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|------------------|----------|-------------|----------------------|----------|------------------------|
| DATE IN 08/20/13 | SUSPENSE | ENGINEER TG | LOGGED IN 08/20/2013 | TYPE PMX | PPR NO. PPRG1323839191 |
|------------------|----------|-------------|----------------------|----------|------------------------|

ABOVE THIS LINE FOR DIVISION USE ONLY

**NEW MEXICO OIL CONSERVATION DIVISION**  
 - Engineering Bureau -  
 1220 South St. Francis Drive, Santa Fe, NM 87505



**ADMINISTRATIVE APPLICATION CHECKLIST**

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

**Application Acronyms:**

**[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]**  
**[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]**  
**[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]**  
**[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]**  
**[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]**  
**[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]**

**[1] TYPE OF APPLICATION - Check Those Which Apply for [A]**

**[A] Location - Spacing Unit - Simultaneous Dedication**  
☐ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

**[B] Commingling - Storage - Measurement**  
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

**[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery** Empire Abo Unit 45  
☐ WFX ☒ PMX ☐ SWD ☐ IPI ☐ EOR ☐ PPR 30-015-03188

**[D] Other: Specify** \_\_\_\_\_

**[2] NOTIFICATION REQUIRED TO: - Check Those Which Apply, or Does Not Apply**

**[A] X Working, Royalty or Overriding Royalty Interest Owners**  
**[B] X Offset Operators, Leaseholders or Surface Owner**  
**[C] X Application is One Which Requires Published Legal Notice**  
**[D] X Notification and/or Concurrent Approval by BLM or SLO**  
 U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office  
**[E] X For all of the above, Proof of Notification or Publication is Attached, and/or,**  
**[F] ☐ Waivers are Attached**

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**[3] SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.**

**[4] CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

**Note: Statement must be completed by an individual with managerial and/or supervisory capacity.**

Brian Wood

Print or Type Name

Signature

Consultant

Title

8-20-13

Date

brian@permitswest.com

e-mail Address

**APPLICATION FOR AUTHORIZATION TO INJECT**

- I. PURPOSE: \_\_\_\_\_ Secondary Recovery \_\_\_\_\_ XXX Pressure Maintenance \_\_\_\_\_ Disposal \_\_\_\_\_ Storage  
Application qualifies for administrative approval? \_\_\_\_\_ Yes \_\_\_\_\_ No
- II. OPERATOR: APACHE CORPORATION  
ADDRESS: 303 VETERANS AIR PARK LANE, SUITE 3000, MIDLAND, TX 79705  
CONTACT PARTY: BRIAN WOOD (PERMITS WEST, INC.) PHONE: 505 466-8120
- 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? XXX Yes \_\_\_\_\_ No  
If yes, give the Division order number authorizing the project: R-4549 et al
- 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: **Empire Abo Unit 45**  
**30-015-03188**
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 geologic data on the injection zone including appropriate lithologic detail, geologic 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 sources 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 sources 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: BRIAN WOOD

TITLE: CONSULTANT

SIGNATURE: \_\_\_\_\_

DATE: AUG. 19, 2013

E-MAIL ADDRESS: brian@permitswest.com

- \* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: \_\_\_\_\_

### 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 the 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, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, 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.

## INJECTION WELL DATA SHEET

OPERATOR: APACHE CORPORATIONWELL NAME & NUMBER: EMPIRE ABO UNIT 45

|  |             |           |             |             |
|--|-------------|-----------|-------------|-------------|
| WELL LOCATION: <u>2310 FNL &amp; 330 FWL</u> | <u>E</u>    | <u>30</u> | <u>17 S</u> | <u>29 E</u> |
| FOOTAGE LOCATION                             | UNIT LETTER | SECTION   | TOWNSHIP    | RANGE       |

WELLBORE SCHEMATICWELL CONSTRUCTION DATASurface Casing

Hole Size: 11" Casing Size: 8-5/8"  
 Cemented with: 300 sx. *or* \_\_\_\_\_ ft<sup>3</sup>  
 Top of Cement: SURFACE Method Determined: VISUAL

Intermediate Casing

Hole Size: \_\_\_\_\_ Casing Size: \_\_\_\_\_  
 Cemented with: \_\_\_\_\_ sx. *or* \_\_\_\_\_ ft<sup>3</sup>  
 Top of Cement: \_\_\_\_\_ Method Determined: \_\_\_\_\_

Production Casing

Hole Size: 7-7/8" Casing Size: 5-1/2"  
 Cemented with: 600 sx. *or* \_\_\_\_\_ ft<sup>3</sup>  
 Top of Cement: 1,180' Method Determined: temperature  
 Total Depth: 6,375' survey

Injection Interval

5,998' feet to 6,334'

(Perforated or Open Hole; indicate which)

8-5/8" 24# in  
 11" hole @ 724'  
 TOC = GL

5-1/2" 14# & 15.5# in  
 7-7/8" hole @ 6,375'  
 TOC = 1,180'  
 (temp. survey)

now perforated  
 5998' - 6180'

will set packer  
 @ ≈5,950'

will set  
 3-1/2" tbg  
 @ ≈5975'

will add perfs  
 6180'-6334'

PBTD 6198'  
 TD 6375'

(not to scale)

**INJECTION WELL DATA SHEET**Tubing Size: 3-1/2" Lining Material: TUBOSCOPE TK FIBERType of Packer: ARROW AS-1XPacker Setting Depth: ≈5950'

Other Type of Tubing/Casing Seal (if applicable): \_\_\_\_\_

Additional Data

1. Is this a new well drilled for injection? \_\_\_\_\_ Yes XXX No

If no, for what purpose was the well originally drilled? OIL WELL

2. Name of the Injection Formation: ABO

3. Name of Field or Pool (if applicable): EMPIRE; ABO (22040)

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. ONLY PERFORATED IN ABO

PERF 5998-6180 (now open), 6207-6289 (squeezed w/ 125 sx), 6269-6334 (sqzd. 250 sx)

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: \_\_\_\_\_

OVER: PADDOCK (3940'), GLORIETA YESO (3908'), SAN ANDRES (2350'),GRAYBURG (1970'), QUEEN (1640'), SEVEN RIVERS (1039'), YATES (792')UNDER: CISCO (8600'), ATOKA (10100'), MORROW (10530')

APACHE CORPORATION  
EMPIRE ABO UNIT 45  
2310' FNL & 330' FWL SEC. 30, T. 17 S., R. 29 E.  
EDDY COUNTY, NEW MEXICO

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I. Purpose is to convert a 6,375' deep Empire; Abo oil well to a water injection well. Most recent production was from the Abo shale (5,998' - 6,180'). Production also occurred in the lower Abo reef (6,260' - 6,334'). Injection may occur in the entire Abo shale - reef interval (from 5,998' to 6,334'). This is the Empire; Abo Pool (NMOCD pool code 22040). It would be the 22nd injection well in the unit. Previous injection well rules or orders are R-4549 and PMX-55, PMX-58, PMX-61, PMX-62, PMX-65, PMX-116, and PMX-188.

II. Operator: Apache Corporation (OGRID #873)  
Operator phone number: (432) 818-1052  
Operator address: 303 Veterans Air Park Lane, Suite 3000  
Midland, TX 79705  
Contact for Application: Brian Wood (Permits West, Inc.)  
Phone: (505) 466-8120

III. A. (1) Lease: New Mexico State Land Office lease E0-4201-0000  
Lease Size: 283.82 acres (see Exhibit A for C-102 and maps)  
Unit Size: 11,339.15 acres  
Unit Number: 300117  
Closest Lease Line: 330'  
Closest Unit Line: 990'  
Lease: Lots 1 - 3 & E2NW4 Section 30, T. 17 S., R. 29 E. et al

A. (2) Surface casing (8-5/8", 24#, J-55) was set in 1960 at 724' in an 11" hole. Casing was cemented to the surface with 300 sacks Halliburton. Cement circulated to the surface.

Production casing (5-1/2", 14# & 15.5#, J-55) was set at 6,375' (TD) in a 7-7/8" hole. Casing was cemented to 1,180' (according to temperature survey) with 600 sacks Halliburton and 50 gallons latex.

- A. (3) Tubing will be 3-1/2", J-55, 9.3#, 8 rd EUE with turned down couplings coated with Tuboscope® TK fiber line. Setting depth will be ≈5,975'. (Highest perforation is at 5,998'.)
- A. (4) An Arrow AS-1X packer will be set at ≈5,950' (48' above the highest perforation of 5,998').
- B. (1) Injection zone will be the Abo, which is part of the Empire; Abo Pool (NMOCD pool code number 22040).
- B. (2) Injection interval will be 5,998' to 6,334'. The entire well bore is cased.
- B. (3) Well was drilled in 1960 as an Empire; Abo oil well. The well last produced in April 2012. Production in the first four months of 2012 averaged 0.77 bopd and 1.8 Mcfd. The well has cumulatively produced 323,536 barrels of oil, 420,573 Mcf of gas, and 148,807 barrels of water from 3 different Abo intervals. Two intervals have been squeezed. Only the Abo shale is currently perforated (5,998' - 6,180'). See Exhibit B for current well bore status.
- B. (4) Apache will drill out to 6,375'. The injection interval will be perforated with 4 shots per foot. Shot diameter = 0.42". Existing open perforations are 5,998' - 6,180'. Perforation history is:

1960: perforated 6,269' - 6,334'  
1971 (March): squeezed above with 250 sx  
1971 (March): perforate 6,207' - 6,287'  
1971 (August): perforated 6,306' - 6,311'  
1988: perforated 6,212' - 6,246'  
1999: squeezed 6,207' - 6,260' with 125 sx  
1999: perforated 5,998' - 6,180'

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- B. (5) Higher and lower potential oil or gas zones and the number of wells in Sections 25 and 30 that have produced from that zone are:

Yates (3 wells)  
Seven Rivers (3 wells)  
Queen (42 wells)  
Grayburg (45 wells)  
San Andres (23 wells)  
Glorieta Yeso (117 wells)  
*Abo (18 wells)*  
Atoka (1 well)  
Morrow (3 wells)

IV. This is an expansion of an existing injection project. There are 5 other Abo injection wells within 3,556' to 6,245' in the unit. Cumulative injection through May 31, 2013 in those 5 wells is 49,671,076 barrels. Converting this oil well to an injection well will improve unit economics and positively affect existing production within the Empire Abo Unit. The well last produced (January-April 2012) at rates of <1 bopd, <2 Mcfd, and >5 bwpd. Those production levels generated a negative present value when run against an average operating cost of ≈\$3,400 per month and Nymex strip pricing.

V. Exhibit C shows 73 existing wells (58 producing oil or gas + 13 plugged & abandoned + 2 water injection (none Abo)) within a half-mile radius. Exhibit D shows 684 existing wells (574 producing oil or gas + 87 plugged & abandoned + 20 water injectors or disposals + 3 water wells) within a two-mile radius.

Exhibit E shows all leases and lessors (only State and BLM) within a half-mile. Exhibit F shows all leases and lessors within a two-mile radius. Most of the land is State, some is BLM, and less is fee. Details on the leases within a half-mile are:

| <u>T. 17 S., R. 28 E.</u> | <u>Lessor</u> | <u>Lease Number</u> | <u>Lessee</u> |
|---------------------------|---------------|---------------------|---------------|
| all Sec. 25               | NMSLO         | XO-0647-0405        | Khody         |
| NENE Sec. 36              | NMSLO         | XO-0647-0405        | Khody         |



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| T. 17 S., R. 29 E.       | Lessor | Lease Number | Lessee              |
|--------------------------|--------|--------------|---------------------|
| Lot 4 Sec. 19            | NMSLO  | BO-7677-0004 | COG                 |
| SESW Sec. 19             | NMSLO  | EO-0742-0000 | ExxonMobil          |
| S2SE4 Sec. 30            | BLM    | NMLC-062407  | Khody & Pitch       |
| S2NE4 Sec. 30            | BLM    | NMLC-028480A | COG                 |
| N2SE4 Sec. 30            | BLM    | NMNM-029269  | COG, Concho, Khody  |
| N2NE4 Sec. 30            | BLM    | NMNM-029267  | COG                 |
| Lots 1-3 & E2NW4 Sec. 30 | NMSLO  | EO-4201-0000 | ConocoPhillips      |
| Lot 4 & SESW Sec. 30     | NMSLO  | BO-7596-0000 | ConocoPhillips      |
| NESW Sec. 30             | NMSLO  | OG-0181-0001 | Harvey E. Yates Co. |

VI. Twelve of the 73 existing wells that are within a half-mile penetrated the Abo. Eight of the 12 penetrators are Abo wells and 4 are deeper gas wells. Five of the eight Abo wells are plugged and abandoned. Closest Abo well is a plugged and abandoned well (46) that is 926' east. Closest current Abo producer (46A) is 1,152' southeast and produces from the upper reef. Injection will be in the shale and lower reef. A table abstracting construction details and history of all 12 penetrators and diagrams of the 6 plugged penetrators are in Exhibit G.

