTICE**
**October 29, 1993**

Notice is hereby given of the application of Phillips Petroleum Company, 4001 Penbrook Street, Odessa, Texas 79762, Attn.: L. M. Sanders, (915) 368-1488, to the Oil Conservation Division, New Mexico Energy & Mineral Department, for approval of the following water injection well authorization for the purpose of water injection.

Well name: Ranger Well No. 16.

Location 1980 feet from the South line and 1980 feet from the West line, Section 26, T-12-S, R-34-E, Lea County, NM.

The water injection formation is Bough C & Ranger Lake Penn at a depth of 9902'-11,450' below the surface of the ground.

Expected maximum injection rate is 2000 bbls. water per day and expected maximum injection pressure is 1980 pounds per square inch.

Interested parties must file objections or requests for hearing with the Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87501, within fifteen (15) days.

ATTACHMENT NO. XIV
Notification

I hereby certify that a complete copy of this application was sent by certified mail to the below listed persons on November 22, 1993.

Signed: _____
Name: for L. M. Sanders
Title: Supervisor, Regulatory Affairs
Date: 11/22/93

Surface Owner:

State of New Mexico
Commissioner of Public Lands
P. O. Box 1148
Santa Fe, New Mexico 87501-1148

Offset Operator:

Phillips Petroleum Company
4001 Penbrook St.
Odessa, Texas 79762

STATE OF NEW MEXICO

# ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
HOBBS DISTRICT OFFICE

93 DE R AM 9 25

11-24-93

BRUCE KING
GOVERNOR

POST OFFICE BOX 1980
HOBBS, NEW MEXICO 88241-1980
(505) 393-6161

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

RE: Proposed:
MC _____
DHC _____
NSL _____
NSP _____
SWD _____
WFX _____
PMX X

Gentlemen:

I have examined the application for the:

Phillips Petroleum Co Ranger #16-K 26-12-39
Operator Lease & Well No. Unit S-T-R

and my recommendations are as follows:

OK

Yours very truly,

Jerry Sexton
Supervisor, District 1

/ed