The 67 existing wells and 2 approved, but not yet drilled, wells that are within a half-mile (regardless of depth) are:

| OPERATOR | WELL             | API 30-015- | LOCATION                       | ZONE(S)                       | STATUS | TD   | DISTANCE |
|----------|------------------|-------------|--------------------------------|-------------------------------|--------|------|----------|
| COG      | Continental A 9  | 32302       | 2310 FN & 580 FW<br>30-17s-29e | Empire;<br>Glorieta-Yeso      | Oil    | 4376 | 250      |
| COG      | Continental A 13 | 35946       | 1650 FN & 330 FW<br>30-17s-29e | Empire;<br>Glorieta-Yeso      | Oil    | 5600 | 660      |
| Apache   | D State 21       | 30975       | 2310 FS & 330 FE<br>25-17s-28e | Art; Glor-Yeso<br>Art; Q-G-SA | Oil    | 4430 | 718      |
| COG      | Continental A 22 | 39776       | 1650 FN & 660 FW<br>30-17s-29e | Empire;<br>Glorieta-Yeso      | Oil    | 5559 | 737      |
| COG      | Continental A 14 | 39329       | 2280 FS & 800 FW<br>30-17s-29e | Empire;<br>Glorieta-Yeso      | Oil    | 5613 | 861      |

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| OPERATOR | WELL             | API 30-015- | LOCATION                        | ZONE(S)                  | STATUS | TD   | DISTANCE |
|----------|------------------|-------------|---------------------------------|--------------------------|--------|------|----------|
| BP       | Empire Abo 46    | 03189       | 2310 FN & 1254 FW<br>30-17s-29e | Empire; Abo              | P & A  | 6353 | 926      |
| COG      | Continental A 15 | 39146       | 2060 FS & 417 FW<br>30-17s-29e  | Empire;<br>Glorieta-Yeso | Oil    | 5884 | 937      |
| BP       | Empire Abo 45A   | 03190       | 1980 FS & 330 FW<br>30-17s-29e  | Empire; Abo              | P & A  | 6374 | 1014     |
| Apache   | D State 45       | 38409       | 1820 FS & 350 FE<br>25-17s-28e  | Art; Glor-Yeso           | Oil    | 4600 | 1026     |
| COG      | Continental A 5  | 30613       | 1927 FS & 435 FW<br>30-17s-29e  | Empire;<br>Glorieta-Yeso | Oil    | 4422 | 1073     |
| Mack     | Continental E 1  | 10317       | 1914 FS & 401 FW<br>30-17s-29e  | Art; Q-G-SA              | P & A  | 2501 | 1085     |
| COG      | Continental A 2  | 29697       | 1650 FN & 1251 FW<br>30-17s-29e | Empire;<br>Glorieta-Yeso | Oil    | 4287 | 1130     |
| Apache   | N B State 11     | 36789       | 1810 FN & 330 FE<br>25-17s-28e  | Art; Glor-Yeso           | Oil    | 5200 | 1131     |
| COG      | Continental A 8  | 31619       | 2110 FN & 1449 FW<br>30-17s-29e | Empire;<br>Glorieta-Yeso | Oil    | 4360 | 1139     |
| Mack     | Five J 1         | 10480       | 1650 FS & 330 FE<br>25-17s-28e  | Art; Q-G-SA              | P & A  | 2385 | 1149     |
| Apache   | Empire Abo 46A   | 03194       | 2314 FS & 1256 FW<br>30-17s-29e | Empire; Abo              | Oil    | 6360 | 1152     |
| COG      | Continental A 10 | 32412       | 990 FN & 330 FW<br>30-17s-29e   | Empire;<br>Glorieta-Yeso | Oil    | 5436 | 1320     |
| Apache   | N B State 1      | 35915       | 2310 FN & 990 FE<br>25-17s-28e  | Art; Glor-Yeso           | Oil    | 5600 | 1387     |
| LRE      | Marathon A 25 14 | 30825       | 1650 FN & 330 FE<br>25-17s-28e  | Red Lake; Q-G-SA         | Oil    | 3505 | 1388     |
| Apache   | D State 76       | 40309       | 2270 FS & 1040 FE<br>25-17s-28e | Art; Glor-Yeso           | Oil    | 4721 | 1414     |

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| OPERATOR        | WELL             | API 30-015- | LOCATION                        | ZONE(S)                       | STATUS | TD    | DISTANCE |
|-----------------|------------------|-------------|---------------------------------|-------------------------------|--------|-------|----------|
| COG             | Mimosa 1         | 30575       | 2310 FS & 1580 FW<br>30-17s-29e | Empire;<br>Glorieta-Yeso      | Oil    | 5333  | 1423     |
| BP              | Empire Abo 44    | 01543       | 1980 FS & 990 FE<br>25-17s-28e  | Empire; Abo                   | P & A  | 6385  | 1461     |
| COG             | Continental A 19 | 37870       | 870 FN & 750 FW<br>30-17s-29e   | Empire;<br>Glorieta-Yeso      | Oil    | 5580  | 1501     |
| Mack            | Continental E 4  | 10542       | 2310 FN & 1911 FW<br>30-17s-29e | Art; Q-G-SA                   | P & A  | 2401  | 1585     |
| COG             | Continental A 4  | 34690       | 990 FN & 1242 FW<br>30-17s-29e  | Empire;<br>Glorieta-Yeso      | Oil    | 5415  | 1607     |
| Apache          | N B State 30     | 39748       | 2310 FN & 330 FE<br>25-17s-28e  | Art; Glor-Yeso                | Oil    | 5708  | 1636     |
| COG             | Mimosa 4         | 34691       | 1650 FS & 1263 FW<br>30-17s-29e | Empire;<br>Glorieta-Yeso      | Oil    | 4618  | 1640     |
| COG             | Continental A 7  | 31507       | 2314 FN & 1968 FW<br>30-17s-29e | Empire;<br>Glorieta-Yeso      | Oil    | 4335  | 1640     |
| Apache          | Dad State 42     | 33456       | 1916 FS & 1190 FE<br>25-17s-28e | Art; Glor-Yeso                | Oil    | 4580  | 1672     |
| Harvey<br>Yates | Empire Deep 18   | 22400       | 1980 FN & 1980 FW<br>30-17s-29e | South Empire<br>Morrow        | P & A  | 11010 | 1687     |
| Apache          | N B State 16     | 38406       | 1650 FN & 990 FE<br>25-17s-28e  | Art; Glor-Yeso                | Oil    | 5705  | 1704     |
| Mack            | Johnson 1        | 10548       | 1760 FS & 1592 FW<br>30-17s-29e | Art; Q-G-SA                   | P & A  | 2463  | 1770     |
| COG             | Continental A 11 | 34742       | 1450 FN & 1907 FW<br>30-17s-29e | Empire;<br>Glorieta-Yeso      | WIW    | 5757  | 1799     |
| COG             | Mimosa 3         | 33006       | 2160 FS & 1919 FW<br>30-17s-29e | Empire;<br>Glorieta-Yeso      | Oil    | 4405  | 1800     |
| Apache          | D State 22       | 31966       | 840 FS & 330 FE<br>25-17s-28e   | Art; Glor-Yeso<br>Art; Q-G-SA | Oil    | 4560  | 1873     |

**APACHE CORPORATION**  
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| OPERATOR | WELL             | API 30-015- | LOCATION                        | ZONE(S)                  | STATUS | TD   | DISTANCE |
|----------|------------------|-------------|---------------------------------|--------------------------|--------|------|----------|
| COG      | Continental A 12 | 35052       | 330 FN & 583 FW<br>30-17s-29e   | Empire;<br>Glorieta-Yeso | WIW    | 5460 | 2001     |
| Mack     | Continental B 2  | 10318       | 990 FS & 330 FW<br>30-17s-29e   | Art; Q-G-SA              | P & A  | 2486 | 2006     |
| Apache   | N B State 36     | 40154       | 2310 FN & 1650 FE<br>25-17s-28e | Art; Glor-Yeso           | Oil    | 5711 | 2024     |
| COG      | Continental A 6  | 30610       | 990 FN & 1907 FW<br>30-17s-29e  | Empire;<br>Glorieta-Yeso | Oil    | 4220 | 2058     |
| Apache   | D State 56       | 38469       | 990 FS & 990 FE<br>25-17s-28e   | Art; Glor-Yeso           | Oil    | 4622 | 2085     |
| Apache   | A State 48       | 38549       | 1000 FN & 890 FE<br>25-17s-28e  | Empire;<br>Glorieta-Yeso | Oil    | 5700 | 2116     |
| Apache   | D State 7        | 40310       | 1786 FS & 1620 FE<br>25-17s-28e | Art; Glor-Yeso           | Oil    | 4700 | 2124     |
| COG      | Continental A 23 | 39718       | 240 FN & 940 FW<br>30-17s-29e   | Empire;<br>Glorieta-Yeso | Oil    | 5582 | 2161     |
| Apache   | N B State 8      | 36796       | 1850 FN & 1650 FE<br>25-17s-28e | Art; Glor-Yeso           | Oil    | 5600 | 2165     |
| COG      | Mimosa 2         | 30626       | 1650 FS & 2070 FW<br>30-17s-29e | Empire;<br>Glorieta-Yeso | Oil    | 5292 | 2205     |
| Alamo    | State 647 204    | 41077       | 660 FS & 790 FE<br>25-17s-28e   | Art; Q-G-SA              | Oil    | 2745 | 2241     |
| COG      | Western 3        | 30357       | 2330 FN & 1650 FE<br>30-17s-29e | Empire;<br>Glorieta-Yeso | Oil    | 5200 | 2242     |
| COG      | Continental B 3  | 10319       | 990 FS & 1375 FW<br>30-17s-29e  | Art; Q-G-SA              | Oil    | 2512 | 2251     |
| COG      | Continental A 1  | 29696       | 330 FN & 1409 FW<br>30-17s-29e  | Empire;<br>Glorieta-Yeso | Oil    | 4260 | 2258     |
| BP       | Empire Abo 47A   | 03197       | 2310 FN & 2310 FE<br>30-17s-29e | Empire; Abo              | P & A  | 6313 | 2262     |

APACHE CORPORATION  
 EMPIRE ABO UNIT 45  
 2310' FNL & 330' FWL SEC. 30, T. 17 S., R. 29 E.  
 EDDY COUNTY, NEW MEXICO

PAGE 8

30-015-03188


| OPERATOR  | WELL             | API 30-015- | LOCATION                        | ZONE(S)                           | STATUS | TD    | DISTANCE |
|-----------|------------------|-------------|---------------------------------|-----------------------------------|--------|-------|----------|
| LRE       | Marathon A 25 12 | 30682       | 1650 FN & 1650 FE<br>25-17s-28e | Red Lake;<br>Q-G-SA               | Oil    | 3510  | 2269     |
| COG       | Continental B 4  | 30517       | 990 FS & 1420 FW<br>30-17s-29e  | Empire;<br>Glorieta-Yeso          | Oil    | 4515  | 2289     |
| COG       | Western 2        | 30310       | 1650 FN & 2310 FE<br>30-17s-29e | Empire;<br>Glorieta-Yeso          | Oil    | 5170  | 2322     |
| COG       | Western 5        | 31777       | 2160 FN & 2310 FE<br>30-17s-29e | Empire;<br>Glorieta-Yeso          | Oil    | 5669  | 2336     |
| ARCO      | Empire Abo 43    | 01540       | 2310 FN & 1980 FE<br>25-17s-28e | Empire; Abo                       | P & A  | 7950  | 2349     |
| Alamo     | State 647 203    | 10312       | 330 FS & 330 FE<br>25-17s-28e   | Art; Q-G-SA                       | P & A  | 2521  | 2358     |
| Apache    | Empire Abo 47    | 03193       | 2150 FS & 2310 FE<br>30-17s-29e | Empire; Abo                       | Oil    | 6370  | 2392     |
| Apache    | D State 75       | 39925       | 350 FS & 500 FE<br>25-17s-28e   | Art; Glor-Yeso                    | Oil    | 4738  | 2394     |
| COG       | Continental A 3  | 34741       | 505 FN & 1902 FW<br>30-17s-29e  | Empire;<br>Glorieta-Yeso          | Oil    | 5425  | 2396     |
| Alamo     | Leonard 9        | 03191       | 2050 FS & 2310 FE<br>30-17s-29e | Art; Q-G-SA                       | Oil    | 2699  | 2400     |
| Mewbourne | Empire 25 1      | 31140       | 1980 FN & 1980 FE<br>25-17s-28e | Empire; Atoka<br>Empire; Morrow S | Gas    | 10851 | 2428     |
| Enervest  | State B V 1      | 22317       | 1800 FS & 1980 FE<br>25-17s-28e | Empire; Morrow S                  | Gas    | 10860 | 2455     |
| Apache    | D State 29       | 31940       | 510 FS & 990 FE<br>25-17s-28e   | Art; Glor-Yeso<br>Art; Q-G-SA     | Oil    | 4550  | 2478     |
| Apache    | A State 49       | 38963       | 380 FN & 450 FE<br>25-17s-28e   | Art; Glor-Yeso                    | Oil    | 5700  | 2478     |
| Apache    | Empire Abo 43    | 01538       | 1650 FS & 1980 FE<br>25-17s-28e | Empire; Abo                       | Oil    | 6374  | 2510     |

APACHE CORPORATION  
 EMPIRE ABO UNIT 45  
 2310' FNL & 330' FWL SEC. 30, T. 17 S., R. 29 E.  
 EDDY COUNTY, NEW MEXICO

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30-015-03188

| OPERATOR           | WELL             | API 30-015- | LOCATION                        | ZONE(S)                       | STATUS | TD    | DISTANCE |
|--------------------|------------------|-------------|---------------------------------|-------------------------------|--------|-------|----------|
| COG                | Navaho 4         | 31094       | 2141 FS & 2188 FE<br>30-17s-29e | Empire;<br>Glorieta-Yeso      | Oil    | 4549  | 2511     |
| COG                | Continental B 7  | 35239       | 990 FS & 1856 FW<br>30-17s-29e  | Empire;<br>Glorieta-Yeso      | Oil    | 5720  | 2528     |
| Johnston           | Continental 5    | 10615       | 330 FN & 1902 FW<br>30-17s-29e  | Aid; 7 Rivers                 | P & A  | 951   | 2530     |
| Apache             | D State 24       | 31390       | 990 FS & 1650 FE<br>25-17s-28e  | Art; Glor-Yeso<br>Art; Q-G-SA | Oil    | 4467  | 2565     |
| COG                | Goldstar 8       | 32369       | 990 FN & 2310 FE<br>30-17s-29e  | Empire;<br>Glorieta-Yeso      | Oil    | 4325  | 2589     |
| COG                | Navaho 8         | 35014       | 1650 FS & 2308 FE<br>30-17s-29e | Empire;<br>Glorieta-Yeso      | Oil    | 6060  | 2617     |
| Nadel &<br>Gussman | Empire S Deep 13 | 22000       | 660 FS & 1432 FW<br>30-17s-29e  | Empire;<br>Morrow, S          | Gas    | 11060 | 2619     |
| Apache             | N B State 3      | 35916       | 2160 FN & 2240 FE<br>25-17s-28e | Art; Glor-Yeso                | Oil    | 5600  | 2633     |

- VII. 1. Average injection rate will be  $\approx 5,000$  bwpd.  
 Maximum injection rate will be  $\approx 7,500$  bwpd.
2. System will be open and closed. Water will initially be trucked. Later, the well may be tied into a proposed Apache pipeline system. Even after the well is connected to a pipeline system, Apache will continue to truck water to the well.
3. Average injection pressure will be  $\approx 1,000$  psi  
 Maximum injection pressure will be  $\approx 1,199$  psi ( $= 0.2$  psi/foot  $\times 5,998'$  (highest perforation)).
4. Injection source will be produced water only from Apache wells in the Empire Abo Unit, mainly from the Abo. Apache has  $>200$  wells in the unit. A summary of the closest (1.39 miles southeast) Abo well data in the WAIDS database is in Exhibit H. 

No compatibility problems have been reported from the other 21 injection wells in the Empire Abo Unit. At least 44,088,712 barrels of water have been injected into five nearby injection wells. The five wells are 3,556' to 6,245' away from the #45.

5. Abo is productive within one mile. The #45 well has produced 323,536 barrels of oil, 420,573 Mcf of gas, and 148,807 barrels of water from 3 different Abo intervals. Two intervals have been squeezed. Only the Abo shale is currently perforated (5,998' - 6,180'). In addition, there are 3 other wells (43, 46A, and 47) that currently produce from the Abo within a half-mile. Closest (1,152') of the three is 46A (30-015-03194).

VIII. The Abo (>300' thick in this well) reef extends east to west and is composed of fractured and vugular dolomitized limestone. Closest possible underground source of drinking water above the proposed injection interval is the Triassic between  $\approx$ 300' and  $\approx$ 350'. Surface casing was set at 724' and cement circulated to the surface in the #45 well.

According to State Engineer records (Exhibit I), there are no water wells within 2,000 meters (6,561'). However, NMOCD records show an oil well (30-015-03003) was converted to water well.

That (now abandoned) water well is 2,647' north. It was drilled to 903' in 1953 as an unsuccessful Yates oil well. A cement plug was set at 570' and mud was added to 345'. Fresh water was recorded from 290' - 300'.

The well is currently abandoned. A sucker rod and wellhead hidden by a bush are the only clue to its location (Exhibit I). There is no indication (e. g., riparian vegetation, livestock, equipment) of recent use. Air photos going back to 1996 show no use.

No underground source of drinking water is below the proposed injection interval.

Formation tops are:

Quaternary = 0'  
Yates = 792'  
Seven Rivers = 1,039'  
Queen = 1,640'

Grayburg = 1,970'  
San Andres = 2,350'  
Glorieta = 3,908'  
Paddock = 3,940'  
Abo shale = 5,939'  
Abo reef porosity stringers = 6,202'  
Abo reef solid porosity = 6,265'  
Total Depth: 6,375'

One water well (abandoned) is within a one-mile radius. There will be more than a mile of vertical separation between the bottom of the only possible underground water source (Triassic) and the top of the Abo.

Produced water has been injected or disposed into zones above (Queen, Grayburg, San Andres, Glorieta, Yeso), opposite (Abo), and below (Cisco, Canyon, Strawn) the proposed injection interval in 29 wells within Section 30 and the 8 bordering sections.

IX. The well will be stimulated with acid to clean out scale or fill.

X. Gamma ray and neutron logs were run and are on file with the NMOCD.

XI. According to the State Engineer's records, there are no water wells within a one-mile radius. However, there is an abandoned water well 2,647' north. It was drilled to 903' in 1953 as an unsuccessful Yates oil well (30-015-03003). A cement plug was set at 570' and mud was added to 345'. Fresh water was recorded from 290' - 300'. The well is currently abandoned. A wellhead with a sucker rod hidden by a bush is the only indication of its location. There is no indication (riparian vegetation, livestock, equipment) of recent use.

XII. Apache is not aware of any geologic or engineering data that may indicate that the Abo is in hydrologic connection with any underground sources of water.



APACHE CORPORATION  
EMPIRE ABO UNIT 45  
2310' FNL & 330' FWL SEC. 30, T. 17 S., R. 29 E.  
EDDY COUNTY, NEW MEXICO

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30-015-03188

Closest Quaternary fault is 63 miles southwest (Exhibit J). At least 127 injection and 14 saltwater disposal wells have been drilled into the Abo.

XIII. Notice (this application) has been sent (Exhibit K) to the surface owner (NM State Land Office), all oil and gas lessees or Abo operating right holders (see below), and all oil and gas lessors (only New Mexico State Land Office and BLM) within a half-mile:

NM State Land Office  
BLM  
ConocoPhillips Company  
COG Operating LLC  
ExxonMobil Corporation  
Harvey E. Yates Company  
Khody Land & Minerals  
Pitch Energy Corporation  
Yates Petroleum Corp.

A legal ad (see Exhibit L) was published on August 14, 2013.

RECEIVED  
DEC 23 1960

FORM C-128  
Revised 5/1/57

NEW MEXICO OIL CONSERVATION COMMISSION  
WELL LOCATION AND ACREAGE DEDICATION PLAT

SEE INSTRUCTIONS FOR COMPLETING THIS FORM ON THE REVERSE SIDE. **E. C.**

SECTION A

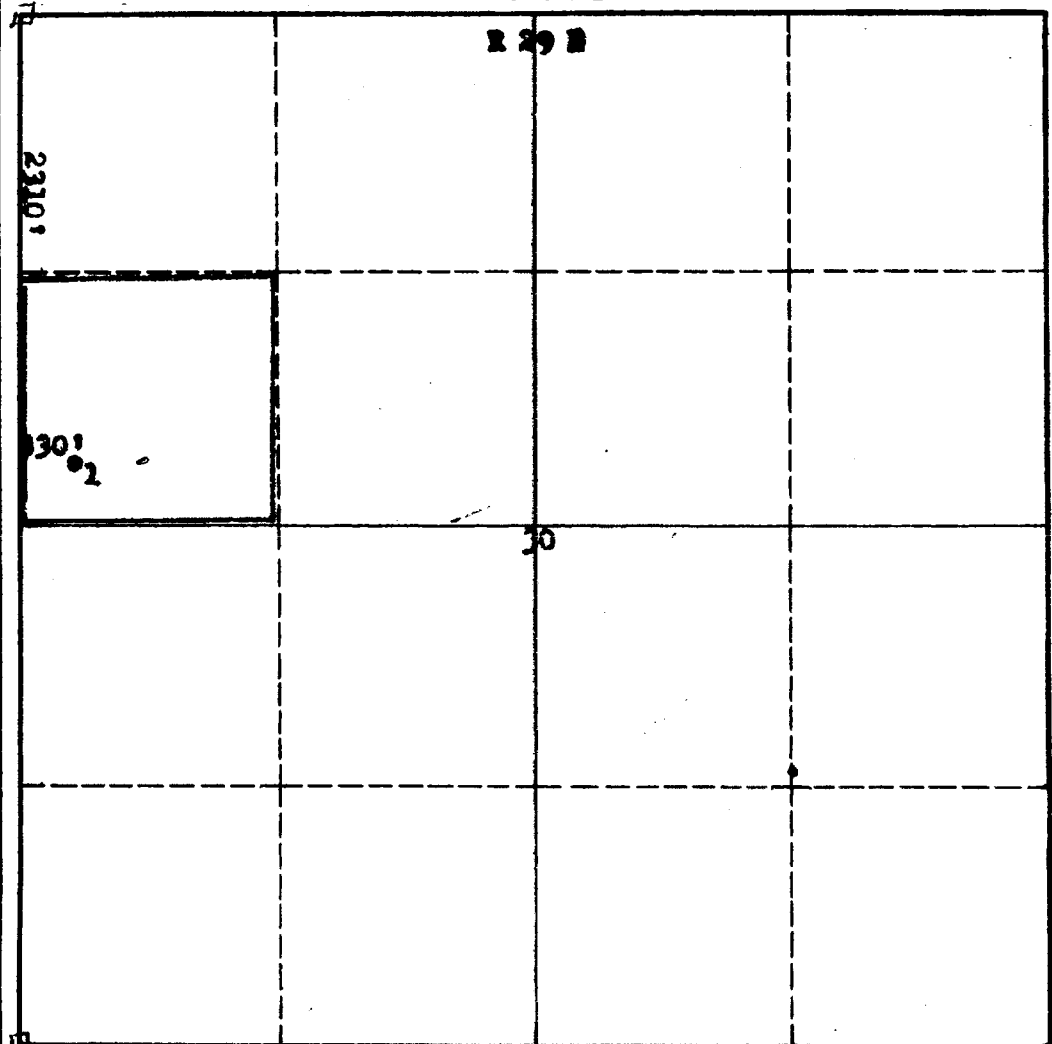
ARTESIA, OFFICE

|   |                                    |                             |                                       |                                       |                      |
|---|------------------------------------|-----------------------------|---------------------------------------|---------------------------------------|----------------------|
| Operator<br><b>Continental Oil Company</b>  |                                    |                             | Lease<br><b>State 8-30</b>            |                                       | Well No.<br><b>1</b> |
| Unit Letter<br><b>E</b>   | Section<br><b>30</b>               | Township<br><b>17 South</b> | Range<br><b>29 East</b>               | County<br><b>Deaf</b>                 |                      |
| Actual Footage Location of Well:<br><b>2310</b> feet from the <b>North</b> line and <b>330</b> feet from the <b>West</b> line |                                    |                             |                                       |                                       |                      |
| Ground Level Elev.<br><b>3660</b>   | Producing Formation<br><b>Alto</b> |                             | Pool<br><b>Empire Alto Undrilling</b> | Dedicated Acreage:<br><b>40</b> Acres |                      |

1. Is the Operator the only owner in the dedicated acreage outlined on the plat below? YES **X** NO \_\_\_\_ . ("Owner" means the person who has the right to drill into and to produce from any pool and to appropriate the production either for himself or for himself and another. (65-3-29 (e) NMSA 1935 Comp.)
2. If the answer to question one is "no," have the interests of all the owners been consolidated by communitization agreement or otherwise? YES \_\_\_\_ NO \_\_\_\_ . If answer is "yes," Type of Consolidation \_\_\_\_
3. If the answer to question two is "no," list all the owners and their respective interests below:

| Owner | Land Description |
|-------|------------------|
|       |                  |

SECTION B



CERTIFICATION

I hereby certify that the information in SECTION A above is true and complete to the best of my knowledge and belief.

Name **CH Hesser**  
Position **District Superintendent**  
Company **Continental Oil Company**  
Date **12-21-60**

I hereby certify that the well location shown on the plat in SECTION B 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 knowledge and belief.

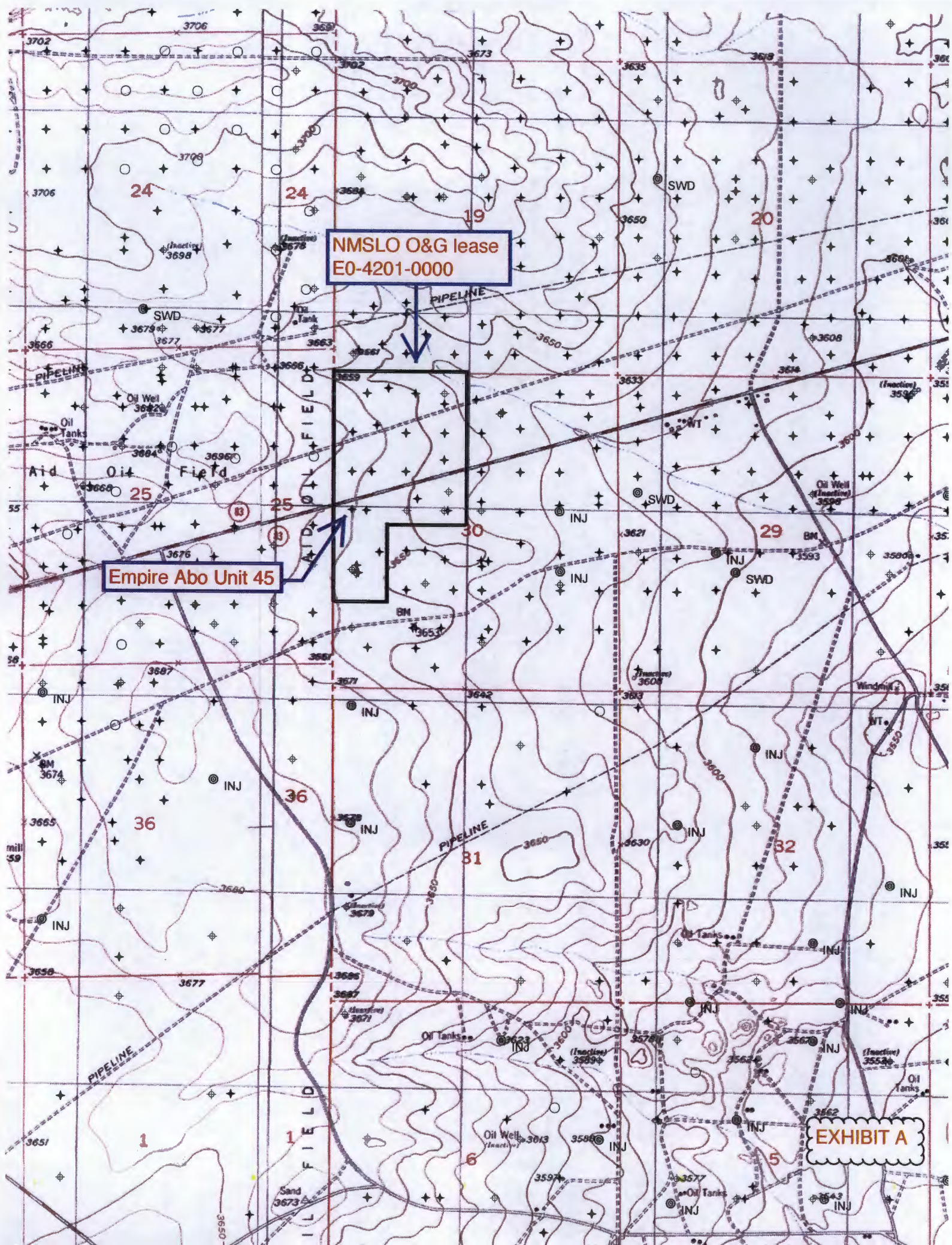
EXHIBIT A

Date Surveyed **December 7, 1960**  
Registered Professional Engineer and/or Land Surveyor

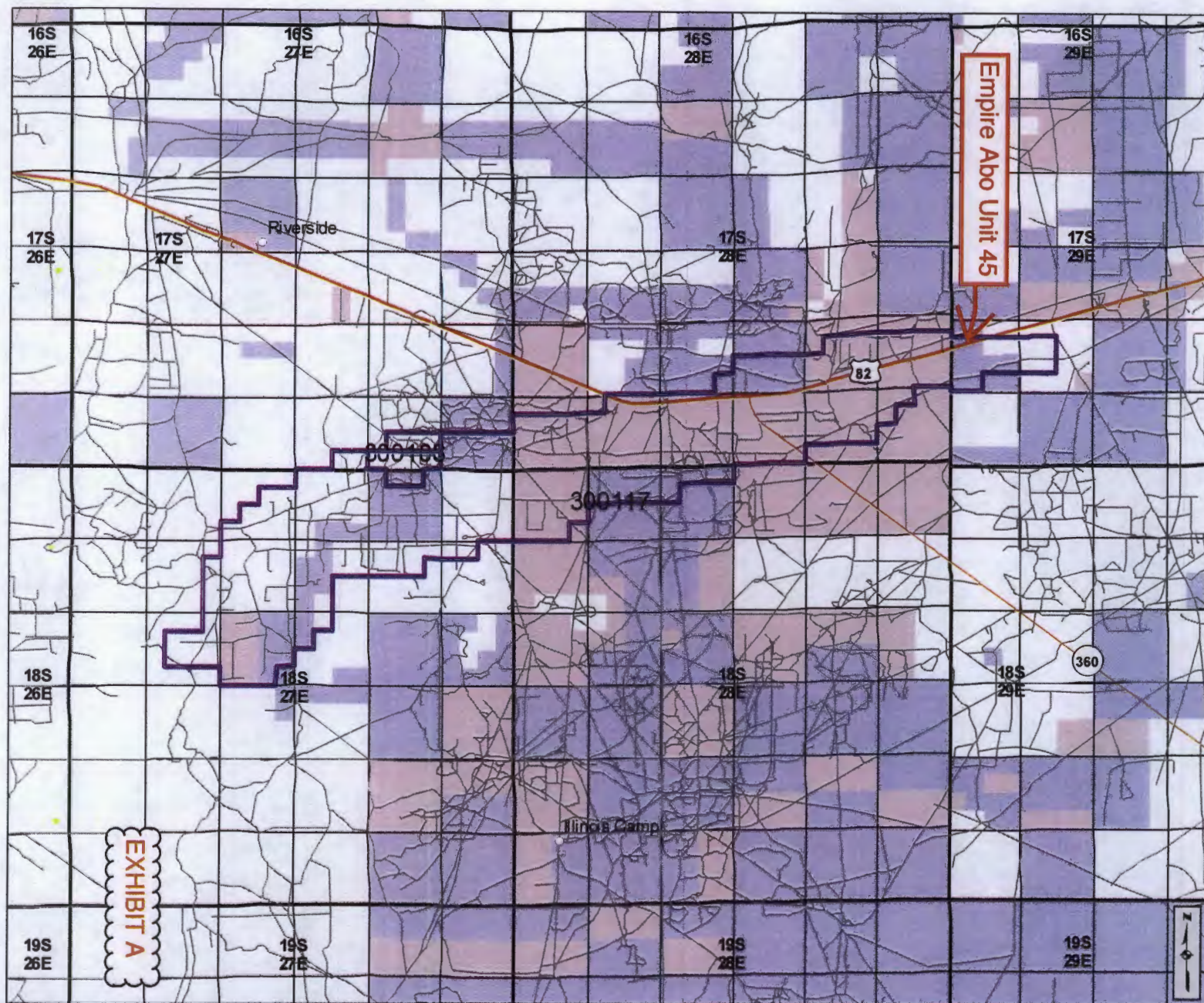
**James H. Brown**  
Certificate No.

N.M.L.S. No. 542









#### Point Locations

- County Seat
- ▲ SLO District Offices
- City, Town or Village
- ★ Volcanic Vents
- Highway Mileposts

#### NMOC Oil and Gas Wells

- Oil
- Injection
- ★ Carbon Dioxide
- Miscellaneous
- ☆ Gas
- ◇ Water
- ◇ DA or PA
- △ Salt Water Disposal

#### Federal Minerals

- All Minerals
- Coal Only
- Oil and Gas Only
- Oil, Gas and Coal Only
- Other Minerals

#### State Trust Lands

- Surface Estate
- Subsurface Estate
- Both Estates

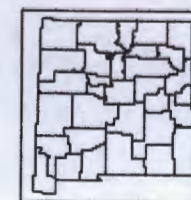
#### NMSLO Leasing

- Option Agreement
- Commercial Lease
- Minerals Lease
- Oil and Gas Lease
- Agricultural Lease
- Not Available for Oil and Gas Leasing
- Restriction Influences Oil and Gas Leasing

#### Other Boundaries

- Continental Divide
- State Boundary
- County Boundaries
- Oil and Gas Unit Boundary
- Participating Areas in Units
- Geologic Regions
- Potash Enclave (NMOC R-111-P)

For detailed legend of the Geologic Map of New Mexico, please see <http://geoinfo.nmt.edu>



[www.nmstatelands.org](http://www.nmstatelands.org)

## New Mexico State Land Office

### Oil, Gas, and Minerals

0 0.45 0.9 1.8 2.7 3.6 Miles

Universal Transverse Mercator Projection, Zone 13  
1983 North American Datum

The New Mexico State Land Office assumes no responsibility or liability for, or in connection with, the accuracy, reliability or use of the information provided here, in State Land Office data layers or any other data layer.

Land Office Geographic Information Center  
[logic@slo.state.nm.us](mailto:logic@slo.state.nm.us)

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# Apache Corp.

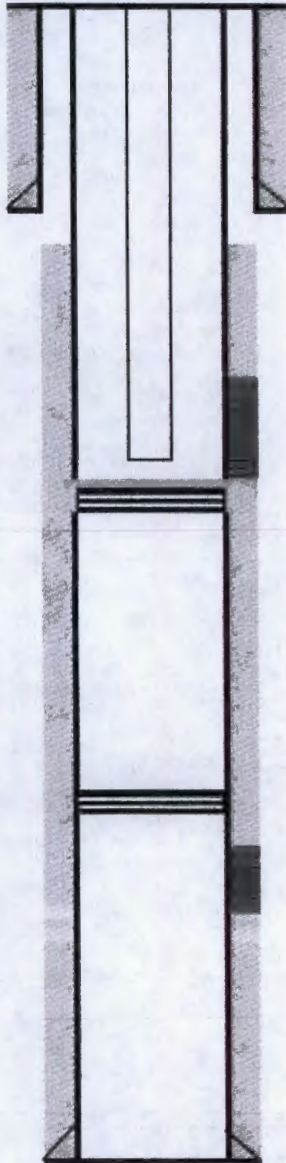
**GROUP:** Permian North  
**FIELD:** Artesia (BP)  
**LEASE/UNIT:** Empire Abo Unit  
**COUNTY:** Eddy  
**API:** 30-015-03188

**DATE:** Mar. 13, 2012  
**BY:** Sarah Hardin  
**WELL:** B-45  
**STATE:** New Mexico

Unit Letter E, Section 30, T-17-S, R-29-E  
Spud Date: 12/30/60

**KB = 11'**  
**GL = 3660'**

10/1/1973: Shut in due to high GOR  
6/15/1976: Pressure observation well  
1976-1977: RWTP (not sure of date)



8 5/8" 24# J-55 Set @ 724'  
CMT W/ 300 SX (SURF/CIRC)

2 7/8" TUBING @ 5897'

## ABO SHALE

8/98: Perf @ 5998'-6180' w/1 JSPF

8/98: Acidized w/3150 gals 15% NEFE

8/98: Frac w/61140# 20/40 sand

8/98: Possible CR @ 6198' w/cmt (Did not state that it was drilled out in reports)

## ABO

2/71: Perf @ 6207', 6209', 6216', 6235', 6244', 6247', 6260', 6278', 6283', 6289' w/1 JSPF

2/71: Acidized w/5000 gals 20% LSTNE

3/71: Acidized w/5000 gals 20% LSTNE

8/71: Frac'd w/20000 gals mod brine & 35000 # 20/40 sand @ 17.9 BPM

9/88: Perf @ 6212'-6246'

9/88: Acidized w/1400 gals

8/98: Sq'd 6207'-6289' w/125 sx Class C cmt

9/88: CICR @ 6265'

## ABO

8/71: 6306'-6311' w/1 JSPF

8/71: Acidized w/1500 gals 20% HCL-NE

## ABO

1/61: Perf @ 6269'-92', 6306'-11', 6328'-34'

1/61: Acidized w/3000 gals acid

2/71: Sq'd perfs w/250 sx Class C

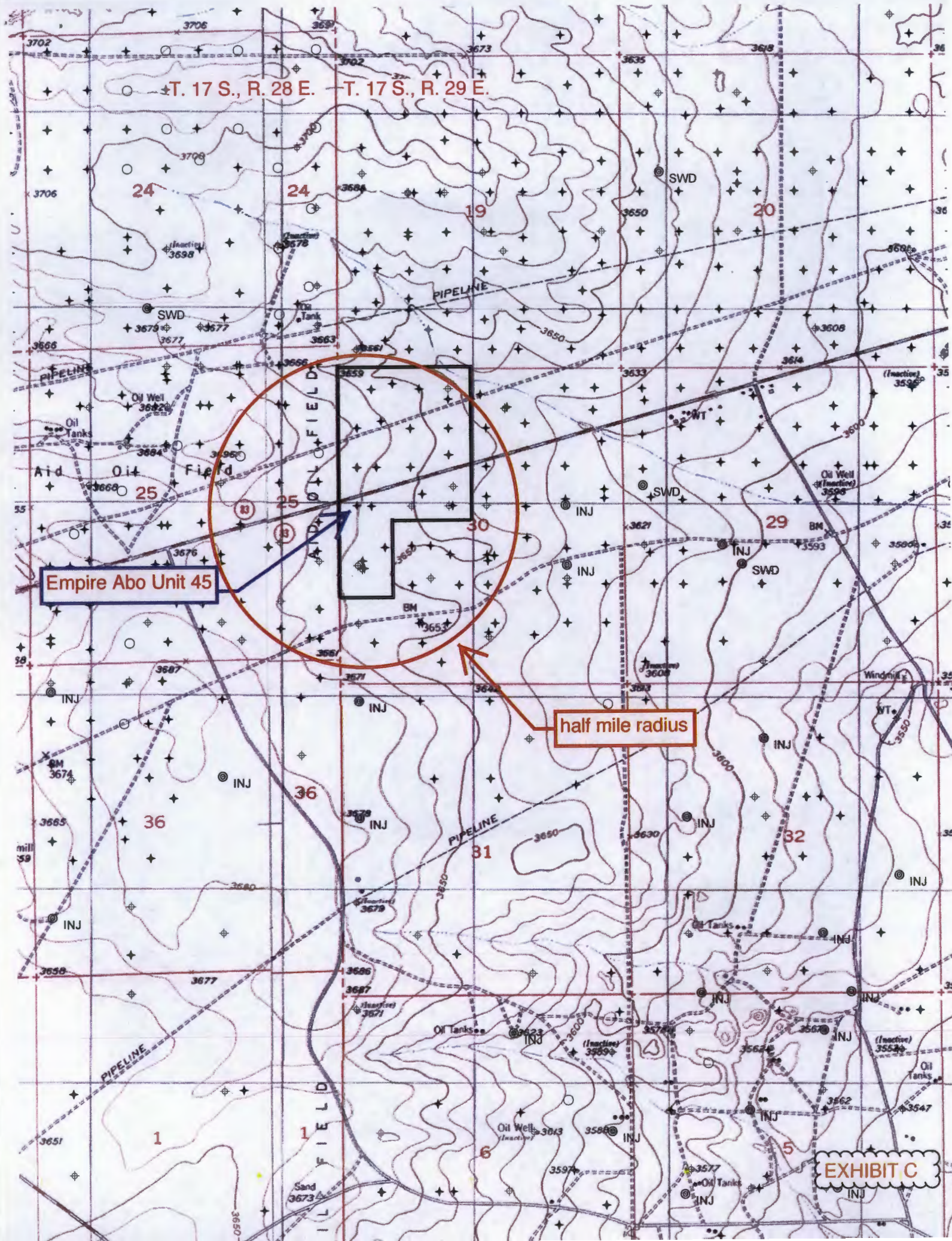
5 1/2" 14/15.5# J-55 Set @ 6375'

CMT W/ 600 SX & 50 gal latex (TOC=1180')

**TD: 6375'**  
**PBTD: 6198'**

**EXHIBIT B**





T. 17 S., R. 28 E. T. 17 S., R. 29 E.

24

24

19

20

25

25

30

29

Empire Abo Unit 45

half mile radius

36

36

31

32

1

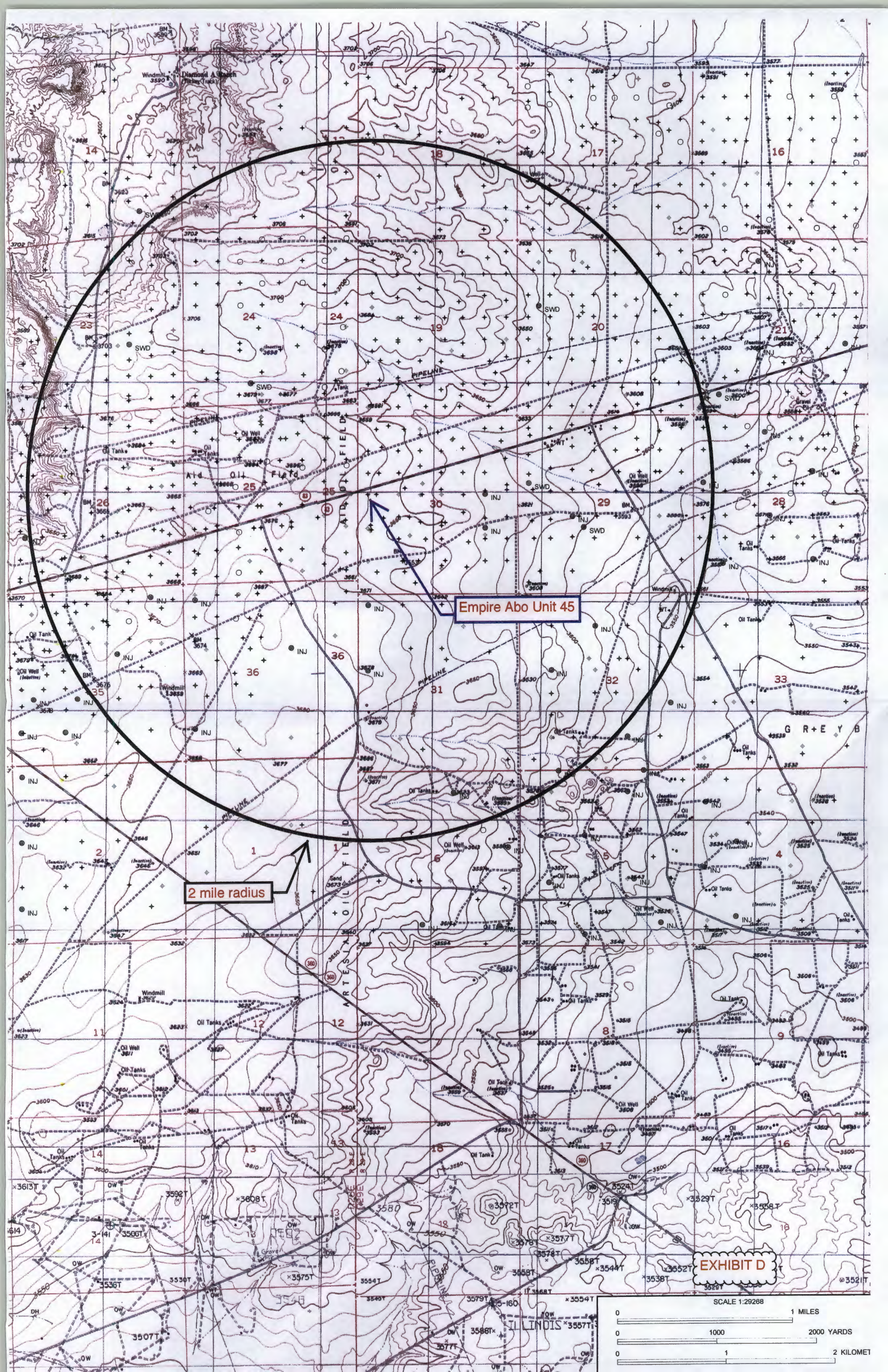
1

6

5

EXHIBIT C





Empire Abo Unit 45

2 mile radius

EXHIBIT D

SCALE 1:29288

1 MILES

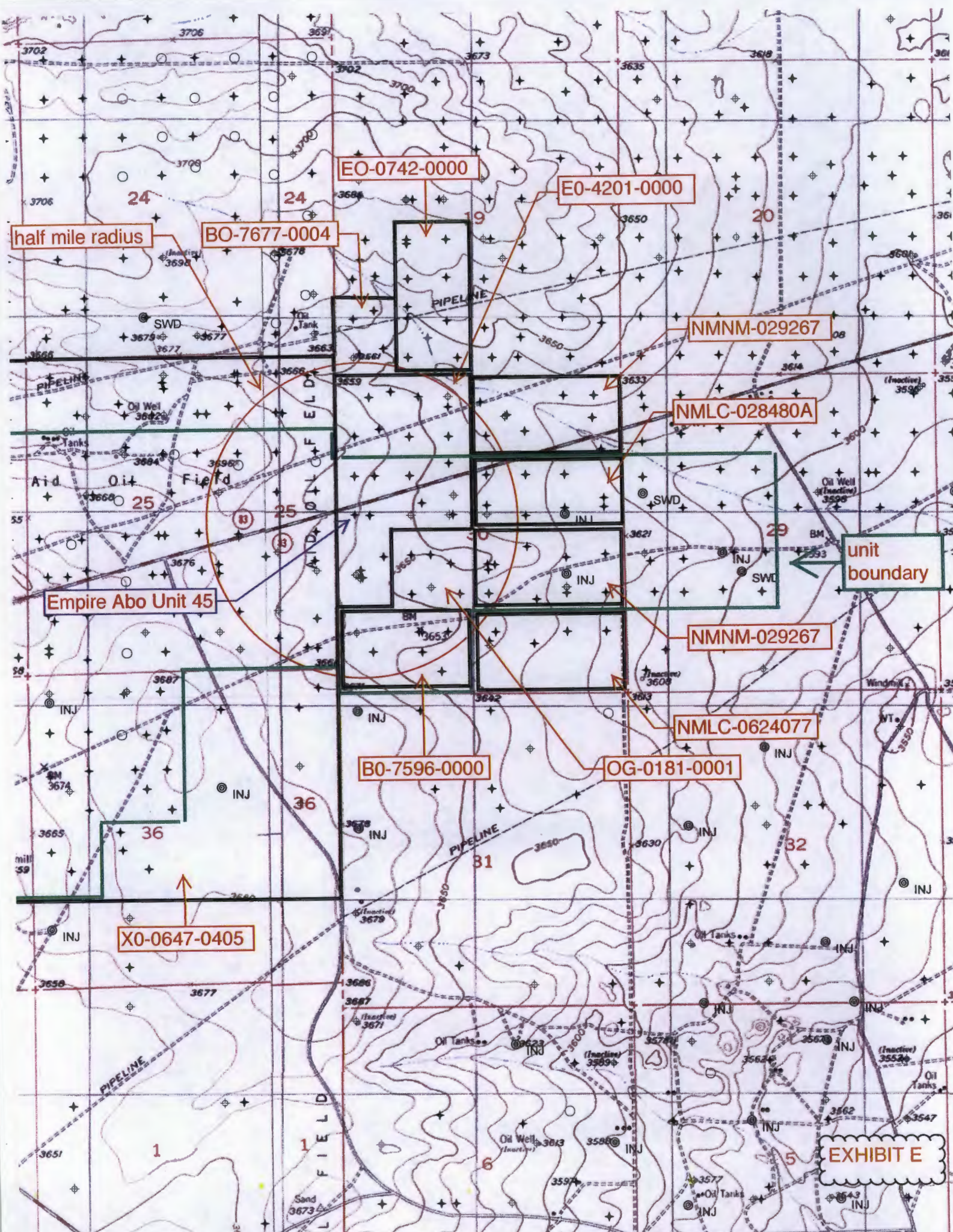
1000

2000 YARDS

1

2 KILOMET





half mile radius

EO-0742-0000

EO-4201-0000

BO-7677-0004

NMNM-029267

NMLC-028480A

Empire Abo Unit 45

unit boundary

NMNM-029267

NMLC-0624077

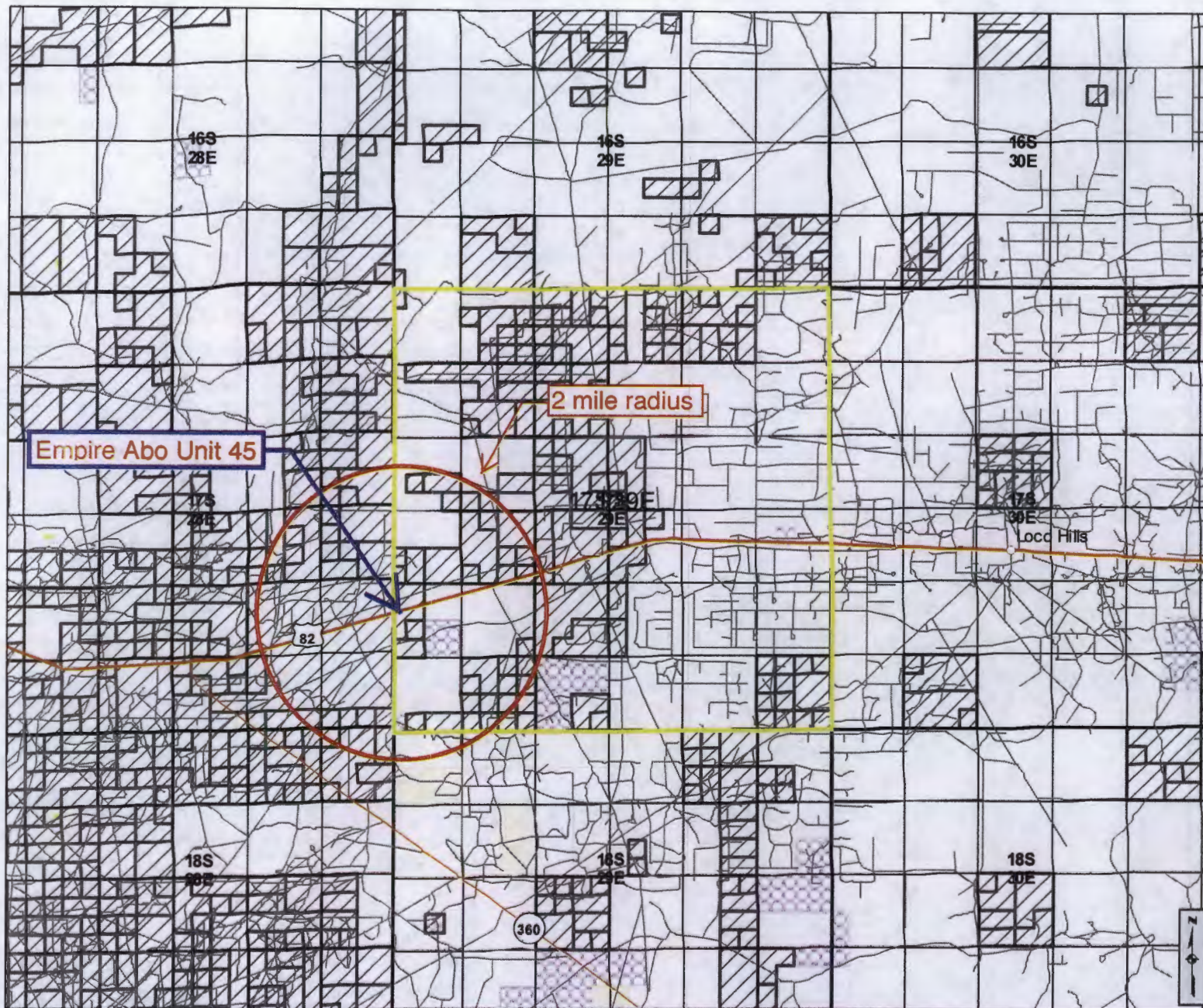
BO-7596-0000

OG-0181-0001

X0-0647-0405

EXHIBIT E





#### Point Locations

- County Seat
- ▲ SLO District Offices
- City, Town or Village
- ★ Volcanic Vents
- Highway Mileposts

#### NMOCD Oil and Gas Wells

- Oil
- Injection
- ★ Carbon Dioxide
- Miscellaneous
- ☆ Gas
- ◆ Water
- ◇ DA or PA
- △ Salt Water Disposal

#### Federal Minerals

- All Minerals
- Coal Only
- Oil and Gas Only
- Oil, Gas and Coal Only
- Other Minerals

#### State Trust Lands

- Surface Estate
- Subsurface Estate
- Both Estates

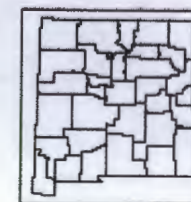
#### NMSLO Leasing

- Option Agreement
- Commercial Lease
- Minerals Lease
- Oil and Gas Lease
- Agricultural Lease
- Not Available for Oil and Gas Leasing
- Restriction Influences Oil and Gas Leasing

#### Other Boundaries

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[www.nmstatelands.org](http://www.nmstatelands.org)

## New Mexico State Land Office Oil, Gas, and Minerals

0 0.5 1 1.5 2  
Miles

Universal Transverse Mercator Projection, Zone 13  
1983 North American Datum

**EXHIBIT F**

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Land Office Geographic Information Center  
[logic@slo.state.nm.us](mailto:logic@slo.state.nm.us)

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Abo penetrators ranked by distance from EAU 45

| WELL                 | SPUD     | TD    | POOL                 | WELL TYPE      | HOLE O.D. | CASING O.D. | SET @ | CEMENT  | TOC   | HOW DETERMINED   |
|----------------------|----------|-------|----------------------|----------------|-----------|-------------|-------|---------|-------|------------------|
| Empire Abo Unit 46   | 7/1/61   | 6353  | Empire; Abo          | P & A 8/28/08  | 11"       | 8-5/8"      | 718   | 350 sx  | GL    | circulated       |
| 30-015-03189         |          |       |                      |                | 7-7/8"    | 5-1/2"      | 6353  | 500 sx  | 1350  | temperature      |
| F 30-17s-29e         |          |       |                      |                |           |             |       |         |       |                  |
| Empire Abo Unit 45A  | 10/22/61 | 6374  | Empire; Abo          | P & A 11/27/02 | 11"       | 8-5/8"      | 757   | 300 sx  | GL    | circulated       |
| 30-015-03190         |          |       |                      |                | 6-3/4"    | 4-1/2"      | 6350  | 500 sx  | 900   | CBL              |
| L 30-17s-29e         |          |       |                      |                |           |             |       |         |       |                  |
| Empire Abo Unit 46A  | 3/2/61   | 6360  | Empire; Abo          | oil well       | 11"       | 8-5/8"      | 787   | 1000 sx | GL    | circulated       |
| 30-015-03194         |          |       |                      |                | 7-7/8"    | 4-1/2"      | 6358  | 850 sx  | 1200  | temperature      |
| K 30-17s-29e         |          |       |                      |                |           |             |       |         |       |                  |
| Empire Abo Unit 44   | 10/7/60  | 6385  | Empire; Abo          | P & A 10/7/09  | 11"       | 8-5/8"      | 725   | 375 sx  | GL    | top job          |
| 30-015-01543         |          |       |                      |                | 7-7/8"    | 5-1/2"      | 6384  | 320 sx  | GL    | no report        |
| I 25-17s-28e         |          |       |                      |                |           |             |       |         |       |                  |
| Empire Deep 18       | 4/8/78   | 11010 | Empire; Morrow South | P & A 11/5/88  | 17-1/2"   | 12-3/4"     | 400   | 475 sx  | GL    | circulated 21 sx |
| 30-015-22400         |          |       |                      |                | 11"       | 8-5/8"      | 2895  | 950 sx  | 600   | temperature      |
| F 30-17s-29e         |          |       |                      |                | 7-7/8"    | 5-1/2"      | 11010 | 1525 sx | 4010  | temperature      |
| Empire Abo Unit 47A  | 11/21/61 | 6313  | Empire; Abo          | P & A 3/2/09   | no report | 8-5/8"      | 800   | 250 sx  | GL    | circulated       |
| 30-015-03197         |          |       |                      |                | no report | 5-1/2"      | 6313  | 566 sx  | 2700  | calculated       |
| G 30-17s-29e         |          |       |                      |                |           |             |       |         |       |                  |
| Empire Abo Unit B 43 | 7/25/60  | 7950  | Empire; Abo          | P & A 11/20/75 | 11"       | 8-5/8"      | 705   | 375 sx  | GL    | circulated       |
| 30-015-01540         |          |       |                      |                | 7-7/8"    | 5-1/2"      | 6483  | 150 sx  | 5355  | no report        |
| G 25-17s-28e         |          |       |                      |                | more      | csg         | cmt   | run     | while | plugging         |

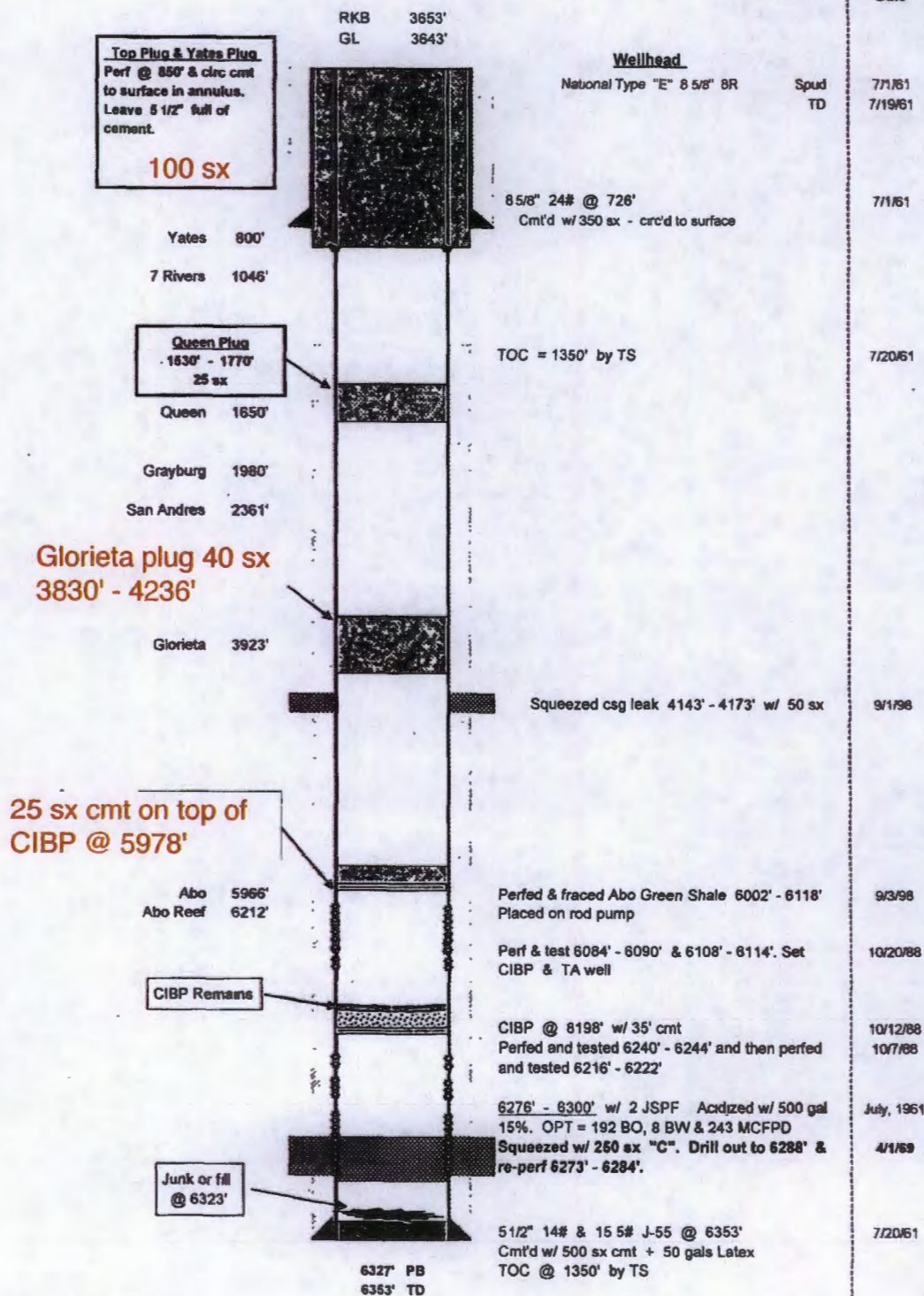
Abo penetrators ranked by distance from EAU 45

| WELL               | SPUD    | TD    | POOL   | WELL TYPE | HOLE O.D. | CASING O.D. | SET @ | CEMENT  | TOC       | HOW DETERMINED          |
|--------------------|---------|-------|--|-----------|-----------|-------------|-------|---------|-----------|-------------------------|
| Empire Abo Unit 47 | 9/30/61 | 6370  | Empire; Abo  | oil well  | 10-3/4"   | 8-5/8"      | 760   | 350     | no report |                         |
| 30-015-03193       |         |       |  |           | 7-7/8"    | 5-1/2"      | 6359  | 450     | no report |                         |
| J 30-17s-29e       |         |       |  |           |           |             |       |         |           |                         |
| Empire 25 1        | 5/23/00 | 10851 | Empire; <del>Deep</del> Atoka & Empire; Morrow South | gas well  | 17-1/2"   | 13-3/8"     | 365   | 360 sx  | GL        | circulated              |
| 30-015-31140       |         |       |  |           | 12-1/4"   | 8-5/8"      | 2605  | 1175 sx | GL        | circulated              |
| G 25-17s-28e       |         |       |  |           | 7-7/8"    | 5-1/2"      | 10851 | 1775 sx | 1100      | no report               |
| State BV 1         | 4/6/78  | 10860 | Empire; <del>Deep</del> Morrow South                 | gas well  | 13-3/4"   | 10-3/4"     | 880   | 510 sx  | GL        | circulated 40 sx to pit |
| 30-015-22317       |         |       |  |           | 9-1/2"    | 7-5/8"      | 6805  | 1370 sx | GL        | circulated              |
| J 25-17s-28e       |         |       |  |           | 6-1/2"    | 4-1/2"      | 10860 | 895 sx  | 6562      | CBL                     |
| Empire Abo Unit 43 | 8/21/60 | 6374  | Empire; Abo  | oil well  | 11"       | 8-5/8"      | 742   | 350 sx  | no report |                         |
| 30-015-01538       |         |       |  |           | 7-7/8"    | 5-1/2"      | 6380  | 320 sx  | no report |                         |
| J 25-17s-28e       |         |       |  |           |           |             |       |         |           |                         |
| Empire Deep 13     | 1/31/77 | 11060 | Empire; <del>Deep</del> Morrow South                 | gas well  | 15"       | 12-3/4"     | 327   | 250 sx  | GL        | circulated              |
| 30-015-22000       |         |       |  |           | 11"       | 8-5/8"      | 2900  | 1200 sx | GL        | circulated              |
| N 30-17s-29e       |         |       |  |           | 7-7/8"    | 5-1/2"      | 11060 | 1200 sx | 9192      | no report               |

926' from Empire Abo Unit 45

**Empire Abo Unit "B" #46**  
 Empire Abo Field  
 API No. 30-015-03189  
 2310' FNL & 1264' FWL  
 Sec 30 - T17S - R29E  
 Eddy County, New Mexico  
 Originally drilled by Continental Oil Company as the  
 State "S-30" #2

P & A 8/28/08





1,014' from Empire Abo Unit 45

# PLUGGING & ABANDONMENT WORKSHEET (2 STRING CSNG)

OPERATOR B-P America

LEASENAME Empire Abo Unit

Unit 1 to L

WELL # C-45

SECT 30 TWN 17 S RNG 29 E

FROM 1980 MSL 330 BWL

TD: 6350

FORMATION @ TD

PBTD: 6345

FORMATION @ PBTD

85 sx cmt  
GL - 807

spot 35 sx cmt  
from 807 to 707  
TAG

856-24

@ 757

TOC surface

9.5"  
salt gel  
mud

50 sx cmt  
3750 - 3990

CIRC hole w/  
9.5" salt gel mud

50' cmt on top  
CIBP @ 6150

4 1/2 - 9.5 + 14.6"

@ 6350

TOC surface

Perfs  
6298  
6311

Empire Abo Unit 45A  
30-015-03190  
spud 10/22/61  
P & A 11/27/02

TD 6350

|          | SIZE         | SET @ | TOC     | TOC DETERMINED BY |               |
|----------|--------------|-------|---------|-------------------|---------------|
| SURFACE  | 8 5/8        | 757   | surface | CIR. top: t       |               |
| INTMED 1 | 4 1/2        | 6350  | surface | CIR. 9-25-88      |               |
| INTMED 2 |              |       |         |                   |               |
| PROD     |              |       |         |                   |               |
|          | SIZE         | TOP   | BOT     | TOC               | DETERMINED BY |
| LINER 1  |              |       |         |                   |               |
| LINER 2  |              |       |         |                   |               |
|          | CUT & PULL @ |       |         | TOP - BOTTOM      |               |
| INTMED 1 |              |       | PERFS   | 6270 - 6288       |               |
| INTMED 2 |              |       |         | 6298 - 6311       |               |
| PROD     |              |       |         |                   |               |

## \*REQUIRED PLUGS DISTRICT I

| RUSTLER (UNIT) |      |
|----------------|------|
| TATES          | 800' |
| QUEEN          |      |
| GRAYBURG       |      |
| SAN ANDREW     |      |
| CANYON REEF    |      |
| DELAWARE       |      |
| BELL CANYON    |      |
| CHERRY CANYON  |      |
| BRUSHY CANYON  |      |
| BONE SPRING    |      |
| GLORIETA       | 3990 |
| GLINEBRY       |      |
| TUBB           |      |
| DRINKARD       |      |
| ABO            |      |
| WC             |      |
| PENN           |      |
| STRAWN         |      |
| ATOKA          |      |
| MORROW         |      |
| MISS           |      |
| DEVONIAN       |      |

| PLUG     | TYPE      | SACKS   | DEPTH       |
|----------|-----------|---------|-------------|
| PLUG     | PLUG      | CMNT    |             |
| EXAMPLES |           |         |             |
| PLUG #1  | OH        | 35 SXS  | 6400'       |
| PLUG #2  | SHOE      | 50 SXS  | 5550'-5450' |
| PLUG #3  | CIBP/35'  |         | 4800'       |
| PLUG #4  | CIBP      | 25 SXS  | 4800'       |
| PLUG #5  | STUB      | 50 SXS  | 3600'-3700' |
| PLUG #6  | RETRN SQZ | 200 SXS | 400'        |
| PLUG #7  | SURF      | 10 SXS  | 0-10'       |
| PLUG #1  | CTAP      | 50'     | 6128-6128   |
| PLUG #2  | Glorieta  | 25 SXS  | 3990-3990   |
| PLUG #3  | Shoe      | 35 SXS  | 807-707     |
| PLUG #4  | Yates     | 125x    | 0-60'       |
| PLUG #5  | Surface   |         |             |
| PLUG #6  |           |         |             |
| PLUG #7  |           |         |             |
| PLUG #8  |           |         |             |
| PLUG #9  |           |         |             |
| PLUG #10 |           |         |             |
| PLUG #11 |           |         |             |
| PLUG #12 |           |         |             |

EXHIBIT G



1,461' from Empire Abo Unit 45

**Empire Abo Unit C-44**  
Empire Abo Field

API No. 30-015-01543

1980' FSL & 990' FEL  
Sec 25 - T17S - R28E  
Eddy County, New Mexico

Spud 10/7/60  
Completed 10/22/60

P & A 1/30/09

Plug from 850'  
to surface. No  
report on number  
of sacks, but  
cement was still at  
surface on 2/2/09.

RKB 3685'  
GL 3672'

Hole(s) in 5 1/2" csg 62-93'  
cmt'd w/ 100 sx in 3 stages

8 5/8" 28# @ 725'  
Cmt'd w/ 300 sx  
"topped out" w/ 75 sx + 3 yds Redi-mix  
cmt to surface

Glorieta plug  
25 sx  
3600' - 3860'

Abo (prod zone) Plug  
5870' - 6170'  
30 sx Cl C  
on top of CIBP

CIBP @ 6170'

Abo perms 6220-6236'

Abo perms 6250-6260'

Abo perms 6282-6294' - cmt'd w/ 75 sx, CR @ 6270'

5 1/2" 15.5# @ 6384'  
Cmt'd w/ 170 units FYS-400 + 150 sx  
Cmt circulated

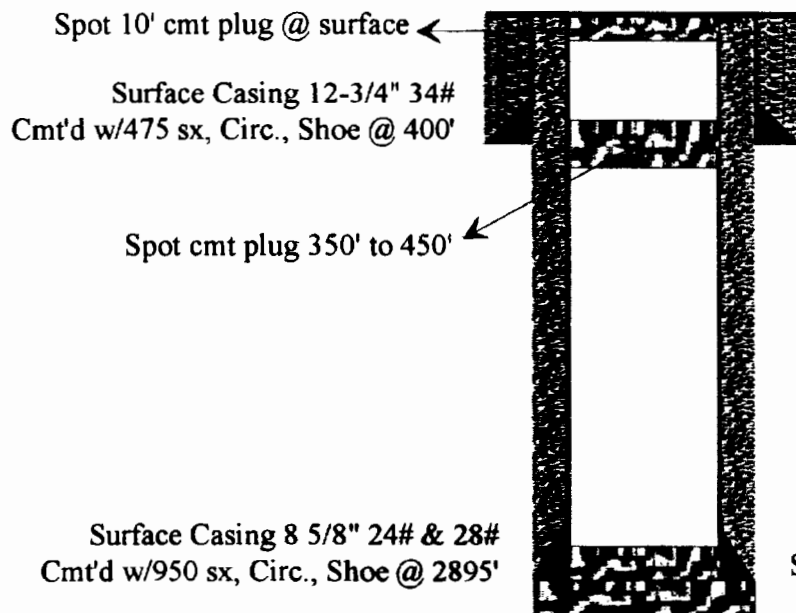
TD 6385'  
PBD 6270'

WCH 10/17/2008

EXHIBIT G

1,687' from Empire Abo Unit 45

## WELLBORE SCHEMATIC



Spot 10' cmt plug @ surface

Surface Casing 12-3/4" 34#  
Cmt'd w/475 sx, Circ., Shoe @ 400'

Spot cmt plug 350' to 450'

Surface Casing 8 5/8" 24# & 28#  
Cmt'd w/950 sx, Circ., Shoe @ 2895'

### Empire South Deep Unit #18

1980' FNL & 1980' FWL (F)

Sec. 30, T-17-S, R-29-E,

Eddy County, NM

API: 30-015-22400

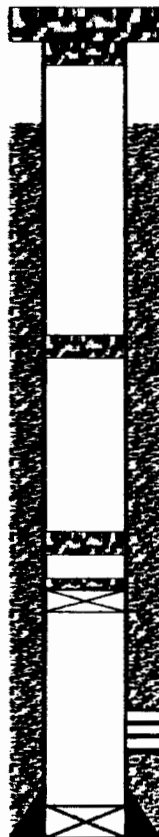
Spudded 04/08/78

Completed 06/22/78

P & A 11/5/88

GL: 3643.4'

Spot cmt plug 2850' to 2955'



Cut 5-1/2" csg @ 3630'

Spot cmt plug 3680' to tag @ 3551'

100' cmt plug 5900'-6000'

100' cmt plug 7200'-7300'

CIBP @ 7785' w/35' cmt

Production Casing 5-1/2" 14# & 15.5#  
Cement w/1525 sx, TOC @ 4010' TS  
Shoe @ 11,010'

Perfs @ 10,722'-758' (2 spf - open)

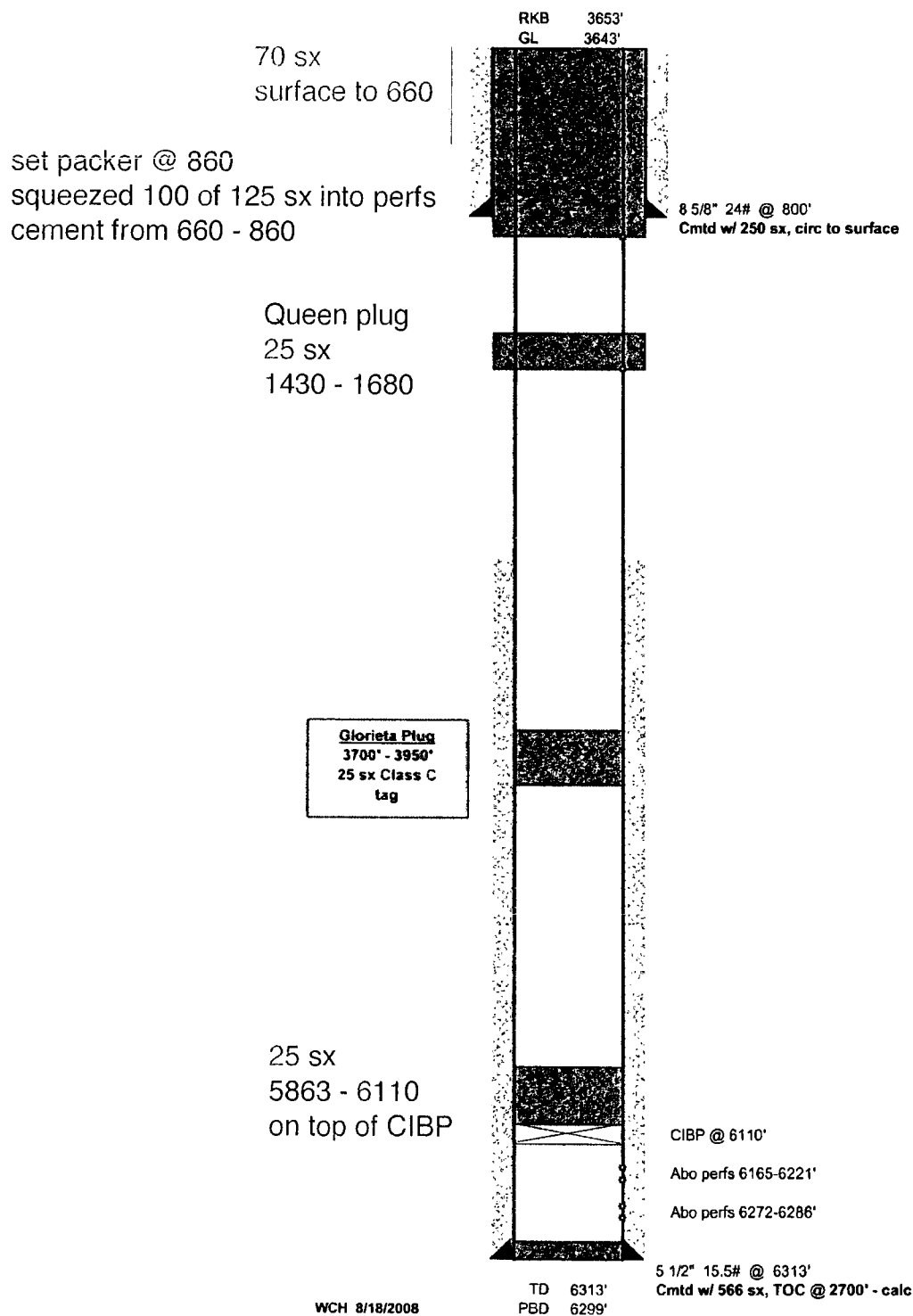
TD @ 11,010' PBTD @ 10,968'

EXHIBIT G

DLK 03-31-97

2,262' from Empire Abo Unit 45

**Empire Abo Unit B-47**  
Empire Abo Field  
API No. 30-015-03197  
2310' FNL & 2310' FEL  
Sec 30 - T17S - R29E  
Eddy County, New Mexico



Spud 11/21/61  
Completed 12/3/61  
P&A 2/17/09

EXHIBIT G



2,349' from Empire Abo Unit 45

30-015-01540

Empire Abo Unit "B" 43  
Unit Letter G,  
Sec. 25-17S-28E  
Eddy Co., New Mexico

Elevation 3679.6' GR

spud 7/25/60  
completed 8/13/60  
P&A 11/20/75

spot 10 sx inside 8.625"  
@ surface

ran 8.625" cmt retr @ 680'  
cmt with 230 sx  
plug top not recorded

cut csg @ 840'  
pull & recover

8- $\frac{5}{8}$ " OD 28# csg set @ 715'  
Cmt'd w/ 375 sx. Circ. to surf.

Perf 5.5" 1500-02'  
Set cmt retr @ 1409  
cmt csg w/ 1800 sx to 840'

Perf 5.5" 2700-02'  
Set cmt retr @ 2590  
cmt csg w/ 1800 sx to 1450'

squeezed Abo  
perfs 6240-6260  
w/ 200 sx

Present perfs 6240-60' 2JSPF

PBD 6300'

EXHIBIT G

5 $\frac{1}{2}$ " OD 15.5# csg set @ 6483'.  
Cmt'd w/ 150 sx. TOC @ 5355'.

TD 7950

### General Information About: Sample 5343

GREEN B

| API                             | 3001503183            | Sample Number                       |                  |
|---------------------------------|-----------------------|-------------------------------------|------------------|
| Unit/Section/<br>Township/Range | N / 29 / 17S / 29E    | Field                               | GRAYBURG-JACKSON |
| County                          | Eddy                  | Formation                           | ABO              |
| State                           | NM                    | Depth                               |                  |
| Lat/Long                        | 32.79889 , -104.09750 | Sample Source                       | UNKNOWN          |
| TDS (mg/L)                      | 29400                 | Water Type                          |                  |
| Sample<br>Date(MM/DD/YYYY)      |                       | Analysis<br>Date(MM/DD/YYYY)        |                  |
| Remarks/Description             |                       |                                     |                  |
| Cation Information<br>(mg/L)    |                       | Anion Information<br>(mg/L)         |                  |
| Potassium (K)                   |                       | Sulfate (SO)                        | 2800             |
| Sodium (Na)                     |                       | Chloride (Cl)                       | 13700            |
| Calcium (Ca)                    |                       | Carbonate (CO <sub>3</sub> )        |                  |
| Magnesium (Mg)                  |                       | Bicarbonate (HCO <sub>3</sub> )     | 2520             |
| Barium (Ba)                     |                       | Hydroxide (OH)                      |                  |
| Manganese (Mn)                  |                       | Hydrogen Sulfide (H <sub>2</sub> S) |                  |
| Strontium (Sr)                  |                       | Carbon Dioxide (CO <sub>2</sub> )   |                  |
| Iron (Fe)                       |                       | Oxygen (O)                          |                  |

EXHIBIT H



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*New Mexico Office of the State Engineer*  
**Active & Inactive Points of Diversion**  
(with Ownership Information)

---

No PODs found.

**UTMNA83 Radius Search (in meters):**

Easting (X): 582348

Northing (Y): 3630180

Radius: 2000

EXHIBIT I

---

Data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.



EXHIBIT I

abandoned water well,  
aka, 30-015-03003





Empire Abo Unit 45

Guadalupe Fault  
(63 miles from well)

EXHIBIT J

Google earth

Imagery Date: 4/16/2013 lat: 32.738636° lon: -104.582571° elev: 3718 ft eye alt: 2003 m

**PERMITS WEST** INC.  
PROVIDING PERMITS for LAND USERS  
37 Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8126

August 19, 2013

Nick Jaramillo  
New Mexico State Land Office  
P. O. Box 1148  
Santa Fe, NM 87504-1148

Dear Nick,

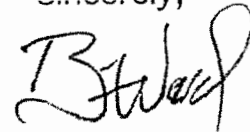
Apache Corporation is applying (application attached) to convert its Empire Abo Unit 45 oil well to a water injection well. As required by NM Oil Conservation Division Rules, I am notifying you of the following proposal. This letter is a notice only. No action is needed unless you have questions or objections.

Well Name: Empire Abo Unit 45 (state lease)      ID = 6,375'  
Proposed Injection Zone: Abo (from 5,998' to 6,334')  
Location: 2310' FNL & 330' FWL Sec. 30, T. 17 S., R. 29 E., Eddy County, NM  
Approximate Location: ~8 air miles west of Loco Hills, NM  
Applicant Name: Apache Corporation      (432) 818-1167  
Applicant's Address: 303 Veterans Airpark Lane, #3000, Midland, TX 79705

Submittal Information: Application for a water injection well will be filed with the NM Oil Conservation Division (NMOCD). If you have an objection, or wish to request a hearing, then it must be filed with the NMOCD within 15 days of receipt of this letter. The New Mexico Oil Conservation Division address is 1220 South St. Francis Dr. Santa Fe, NM 87505. Their phone number is (505) 476-3440.

Please call me if you have any questions.

Sincerely,



Brian Wood

EXHIBIT K

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City, State, ZIP+4:  
PS Form 3800, August 2006 See Reverse for Instructions

DECOS NM  
AUG 19 2013  
Postmark Here  
87552



August 19, 2013

COG Operating LLC  
600 West Illinois Ave.  
Midland, TX 79701

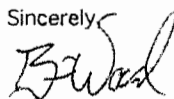
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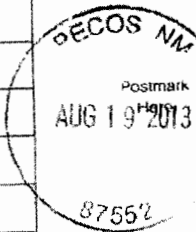
Sincerely,



Brian Wood

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Sent To **COG**  
Street, Apt. No., or PO Box No.  
City, State, ZIP+4

EXHIBIT K

7010 2780 0002 6818 8747

August 19, 2013

BLM  
620 E. Greene St.  
Carlsbad, NM 88220

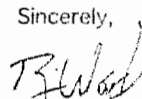
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Please call me if you have any questions.

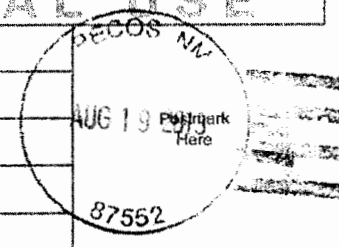
Sincerely,



Brian Wood

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Sent To **BLM**  
Street, Apt. No., or PO Box No.  
City, State, ZIP+4

7010 2780 0002 6818 8723



August 19, 2013

ConocoPhillips Company  
P. O. Box 7500  
Bartlesville, OK 74005-7500

Apache Corporation is applying (application attached) to convert its Empire Abo Unit 45 oil well to a water injection well. As required by NM Oil Conservation Division Rules, I am notifying you of the following proposal. This letter is a notice only. No action is needed unless you have questions or objections.

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Approximate Location: ~8 air miles west of Loco Hills, NM  
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Please call me if you have any questions.

Sincerely,

Brian Wood

7010 2780 0002 6818 8754

EXHIBIT K

|  |    |
|--|----|
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| For delivery information visit our website at <a href="http://www.usps.com">www.usps.com</a> |    |
| OFFICIAL USE   |    |
| Postage  | \$ |
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| Return Receipt Fee (Endorsement Required)  |    |
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| Total Postage & Fees   | \$ |
| Sent To: ConocoPhillips  |    |
| Street, Apt. No., or PO Box No.  |    |
| City, State, ZIP+4   |    |

Postmark: AUG 19 2013 87552



August 19, 2013

ExxonMobil Corporation  
P. O. Box 4358  
Houston, TX 77210-4358

Apache Corporation is applying (application attached) to convert its Empire Abo Unit 45 oil well to a water injection well. As required by NM Oil Conservation Division Rules, I am notifying you of the following proposal. This letter is a notice only. No action is needed unless you have questions or objections.

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Please call me if you have any questions.

Sincerely,

Brian Wood

7010 2780 0002 6818 8761

|  |    |
|--|----|
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August 19, 2013

Harvey E. Yates Company  
P. O. Box 1933  
Roswell, NM 88202-1933

Apache Corporation is applying (application attached) to convert its Empire Abo Unit 45 oil well to a water injection well. As required by NM Oil Conservation Division Rules, I am notifying you of the following proposal. This letter is a notice only. No action is needed unless you have questions or objections.

Well Name: Empire Abo Unit 45 (state lease) ID = 6,375'  
Proposed Injection Zone: Abo (from 5,998' to 6,334')  
Location: 2310' FNL & 330' FWL Sec. 30, T. 17 S., R. 29 E., Eddy County, NM  
Approximate Location: ≈8 air miles west of Loco Hills, NM  
Applicant Name: Apache Corporation (432) 818-1167  
Applicant's Address: 303 Veterans Airpark Lane, #3000, Midland, TX 79705

Submittal Information: Application for a water injection well will be filed with the NM Oil Conservation Division (NMOCD). If you have an objection, or wish to request a hearing, then it must be filed with the NMOCD within 15 days of receipt of this letter. The New Mexico Oil Conservation Division address is 1220 South St. Francis Dr. Santa Fe, NM 87505. Their phone number is (505) 476-3440.

Please call me if you have any questions.

Sincerely,

*Brian Wood*  
Brian Wood

7010 2780 0002 6818 8778

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EXHIBIT K

August 19, 2013

Khody Land & Minerals  
210 Park Ave., Suite 900  
Oklahoma City, OK 73102

Apache Corporation is applying (application attached) to convert its Empire Abo Unit 45 oil well to a water injection well. As required by NM Oil Conservation Division Rules, I am notifying you of the following proposal. This letter is a notice only. No action is needed unless you have questions or objections.

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Please call me if you have any questions.

Sincerely,

*Brian Wood*  
Brian Wood

7010 2780 0002 6818 8785

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August 19, 2013

Pitch Energy Corp.  
P. O. Box 304  
Artesia, NM 88211-0304

Apache Corporation is applying (application attached) to convert its Empire Abo Unit 45 oil well to a water injection well. As required by NM Oil Conservation Division Rules, I am notifying you of the following proposal. This letter is a notice only. No action is needed unless you have questions or objections.

Well Name: Empire Abo Unit 45 (state lease) TD = 6,375'  
Proposed Injection Zone: Abo (from 5,998' to 6,334')  
Location: 2310' FNL & 330' FWL Sec. 30, T. 17 S., R. 29 E., Eddy County, NM  
Approximate Location: ~8 air miles west of Loco Hills, NM  
Applicant Name: Apache Corporation (432) 818-1167  
Applicant's Address: 303 Veterans Airpark Lane, #3000, Midland, TX 79705

Submission Information: Application for a water injection well will be filed with the NM Oil Conservation Division (NMOCD). If you have an objection, or wish to request a hearing, then it must be filed with the NMOCD within 15 days of receipt of this letter. The New Mexico Oil Conservation Division address is 1220 South St. Francis Dr. Santa Fe, NM 87505. Their phone number is (505) 476-3440.

Please call me if you have any questions.

Sincerely,

Brian Wood

7010 2760 0002 6818 8792

EXHIBIT K

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August 19, 2013

Yates Petroleum Corp.  
105 S. 4th St.  
Artesia, NM 88210

Apache Corporation is applying (application attached) to convert its Empire Abo Unit 45 oil well to a water injection well. As required by NM Oil Conservation Division Rules, I am notifying you of the following proposal. This letter is a notice only. No action is needed unless you have questions or objections.

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Proposed Injection Zone: Abo (from 5,998' to 6,334')  
Location: 2310' FNL & 330' FWL Sec. 30, T. 17 S., R. 29 E., Eddy County, NM  
Approximate Location: ~8 air miles west of Loco Hills, NM  
Applicant Name: Apache Corporation (432) 818-1167  
Applicant's Address: 303 Veterans Airpark Lane, #3000, Midland, TX 79705

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Please call me if you have any questions.

Sincerely,

Brian Wood

7010 2760 0002 6818 8808

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# Affidavit of Publication

NO. 22691

STATE OF NEW MEXICO

County of Eddy:

Danny Scott

being duly sworn, says that he is the

Publisher

of the Artesia Daily Press, a daily newspaper of general circulation, published in English at Artesia, said county and state, and that the hereto attached

## Legal Notice

was published in a regular and entire issue of the said Artesia Daily Press, a daily newspaper duly qualified for that purpose within the meaning of Chapter 167 of the 1937 Session Laws of the state of New Mexico for 1 Consecutive weeks/days on the same day as follows:

First Publication

August 14, 2013

Second Publication

Third Publication

Fourth Publication

Fifth Publication

Subscribed and sworn to before me this

14th day of August 2013



OFFICIAL SEAL  
Latisha Romine  
NOTARY PUBLIC-STATE OF NEW MEXICO

My commission expires: 5/12/2015

Latisha Romine

Latisha Romine  
Notary Public, Eddy County, New Mexico

# Copy of Publication:

## LEGAL NOTICE

Apache Corporation is applying for a water injection well. The Empire Abo Unit 45 will dispose into the Abo from 5,998' to 6,334'. It is located 8 miles west of Loco Hills at 2310 FNL & 330 FWL Sec. 30, T. 17 S., R. 29 E., Eddy County. Maximum injection rate will be 7,500 bwpd. Maximum injection pressure will be 1,199 psi. Interested parties must file objections or requests for hearing with the NM Oil Conservation Division, 1220 South Saint Francis Dr., Santa Fe, NM 87505 within 15 days. Additional information can be obtained by contacting: Brian Wood, Permits West, Inc., 37 Verano Loop, Santa Fe, NM 87508. Phone number is (505) 466-8120.

Published in the Artesia Daily Press, Artesia, N.M., Aug. 14, 2013. Legal No 22691.

EXHIBIT L



## United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
Pecos District  
Carlsbad Field Office  
620 E. Greene  
Carlsbad, New Mexico 88220-6292  
www.blm.gov/nm



RECEIVED 2013  
2013 AUG -1 P 2:57

IN REPLY REFER TO:  
3162.3-2 (P0220)  
NM70954X

*Prior application protest*

JUL 30 2013

Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, NM 87505

Re: Empire Abo Unit 45 – Convert to a gas and water injection well.

The BLM will object to the conversion of this unit well as a gas injector located within a Federal Unit. According to the operator's 2013 Unit Plan of Development, this well is designated to be converted to a water injection. The BLM fully supports this well as a water injection well in the lowest structural area of the unit.

Gas injection into the gas cap did not occur in this part unit and does not match their current Plan of Development. This is not a previously permitted gas injection area. According to the operator's plan of development, gas injection will not occur in the unit until they implement their pilot project area number two.

If you have any questions regarding this approval, please contact Edward G Fernandez, Petroleum Engineer at (575) 234-2220.

Sincerely,

Edward G. Fernandez  
Petroleum Engineer  
Bureau of Land Management  
Carlsbad Field Office

cc: Apache Corporation

July 23, 2013

BLM  
620 E. Greene St.  
Carlsbad, NM 88220

Apache Corporation is applying (application attached) to convert its Empire Abo Unit 45 oil well to a gas and water injection well. As required by NM Oil Conservation Division Rules, I am notifying you of the following proposal. This letter is a notice only. No action is needed unless you have questions or objections.

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Proposed Injection Zone: Abo (from 5,998' to 6,334')  
Location: 2310' FNL & 330' FWL Sec. 30, T. 17 S., R. 29 E., Eddy County, NM  
Approximate Location: ≈8 air miles west of Loco Hills, NM  
Applicant Name: Apache Corporation      (432) 818-1167  
Applicant's Address: 303 Veterans Airpark Lane, #3000, Midland, TX 79705

Submittal Information: Application for a water injection well will be filed with the NM Oil Conservation Division (NMOCD). If you have an objection, or wish to request a hearing, then it must be filed with the NMOCD within 15 days of receipt of this letter. The New Mexico Oil Conservation Division address is 1220 South St. Francis Dr. Santa Fe, NM 87505. Their phone number is (505) 476-3440.

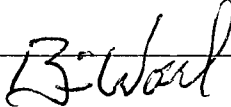
Please call me if you have any questions.

Sincerely,



Brian Wood

**APPLICATION FOR AUTHORIZATION TO INJECT**

- I. PURPOSE: Secondary Recovery XXX Pressure Maintenance Disposal Storage  
Application qualifies for administrative approval? Yes No
- II. OPERATOR: APACHE CORPORATION  
ADDRESS: 303 VETERANS AIR PARK LANE, SUITE 3000, MIDLAND, TX 79705  
CONTACT PARTY: BRIAN WOOD (PERMITS WEST, INC.) PHONE: 505 466-8120
- 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? XXX Yes No  
If yes, give the Division order number authorizing the project: R-4549 et al
- 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: Empire Abo Unit 45  
30-015-03188  
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 geologic data on the injection zone including appropriate lithologic detail, geologic 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 sources 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 sources 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: BRIAN WOOD  TITLE: CONSULTANT  
SIGNATURE: Brian Wood DATE: JULY 23, 2013  
E-MAIL ADDRESS: brian@permitswest.com
- \* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: \_\_\_\_\_



**C-108 Review Checklist:** Received 08/26/13 Add. Request:        Reply Date:        Suspended:        [Ver 9]

**PERMIT TYPE:** WFX / PMX / SWD Number:        Permit Date: 10/17/13 Legacy Permits/Orders: R-4549  
R-4549-A to R4549-I num. WFXs

Well No. 45 Well Name(s): Empire Abo Unit

API: 30-0 15-03188 Spud Date: 12-30-1960 New or Old: Old (UIC Class II Primacy 03/07/1982)

Footages 2310 FNL / 330 FWL Lot        Unit E Sec 30 Tsp 17S Rge 29E County Eddy

General Location: 47 miles east of Artesia Pool: Empire Abo Pool No. 22040

Operator: Apache Corp. OGRID: 873 Contact: Brian Wood / Permits West

**COMPLIANCE RULE 5.9:** Inactive Wells: 5 Total Wells: 2818 [well listed in 5] Fincl Assur: Yes Compl. Order? No IS 5.9 OK? Yes

Well File Reviewed ☒ Current Status: SI / no production, attempt to convert to SWD then PMX injection

Well Diagrams: NEW: Proposed ☐ RE-ENTER: Before Conv. ☒ After Conv. ☒ Are Elogs in Imaging?: Yes

Planned Rehab Work to Well: Redrill / and perf additional interval from 6180' to 6334' / acidize

| Well Construction Details:  | Sizes (in)<br>Borehole / Pipe | Setting<br>Depths (ft) | Cement<br>Sx or Cf | Cement Top and<br>Determination Method |
|---|-------------------------------|------------------------|--------------------|--|
| Planned <input type="checkbox"/> or Existing <input checked="" type="checkbox"/> Cond                 | —                             | —                      | —                  | —                                      |
| Planned <input type="checkbox"/> or Existing <input checked="" type="checkbox"/> Surface              | 11 / 8 5/8                    | 0 to 724               | 300                | Cr. to Surf                            |
| Planned <input type="checkbox"/> or Existing <input checked="" type="checkbox"/> Intern Prod          | 7 7/8 / 5 1/2                 | 0 to 6375              | 600                | 1,180 / Temp Survey                    |
| Planned <input type="checkbox"/> or Existing <input type="checkbox"/> Long St/Prod                    | —                             | —                      | —                  | —                                      |
| Planned <input type="checkbox"/> or Existing <input type="checkbox"/> Liner                           | —                             | —                      | —                  | —                                      |
| Planned <input checked="" type="checkbox"/> or Existing <input checked="" type="checkbox"/> OH / PERF | 7 7/8 / 5 1/2                 | 5998 - 6334            | —                  | —                                      |

| Injection Stratigraphic Units:     | Depths (ft) | Injection or Confining<br>Units | Tops? | Completion/Operation Details:   |
|------------------------------------|-------------|---------------------------------|-------|---|
| Adjacent Unit: Litho. Struc. Por.  | —           | Tubb                            | —     | Drilled TD <u>6375</u> PBDT <u>6198</u>   |
| Confining Unit: Litho. Struc. Por. | —           | Drinkard                        | —     | NEW TD <u>NA</u> NEW PBDT <u>NA</u>   |
| Proposed Inj Interval TOP:         | 5998        | Abo (Shale)                     | 5939  | NEW Open Hole <input type="checkbox"/> or NEW Perfs <input checked="" type="checkbox"/> |
| Proposed Inj Interval BOTTOM:      | 6334        | Abo (Reef)                      | 6265  | Tubing Size <u>3 1/2</u> in. Inter Coated? <u>Yes</u>                                   |
| Confining Unit: Litho. Struc. Por. | —           | Abo to TD                       | —     | Proposed Packer Depth <u>5956</u> ft  |
| Adjacent Unit: Litho. Struc. Por.  | —           | —                               | —     | Min. Packer Depth <u>5898</u> (100-ft limit)  |
|                                    |             |                                 |       | Proposed Max. Surface Press <u>1060</u> psi   |
|                                    |             |                                 |       | Admin Inj. Press <u>1200</u> (0.2 psi per ft)   |

#### AOR: Hydrologic and Geologic Information

POTASH: R-111-P ☐ Noticed NA BLM Sec Ord ☐ WIPP ☐ Noticed? NA SALADO: T:        B:        CLIFF HOUSE NA

Fresh Water: FW Formation 290' - 300' Observed Max Depth 300' Wells? 1 converted oil well Analysis? No Hydrologic Affirm Statement Yes

Disposal Fluid: Formation Source(s) Production from unit Analysis? Yes On Lease ☒ Operator Only ☐ or Commercial ☐

Disposal Interval: Injection Rate (Avg/Max BWPD): 5000 / 7000 Protectable Waters: No CAPITAN REEF: thru No adjacent 16

H/C Potential: Producing Interval? Yes Formerly Producing? Yes Method: E Log / Mudlog / DST / Depleted Other Prod. records Yes

AOR Wells: 1/2-M Radius Map? Yes Well List? Yes Total No. Wells Penetrating Interval: 12 Horizontals? 0

Penetrating Wells: No. Active Wells 6 Num Repairs? 0 on which well(s)?        Diagrams? Yes

Penetrating Wells: No. P&A Wells 6 Num Repairs? 0 on which well(s)?        Diagrams? Yes

**NOTICE:** Newspaper Date 08/14/13 Mineral Owner SLO Surface Owner SLO N. Date 08/19/13

**RULE 26.7(A):** Identified Tracts? Yes Affected Persons: COG / Yates / Conoco Phillips / Exxon Mobil / H. Yates N. Date 08/19/13

**Permit Conditions:** Issues: Two previous attempts to convert protested by BLM - "still good producer" &

Add Permit Cond: Third application - water only with new interval proposed gas injection not  
consistent with Unit Plan